HSPA+ AT Commands

Reference Guide Firmware 12.00.024

HSPA+ AT Commands Reference Guide

Model: MTSMC-H5-xx.R1, MTPCIE-H5-xx, MTC-H5-xx, MTR-H5-xx, MTR3-H5-xx, MTR-H6, MTCMR-H5-xx, MT100UCC-H5-xx, MT100EOCG-H5-xx, MTCDP-H5-xx, MTD-H5-xx, MTCBA-H5-xx

Part Number: S000574 Version: 1.0.2

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Introduction

What This Guide Describes

This guide describes the AT commands:

- ■ Hayes standard AT command set, to maintain the compatibility with existing SW programs.
- ■ 3GPP TS 27.007 specific AT command and GPRS specific commands.
- ■ 3GPP TS 27.005 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)
- ■ Standard AT commands and proprietary AT commands help you control your product.

Checking the version of the device's firmware

This guide describes commands that work with firmware version 12.00.024. To check your device's firmware version, issue the AT+GMR command.

Changes from Firmware 12.00.023 to Firmware 12.00.024

The following AT commands are changed, removed or added to this guide because the 12.00.024 firmware is modified since Firmware 12.00.023.

Changed

#AUTOBND

#BND

#CODEC

#CODECINFO

#DVI

#DVIEXT

#ENS

#EVMONI

#FTPGETPKT

#GPIO

#MONI

#PING

#PORTCFG

#PSMRI

#RXDIV

#SCFGEXT

#SPCM

#SRECV

#STIA

#TCPATCONSER

$GPSACP

$GPSQOS

$GPSR

$GPSSTOP $LTC

+CBST

+CFUN

A

D

S0

#ENHRST

#GAUTH

&D

#SERVINFO

+CSMP

#FTPAPP

#FTPPUT

#SD

#SL

#SGACT

#TEMPMON

#DNS

#ENCALG

#SH

#WAKE

#WSCRIPT

$GPSSLSR

+CSSN S25

#QSS

$LCSLK

$LCSSLP

$LCSTER

$LICLS

+CCLK

#ENAEVMONICFG

#MSCLASS

#RFSTS

#SCFG

#SCFGEXT2

#SMSATRUNCFG

#SS

#TCPATRUNCFG

+CPBR

+CPBW

+CPBF

+CPBS

+CPMS

+CGDCONT

Removed

$GPSSW

Added

+ICF

+IFC

#ALARMPIN

#CFLO

#FTPCFG

#DELAY

#CCLKMODE

#E2ESC

#ECHOCFG

#JDR

#NCIH

#SCFGEXT3

#SLASTCLOSURE

#SMSMOVE

#SSLD

#SSLEN

#SSLH

#SSLO

#SSLRECV

#SSLS

#SSLSECDATA

#SSLSEND

#SSLSECCFG

#SSLCFG

#HTTPCFG

#HTTPQRY

#HTTPSND

#HTTPRCV

#CPBGR

#CPBGW

#NWDNS

#SMSMODE

+CECALL

#ECALL

#EMRGD

#MSDPUSH

#MSDSEND

Formatting Conventions Overview

The following syntactical definitions apply:

<CR>	Carriage return character, is the command line and result code terminator character, which value, in decimal ASCII between 0 and 255, is specified within parameter S3. Default: 13.
<LF>	Linefeed character, is the character recognized as line feed character. Its value, in decimal ASCII between 0 and 255, is specified within parameter S4. The line feed character is output after carriage return character if verbose result codes are used (V1 option used) otherwise, if numeric format result codes are used (V0 option used) it does not appear in the result codes. Default: 10.
<...>	Name enclosed in angle brackets is a syntactical element. They do not appear in the command line.
[...]	Optional subparameter of a command or an optional part of Terminal Adapter (TA) information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When subparameter is not given in AT commands which have a Read command, new value equals its previous value. For AT commands that do not store the values of any of their subparameters—which are called action type commands and do not have a Read command—action performed based on the recommended default setting of the subparameter.

AT Command Syntax

The syntax rules followed by commands in this guide are similar to those of standard basic and extended AT commands. There are two types of extended commands:

- Parameter type commands. This type of command may be:
  - "set" to store a value or values for later use.
  - "read" to determine the current value or values stored.
  - "tested" to determine ranges of values supported. Each has a test command (trailing =?) to give information about the type of its subparameters. The parameters also have a read command (trailing ?) to check the current values of subparameters.
- Action type commands. This type of command may be "executed" or "tested".
  - "executed" to invoke a particular function of the equipment, which generally involves more than the simple storage of a value for later use.
  - "tested" to determine:
  - If subparameters are associated with the action, the ranges of subparameters values that are supported. If the command has no subparameters, issuing the corresponding test command (trailing =?) raises the result code "ERROR".
  - The response to the test command (trailing =?) may change in the future to allow the description of new values and functions. Note: Issuing the read command (trailing ?) causes the command to be executed.
  - Whether or not the equipment implements the action command (in this case issuing the corresponding test command - trailing =? - returns the OK result code), and, if subparameters are associated with the action, the ranges of subparameters values that are supported. Action commands do not store the values of any of their possible subparameters. Moreover: If all the subparameters of a parameter type command +CMD (or #CMD or $CMD) are optional, issuing AT+CMD=<CR> (or AT#CMD=<CR> or AT$CMD=<CR>) causes the OK result code to be returned and the previous values of the omitted subparameters to be retained.

String Type Parameters

A string, enclosed between quotes or not, is a valid string type parameter input. According to V.25ter space characters are ignored on the command line and may be used freely for formatting purposes, unless they are embedded in numeric or quoted string constants. Therefore a string containing a space character has to be enclosed between quotes to be considered a valid string type parameter. For example typing AT+COPS=1,0,"A1" is the same as typing AT+COPS=1,0,A1; typing AT+COPS=1,0,"A BB" is different from typing AT+COPS=1,0,A BB.

A string is always case sensitive.

Some commands require you to always place the input string parameters within quotes. When this is required, the command descriptions explicitly tell you so.

Command Lines

A command line is made up of three elements: the prefix, the body and the termination character. The command line prefix consists of the characters "AT" or "at". To repeat the execution of the previous command line, use the characters "A/" or "a/" or AT#/ or at#/. Using parameter S3, you can select the termination character. The default is <CR>.

The structures of the command line are:

- ATCMD1<CR> where AT is the command line prefix, CMD1 is the body of a basic command and <CR> is the command line terminator character. The name of the command never begins with the character "+"
- ATCMD2=10<CR> where 10 is a subparameter.
- AT+CMD1;+CMD2=, ,10<CR> These are two examples of extended commands They are delimited with semicolon. In the second command the subparameter is omitted. The name of the command always begins with the character "+".
  - +CMD1?<CR> This is a read command for checking current subparameter values.
  - +CMD1=?<CR> This is a test command for checking possible subparameter values. These commands might be performed in a single command line as shown below: ATCMD1 CMD2=10+CMD1;+CMD2=, ,10;+CMD1?;+CMD1=?<CR>
- It is recommended to separate the basic commands and the extended commands into different command lines.
- Avoid placing several action commands in the same command line. If one command fails, an error message is received. However, it is not possible to determine which command failed the execution.
- If command V1 is enabled (verbose responses codes) and all commands in a command line performed successfully, result code <CR><LF>OK<CR><LF> is sent from the TA to the TE, if subparameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code <CR><LF>ERROR<CR><LF> is sent and no subsequent commands in the command line are processed.
- If command V0 is enabled (numeric responses codes), and all commands in a command line performed successfully, result code 0<CR> is sent from the TA to the TE. If sub-parameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code 4<CR> and no subsequent commands in the command line are processed.
- In case of errors depending on ME operation, ERROR (or 4) response may be replaced by +CME ERROR: <err> or +CMS ERROR: <err>.

Note: The command line buffer accepts a maximum of 80 characters. If this number is exceeded none of the commands are executed and TA returns ERROR.

Information Responses And Result Codes

For the previous examples, if verbose response format is enabled the terminal adapter (TA) response might appear as:

- Information response to +CMD1? <CR><LF>+CMD1:2,1,10<CR><LF>
- Information response to +CMD1=? <CR><LF>+CMD1(0-2),(0,1),(0-15)<CR><LF>
- Final result code <CR><LF>OK<CR><LF>

Result codes according to ITU-T V.25ter

Two types of result codes include:
- Result codes that inform about progress of TA operation, for example connection establishment CONNECT.
- Result codes that indicate occurrence of an event not directly associated with issuance of a command from TE (for example ring indication RING).

Numeric form	Verbose form
0	OK
1	CONNECT or CONNECT <text>. where <text> can be"300", "1200", "2400", "4800", "9600", "14400" or "1200/75".
2	RING.
3	NO CARRIER.
4	ERROR.
6	NO DIALTONE.
7	BUSY
8	NO ANSWER.
10	CONNECT 2400.
11	CONNECT 4800.
12	CONNECT 9600.
15	CONNECT 14400.
23	CONNECT 1200/75.

Command Response Time-Out

If response codes are enabled, which is the default setting, then every command issued to the module returns a result response. The time needed to process the given command and return the response varies, depending on the command type. Commands that do not interact with the SIM or the network, and only involve internal setups or readings, have an immediate response. Commands that interact with the SIM or the network can take many seconds to send a response, depending on:

- SIM configuration—for example, number of contacts stored in the phonebook, number of stored SMS.
- The network the command may interact with.

Timing of Issuing Commands

The chain Command -> Response is always respected. You may not issue a new command until the module finishes sending all of its response result codes. This applies especially to applications that "sense" the OK text and therefore may send the next command before the complete code <CR><LF>OK<CR><LF> is sent by the module.

It is recommended to wait for at least 20ms between the end of the reception of the response and the issue of the next AT command. If the response codes are disabled, and as such, the module does not report responses to the command, then the 20ms pause time is respected.

During command mode, due to hardware limitations, under severe CPU load the serial port can lose some characters if placed in autobauding at high speeds. Therefore if you encounter this problem fix the baud rate with +IPR command. The flow control in command mode is enabled.

Storing Values Set by Commands

Factory Profile And User Profiles

The wireless module stores the values set by several commands in the internal, non-volatile memory (NVM, allowing to remember this setting even after power off. In the non-volatile memory these values are set either as factory profile or as user profiles.

There are two customizable user profiles and one factory profile in the non-volatile memory of the device: By default the device starts with user profile 0 equal to factory profile.

For backward compatibility each profile is divided into two sections:

- Base section which was historically the one that was saved and restored in early releases of code
- Extended section which includes all the remaining values

The &W command is used to save the actual values of both sections of profiles into the non-volatile memory user profile.

Commands &Y and &P are both used to set the profile to be loaded at startup.

&Y instructs the device to load only the base section at startup. &P instructs the device to load, at startup, the full profile: base + extended sections.

For commands in the base section, the &F command resets values to factory profile defaults. &F1 resets to factory profile values the full set of base + extended section commands.

The values set by other commands are stored in non-volatile memory outside the profile. Some values are always stored, without issuing &W. Other values are stored by issuing specific commands (+CSAS, #SLEDSAV, #SKTSAV, #ESAV). All of these values are read at power-up.

The values set by the following commands are stored in the profile base section.

GSM DATA MODE	+CBST
115200	+IPR
COMMAND ECHO	E
RESULT MESSAGES	Q
VERBOSE MESSAGES	V

EXTENDED MESSAGES	X
DSR (C107) OPTIONS	&S
DTR (C108) OPTIONS	&D
DCD (C109) OPTIONS	&C
RI (C125) OPTIONS	\R
POWER SAVING	+CFUN
DEFAULT PROFILE	&Y0
S REGISTERS	S0;S3;S4;S5;S7;S25;S30;S38
CHARACTER FORMAT	

The values set by following commands are stored in the profile extended section and they depend on the specific AT instance. See +CMUX.

- +FCLASS
- +CSCS
- +CR
- +CREG
- +CLIP
- +CRLP
- +CRC
- +CLIR
- +CSVM
- +CCWA
- +CUSD
- +CAOC
- +CSSN
- +CIND
- +CMER
- +CPBS
- +CMEE
- +CGREG
- +CGEREP
- +CMGF
- +CSDH
- +CNMI
- #QSS
- #ECAM
- #SMOV
- #MWI
- #NITZ

- #SKIPESC
- #CFF
- #STIA
- +CSTF
- +CSDF
- +CTZU
- +CAPD
- +CCWE
- +CSIL
- +CTZR
- #NWEN
- #PSNT
- #SIMPR
- +COLP
- #CESTHLCK
- +DR
- $GPSNUM
- +CSTA

The values set by the following commands are stored in the profile extended section and they do not depend on the specific AT instance. See +CMUX.

- +CALM
- +CRSL
- +CMUT5
- +CLVL5
- +VTD
- +CSCB
- #CAP5
- #SRS5
- #SRP5
- #STM5
- #TSVOL
- #E2SMSRI
- #PSEL
- #CODEC
- #SHFEC5
- #HFMICG5
- #HSMICG
- #SHFSD5
- #SPKMUT

- #NITZ
- #E2SLRI
- #HFRECG
- #HSRECG
- #SHFAGC
- #SHSAGC
- #SHSEC
- #SHSNR
- #SHFNR
- #SHSSD
- #DVI

Note: +CSCB is still stored in the profile extended section only for backward compatibility issues: its actual storing and restoring are accomplished issuing +CSAS and +CRES

The values set by the following commands are automatically stored in non-volatile memory, without issuing any storing command and independently from the profile (unique values), and are automatically restored at startup:

- #SELINT
- +COPS
- +CGCLASS
- +CGDCONT
- +CGQMIN
- +CGQREQ
- #ENS
- #SCFG
- #AUTOATT
- #DNS
- #ICMP
- #GSMCONT
- +CGSMS
- +CGEQMIN
- +CGEQREQ

Note: +COPS is partially stored in non-volatile memory. See command description.

The values set by the following commands are stored in non-volatile memory on demand, issuing specific commands and independently from the profile:

- +CSCA
- +CSMP
- +CSCB

Stored by +CSAS command and restored by +CRES command.

- #SLED

Note: Both commands +CSAS and +CRES deal with non-volatile memory, intending for it either the non-volatile memory and the SIM storage.

Stored by #SLEDSAV command
- #VAUX

Stored by #SKTSAV command and automatically restored at startup. #SKTRST command restores default values.
- #ESMTP
- #EADDR
- #EUSER
- #EPASSW

Stored by #ESAV command and automatically restored at startup. #ERST command restores default values

Format for Entering AT Commands

Starting a Command Line AT

The prefix AT is a two-character abbreviation for Attention. With one exception—the AT#/ prefix—you always use AT to start a command line that is sending commands from Terminal Equipment (TE) to Terminal Adapter (TA).

Notes
- If you want to learn more about this command, refer to the 3GPP TS 27.007 specification.

Repeat Last Command AT#/

Use this prefix to re-execute the last received command.

Last Command Automatic Repetition A/

If the prefix A/ or a/ is issued, the module immediately re-executes the body of the preceding command line. No editing is possible and no termination character is necessary. A command line may be repeated multiple times through this mechanism, if desired. If A/ is issued before any command line is executed, the preceding command line is assumed to have been empty (that results in an OK result code).

Notes
- This command works only at fixed IPR.
- The A/ command is similar to the custom prefix AT#/, in that both prefixes cause the last command to be re-executed. However, the prefix AT#/ does not need a fixed IPR.
- If you want to learn more about this command, refer to the V.25ter specification.

V.250 AT Commands

Generic Modem Control

Set to Factory-Defined Configuration &F

Execute this command to set the configuration parameters to default values specified by the manufacturer. This includes hardware configuration switches and other manufacturer-defined criteria.

Syntax

Command	Command type
AT&F[<value>]	Set

Parameters and Values

<value>	**Hardware version, a string of no more than 31 characters.**
0	Only the factory profile base section parameters are set to default values.
1	Full factory profile restored, that is, the factory profile base section and the extended section are restored.

Notes

- If parameter <value> is omitted, the command has the same behavior as AT&F0.
- Reference: V.25ter.

Soft Reset Z

Execute this command to the base section of the specified user profile and the extended section of the default factory profile..

Syntax

Command	Command type
ATZ[<n>]	

Parameters and values

<n>	Hardware version, a string of no more than 31 characters.
0-1	User profile number.

Notes

- Any call in progress is terminated.
- If parameter <n> is omitted, the command has the same behavior as ATZ0.
- Reference: V.25ter.

Select Active Service Class AT+FCLASS

Use the set command to set the wireless module in specified connection mode (data, voice). All calls done after you set FCLASS are data or voice.

Use the READ command to query the current mode.

Use the TEST command to return all supported values of the parameters <n>.

Syntax

Command	Command type
AT+FCLASS=<n>	
AT+FCLASS?	
AT+FCLASS=?	

Parameters and values

<value>	
0	Data.
8	Voice.

Notes

■ Reference: 3GPP TS 27.007

Default Reset Basic Profile Designation &Y

Use this command to define the basic profiles that load on startup.

Syntax

Command	Command type
AT&Y[<n>]	

Parameters and values

<n>

0-1   Profile. The wireless module can store 2 complete configurations See &W. Default: 0.

Notes

■ Different from command Z<n>, which loads just once the desired profile, the one chosen through command &Y is loaded on every startup..

■ If parameter is omitted, the command has the same behavior as AT&Y0.

Default Reset Full Profile Designation &P

Use this command to specify which full profile is loaded on startup.

Syntax

Command	Command type
AT&P[<n>]	

Parameters and values

<n>

0-1 Profile number. The wireless module can store 2 full configurations. See &W.

Notes

- Different from command Z<n>, which loads just once the desired profile, the one chosen through command &P is loaded on every startup.
- If parameter is omitted, the command has the same behavior as AT&P0.

Store Current Configuration &W

Use this command to store the complete configuration of the device in profile <n>.

Syntax

Command	Command type
AT&W[<n>]	

Parameters and values

<n>

0-1 Profile.

Notes

- If parameter is omitted, the command behaves the same as AT&W0.

Store Telephone Number &Z

Use this command to store the telephone number <nr> in the record <n>. The records cannot be overwritten. You must clear them before rewriting.

Syntax

Command	Command type
AT&Z<n>=<nr>	

Parameters and values

<n> Phonebook record.

<nr> String type, telephone number.

Notes

- The wireless module has built-in, non-volatile memory where you can store 10 telephone numbers, each with a maximum 24 digits.
- To delete the record <n>, issue the command AT&Z<n>=<CR>.
- Use the command &N to view the records in the module memory
- To dial the telephone number stored in the record use the command ATDS=<n>.

Display Stored Numbers &N

Execute command returns the telephone number stored at the <n> position in the internal memory

Syntax

Command	Command type
AT&N[<n>]	

Parameters and values

      <n>   Phonebook record number.

Notes

- If parameter <n> is omitted then all the internal records are shown.

Manufacturer Identification +GMI

Execute command returns the manufacturer identification.

Syntax

Command	Command type
AT+GMI	Execute

Notes

- Reference: V.25ter.

Model Identification +GMM

Execute command returns the model identification.

Syntax

Command	Command type
AT+GMM	Execute

Notes

- Reference: V.25ter.

Revision Identification +GMR

Execute command returns the revision number of the firmware.

Syntax

Command	Command type
AT+GMR	Execute

Notes

- Reference: V.25ter.

Capabilities List +GCAP

Execute command returns the equipment supported command set list.

Syntax

Command	Command type
AT+GCAP	Execute

Notes

- Reference: V.25ter.
- Response indicates:
    - +CGSM: GSM ETSI command set.
    - +DS: Data Service common modem command set.
    - +MS: Mobile Specific command set.
    - +ES: WCDMA data Service common modem command set.
    - +FCLASS: Fax class.

Serial Number +GSN

Execute command returns the device board serial number.

Syntax

Command	Command type
AT+GSN	Execute

Notes

- The number returned is not the IMSI, it is only the board number.
- Reference: V.25ter.

Display Configuration and Profile &V

Execute command returns some of the base configuration parameters settings.

Syntax

Command	Command type
AT&V	Execute

Notes

- The row of information about **CTS (C106) OPTIONS** is in the output of **&V** only for compatibility reasons and represents only a dummy value.

Display Configuration and Profile &V0

Execute command returns all the configuration parameters settings.

Syntax

Command	Command type
AT&V0	Execute

Notes

- ■ This command is the same as &V, it is included only for backwards compatibility.
- ■ The row of information about CTS (C106) OPTIONS is in the output of &V0 only for compatibility reasons and represents only a dummy value.

S Registers Display &V1

Use this command to get the value of the S registers in decimal and hexadecimal value in the format:

REG	DEC	HEX
<reg0>	<dec>	<hex>
<reg1>	<dec>	<hex>

Syntax

Command	Command type
AT&V1	

Parameters and values

<regn>	S register number.
<dec>	Current value in decimal notation.
<hex>	Current value in hexadecimal notation..

Extended S Registers Display &V3

Execute command returns the value of the S registers in decimal and hexadecimal value in the format:

REG	DEC	HEX
<reg0>	<dec>	<hex>
<reg1>	<dec>	<hex>

Syntax

Command	Command type
AT&V3	Execute

Parameters and values

<regn>	S register number.
000-005	
007	
012	

025

030

038

<dec>　　　　Current value in decimal notation.

<hex>　　　　Current value in hexadecimal notation..

Display Last Connection Statistics &V2

Execute command returns the last connection statistics & connection failure reason.

Syntax

Command	Command type
AT&V2	Execute

Single Line Connect Message \V

Execute command set single line connect message.

Syntax

Command	Command type
AT\V	Execute

Parameters and values

<n>

0　　　　Off.

1　　　　On.

Country of Installation +GCI

Set command selects the installation country code according to ITU-T.35 Annex A.

Read reports the currently selected country code.

Test command reports the supported country codes.

Syntax

Command	Command type
AT+GCI=<code>	Set
AT+GCI?	Read
AT+GCI=?	Test

Parameters and values

<code>

59　　　　Currently supports only the Italy country code.

Notes

- Reference: V.25ter.

DTE Modem Interface Control

Command Echo E

Set command enables or disables the command echo.

Syntax

Command	Command type
ATE[<n>]	Set

Parameters and values

<n>

0   Disables command echo.

1   Enables command echo, hence command sent to the device are echoed back to the DTE before the response is given. Default: 1.

Notes

- If parameter is omitted, the command has the same behavior as ATE0.
- Reference: V.25ter.

Quiet Result Codes Q

Set command enables or disables the result codes.

Syntax

Command	Command type
ATQ[<n>]	Set

Parameters and values

<n>

0   Enables result codes. Default: 0.

1   Disables result codes.

2   Disables result codes. Only for backward compatibility.

Notes

- After issuing either ATQ1 or ATQ2 every information text transmitted in response to commands is not affected.
- If parameter is omitted, the command has the same behavior as ATQ0.

Examples

After issuing ATQ1 or ATQ2

AT+CGACT=?

+CGACT: (0-1) nothing is appended to the response

Response Format V

Set command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form. For more information about the result codes, refer to "Information Responses And Result Codes".

Syntax

Command	Command type
ATV[<n>]	Set

Parameters and values

<n>

0   Limited headers and trailers and numeric format of result codes.

         information responses <text><CR><LF>

         result codes <numeric code><CR>

1   Full headers and trailers and verbose format of result codes. Default: 1.

         information responses <CR><LF>

         <text><CR><LF>

         result codes <CR><LF>

         <verbose code><CR><LF>

Notes

- The <text> portion of information responses is not affected by this setting.
- If parameter is omitted, the command has the same behavior as ATV0.
- Reference: V.25ter.

Extended Result Codes X

Set command selects the result code messages subset that the modem uses to inform the DTE of command results.

Syntax

Command	Command type
ATX[<n>]	Set

Parameters and values

<n>

0   On entering dial-mode CONNECT result code is given; OK, CONNECT, RING, NO CARRIER, ERROR, NO ANSWER result codes are enabled . Dial tone and busy detection (NO DIALTONE and BUSY result codes) are disabled.

1-4	On entering dial-mode CONNECT <text> result code is given; all the other result codes are enabled. **Default: 1.**

Notes

- ■ If parameter is omitted, the command has the same behavior as ATX0..
- ■ For complete control on CONNECT response message see +DR command.
- ■ Reference: V.25ter.

Identification Information I

Execute command returns one or more lines of information text followed by a result code.

Syntax

Command	Command type
ATI[<n>]	Execute

Parameters and values

<n>

0	Numerical identifier.
1	Module checksum.
2	Checksum check result.
3	Manufacturer.
4	Product name..
5	DOB version.

Notes

- ■ If parameter is omitted, the command has the same behavior as ATI0.
- ■ Reference: V.25ter.

Data Carrier Detect (DCD) Control &C

Set command controls the RS232 DCD output behavior.

Syntax

Command	Command type
AT&C[<n>]	Set

Parameters and values

<n>

0	DCD remains high always.
1	DCD follows the Carrier detect status: if carrier is detected DCD is high, otherwise DCD is low. **Default: 1**.
2	DCD off while disconnecting.

Notes

- ■ If parameter is omitted, the command has the same behavior as AT&C0.
- ■ Reference: V.25ter.

Data Terminal Ready (DTR) Control &D

Set command controls the module behavior to the RS232 DTR transitions.

Syntax

Command	Command type
AT&D[<n>]	Set

Parameters and values

<n>

0   Device ignores DTR transitions. If +CVHU current setting difference from 2 then every setting AT&D0 is equivalent to AT&D5**Default: 0.**

1   When the MODULE is connected, the High to Low transition of DTR pin sets the device in command mode, the current connection is NOT closed. If +CVHU current setting is different from 2 then issuing AT&D1 is equivalent to AT&D5

2   When the module is connected, the high to low transition of DTR pin sets the device in command mode, and the current connection is closed; if +CVHU current setting is different from 2 then issuing AT&D2 is equivalent to AT&D5

3   Device ignores DTR transitions. If +CVHU current setting is different from 2 then issuing AT&D3 is equivalent to AT&D5.

5   C108/1 operation is enabled. Same behavior as for <n>=2.

Notes

- ■ If a connection is set up issuing either #SKTD or #SKTOP, then AT&D1 has the same effect as AT&D2. If a connection is set up issuing AT#SD then AT&D1 and AT&D2 have different effect, as described above.
- ■ If parameter is omitted, the command has the same behavior as AT&D0.
- ■ If AT&D2 is issued, the call is drop on falling DTR edge and NO CARRIER exits on rising DTR edge.
- ■ Reference: V.25ter.

Data Set Ready (DSR) Control &S

Set command controls the RS232 DSR pin behavior.

Syntax

Command	Command type
AT&S[<n>]	Set

Parameters and values

<n>

0   Always high.

1	Follows the GSM traffic channel indication.
2	High when connected.
3	High when device is ready to receive commands. **Default: 3**

Notes

- If option 1 is selected then DSR is tied high when the device receives from the network the GSM traffic channel indication.
- In power saving mode the DSR pin is always tied low.
- If parameter is omitted, the command has the same behavior as AT&S0.

Ring (RI) Control \R

Set command controls the RING output pin behavior.

Syntax

Command	Command type
AT\R[<n>]	Set

Parameters and values

<n>	
0	RING on during ringing and further connection.
1	RING on during ringing. Default: 1.
2	RING follows the ring signal.

Notes

- To check the ring option status use the &V command.
- If parameter is omitted, the command has the same behavior as AT\R0.

Fixed DTE Interface Rate +IPR

Set command specifies the DTE speed at which the device accepts commands during command mode operations; it may be used to fix the DTE-DCE interface speed.

Read command returns the current value of +IPR parameter.

Test command returns the list of fixed-only <rate> values in the format:

+IPR: (list of fixed-only <rate> values)

Syntax

Command	Command type
AT+IPR=<rate>	Set
AT+IPR?	Read
AT+IPR=?	Test

Parameters and values

\<rate\>	
300	
1200	
2400	
4800	
9600	
19200	
38400	
57600	
115200	**Default: 115200**
230400	
460800	
921600	

Notes

- Rate can be higher than 115200. Maximum value depends on specific product. Check this value with AT+IPR=?.
- Reference: V.25ter.

DTE-Modem Character Framing +ICF

Set command defines the asynchronous character framing to be used when autobauding is disabled.

Read command returns current settings for subparameters \<format\> and \<parity\>. If current setting of subparameter \<format\> is neither 2 nor 5, the current setting of subparameter \<parity\> will always be represented as 0.

Test command returns the ranges of values for the parameters \<format\> and \<parity\>

Syntax

Command	Command type
AT+ICF=\<format\> [,\<parity\>]	Set
AT+ICF?	Read
AT+ICF=?	Test

Parameters and values

\<format\>	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.
1 - 8 data, 2 stop	

2 - 8 Data, 1 Parity, 1 Stop	
3 - 8 Data, 1 Stop	
5 - 7 Data, 1 Parity, 1 Stop	
<parity>	Determines how the parity bit is generated and checked, if present; setting this subparameter is mandatory and has a meaning only if <format> subparameter is either 2 or 5 otherwise is not allowed.
0	Odd
1	Even

Notes

■ Reference: V.25ter.

Examples

```
8N2
AT+ICF = 1
OK
8O1
AT+ICF = 2,0
OK
8E1
AT+ICF = 2,1
OK
8N1
AT+ICF = 3
OK
7O1
AT+ICF = 5,0
OK
7E1
AT+ICF = 5,1
OK
```

DTE-Modem Local Flow Control +IFC

Set command selects the flow control behavior of the serial port in both directions: from DTE to modem (<by_ta> option) and from modem to DTE (<by_te>)

Read command returns active flow control settings.

Test command returns all supported values of the parameters <by_te> and <by_ta>.

Syntax

Command	Command type
AT+IFC=<by_te>, <by_ta>	Set

Command	Command type
AT+IFC?	Read
AT+IFC=?	Test

Parameters and values

<by_te>   Flow control option for the data received by DTE

   0   flow control None

   2   C105 (RTS) (factory default)

<by_ta>   - flow control option for the data sent by modem Note: only possible commands are AT+IFC=0,0 and AT+IFC=2,2.

   0   flow control None

   2   C106 (CTS) (factory default)

Notes

■ Reference: V.25ter.

Call Control

Answer A

Execute command answers an incoming call if automatic answer is disabled.

Syntax

Command	Command type
ATA	Execute

Notes

■ This command must be the last in the command line and must be followed immediately by a <CR> character.

■ Data only products do not start the call and command answer is ERROR if a voice call is requested.

■ Reference: V.25ter.

Dial D

Execute command starts a call to the phone number given as parameter.

If ";" is present, a voice call to the given number is performed, regardless of the current value of the connection mode set by +FCLASS command.

Syntax

Command	Description
ATD<number>[;]	**<number>** Phone number to be dialed.

Command	Description
ATD><str>[;]	Issues a call to phone number which corresponding alphanumeric field is <str>; all available memories are searched for the correct entry. If ";" is present a voice call is performed. <str> - alphanumeric field corresponding to phone number; it must be enclosed in quotation marks. Parameter **<str>** is case sensitive. **Note:** Used character set is the one selected with +CSCS.
ATD><mem><n>[;]	Issues a call to phone number in phonebook memory storage **<mem>**, entry location <n> (available memories may be queried with AT+CPBS=?). If ";" is present a voice call is performed. Parameters: **<mem>** - phonebook memory storage; it must not be enclosed in quotation marks. SM - SIM phonebook FD - SIM fixed dialing-phonebook LD - SIM last-dialing-phonebook MC - device missed (unanswered received) calls list RC - ME received calls list MB - mailbox numbers stored on SIM, if this service is provided by the SIM. See #MBN. <n> - entry location; Ensure it is in the range of locations available in the memory used.
ATD><n>[;]	Issues a call to phone number in entry location <n> of the active phonebook memory storage. See +CPBS. If ";" is present a voice call is performed. **<n>** - active phonebook memory storage entry location; it should be in the range of locations available in the active phonebook memory storage.
ATDL	Issues a call to the last number dialed.

Command	Description
ATDS=<nr>[;]	Issues a call to the number stored in the module internal phonebook position number <nr>. If ";" is present a voice call is performed. **<nr>** - internal phonebook position to be called. See commands &N and &Z.
ATD<number>I[;] ATD<number>i[;]	Issues a call overwriting the CLIR supplementary service subscription default value for this call If ";" is present a voice call is performed. I - invocation, restrict CLI presentation i - suppression, allow CLI presentation
ATD<number>G[;] ATD<number>g[;]	Issues a call checking the CUG supplementary service information for the current call. Refer to +CCUG command. If ";" is present a voice call is performed.
ATD*<gprs_sc> [*<addr>][*[<L2P>] [*[<cid>]]]#	This command is specific of GPRS function and causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN. **<gprs_sc>** - GPRS Service Code, a digit string (value 99) that identifies a request to use the GPRS **<addr>** - string that identifies the called party in the address space applicable to the PDP. **<L2P>** - a string that indicates the layer 2 protocol. For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents are used: 1 - PPP **<cid>** - Digit that specifies a particular PDP context definition. See +CGDCONT.

Notes

- Data only products do not start the call and command answer is ERROR is a voice call is requested.
- The escape sequence creates a closure of the link.
- Reference: V.25ter.

Example

To dial a number in SIM phonebook entry 6:

ATD>SM6

OK

To have a voice call to the 6-th entry of active phonebook:

ATD>6;
OK

To call the entry with alphanumeric field "Name":

ATD>"Name";

Disconnect H

Execute command closes the current conversation (voice or data).

Syntax

Command	Command type
ATH	Execute

Notes

- This command can be issued only in command mode; when a data conversation is active the device is in on-line mode (commands are not sensed and characters are sent to the other party), hence escape sequence is required before issuing this command, otherwise if &D1 option is active, DTR pin has to be tied Low to return in command mode.
- Reference: V.25ter.

Compression Control

Data Compression Reporting +DR

Set command enables or disables the data compression reporting upon connection.

Read command returns current value of <n>.

Test command returns all supported values of the parameter <n>.

Syntax

Command	Command type
AT+DR=<n>	Set
AT+DR?	Read
AT+DR=?	Test

Parameters and values

<n>

0   Data compression reporting disabled.

1   Data compression reporting enabled upon connection. If enabled, the following intermediate result code is transmitted before the final result code: +DR: <compression> The only supported value for <compression> is "NONE".

Notes

■ Reference: V.25ter.

S Parameters

Basic commands that begin with the letter "S" are known as "S-Parameters". The number following the "S" indicates the "parameter number" being referenced. If the number is not recognized as a valid parameter number, an ERROR result code is issued.

If no value is given for the subparameter of an S-Parameter, an ERROR result code is issued and the stored value left unchanged.

Notes

■ Reference: V.25ter.

Number of Rings to Auto Answer S0

Set command sets the number of rings required before device automatically answers an incoming call.

Read command returns the current value of S0 parameter.

Syntax

Command	Command type
ATS0=[<n>]	Set
ATS0?	Read

Parameters and values

<n>	Number of rings.	
0	Auto answer disabled. **Default: 0.**	
1-255	Number of rings required before automatic answer.	

Notes

■ Data only products ignore command setting and have auto answer disabled if incoming call is a voice call.
■ Reference: V.25ter.

Ring Counter S1

S1 is incremented each time the device detects the ring signal of an incoming call. S1 is cleared as soon as no ring occurs.

Read command returns the value of this parameter.

Syntax

Command	Command type
ATS1	
ATS1?	Read

Notes

■ **Command Line Termination Character S3**

Set command sets the value of the character either recognized by the device as command line terminator and generated by the device as part of the header, trailer, and terminator for result codes and information text, along with S4 parameter.

Read command returns the current value of S3 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS3=[<char>]	Set
ATS3?	Read

Parameters and values

<char>	Command line termination character (decimal ASCII). 0-127	
0-127	**Default: 13** (ASCII <CR>).	
	Note: The "previous" value of S3 is used to determine the command line termination character for entering the command line containing the S3 setting command. However the result code issued uses the "new" value of S3, as set during the processing of the command line.	

Notes

■ Reference: V.25ter.

Response Formatting Character S4

Set command sets the value of the character generated by the device as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter.

Read command returns the current value of S4 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS4=[<char>]	Set
ATS4?	Read

Parameters and values

<char>	Response formatting character (decimal ASCII).
0-127	**Default: 10** (ASCII LF).

Notes

■ If the value of S4 is changed in a command line the result code issued in response of that command line uses the new value of S4.

■ Reference: V.25ter.

Command Line Editing Character S5

Set command sets the value of the character recognized by the device as a request to delete from the command line the immediately preceding character.

Read command returns the current value of S5 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS5=[<char>]	Set
ATS5?	Read

Parameters and values

<char>	Command line editing character (decimal ASCII).
0-127	**Default: 8.** (ASCII BS).

Notes

■ Reference: V.25ter.

Connection Completion Time-Out S7

Set command sets the amount of time, in seconds, that the device allows between either answering a call (automatically or by A command) or completion of signaling of call addressing information to network (dialing), and establishment of a connection with the remote device.

Read command returns the current value of S7 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS7=[<tout>]	Set
ATS7?	Read

Parameters and values

<tout>	Number of seconds.
1-255	**Default: 60.**
	Note: The delay is effective only if its value is greater than 5. Command not yet implemented.

Notes

■ Reference: V.25ter.

S12

This command will be defined for a future release. The default for this command is 050.

Delay to DTR Off S25

Set command defines the amount of time, in hundredths of second, that the device ignores the DTR for taking the action specified by command &D.

Read command returns the current value of S25 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS25=[<time>]	Set
ATS25?	Read

Parameters and values

<time>	Expressed in hundredths of a second.
0-255	**Default: 5.**
	Note: The delay is effective only if its value is greater than 5. Command not yet implemented.

Notes

- In power saving (for example CFUN 5 with DTR low) DTR has to be off at least 3 seconds for taking the action specified by command &D, independently of S25 parameter.

S38

This command will be defined for a future release. Default is 0000.

3GPP TS 27.007 AT Comands

General

Request Manufacturer Identification +CGMI

Execute command returns the device manufacturer identification code without command echo.

Test command returns OK result code.

Syntax

Command	Command type
AT+CGMI	Execute
AT+CGMI=?	Test

Notes

■ Reference: 3GPP TS 27.007.

Request Model Identification +CGMM

Execute command returns the device model identification code without command echo.

Test command returns OK result code.

Syntax

Command	Command type
AT+CGMM	Execute
AT+CGMM=?	Test

Notes

■ Reference: 3GPP TS 27.007.

Request Revision Identification +CGMR

Execute command returns device software revision number without command echo.

Test command returns OK result code.

Syntax

Command	Command type
AT+CGMR	Execute
AT+CGMR=?	Test

Notes

■ Reference: 3GPP TS 27.007.

Request Product Serial Number Identification +CGSN

Execute command returns the product serial number, identified as the IMEI of the mobile, without command echo.

Test command returns OK result code.

Syntax

Command	Command type
AT+CGSN	Execute
AT+CGSN=?	Test

Notes

- Reference: 3GPP TS 27.007.

Select TE Character Set +CSCS

Set command sets the current character set used by the device.

Read command returns the current value of the active character set.

Test command returns the supported values for parameter <chset>.

Syntax

Command	Command type
AT+CSCS=[<chset>]	Set
AT+CSCS?	Read
AT+CSCS=?	Test

Parameters and values

    <chset>   Character set.

    GSM   GSM default alphabet (3GPP TS 23.038)..

    IRA   International reference alphabet (ITU-T T.50). **Default: IRA.**

    8859-1   ISO 8859 Latin 1 character set.

    PCCP437   PC character set Code Page 437.

    UCS2   16-bit universal multiple-octet coded character set (ISO/IEC10646).

Notes

- Reference: 3GPP TS 27.007.

International Mobile Subscriber Identity (IMSI) +CIMI

Execute command returns the value of the Internal Mobile Subscriber Identity stored in the SIM without command echo.

Test command returns OK result code.

Syntax

Command	Command type
AT+CIMI	Execute
AT+CIMI=?	Test

Notes

- A SIM card must be present in the SIM card housing, otherwise the execute command returns ERROR.
- Reference: 3GPP TS 27.007.

Multiplexing Mode +CMUX

Set command enables or disables the 3GPP TS 27.010 multiplexing protocol control channel.

Read command returns the current value of <mode>, <subset>, <port_speed>, <N1>, <T1>, <N2>, <T2>, <T3> and <k> parameters, in the format:

+CMUX: <mode>,<subset>, <port_speed>, <N1>, <T1>, <N2>, <T2>, <T3>,<k>.

Test command returns the range of supported values for <mode>, <subset>, <port_speed>, <N1>, <T1>, <N2>, <T2>, <T3> and <k>.

Syntax

Command	Command type
AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[, <T3>[,<k>]]]]]]]]	Set
AT+CMUX?	Read
AT+CMUX=?	Test

Parameters and values

<mode>	Multiplexer transparency mechanism.
0	Basic option. Currently the only supported value.
<subset>	
0	UIH frames used only; it is currently the only supported value.
<port_speed>	Transmission rate.
5	115 200 bit/s. **Default: 5**.
<N1>	Maximum frame size.
1-1509	**Default: 121.**
<TI>	Acknowledgement timer in units of ten milliseconds.
1-255	**Default: 10** (100 ms).
<N2>	Maximum number of re-transmissions.
0-100	Currently only the range 0-5 is supported. **Default: 3.**
<T2>	Response timer for the multiplexer control channel in units of ten milliseconds.

2-255	**Default: 30** (300 ms). Note: T2 must be longer than T1.
<T3>	Wake up response timer in seconds.
1-255	Currently not supported, in case of read command 0 is returned.
<k>	Window size, for Advanced operation with Error Recovery options.
1-7	Currently not supported. For read command, 0 is returned.

Notes

■ All the CMUX protocol parameters are fixed as defined in GSM07.10 and cannot be changed.
■ Reference: 3GPP TS 27.007, 3GPP TS 27.010.

Call Control

Hang Up Call +CHUP

Execute command cancels all active and held calls, as well as multi-party sessions, if running.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CHUP	Execute
AT+CHUP=?	Test

Notes

■ Reference: 3GPP TS 27.007.

Select Bearer Service Type +CBST

Set command sets the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls originate. This setting is also used during mobile terminated data call setup, in case of single numbering scheme calls.

Read command returns current value of the parameters <speed>, <name> and <ce>.

Test command returns the supported range of values for the parameters.

Syntax

Command	Command type
AT+CBST=[<speed>[,<name>[,<ce>]]]	Set
AT+CBST?	Read
AT+CBST=?	Test

Parameters and values

<speed>	Data rate.
0	Autobauding. Automatic selection of the speed. **Default: 0.**

4	2400 bps (V.22bis).
5	2400 bps (V.26ter).
6	4800 bps (V.32).
7	9600 bps (V.32).
12	9600 bps (V.34).
14	14400 bps (V.34).
15	19200 bps (V.34).
16	28800 bps (V.34).
17	33600 bps (V.34).
68	2400 bps (V.110 or X.31 flag stuffing).
70	4800 bps (V.110 or X.31 flag stuffing).
71	9600 bps (V.110 or X.31 flag stuffing).
75	14400 bps (V110 or X.31 flag stuffing).
79	19200 bps (V.110 or X.31 flag stuffing).
80	28800 bps (V.110 or X.31 flag stuffing).
81	38400 bps (V.110 or X.31 flag stuffing).
82	48000 bps (V.110 or X.31 flag stuffing).
83	56000 bps (V.110 or X.31 flag stuffing).
84	64000 bps (X.31 flag stuffing).
115	56000 bps (bit transparent).
116	64000 bps (bit transparent).
120	32000 bps (PIAFS32k).
121	64000 bps (PIAFS64k).
130	28800 bps (multimedia).
131	32000 bps (multimedia).
132	33600 bps (multimedia).
133	56000 bps (multimedia).
134	64000 bps (multimedia).
<name>	Bearer service name.
0	Data circuit asynchronous. **Default: 0**.
1	Data circuit synchronous.
<ce>	Connection element.
0	Transparent.
1	Non transparent. **Default: 1**.

Notes

- The following settings are not supported:
  - AT+CBST=0,0,0
  - AT+CBST=14,0,0
  - AT+CBST=75,0,0
- If <name>=1 then <speed>=0,4,6,7,14,68,70,71,75 is not supported.
- The following settings are recommended
  - AT+CBST=71,0,1 for mobile-to-mobile calls
  - AT+CBST=7,0,1 for mobile-to-fix calls
- Reference: 3GPP TS 27.007.

Radio Link Protocol +CRLP

Set command sets Radio Link Protocol (RLP) parameters used when non-transparent data calls originate.

Read command returns the current value of the RLP protocol parameters.

Test command returns supported range of values of the RLP protocol parameters.

Syntax

Command	Command type
AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>[,<ver>]]]]]	Set
AT+CRLP?	Read
AT+CRLP=?	Test

Parameters and values

<iws>	IWF window dimension.
1-61	**Default: 61..**
<mws>	MS window dimension.
1-61	**Default: 61.**
<T1>1	Acknowledge timer (10 ms units).
39-255	**Default: 48.**
<N2>	Retransmission attempts.
1-255	**Default: 6.**
<ver>	Protocol version.
0	

Notes

- Reference: 3GPP TS 27.007.

Service Reporting Control +CR

Set command controls whether the intermediate result code +CR is returned from TA to TE.

Read command returns whether the intermediate result code +CR is enabled, in the format:

+CR: <mode>

Test command returns the supported range of values of parameter <mode>.

Syntax

Command	Command type
AT+CR=[<mode>]	Set
AT+CR?	Read
AT+CR=?	Test

Parameters and values

<mode>

0   Disables +CR reporting. **Default: 0**.

1
pEnables +CR reporting. The intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service are used, before any error control or data compression reports are transmitted, and before the intermediate result code CONNECT is transmitted. Format is:

+CR: <serv>

where:

<serv>

ASYNC - asynchronous transparent

SYNC - synchronous transparent

REL ASYNC - asynchronous non-transparent

REL SYNC - synchronous non-transparent.

Note: This command replaces V.25ter [14] command Modulation Reporting Control (+MR), which is not appropriate for use with a GSM terminal.

Notes

■ Reference: 3GPP TS 27.007.

Extended Error Report +CEER

Execute command returns one or more lines of information text <report> offering the TA user an extended error report, in the format:

  +CEER: <report>

This report regards some error condition that may occur:

■ The failure in the last unsuccessful call setup, originating or answering.

■ The last call release

Note: If none of the previous conditions has occurred since power up then "Normal, unspecified" condition is reported.

Test command returns OK result code.

Syntax

Command	Command type
AT+CEER	Execute
AT+CEER=?	Test

Notes

■ Reference: 3GPP TS 27.007, GSM 04.08.

Cellular Result Codes +CRC

Set command controls whether the extended format of incoming call indication is used.

Read command returns current value of the parameter <mode>.

Test command returns supported values of the parameter <mode>.

Syntax

Command	Command type
AT+CRC=[<mode>]	Set
AT+CRC?	Read
AT+CRC=?	Test

Parameters and values

<mode>

0   Disables extended format reporting. **Default: 0**.

1	Enables extended format reporting:
	When enabled, an incoming call is indicated to the TE with unsolicited result code
	+CRING: <type>
	instead of the normal RING.
	where
	<type> - call type:
	ASYNC - asynchronous transparent data
	SYNC - synchronous transparent data
	REL ASYNC - asynchronous non-transparent data
	REL SYNC - synchronous non-transparent data
	VOICE - normal voice (TS 11)

Notes

■ Reference: 3GPP TS 27.007.

Voice Hung Up Control +CVHU

Set command selects whether ATH or "drop DTR" causes a voice connection to be disconnected.

Read command reports the current value of the <mode> parameter, in the format: +CVHU: <mode>

Test command reports the range of supported values for parameter <mode>.

Syntax

Command	Command type
AT+CVHU=[<mode>]	Set
AT+CVHU?	Read
AT+CVHU=?	Test

Parameters and values

<mode>

0	Drop DTR ignored but OK result code given. ATH disconnects.
1	Drop DTR and ATH ignored but OK result code given.
2	Drop DTR" behavior according to &D setting. ATH disconnects. **Default: 2**.

Select Type of Address +CSTA

Set command selects the type of number for further dialing commands (D) according to GSM/UMTS specifications.

Read command returns the current value of <type> in the format: +CSTA: <type>

Test command reports the range for <type>.

Syntax

Command	Command type
AT+CSTA=[<type>]	Set
AT+CSTA?	Read
AT+CSTA=?	Test

Parameters and values

<table>
<tr><td><type></td><td>Type of address octet in integer format (refer TS 24.008, subclause 10.5.4.7). Default is 145, when dialing string includes international access code character "+", otherwise 129.</td></tr>
</table>

Network Service Handling

Subscriber Number +CNUM

Execute command returns the MSISDN—if the phone number of the device is stored in the SIM card—in the format:

+CNUM: <alpha>,<number>,<type>[<CR><LF>

+CNUM: <alpha>,<number>,<type>[…]]

where:

<alpha>	Alphanumeric string associated to <number>; Character set used is the one selected with +CSCS.
<number>	String containing the phone number in the format <type>.
<type>	Type of number
129	National numbering scheme.
145	International numbering scheme. Contains the character "+".

Test command returns the OK result code

Syntax

Command	Command type
AT+CNUM	Execute
AT+CNUM=?	Test

Notes

- Reference: 3GPP TS 27.007

Read Operator Names +COPN

Execute command returns the list of operator names from the ME in the format:

+COPN: <numeric1>,<alpha1>[<CR><LF>

+COPN: <numeric2>,<alpha2>[...]]

where:

<numericn> String type, operator in numeric format. See +COPS.

<alphan> String type, operator in long alphanumeric format. See +COPS.

Note: Each operator code <numericn> that has an alphanumeric equivalent <alphan> in the ME memory is returned.

Test command returns the OK result code.

Syntax

Command	Command type
AT+COPN	Execute
AT+COPN=?	Test

Notes

■ Reference: 3GPP TS 27.007

Network Registration Report +CREG

Set command enables or disables network registration reports depending on the parameter <mode>.

Read command reports the <mode> and <stat> parameter values in the format:

+CREG: <mode>,<stat>[,<Lac>,<Ci>[,<AcT>]]

Note: <Lac>, and <Ci> and <AcT> are reported only if <mode>=2 and the mobile is registered on some network cell.

Test command returns the range of supported <mode>.

Syntax

Command	Command type
AT+CREG=[<mode>]	Set
AT+CREG?	Read
AT+CREG=?	Test

Parameters and values

<mode>

0   Disable network registration unsolicited result code. **Default: 0**.

1	Enable network registration unsolicited result code.
	If <mode>=1, network registration result code reports:
	+CREG: <stat>
	where
	<stat>
	0 - not registered, ME is not currently searching a new operator to register to
	1 - registered, home network
	2 - not registered, but ME is currently searching a new operator to register to
	3 - registration denied
	4 -unknown
	5 - registered, roaming
2	Enable network registration unsolicited result code with network Cell identification data.
	If <mode>=2, network registration result code reports:
	+CREG: <stat>[,<Lac>,<Ci>[,<AcT>]]
	where:
	<Lac> - Local Area Code for the currently registered on cell
	<Ci> - Cell Id for the currently registered on cell
	<AcT>: access technology of the registered network:
	0 GSM
	2 UTRAN
	Note: <Lac>, and <Ci> and <AcT> are reported only if <mode>=2 and the mobile is registered on some network cell

Notes

■ Reference: 3GPP TS 27.007.

Examples

AT
OK
at+creg?
+CREG: 0,2
OK

The MODULE is in network searching state.

at+creg?

+CREG: 0,2
OK

at+creg?
+CREG: 0,2
OK

at+creg?
+CREG: 0,2
OK

at+creg?
+CREG: 0,1
OK

The MODULE is registered.

at+creg?
+CREG: 0,1
OK

Operator Selection +COPS

Set command tries to select and register the GSM network operator.

Read command returns current value of <mode>,<format>,<oper> and <AcT> in format <format>. If no operator is selected, <format>, <oper> and <AcT> are omitted.

+COPS: <mode>[, <format>, <oper>,< AcT>]

Test command returns a list of quadruplets, each representing an operator present in the network.

The quadruplets in the list are separated by commas:

+COPS: [list of supported (<stat> ,<oper (in <format>=0)>,,

<oper (in <format>=2)>,< AcT>)s][,,(list of supported <mode>s),

(list of supported<format>s)]

where

<stat>	Operator availability.
0	Unknown.
1	Available.
2	Current.
3	Forbidden.
<AcT>	Access technology selected.
0	GSM.
2	UTRAN.

Note: Because this command requires network scan, it may take a few second to return the output.

Syntax

Command	Command type
AT+COPS=[<mode>[,<format>[,<oper>[,< AcT>]]]]	Set
AT+COPS?	Read
AT+COPS=?	Test

Parameters and values

<mode>   Defines whether the operator selection is done automatically or it is forced by this command to operator <oper>. The operator <oper> is given in format <format>.

0   Automatic choice. The parameter <oper> is ignored. **Default: 0**.

1   Manual choice. <oper> field is present.

2   De-register from GSM network; the module is kept unregistered until a +COPS with <mode>=0, 1 or 4 is issued.

3   Set only <format> parameter. The parameter <oper> is ignored.

4   <manual/automatic (<oper> field is present); if manual selection fails, automatic mode (<mode>=0) is entered

<format>

0   Alphanumeric long form. Maximum length is 16 digits. the RTC (issuing +CCLK)

2   Numeric 5 or 6 digits [country code (3) + network code (2 or 3)]

<oper>   Network operator in format defined by <format> parameter.

<AcT>   Access technology selected.

0   GSM.

2   UTRAN.

Notes

- <mode> parameter setting is stored in non-volatile memory and available at next reboot, if it is not 3—that is, set only <format> parameter.
- If <mode>=1 or 4, the selected network is stored in non-volatile memory too and is available at next reboot. This occurs even with a new SIM inserted.
- <format> parameter setting is never stored in non-volatile memory.
- Reference: 3GPP TS 27.007

Select Wireless Network +WS46

Set command selects the cellular network (Wireless Data Service, WDS) to operate with the TA (WDS-Side Stack Selection).

Read command reports the currently selected cellular network, in the format:

+ WS46: <n>

Test command reports the range for the parameter <n>.

Syntax

Command	Command type
AT+WS46=[<n>]	Set
AT+WS46?	Read
AT+WS46=?	Test

Parameters and values

<n>	Integer type. The WDS-Side Stack that the TA uses.
12	GSM digital cellular.
22	UTRAN only.
25	3GPP Systems (both GERAN and UTRAN). **Default: 25**.

Notes

- Value of <n> is stored in non-volatile memory and is available after reboot.
- Reference: 3GPP TS 27.007.

Facility Lock/Unlock +CLCK

Execute command locks or unlocks a ME on a network facility.

Test command reports all the facilities supported by the device.

Syntax

Command	Command type
AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	Execute
AT+CLCK=?	Test

Parameters and values

<fac>	Facility.
"PS"	PH-SIM (lock Phone to SIM card) MT asks password when other than current SIM card inserted; MT may remember certain amount of previously used cards thus not requiring password when they are inserted.
"PF"	Lock Phone to the first inserted SIM card (MT asks password when other than the first SIM card is inserted)
"SC"	SIM (PIN request) (device asks SIM password at power-up and when this lock command issued)
"AO"	BAOC (Barr All Outgoing Calls)
"OI"	BOIC (Barr Outgoing International Calls)
"OX"	BOIC-exHC (Barr Outgoing International Calls except to Home Country)
"AI"	BAIC (Barr All Incoming Calls)

"IR"	BIC-roam (Barr Incoming Calls when Roaming outside the home country)
"AB"	All Barring services (applicable only for <mode>=0)
"AG"	All out going barring services (applicable only for <mode>=0) (not yet supported)
"AC"	All incoming barring services (applicable only for <mode>=0)
"FD"	SIM fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)
"PN"	Network personalization
"PU"	Network subset personalization
"PP"	Service provider personalization
"PC"	Corporate personalization
"MC"	Multi country lock
<class>	Sum of integers each representing a class of information. **Default: 7**.
1	Voice (telephony)
2	Data. Refers to all bearer services.
4	Fax. Facsimile services.
8	Short message service.
16	Data circuit sync.
32	Data circuit async.
64	Dedicated packet access.
128	Dedicated PAD access.
<mode>	Defines the operation to be done on the facility.
0	Unlock facility.
1	Lock facility.
2	Query status.

<passwd>   The same as password specified for the facility from the DTE user interface or with command Change Password +CPWD.

Note: When <mode>=2 and command successful, it returns:

+CLCK: <status>[,<class1>[<CR><LF>+CLCK: <status>,<class2>

[...]]

where

<status> - the current status of the facility

0 - not active

1 - active

<classn> - class of information of the facility

Notes

- Reference 3GPP TS 27.007.

Examples

When queried, to have the facility return output on three rows: the first for voice, the second for data, the third for fax:

```
AT+CLCK  ="AO",2
+CLCK:  <status>,1
+CLCK:  <status>,2
+CLCK:  <status>,4
```

Change Facility Password +CPWD

Execute command changes the password for the facility lock function defined by command Facility Lock +CLCK.

Test command returns a list of pairs (<fac>,<pwdlength>) which presents the available facilities and the maximum length of their password (<pwdlength>).

Syntax

Command	Command type
AT+CPWD=<fac>, <oldpwd>, <newpwd>	Execute
AT+CPWD=?	Test

Parameters and values

<fac>   Facility

"SC"   SIM (PIN request)

"AB"   All barring services

"P2"   SIM PIN2

"PS"   SIM VO

<oldpwd>   String type. The same as password specified for the facility from the ME user interface or with command +CPWD

<newpwd>   String type. The new password.

Notes

- Parameter <oldpwd> is the old password while <newpwd> is the new one.
- Reference: 3GPP TS 27.007

Examples

at+cpwd=?
+CPWD: ("SC",8),("AB",4),("P2",8),("PS",8)

OK

Calling Line Identification Presentation +CLIP

Set command enables or disables the presentation of the CLI (Calling Line Identity) at the TE. This command refers to the GSM supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the CLI of the calling party when receiving a mobile terminated call.

Read command returns the presentation status of the CLI in the format:

+CLIP: <n>,<m>

where:

<n>

0 - CLI presentation disabled

1 - CLI presentation enabled

<m> - status of the CLIP service on the GSM network

0 - CLIP not provisioned

1 - CLIP provisioned

2 - unknown (for Examples no network is present)

Note: This command issues a status request to the network, hence it may take a few seconds to give the answer due to the time needed to exchange data with it.

Test command returns the supported values for <n>.

Syntax

Command	Command type
AT+CLIP=[<n>]	Set
AT+CLIP?	Read
AT+CLIP=?	Test

Parameters and values

<n>

0   Disables CLI indication. **Default: 0**.

1   Enables CLI indication.

If enabled the device reports after each RING the response:

+CLIP: <number>,<type>,"",128,<alpha>,<CLI_validity>

where:

<number> - String type, phone number of format specified by <type>

<type> - type of address octet in integer format

128 - both the type of number and the numbering plan are unknown

129 - unknown type of number and ISDN/Telephony numbering plan

145 - international type of number and ISDN/Telephony numbering plan. Contains the character "+".

<alpha> - String type, alphanumeric representation of <number> corresponding to the entry found in phonebook. Character set used is the one selected with command Select TE character set +CSCS.

<CLI_validity>

0 - CLI valid

1 - CLI withheld by the originator.

2 - CLI is not available due to interworking problems or limitation or originating network.

Notes

- The command changes only the reported behavior of the device. It does not change CLI supplementary service setting on the network.
- Reference: 3GPP TS 27.007.

Calling Line Identification Restriction +CLIR

Set command overrides the CLIR subscription when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command. This command refers to CLIR-service (GSM 02.81) that allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call.

Read command gives the default adjustment for all outgoing calls (<n>) and also triggers an interrogation of the provision status of the CLIR service (<m>), where

<n> - facility status on the Mobile

0 - CLIR facility according to CLIR service network status

1 - CLIR facility active (CLI not sent)

2 - CLIR facility not active (CLI sent)

<m> - facility status on the Network

0 - CLIR service not provisioned

1 - CLIR service provisioned permanently

2 - unknown (for example no network present)

3 - CLI temporary mode presentation restricted

4 - CLI temporary mode presentation allowed

Test command reports the supported values of parameter <n>.

Syntax

Command	Command type
AT+CLIR=[<n>]	Set
AT+CLIR?	Read
AT+CLIR=?	Test

Parameters and values

<n>	Facility status on the Mobile.	
0	CLIR facility according to CLIR service network status.	
1	CLIR facility active. CLI not sent.	
2	CLIR facility not active. CLI sent.	

Notes

- ■ This command sets the default behavior of the device in outgoing calls.
- ■ Reference: 3GPP TS 27.007.

Connected Line Identification Presentation +COLP

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

Read command gives the status of <n>, and also triggers an interrogation of the provision status of the COLP service according 3GPP TS 22.081 (given in <m>) in the format:

+COLP: <n>,<m>

where:

<n>	
0	COL presentation disabled.

1	COL presentation enabled.
<m>	status of the COLP service on the GSM network.
0	COLP not provisioned.
1	COLP provisioned.
2	Unknown; for example no network is present.

Note: This command issues a status request to the network, hence it may take a few seconds to give the answer due to the time needed to exchange data with it.

Test command reports the range for the parameter <n>.

Syntax

Command	Command type
AT+COLP=[<n>]	
AT+COLP?	Read
AT+COLP=?	Test

Parameters and values

<n>

0 Disables COL indication. **Default: 0**.

1 Enables COL indication.

When enabled (and called subscriber allows),

+COLP: <number>,<type>

intermediate result code is returned from TA to TE before any +CR or ITU T Recommendation V.250 responses, where

<number> - String type, phone number of format specified by <type>.

<type> - type of address octet in integer format.

129 - unknown type of number and ISDN/Telephony numbering plan.

145 - international type of number and ISDN/Telephony numbering plan.

Contains the character "+".

Notes

■ If COL information is needed, it is recommended to set DIALMODE to 1—see AT#DIALMODE—so that network information available for display before returning to command mode.

Connected Line Identification Restriction Status +COLR

This command refers to the GSM/UMTS supplementary service COLR (Connected Line Identification Restriction) that enables a called subscriber to restrict the possibility of presentation of connected line identity (COL) to the

calling party after receiving a mobile terminated call. The command displays the status of the COL presentation in the network. It has no effect on the execution of the supplementary service COLR in the network.

Execute command triggers an interrogation of the activation status of the COLR service according 3GPP TS 22.081 (given in <m>):

+COLR: <m>

where:

<m>	Integer type. Parameter shows the subscriber COLR service status in the network.
0	COLR not provisioned.
1	COLR provisioned.
2	Unknown; for example, no network.

Activation, deactivation, registration and erasure of the supplementary service COLR are not applicable.

Test command tests for command existence.

Syntax

Command	Command type
AT+COLR	
AT+COLR=?	Test

Call Forwarding Number and Conditions +CCFC

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

Test command reports supported values for the parameter <reason>.

Syntax

Command	Command type
AT+CCFC=<reason>,<cmd>[,<number>[,<type>[,<class> [,,,<time>]]]	Execute
AT+CCFC=?	Test

Parameters and values

<reason>

0	Unconditional.
1	Mobile busy.
2	No reply.
3	Not reachable.
4	All calls. Not with query command.

5	All conditional calls. Not with query command.
<cmd>	
0	Disable.
1	Enable.
2	Query status.
3	Registration.
4	Erasure.
<number>	String type, phone number of forwarding address in format specified by <type>
<type>	Type of address octet in integer format.
129	National numbering scheme.
145	International numbering scheme. Contains the character "+".
<class>	Sum of integers each representing a class of information to which the command refers.
1	Voice (telephony).
2	Data.
4	Fax (facsimile services).
7	Voice + data + fax. **Default: 7**.
8	Short message service.
16	Data circuit sync.
32	Data circuit async.
64	Dedicated packet access.
128	Dedicated PAD access.
<time>	Time in seconds to wait before call is forwarded; it is valid only when <reason> "no reply" is enabled (<cmd>=1) or queried (<cmd>=2)

1-30	Automatically rounded to a multiple of 5 seconds. Default: 20.
	Note: When <cmd>=2 and command successful, it returns:
	+CCFC: <status>,<class1>[,<number>,<type>[,,,<time>]][<CR><LF>
	+CCFC: <status>,<class2>[,<number>,<type>[,,,<time>]][…]]
	where:
	<status> - current status of the network service
	0 - not active
	1 - active
	<classn> - same as <class>
	<time> - it is returned only when <reason>=2 ("no reply") and <cmd>=2.
	The other parameters are described in the Parameters and Values section.

Notes

- When querying the status of a network service (<cmd>=2) the response line for 'not active' case (<status>=0) is returned only if service is not active for any <class>.
- Reference: 3GPP TS 27.007.

Call Waiting +CCWA

Set command allows the control of the call waiting supplementary service. Activation, deactivation, and status query are supported.

Read command reports the current value of the parameter <n>.

Test command reports the supported values for the parameter <n>.

Syntax

Command	Command type
AT+CCWA=[<n>[,<cmd>[,<class>]]]	Set
AT+CCWA?	Read
AT+CCWA=?	Test

Parameters and values

<char>	
<n>	Enables or disables the presentation of an unsolicited result code.
0	Disable.
1	Enable.
<cmd>	Enables or disables or queries the service at network level.
0	Disable.

1	Enable.
2	Query status.
<class>	A sum of integers each representing a class of information to which the command refers.
1	Voice (telephony).
2	Data.
4	Fax (facsimile services).
7	Voice + data + fax. **Default: 7**.
8	Short message service.
16	Data circuit sync.
32	Data circuit async.
64	Dedicated packet access.
128	Dedicated PAD access.

Notes

- Reference: 3GPP TS 27.007

Call Holding Services +CHLD

Execute command controls the network call hold service. This command is used to manage call hold and multiparty conversation (conference call). Calls can be put on hold, recovered, released or added to a conversation.

Test command returns the list of supported <n>s.

+CHLD:(0,1,1X,2,2X,3,4)

Syntax

Command	Command type
AT+CHLD=[<n>]	Execute
AT+CHLD=?	Test

Parameters and values

<n>	
0	Releases all held calls, or sets the UDUB (User Determined User Busy) indication for a waiting call. (only from version D).
1	Releases all active calls if any exist, and accepts the other (held or waiting) call
1X	Releases a specific active call X.
2	Places all active calls, if any exist, on hold and accepts the other (held or waiting) call.
2X	Places all active calls on hold except call X with which communication is supported (only from version D).

3   Adds held call to the conversation.

4

Connects the two calls and disconnects the subscriber from both calls (Explicit Call Transfer (ECT))

Note: "X" is the numbering (starting with 1) of the call given by the sequence of setting up or receiving the calls (active, held or waiting) as seen by the served subscriber. Calls hold their number until they are released. New calls take the lowest available number.

Note: Where both a held and a waiting call exist, the above procedures apply to the waiting call—not to the held call—in conflicting situations.

Notes

- Only for VOICE calls.
- Reference: 3GPP TS 27.007.

Unstructured Supplementary Service Data +CUSD

Set command allows control of the Unstructured Supplementary Service Data (USSD [GSM 02.90]).

Read command reports the current value of the parameter <n>.

Test command reports the supported values for the parameter <n>.

Syntax

Command	Command type
AT+CUSD=[<n>[,<str>[,<dcs>]]]	Set
AT+CUSD?	Read
AT+CUSD=?	Test

Parameters and values

<n>   Disables or enable the presentation of an unsolicited result code.

0   Disable the result code presentation in the DTA.

1   Enable the result code presentation in the DTA.

2   Cancel an ongoing USSD session. Not applicable to read command response.

<str>

USSD-string. When <str> parameter is not given, network is not interrogated.

If <dcs> indicates that GSM338 default alphabet is used ME/TA converts GSM alphabet into current TE character set. See +CSCS.

If <dcs> indicates that 8-bit data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number; for example octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65).

<dcs>	GSM 3.38 Cell Broadcast Data Coding Scheme in integer format. Default: 0.

Note: The unsolicited result code enabled by parameter <n> is in the format:

+CUSD: <m>[,<str>,<dcs>] to the TE

where:

<m>:

0 - no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation).

1 - further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation)

2 - USSD terminated by the network

3 - other local client has responded

4 - operation not supported

5 - network time out

Notes

- Only mobile initiated operations are supported.
- Reference: 3GPP TS 27.007.

Advice of Charge +CAOC

Set command refers to the Advice of Charge supplementary services that enable subscriber to get information about the cost of calls; the command also includes the possibility to enable an unsolicited event reporting of the Current Call Meter (CCM) information.

Read command reports the value of parameter <mode> in the format:

+CAOC: <mode>

Test command reports the supported values for <mode> parameter.

Syntax

Command	Command type
AT+CAOC=<mode>	Set
AT+CAOC?	Read
AT+CAOC=?	Test

Parameters and values

	<mode>	
	0	Query CCM value.
	1	Disables unsolicited CCM reporting.

| **2** | Enables unsolicited CCM reporting. |

Note: The unsolicited result code enabled by parameter <mode> is in the format: +CCCM: <ccm>

where:

<ccm> - String type, current call meter in home units: three bytes of the CCM value in hexadecimal format. For example "00001E" indicates decimal value 30.

Note: The unsolicited result code +CCCM is sent when the CCM value changes, but not more than every 10 seconds.

Notes

- +CAOC command returns an estimate of the cost of the current call only, produced by the MS and based on the information provided by either AoCI or AOCC supplementary services. It is not stored in the SIM.
- Reference: 3GPP TS 27.007.

List Current Calls +CLCC

Execute command returns the list of current calls and their characteristics in the format:

[+CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>

,<alpha>[<CR><LF>+CLCC:<id2>,<dir>,<stat>,<mode>,

<mpty>,<number>,<type>,<alpha>[...]]]

where:

<idn>	Call identification number.
<dir>	Call direction.
0	Mobile originated call.
1	Mobile terminated call.
<stat>	State of the call.
0	Active.
1	Held.
2	Dialing (MO call).
3	Alerting (MO call).
4	Incoming (MT call)
5	Waiting (MT call).
<mode>	Call type.
0	Voice.
1	Data.
9	Unknown.

<mpty>	Multiparty call flag.
0	Call is not one of multiparty (conference) call parties.
1	Call is one of multiparty (conference) call parties.
<number>	String type, phone number in format specified by <type>.
<type>	Type of phone number octet in integer format.
129	National numbering scheme.
145	International numbering scheme. Contains the character "+".
<alpha>	String type; alphanumeric representation of <number> corresponding to the entry found in phonebook. Character set used is the one selected with +CSCS. Note: If no call is active then only OK message is sent. This command is useful in conjunction with command +CHLD to know the various call status for call holding.

Test command returns the OK result code. Syntax Command Command type AT+CLCC Execute AT+CLCC=? Test Notes

Syntax

Command	Command type
AT+CLCC	Execute
AT+CLCC=?	Test

Notes

■ Reference: 3GPP TS 27.007.

SS Notification +CSSN

This command controls supplementary service related network initiated notifications.

Set command enables or disables the presentation of notification result codes from TA to TE.

Read command reports the current value of the parameters.

Test command reports the supported range of values for <n>, <m>.

Syntax

Command	Command type
AT+CSSN=[<n>[,<m>]]	Set
AT+CSSN?	Read
AT+CSSN=?	Test

Parameters and values

<n>	Sets the +CSSI result code presentation status.
0	Disable.
1	Enable.

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, an unsolicited code:

+CSSI: <code1>

is sent to TE before any other MO call setup result codes, where:

<code1>	
0	Unconditional call forwarding is active
1	Some of the conditional call forwardings are active.
2	Call is forwarded.
3	Call is waiting.
5	Outgoing calls are barred.
6	Incoming calls are barred.
<m>	Sets the +CSSU result code presentation status
0	Disable
1	Enable

When <m>=1 and a supplementary service notification is received during a mobile terminated call setup or during a call, an unsolicited result code:

+CSSU: <code2>

is sent to TE, where:

<code2>	
0	This is a forwarded call (MT call setup).
2	Call is put on hold (during a voice call).
3	Call is retrieved (during a voice call).

Notes

■ Reference: 3GPP TS 27.007.

Closed User Group +CCUG

Set command allows control of the Closed User Group supplementary service [GSM 02.85]

Read command reports the current value of the parameters.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CCUG=[<n>[,<index>[,<info>]]]	Set
AT+CCUG?	Read
AT+CCUG=?	Test

Parameters and values

<n>

0 Disable CUG temporary mode. **Default: 0**.

1 Enable CUG temporary mode: it enables to control the CUG information on the air interface as a default adjustment for all following outgoing calls.

<index>

0-9 CUG index.

10 No index (preferential CUG taken from subscriber data). **Default: 10**.

<info>

0 No information. **Default: 0**.

1 Suppress Outgoing Access (OA).

2 Suppress preferential CUG.

3 Suppress OA and preferential CUG.

Notes

- Reference: 3GPP TS 27.007.

Selection of preferred PLMN list +CPLS

Execute command selects a list of preferred PLMNs in the SIM/USIM.

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

Test command returns the whole index range supported <list>s by the SIM/USIM.

Syntax

Command	Command type
AT+CPLS=<list>	Execute
AT+CPLS?	Read
AT+CPLS=?	Test

Parameters and values

<list>

0	User controlled PLMN selector with Access Technology EFPLMNwAcT, 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 EFOPLMNwAcT.
2	HPLMN selector with Access Technology EFHPLMNwAcT.

Notes

- The value set by command is stored in non-volatile memory. The value does not depend on the specific CMUX instance.

Mobile Equipment Contol

Phone Activity Status +CPAS

Execute command reports the device status in the form:

+CPAS: <pas>

where:

<pas>	Phone activity status.
0	Ready. Device allows commands from TA/TE.
1	Unavailable. Device does not allow commands from TA/TE.
2	Unknown. Device is not guaranteed to respond to instructions.
3	Ringing. Device is ready for commands from TA/TE, but the ringer is active.
4	Call in progress. Device is ready for commands from TA/TE, but a call is in progress.

Test command reports the supported range of values for <pas>. Syntax Command Command type AT+CPAS Execute AT+CPAS=? Test Notes

Syntax

Command	Command type
AT+CPAS	Execute
AT+CPAS=?	Test

Notes

- Although +CPAS is an Execute command, ETSI 07.07 requires the Test command to be defined.
- Reference: 3GPP TS 27.007.

Examples

ATD03282131321;
OK

```
AT+CPAS
+CPAS: 4    A call is in progress.
OK
ATH
OK
```

Set Phone Functions +CFUN

Set command selects the level of function in the ME.

Read command reports the current setting of <fun>.

Test command returns the list of supported values for <fun> and <rst>.

Syntax

Command	Command type
AT+CFUN=[<fun>[,<rst>]]	Set
AT+CFUN?	Read
AT+CFUN=?	Test

Parameters and values

<fun>	Power saving function mode.
0	Minimum functions, NON-CYCLIC SLEEP mode. In this mode, the AT interface is not accessible. Consequently, once you have set <fun> level 0, do not send further characters. Otherwise these characters remain in the input buffer and may delay the output of an unsolicited result code. The first wake-up event stops power saving and takes the ME back to a fully functioning level <fun>=1.
1	Mobile full functions with power saving disabled. **Default: 1**.
4	Disable both TX and RX.
5	Mobile full functions with power saving enabled.
7	CYCLIC SLEEP mode. In this mode, the serial interface is periodically enabled while CTS is active. If characters are recognized on the serial interface, the ME stays active for 2 seconds after the last character was sent or received. ME exits SLEEP mode only, if AT+CFUN=1 is entered.
9	Similar to 0, but with different wake-up events.
<rst>	Reset flag.
0	Do not reset the ME before setting it to <fun> function level.
1	Reset the device. The device is fully functional after the reset. This value is available only for <fun> = 1

Notes

■ Issuing AT+CFUN=4[,0] causes the module to perform a network deregistration and a SIM deactivation.

■ If power saving enabled, it reduces the power consumption during the idle time, thus allowing a longer standby time with a given battery capacity.

■ To place the module in power saving mode, set the <fun> parameter at value = 5 and set the line DTR (RS232) to OFF. Once in power saving, the CTS line switches to the OFF status to signal that the module is really in power saving condition. During the power saving condition, before sending any AT command on the serial line, the DTR must be set to ON (0V) to exit from power saving and it must wait for the CTS (RS232) line to go in ON status. Until the DTR line is ON, the module does not return back in the power saving condition.

■ The power saving function does not affect the network behavior of the module, even during the power save condition the module remains registered on the network and reachable for incoming calls or SMS. If a call incomes during the power save, then the module wake ups and proceeds normally with the unsolicited incoming call code.

■ When the module detects USB port is connected, then the power saving mode is not allowed

■ In CYCLIC SLEEP mode (AT+CFUN=7) CTS line toggles slowly, the toggle delay is about 2 seconds

■ In CYCLIC SLEEP mode (AT+CFUN=7) during incoming voice call the CTS line continues to toggle

■ If AT#ENS=1 then AT+CFUN=0 has the same functionality of AT+CFUN=4

■ Reference: 3GPP TS 27.007.

Enter PIN +CPIN

Set command sends to the device a password which is necessary before it can be operated (SIM PIN, SIM PUK, PHSIM PIN, and so on).

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

You can use the command to change the SIM PIN by sending it with both parameters <pin> and <newpin> when PIN request is pending. If no PIN request is pending the command returns an error code and to change the PIN the command +CPWD must be used instead.

Read Command

Read command reports the PIN/PUK/PUK2 request status of the device in the form:

+CPIN: <code>

where:

<code>	PIN/PUK/PUK2 request status code.
READY	ME is not pending for any password .
SIM PIN	ME is waiting for SIM PIN.
SIM PUK	ME is waiting for SIM PUK
PH-SIM PIN	ME is waiting for phone-to-SIM card password.
PH-FSIM PIN	ME is waiting for phone-to-very first SIM card password.
PH-FSIM PUK	ME is waiting for phone-to-very first SIM card unblocking password.

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SIM PIN2	ME is waiting for SIM PIN2. This <code> is returned only when the last executed command resulted in PIN2 authentication failure; that is, +CME ERROR: 17.
SIM PUK2	ME is waiting for SIM PUK2. This <code> is returned only when the last executed command resulted in PUK2 authentication failure; that is +CME ERROR: 18.
PH-NET PIN	ME is waiting for network personalization password.
PH-NET PUK	ME is waiting for network personalization unblocking password.
PH-NETSUB PIN	ME is waiting for network subset personalization password.
PH-NETSUB PUK	ME is waiting for network subset personalization unblocking password.
PH-SP PIN	ME is waiting for service provider personalization password.
PH-SP PUK	ME is waiting for service provider personalization unblocking password.
PH-CORP PIN	ME is waiting for corporate personalization password.
PH-CORP PUK	ME is waiting for corporate personalization unblocking password.

Note: Pin pending status at startup depends on PIN facility setting. To change or query the default power up setting use the command AT+CLCK=SC,<mode>,<pin>.

Test command returns OK result code.

Syntax

Command	Command type
AT+CPIN=<pin>[,<newpin>]	Set
AT+CPIN?	Read
AT+CPIN=?	Test

Parameters and values

<pin>   String type value.

<newpin>   String type value. To check the status of the PIN request use the command AT+CPIN? Note: If all parameters are omitted then the behavior of Set command is the same as Read command.

Notes

- Reference: 3GPP TS 27.007

Examples

AT+CMEE=1
OK
AT+CPIN?
+CME ERROR: 10 Error: You have to insert the SIM.
AT+CPIN?
+CPIN: READY You inserted the SIM and device is not waiting for PIN to be given.
OK

Signal Quality +CSQ

Execute command reports received signal quality indicators.

Test command returns the supported range of values of the parameters <rssi> and <ber>. Although +CSQ is an Execute command without parameters, ETSI 07.07 requires the Test command to be defined.

Syntax

Command	Command type
AT+CSQ	Execute
AT+CSQ=?	Test

Execute command reports received signal quality indicators in the form:

+CSQ: <rssi>,<ber>

where

<rssi>	Received signal strength indication.
0	(-113) dBm or less
1	(-111) dBm
2-30	(-109)dBm-(-53)dBm / 2 dBm per step
31	(-51)dBm or greater
99	Not known or not detectable
<ber>	Bit error rate (in percent)
0	Less than 0.2%
1	0.2% to 0.4%
2	0.4% to 0.8%
3	0.8% to 1.6%
4	1.6% to 3.2%
5	3.2% to 6.4%
6	6.4% to 12.8%

7	More than 12.8%
99	Not known or not detectable

Notes

■ Reference: 3GPP TS 27.007.

Indicator Control +CIND

Set command controls the registration state of ME indicators, in order to automatically send the +CIEV URC, whenever the value of the associated indicator changes. The supported indicators (<descr>) and their order appear from test command AT+CIND=?.

Read command returns the current value of ME indicators, in the format:

+CIND: <ind>[,<ind>[,...]]

Note: The order of the values <ind>s is the same order appears from test command AT+CIND=?

Test command returns pairs, where string value <descr> is a description (maximum of 16 characters) of the indicator and compound value is the supported values for the indicator, in the format:

+CIND: ((<descr>, (list of supported <ind>s))[,(<descr>, (list of supported <ind>s))[,...]])

where:

<descr>	Indicator names as follows (along with their <ind> ranges).
"battchg"	Battery charge level.
<ind>	Battery charge level indicator range .
0-5	
99	Not measurable.
"signal"	Signal quality.
<ind>	Signal quality indicator range.
0-7	
99	Not measurable.
"service"	Service availability.
<ind>	Service availability indicator range.
0	Not registered to any network.
1	Registered.
"sounder"	Sounder activity.
<ind>	Sounder activity indicator range.
0	No sound activity.
1	Some sound activity.
"message"	Message received.

<ind>	Message received indicator range.
0	No unread short message at memory location "SM".
1	Unread short message at memory location "SM".
"call"	Call in progress.
<ind>	Call in progress indicator range.
0	No calls in progress.
1	At least a call is established.
"roam"	Roaming.
<ind>	Roaming indicator range.
0	Registered to home network or not registered.
1	Registered to other network.
"smsfull"	Short message memory storage in the MT is full (1), or memory locations are available (0).
<ind>	Short message memory storage indicator range.
0	Memory locations are available
1	Short message memory storage in the MT is full.
"rssi"	Received signal (field) strength
<ind>	Received signal strength level indicator range
0	Signal strength ≤ (-112) dBm
1-4	Signal strength in (-97) dBm..(-66) dBm (15 dBm steps)
5	Signal strength ≥ (-51) dBm
99	Not measurable.

Syntax

Command	Command type
AT+CIND=[<state>[,<state>[,…]]]	Set
AT+CIND?	Read
AT+CIND=?	Test

Parameters and values

| **<state>** | Registration state. |
| **0** | The indicator is deregistered; there's no unsolicited result code (+CIEV URC) automatically sent by the ME to the application, whenever the value of the associated indicator changes; the value can be directly queried with +CIND? |

| 1 | The indicator is registered. An unsolicited result code (+CIEV URC) is automatically sent by the ME to the application, whenever the value of the associated indicator changes; it is still possible to query the value through +CIND? **Default: 1**. Note: When the ME is switched on all of the indicators are in registered mode. |

Notes

- See command +CMER.
- Reference: 3GPP TS 27.007.

Examples

Command causes all the indicators to be registered

AT+CIND=1,1,1,1,1,1,1,1,1

Command causes all the indicators to be de-registered

AT+CIND=0,0,0,0,0,0,0,0,0

Command to query the current value of all indicators

AT+CIND? CIND: 4,0,1,0,0,0,0,0,2
OK

Mobile Equipment Event Reporting +CMER

Set command enables or disables sending of unsolicited result codes from TA to TE in the case of indicator state changes. Sending of URCs if keys are pressed or display changes is not implemented yet.

Read command returns the current setting of parameters, in the format:

+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr>

Test command returns the range of supported values for <mode>, <keyp>, <disp>, <ind>, <bfr>, in the format:

+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)

Syntax

Command	Command type
AT+CMER=[<mode>[,<keyp>[,<disp>[,<ind>[,<bfr>]]]]]	Set
AT+CMER?	Read
AT+CMER=?	Test

Parameters and values

<mode>	Controls the processing of unsolicited result codes.
0	Buffer +CIEV unsolicited result codes. **Default: 0**.
1	Discard +CIEV unsolicited result codes when TA-TE link is reserved (for example on-line data mode); otherwise forward them directly to the TE.

2		Buffer +CIEV unsolicited result codes in the TA when TA-TE link is reserved (for example on-line data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE.
3		Forward +CIEV unsolicited result codes directly to the TE. When TA is in online data mode each +CIEV URC is replaced with a Break (100 ms), and is stored in a buffer. Once the ME goes into command mode (after +++ was entered), all URCs stored in the buffer are output.
<keyp>		Keypad event reporting.
0		No keypad event reporting.
<disp>		Display event reporting.
0		No display event reporting.
<ind>		Indicator event reporting.
0		No indicator event reporting.
2		Indicator event reporting.
<bfr>		TA buffer clearing.
0		TA buffer of unsolicited result codes is cleared when <mode> 1-3 is entered.
1		TA buffer of unsolicited result codes is flushed to the TE when <mode> 1-3 is entered. OK response is given before flushing the codes.

Notes

- After AT+CMER is switched on—with for example the AT+CMER=2,0,0,2 command; that is <bfr> is 0—URCs for all registered indicators are issued only first time, if previous <mode> was 0, for backward compatibility. Values shown by the indicators are current indicators values, not buffered ones. Subsequent AT+CMER commands with <mode> different from 0 and <bfr> equal to 0 do not flush the codes, even if <mode> was set again to 0 before. To flush the codes, <bfr> must be set to 1. Although it is possible to issue the command when SIM PIN is pending, it answers ERROR if "message" or "smsfull" indicators are enabled in AT+CIND, because with pending PIN it is not possible to give a correct indication about SMS status. To issue the command when SIM PIN is pending you must disable "message" and "smsfull" indicators in AT+CIND first.
- Reference: 3GPP TS 27.007.

Select Phonebook Memory Storage +CPBS

Set command selects phonebook memory storage <storage> that is used by other phonebook commands.

Read command returns the actual values of the parameter <storage>, the number of occupied records <used> and the maximum index number <total>, in the format:

+CPBS: <storage>,<used>,<total>

Note: For <storage>="MC": if there is more than one missed call from the same number the read command returns only the last call.

Test command returns the supported range of values for the parameters <storage>.

Syntax

Command	Command type
AT+CPBS= <storage>[,<passw ord>]	Set
AT+CPBS?	Read
AT+CPBS=?	Test

Parameters and values

<storage>

"SM"	SIM phonebook.
"FD"	SIM fixed dialing-phonebook. (FDN) Only phase 2/2+ SIM.
"LD"	SIM last-dialing-phonebook. +CPBF is not applicable for storage.
"MC"	Device missed (unanswered received) calls list. +CPBF is not applicable for storage.
"RC"	ME received calls list. +CPBF is not applicable for this storage.
"MB"	Mailbox numbers stored on SIM; it is possible to select this storage only if the mailbox service is provided by the SIM. See #MBN.
"DC"	ME last-dialing-phonebook. +CPBF is not applicable for this storage.
"ME"	ME phonebook. +CPBF is not applicable for this storage.
"EN"	SIM emergency numbers phonebook. +CPBW and +CPBF not applicable for this storage.
"ON"	SIM own numbers (MSISDNs) phonebook +CPBF is not applicable for this storage.
"SD"	SIM Service Dialling Numbers (SDN) phonebook (+CPBW is not applicable for this storage).
<password>	String type value representing the PIN2-code required when selecting PIN2-code locked <storage> above "FD

Notes

- If "SM" is the currently selected phonebook, selecting"FD" phonebook with "AT+CPBS="FD"" command simply selects the FDN as the phonebook upon which all subsequent +CPBW, +CPBF and +CPBR commands act; the comm
- If <password> parameter is given, PIN2 will be verified, even if it is not required, i.e. it has already been inserted and verified during current session
- Reference: 3GPP TS 27.007.

Read Phonebook Entries +CPBR

Execute command returns phonebook entries in location number range <index1>..<index2> from the current phonebook memory storage selected with +CPBS. If <index2> is omitted, only location <index1> is returned.

Test command returns the supported range of values for parameters <indexn> and the maximum lengths of <number> , <text>, <group>, <secondtext> and <email> fields, in the format:

+CPBR: (<minIndex> -
<maxIndex>),<nlength>,<tlength>,<glength>,<slength>,<elength>

where:

<minIndex> - the minimum <index> number, integer type

<maxIndex>- the maximum <index> number, integer type

<nlength> - maximum <number> field length, integer type

<tlength> - maximum <name> field length, integer type

<glength>: integer type value indicating the maximum length of field <group>

<slength>: integer type value indicating the maximum length of field <secondtext>

<elength>: integer type value indicating the maximum length of field <email>

Note: The value of <nlength> varies, depending on the availability of Extension service, in the following situations:

1. if "SM" memory storage is selected (see +CPBS) and the SIM supports the Extension1 service

2. if "FD" memory storage is selected (see +CPBS) and the SIM supports the Extension2 service

if "MB" memory storage is selected (see +CPBS) and the SIM supports the Extension6 service

Syntax

Command	Command type
AT+CPBR=<index1>[,<index2>]	Execute
AT+CPBR=?	Test

Parameters and values

<index1>	Integer type, value in the range of location numbers of the currently selected phonebook memory storage. See +CPBS.

<index2>	Integer type, value in the range of location numbers of the currently selected phonebook memory storage. See +CPBS.

The response format is:

where:

<indexn> - Location number of the phonebook entry

<number> - String type, phone number of format <type>

<type> - Type of phone number octet in integer format

129 - National numbering scheme

145 - International numbering scheme. Contains the character "+".

<text> - The alphanumeric text associated to the number. Used character set is the one selected with command +CSCS.

<group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command

Select TE Character Set +CSCS

<adnumber>: additional number ; string type phone number of format <adtype>

<adtype>: type of address octet in integer format

<secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS

<email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS

<hidden>: indicates if the entry is hidden or not 0: phonebook entry not hidden 1: phonebook entry hidden

Note: If "MC" is the currently selected phonebook memory storage, a sequence of missed calls coming from the same number are saved as one missed call. +CPBR shows one line of information.

Note: If all queried locations are empty (but available), no information text lines are returned, while if listing fails in an ME error, +CME ERROR: <err> is returned.

Notes

- Before issuing PB commands, select the PB storage with +CPBS command.
- Reference: 3GPP TS 27.007.

Find Phonebook Entries +CPBF

Execute command returns phonebook entries (from the current phonebook memory storage selected with +CPBS) which alphanumeric field start with string <findtext>.

Test command reports the maximum lengths of <number> and <text> fields, in the format:

+CPBF: <nlength>,<tlength>,<glength>,<slength>,<elen gth>
where:
<nlength> - maximum length of field <number>, integer type
<tlength> - maximum length of field <text>, integer type
<glength>: integer type value indicating the maximum length of field <group>
<slength>: integer type value indicating the maximum length of field <secondtext>
<elength>: integer type value indicating the maximum length of field <email>

The value of <nlength> can vary, depending on the availability of Extension service, in the following situations:

If "SM" memory storage is selected (see +CPBS) and the SIM supports the Extension1 service

if "FD" memory storage is selected (see +CPBS) and the SIM supports the Extension2 service

if "MB" memory storage is selected (see +CPBS) and the SIM supports the Extension6 service

Syntax

Command	Command type
AT+CPBF=<findtext>	Execute
AT+CPBF=?	Test

Parameters and values

<findtext>

String type. The command +CSCS selects the character set used.

The command returns a report in the form:

[+CPBF:
<index1>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adty
pe>][,<secondtext>][,<email>]<CR><LF> +CPBF:
<index2>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adty
pe>][,<secondtext>][,<email>][…]]]

where:

<indexn> - the location number of the phonebook entry

<number> - String type, phone number of format <type>.

<type> - type of phone number octet in integer format

129 - National numbering scheme

145 - International numbering scheme. Contains the character "+".

<text> - the alphanumeric text associated to the number; used character set is
the one selected with command +CSCS.

<group>: string type field of maximum length

<glength> indicating a group the entry may belong to; character set as specified
by command Select TE Character Set +CSCS

<adnumber>: additional number ; string type phone number of format <adtype>
<adtype>: type of address octet in integer format

<secondtext>: string type field of maximum length <slength> indicating a second
text field associated with the number; character set as specified by command
Select TE Character Set +CSCS

<email>: string type field of maximum length <elength> indicating an email
address; character set as specified by command Select TE Character Set +CSCS

<hidden>: indicates if the entry is hidden or not

0: phonebook entry not hidden

1: phonebook entry hidden

Note: +CPBF is not applicable if the current selected storage (see +CPBS) is
either "MC", either "RC" or "LD".

Note: If <findtext>="" the command returns all the phonebook records.Note: If
no PB records satisfy the search criteria then an ERROR message is reported.

Notes

■ Remember to select the PB storage with +CPBS command before issuing PB commands.

■ Reference: 3GPP TS 27.007.

Write Phonebook Entry +CPBW

Execute command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS.

Test command returns location range supported by the current storage as a compound value, the maximum length of <number> field, supported number format of the storage and maximum length of <text> field. The format is:

+CPBW: (list of supported <index>s),<nlength>, (list of supported
<type>s),<tlength>>,<glength>,<slength>,<elength>

where:

<nlength> - integer type value indicating the maximum length of field <number>.

<tlength> - integer type value indicating the maximum length of field <text>

<glength>: integer type value indicating the maximum length of field <group>

<slength>: integer type value indicating the maximum length of field <secondtext>

<elength>: integer type value indicating the maximum length of field <email>

Note: The value of <nlength> can vary, depending on the availability of Extension service, in the following situations:

(1) If "SM" memory storage is selected (see +CPBS) and the SIM supports the Extension1 service

(2) If "FD" memory storage is selected (see +CPBS) and the SIM supports the Extension2 service if "MB" memory storage is selected (see +CPBS) and the SIM supports the Extension6 service

Syntax

Command	Command type
AT+CPBW= [<index>] [,<number> [,<type> [,<text>[,<group>[,<adnumber>[,<a dtype>[,<second text>[,<email>[,<hidden>]]]]]]]]]	Execute
AT+CPBW=?	Test

Parameters and values

<index>	Integer type, value in the range of location numbers of the currently selected phonebook memory storage. See +CPBS.
<number>	String type, phone number in the format <type>.
<type>	Type of number.
129	National numbering scheme.
145	International numbering scheme. Contains the character "+".
<text>	String type, the text associated to the number. The used character set is the one selected with command +CSCS. Note: If record number <index> already exists, it is overwritten.

<group>	String type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS
<adnumber>	Additional number ; string type phone number of format <adtype>
<adtype>	Type of address octet in integer format
<secondtext>	String type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS
<email>	String type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS <hidden>: indicates if the entry is hidden or not
0	Phonebook entry not hidden
1	Phonebook entry hidden

Note: If either <number>, <type> and <text> are omitted, the phonebook entry in location <index> is deleted.

Note: If <index> is omitted or <index>=0, the number <number> is stored in the first free phonebook location. (example at+cpbw=0,"+390404192701",129,"Text" and at+cpbw=,"+390404192701",129,"Text")

Note: If either "LD", "MC" or "RC" memory storage is selected (see +CPBS) it is possible just to delete the phonebook entry in location <index>, therefore parameters <number>, <type> and <text> must be omitted.

Notes

- Before issuing PB commands, select the PB storage with +CPBS command.
- Before defining <group> string, it is recommended to check, with #CPBGR command, the predefined group names, that could be already stored in USIM in Grouping information Alpha String (GAS) file. If all records in such file are already occupied, +CPBW command will return ERROR when trying to use a new group name that is not in the predefined GAS names. To define a new custom group string, it is necessary to overwrite with it one of the old predefined strings, using #CPBGW command.
- Reference: 3GPP TS 27.007

Clock Management #CCLK

Set command sets the real-time clock of the ME.

Read command returns the current setting of the real-time clock, in the format <time>.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CCLK=<time>	Set
AT#CCLK?	Read
AT#CCLK=?	Test

Parameters and values

\<time\>	Current time as quoted string in the format: "yy/MM/dd,hh:mm:ss±zz,d".
yy	Year. Two last digits are mandatory. Range is 00-99.
MM	Month. Two last digits are mandatory. Range is 01-12.
dd	Day. Two last digits are mandatory.
	The range for dd(day) depends on the month and the year it refers to. Available ranges are:
	(01-28)
	(01-29)
	(01-30)
	(01-31)
	Trying to enter an out of range value raises an error.
hh	Hour. Two last digits are mandatory. Range is 00-23.
mm	Minute. Two last digits are mandatory. Range is 00-59.
ss	Seconds. Two last digits are mandatory. Range is 00-59.
±zz	Time zone. Indicates the difference, expressed in quarter of an hour, between the local time and GMT. Two last digits are mandatory. Range is -47 to +48.
d	Number of hours added to the local time zone because of daylight savings time adjustment. Range is 0-2.

Notes

■ If the time is set by the network but the DST information is missing, or the time is set by +CCLK command, then the \<time\> format is: "yy/MM/dd,hh:mm:ss±zz"

Examples

AT+CCLK="02/09/07,22:30:00+00"
OK
AT+CCLK?
+CCLK: "02/09/07,22:30:25"
OK

Alarm Management +CALA

Set command stores in the internal Real Time Clock an alarm time with respective settings. It is possible to set up a recurrent alarm for one or more days in the week.

Currently just one alarm can be set.

When the RTC time reaches the alarm time then the alarm starts, the behavior of the module depends upon the setting \<type\> and if the device was already ON at the moment when the alarm time had come.

Read command returns the list of current active alarm settings in the ME, in the format:

[+CALA: <time>,<n>,<type>,[<text>],<recurr>,<silent>]

Test command returns the list of supported index values (currently just 0), alarm types, maximum length of the text to be displayed, maximum length of <recurr> and supported <silent>s, in the format:

+CALA: (list of supported <n>s),(list of supported <type>s),<tlength>, <rlength>,(list of supported <silent>s)

Syntax

Command	Command type
AT+CALA=<time>[,<n>[,<type>[,<text>[,<recurr>[, <silent>]]]]]	Set
AT+CALA?	Read
AT+CALA=?	Test

Parameters and values

<time>	Current alarm time as quoted string.
""	Empty string. Deletes the current alarm and resets all the +CALA parameters to the default configuration.
"hh:mm:ss±zz"	Format used only when issuing +CALA with parameter <recurr> too
"yy/MM/dd,hh :mm:ss±zz"	Generic format: it's the same as defined for +CCLK.
<n>	Index of the alarm.
0	The only value supported is 0
<type>	Alarm behavior type
0	Reserved for other equipment use
1	The module simply wakes up fully operative as if the ON/OFF button had been pressed. If the device is already ON at the alarm time, then it does nothing. **Default** .
2	The module wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the module issues an unsolicited code every 3 seconds.
	+CALA: <text>
	where <text> is the +CALA optional parameter previously set.
	The device keeps on sending the unsolicited code every 3 seconds until a #WAKE command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the #WAKE command within 90 seconds then it shuts down.

3	The module wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the module starts playing the alarm tone on the selected path for the ringer. See command #SRP.
	The device keeps playing the alarm tone until a #WAKE command is received or a 90 second time-out occurs. If the device is in "alarm mode" and it does not receive the #WAKE command within 90 seconds then it shuts down.
4	The module wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the module brings the pin GPIO6 high, provided its <direction> is set to alarm output, and keeps it in this state until a #WAKE command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the #WAKE command within 90 seconds then it shuts down.
5	The module makes both the actions as for type=2 and <type>=3.
6	The module makes both the actions as for type=2 and <type>=4.
7	The module makes both the actions as for type=3 and <type>=4.
8	The module wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the module sets High the RI output pin. The RI output pin remains High until next #WAKE issue or until a 90 second timer expires. If the device is in "alarm mode" and it does not receive the #WAKE command within 90 seconds. After that it shuts down.
<text>	Unsolicited alarm code text string. It has meaning only if <type> is equal to 2, 5 or 6.
<recurr>	String type, value indicating day of week for the alarm in one of the following formats:
"<1..7>[,<1..7>[, …]]"	Sets a recurrent alarm for one or more days in the week; the digits 1 to 7 corresponds to the days in the week. Monday is 1.
"0"	Sets a recurrent alarm for all days in the week.
<silent>	Integer type indicating if the alarm is silent or not.
0	The alarm is not silent.
1	During the "alarm mode" the device does not make any network scan and does not register to any network and therefore is not able to dial or receive any call or SMS, the only command that can be issued to the module in this state is #WAKE. All other command must not be issued during this state. Note: You must set the RTC (issuing +CCLK) at least once before you can issue +CALA with <type>=8.

Notes

■ Reference: ETSI 07.07, ETSI 27.007.

Examples

AT+CALA="02/09/07,23:30:00+00"
OK

Delete Alarm +CALD

Execute command deletes an alarm in the ME.

Test command reports the range of supported values for <n> parameter.

Syntax

Command	Command type
AT+CALD=<n>	Execute
AT+CALD=?	Test

Parameters and values

<n>

0

Notes

■ Reference: 3G TS 27.007

Postpone Alarm +CAPD

Set command postpones or dismisses a currently active alarm.

Test command reports the supported range of values for <sec>.

Syntax

Command	Command type
AT+CAPD=[<sec>]	Set
AT+CAPD=?	Test

Parameters and values

<sec>   Integer type value indicating the number of seconds to postpone the alarm. Maximum is 60 seconds. **Default: 0**. When 0, the alarm is dismissed.

Setting Date Format +CSDF

This command sets the date format of the date information presented to the user, which is specified by use of the <mode> parameter. The <mode> affects the date format on the phone display and does not affect the date format of the AT command serial interface, so it is not used.

The command also sets the date format of the TE-TA interface, which is specified by use of the <auxmode> parameter—that is, the <auxmode> affects the <time> of AT+CCLK and AT+CALA. If the parameters are omitted then this sets the default value of <mode>.

Read command reports the currently selected <mode> and <auxmode> in the format:

+CSDF: <mode>,<auxmode>

Test command reports the supported range of values for <mode> and <auxmode>.

Syntax

Command	Command type
AT+CSDF=[<mode>[,<auxmode>]]	Set

Command	Command type
AT+CSDF?	Read
AT+CSDF=?	Test

Parameters and values

<mode>

1	DD-MMM-YYYY. **Default: 1**.
2	DD-MM-YY
3	MM/DD/YY
4	DD/MM/YY
5	DD.MM.YY
6	YYMMDD
7	YY-MM-DD

<auxmode>

1	yy/MM/dd. **Default: 1**.
2	yyyy/MM/dd

Notes

■ When <auxmode>=1, the <time> format of +CCLK and +CALA is "yy/MM/dd,hh:mm:ss+zz". When <auxmode>=2 it is "yyyy/MM/dd,hh:mm:ss+zz".

Setting Time Format +CSTF

This command sets the time format of the time information presented to the user, which is specified by use of the <mode> parameter. The <mode> affects the time format on the phone display and does not affect the time format of the AT command serial interface, so it not actually not used.

Read command reports the currently selected <mode> in the format:

+CSTF: <mode>

Test command reports the supported range of values for <mode>.

Syntax

Command	Command type
AT+CSTF=[<mode>]	
AT+CSTF?	Read
AT+CSTF=?	Test

Parameters and values

<mode>

1	HH:MM 24 hour clock. **Default: 1**.

2	HH:MM a.m./p.m.

Time Zone Reporting +CTZR

This command enables and disables the time zone change event reporting. If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed.

Read command reports the currently selected <onoff> in the format:

+CTZR: <onoff>

Test command reports the supported range of values for parameter <onoff>

Syntax

Command	Command type
AT+CTZR=<onoff>	
AT+CTZR?	Read
AT+CTZR=?	Test

Parameters and values

<onoff>

0   Disable time zone change event reporting. **Default: 0**.

1   Enable time zone change event reporting.

Automatic Time Zone Update +CTZU

This command enables and disables automatic time zone update through NITZ.

Read command reports the currently selected <onoff> in the format:

+CTZU: <onoff>

Test command reports the supported range of values for parameter <onoff>.

Syntax

Command	Command type
AT+CTZU=<onoff>	
AT+CTZU?	Read
AT+CTZU=?	Test

Parameters and values

<onoff>

0   Disable automatic time zone update via NITZ. **Default: 0**.

1   Enable automatic time zone update via NITZ

Notes

■ The command AT+CTZU=1 enables automatic update of the date and time set by AT+CCLK command (not only time zone). This happens when a Network Identity and Time Zone (NITZ) message is sent by the network. This command is the ETSI standard equivalent of Telit custom command AT#NITZ=1. If command AT+CTZU=1, or AT#NITZ=1 (or both) is issued, NITZ message causes a date and time update.

Alert Sound Mode +CALM

Set command selects the general alert sound mode of the device.

Read command returns the current value of parameter <mode>.

Test command returns the supported values for the parameter <mode> as compound value.

+CALM: (0-2)

Syntax

Command	Command type
AT+CALM=<mode>	Set
AT+CALM?	Read
AT+CALM=?	Test

Parameters and values

<mode>

0   Normal mode.

1   Silent mode. No sound is generated by the device, except for alarm sound.

2   Stealth mode. No sound is generated by the device. Note: If silent mode is selected, incoming calls do not produce alerting sounds but only the unsolicited messages RING or +CRING.

Notes

■ Reference: 3GPP TS 27.007

Ringer Sound Level +CRSL

Set command selects the incoming call ringer sound level of the device.

Read command reports the current <level> setting of the call ringer in the format:

+CRSL: <level>

Test command reports <level> supported values as compound value.

+CRSL: (0-4)

Syntax

Command	Command type
AT+CRSL=<level>	Set

Command	Command type
AT+CRSL?	Read
AT+CRSL=?	Test

Parameters and values

<level>	Ringer sound level
0	Off
1	Low
2	Middle
3	High
4	Progressive

Notes

■ Reference: 3GPP TS 27.007.

Loudspeaker Volume Level +CLVL

Set command selects the volume of the internal loudspeaker audio output of the device.

Read command reports the current <level> setting of the loudspeaker volume in the format:

+CLVL: <level>

Test command reports <level> supported values range in the format:

+CLVL: (0-max)

Syntax

Command	Command type
AT+CLVL=<level>	Set
AT+CLVL?	Read
AT+CLVL=?	Test

Parameters and values

<level>	Loudspeaker volume
0-max	The value of max can be read by issuing the Test command AT+CLVL=?

Notes

■ Reference: 3GPP TS 27.007.

Microphone Mute Control +CMUT

Set command enables or disables the muting of the microphone audio line during a voice call.

Read command reports whether the muting of the microphone audio line during a voice call is enabled or not, in the format:

+CMUT: <n>

Test command reports the supported values for <n> parameter.

Syntax

Command	Command type
AT+CMUT=<n>	Set
AT+CMUT?	Read
AT+CMUT=?	Test

Parameters and values

<n>

0   Mute off, microphone active. **Default: 0**.

1   Mute on, microphone muted. Note: This command mutes or activates both microphone audio paths, internal mic and external mic.

Notes

- Reference: 3GPP TS 27.007.

Silence Command +CSIL

This command enables or disables the silent mode. When the phone is in silent mode, all signaling tones from MT are suppressed.

Read command reports the currently selected <mode> in the format:

+CSIL: <mode>

Test command reports the supported range of values for <mode>.

Syntax

Command	Command type
AT+CSIL=[<mode>]	
AT+CSIL?	Read
AT+CSIL=?	Test

Parameters and values

<mode>

0   Silent mode off. **Default: 0**.

1   Silent mode on.

Accumulated Call Meter +CACM

Set command resets the Advice of Charge related Accumulated Call Meter stored in SIM (ACM). It contains the number of home units for both the current and preceding calls.

Read command reports the current value of the SIM ACM in the format:

+CACM: <acm>

where:

<acm> - accumulated call meter in home units, string type: three bytes of the ACM value in hexadecimal format (for example "00001E" indicates decimal value 30)

Note: The value <acm> is in home units; price per unit and currency are defined with command +CPUC

Test command returns the OK result code.

Syntax

Command	Command type
AT+CACM=[<pwd>]	Set
AT+CACM?	Read
AT+CACM=?	Test

Parameters and values

<pwd> To access this command PIN2. If PIN2 is already input once after startup, it is not required again.

Notes

■ Reference: 3GPP TS 27.007.

Accumulated Call Meter Maximum +CAMM

Set command sets the Advice of Charge related Accumulated Call Meter Maximum Value stored in SIM (ACMmax). This value represents the maximum number of home units allowed to be consumed by the subscriber. When ACM reaches <acmmax> value further calls are prohibited.

Read command reports the ACMmax value stored in SIM in the format:

+CAMM : <acmm>

where:

<acmm> - ACMmax value in home units, string type: three bytes of the ACMmax value in hexadecimal format (for example "00001E" indicates decimal value 30)

Test command returns the OK result code.

Syntax

Command	Command type
AT+CAMM=[<acmmax>[,<pwd>]]	Set
AT+CAMM?	Read
AT+CAMM=?	Test

Parameters and values

\<acmmax\>	ACMmax value, integer type. The maximum number of home units the subscriber can consume.
	Note: To disable the feature set \<acmmax\> = 0.
\<pwd\>	PIN2. If PIN2 is input once after startup, it is not required again.

Notes

- Reference: 3GPP TS 27.007.

Price per Unit and Currency Table +CPUC

Set command sets the values of Advice of Charge related Price per Unit and Currency Table stored in SIM (PUCT). The PUCT information can be used to convert the home units (as used in commands +CAOC, +CACM and +CAMM) into currency units.

Read command reports the current values of \<currency\> and \<ppu\> parameters in the format:

+CPUC : \<currency\>,\<ppu\>

Test command returns the OK result code.

Syntax

Command	Command type
AT+CPUC=\<currency\>,\<ppu\>[,\<pwd\>]	Set
AT+CPUC?	Read
AT+CPUC=?	Test

Parameters and values

\<currency\>	String type. 3-character currency code. For example "LIT", "L. ", "USD", "DEM". Used character set is the one selected with command +CSCS.
\<ppu\>	String type, price per unit, dot is used as decimal separator. For example "1989.27".
\<pwd\>	SIM PIN2. If PIN2 is input once after startup, it is not required again.

Notes

- Reference: 3GPP TS 27.007.

Call Meter Maximum Event +CCWE

Set command enabled and disabled sending of an unsolicited result code +CCWV shortly before the ACM (Accumulated Call Meter) maximum value is reached. The warning is issued approximately when 30 seconds call time remains. It is also issued when starting a call if less than 30 seconds call time remains.

Note: The set command responds with an error if the Accumulated Call Meter service is not active in SIM.

Read command reports the currently selected \<mode\> in the format:

+CCWE: \<mode\>

Test command reports the supported range of values for parameter <mode>.

Syntax

Command	Command type
AT+CCWE=<mode>	Set
AT+CCWE?	Read
AT+CCWE=?	Test

Parameters and values

    <mode>

        0   Disable call meter warning event. **Default: 0**.

        1   Enable call meter warning event.

Notes

    ■

■ **Set Voice Mail Number +CSVM**

This command sets the number to the voice mail server. If the parameter <mode> is set to 0, you can omit the parameters <number> and <type>.

Read command returns the currently selected voice mail number and the status (that is, enabled or disabled) in the format

+CSVM:<mode>,<number>,<type>

Test command reports the range for the parameters <mode> and <type>.

Syntax

Command	Command type
AT+CSVM=<mode>[,<number>[,<type>]]	Set
AT+CSVM?	Read
AT+CSVM=?	Test

Parameters and values

    <mode>

        0   Disable the voice mail number

        1   Enable the voice mail number. **Default: 1**.

    <number>   String type, phone number of format specified by <type>.

      <type>   Type of address octet in integer format.

        129   Unknown type of number and ISDN/Telephony numbering plan.

| 145 | International type of number and ISDN/Telephony numbering plan. Contains the character "+". |

Note: Set command only checks for parameters values validity. The command does not actually write to SIM to update voice mail number.

Mobile Equipment Errors

Report Mobile Equipment Error +CMEE

Set command enables or disables the report of result code:

+CME ERROR: <err>

as an indication of an error relating to the +Cxxx commands issued.

When enabled, device related errors cause the +CME ERROR: <err> final result code instead of the default ERROR final result code. ERROR is always returned when the error message is related to syntax, invalid parameters, or DTE function.

Read command returns the current value of subparameter <n>:

+CMEE: <n>

Test command returns the range of values for subparameter <n>

Syntax

Command	Command type
AT+CMEE=[<n>]	Set
AT+CMEE?	Read
AT+CMEE=?	Test

Parameters and values

<n>	Enable flag.
0	Disable +CME ERROR:<err> reports, use only ERROR report.
1	Enable +CME ERROR:<err> reports, with <err> in numeric format.
2	Enable +CME ERROR: <err> reports, with <err> in verbose format.

Notes

- ■ +CMEE has no effect on the final result code +CMS.
- ■ Reference: 3GPP TS 27.007.

Voice Control

DTMF Tones Transmission +VTS

Execute command allows the transmission of DTMF tones.

Test command provides the list of supported <dtmf>s and the list of supported <duration>s in the format:

(list of supported <dtmf>s)[,(list of supported <duration>s)]

Syntax

Command	Command type
AT+VTS=<dtmfstring>[,duration]	Execute
AT+VTS=?	Test

Parameters and values

<dtmfstring>	String of <dtmf>s; that is ASCII characters in the set (0 9), #,*,(A D),P; it allows the user to send a sequence of DTMF tones, each of them with a duration that was defined through +VTD command
<duration>	Duration of a tone in 1/100 sec. This parameter can be specified if only one ASCII character is used in the dtmfstring.
0	A single DTMF tone is transmitted for a duration depending on the network, no matter what the current +VTD setting is.
1-255	A single DTMF tone is transmitted for a time <duration> (in 10 ms multiples), no matter what the current +VTD setting is.

Notes

- This command operates in voice mode only. See +FCLASS.
- The character P does not correspond to any DTMF tone, but it is interpreted as a pause of 3 seconds between the preceding and succeeding DTMF string elements.
- Reference: 3GPP TS 27.007 and TIA IS-101.

Tone Duration +VTD

Set command sets the length of tones transmitted with +VTS command.

Read command reports the current Tone Duration, in the format:

Test command provides the list of supported <duration>s in the format:

(list of supported <duration>s)

Syntax

Command	Command type
AT+VTD=<duration>	Set
AT+VTD?	Read
AT+VTD=?	Test

Parameters and values

<duration>	Duration of a tone.

0	The duration of every tone depends on the network. **Default: 0**.
1-255	Duration of every tone in 1/10 sec.

Notes

■ Reference: 3GPP TS 27.007 and TIA IS-101.

Commands for GPRS

GPRS Mobile Station Class +CGCLASS

Set command sets the GPRS class according to <class> parameter.

Read command returns the current value of the GPRS class in the format:

+CGLASS: <class>

Test command reports the range for the parameter <class>.

Syntax

Command	Command type
AT+CGCLASS=[<class>]	Set
AT+CGCLASS?	Read
AT+CGCLASS=?	Test

Parameters and values

<class>	GPRS class.
"A"	UMTS. Default: "A".
"B"	GSM/GPRS.
"CG"	Class C in GPRS only mode. GPRS only.
"CC"	Class C in circuit switched only mode. GSM only.

Notes

■ The setting is saved in non-volatile memory and available after a reboot.

GPRS Attach or Detach +CGATT

Execute command attaches the terminal to, or detaches the terminal from, the GPRS service depending on the parameter <state>.

Read command returns the current GPRS service state.

Test command requests information on the supported GPRS service states.

Syntax

Command	Command type
AT+CGATT=[<state>]	Execute

Command	Command type
AT+CGATT?	Read
AT+CGATT=?	Test

Parameters and values

<state>	State of GPRS attachment.	
0	Detached.	
1	Attached.	

Notes

■ Reference: 3GPP TS 27.007

Examples

AT+CGATT?
+CGATT: 0
OK
AT+CGATT=?
+CGATT: (0,1)
OK
AT+CGATT=1
OK

GPRS Event Reporting +CGEREP

Set command enables or disables sending of unsolicited result codes +CGEV: XXX from TA to TE in the case of certain events occurring in the TA or the network. For more information see the section Unsolicited Result Codes.

Read command returns the current <mode> and <bfr> settings, in the format:

+CGEREP: <mode>,<bfr>

Test command reports the supported range of values for the +CGEREP command parameters.

Syntax

Command	Command type
AT+CGEREP=[<mode>[,<bfr>]]	Set
AT+CGEREP?	Read
AT+CGEREP=?	Test

Parameters and values

<mode>	Controls the processing of URCs specified with this command.
0	Buffer unsolicited result codes in the TA. If TA result code buffer is full, the oldest one can be discarded. No codes are forwarded to the TE.
1	Discard unsolicited result codes when TA-TE link is reserved (for example 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 (for example in on-line data mode) and flush them to the TE when TA-TE link becomes available; otherwise forward them directly to the TE.
<bfr>	Controls the effect on buffered codes when <mode> 1 or 2 is entered:
0	TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1 or 2 is entered.
1	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1 or 2 is entered. OK response is given before flushing codes.

Unsolicited Result Codes

The following unsolicited result codes and the corresponding events are defined:

- +CGEV: REJECT <PDP_type>, <PDP_addr> A network request for PDP context activation occurred when the TA was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected.
- +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 TA.
- +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 TA.
- +CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>] The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to TA.
- +CGEV: NW DETACH The network has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.
- +CGEV: ME DETACH The mobile equipment has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.
- +CGEV: ME CLASS <class> The mobile equipment has forced a change of MS class. The highest available class is reported, see +CGCLASS.

Notes

- Reference: 3GPP TS 27.007.

GPRS Network Registration Status +CGREG

Set command controls the presentation of an unsolicited result code +CGREG: For more information about the result codes see the section Unsolicited Result Codes.

Read command returns the status of result code presentation mode <n> and the integer <stat> which shows whether the network has currently indicated the registration of the terminal in the format:

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

Note: <lac>, <Ci>, <AcT> and <rac> are reported only if <mode>=2 and the mobile is registered on some network cell.

Test command returns supported values for parameter <n>.

Syntax

Command	Command type
AT+CGREG=[<n>]	

Command	Command type
AT+CGREG?	Read
AT+CGREG=?	Test

Parameters and values

<n>	Result code presentation mode.
0	Disable network registration unsolicited result code.
1	Enable network registration unsolicited result code.

Unsolicited Result Codes

If there is a change in the terminal GPRS network registration status, it is issued the unsolicited result code:

+CGREG: <stat>

where:

<stat>	Registration status.
0	Not registered, terminal is not currently search for a new operator to register with.
1	Registered, home network.
2	Not registered. Terminal is currently searching for a new operator to register with.
3	Registration denied.
4	Unknown.
5	Registered, roaming.

2 - enable network registration and location information unsolicited result code; if there is a change of the network cell, it is issued the unsolicited result code:

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

where:

<stat>	Registration status.
<lac>	Location area code in hexadecimal format. For example "00C3" equals 195 in decimal.
<ci>	Cell ID in hexadecimal format.
<AcT>	Access technology of the registered network:
0	GSM
2	UTRAN
<rac>	String type, one byte routing area code in hexadecimal format.

Note: <lac>, <Ci>, <AcT> and <rac> are reported only if <mode>=2 and the mobile is registered on some network cell.

Notes

■ Reference: 3GPP TS 27.007.

Define PDP Context +CGDCONT

Set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>.

Read command returns the current settings for each defined context in the format:

 +CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>, <h_comp>[,<pd1>[,…[,pdN]]]
[<CR><LF>+CGDCONT: <cid>, <PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>
 [,<pd1>[,…[,pdN]]][…]]

Test command returns values supported as a compound value.

Syntax

Command	Command type
AT+CGDCONT=[<cid>[,<PDP_type>,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<pd1>[,…[,pdN]]]]]]]]]	Set
AT+CGDCONT?	Read
AT+CGDCONT=?	Test

Parameters and values

<cid>	PDP Context Identifier. Numeric parameter that specifies a PDP context definition.
1-max	The value of max is returned by the Test command.
	Note: A special form of the Set command, +CGDCONT=<cid>, causes the values for context number <cid> to become undefined.
<PDP_type>	Packet Data Protocol type. String parameter that specifies the type of packet data protocol
"IP"	Internet Protocol
"IPV6"	Internet Protocol version 6
<APN>	Access Point Name. String parameter that is a logical name used to select the GGSN or the external packet data network. If the value is empty ("") or omitted,then the subscription value is requested.
<PDP_addr>	String parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the +CGPADDR command.
<d_comp>	Numeric parameter that controls PDP data compression
0	Off. If value is omitted, **Default: 0**.
1	On.
<h_comp>	Numeric parameter that controls PDP header compression
0	Off. If value is omitted, **Default: 0**.

1	On.
<pd1>, …, <pdN>	Zero to N string parameters whose meanings are specific to the <PDP_type>

Notes

■ Reference: 3GPP TS 27.007

Examples

AT+CGDCONT=1,"IP","APN","10.10.10.10",0,0
OK
AT+CGDCONT?
+CGDCONT: 1,"IP","APN","10.10.10.10",0,0
OK
AT+CGDCONT=?
+CGDCONT: (1-5),"IP",,,(0-1),(0-1)
OK

Quality of Service Profile +CGQMIN

Set command specifies a minimum acceptable profile that is checked by the terminal against the negotiated profile returned in the Activate PDP Context Accept message.

Read command returns the current settings for each defined context in the format:

+CGQMIN: <cid>,<precedence>,
<delay>,<reliability>,<peak>,
<mean>[<CR><LF>+CGQMIN: <cid>,<precedence>,
<delay>,<reliability>,<peak>,<mean>[…]]

If no PDP context is defined, it has no effect and OK result code is returned. Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format:

+CGQMIN: <PDP_Type>,(list of supported <precedence>s),
(list of supported <delay>s),(list of supported <reliability>s),
 (list of supported <peak>s),(list of supported <mean>s)

Note: Only the "IP" <PDP_Type> is currently supported.

Syntax

Command	Command type
AT+CGQMIN= [<cid> [,<precedence> [,<delay> [,<reliability> [,<peak> [,<mean>]]]]]]	
AT+CGQMIN=?	Read
AT+CGQMIN=?	Test

Parameters and values

<cid>	PDP context identification. See +CGDCONT command.
<precedence>	Precedence class.

\<delay>	Delay class.
\<reliability>	Reliability class.
\<peak>	Peak throughput class.
\<mean>	Mean throughput class.
	Note: If a value is omitted for a particular class then this class is not checked.

Notes

- A special form of the Set command, +CGQMIN=\<cid> causes the requested profile for context number \<cid> to become undefined.
- Set command can modify the 3G QoS according to 3GPP 23.107. See +CGEQMIN.
- Reference: 3GPP TS 27.007; GSM 03.60

Examples

AT+CGQMIN=1,0,0,3,0,0
OK
AT+CGQMIN?
+CGQMIN: 1,0,0,5,0,0
OK
AT+CGQMIN=?
+CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)
OK

Quality of Service Profile +CGQREQ

Set command allows to specify a Quality of Service Profile that is used when the terminal sends an Activate PDP Context Request message to the network. It specifies a profile for the context identified by the (local) context identification parameter, \<cid>.

Read command returns the current settings for each defined context in the format:

+CGQREQ: \<cid>,\<precedence>,\<delay>,\<reliability>,\<peak>,
\<mean>[\<CR>\<LF>+CGQREQ: \<cid>,\<precedence>,
\<delay>,\<reliability>,\<peak>,\<mean>[…]]

If no PDP context is defined, it has no effect and OK result code is returned. Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format:

+CGQREQ: \<PDP_Type>,(list of supported \<precedence>s),

(list of supported \<delay>s),(list of supported \<reliability>s),

(list of supported \<peak>s),(list of supported \<mean>s)

Note: Only the "IP" \<PDP_Type> is currently supported.

Syntax

Command	Command type
AT+CGQREQ=[\<cid>[,\<precedence>[,\<delay>[,\<reliability>[,\<peak> [,\<mean>]]]]]]	

Command	Command type
AT+CGQREQ?	Read
AT+CGQREQ=?	Test

Parameters and values

<cid>   PDP context identification. See +CGDCONT command.

<precedence>   Precedence class.

<delay>   Delay class.

<reliability>   Reliability class.

<peak>   Peak throughput class.

<mean>   Mean throughput class.

Note: If a value is omitted for a particular class then this class is not checked.

Notes

■ A special form of the Set command, +CGQREQ=<cid> causes the requested profile for context number <cid> to become undefined.

■

■ Reference: 3GPP TS 27.007; GSM 03.60.

Examples

AT+CGQREQ?
+CGQREQ: 1,0,0,3,0,0
OK
AT+CGQREQ=1,0,0,3,0,0
OK
AT+CGQREQ=?
+CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)
OK

3G Quality of Service Profile (Requested) +CGEQREQ

Set command specifies a 3G quality of service profile for the context identified by the(local) context identification parameter <cid> which is used when the MT sends an Activate PDP Context Request message to the network.

Read command returns the current settings for each defined context in the format:

[+CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling>,<Source statistics descriptor>,<Signalling indication><CR><LF>] [+CGEQREQ:…]

If no PDP context is defined, it has no effect and OK result code is returned.

Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format:

+CGQEQREQ: <PDP_Type>,(list of supported <Traffic class>s),
(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s), (list of supported <Source statistics descriptor>s), (list of supported <Signalling indication>s)

Note: Only "IP" PDP_Type is currently supported.

Syntax

Command	Command type
AT+CGEQREQ= [<cid> [,<Traffic class> [,<Maximum bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority> [,<Source statistics descriptor> [,<Signalling indication>]]]]]]]]]]]]]]]	Set
AT+CGEQREQ?	Read
AT+CGEQREQ=?	Test

Parameters and values

<cid>	PDP context identification. See +CGDCONT.
<Traffic class>	Traffic class.
0	Conversational.
1	Streaming.
2	Interactive.
3	Background.
4	Subscribed value. **Default: 4**.
<Maximum bitrate UL>	Maximum bitrate Up Link (kbits/s). Provide this parameter if the <Traffic class> is specified as conversational or streaming
0	Subscribed value. **Default: 0**.
1…568	
576…8640	
<Maximum bitrate DL>	Maximum bitrate down link (kbits/s). Provide this parameter if the <Traffic class> is specified as conversational or streaming.
0	Subscribed value. **Default: 0**.
1…568	
576…8640	

8700…16000	
<Guaranteed bitrate UL>	The guaranteed bitrate up link(kbits/s). Provide this parameter if the <Traffic class> is specified as conversational or streaming.
0	Subscribed value. **Default: 0.**
1…568	
576…8640	
<Guaranteed bitrate DL>	the guaranteed bitrate down link(kbits/s). Provide this parameter if the <Traffic class> is specified as conversational or streaming.
0	subscribed value. **Default: 0**.
1…568	
576…8640	
8700…16000	
<Delivery order>	SDU Delivery order.
0	No
1	Yes
2	Subscribed value. **Default: 2**.
< Maximum SDU size>	Maximum SDU size in octets.
0	Subscribed value. Default: 0.
10…1500	
1502	
1510	
1520	
<SDU error ratio>	SDU error ratio mEe mean m*10-e , for example 1E2 mean 1*10- 2.
	"0E0" Default: "0E0".
	"1E1"
	"1E2"
	"7E3"
	"1E3"
	"1E4"
	"1E5"
	"1E6"

	<Residual bit error ratio> Residual bit error ratio - mEe mean m*10-e , for example 1E2 mean 1*10-2
"0E0"	**Default: "0E0"**.
"5E2"	
"1E2"	
"5E3"	
"4E3"	
"1E3"	
"1E4"	
"1E5"	
"1E6"	
"6E8"	
<Delivery of erroneous SDUs>	Delivery of erroneous SDUs.
0	No
1	Yes
2	No detect. .
3	Subscribed value. **Default: 3**
<Transfer delay >	Transfer delay (milliseconds)
0	Subscribed value. **Default: 0**.
10…150	
200…950	
1000…4000	
<Traffic handling priority >	Traffic handling priority.
0	Subscribed value. **Default: 0**.
1-3	
<Source Statistics Descriptor>	Characteristics of the source of the submitted SDUs for a PDP context. Provide this parameter if the <Traffic class> is specified as conversational or streaming.
0	Characteristics of SDUs is unknown. **Default: 0**.
1	Characteristics of SDUs corresponds to a speech source
<Signalling Indication>	Signaling content of submitted SDUs for a PDP context. Provide this parameter if the <Traffic class> is specified as interactive.

0   PDP context is not optimized for signaling. **Default: 0**.

1   PDP context is optimized for signaling <PDP_type>. See +CGDCONT. Note: A special form of the Set command, +CGEQREQ=<cid> causes the requested profile for context number <cid> to become undefined.

Note: The current settings are stored in non-volatile memory.

Note: Set command can modify the 2G QoS according to 3GPP 23.107. See +CGQREQ

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

Set command allows specifying a 3G quality of service profile for the context identified by the (local) context identification parameter <cid> which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept Message.

Read command returns the current settings for each defined context in the format:

  [+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>, <Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling>, <Source statistics descriptor>,<Signalling indication><CR><LF>]
  [+CGEQMIN:…]

Parameters are described as for the set command except:

<Traffic class> - Traffic class

0 – conversational. If the value is explicitly defined. Otherwise, if the context or the QoS is undefined it is the default value as undefined.

1 - streaming

2 - interactive

3 – background

<Traffic handling priority > - Traffic handling priority

0 (default value as undefined)

1…3

If no PDP context is defined, it has no effect and OK result code is returned.

Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format:

+CGQMIN: <PDP_Type>,(list of supported <Traffic class>s),

(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported

<Traffic handling priority>s), (list of supported <Source statistics descriptor>s), (list of supported <Signalling indication>s)

Note: Only the "IP" PDP_Type is currently supported.

Syntax

Command	Command type
AT+CGEQMIN= [<cid> [,<Traffic class> [,<Maximum bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority> [,<Source statistics descriptor> [,<Signalling indication>]]]]]]]]]]]]]]]	
AT+CGEQMIN?	Read
AT+CGEQMIN=?	Test

Parameters and values

<cid>	PDP context identification. See +CGDCONT command.
<Traffic class>	Traffic class
0	Conversational. **Default: 0**.
1	Streaming
2	Interactive
3	background
<Maximum bitrate UL>	Maximum bitrate Up Link (kbits/s)
0	**Default: 0**.
1-568	
576-8640	
<Maximum bitrate DL>	<Maximum bitrate DL>
0	**Default: 0**.
1-568	
576-8640	
8700-16000	
<Guaranteed bitrate UL>	Guaranteed bitrate up link(kbits/s)
0	**Default: 0**.
1-568	

576-8640	
\<Guaranteed bitrate DL\>	the guaranteed bitrate down link(kbits/s)
0	**Default: 0**
1-568	
576-8640	
8700-16000	
\<Delivery order\>	SDU Delivery order
0	No. **Default: 0**.
1	Yes
\<Maximum SDU size\>	Maximum SDU size in octets
0	**Default: 0**.
10-1500	
1502	
1510	
1520	
\<SDU error ratio\>	SDU error ratio - mEe mean m*10-e , for example 1E2 mean 1*10-2
"0E0"	**Default: 0**.
"1E1"	
"1E2"	
"7E3"	
"1E3"	
"1E4"	
"1E5"	
"1E6"	
\<Residual bit error ratio\>	Residual bit error ratio - mEe mean m*10-e , for example 1E2 mean 1*10-2
"0E0"	**Default: 0**.
"5E2"	
"1E2"	
"5E3"	
"4E3"	
"1E3"	

"1E4"	
"1E5"	
"1E6"	
"6E8"	
<Delivery of erroneous SDUs>	Delivery of erroneous SDUs
0	No. **Default: 0**.
1	Yes.
2	no detect.
<Transfer delay>	Transfer delay (milliseconds)
0	**Default: 0**
10...150	
200...950	
1000...4000	
<Traffic handling priority>	Traffic handling priority
1...3	
<Source Statistics Descriptor>	Characteristics of the source of the submitted SDUs for a PDP context. Provide this parameter if the <Traffic class> is specified as conversational or streaming.
0	Characteristics of SDUs is unknown. **Default: 0**.
1	Characteristics of SDUs corresponds to a speech source.
<Signalling Indication>	Signalling content of submitted SDUs for a PDP context. Provide this parameter if the <Traffic class> is specified as interactive.
0	PDP context is not optimized for signaling. **Default: 0**.
1	PDP context is optimized for signaling. Note: A special form of the Set command, +CGEQMIN=<cid> causes the requested profile for context number <cid> to become undefined. Note: The current settings are stored in non-volatile memory. Note: Set command can modify the 2G QoS according to 3GPP 23.107. See +CGQMIN.

PDP Context Activate or Deactivate +CGACT

Execute command activates or deactivates the specified PDP contexts.

Read command returns the current activation state for all the defined PDP contexts in the format:

+CGACT: <cid>,<state>[<CR><LF>+CGACT: <cid>,<state>[…]]

Test command reports information on the supported PDP context activation states parameters in the format:

+CGACT: (0,1)

Syntax

Command	Command type
AT+CGACT=[<state>[,<cid>[,<cid>[,…]]]]	Set
AT+CGACT?	Read
AT+CGACT=?	Test

Parameters and values

<state>		Indicates the state of PDP context activation.
0		Deactivated
1		Activated
<cid>		Numeric parameter which specifies a particular PDP context definition. See +CGDCONT.

Note: Only three <cid>s can be activated at the same time.

Note: If no <cid>s are specified, the command's activation form activates the first three defined contexts. The deactivation form deactivates all active contexts.

Notes

- Reference: 3GPP TS 27.007.

Examples

AT+CGACT=1,1
OK
AT+CGACT?
+CGACT: 1,1
OK

3G Quality of Service Profile (Negotiated) +CGEQNEG

This command allows the TE to retrieve the negotiated 3G quality of service returned in the Activate PDP Context Accept/Modify message.

Set command returns the negotiated 3G QoS profile for the specified context identifiers, <cid>s. The QoS profile consists of a number of parameters, each of which may have a separate value.

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

Syntax

Command	Command type
AT+CGEQNEG= [<cid>[,<cid>[,…]]]	Set
AT+CGEQNEG=?	Test

Parameters and values

<cid>

PDP context identification. See +CGDCONT. Returns the current settings for each specified context in the format. See +CGEQREQ.

[+CGEQNEG: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,

<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,

<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,

<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling>

<CR><LF>] [+CGEQNEG:…]

0 .

1

Notes

■ Reference: 3GPP TS 27.007.

PDP Context +CGACT

Execute command activates or deactivates the specified PDP contexts.

Read command returns the current activation state for all the defined PDP contexts in the format:

+CGACT: <cid>,<state>[<CR><LF>+CGACT: <cid>,<state>[…]]

Test command reports information on the supported PDP context activation states parameters in the format:

+CGACT: (0,1)

Syntax

Command	Command type
AT+CGACT=[<state>[,<cid>[,<cid>[,…]]]]	Set
AT+CGACT?	Read
AT+CGACT=?	Test

Parameters and values

<state> Indicates the state of PDP context activation.

0 Deactivated

1 Activated

<cid>

Numeric parameter that specifies a PDP context definition. See +CGDCONT.

Note: If no <cid>s are specified the activation/deactivation form of the command activates/deactivates all defined contexts.

Notes

■ Reference: 3GPP TS 27.007

Examples

AT+CGACT=1,1
OK
AT+CGACT?
+CGACT: 1,1
OK

Show PDP Address +CGPADDR

Execute command returns a list of PDP addresses for the specified context identifiers in the format:

+CGPADDR: <cid>,<PDP_addr>[<CR><LF>+CGPADDR: <cid>,<PDP_addr>[…]]

Test command returns a list of defined <cid>s.

Syntax

Command	Command type
AT+CGPADDR=[<cid>[,<cid>[,…]]]	Set
AT+CGPADDR=?	Test

Parameters and values

<cid>   Numeric parameter that specifies a PDP context definition. See +CGDCONT. If no <cid> is specified, the addresses for all defined contexts are returned.

<PDP_addr>   String that identifies the terminal in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it is the one set by the +CGDCONT command when the context was defined. For a dynamic address it is the one assigned during the last PDP context activation that used the context definition referred to by <cid>; if no address is available the empty string ("") is represented as <PDP_addr>

Notes

■ Reference: 3GPP TS 27.007

Examples

AT#GPRS=1
+IP: xxx.yyy.zzz.www
OK
AT+CGPADDR=1
+CGPADDR: 1,"xxx.yyy.zzz.www"
OK
AT+CGPADDR=?
+CGPADDR: (1)
OK

Modify PDP Context +CGCMOD

The Execute command modifies the specified PDP context(s) with respect to QoS profiles.

If no <cidi> is specified the command modifies all active contexts.

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

Syntax

Command	Command type
AT+CGCMOD=[<cid1>[,<cid2>[,…,<cidN>]]]	Set
AT+CGCMOD=?	Test

Parameters and values

<cidi>   Numeric parameter which specifies a particular PDP context.

3GPP TS 27.005 AT Commands for SMS and CBS

General

Select Message Service +CSMS

Set command selects messaging service <service>. It returns the types of messages supported by the ME:

Read command reports current service setting along with supported message types in the format:

+CSMS: <service>,<mt>,<mo>,<bm>

where:

<service>	Messaging service.
<mt>	Mobile terminated messages support.
<mo>	Mobile originated messages support.
<bm>	Broadcast type messages support.

For more information about these values, see the Values section for the set command.

Test command reports the supported value of the parameter <service>.

Syntax

Command	Command type
AT+CSMS=<service>	Set
AT+CSMS?	Read
AT+CSMS=?	Test

Parameters and values

<service>

0   3GPP TS 23.040 and 3GPP TS 23.041. The syntax of SMS AT commands is compatible with 3GPP TS 27.005 **Default: 0**.

1 3GPP TS 23.040 and 3GPP TS 23.041. The syntax of SMS AT commands is compatible with 3GPP TS 27.005. The requirement of <service> setting 1 is mentioned under corresponding command descriptions.

Set command returns the types of messages supported by the ME:

+CSMS: <mt>,<mo>,<bm> where:

<mt> - mobile terminated messages support

0 - type not supported

1 - type supported

<mo> - mobile originated messages support

0 - type not supported

1 - type supported

<bm> - broadcast type messages support

0 - type not supported

1 - type supported

Notes

■ Reference: 3GPP TS 27.005; 3GPP TS 23.040; 3GPP TS 23.041.

Preferred Message Storage +CPMS

Set command selects memory storages <memr>, <memw> and <mems> to be used for reading, writing, sending and storing SMS messages.

Read command reports the message storage status in the format:

+CPMS: <memr>,<usedr>,<totalr>,<memw>,<usedw>,<totalw>,<mems>,<useds>,<totals>

where <memr>, <memw> and <mems> are the selected storage memories for reading, writing and storing respectively.

Test command reports the supported values for <memr>, <memw> and <mems>.

Syntax

Command	Command type
AT+CPMS=<memr>[,<memw>[,<mems>]]	Set
AT+CPMS?	Read
AT+CPMS=?	Test

Parameters and values

<memr>   Memory from which messages are read and deleted.

"SM"   SIM SMS memory storage. **Default: SM**

<memw>	Memory to which writing and sending operations are made.
"SM"	SIM SMS memory storage. **Default: SM**
<mems>	Memory to which received SMs are preferred to be stored.

"SM"   SIM SMS memory storage. **Default: SM**

The command returns the memory storage status in the format:

+CPMS: <usedr>,<totalr>,<usedw>,<totalw>,<useds>,<totals>

where:

<usedr> - number of SMs stored into <memr>.

<totalr> - maximum number of SMs that <memr> can contain.

<usedw> - number of SMs stored into <memw>.

<totalw> maximum number of SMs that <memw> can contain.

<useds> - number of SMs stored into <mems>.

<totals> - maximum number of SMs that <mems> can contain. Notes

Notes

- When <memr> is set to a memory, also <memw> and <mems> are set to the same memory.
- The set memory is automatically saved in NVM.
- Reference: GSM 27.005

Examples

5 out of 10 SMS SIM positions occupied.

Change memory to ME where there are 15 SMS positions occupiedAT+CPMS="ME"
+CPMS: "ME",15,100,"ME",15,100,"ME",15,100
OK

Message Format +CMGF

Set command selects the format of messages used with send, list, read and write commands.

Read command reports the current value of the parameter <mode>.

Test command reports the supported value of <mode> parameter.

Syntax

Command	Command type
AT+CMGF=[<mode>]	Set
AT+CMGF=?	Read
AT+CMGF=?	Test

Parameters and values

<table>
<tr><td colspan="2"><mode></td></tr>
<tr><td>0</td><td>PDU mode, as defined in GSM 3.40 and GSM 3.41. Default: 0.</td></tr>
<tr><td>1</td><td>Text mode.</td></tr>
</table>

Notes

■ Reference: GSM 27.005

Message Configuration

Service Center Address +CSCA

Set command sets the service center address (SCA) used for mobile originated SMS transmissions.

Read command reports the current value of the SCA in the format:

+CSCA: <number>,<type>

Note: If SCA is not present the device reports an error message. Test command returns the OK result code.

Syntax

Command	Command type
AT+CSCA=<number>[,<type>]	Set
AT+CSCA?	Read
AT+CSCA=?	Test

Parameters and values

<table>
<tr><td><number></td><td>SC phone number in the format defined by <type>.</td></tr>
<tr><td><type></td><td>Type of number.</td></tr>
<tr><td>129</td><td>National numbering scheme.</td></tr>
<tr><td>145</td><td>International numbering scheme. Contains the character "+".

Note: To use the SM service, you must set a Service Center Address to which service requests are directed.

Note: In Text mode, this 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 the <pdu> parameter equals zero.

Note: The current settings are stored through +CSAS</td></tr>
</table>

Notes

■ Reference: GSM 27.005.

Set Text Mode Parameters +CSMP

Set command selects values for additional parameters for storing and sending SMS when text mode is used (AT+CMGF=1).

Read command reports the current setting in the format:

+CSMP: <fo>,<vp>,<pid>,<dcs>

Note: If the Validity Period Format (<fo>'s bit[4]bit[3]) is [00]—that is, Not Present—<vp> is represented as a quoted empty string ("").

Test command returns the OK result code.

Syntax

Command	Command type
AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	Set
AT+CSMP?	Read
AT+CSMP=?	Test

Parameters and values

<fo>

First octet of 3GPP TS 23.040 SMS-SUBMIT or SMS-DELIVER, in integer format. Default: 17, that is, SMS-SUBMIT with validity period in relative format. As first octet of a PDU has the following bit field description (bit[7]bit[6]bit[5]bit[4]bit[3]bit[2]bit[1]bit[0]):

bit[1]bit[0]: Message Type Indicator, 2-bit field describing the message type;

[00] - SMS-DELIVER;

[01] - SMS-SUBMIT **Default**.

bit[2]: Reject Duplicates, 1-bit field: user is not responsible for setting this bit and, if any set, it has no meaning. **Default: [0]**

bit[4]bit[3]: Validity Period Format, 2-bit field indicating if the Validity Period field is present. **Default: [10]**:

[00] - Validity Period field not present

[01] - Validity Period field present in enhanced format; that is quoted time-string type, see below.

[10] - Validity Period field present in relative format; that is, integer type, see below.

[11] - Validity Period field present in absolute format; that is, quoted time-string type, see below.

bit[5]: Status Report Request, 1-bit field indicating the MS is requesting a status report. **Default: [0]**

[0] - MS is not requesting a status report

[1] - MS is requesting a status report

bit[6]: User Data Header Indicator, 1-bit field: user is not responsible for setting this bit and, if any set, it has no meaning. **Default: [0]**

bit[7]: Reply Path, 1-bit field indicating the request for Reply Path. **Default [0]**.

[0] - Reply Path not requested

[1] - Reply Path requested

<vp>	Depending on <fo> setting:

a) if <fo> asks for a Not Present Validity Period, <vp> can be any type and it is not considered;

b) if <fo> asks for a Validity Period in relative format, <vp> is integer type **Default: 167**, that is, 24 hours.

0..143 - (<vp> + 1) x 5 minutes

144..167 - 12 hours + ((<vp> - 143) x 30 minutes)

168..196 - (<vp> - 166) x 1 day

197..255 - (<vp> - 192) x 1 week

c) if <fo> asks for a Validity Period in absolute format, <vp> is quoted time-string type. See +CCLK.

d) if <fo> asks for a Validity Period in enhanced format, <vp> is the quoted hexadecimal representation (string type) of 7 octets, as follows:

the first octet is the Validity Period Functionality Indicator, indicating the way in which the other 6 octets are used; let's consider its bit field description:

bit[7]: extension bit

[0] - there are no more VP fuction indicator extension octets to follow bit[6]: Single Shot SM;

[0] - the SC is not required to make up to one delivery attempt

[1] - the SC is required to make up to one delivery attempt

bit[5]bit[4]bit[3]: reserved

[000]

bit[2]bit[1]bit[0]: Validity Period Format

[000] - No Validity Period specified

[001] - Validity Period specified as for the relative format. The following octet contains the VP value as described before. All other octets are 0s.

[010] - Validity Period is relative in integer representation. The following octet contains the VP value in the range 0 to 255, representing 0 to 255 seconds. All other octets are 0s.

[011] - Validity Period is relative in semi-octet representation. The following 3 octets contain the relative time in Hours, Minutes and Seconds, giving the length of the validity period counted from when SC receives the SMS-SUBMIT. All other octets are 0s.

<pid>	3GPP TS 23.040 TP-Protocol-Identifier in integer format. **Default: 0**

<dcs> Depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme. **Default: 0**, or Cell Broadcast Data Coding Scheme

Note: The current settings are stored through +CSAS.

Note: The <vp> value is also stored through +CSAS, but only as integer type, that is, only in its relative format.

Notes

- <vp>, <pid> and <dcs> default values are loaded from first SIM SMS Parameters profile, if present. If it is not present, then the default values are those indicated previously.
- Reference: GSM 27.005; 3GPP TS 23.040; 3GPP TS 23.038.

Examples

Set the parameters for an outgoing message with 24 hours of validity period and default properties:

AT+CSMP=17,167,0,0
OK

Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 24 hours of validity period.

AT+CSMP=9,"01A80000000000"
OK

Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 60 seconds of validity period.

AT+CSMP=9,"023C0000000000"
OK

Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 29 hours 85 minutes 30 seconds of validity period.

AT+CSMP=9,"03925803000000"
OK

Show Text Mode Parameters +CSDH

Set command controls whether detailed header information is shown in text mode (AT+CMGF=1) result codes.

Read command reports the current setting in the format:

+CSDH: <show>

Test command reports the supported range of values for parameter <show>.

Syntax

Command	Command type
AT+CSDH=[<show>]	Set
AT+CSDH?	Read
AT+CSDH=?	Test

Parameters and values

<show>	
0	Do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs 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.

Notes

■ Reference: GSM 27.005.

Select Cell Broadcast +CSCB

Set command selects which types of Cell Broadcast Messages the device receives.

Read command reports the current value of parameters <mode>, <mids> and <dcss>.

Test command returns the range of values for parameter <mode>.

Syntax

Command	Command type
AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	Set
AT+CSCB?	Read
AT+CSCB=?	Test

Parameters and values

<mode>	
0	The message types defined by <mids> and <dcss> are accepted. **Default: 0**.
1	The message types defined by <mids> and <dcss> are rejected.
<mids>	String type, message Identifiers: all different possible combinations of the CBM message identifiers. **Default: empty string ("")**.
<dcss>	String type, Data Coding Schemes,: all different possible combinations of CBM data coding schemes. **Default: empty string ("")**. Note: The current settings are stored through +CSAS.

Notes

■ Reference: GSM 27.005, 3GPP TS 23.041, 3GPP TS 23.038.

Examples

```
AT+CSCB?
+CSCB: 1,"",""
OK (all CBMs are accepted, none is rejected)
AT+CSCB=0,"0,1,300-315,450","0-3"
OK
```

Save Settings +CSAS

Execute command saves settings—made by the +CSCA, +CSMP and +CSCB commands—in local, non-volatile memory.

Test command returns the possible range of values for the parameter <profile>.

Syntax

Command	Command type
AT+CSAS[=<profile>]	Execute
AT+CSAS=?	Test

Parameters and values

<profile>

0	Settings saved to non-volatile memory. **Default: 0**.
1-n	SIM profile number. The value of n depends on the SIM. Maximum is 3.

Notes

- The SIM may not support certain settings, therefore they are always saved to non-volatile memory, regardless the value of <profile>.
- If parameter is omitted the settings are saved in non-volatile memory.
- +CSCB <mids> (Message Identifiers) parameter can be saved to SIM only if the "Cell broadcast message identifier selection" file is present on the SIM itself. This file, if present, has storage for only a single set of data. Therefore, it is not possible to save different <mids> in different SIM profiles. The <mids> value, once changed and saved, is the same for all SIM profiles.
- Reference: GSM 27.005

Restore Settings +CRES

Execute command restores message service settings saved by +CSAS command from either non-volatile memory or SIM.

Test command returns the possible range of values for the parameter <profile>.

Syntax

Command	Command type
AT+CRES[=<profile>]	Execute
AT+CRES=?	Test

Parameters and values

<profile>

0	Restores message service settings from non-volatile memory.
1-n	Restores message service settings from SIM. The value of n depends on the SIM and its maximum is 3.

Notes

■ The SIM might not support certain settings. There the settings are always restored from non-volatile memory, regardless the value of <profile>.

■ If parameter is omitted the command restores message service settings from non-volatile memory.

■ Reference: GSM 27.005.

More Message to Send +CMMS

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.

Read command reports the current value of the parameter <n> in the format:

+CMMS: <n>

Test command returns the range of supported <n>.

Syntax

Command	Command type
AT+CMMS=[<n>]	Set
AT+CMMS?	Read
AT+CMMS=?	Test

Parameters and values

<n>

0   Disable. **Default: 0**.

1   Keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, and so on) and the next send command exceeds 5 seconds, then the link is closed and the parameter <n> is automatically reset to 0.

2   Enable. If the time between the response of the latest message send command and the next send command exceeds 5 seconds, the link is closed but the parameter <n> remains set at 2.

Notes

■ Reference: 3GPP TS 27.005

Message Receiving and Reading

New Message Indications +CNMI

Set command selects the behavior of the device on how the receiving of new messages from the network is indicated to the DTE.

Read command returns the current parameter settings for +CNMI command in the form:

+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>

Test command reports the supported range of values for the +CNMI command parameters.

Syntax

Command	Command type
AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	Set
AT+CNMI?	Read
AT+CNMI=?	Test

Parameters and values

<mode>	Unsolicited result codes buffering option.
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, otherwise forward them directly to the TE.
2	Buffer unsolicited result codes in the TA in case the DTE is busy and flush them to the TE after reservation. Otherwise forward them directly to the TE.
3	If <mt> is set to 1 an indication via 100 ms break is issued when a SMS is received while the module is in GPRS online mode. It enables the hardware ring line for 1 s. too.
<mt>	Result code indication reporting for SMS-DELIVER.
0	No SMS-DELIVER indications are routed to the TE and messages are stored in SIM.
1	If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using the following unsolicited result code:

+CMTI: <mems>,<index>

where:

<mems> - memory storage where the new message is stored. See +CPMS.

<index> - location on the memory where SMS is stored. |

2

SMS-DELIVERs—except class 2 messages and messages in the "store" message waiting indication group—are routed directly to the TE using the following unsolicited result code:

PDU Mode

+CMT: <alpha>,<length><CR><LF><pdu>

where:

<alpha> - alphanumeric representation of originator/destination number corresponding to the entry found in MT phonebook. Used character set is the one selected with command +CSCS.

<length> - PDU length

<pdu> - PDU message

TEXT Mode

+CMT:<oa>,<alpha>,<scts>*[,<tooa>,<fo>,<pid>,<dcs>,*
  <sca>,<tosca>,<length>]<CR><LF><data>

Italicized information depends on +CSDH last setting.

where:

<oa> - string type, originating address, converted in the currently selected character set. See +CSCS.

<alpha> - Alphanumeric representation of <oa>. +CSCS selects the character set used.

<scts> - Arrival time of the message to the SC

<tooa>, <tosca> - type of number <oa> or <sca>:

129 - Number in national format

145 - Number in international format. Contains the "+".

<fo> - First octet of 3GPP TS 23.040

<pid> - Protocol identifier

<dcs> - Data coding scheme

<sca> - String type, service center address. Converted in the currently selected character set. See +CSCS.

<length> - Text length

<data> - TP-User-Data

(1) If <dcs> indicates that GSM03.38 default alphabet is used and <fo> indicates that GSM03.40 TP-User-Data-Header-Indication is not set (bit 6 of <fo> is 0), each character of GSM alphabet is converted into current TE character set. See +CSCS.

(2) If <dcs> indicates that 8-bit or UCS2 data coding scheme is used or <fo> indicates that GSM03.40 TP-User-Data-Header-Indication is set (bit 6 of <fo> is 1), each 8-bit octet is converted into two IRA character long hexadecimal number (for example octet 0x2A is converted as two characters 0x32 0x41)

Class 2 messages and messages in the "store" message waiting indication group 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>   Broadcast reporting option.

0   Cell Broadcast Messages are not sent to the DTE

2
New Cell Broadcast Messages are sent to the DTE with the unsolicited result code:

PDU Mode

+CBM: <length><CR><LF><PDU>

where:

<length> - PDU length

<PDU> - message PDU

TEXT Mode

+CBM:<sn>,<mid>,<dcs>,<pag>,<pags><CR><LF><data>

where:

<sn> - message serial number

<mid> - message ID

<dcs> - Data Coding Scheme

<pag> - page number

<pags> - total number of pages of the message

<data> - CBM Content of Message

(1) If <dcs> indicates that GSM03.38 default alphabet is used , each character of GSM alphabet is converted into current TE character set. See +CSCS.

(2) If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet is converted into two IRA character long hexadecimal number. For example octet 0x2A is converted as two characters 0x32 0x41.

<ds>   SMS-STATUS-REPORTs reporting option

0   Status report receiving is not reported to the DTE and is not stored

1	Status report is sent to the DTE with the following unsolicited result code

PDU Mode

+CDS: <length><CR><LF><PDU>

where:

<length> - PDU length

<PDU> - message PDU

TEXT Mode

+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>

where:

<fo> - first octet of the message PDU

<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format

<ra> - string type, recipient address represented in the currently selected character set. See +CSCS.

<tora> - type of number <ra>

<scts> - arrival time of the message to the SC

<dt> - sending time of the message

<st> - message status as coded in the PDU

2	If a status report is stored, then the following unsolicited result code is sent:

+CDSI: <memr>,<index>

where:

<memr> - memory storage where the new message is stored "SM"

<index> - location on the memory where SMS is stored

<bfr>	Buffered result codes handling method.
0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1-3 is entered. OK response is given before flushing the codes.
1	TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1-3 is entered.

Notes

- Reference GSM 27.005.
- DTR signal is ignored, hence the indication is sent even if the DTE is inactive (DTR signal is Low). In this case the unsolicited result code may be lost so if module remains active while DTE is not, at DTE startup is

suggested to check whether new messages have reached the device meanwhile with command AT+CMGL=0 that lists the new messages received.

■ Use the following table to resolve incoherence problems, due to the possibility that the parameter <mt> can have different settings at the same time, in different sessions. See #PORTCFG and +CMUX

	Message class or indication group, as in the DCS	Message class or indication group, as in the DCS
	SM class is no class or SM class is 0 or 1 or 3 or SM is an Indication with group "Discard"	SM class is 3.
<mt> settings in different sessions		
<mt>=2 for session "0" and <mt>=anyvalue for other session(s)	URC is shown only on session 0.	
<mt>=3 for session "0" and <mt>=0 or 1 for other session(s)		URC is shown only on session 0.

.

■ The following table clarifies which URC is shown and if the DELIVER SM is stored, depending on the <mt> parameter value and the SM class.

	SM CLASS 0 / msg waiting discard	SM CLASS 1 / no class	SM CLASS 2	SM CLASS 3	SM CLASS msg waiting store
<mt> 0	Store in <mems>	Store in <mems>	Store in SIM	Store in <mems>	Store in <mems>
<mt> 1	Store in <mems> - Send ind +CMTI	Store in <mems> - Send ind +CMTI	Store in SIM - Send ind +CMTI	Store in <mems> - Send ind +CMTI	Store in <mems> - Send ind +CMTI
<mt> 2	Route msg to TE: +CMT See **Note.	Route msg to TE: +CMT	Store in SIM - Send ind +CMTI	Route msg to TE: +CMT	Store in <mems> - Send ind +CMTI
<mt> 3	Store in <mems> - Send ind +CMTI	Store in <mems> - Send ind +CMTI	Store in SIM - Send ind +CMTI	Route msg to TE: +CMT	Store in <mems> - Send ind +CMTI

where <mems> is the memory where the received messages are stored. See +CPMS. **Note: The SM is not stored.

■ Use the following table to correct an incoherence problem, due to the fact that it is possible to have contemporaneous different settings of parameter <ds> in different sessions. See #PORTCFG and +CMUX.

<ds> settings in different sessions	<ds> settings in different sessions
<ds>=1 for session "0" AND <ds>=2 for at least one of the other sessions	URC +CDS is shown only on session "0" and no status report is stored on SIM
<ds>=0 for session "0" AND <ds>=2 for at least one of the other sessions	No URC is shown on any session and no status report is stored on SIM

New Message Acknowledgement +CNMA

Execute command confirms correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE.

Acknowledge with +CNMA is possible only if the +CSMS parameter is set to 1 (+CSMS=1) when a +CMT or +CDS indication is shown.

If no acknowledgement is given within the network timeout (17 seconds), an RP-ERROR is sent to the network, the <mt> and <ds> parameters of the +CNMI command are then reset to zero (do not show new message indication).

If command is executed, but no acknowledgement is expected, or some other ME related error occurs, final result code +CMS ERROR: <err> is returned.

The AT command syntax and functionalities are different between SMS PDU Mode and SMS Text Mode.

PDU Mode

For the PDU execute command, either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the network is possible. Parameter <n> defines which one is 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 SMSC address field is not present.

PDU mode, test command returns the possible range of values for the <n>.

Text Mode

For execute command, only positive acknowledgement to network (RP-ACK) is possible.

Text mode, test command returns the OK result code.

Syntax

Command	Command type
AT+CNMA	Execute
AT+CNMA[=<n>[,<length>[<CR>PDU is given<ctrl-Z/ESC]]]	Execute PDU mode
AT+CNMA	Execute Test mode
AT+CNMA=?	Test PDU mode
AT+CNMA=?	Test Text mode

Parameters and values

<n>	For PDU mode, type of acknowledgement.
0	Send RP-ACK without PDU (same as TEXT mode).
1	Send RP-ACK with optional PDU message.
2	Send RP-ERROR with optional PDU message.
<length>	Length of the PDU message.

Notes

- If a directly routed message must be buffered in ME/TA (possible when +CNMI parameter <mode> equals 0 or 2) or AT interpreter remains too long in a state where result codes cannot be sent to TE (for example user is entering a message using +CMGS), acknowledgement (RP-ACK) is sent to the network without waiting +CNMA command from TE.

- You may need to resolve an incoherence problem, due to the fact that it is possible to have contemporaneous different settings of parameter <mt> and <ds> of the +CNMI command in different sessions. See #PORTCFG and +CMUX. Only the <mt> and <ds> setting for session "0" are considered as valid to decide if +CNMA acknowledgment is expected or not.

- Reference 3GPP TS 27.005.

Examples

(PDU Mode)

```
AT+CSMS=1
+CSMS:  1,1,1
OK
Set  PDU  mode.
AT+CMGF=0
OK
AT+CNMI=2,2,0,0,0
OK
```

Message is received from network.

+CMT: "",70 06816000585426000480980600F170110370537284…

Send positive acknowledgement to the network.

```
AT+CNMA=0
OK
```

Message is received from network.

+CMT: "",70
06816000585426000480980600F170110370537284…

Send negative acknowledgment (Unspecified error) to the network.

```
AT+CNMA=2,3<CR>
>  00FF00  <Ctrl-Z>
OK
```

(Text Mode)

```
AT+CSMS=1
+CSMS:  1,1,1
OK
```

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

```
AT+CMGF=1
OK
```

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

Message is received from network.

+CMT: "+821020955219",,"07/07/26,20:09:07+36"
TEST MESSAGE

Send positive acknowledgement to the network.

AT+CNMA
OK

List Messages +CMGL

Execute command reports the list of all the messages with status value <stat> stored into <memr> message storage. <memr> is the message storage for read and delete SMs as last settings of command +CPMS.

The parameter type and the command output depend on the last settings of command +CMGF (message format to be used).

Test command returns a list of supported <stat>s

Syntax

Command	Command type
AT+CMGL[=<stat>]	Execute
AT+CMGL=?	Test

Parameters and values PDU Mode

PDU mode is used when the device is set to PDU mode by command AT+CMGF=0.

<stat>

0   New message.

1   Read message.

2   Stored message not yet sent.

3   Stored message already sent.

4	All messages.

If there is at least one message to be listed the representation format is:

+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[<CR><LF>

  +CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[...]]

where:

<index> - message position in the memory storage list.

<stat> - status of the message

<alpha> - String type alphanumeric representation of <da> or <oa>, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.

<length> - length of the PDU in bytes

<pdu> - message in PDU format according to GSM 3.40

Parameters and values Text Mode

Text mode is used when the device is set to PDU mode by command AT+CMGF=1.

<stat>	
"REC UNREAD"	New message
"REC READ"	Read message
"STO UNSENT"	Stored message not yet sent
"STO SENT"	Stored message already sent

"ALL"   All messages

The representation format for stored messages (either sent or unsent) or received messages (either read or unread, not message delivery confirm) is (the information written in italics is present depending on +CSDH last setting):

+CMGL: <index>,<stat>,<oa/da>,<alpha>,<scts>[,<tooa/toda>, <length>]<CR><LF><data>[<CR><LF>
+CMGL: <index>,<stat>,<oa/da>,<alpha>,<scts>[,<tooa/toda>, <length>]<CR><LF><data>[...]]

where:

<index> - message position in the storage

<stat> - message status

<oa/da> - String type, originator/destination address, represented in the currently selected character set. See +CSCS.

<alpha> - String type alphanumeric representation of <da> or <oa>, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.

<scts> - TP-Service Centre Time Stamp in Time String Format

<tooa/toda> - type of number <oa/da>

129 - number in national format

145 - number in international format (contains the "+")

<length> - text length

<data> - TP-User-Data
- If <dcs> indicates that GSM03.38 default alphabet is used , each character of GSM alphabet is converted into current TE character set. See +CSCS.
- If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet is converted into two IRA character long hexadecimal number (for example octet 0x2A is converted as two characters 0x32 0x41)
- If <fo> indicates that a UDH is present each 8-bit octet is converted into two IRA character long hexadecimal number. The <length> indicates text length in characters without UDH length.

If there is at least one message delivery confirm to be listed the representation format is:

+CMGL: <index>,<stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>
[<CR><LF>
+CMGL: <index>,<stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>
[...]]

where

<index> - Message position in the storage

<stat> - Message status

<fo> - First octet of the message PDU

<mr> - Message reference number; 3GPP TS 23.040 TP-Message- Reference in integer format

<ra> - String type, recipient address, represented in the currently selected character set. See +CSCS.

<tora> - Type of number <ra>

<scts> - Arrival time of the message to the SC

<dt> - Sending time of the message

<st> - Message status as coded in the PDU Note: If parameter is omitted the command returns the list of sms with "REC UNREAD" status.

Note: The order in which the messages are reported by +CMGL corresponds to their position in the memory storage

Notes

■ Reference GSM 27.005, 3GPP TS 23.040.

Read Message +CMGR

Execute command reports the message with location value <index> from <memr> message storage (<memr> is the message storage for read and delete SMs as last settings of command +CPMS).

Test command returns the OK result code.

Syntax

Command	Command type
AT+CMGR=<index>	Execute
AT+CMGR=?	Test

Parameters and values

<index>   Message index. The output depends on the last settings of command +CMGF (message format to be used).

PDU Modem

If there is a message in location <index>, the output has the following format:

+CMGR: <stat>,<alpha>,<length><CR><LF><pdu>

Where
<stat> Status of the message.0New message.1Read message.2Stored message not yet sent.3Stored message already sent.<alpha> String type, alphanumeric representation of <da> or <oa>, corresponding to an entry found in

the phonebook; used character set is the one selected with command +CSCS.<length> Length of the PDU in bytes. <pdu> Message in PDU format according to GSM 3.40.

The status of the message and entire message data unit <pdu> is returned

Text Modem

If there is a Received message in location <index> the output format is:

+CMGR: <stat>,<oa>,<alpha>,<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>

The information written in italics is present depending on +CSDH last setting.

If there is either a Sent or an Unsent message in location <index> the output format is:

+CMGR: <stat>,<da>,<alpha>[,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>

If there is a Message Delivery Confirm in location <index> the output format is:

+CMGR: <stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>

where:

<stat>	Status of the message.
"REC UNREAD"	New received message unread
"REC READ"	Received message read.
"STO UNSENT"	Message stored not yet sent.
"STO SENT"	Message stored already sent.
<fo>	First octet of the message PDU.
<mr>	Message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.
<ra>	String type, recipient address, represented in the currently selected character set. See +CSCS.
<tora>	Type of number <ra>. <scts> Arrival time of the message to the SC.
<dt>	Sending time of the message. <st> Message status as coded in the PDU.
<pid>	Protocol identifier.
<dcs>	Data coding scheme.
<vp>	Validity Period; its format depends on SMS-SUBMIT <fo> setting. See +CSMP.
a)	Not Present if <fo> tells that the Validity Period Format is Not Present.
b)	Integer type if <fo> tells that the Validity Period Format is Relative.
c)	Quoted time-string type if <fo> tells that the Validity Period Format is Absolute.

d)	Quoted hexadecimal representation of 7 octets if <fo> tells that the Validity Period Format is Enhanced.
<oa>	Originator address, string type represented in the currently selected character set. See +CSCS.
<da>	Destination address, string type represented in the currently selected character set. See +CSCS.
<alpha>	String type alphanumeric representation of <da> or <oa>, corresponding to an entry found in the phonebook. Used character set is selected with command +CSCS.
<sca>	Service center number.
<tooa>,	Type of number <oa>,<da>,<sca>.
<toda >,	
<tosca>	
129	Number in national format.
145	Number in international format. Contains the "+".
<length>	Text length.
<data>	TP-User_data.
	If <dcs> indicates that GSM03.38 default alphabet is used , each character of GSM alphabet is converted into current TE character set See +CSCS.
	If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet is converted into two IRA character long hexadecimal number. For example octet 0x2A is converted as two characters 0x32 0x41.
	Note: In both cases if status of the message is 'received unread', status in the storage changes to 'received read'.

Notes

- Reference GSM 27.005.

Message Sending and Writing

Send Message +CMGS

For both PDU mode and text mode, the execute command sends a message to the network.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CMGS=<length>	Execute PDU mode
AT+CMGS=<da>[,<toda>]	Execute Text mode
AT+CMGS=?	Test

Parameters and values PDU Mode

<length>   <length> Length of the PDU to be sent in bytes, excluding the SMSC address octets.

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    After command line is terminated with <CR>, the device responds sending a four character sequence prompt:

    <CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

    and waits for the specified number of bytes.

Notes PDU Mode

- The DCD signal is in ON state while PDU is given.
- The echoing of given characters back from the TA is controlled by echo command E.
- The PDU is hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line.
- When the length octet of the SMSC address (given in the PDU) equals zero, the SMSC address set with command +CSCA is used; in this case the SMSC Type-of-Address octet is not present in the PDU. To send the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex). If message is successfully sent to the network, then the result is sent in the format: +CMGS: <mr> where <mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.
- If message sending fails for some reason, an error code is reported.
- Ensure no other SIM interacting commands are issued during the command execution, which may take several seconds.

Parameters and values Text Mode

<da>   Destination address, string type represented in the currently selected character set. See +CSCS.

<toda>   Type of destination address.

129   Number in national format.

145   Number in international format. Contains the "+".

After command line is terminated with <CR>, the device responds sending a four character sequence prompt:

<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

After this prompt text can be entered. Format the text as follows:

- If current <dcs> (see +CSMP) indicates that GSM03.38 default alphabet is used and current <fo> (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A; backspace can be used to delete last character and carriage returns can be used; after every <CR> entered by the user the sequence <CR><LF><greather_than><space> is sent to the TE.

- If current <dcs> (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current <fo> (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set. Entered text consists of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (for example the 'asterisk' is entered as 2A (IRA50 and IRA65) and this is converted to an octet with integer value 0x2A)

Notes Text Mode

- The DCD signal is in ON state while text is entered.
- The echo command E controls the echoing of entered characters back from the TA. To send the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex). If message is successfully sent to the network, the result is sent in the format: +CMGS: <mr> where <mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.
- If message sending fails for some reason, an error code is reported.
- Make sure no other SIM interacting commands are issued during the command execution, which may take several seconds.
- It is possible to send a concatenation of at most 10 SMs. The maximum number of characters depends on the <dcs>: 1520 characters if 3GPP TS 23.038 default alphabet is used, 1330 characters if 8-bit is used, 660 characters if UCS2 is used. If entered text is longer than this maximum value an error is raised

Notes

- To avoid malfunctions, wait for the +CMGS: <mr> or +CMS ERROR: <err> response before issuing further commands.
- Reference GSM 27.005.

Write Message to Memory +CMGW

PDU Mode

Execute command writes in the <memw> memory storage a new message.

Text Mode

Execute command writes in the <memw> memory storage a new message.

Test command returns the OK result code.

Syntax

Command	Command type
(PDU Mode) AT+CMGW=<length>[,<stat>]	
(Text Mode) AT+CMGW[=<da>[,<toda>[,<stat>]]]	
AT+CMGW=?	Test

Parameters and values PDU Mode

<length>   Length in bytes of the PDU to be written.

7-164

<stat>   Message status.

0   New message. Received unread message. Default for DELIVER messages (3GPP TS 23.040 SMS-DELIVER messages)

1   Read message

2   Stored message not yet sent. Default for SUBMIT messages(3GPP TS 23.040 SMS-SUBMIT messages).

3

Stored message already sent.

The device responds to the command with the prompt '>' and waits for the specified number of bytes.

To write the message issue Ctrl-Z char (0x1A hex).

To exit without writing the message issue ESC char (0x1B hex).

If message is successfully written in memory, the result is sent in the format:

+CMGW: <index>

where:

<index> - message location index in the memory <memw>.

If message storing fails for some reason, an error code is reported.

Note: Ensure that no other SIM interacting commands are issued during the command execution.

Note: In PDU mode, not only SUBMIT messages can be stored in SIM, but also DELIVER and STATUS REPORT messages (3GPP TS 23.040 SMS-STATUS-REPORT messages). SUBMIT messages can only be stored with status 2 or 3; DELIVER and STATUS REPORT messages can only be stored with status 0 or 1.

Parameters and Values Text Mode

<da>   Destination address, string type represented in the currently selected character set. See +CSCS.

<toda>	Type of destination address.
129	Number in national format.
145	Number in international format. Contains the "+".
<stat>	Message status.
"REC UNREAD"	New received message unread. Default for DELIVER messages.
"REC READ"	Received message read
"STO UNSENT"	Message stored not yet sent. Default for SUBMIT messages.
"STO SENT"	Message stored already sent.

After command line is terminated with <CR>, the device responds sending a four character sequence prompt:

 <CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

After this prompt text can be entered. Format text as follows:

■ If current <dcs> (see +CSMP) indicates that GSM03.38 default alphabet is used and current <fo> (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A. Use backspace to delete last character. You can use carriage returns. After every <CR> entered by the user the sequence <CR><LF><greather_than><space> is sent to the TE.

■ If current <dcs> (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current <fo> (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set. Entered text consists of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (for example the 'asterisk' is entered as 2A (IRA50 and IRA65) and this is converted to an octet with integer value 0x2A)

Note: The DCD signal is in ON state while text is entered.

Note: The echoing of entered characters back from the TA is controlled by echo command E

To write the message issue Ctrl-Z char (0x1A hex).

To exit without writing the message issue ESC char (0x1B hex).

If message is successfully written in the memory, then the result is sent in the format:

+CMGW: <index>

where:

<index> - message location index in the memory <memw>.

If message storing fails for some reason, an error code is reported.

Note: Make sure that no other SIM interacting commands are issued during the command execution.

Note: It is possible to save a concatenation of at most 10 SMs. The maximum number of characters depends on the <dcs>: 1530 characters if 3GPP TS 23.038 default alphabet is used, 1340 characters if 8-bit is used, 670 characters if UCS2 is used. If entered text is longer than this maximum value an error is raised.

Note: In text mode, both SUBMIT and DELIVER messages can be stored in SIM.

The type of saved message depends upon the current <fo> parameter (see +CSMP). For a DELIVER message, current <vp> parameter (see +CSMP) is used to set the message Service Centre Time Stamp <scts>, so it has to be an absolute time string, for example "09/01/12,11:15:00+04".

SUBMIT messages can only be stored with status "STO UNSENT" or "STO SENT"; DELIVER messages can only be stored with status "REC UNREAD" or "REC READ".

Notes

- Reference GSM 27.005
- To avoid malfunctions, wait for the +CMGW: <index> or +CMS ERROR: <err> response before issuing further commands.

Send Message from Storage +CMSS

Execute command sends to the network a message which is already stored in the <memw> storage (see +CPMS) at the location <index>.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CMSS=<index>[,<da>[,<toda>]]	Execute
AT+CMSS=?	Test

Parameters and values

<index>	Location value in the message storage <memw> of the message to send
<da>	Destination address, string type represented in the currently selected character set (see +CSCS); if given it is used instead of the one stored with the message.
<toda>	Type of destination address.
129	Number in national format
145	Number in international format (contains the "+")
	If message is successfully sent to the network then the result is sent in the format:
	+CMSS: <mr>
	where:
	<mr> - message reference number.
	If message sending fails for some reason, an error code is reported: +CMS ERROR:<err>

Notes

- To store a message in the <memw> storage see command +CMGW.
- Make sure that no other SIM interacting commands are issued during command execution. Execution may take several seconds.

- To avoid malfunctions is suggested to wait for the +CMSS: <mr> or +CMS ERROR: <err> response before issuing further commands.
- Reference: GSM 27.005.

Delete Message +CMGD

Execute command deletes messages from memory <memr>.

Test command shows the valid memory locations and optionally the supported values of <delflag>.

+CMGD: (supported <index>s list)[,(supported <delflag>s list)]

Syntax

Command	Command type
AT+CMGD=<index>[,<delflag>]	Execute
AT+CMGD=?	Test

Parameters and values

<index>	Message index in the selected storage <memr>. Can have values from 1 to N, where N depends on the available space. See +CPMS.
<delflag>	Integer indicating multiple message deletion request.
0	If 0 or value omitted, delete message specified in <index>.
1	Delete all read messages from <memr> storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched
2	Delete all read messages from <memr> storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched.
3	Delete all read messages from <memr> storage, sent and unsent mobile originated messages, leaving unread messages untouched.
4	Delete all messages from <memr> storage.

Notes

- If <delflag> is present and not set to 0 then, if <index> is greater than 0, <index> is ignored and ME follows the rules for <delflag> shown above
- Reference: GSM 27.005.

Examples

```
AT+CMGD=?
+CMGD: (1,2,3,6,7,17,18,19,20,37,38,39,47),(0-4)
OK
```

Select Service for MO SMS Messages +CGSMS

Set command specifies the service or service preference that the MT uses to send MO SMS messages.

Read command returns the currently selected service or service preference in the form:

+CGSMS: <service>

Test command reports the supported list of currently available services <service>.

Syntax

Command	Command type
AT+CGSMS=[<service>]	Set
AT+CGSMS?	Read
AT+CGSMS=?	Test

Parameters and values

<service>   Numeric parameter indicating the service or service preference used.

0   GPRS.

1   Circuit switched. **Default: 1**.

2   GPRS preferred. Use circuit switched if SMS through GPRS service not available or GPRS not registered.

3   Circuit switched preferred. Use GPRS if SMS through GSM service not available or GSM not registered.

Notes

■ The <service> value is saved on non-volatile memory as global parameter.

Custom AT Commands

General Configuration AT Commands

Set AT Interface and Trace Interface #PORTCFG

AT#PORTCFG command allows connection of Service Access Points (software anchorage points) to the external physical ports giving a great flexibility. Examples of Service Access Points: AT Parser Instance #1,#2, #3, TT(Telit Trace), 3G(Trace).

To enable the set port configuration, reboot the module.

Refer to the appendix for a detailed explanation of all port configurations.

Read command reports: <requested> value shows the requested configuration that is activated on the next power off /on of the module; <active> value shows the actual configuration.

#PORTCFG: <requested>,<active>

Test command reports a brief description of the supported ports arrangement solutions. For each <Variant> parameter value are displayed, on one row, the allowed couples formed by: a physical port and the logically connected internal software Access Point (AT, TT). On each row are reported the couples concerning both configurations: USB cable plugged into USB port or not plugged in.

AT, indicated on each command row result, can be AT0, AT1, or AT2. For a correct interpretation refer to the tables in this section.

Syntax

Command	Command type
AT#PORTCFG=<variant>	
AT#PORTCFG?	Read
AT#PORTCFG=?	Test

Parameters and values

       <vaiant>

        0-10   Default: 1

Network Selection Menu Availability +PACSP

Read command returns the current value of the <mode> parameter in the format:

+PACSP<mode>

where:

<mode> - PLMN mode bit (in CSP file on the SIM)

0 - restriction of menu option for manual PLMN selection.

1 - no restriction of menu option for Manual PLMN selection.

Test command returns the OK result code.

Syntax

Command	Command type
AT+PACSP?	Read
AT+PACSP=?	Test

Manufacturer Identification #CGMI

Execute command returns the device manufacturer identification code with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CGMI	Execute
AT#CGMI=?	Test

Model Identification #CGMM

Execute command returns the device model identification code with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CGMM	Execute
AT#CGMM=?	Test

Revision Identification #CGMR

Execute command returns device software revision number with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CGMR	Execute
AT#CGMR=?	Test

Product Serial Number Identification #CGSN

Execute command returns the product serial number, identified as the IMEI of the mobile, with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CGSN	Execute
AT#CGSN=?	Test

International Mobile Subscriber Identity (IMSI) #CIMI

Execute command returns the international mobile subscriber identity, identified as the IMSI number, with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CIMI	Execute
AT#CIMI=?	Test

Read ICCID (Integrated Circuit Card Identification) #CCID

Execute command reads the ICCID—card identification number that provides a unique identification number for the SIM—on SIM.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CCID	Execute
AT#CCID=?	Test

Extended Numeric Error Report #CEER

Execute command causes the TA to return a numeric code in the format:

#CEER: <code>

This tells you the reason for:

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

Note: If none of the previous conditions has occurred since power up, 0 "No error" is reported.

<code> values as follows:

Value	Diagnostic
0	No error
1	Unassigned (unallocated) number

Value	Diagnostic
3	No route to destination
6	Channel unacceptable
8	Operator determined barring
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Call rejected
22	Number changed
26	Non selected user clearing
27	Destination out of order
28	Invalid number format (incomplete number)
29	Facility rejected
30	Response to STATUS ENQUIRY
31	Normal, unspecified
34	No circuit/channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit/channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred within the CUG
57	Bearer capability not authorized
58	Bearer capability not presently available
63	Service or option not available, unspecified
65	Bearer service not implemented
68	ACM equal to or greater than ACMmax
69	Requested facility not implemented
70	Only restricted digital information bearer capability is available

Value	Diagnostic
79	Service or option not implemented, unspecified
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with protocol state
99	Information element non-existent or not implemented
100	Conditional IE error
101	Message not compatible with protocol state
102	Recovery on timer expiry
111	Protocol error, unspecified
127	Interworking, unspecified

GPRS related errors

224	MS requested detach
225	NWK requested detach
226	Unsuccessful attach cause NO SERVICE
227	Unsuccessful attach cause NO ACCESS
228	Unsuccessful attach cause GPRS SERVICE REFUSED
229	PDP deactivation requested by NWK
230	PDP deactivation cause LLC link activation Failed
231	PDP deactivation cause NWK reactivation with same TI
232	PDP deactivation cause GMM abort
233	PDP deactivation cause LLC or SNDCP failure
234	PDP unsuccessful activation cause GMM error
235	PDP unsuccessful activation cause NWK reject
236	PDP unsuccessful activation cause NO NSAPI available
237	PDP unsuccessful activation cause SM refuse
238	PDP unsuccessful activation cause MMI ignore

239	PDP unsuccessful activation cause Nb Max Session Reach
256	PDP unsuccessful activation cause wrong APN
257	PDP unsuccessful activation cause unknown PDP address or type
258	PDP unsuccessful activation cause service not supported
259	PDP unsuccessful activation cause QOS not accepted
260	PDP unsuccessful activation cause socket error

Other Custom Values

240	FDN is active and number is not in FDN
241	Call operation not allowed
252	Call barring on outgoing calls
253	Call barring on incoming calls
254	Call impossible
255	Lower layer failure

Test command returns OK result code.

Syntax

Command	Command type
AT#CEER	Execute
AT#CEER=?	Test

Notes

- Reference: GSM 04.08.

Extended Error Report for Network Reject Cause #CEERNET

Execute command causes the TA to return a numeric code in the format

  #CEERNET: <code>

This offers the user of the TA a report for the last mobility management (GMM/MM) or session management (SM) procedure not accepted by the network and a report of detach or deactivation causes from network.

<code> values as follows

Value	Diagnostic
2	IMSI UNKNOWN IN HLR
3	ILLEGAL MS
4	IMSI UNKNOWN IN VISITOR LR

Value	Diagnostic
5	IMEI NOT ACCEPTED
6	ILLEGAL ME
7	GPRS NOT ALLOWED
8	OPERATOR DETERMINED BARRING(SM cause failure)/GPRS AND NON GPRS NOT ALLOWED(GMM cause failure)
9	MS IDENTITY CANNOT BE DERIVED BY NETWORK
10	IMPLICITLY DETACHED
11	PLMN NOT ALLOWED
12	LA NOT ALLOWED
13	ROAMING NOT ALLOWED
14	GPRS NOT ALLOWED IN THIS PLMN
15	NO SUITABLE CELLS IN LA
16	MSC TEMP NOT REACHABLE
17	NETWORK FAILURE
20	MAC FAILURE
21	SYNCH FAILURE
22	CONGESTION
23	GSM AUTHENTICATION UNACCEPTABLE
24	MBMS BEARER CAPABILITIES INSUFFICIENT FOR THE SERVICE
25	LLC OR SNDCP FAILURE
26	INSUFFICIENT RESOURCES
27	MISSING OR UNKNOWN APN
28	UNKNOWN PDP ADDRESS OR PDP TYPE
29	USER AUTHENTICATION FAILED
30	ACTIVATION REJECTED BY GGSN
31	ACTIVATION REJECTED UNSPECIFIED
32	SERVICE OPTION NOT SUPPORTED
33	REQ. SERVICE OPTION NOT SUBSCRIBED
34	SERV.OPTION TEMPORARILY OUT OF ORDER
35	NSAPI ALREADY USED
36	REGULAR DEACTIVATION
37	QOS NOT ACCEPTED

Value	Diagnostic
38	CALL CANNOT BE IDENTIFIED(MM cause failure) /SMN NETWORK FAILURE(SM cause failure)
39	REACTIVATION REQUIRED
40	NO PDP CTXT ACTIVATED(GMM cause failure)/FEATURE NOT SUPPORTED(SM cause failure)
41	SEMANTIC ERROR IN TFT OPERATION
42	SYNTACTICAL ERROR IN TFT OPERATION
43	UNKNOWN PDP CNTXT
44	SEM ERR IN PKT FILTER
45	SYNT ERR IN PKT FILTER
46	PDP CNTXT WITHOUT TFT ACTIVATED
47	MULTICAST GROUP MEMBERSHIP TIMEOUT
48	RETRY ON NEW CELL BEGIN(if MM cause failure) /ACTIVATION REJECTED BCM VIOLATION(if SM cause failure)
50	PDP TYPE IPV4 ONLY ALLOWED
51	PDP TYPE IPV6 ONLY ALLOWED
52	SINGLE ADDRESS BEARERS ONLY ALLOWED
63	RETRY ON NEW CELL END
81	INVALID TRANSACTION IDENTIFIER
95	SEMANTICALLY INCORRECT MESSAGE
96	INVALID MANDATORY INFORMATION
97	MSG TYPE NON EXISTENT OR NOT IMPLEMENTED
98	MSG TYPE NOT COMPATIBLE WITH PROTOCOL STATE
99	IE NON_EXISTENT OR NOT IMPLEMENTED
100	CONDITIONAL IE ERROR
101	MSG NOT COMPATIBLE WITH PROTOCOL STATE
111	PROTOCOL ERROR UNSPECIFIED
112	APN RESTRICTION VALUE INCOMPATIBLE WITH ACTIVE PDP CONTEXT

Test command returns OK result code.

Syntax

Command	Command type
AT#CEERNET	Execute
AT#CEERNET=?	Test

Notes

- Reference: 3GPP 24.008.

Display PIN Counter #PCT

Execute command reports the PIN/PUK or PIN2/PUK2 input remaining attempts, depending on +CPIN requested password in the format:

#PCT: <n>

where:

<n>	Remaining attempts.
0	SIM is blocked.
1-3	If the device is waiting, SIM PIN or SIM PIN2 is given.
1-10	If device is waiting, SIM PUK or SIM PUK2 is given.

Test command returns the OK result code.

Syntax

Command	Command type
AT#PCT	Execute
AT#PCT=?	Test

Notes

- When +CPIN is in the READY state then #PCT is not applicable.

Extended Reset #Z

Set command loads both base section and extended section of the specified user profile stored with AT&W and selected with AT&P.

Test command tests for command existence.

Syntax

Command	Command type
AT#Z=<profile>	Set
AT#Z=?	Test

Parameters and values

> **<profile>**
>
> > **0**   User profile 0.
> >
> > **1**   User profile 1.

Periodic Reset #ENHRST

Set command enables or disables the unit reset after <delay> minutes.

Read command reports the current parameter settings for # EHNRST command in the format:

EHNRST: < mod >[,<delay>,<remainTime>]

<remainTime> - time remaining before next reset

Test command reports supported range of values for <mod> and <delay>.

Syntax

Command	Command type
AT#ENHRST=<mod>[,<delay>]	Set
AT#ENHRST?	Read
AT#ENHRST=?	Test

Parameters and values

> **<mod>**
>
> > **0**   Disables the unit reset. **Default: 0**.
> >
> > **1**   Enables the unit reset one time.
> >
> > **2**   Enables the periodic unit reset.
>
> **<delay>**   Time interval after which the unit reboots. Numeric value in minutes.

Notes

- Settings are saved automatically in non-volatile memory only if old or new mod is 2. Any change from 0 to 1 or from 1 to 0 is not stored in non-volatile memory.
- The particular case AT#ENHRST=1,0 causes the module to immediately reboot. So if AT#ENHRST=1,0 follows an AT command that stores some parameters in non-volatile memory, it is recommended to insert a delay of at least 5 seconds before to issuing AT#ENHRST=1,0. Doing so permits the storing of parameters in non-volatile memory to finish.

Examples

Module reboots after 60 minutes

AT#ENHRST=1,60

Module reboots now

AT#ENHRST=1,0

Module reboots after 60 minutes and indefinitely after every following power on

AT#ENHRST=2,60

Wake from Alarm Mode #WAKE

Execute command stops any present alarm activity.And if the module is in alarm mode, it exits the alarm mode and enters the normal operating mode.

Read command returns the operating status of the device in the format:

#WAKE: <status>

where:

<status>	
0	Normal operating mode.
1	Alarm mode or normal operating mode with some alarm activity.

Test command returns OK result code.

Syntax

Command	Command type
AT#WAKE=[<opmode>]	Execute
AT#WAKE?	Read
AT#WAKE=?	Test

Parameters and values

<opmode>	Operating mode.
0	Normal operating mode. The module exits the alarm mode, enters the normal operating mode. Alarm activity—for example alarm tone playing—is stopped and an OK result code is returned.

Notes

- The alarm mode is indicated by status ON of hardware pin CTS and by status ON of pin DSR. The power saving status is indicated by a CTS - OFF and DSR - OFF status. The normal operating status is indicated by DSR - ON.

- During the alarm mode the device does not make any network scan and does not register to any network. Therefore, the device cannot dial or receive any call or SM. The only command that can be issued to the module in this state is #WAKE. Every other command must not be issued during this state.

- If #WAKE=0 command is issued after an alarm has been set with +CALA command, but before the alarm has expired, it answers OK but has no effect.

Temperature Monitor #TEMPMON

Set command sets the behavior of the module internal temperature monitor.

Read command reports the current parameter settings for #TEMPMON command in the format:

#TEMPMON: <urcmode>,<action>[,<hyst_time>[,<GPIO>]]

Test command reports the supported range of values for parameters <mod>, <urcmode>, <action>, <hyst_time> and <GPIO>

Syntax

Command	Command type
AT#TEMPMON=<mod>[,<urcmode>[,<action>[,<hyst_time>[,<GPIO>]]]]	Set
AT#TEMPMON?	Read
AT#TEMPMON=?	Test

Parameters and values

<mod>

0　　　Sets the command parameters.

1

Triggers the measurement of the module internal temperature, reporting the result in the format:

#TEMPMEAS: <level>,<value>

where:

<level> - Threshold level

-2 - Extreme temperature lower bound. For details, see the Notes section.

-1 - Operating temperature lower bound. For details, see the Notes section.

0 - Normal temperature

1 - Operating temperature upper bound. For details, see the Notes section.

2 - Extreme temperature upper bound. For details, see the Notes section.

<value> - Actual temperature expressed in Celsius degrees.

<urcmode>　　　<urcmode> - URC presentation mode.

0　　　Disables the presentation of the temperature monitor URC

1

Enables the presentation of the temperature monitor URC, whenever the module internal temperature reaches either operating or extreme levels; the unsolicited message is in the format:

#TEMPMEAS: <level>,<value>

where:

<level> and <value> are as before

\<action\>   Sum of integers, each representing an action to be done whenever the module internal temperature reaches either operating or extreme levels **Default: 0.**

If \<action\> is not zero, it is mandatory to set the \<hyst_time\> parameter too. 0..7 - As a sum of:

0 - No action

1 - Automatic shut-down when the temperature is beyond the extreme bounds

2 - RF TX circuits automatically disabled (using +CFUN=2) when operating temperature bounds are reached. When the temperature is back to normal the module is brought back to the previous state, before RF TX disabled.

4 - The output pin \<GPIO\> is tied HIGH when operating temperature bounds are reached; when the temperature is back to normal the output pin \<GPIO\> is tied LOW. If this \<action\> is required, it is mandatory to set the \<GPIO\> parameter too.

\<hyst_time\>   \<hyst_time\> - hysteresis time: all the actions happen only if the extreme or operating bounds are maintained at least for this period. This parameter is needed and required if \<action\> is not zero.

0..255 - time in seconds

\<GPIO\>   GPIO number. valid range is "any output pin" (see "Hardware User's Guide"). This parameter is needed and required only if \<action\>=4 is required.

Notes

- The URC presentation mode \<urcmode\> is related to the current AT instance only (see +cmux); last \<urcmode\> settings are saved for every instance as extended profile parameters, thus it is possible to restore them either if the multiplexer control channel is released and set up, back and forth.
- Last \<action\>, \<hyst_time\> and \<GPIO\> settings are saved in NVM too, but they are not related to the current CMUX instance only (see +cmux).
- The following table lists typical temperature bounds

Extreme Temperature Lower Bound	-30°C
Operating Temperature Lower Bound	-10°C
Operating Temperature Upper Bound	55°C
Extreme Temperature Upper Bound	80°C

General Purpose Input/Output Pin Control #GPIO

Execute command sets the value of the general purpose output pin GPIO\<pin\> according to \<dir\> and \<mode\> parameter. Not all configurations for the three parameters are valid.

Not all configurations for the three parameters are valid.

Read command reports the read direction and value of all GPIO pins, in the format:

#GPIO: \<dir\>,\<stat\>[\<CR\>\<LF\>#GPIO: \<dir\>,\<stat\>[…]]

where the sections that follow describe values for <dir> and <stat>.

Test command reports the supported range of values of the command parameters <pin>, <mode> and <dir>.

Syntax

Command	Command type
AT#GPIO=[<pin>, <mode>[,<dir>[,<save]]]	Execute
AT#GPIO?	Read
AT#GPIO=?	Test

Parameters and values

<pin> GPIO pin number. Range is from 1 to a value that depends on the hardware. New Socket modem support GPIO0 to GPIO3. New MTPCIE-x support GPIO1 to GPIO3.

<mode> <mode> - Meaning depends on <dir> setting:

0 If <dir>=0 - INPUT remove any Pull-up/Pull-down

- output pin cleared to 0 (Low) if <dir>=1 - OUTPUT

- no meaning if <dir>=2 - ALTERNATE FUNCTION

- no meaning if <dir>=3 – TRISTATE PULL DOWN

1 If <dir>=0 - INPUT remove any Pull-up/Pull-down

- output pin set to 1 (High) if <dir>=1 - OUTPUT

- no meaning if <dir>=2 - ALTERNATE FUNCTION

- no meaning if <dir>=3 – TRISTATE PULL DOWN

2 Reports the read value from the input pin if <dir>=0 - INPUT

- Reports the read value from the input pin if <dir>=1 - OUTPUT

- Reports a no meaning value if <dir>=2 - ALTERNATE FUNCTION

- Reports a no meaning if <dir>=3 – TRISTATE PULL DOWN

3 If <dir>=0 – INPUT, enable Pull-Up

4 If <dir>=0 – INPUT, enable Pull-Down

<dir> GPIO pin direction

0 - pin direction is INPUT

1 - pin direction is OUTPUT

2,3,4,5,6 - pin direction is Alternate Function ALT1, ALT2, ALT3, ALT4, ALT5 respectively (see Note).

3 - pin is set to PULL DOWN. See Notes section.

\<save\>	GPIO pin save configuration	
0	Pin configuration is not saved	
1	Pin configuration is saved	

Notes

- When \<save\> is omitted the configuration is stored only if user set or reset ALTx function on \<dir\> parameter.
- If values of \<dir\> is set in output and save omitted then it is set automatically in input on next power cycle.
- When \<mode\>=2 (and \<dir\> is omitted) the command reports the direction and value of pin GPIO\<pin\> in the format:

#GPIO: \<dir\>,\<stat\>

where:

\<dir\> Current direction setting for the GPIO\<pin\>.

\<stat\> Logic value read from pin GPIO\<pin\> in the case the pin \<dir\> is set to input. Logic value present in output of the pin GPIO\<pin\> in the case the pin \<dir\> is currently set to output. No meaning value for the pin GPIO\<pin\> in the case the pin \<dir\> is set to alternate function or Tristate pull down

- "ALT1" value is valid only for following pins:
  - GPIO1: alternate function is "Stat Led";
  - GPIO7 - alternate function is "DAC Output"

"ALT2" value is valid for all GPIOs: alternate function is "Alarm Pin"

"ALT3" value is valid for all GPIOs as "TempMon Pin"

"ALT4" value is valid for all GPIOs as "AD_Det Pin"

"ALT5" value is valid for all GPIOs as "AD_rep Pin"

- While using the pins in the alternate function, the GPIO read/write access to that pin is not accessible Avoid access.
- GPIO7 is also configured as DAC pin (ALT1 function) with the command #DAC
- AD_Det and AD_Rep pin can be also configured through #GSMAD command
- Alarm Pin can be also configured through #ALARMPIN command

Examples

```
AT#GPIO=3,0,1
OK
AT#GPIO=3,2
#GPIO:  1,0
OK
AT#GPIO=4,1,1
OK
AT#GPIO=5,0,0
OK
AT#GPIO=6,2
```

#GPIO: 0,1
OK

#ALARMPIN Alarm Pin

Set command sets the GPIO pin for the ALARM pin

Read command returns the current parameter settings for #ALARMPIN command in the format: #ALARMPIN: <pin>

Test command reports the supported range of values for parameter <pin>.

Syntax

Command	Command type
AT#ALARMPIN= <pin>	Set
AT#ALARMPIN?	Read
AT#ALARMPIN=?	Test

Parameters and values

<pin>   Defines which GPIO is used as ALARM pin. Default value is 0, which means no ALARM pin set.

Notes

- The setting is saved in NVM
- ALARM pin function of a GPIO corresponds to ALT2 function of the GPIO. So it can be also set through AT#GPIO command, ALT2 function.

STAT_LED GPIO Setting #SLED

Set command sets the behavior of the STAT_LED GPIO

Read command returns the STAT_LED GPIO current setting, in the format:

#SLED: <mode>,<on_duration>,<off_duration>

Test command returns the range of available values for <mode>, <on_duration> and <off_duration>.

Syntax

Command	Command type
AT#SLED=<mode> [,<on_duration> [,<off_duration>]]	Set
AT#SLED?	Read
AT#SLED=?	Test

Parameters and values

<mode>   Defines how the STAT_LED GPIO is handled.

0   GPIO tied low.

1   GPIO tied high.

2	GPIO handled by Module Software. **Default: 2.** with the following settings:
	Not registered : always on
	Registered in idle: blinking 1s on and 2s off
	Registered in idle with powersaving : blinking time depends on network condition in order to minimize power consumption
3	GPIO is turned on and off alternatively, with period defined by the sum <on_duration> + <off_duration>.
<on_duration>	Duration of period in which STAT_LED GPIO is tied high while <mode>=3.
4	GPIO handled by Module Software with the following timings:
	not registered : blinking 0,5s on and 0,5s off
	registered in idle: blinking 300ms on and 2,7s off
	registered in idle with powersaving : blinking time depends on network condition in order to minimize power consumption
1-100	In tenth of seconds. Default: 10.
<off_duration>	Duration of period in which STAT_LED GPIO is tied low while <mode>=3
1-100	In tenth of seconds. Default: 10.

Notes

- Values are saved in non-volatile memory by command #SLEDSAV.
- At module boot the STAT_LED GPIO is always tied high and holds this value until the first non-volatile memory reading.
- To have STAT_LED operative, the first time enter AT#GPIO=1,0,2 setting the GPIO1 as alternate function.

Save STAT_LED GPIO Setting #SLEDSAV

Execute command saves STAT_LED setting in non-volatile memory.

Test command returns OK result code.

Syntax

Command	Command type
AT#SLEDSAV	Execute
AT#SLED=?	Test

SMS Ring Indicator #E2SMSRI

Set command enables or disables the ring indicator (RI) pin response to an incoming SMS message. If enabled, a negative going pulse is generated on receipt of an incoming SMS message. The duration of this pulse is determined by the value of <n>.

Read command reports the duration in ms of the pulse generated on receipt of an incoming SM, in the format:

#E2SMSRI: <n>

Note: Value <n>=0 means that the RI pin response to an incoming SM is disabled.

Test command reports the range of supported values for parameter <n>.

Syntax

Command	Command type
AT#E2SMSRI=[<n>]	Set
AT#E2SMSRI?	Read
AT#E2SMSRI=?	Test

Parameters and values

<n>	RI enabling
	Note: If +CNMI=3,1 command is issued and the module is in a GPRS connection, a 100 ms break signal is sent and a 1 sec. pulse is generated on RI pin, whether the RI pin response is enabled or not.
0	Disables RI pin response for incoming SMS messages. **Default: 0.**
50-1150	Enables RI pin response for incoming SMS messages. The value of <n> is the duration in ms of the pulse generated on receipt of an incoming SM.

V24 Output Pins Configuration #V24CFG

Set command sets the AT commands serial port interface output pins mode. Read command returns actual mode for all the pins—output or input—in the format:

#V24CFG: <pin1>,<mode1>[<CR><LF><CR><LF>

#V24CFG: <pin2>,<mode2>[...]]

where:

<pinn> - AT command serial port interface HW pin

<moden> - AT commands serial port interface hardware pin mode

Test command reports supported range of values for <pin> and <mode>.

Syntax

Command	Command type
AT#V24CFG=<pin>,<mode>	Set
AT#V24CFG?	Read
AT#V24CFG=?	Test

Parameters and values

<pin>	AT commands serial port interface hardware pin.
0	DCD (Data Carrier Detect)
1	CTS (Clear To Send)

2	RI (Ring Indicator)
3	DSR (Data Set Ready). Not supported.
4	DTR (Data Terminal Ready). This is not an output pin. Value is maintained for backward compatibility. Trying to set its state raises the result code "ERROR" Not yet implemented.
5	RTS (Request To Send). This is not an output pin. Maintained only for backward compatibility. Trying to set its state raises the result code "ERROR"
\<mode\>	AT commands serial port interface hardware pins mode:
0	AT commands serial port mode: output pins are controlled by serial port device driver. **Default: 0**.
1	GPIO mode: output pins are directly controlled by #V24 command only.

V24 Output Pins Control #V24

Set command sets the AT commands serial port interface output pins state.

Read command returns actual state for all the pins—output or input—in the format:

#V24: \<pin1\>,\<state1\>[\<CR\>\<LF\>

#V24: \<pin2\>,\<state2\>[...]]

where

\<pinn\> - AT command serial port interface HW pin

\<staten\> - AT commands serial port interface hardware pin state

Test command reports supported range of values for \<pin\> and \<state\>.

Syntax

Command	Command type
AT#V24=\<pin\>[,\<state\>]	Set
AT#V24?	Read
AT#V24=?	Test

Parameters and values

\<pin\>	AT commands serial port interface hardware pin.
0	DCD (Data Carrier Detect).
1	CTS (Clear To Send).
2	RI (Ring Indicator).
3	DSR (Data Set Ready).
4	DTR (Data Terminal Ready). This is not an output pin: value is maintained only for backward compatibility, but trying to set its state raises the result code "ERROR" Not yet implemented.

5		RTS (Request To Send). This is not an output pin. The value is maintained only for backward compatibility. Trying to set its state raises the result code "ERROR"
<state>		State of AT commands serial port interface output hardware pins 0, 1, 2, 3 when pin is in GPIO mode. See #V24CFG.
0		Low
1		High

Notes

- If <state> is omitted the command returns the actual state of the pin <pin>.

GPRS Auto-Attach Property #AUTOATT

Set command enables or disables the TE GPRS auto-attach property.

Read command reports whether the auto-attach property is currently enabled or not, in the format:

#AUTOATT: <auto>

Test command reports available values for parameter <auto>.

Syntax

Command	Command type
AT#AUTOATT=[<auto>]	Set
AT#AUTOATT?	Read
AT#AUTOATT=?	Test

Parameters and values

<auto>

0   Disables GPRS auto-attach property.

1   Enables GPRS auto-attach property. **Default: 1.**

After the command #AUTOATT=1 is issued—and at every following startup—the terminal automatically tries to attach to the GPRS service.

Multislot Class Control #MSCLASS

Set command sets the multislot class. Read command reports the current value of the multislot class in the format:

#MSCLASS: <class>

Test command reports the range of available values for both parameters <class> and <autoattach>.

Syntax

Command	Command type
AT#MSCLASS=[<class>[,<autoattach>]]	Set
AT#MSCLASS?	Read

Command	Command type
AT#MSCLASS=?	Test

Parameters and values

<class>	Multislot class.
1-12	Class 7 is not supported.
30-33	**Default: 33.**
35-38	GPRS (EGPRS) class.
<autoattach>	
0	New multislot class is enabled only at the next detach/attach or after a reboot.
1	New multislot class is enabled immediately, automatically forcing detach/attach procedure.

Notes

■ DTM multislot class is automatically chosen with maximum allowed value for every GPRS (EGPRS) subset.

Cell Monitor #MONI

#MONI is both a Set and an Execute command.

Set command sets one cell out of seven, in the neighbor list of the serving cell including it, from which extract GSM/UMTS-related information.

Execute command (AT#MONI<CR>) reports GSM/UMTS-related information for selected cell and dedicated channel (if exists).

If the last setting done by #MONI is in the range [0-6], the output format is as follows:
■ When extracting data for the serving cell and the network name is known the format is:

GSM network

#MONI: <netname> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA: <timadv>

UMTS network

#MONI: <netname> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id>EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> dBm DRX:<drx> SCR:<scr>

■ When the network name is unknown, the format is:

GSM network

#MONI: cc:<cc> nc:<nc> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA: <timadv>

UMTS network

#MONI: cc:<cc> nc:<nc> PSC:<psc> RSCP:<rscp> LAC:,<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> dBm DRX:<drx>SCR:<scr>

■ When extracting data for an adjacent cell (or active set cell) the format is:

GSM network

#MONI: Adj Cell<n> [LAC:<lac> Id:<id>] ARFCN:<arfcn> PWR:<dBm> dBm

UMTS network

#MONI: PSC:<psc> RSCP:<rscp> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr>

where:

<netname> Name of network operator.

<cc> country code.

<nc> network operator code.

<n> progressive number of adjacent cell.

<bsic> base station identification code.

<qual> quality of reception. 0-7

<lac> localization area code.

<id> cell identifier.

<arfcn> assigned radio channel

<dBm> received signal strength in dBm; for serving cell in UMTS network this is not available during a call, and is displayed as 0.

<timadv> timing advance.

<psc> primary scrambling code.

<rscp> received Signal Code Power in dBm; for serving cell this is not available during a call, and is displayed as 255.

<ecio> chip energy per total wideband power in dBm; for serving cell this is not available during a call, and is displayed as 255.

<uarfcn> UMTS assigned radio channel.

<drx> discontinuous reception cycle length.

<scr> scrambling code.

Note: TA: <timadv> is reported only for the serving cell.

If the last setting done by #MONI is 7, the Execute command produces a table-like formatted output, as follows:

■ First row reports the identifying name of the 'columns'

#MONI: Cell BSIC LAC CellId ARFCN Power C1 C2 TA RxQual PLMN<CR><LF>

■ Second row reports a complete set of GSM-related information for the serving cell:

#MONI: S: <bsic> <lac> <id> <arfcn> <dBm> <C1value> <C2value> <timadv> <qual> <netname><CR><LF>

- 3rd to 8th rows report a reduced set of GSM-related information for the cells in the neighbours:

#MONI: N<n> <bsic> <lac> <id> <arfcn> <dBm> <C1value> <C2value>[<CR><LF>]

where:

<C1value> C1 reselection parameter.

<C2value> C2 reselection parameter.

Other parameters are described earlier.

Note: Currently, AT#MONI=7 is only available in case of GSM network.

Test command reports the maximum number of cells, in the neighbor list of the serving cell excluding it, from which GSM/UMTS-related information can be extracted, along with the ordinal number of the current selected cell, in the format:

#MONI: (<MaxCellNo>,<CellSet>)

where:

<MaxCellNo> Maximum number of cells, in the neighbor list of the serving cell and excluding it, from which GSM-related information can be extracted. This value is always 6.

<CellSet> Last setting done with command #MONI.

Syntax

Command	Command type
AT#MONI[=[<number>]]	Set
AT#MONI=?	Test

Parameters and values

<number>

GSM network

0-6	The ordinal number of the cell, in the neighbor list of the serving cell. **Default: 0**, serving cell.
7	Special request to obtain GSM-related information from the whole set of seven cells in the neighbor list of the serving cell.

UMTS network

0	serving cell and active set cells. **Default: 0**
1	Candidate set.
2	Synchronized neighbor set.
3	Asynchronized neighbor set.
4-7	Not available.

Notes

- The timing advance value is meaningful only during calls or GPRS transfers active.
- The serving cell is the current serving cell or the last available serving cell, if the module loses coverage.

Examples

Set command selects the cell 0 in GSM network

at#moni=0
OK

Execute command reports GSM-related information for cell 0

at#moni
#MONI: I WIND BSIC:70 RxQual:0 LAC:55FA Id:1D23 ARFCN:736 PWR:-83dbm TA:1

Set command selects the cell 0 in UMTS network

at#moni=0
OK

Execution command reports UMTS-related information for serving cell and active cell
at#moni #MONI: I TIM PSC:65535 RSCP:255 LAC:EF8D Id:52D2388 EcIo:255 UARFCN:65535 PWR:0dbm DRX:128 SCR:0 #MONI: PSC:49 RSCP:-96 EcIo:-2.0 UARFCN:10638 SCR:784

Set command selects the special request to obtain GSM-related information from the whole set of seven cells in the neighbor list of the serving cell

at#moni=7
OK

Execute command reports the requested information in table-like format

at#moni
#MONI: Cell BSIC LAC CellId ARFCN Power C1 C2 TA RxQual PLMN
#MONI: S 70 55FA 1D23 736 -83dbm 19 33 1 0 I WIND
#MONI: N1 75 55FA 1297 983 -78dbm 26 20
#MONI: N2 72 55FA 1289 976 -82dbm 22 16
#MONI: N3 70 55FA 1D15 749 -92dbm 10 18
#MONI: N4 72 55FA 1D0D 751 -92dbm 10 18
#MONI: N5 75 55FA 1296 978 -95dbm 9 3
#MONI: N6 70 55FA 1D77 756 -99dbm 3 11

OK

Serving Cell Information #SERVINFO

Execute command reports information about serving cell, in the format:

GSM network

#SERVINFO: <B-ARFCN>,<dBM>,<NetNameAsc>,<NetCode>,<BSIC>,<LAC>,<TA>,<GPRS>[,[<PBARFCN>],[< NOM>],<RAC>,[<PAT>]]

UMTS network

#SERVINFO: <UARFCN>, <dBM>, <NetNameAsc>,<NetCode>, <PSC>,<LAC>,<DRX>,<SD>,<RSCP>, <NOM>,<RAC>

where:

<B-ARFCN>	BCCH ARFCN of the serving cell.
<dBM>	Received signal strength in dBm.
<NetNameAsc>	Operator name, quoted string type.
<NetCode>	String representing the network operator in numeric format: 5 or 6 digits [country code (3) + network code (2 or 3)]
<BSIC>	Base Station Identification Code.
<LAC>	Localization Area Code.
<TA>	Time Advance: it's available only if a GSM or GPRS is running.
<GPRS>	GPRS supported in the cell.
0	Not supported.
1	Supported.
	The following information appears if GPRS is supported in the cell:
<PB-ARFCN>	If PBCCH is supported by the cell:
	if its content is the PBCCH ARFCN of the serving cell then <PB-ARFCN> is available
	else the label "hopping" is printed
	else <PB-ARFCN> is not available
<NOM >	Network Operation Mode
"I"	
"II"	
"III"	
<RAC>	Routing Area Color Code
<PAT>	Priority Access Threshold
0	
3-6	
<UARFCN>	UMTS ARFCN of the serving cell
<PSC>	Primary Synchronization Code
<DRX>	Discontinuous reception cycle length
<SD>	Service Domain
0	No service

1	CS only
2	PS only
3	CS and PS
	<RSCP> Received Signal Code Power in dBm
	During a call, a SMS sending/receiving or a location update the value of <GPRS>, <PB-ARFCN>, <NOM>, <RAC> and <PAT> parameters do not make sense.

Test command tests for command existence.

Syntax

Command	Command type
AT#SERVINFO	Execute
AT#SERVINFO=?	Test

Read Current Network Status #RFSTS

Execute command reads current network status, in the format:

GSM network

#RFSTS:<PLMN>,<ARFCN>,<RSSI>,<LAC>,<RAC>,<TXPWR>,<MM>,
<RR>,<NOM>,<CID>,<IMSI>,<NetNameAsc>,<SD>,<ABND>

where:

<PLMN>	Country code and operator code(MCC, MNC)
<ARFCN>	GSM Assigned Radio Channel
<RSSI>	Received Signal Strength Indication
<LAC>	Localization Area Code
<RAC>	Routing Area Code
<TXPWR>	Tx Power
<MM>	Mobility Management state
0	NULL
3	LOCATION UPDATING INITIATED
5	WAIT FOR OUTGOING MM CONNECTION
6	CONNECTION ACTIVE
7	IMSI DETACH INITIATED
8	PROCESS CM SERVICE PROMPT
9	WAIT FOR NETWORK COMMAND
10	LOCATION UPDATE REJECTED

13	WAIT FOR RR CONNECTION LOCATION UPDATE
14	WAIT FOR RR CONNECTION MM
15	WAIT FOR RR CONNECTION IMSI DETACH
17	WAIT FOR REESTABLISHMENT
18	WAIT FOR RR ACTIVE
19	IDLE
20	WAIT FOR ADDITIONAL OUTGOING MM CONNECTION
21	CONNECTION ACTIVE GROUP TRANSMIT
22	WAIT RR CONNECTION GROUP TRANSMIT
23	LOCATION UPDATING PENDING
24	IMSI DETACH PENDING
25	RR CONNECTION RELEASE NOT ALLOWED
255	UNKNOWN
<RR>	Radio Resource state
2	2 - CELL SELECTION
3	WAIT CELL SELECTION
4	DEACTIVATION CELL SELECTION
5	SELECT ANY CELL
6	WAIT SELECT ANY CELL
7	DEACTIVATION SELECT ANY CELL
8	WAIT INACTIVE
9	INACTIVE
10	WAIT IDLE
11	IDLE
12	PLMN SEARCH
13	CELL RESELECTION
14	WAIT CELL RESELECTION
15	DEACTIVATION PLMN SEARCH
16	CELL CHANGE
17	CS CELL CHANGE
18	WAIT CELL CHANGE
19	SINGLE BLOCK ASSIGNMENT
20	DOWNLINK TBF ESTABLISH
21	UPLINK TBF ESTABLISH

22	WAIT TBF
23	TRANSFER
24	WAIT SYNC
25	DTM ENHANCED CALL ESTABLISH
26	DTM
27	DTM ENHANCED MO CALL ESTABLISH
28	MO CONNECTION ESTABLISH
29	MT CONNECTION ESTABLISH
30	RR CONNECTION
31	DTM ESTABLISH
32	DTM RELEASE
33	CALL REESTABLISH
34	DEACTIVATION CALL REESTABLISH
35	NORMAL CHANNEL RELEASE
36	LOCAL CHANNEL RELEASE
37	DEACTIVATION
38	ENHANCED DTM CS CALL ESTABLISH
39	CELL RESELECTION TO UTRAN
40	DTM ENHANCED CS CALL ESTABLISH
41	INTER RAT ACTIVE ON HOLD
42	INTER RAT RESEL ABORT
43	INTER RAT WAIT INTER RAT
44	INTER RAT WAIT FOR RSRC
45	DSIM SUSPEND
46	DSIM WAIT SUSPEND
47	DSIM WAIT SUSPEND IDLE
<NOM>	Network Operator Mode
<CID>	Cell ID
<IMSI>	International Mobile Subscriber Identity
<NetNameAsc>	Operator name
<SD>	Service Domain
0	No Service
1	CS only
2	PS only
3	CS+PS

<ABND>	Active band
1	GSM 850
2	GSM 900
3	DCS 1800
4	PCS 1900

WCDMA network

#RFSTS:
<PLMN>,[<UARFCN>],[<PSC>],[<Ec/Io>],[<RSCP>], [RSSI>],[<LAC>],
[<RAC>],<TXPWR>,<DRX>,<MM>,<RRC>,<NOM>,<BLER>,<CID>,<IMSI>,
<NetNameAsc>,<SD>,<nAST>[,<nUARFCN><nPSC>,<nEc/Io>]

where:

<PLMN>	Country code and operator code(MCC, MNC)
<UARFCN>	UMTS assigned radio channel
<PSC>	Active PSC (primary synchronization code)
<Ec/Io>	Active Ec/Io (chip energy per total wideband power in dBm)
<RSCP>	Active RSCP (Received Signal Code Power in dBm)
<RSSI>	Received Signal Strength Indication
<LAC>	Localization area code
<RAC>	Routing area code
<TXPWR>	Tx power
<DRX>	Discontinuous reception cycle length (cycle length in ms)
<MM>	Mobility Management state
0	NULL
3	LOCATION UPDATING INITIATED
5	WAIT FOR OUTGOING MM CONNECTION
6	CONNECTION ACTIVE
7	IMSI DETACH INITIATED
8	PROCESS CM SERVICE PROMPT
9	WAIT FOR NETWORK COMMAND
10	LOCATION UPDATE REJECTED
13	WAIT FOR RR CONNECTION LOCATION UPDATE
14	WAIT FOR RR CONNECTION MM
15	WAIT FOR RR CONNECTION IMSI DETACH

17	WAIT FOR REESTABLISHMENT
18	WAIT FOR RR ACTIVE
19	IDLE
20	WAIT FOR ADDITIONAL OUTGOING MM CONNECTION
21	CONNECTION ACTIVE GROUP TRANSMIT
22	WAIT RR CONNECTION GROUP TRANSMIT
23	LOCATION UPDATING PENDING
24	IMSI DETACH PENDING
25	RR CONNECTION RELEASE NOT ALLOWED
255	UNKNOWN
<RR>	Radio Resource state
0	CELL DCH
1	CELL FACH
2	CELL PCH
3	URA PCH
4	IDLE
5	IDLE CCCH
<NOM>	Network Operator Mode
<BLER>	Block Error Rate. For example, 005 means 0.5 %.
<CID>	Cell ID
<IMSI>	International Mobile Station ID
<NetNameAsc>	Operator name
<SD>	Service Domain
0	No service
1	CS only
2	PS only
3	CS and PS
<nAST>	Number of Active Set. Maximum is 6.
<nUARFCN>	UARFCN of nth active set.
<nPSC>	PSC of nth active set.
<nEc/Io>	Ec/Io of nth active set.

Test command tests for command existence.

Syntax

Command	Command type
AT#RFSTS	Execute
AT#RFSTS=?	Test

Query SIM Status #QSS

Set command enables or disables the Query SIM Status unsolicited indication in the ME.

Read command reports whether the unsolicited indication #QSS is currently enabled or not, along with the SIM status, in the format:

#QSS: <mode>,<status>

The sections that follow describe <mode> and <status>.

To get the proper SIM status, set <mode>=2 and save the value in the user profile, then power off and power on the module.

Test command returns the supported range of values for parameter <mode>.

Syntax

Command	Command type
AT#QSS=[<mode>]	Set
AT#QSS?	Read
AT#QSS=?	Test

Parameters and values

<mode>	Type of notification.	
0	Disabled. You can only query the current SIM status through Read command AT#QSS?. **Default: 0.**	
1	Enabled. The ME informs at every SIM status change through the following basic unsolicited indication:	

#QSS: <status>

where:

<status> - current SIM status

0 - SIM NOT INSERTED

1 - SIM INSERTED

2	Enabled. The ME informs at every SIM status change through the following unsolicited indication:

#QSS: <status>

where:

<status> - current SIM status

0 - SIM NOT INSERTED

1 - SIM INSERTED

2 - SIM INSERTED and PIN UNLOCKED

3 - SIM INSERTED and READY. SMS and Phonebook access are possible.

Note: The command reports the SIM status change after the <mode> is set to 2. It is recommended to set <mode>=2 and save the value in the user profile, then power off the module. The proper SIM status is available at the next power on.

Delete All Phonebook Entries #CPBD

Execute command deletes all phonebook entries in the current phonebook memory storage selected with +CPBS.

Test command tests for command existence.

Syntax

Command	Command type
AT#CPBD	Execute
AT#CPBD=?	Test

ATD Dialing Mode #DIALMODE

Set command sets dialing modality.

Read command returns current ATD dialing mode in the format:

#DIALMODE: <mode>

Test command returns the range of values for parameter <mode>

Syntax

Command	Command type
AT#DIALMODE=[<mode>]	Set
AT#DIALMODE?	Read
AT#DIALMODE=?	Test

Parameters and values

<mode>

0	Voice call only. OK result code is received as soon as it starts remotely ringing. **Default: 0.**
1	Voice call only. OK result code is received only after the called party answers. Any character typed aborts the call and OK result code is received.

Notes

- If a BUSY tone is received when ATX0 is enabled ATD returns NO CARRIER instead of DISCONNECTED.
- <mode> setting is saved in non-volatile memory and available after reboot.

Automatic Call #ACAL

Set command enables or disables the automatic call function.

Read command reports whether the automatic call function is currently enabled or not, in the format:

#ACAL: <mode>

Note: With the introduction of the command #ACALEXT (Extended Automatic Call) it is possible that the Read Command returns a value supported by #ACALEXT but NOT supported by #ACAL.

AT#ACAL?
#ACAL : 2
OK

As such, it is strongly recommended that you do not to use both commands at the same time.

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT#ACAL=[<mode>]	Set
AT#ACAL?	Read
AT#ACAL=?	Test

Parameters and values

<mode>	
0	Disables the automatic call function. **Default: 0.**
1	Enables the automatic call function. If enabled (and &D2 is issued), the transition OFF/ON of DTR causes an automatic call to the first number (position 0) stored in the internal phonebook.

Notes

- Type of call depends on the last issue of command +FCLASS.
- See &Z to write and &N to read the number on module internal phonebook.

Extended Automatic Call #ACALEXT

Set command enables or disables the extended automatic call function.

Read command reports either whether the automatic call function is currently enabled or not, and the last <index> setting in the format:

  #ACALEXT: <mode>,<index>

Test command returns three ranges of values, because the range of available positions in a phonebook depends on the selected phonebook.

- ■ <mode>
- ■ <index> when the internal phonebook is selected.
- ■ <index> when "SM" is the selected phonebook.

Syntax

Command	Command type
AT#ACALEXT=<mode>,<index>	Set
AT#ACALEXT?	Read
AT#ACALEXT=?	Test

Parameters and values

<mode>	Disables the automatic call function. **Default: 0.**
0	Enables the automatic call function from internal phonebook.
1	Enables the automatic call function from "SM" phonebook.
<index>	Indicates a position in the currently selected phonebook. If the extended automatic call function is enabled and &D2 is issued, the transition OFF/ON of DTR causes an automatic call to the number stored in position <index> in the selected phonebook.

Notes

- ■ Type of call depends on the last issue of command +FCLASS
- ■ Issuing #ACALEXT causes the #ACAL <mode> to be changed.
- ■ Issuing AT#ACAL=1 causes the #ACALEXT <index> to be set to default.
- ■ It is recommended to NOT use contemporaneously with either #ACALEXT and #ACAL
- ■ See &Z to write and &N to read the number on module internal phonebook.

Extended Call Monitoring #ECAM

This command enables or disables the call monitoring function in the ME.

Read command reports whether the extended call monitoring function is currently enabled or not, in the format:

#ECAM: <onoff>

Test command returns the list of supported values for <onoff>

Syntax

Command	Command type
AT#ECAM=[<onoff>]	

Command	Command type
AT#ECAM?	Read
AT#ECAM=?	Test

Parameters and values

<onoff>

0   Disables call monitoring function. **Default: 0**.

1   Enables call monitoring function; the ME informs about call events, such as incoming call, connected, hang up and so on using the following unsolicited indication:

#ECAM: <ccid>,<ccstatus>,<calltype>,,,[<number>,<type>]

where

<ccid> - call ID

<ccstatus> - call status

0 - idle

1 - calling (MO)

2 - connecting (MO)

3 - active

4 - hold

5 - waiting (MT)

6 - alerting (MT)

7 - busy

<calltype> - call type

1 - voice

2 - data

<number> - called number (valid only for <ccstatus>=1)

<type> - type of <number>

129 - National number

145 - International number

Note: The unsolicited indication is sent along with usual codes (OK, NO CARRIER, BUSY...)

SMS Overflow #SMOV

Set command enables or disables the SMS overflow signaling function.

Read command reports whether the SMS overflow signaling function is currently enabled or not, in the format:

#SMOV: <mode>

Test command returns the supported range of values of parameter <mode>.

Syntax

Command	Command type
AT#SMOV=[<mode>]	Set
AT#SMOV?	Read
AT#SMOV=?	Test

Parameters and values

<mode>

0   Disables SMS overflow signaling function. **Default: 0**.

1   Enables SMS overflow signaling function; when the maximum storage capacity is reached, the following network initiated notification is sent:

**#SMOV:<memo
>**

1   <memo> is a string—"SM" for SIM memory—indicating the SMS storage that has reached maximum capacity.

Mailbox Numbers #MBN

Execute command returns the mailbox numbers stored on SIM, if this service is provided by the SIM. The response format is:

[#MBN: <index>,<number>,<type>[,<text>][,mboxtype][<CR><LF>
#MBN: <index>,<number>,<type>[,<text>][,mboxtype][…]]]

where:

<index>	Record number.
<number>	String type, mailbox number in the format <type>.
<type>	Type of mailbox number octet in integer format.
129	National numbering scheme.
145	International numbering scheme. Contains the character "+".
<text>	The alphanumeric text associated to the number. Character set used is the one selected with command +CSCS.
<mboxtype>	The message waiting group type of the mailbox, if available.
"VOICE"	

"FAX"

"EMAIL"

"OTHER"

Test command returns the OK result code. Syntax

Syntax

Command	Command type
AT#MBN	Execute
AT#MBN=?	Test

Notes

- If all queried locations are empty but available, no information text lines are returned.

Message Waiting Indication #MWI

Set command enables or disables the presentation of the message waiting indicator URC

Read command reports whether the presentation of the message waiting indicator URC is currently enabled or not, and the current status of the message waiting indicators as they are currently stored on SIM. The format is:

#MWI: <enable>,<status>[,<indicator>[,<count>][<CR><LF>
#MWI: <enable>,<status>,<indicator>[,<count>][...]]]

Test command returns the range of available values for parameter <enable>.

Syntax

Command	Command type
AT#MWI=<enable>	Set
AT#MWI?	Read
AT#MWI=?	Test

Parameters and values

<enable>

0   Disable the presentation of the #MWI URC/

1	Enable the presentation of the #MWI URC each time a new message waiting indicator is received from the network and, at startup, the presentation of the status of the message waiting indicators, as they are currently stored on SIM. The URC format is:

#MWI: <status>,<indicator>[,<count>]

where:

<status>

0 – Clear. Deleted one of the messages related to the indicator <indicator>.

1 – Set. New waiting message related to the indicator <indicator>.

<indicator>

1 - either Line 1 (CPHS context) or Voice (3GPP context)

2 - Line 2 (CPHS context only)

3 - Fax

4 - E-mail

5 - Other

<count> - Message counter. Network information reporting the number of pending messages related to the message waiting indicator <indicator>.

The presentation at startup of the message waiting indicators status, as they are currently stored on SIM, is as follows:

#MWI: <status>[,<indicator>[,<count>][<CR><LF> #MWI: <status>,<indicator>[,<count>][...]]]

where:

<status>

0 - No waiting message indicator is currently set: if this the case no other information is reported

1 - There are waiting messages related to the message waiting indicator <indicator>.

<indicator>

1 - Either Line 1 (CPHS context) or Voice (3GPP context)

2 - Line 2 (CPHS context)

3 - Fax

4 - E-mail

5 - Other

<count> - Message counter. Number of pending messages related to the message waiting indicator <indicator> as it is stored on SIM.

Network Emergency Number Update #NWEN

Set command enables or disables unsolicited indication of emergency number update.

Read command reports whether the unsolicited indication of network emergency number update is currently enabled or not, in the format:

#NWEN: <en>

Test command reports the range for the parameter <en>.

Syntax

Command	Command type
AT#NWEN=[<en>]	Set
AT#NWEN?	Read
AT#NWEN=?	Test

Parameters and values

<en>

0   Disables unsolicited indication of emergency number update. **Default: 0**.

1   Enables unsolicited indication of emergency number update.

#NWEN: <type>

1   Number list update from internal ME.

2   Number list update from SIM.

3   Number list update from network.

Packet Service Network Type #PSNT

Set command enables or disables unsolicited result code for packet service network type (PSNT).

Read command reports the <mode> and <nt> values in the format:

#PSNT: <mode>,<nt> s

where

<mode>

0   PSNT unsolicited result code disabled.

1   PSNT unsolicited result code enabled.

<nt>   Network type.

0   GPRS network.

1   EGPRS network.

2	WCDMA network.
3	HSDPA network. Note: When the type of network is HSPA, the indication is valid during traffic. It is not valid in idle because it depends on network broadcast parameters
4	Unknown or not registered.

Test command reports the range for the parameter <mode>.

Syntax

Command	Command type
AT#PSNT=[<mode>]	Set
AT#PSNT?	Read
AT#PSNT=?]	Test

Parameters and values

<mode>

0 Disable PSNT unsolicited result code. **Default: 0**.

1 Enable PSNT unsolicited result code.

SIM Presence Status #SIMPR

Set command enables or disables the SIM Presence Status unsolicited indication in the ME. This command reports also the status of the remote SIM, if the SAP function is supported and is enabled.

Read command reports whether the unsolicited indication #SIMPR is currently enabled or not, along with the local and remote SIM status, in the format:

#SIMPR: <mode>,0,<status><CR><LF>
#SIMPR: <mode>,1,<status>

If SAP function is not supported or enabled the remote SIM status is always 0.

Test command reports the range for the parameter <mode>.

Syntax

Command	Command type
AT#SIMPR=[<mode>]	Set
AT#SIMPR=?	Read
AT#SIMPR?	Test

Parameters and values

<mode> Notification type.

0 Disabled. **Default: 0**.

1   Enabled. The ME informs at every (local and remote) SIM status change through the following unsolicited indication:

#SIMPR: <SIM>,<status>

where:

<SIM> - local or remote SIM

0 local SIM

1 remote SIM

<status> - current SIM status

0 - SIM NOT INSERTED

1 - SIM INSERTED

Call Forwarding Flags #CFF

Set command enables or disables the presentation of the call forwarding flags URC.

Read command reports if the presentation of the call forwarding flags URC is enabled and, if the flags field is present in the SIM, the current status of the call forwarding flags as they are currently stored on SIM, and the number incoming calls are forwarded to. The format is:

#CFF: <enable>[,<status>,< fwdtonum >]

Test command returns the range of available values for parameter <enable>.

Syntax

Command	Command type
AT#CFF=<enable>	Set
AT#CFF?	Read
AT#CFF=?	Test

Parameters and values

<enable>

0   Disable the presentation of the #CFF URC. **Default: 0**.

1 Enable the presentation of the #CFF URC each time the Call Forwarding Unconditional (CFU) SS setting is changed or checked and, at startup, the presentation of the status of the call forwarding flags, as they are currently stored on SIM.

The URC format is:

#CFF: <status>,<fwdtonum>

where:

<status>

0 – CFU disabled

1 – CFU enabled

< fwdtonum > - number incoming calls are forwarded to

The presentation at start up of the call forwarding flags status, as they are currently stored on SIM, is as follows:

 #CFF: <status>,< fwdtonum >

where:

<status>

0 – CFU disabled

1 – CFU enabled

< fwdtonum > - number to which incoming calls are forwarded.

GSM Audio and UMTS Codec #CODEC

Set command sets the GSM audio codec mode.

Read command returns current audio codec mode in the format:

#CODEC: <codec>

Test command returns the range of available values for parameter <codec>.

Syntax

Command	Command type
AT#CODEC=[<codec>]	Set
AT#CODEC?	Read
AT#CODEC=?	Test

Parameters and values

<codec>

0 All the codec modes are enabled. **Default: 0**.

1-255	Sum of integers each representing a specific codec mode:
	1 - FR, full rate mode enabled.
	2 - EFR, enhanced full rate mode enabled.
	4 - HR, half rate mode enabled.
	8 - AMR-FR, AMR full rate mode enabled.
	16 - AMR-HR, AMR half rate mode enabled.
	32 – FAWB, full rate AMR wide band
	64 – UAMR2, UMTS AMR version 2
	128 – UAWB, UMTS AMR wide band

Notes

- The full rate mode is added by default to any setting in the SETUP message (as specified in ETSI 04.08). But the call drops if the network assigned codec mode has not been selected by the user.
- The setting 0 is equivalent to the setting 255.
- The codec setting is saved in the profile parameters.

Examples

To set the codec modes HR (4), EFR (2) and AMR-FR (8):

AT#CODEC=14
OK

Network Timezone #NITZ

Set command enables or disables (a) automatic date/time updating, (b) Full Network Name applying and (c) #NITZ URC. Command also changes the #NITZ URC format.

The network sends date and time information after GSM registration or after GPRS attach.

Read command reports whether (a) automatic date/time updating, (b) Full Network Name applying, (c) #NITZ URC (as well as its format) are currently enabled or not, in the format:

#NITZ: <val>,<mode>

Test command returns supported values of parameters <val> and <mode>.

Syntax

Command	Command type
AT#NITZ=[<val>[,<mode>]]	Set
AT#NITZ?	Read
AT#NITZ=?	Test

Parameters and values

<val>	You can enable settings of 1, 2, 4, or 8 individually, or combine them by adding values. For example, if you want to enable functions 2 and 4, set a value of 6. To enable all functions, set a value of 15. **Default: 7.**
0	Disables (a) automatic data/time updating, (b) Full Network Name applying and (c) #NITZ URC; moreover it sets the #NITZ URC 'basic' format. See <datetime> in the <mode> description that follows.
1	Enables automatic date/time updating.
2	Enables Full Network Name applying.
4	Sets the #NITZ URC 'extended' format. See <datetime> in the <mode> description that follows.
8	Sets the #NITZ URC 'extended' format with Daylight Saving Time (DST) support. See <datetime> in the <mode> description that follows.
<mode>	
0	Disables #NITZ URC. **Default: 0**.

1	Enables #NITZ URC; after date and time updating the following unsolicited indication is sent:
	#NITZ: <datetime>
	where:
	<datetime> - string whose format depends on subparameter <val>.
	"yy/MM/dd,hh:mm:ss" - 'basic' format, if <val> is in (0-3).
	"yy/MM/dd,hh:mm:ss±zz" - 'extended' format, if <val> is in (4-7).
	"yy/MM/dd,hh:mm:ss±zz,d" - 'extended' format with DST support, if <val> is in (8-15).
	where:
	yy – year.
	MM – month, in digits.
	dd – day.
	hh – hour.
	mm – minute.
	ss – second.
	zz - time zone. Indicates the difference, expressed in quarter of an hour, between the local time and GMT; two last digits are mandatory, range is -47 to +48).
	d – Number of hours added to the local time zone because of daylight savings time (DST) adjustment. Range is 0-3.
	Note: If the DST information is not sent by the network, then the <datetime> parameter has the format "yy/MM/dd,hh:mm:ss±zz".

Clock Management #CCLK

Set command sets the real-time clock of the ME.

Read command returns the current setting of the real-time clock, in the format <time>.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CCLK=<time>	Set
AT#CCLK?	Read
AT#CCLK=?	Test

Parameters and values

<time>	Current time as quoted string in the format: "yy/MM/dd,hh:mm:ss±zz,d".
yy	Year. Two last digits are mandatory. Range is 00-99.
MM	Month. Two last digits are mandatory. Range is 01-12.
dd	Day. Two last digits are mandatory. The range for dd(day) depends on the month and the year it refers to. Available ranges are: (01-28) (01-29) (01-30) (01-31) Trying to enter an out of range value raises an error.
hh	Hour. Two last digits are mandatory. Range is 00-23.
mm	Minute. Two last digits are mandatory. Range is 00-59.
ss	Seconds. Two last digits are mandatory. Range is 00-59.
±zz	Time zone. Indicates the difference, expressed in quarter of an hour, between the local time and GMT. Two last digits are mandatory. Range is -47 to +48.
d	Number of hours added to the local time zone because of daylight savings time adjustment. Range is 0-2.

Notes

- If the time is set by the network but the DST information is missing, or the time is set by +CCLK command, then the <time> format is: "yy/MM/dd,hh:mm:ss±zz"

Examples

AT#CCLK="02/09/07,22:30:00+04,1"
OK
AT#CCLK?
#CCLK: 02/09/07,22:30:25+04,1
OK

Clock Mode #CCLKMODE

Set command enables the local time or the UTC time in AT+CCLK and AT#CCLK commands and in #NITZ URC. Note: the setting is saved automatically in NVM.

Read command reports whether the local time or the UTC time is enabled, in the format: #CCLKMODE: <mode> (<mode> described above)

Test command reports the supported range of values for parameter <mode>

Syntax

Command	Command type
AT#CCLKMODE= <mode>	Set
AT#CCLKMODE?	Read

Command	Command type
AT#CCLKMODE=?	Test

Parameters and values

\<mode\>	\<mode\> - time and date mode
0	Local time + local time zone offset (default)
1	UTC time + local time zone offset

Examples

at#cclkmode?
#CCLKMODE: 0
OK
#NITZ: 13/03/05,15:20:33+04,0
at+cclk?
+CCLK: "13/03/05,15:20:37+04"
OK
at#cclkmode=1
OK
at+cclk?
+CCLK: "13/03/05,14:20:45+04"
OK
at#cclkmode?#CCLKMODE: 1
OK
#NITZ: 13/03/05,14:20:53+04,0
at+cclk?
+CCLK: "13/03/05,14:20:55+04"
OK
at#cclkmode=0
OK
at+cclk?
+CCLK: "13/03/05,15:20:59+04"
OK

Enhanced Network Selection #ENS

Set command activates the ENS functions.

Read command reports whether the ENS function is currently enabled or not, in the format:

#ENS: \<mode\>

Where \<mode\> represents values as described in the Parameters and Values section.

Test command reports the available range of values for parameter \<mode\>.

Syntax

Command	Command type
AT#ENS=[\<mode\>]	Set

Command	Command type
AT#ENS?	Read
AT#ENS=?	Test

Parameters and values

<mode>

0   Disable ENS function. **Default: 0**.

1   Enable ENS function. If AT#ENS=1 is issued, the following values are automatically set:

At every next power-up:

Band GSM 850 and PCS enabled (AT#BND=3)

SIM Application Toolkit enabled on user interface 0 if not previously enabled on a different user interface (AT#STIA=2)

Just at first next power-up a Automatic Band Selection enabled (AT#AUTOBND=2) only if the previous setting was equal to AT#AUTOBND=0.

Note: The new setting is available after next power-up.

Note: If 'Four Band' Automatic Band Selection is activated (AT#AUTOBND=2), at power-up the value returned by AT#BND? might not be 3 if ENS function is enabled.

Select Band #BND

Set command selects the current GSM and UMTS bands. This command only works if AT#AUTOBND is set to value of 0 or 1.

Read command returns the current selected band in the format:

#BND: <band> , <UMTS band>

Test command returns the supported range of values of parameters <band> and < UMTS band>.

Syntax

Command	Command type
AT#BND=[<band> [, <UMTS band>]]	Set
AT#BND?	Read
AT#BND=?	Test

Parameters and values

<band>

0   GSM 900MHz + DCS 1800MHz. **Default: 0**.

1	GSM 900MHz + PCS 1900MHz; this value is not available if the ENS function is activated. See #ENS.
2	GSM 850MHz + DCS 1800MHz. Available only on quad-band modules. This value is not available if the ENS function is activated. See #ENS.
3	GSM 850MHz + PCS 1900MHz. Available only on quad-band modules.
For <UMTS band>	
0	2100MHz(FDD I).
1	1900MHz(FDD II).**Default: 1**Default value for some products.
2	850MHz(FDD V).
3	2100MHz(FDD I) + 1900MHz(FDD II) + 850MHz(FDD V).
4	1900MHz(FDD II) + 850MHz(FDD V).
5	900MHz(FDD VIII) **Default: 5** Default value depends on product.
6	2100MHz(FDD I) + 900MHz(FDD VIII).
7	1700/2100MHz (FDD IV AWS).

Notes

- This setting is maintained after power off.
- If the normal automatic band selection is enabled (AT#AUTOBND=1) then the last #BND settings can automatically change at power-up. After this change you can use the command as you normally do.
- If the 'four bands' automatic band selection is enabled (AT#AUTOBND=2) then you can issue AT#BND=<band> but it has no functional effect. Nevertheless every following read command AT#BND? reports that setting.
- Not all products support all the values of parameter <UMTS band>. Use the test command to find the supported range of values.

Automatic Band Selection #AUTOBND

Set command enables or disables the automatic band selection at power-on.

Read command returns whether the automatic band selection is enabled or not in the form:

#AUTOBND: <value>

Test command returns the range of supported values for parameter <value>.

Syntax

Command	Command type
AT#AUTOBND=[<value>]	Set
AT#AUTOBND?	Read
AT#AUTOBND=?	Test

Parameters and values

<value>

    0   Disables automatic band selection at next power-up.

    1   Enables automatic band selection at next power-up. The automatic band selection stops as soon as a cell is found (deprecated).

    2   Enables automatic band selection all supported bands; differently from previous settings it takes immediate effect. **Default: 2**.

Notes

- Necessary condition to effectively have automatic band selection at next power-up (due to either AT#AUTOBND=1 or AT#AUTOBND=2) is that AT+COPS=0 has to be previously issued.
- If automatic band selection is enabled (AT#AUTOBND=1) the band changes every about 90 seconds through available bands until a cell is found.
- If the current setting is equal to AT#AUTOBND=0 and you issue AT#ENS=1, at first next power-up after the ENS is activated (see #ENS) the automatic band selection (AT#AUTOBND=2) is enabled.

PPP Data Connection Authentication Type #GAUTH

Set command sets the authentication type used in PDP Context Activation during PPP-GPRS connections.

Read command reports the current authentication type, in the format:

#GAUTH: <type>

Test command returns the range of supported values for parameter <type>.

Syntax

Command	Command type
AT#GAUTH=[<type>]	Set
AT#GAUTH?	Read
AT#GAUTH=?	Test

Parameters and values

<value>

    0   No authentication.

    1   PAP authentication. **Default: 1**.

    2   CHAP authentication.

Notes

- If the settings on the server side (the host application) of the PPP are not compatible with the AT#GAUTH setting, then the PDP Context Activation uses no authentication.

Skip Escape Sequence #SKIPESC

Set command enables or disables skipping the escape sequence +++ while transmitting during a data connection.

Read command reports whether escape sequence skipping is currently enabled or not, in the format:

SKIPESC: <mode>

Test command reports supported range of values for parameter <mode>.

Syntax

Command	Command type
AT#SKIPESC=[<mode>]	Set
AT#SKIPESC?	Read
AT#SKIPESC=?	Test

Parameters and values

<mode>

0   Does not skip the escape sequence; its transmission is enabled. **Default: 0**.

1   Skips the escape sequence; its transmission is not enabled.

Notes

- In case of an FTP connection, the escape sequence is not transmitted, regardless of the command setting.

SIM Detection Mode #SIMDET

Set command specifies the SIM Detection mode.

Read command returns the currently selected SIM Detection Mode in the format:

#SIMDET: <mode>,<simin>

where:

<mode>	SIM detection mode.
<simin>	SIMIN pin real status.
0	SIM not inserted.
1	SIM inserted.

Test command reports the supported range of values for parameter <mode>.

Syntax

Command	Command type
AT#SIMDET=<mode>	Set
AT#SIMDET?	Read
AT#SIMDET=?	Test

Parameters and values

<mode>   SIM detection mode.

0	Ignore SIMIN pin and simulate the status 'SIM Not Inserted'.
1	Ignore SIMIN pin and simulate the status 'SIM Inserted'.
2	Automatic SIM detection through SIMIN pin. **Default: 2**.

GSM Context Definition #GSMCONT

Set command specifies context parameter values for the only GSM context, identified by the (local) context identification parameter 0.

Read command returns the current settings for the GSM context, if defined, in the format:

+GSMCONT: <cid>,<P_type>,<CSD_num>

Test command returns the supported range of values for all the parameters.

Syntax

Command	Command type
AT#GSMCONT= <cid>[,<P_type>, <CSD_num>]	Set
AT#GSMCONT?	Read
AT#GSMCONT=?	Test

Parameters and values

<cid>	Context Identifier; numeric parameter which specifies the only GSM context.
0	Note: Issuing #GSMCONT=0 causes the values for context number 0 to become undefined. Note: Command not yet implemented.
<P_type>	Protocol type; a string parameter which specifies the type of protocol "IP" (Internet Protocol).
<CSD_num>	Phone number of the internet service provider.

Show Address #CGPADDR

Execute command returns either the IP address for the GSM context (if specified) or a list of PDP addresses for the specified PDP context identifiers.

Test command returns a list of defined <cid>s.

Syntax

Command	Command type
AT#CGPADDR=[<cid>[,<cid>[,…]]]	Execute
AT#CGPADDR=?	Test

Parameters and values

<cid>	Context identifier.
0	Specifies the GSM context. See +GSMCONT.

1-5   Numeric parameter which specifies a particular PDP context definition. See +CGDCONT command.

Notes

- If no <cid> is specified, the addresses for all defined contexts are returned.

- Issuing the command with more than 6 parameters raises an error.

- The command returns only one row of information for every specified <cid>, even if the same <cid> is present more than once.

- The command returns a row of information for every specified <cid> whose context is already defined. No row is returned for a <cid> whose context has not been defined yet. Response format is:

#CGPADDR: <cid>,<address>[<CR><LF>
#CGPADDR: <cid>,<address>[…]]

where

<cid>	Context identifier.
<address>	Meaning depends on the value of <cid>.
	If <cid> is the (only) GSM context identifier (<cid>=0) it is the dynamic address assigned during the GSM context activation.
	If <cid> is a PDP context identifier (<cid> in (1-5)) it is a string that identifies the terminal in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it is the one set by the +CGDCONT command when the context was defined. For a dynamic address it is the one assigned during the last PDP context activation that used the context definition referred to by <cid>.
	If no address is available the empty string ("") is represented as <address>.

Examples

AT#CGPADDR=0
#CGPADDR: 0,"xxx.yyy.zzz.www"
OK
AT#CGPADDR=?
#CGPADDR: (0)
OK

Call Establishment Lock #CESTHLCK

Use this command to disable call abort before the DCE enters connected state.

Read command returns the current setting of <closure_type> parameter in the format:

#CESTHLCK: <closure_type>

Test command returns the supported range of values for the <closure_type> parameter.

Syntax

Command	Command type
AT#CESTHLCK=[<closure_type >]	
AT#CESTHLCK?	Read
AT#CESTHLCK=?	Test

Parameters and values

<closure_type>

0   Aborting the call setup by reception of a character is generally possible at any time before the DCE enters connected state. **Default: 0**.

1   Aborting the call setup is disabled until the DCE enters connected state.

Read to I2C #I2CRD

Use this command to send data to an I2C peripheral connected to module GPIOs.

Test command reports the supported list of currently available <service>s.

Syntax

Command	Command type
AT#I2CRD=<sdaPin>,<sclPin>,<deviceId>,<registerId>,<len>	
AT#I2CRD=?	Test

Parameters and values

<sdaPin>   GPIO number for SDA . Valid range is "any input/output pin". To determine the range, use the Test command.

<sclPin>   GPIO number to be used for SCL. Valid range is "any output pin" To determine the range, use the Test command.

<deviceId>   Address of the I2C device, with the LSB, used for read\write command. It does not matter if the LSB is set to 0 or to 1. 10 bit addressing supported. Value must be written in hexadecimal form, without 0x before.

<registerId>   Register to read data from. Range: 0-255. Value has to be written in hexadecimal form (without 0x before).

<len>   Number of data to receive. Range: 1-254. Data Read from I2C is dumped in Hex. See Notes section.

Notes

- ■ If data requested are more than data available in the device, dummy data (normally 0x00 or 0xff) is dumped.
- ■ At the end of the execution GPIO is restored to the original setting. See AT#GPIO command.
- ■ Device address, register address where to read from\ write to, and date bytes must be written in hexadecimal form without 0x.

Examples

AT#I2CRD=2,3,20,10,12
#I2CRD: 00112233445566778899AABBCC
OK

Power Saving Mode Ring #PSMRI

Set command enables or disables the Ring Indicator pin response to an URC message while modem is in power saving mode.

If enabled, a negative going pulse is generated when URC message for specific event is invoked. The duration of this pulse is determined by the value of <x>.

Read command reports the duration in ms of the pulse generated, in the format:

#PSMRI: <x>

Test command reports the supported range of values for parameter <x>

Syntax

Command	Command type
AT#PSMRI= <x>	Set
AT#PSMRI?	Read
AT#PSMRI=?	Test

Parameters and values

<x>	RI enabling.
0	Disables RI pin response for URC message. **Default: 0**.
50-1150	Enables RI pin response for URC messages.

Notes

- ■ The behavior for #PSMRI is invoked, only when modem is in sleep mode (AT+CFUN=5 and AT+CFUN=9)
- ■ If AT+CFUN=9, the pulse is generated also when a GPRS packet is received.
- ■ The value set by command is stored in the profile extended section and does not depend on the specific AT instance.
- ■ When RING signal from incoming call/SMS/socket listen is enabled, the behavior for #PSMRI is ignored.

Control Command Flow #CFLO

Set command enables/disables the flow control in command mode. If enabled, current flow control is applied to both data mode and command mode.

Read command returns current setting value in the format #CFLO: <enable>

Test command returns the range of supported values for parameter <enable>

Syntax

Command	Command type
AT#CFLO= <enable>	Set
AT#CFLO?	Read
AT#CFLO=?	Test

Parameters and values

<enable>

0   Disable flow control in command mode <default value>

1   Enable flow control in command modeFlow control option for the data received by DTE

Notes

■ Setting value is saved in the profile.

Report Concatenated SMS Indexes #CMGLCONCINDEX

The command reports a line for each concatenated SMS containing:

#CMGLCONCINDEX: N,i,j,k,…

where

N The number of segments that form the whole concatenated SMS.

I,j,k The SMS indexes of each SMS segment , 0 if segment has not been received.

If no concatenated SMS is present on the SIM, only OK result code is returned.

Test command returns OK result code.

Syntax

Command	Command type
AT#CMGLCONCINDEX	
AT#CMGLCONCINDEX=?	Test

Examples

at#cmglconcindex
#CMGLCONCINDEX: 3,0,2,3
#CMGLCONCINDEX: 5,4,5,6,0,8

OK

Codec Information #CODECINFO

This command is both a set and an execute command.

Set command enables or disables codec information reports depending on the parameter <mode>, in the specified <format>.

Read command reports <format> and <mode> parameter values in the format:

#CODECINFO: <format>,<mode>

Test command returns the range of supported <format> and <mode>.

Syntax

Command	Command type
AT#CODECINFO[=<format>[, <mode>]]	Set Execute
AT#CODECINFO?	Read
AT#CODECINFO=?	Test

Parameters and values

<format>

0   Numeric format. **Default: 0**.

1   Text format.

<mode>

0   Disable codec information unsolicited report. **Default: 0**.

1   Enable codec information unsolicited report only if the codec changes.

2   Enable short codec information unsolicited report only if the codec changes.

If <mode>=1 the unsolicited channel mode information is reported in the following format:

(if <format>=0)

#CODECINFO: <codec_used>,<codec_set>

(if <format>=1)

#CODECINFO: <codec_used>,<codec_set1>
[,<codec_set2>[..[,codec_setn]]]

If <mode>=2 the unsolicited codec information is reported in the following format:

#CODECINFO: <codec_used>

The reported values are described below.

Execute Command

Execute command reports codec information in the specified <format>.

(if <format>=0) #CODECINFO:

<codec_used>,<codec_set>

(if <format>=1)

#CODECINFO: <codec_used>,<codec_set1>
[,<codec_set2>[..[,codec_setn]]]

The reported values are:

(if <format>=0)

<codec_used> - one of the following channel modes:

0 – no TCH

1 - full rate speech 1 on TCH

2 - full rate speech 2 on TCH

4 - half rate speech 1 on TCH

8 - full rate speech 3 – AMR on TCH

16 - half rate speech 3 – AMR on TCH

128 – full data 9.6

129 – full data 4.8

130 – full data 2.4

131 – half data 4.8

132 – half data 2.4

133 – full data 14.4

134 – full rate AMR wide band

135 – UMTS AMR version 2

136 – UMTS AMR wide band

<codec_set>

1..255 - sum of integers each representing a specific codec mode:

1 - FR, full rate mode enabled

2 - EFR, enhanced full rate mode enabled

4 - HR, half rate mode enabled

8 - FAMR, AMR full rate mode enabled

16 - HAMR, AMR half rate mode enabled

32 – FR-AMR-WB, full rate AMR wide band

64 – UMTS-AMR-V2, UMTS AMR version 2

128 – UMTS-AMR-WB, UMTS AMR wide band

(if <format>=1)

<codec_used> - one of the following channel modes:

None – no TCH

FR - full rate speech 1 on TCH

EFR - full rate speech 2 on TCH

HR - half rate speech 1 on TCH

FAMR - full rate speech 3 – AMR on TCH

HAMR - half rate speech 3 – AMR on TCH

FD96 - full data 9.6

FD48 - full data 4.8

FD24 - full data 2.4

HD48 - half data 4.8

HD24 - half data 2.4

FD144 - full data 14.4

FAWB - full rate AMR wide band

UAMR2 – UMTS AMR version 2

UAWB – UMTS AMR wide band

<codec_setn>

FR - full rate mode enabled

EFR - enhanced full rate mode enabled

HR - half rate mode enabled

FAMR - AMR full rate mode enabled

HAMR - AMR half rate mode enabled

FAWB - full rate AMR wide band

UAMR2 - UMTS AMR version 2

UAWB - UMTS AMR wide band

Note: The command refers to codec information in speech call and to channel mode in data call.

Note: If AT#CODEC is 0, the reported codec set for <format>=0 is 255 (all codec).

Select Language #LANG

Set command selects the currently used language for displaying different messages.

Read command reports the currently selected <lan> in the format:

#LANG: <lan>

Test command reports the supported range of values for parameter <lan>

Syntax

Command	Command type
AT#LANG=<lan>	Set
AT#LANG?	Read
AT#LANG=?	Test

Parameters and values

<lan>	Selected language.
"en"	English. **Default: "en".**
"it"	Italian.

Enable RX Diversity and Set DARP #RXDIV

This command enables or disables the RX diversity and sets the DARP.

Read command reports the currently selected <DIV_enable> and <DARP_mode> parameters in the format:

#RXDIV: <DIV_enable>,<DARP_mode>

Test command reports the supported range of values for <DIV_enable> and <DARP_mode>

Syntax

Command	Command type
AT#RXDIV=<DIV_enable>[,<DARP_mode>]	
AT#RXDIV?	Read
AT#RXDIV=?	Test

Parameters and values

<DIV_enable>	RX diversity.	
0	Disable the RX diversity.	
1	Enable RX diversity. **Default: 1**.	
<DARP_mode>		
0	DARP not supported.	
1	DARP phase 1.	
2	DARP phase 2 traffic only.	

3   DARP always on. **Default: 3.**

Notes

- The values set by command are directly stored in non-volatile memory and do not depend on the specific CMUX instance. They are available at next power on.
- If <DIV_enable> is set to 0, then <DARP_mode> is automatically set to 1 regardless the set value

Set Encryption Algorithm #ENCALG

This command enables or disables the GSM and/or GPRS encryption algorithms supported by the module.

Read command reports the currently selected <encGSM> and <encGPRS>, and the last used <useGSM> and <useGPRS> in the format:

#ENCALG: <encGSM>,<encGPRS>,<usedGSM>,<usedGPRS>

where:

<usedGSM>	
0	No GSM encryption algorithm.
1	A5/1.
2	A5/2.
4	A5/3.
<usedGPRS>	
0	No GPRS encryption algorithm.
1	GEA1.
2	GEA2.
4	GEA3.

Test command reports the supported range of values for parameters in the format:

< encGSM > and <encGPRS>.

Syntax

Command	Command type
AT#ENCALG=[<encGSM>][,<encGPRS>]	
AT#ENCALG?	Read
AT#ENCALG=?	Test

Parameters and values

<encGSM>

0   No GSM encryption algorithm.

1-7   Sum of integers each representing a specific GSM encryption algorithm.

1   A5/1.

2	A5/2.
4	A5/3.
255	Reset default values.
<enGPRS>	
0	No GPRS encryption algorithm.
1-7	Sum of integers each representing a specific GPRS encryption algorithm.
1	GEA1.
2	GEA2.
4	GEA3.
255	Reset default values.

Notes

- ■ The values are stored in non-volatile memory and available on following reboot.
- ■ For possible <encGSM> and <encGPRS> encryptions see test command response.
- ■ If no parameter is issued, the set command returns ERROR.

Examples

AT#ENCALG?
#ENCALG: 5,2,1,1
OK
AT#ENCALG=5,1
OK

Sets the GSM encryption algorithm A5/1 and A5/3, and the GPRS encryption algorithm GEA1. It is available at the next reboot.

AT#ENCALG?
#ENCALG: 5,2,1,1

The last two values indicate that the last used GSM encryption algorithm is A5/1 and the last used GPRS encryption algorithm is GEA1. After reboot

AT#ENCALG?
#ENCALG: 5,1,1,1

Escape Sequence Guard Time #E2ESC

Set command sets a guard time in seconds for the escape sequence in GPRS to be considered a valid one (and return to on-line command mode).

Read command returns current value of the escape sequence guard time, in the format: #E2ESC: <gt>

Test command returns the range of supported values for parameter <gt>.

Syntax

Command	Command type
AT#E2ESC= [<gt>]	Set

Command	Command type
AT#E2ESC?	Read
AT#E2ESC=?	Test

Parameters and values

<gt>

0   Guard time defined by command S12 (factory default)

1..10   Guard time in seconds Note: if the Escape Sequence Guard Time is set to a value different from zero, it overrides the one set with S12.

No Carrier Indication Handling - #NCIH

Set command enables/disables sending of a NO CARRIER indication when a remote call that is ringing is dropped by calling party before it is answered at called party.

Read command reports whether the feature is currently enabled or not, in the format: #NCIH: <enable>

Test command returns the supported range of values for parameter <enable>.

Syntax

Command	Command type
AT#NCIH = <enable>	Set
AT#NCIH?	Read
AT#NCIH=?	Test

Parameters and values

<enable>   Parameter: - NO CARRIER indication sending

0   Disabled (factory default)

1   Enabled

AT Run Commands

Enable SMS Run AT Service #SMSATRUN

Set command enables or disables the SMS AT RUN service. Read command returns the current settings of <mode> and the value of <stat> in the format:

SMSATRUN: <mod>,<stat>

where:

<stat> Service status.

0 Not active.

1 Active.

Test command returns the supported values for the SMS AT RUN parameters.

Syntax

Command	Command type
AT#SMSATRUN=<mod>	Set
AT#SMSATRUN?	Read
AT#SMSATRUN=?	Test

Parameters and values

<mod>

0   Service disabled. **Default: 0.**

1   Service enabled.

Notes

- When the service is active on a specific AT instance, that instance cannot be used for any other scope, except for OTA service that has the highest priority. For more information, see AT#SMSATRUNCFG. For example in the multiplexer request to establish the instance, the request is rejected.
- The current settings are stored in non-volatile memory.
- By default the SMS AT RUN service is disabled. You can enable it with the command AT#SMSATRUN or by receiving a special SMS sent from a Telit server.

Set SMS Run AT Service Parameters #SMSATRUNCFG

Set command configures the SMS AT RUN service.

Read command returns the current settings of parameters in the format:

#SMSATRUNCFG:<instance>,<urcmod>,<timeout>

Test command returns the supported values for the SMSATRUNCFG parameters

Syntax

Command	Command type
AT#SMSATRUNCFG=<instance>[,<urcmod>[,<timeout>]]	Set
AT#SMSATRUNCFG?	Read
AT#SMSATRUNCFG=?	Test

Parameters and values

<instance>   AT instance used by the service to run the AT command. Range 1 – 3. **Default: 3**.

<urcmod>

0   Disable unsolicited message.

1	Enable an unsolicited message when an AT command is requested via SMS. **Default: 1.**
	When unsolicited is enabled, the AT command requested via SMS is indicated to TE with unsolicited result code:
	#SMSATRUN: <Text>
	For example:
	#SMSATRUN: AT+CGMR;+CGSN;+GSN;+CCLK
<timeout>	Unsolicited is dumped on the instance that requested the service activation.
	<timeout> Defines in minutes the maximum time for a command execution. If timeout expires the module is rebooted.
1-60	**Default: 5.**

Notes

- The current settings are stored in non-volatile memory.
- The instance used for the SMS AT RUN service is the same used for the EvMoni service. Therefore, when the #SMSATRUNCFG sets the <instance> parameter, the change is reflected also in the <instance> parameter of the #ENAEVMONICFG command, and vice versa.
- The set command returns ERROR if the command AT#ENAEVMONI? returns 1 as <mod> parameter or the command AT#SMSATRUN? returns 1 as <mod> parameter.

SMS AT Run White List #SMSATWL

Set command to handle the white list.

Read command returns the list elements in the format:

#SMSATWL: [<entryType>,<string>]

Test command returns the supported values for the parameter <action>, <index> and <entryType>

Syntax

Command	Command type
AT#SMSATWL=<action>,<index>[,<entryType>[,<string>]]	Set
AT#SMSATWL?	Read
AT#SMSATWL=?	Test

Parameters and values

<action>	
0	Add an entry to the white list.
1	Delete an entry from the white list.
2	Display an entry of the white list.

\<index\>	Index of the white list. Range 1-8.
\<entryType\>	Note: A maxiimum of two passwords can be specified in the white list.
0	Phone number.
1	Password.
\<string\>	String parameter enclosed between double quotes containing or the phone number or the password.
	Phone number contains numerical characters and the character "+" at the beginning of the string and the character "*" at the end of the string.
	Password must be exactly 16 characters length.
	Note: When the character "*" is used, it means that all the numbers that begin with the defined digit are part of the white list.
	For example:
	"+39*" All Italian users can ask to run AT command via SMS.
	"+39349*" All Vodafone users can ask to run AT command via SMS.

TCP Run AT Service in Listen Server Mode #TCPATRUNL

Set command enables or disables the TCP AT RUN service in server mode. When this service is enabled, the module tries to put itself in TCP listen state.

Read command returns the current settings of \<mode\> and the value of \<stat\> in the format:

#TCPATRUNL: \<mod\>,\<stat\>

where:

\<stat\> Connection status.

0 Not in listen.

1 In listen, or active.

Test command returns the supported values for the parameters

Syntax

Command	Command type
AT#TCPATRUNL=\<mod\>	Set
AT#TCPATRUNL?	Read
AT#TCPATRUNL=?	Test

Parameters and values

\<mod\>	
0	Service disabled.

1   Service enabled.

Notes

- If SMSATRUN is active on the same instance—see AT#TCPATRUNCFG—the command returns ERROR.
- When the service is active it is on a specific AT instance—see AT#TCPATRUNCFG—that instance cannot be used for any other scope. For example, if the multiplexer requests to establish the instance, the request is rejected.
- The current settings are stored in non-volatile memory.
- To start the service automatically when the module is powered on, the automatic PDP context activation must be set. See AT#SGACTCFG.

TCP AT Run Firewall List #TCPATRUNFRWL

Set command controls the internal firewall settings for the TCP AT RUN connection.

Read command reports the list of all ACCEPT chain rules registered in the Firewall settings in the format:

#TCPATRUNFRWL: <ip_addr>,<net_mask>
#TCPATRUNFRWL: <ip_addr>,<net_mask>

 …
OK

Test command returns the allowed values for parameter <action>.

Syntax

Command	Command type
AT#TCPATRUNFRWL=<action>,<ip_addr>,<net_mask>	Set
AT#TCPATRUNFRWL?	Read
AT#TCPATRUNFRWL=?	Test

Parameters and values

<action>   Command action.

0   Remove selected chain.

1   Add an ACCEPT chain.

2   Remove all chains (DROP everything); <ip_addr> and <net_mask> has no meaning in this case.

<ip_addr>   String type, remote address added into the ACCEPT chain. Can be any valid IP address in the format: xxx.xxx.xxx.xxx.

<net_mask>	String type, mask to be applied on the <ip_addr>. It can be any valid IP address mask in the format: xxx.xxx.xxx.xxx.

Command returns OK result code if successful.

Firewall general policy is DROP. Therefore all packets that are not included into an ACCEPT chain rule are silently discarded.

When a packet comes from the IP address incoming_IP, the firewall chain rules are scanned for matching with the following criteria:

incoming_IP & <net_mask> = <ip_addr> & <net_mask>

If criteria is matched, then the packet is accepted and the rule scan is finished. If criteria is not matched for any chain the packet is silently dropped.

Notes

- A maximum of 5 firewalls can be present at same time in the list.
- The firewall list is saved in non-volatile memory.

TCP AT Run Authentication Parameters List #TCPATRUNAUTH

Execute command controls the authentication parameters for the TCP AT RUN connection.

Read command reports the list of all ACCEPT chain rules registered in the Authentication settings in the format:

#TCPATRUNAUTH: <user_id>,<passw>
#TCPATRUNAUTH: <user_id>,<passw>
….
OK

Test command returns the allowed values for parameter <action>.

Syntax

Command	Command type
AT#TCPATRUNAUTH=<action>,<userid>,<passw>	Execute
AT#TCPATRUNAUTH?	Read
AT#TCPATRUNAUTH=?	Test

Parameters and values

<action>	Command action.
0	Remove selected chain.
1	Add an ACCEPT chain.
2	Remove all chains (DROP everything). < userid > and < passw > has no meaning in this case.
<userid>	String type, user to be added into the ACCEPT chain. Maximum length 50.
<passw>	String type, password of the user on the < userid >. Maximum length 50. Command returns OK result code if successful.

Notes

- A maximum of 3 entries (password and userid) can be present at same time in the list.
- The Authentication Parameters List is saved in non-volatile memory.

TCP AT Run in Dial (Client) Mode #TCPATRUND

Set command enables or disables the TCP AT RUN service in client mode. When this service is enabled, the module tries to open a connection to the host. The host is specified in AT#TCPATRUNCFG.

Read command returns the current settings of <mode> and the value of <stat> in the format:

#TCPATRUND: <mode>,<stat>

where:

<stat>	
0	Not connected.
1	Connected or connecting at socket level.
2	Not connected but still trying to connect, attempting every delay time. Delay time is specified using AT#TCPATRUNCFG.

Test command returns the supported values for the TCPATRUND parameters.

Syntax

Command	Command type
AT#TCPATRUND=<mod>	Set
AT#TCPATRUND?	Read
AT#TCPATRUND=?	Test

Parameters and values

<mod>

0 Service disabled.

1 Service enabled.

Notes

- If SMSATRUN is active on the same instance (see AT#TCPATRUNCFG) the command returns ERROR.
- When the service is active it is on a specific AT instance (see AT#TCPATRUNCFG), that instance cannot be used for any other scope. For example if the multiplexer request to establish the instance, the request is rejected.
- The current setting are stored in non-volatile memory
- To start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see AT#SGACTCFG command).

■ If the connection closes or when the module reboots, if service is enabled and context is active, the module tries to reconnect for the number of attempts specified in AT#TCPATRUNCFG. The delay between one attempt and the other is specified in AT#TCPATRUNCFG

Closing TCP Run AT Socket #TCPATRUNCLOSE

Closes the socket used by TCP AT RUN service.

Note: TCP AT RUN status is still enabled after this command, so the service re-starts automatically.

Test command returns OK.

Syntax

Command	Command type
AT#TCPATRUNCLOSE	
AT#TCPATRUNCLOSE =?	Test

TCP Run AT Command Sequence #TCPATCMDSEQ

Set command enable/disable, for TCP Run AT service, a feature that allows giving more than one AT command without waiting for responses.

It does not work with commands that use the prompt '>' to receive the message body text (for example "at+cmgs")

Read command returns the current settings of parameters in the format:

#TCPATCMDSEQ: <mod>

Test command returns the supported values for the TCPATCMDSEQ parameters.

Syntax

Command	Command type
AT#TCPATCMDSEQ=<mod>	Set
AT#TCPATCMDSEQ?	Read
AT#TCPATCMDSEQ=?	Test

Parameters and values

<mod>

0   Service disabled**Default: 0.**

1   Service enabled

TCP Run AT Service to a Serial Port #TCPATCONSER

Set command sets the TCP Run AT in transparent mode, to have direct access to the hardware port specified. Data is transferred directly, without being elaborated, between the TCP Run AT service and the hardware port specified.

If the CMUX protocol is running the command returns ERROR.

Test command returns the supported values for the TCPATCONSER parameters.

Syntax

Command	Command type
AT#TCPATCONSER=<port>,<rate>	Set
AT#TCPATCONSER=?	Test

Parameters and values

<port>	Serial port to connect to. Not all of these ports are available at the same time. Use the Test command to display the ports available. They depend on the AT#PORTCFG command.
0	USIF0
1	USIF1
2	USB0
3	USB1
4	USB2
5	USB3
6	SPI
<rate>	Baud rate for data transfer. Allowed values appear under <rate>.
300	
1200	
2400	
4800	
9600	
19200	
38400	
57600	
115200	

Notes

- You must issue the set command from the TCP AT RUN instance.
- After you issue the set command, if no error has occurred, then the module issues a "CONNECT" to advise that the TCP AT RUN instance is in online mode and connected to the port specified.
- To exit from online mode and close the connection, the escape sequence (+++) must be sent on the TCP AT RUN instance.
- For USB ports and SPI the rate parameter is dummy.

Run AT Command Execution #ATRUNDELAY

Set command enables the use of a delay before the execution of AT command received by Run AT service (TCP and SMS). It affects only AT commands given through Run AT service.

Read command returns the current settings of parameters in the format:

#ATRUNDELAY: 0, <delayTCP>
#ATRUNDELAY: 1, <delaySMS>
OK

Test command returns the supported values for the ATRUNDELAY parameters.

Syntax

Command	Command type
AT#ATRUNDELAY=<srv>,<delay>	Set
AT#ATRUNDELAY?	Read
AT#ATRUNDELAY=?	Test

Parameters and values

<srv>

0 TCP Run AT service.

1 SMS Run AT service.

<delay> Value of the delay, in seconds. Range 0-30. **Default: 0** for both services (TCP and SMS).

Notes

- The use of the delay is recommended to execute some AT commands that require network interaction or switch between GSM and GPRS services.
- The delay is valid until a new AT#ATRUNDELAY is set.

Enable EvMoni Service #ENAEVMONI

Set command enables or disables the EvMoni service.

Read command returns the current settings of <mode> and the value of <stat> in the format:

ENAEVMONI: <mod>,<stat>

where:

<stat> Service status.

0 Active.

Connected or connecting at socket level

Test command returns the supported values for the ENAEVMONI parameters.

Syntax

Command	Command type
AT#ENAEVMONI=<mod>	Set
AT#ENAEVMONI?	Read

Command	Command type
AT#ENAEVMONI=?	Test

Parameters and values

<mod>

0   Service disabled. **Default: 0.**

1   Service enabled.

Note: When the service is active on a specific AT instance, that instance cannot be used for any other scope, except for OTA service that has the highest priority. For example in the multiplexer request to establish the instance, the request is rejected.

Notes

■ The current settings are stored in non-volatile memory.

EvMoni Service Parameter #ENAEVMONICFG

Set command configures the EvMoni service.

Read command returns the current settings of parameters in the format:

#ENAEVMONICFG:<instance>,<urcmod>,<timeout>

Test command returns the supported values for the ENAEVMONICFG parameters

Syntax

Command	Command type
AT#ENAEVMONICFG=<instance>[,<urcmod>[,<timeout>]]	Set
AT#ENAEVMONICFG?	Read
AT#ENAEVMONICFG=?	Test

Parameters and values

<instance>   AT instance used by the service to run the AT command. Range 1 - 3. **Default: 3.**

<urcmod>

0   Disable unsolicited message.

1	Enable an unsolicited message when an AT command is executed after an event is occurred. Default: 1.
	When unsolicited is enabled, the AT command is indicated to TE with unsolicited result code:
	#EVMONI: <Text>
	For example:
	#EVMONI: AT+CGMR;+CGSN;+GSN;+CCLK
	Unsolicited is dumped on the instance that requested the service activation.
<timeout>	Defines in minutes the maximum time for a command execution. If timeout expires the module is rebooted. **Default: 5.**

Notes

- The current settings are stored in non-volatile memory.
- The instance used for the EvMoni service is the same used for the SMS AT RUN service. Therefore, when the #ENAEVMONICFG sets the <instance> parameter, the change is reflected also in the <instance> parameter of the #SMSATRUNCFG command, and vice versa.
- The set command returns ERROR if the command AT#ENAEVMONI? returns 1 as <mod> parameter or the command AT#SMSATRUN? returns 1 as <mod> parameter

Event Monitoring #EVMONI

Set command enables or disables the single event monitoring, configures the related parameter and associates the AT command.

Read command returns the current settings for each event in the format:

#EVMONI: <label>,<mode>,<param0>[,<param1>[,<param2>[,<param3>]]]

Where <param0>, <param1>, <param2> and <param3> are defined as before for <param> depending on <label> value.

Test command returns values supported as a compound value.

Syntax

Command	Command type
AT#EVMONI=<label>,<mode>,[,<paramType>,<param>]	Set
AT#EVMONI?	Read
AT#EVMONI=?	Test

Parameters and values

<label>	String parameter—enclosed between double quotes—indicating the event under monitoring. It can assume the following values:
VBATT	Battery voltage monitoring.

DTR	DTR monitoring.
ROAM	Roaming monitoring.
CONTDEACT	Context deactivation monitoring.
RING	Call ringing monitoring.
STARTUP	Module start-up monitoring.
REGISTERED	Network registration monitoring.
GPIO1	Monitoring on a selected GPIO in the GPIO range.
GPIO2	Monitoring on a selected GPIO in the GPIO range.
GPIO3	Monitoring on a selected GPIO in the GPIO range.
GPIO4	Monitoring on a selected GPIO in the GPIO range.
GPIO5	Monitoring on a selected GPIO in the GPIO range.
ADCH1	ADC high voltage monitoring.
ADCL1	ADC low voltage monitoring.
DTMF1	Monitoring on user defined DTMF string.
DTMF2	Monitoring on user defined DTMF string.
DTMF3	Monitoring on user defined DTMF string.
DTMF4	Monitoring on user defined DTMF string.
SMSIN	Monitoring on incoming SMS.
<mode>	
0	Disable the single event monitoring. **Default: 0.**
1	Enable the single event monitoring.
<paramType>	Numeric parameter indicating the type of parameter contained in <param>. 0 value indicates that <param> contains the AT command string to execute when the related event has occurred. Other values depend from the type of event.
<param>	Numeric or string value depending on the value of <paramType> and on the type of event.

If <paramType> is 0, then <param> is a string containing the AT command:
- It has to be enclosed between double quotes
- It has to start with the 2 characters AT (or at).
- If the string contains the character ", then it has to be replaced with the 3 characters \22.
- The maximumstring length is 96 characters.
- If it is an empty string, the AT command is erased.
- If <label> is VBATT, <paramType> can assume values in the range 0 - 2.
  - if <paramType> = 1, <param> indicates the battery voltage threshold in the range 0 – 500, where one unit corresponds to 10 mV (therefore 500 corresponds to 5 V). **Default: 0.**
  - if <paramType> = 2, <param> indicates the time interval in seconds after that the voltage battery under the value specified with <paramType> = 1 causes the event. The range is 0 – 255. **Default: 0.**

- If <label> is DTR, <paramType> can assume values in the range 0 - 2.
  - if <paramType> = 1, <param> indicates the status high or low under monitoring. The values are 0 (low) and 1 (high). **Default: 0.**
  - if <paramType> = 2, <param> indicates the time interval in seconds after that the DTR in the status specified with <paramType> = 1 causes the event. The range is 0 – 255. **Default: 0**
- If <label> is ROAM, <paramType> can assume only the value 0. The event under monitoring is the roaming state.
- If <label> is CONTDEACT, <paramType> can assume only the value 0. The event under monitoring is the context deactivation.
- If <label> is RING, <paramType> can assume values in the range 0 - 1.
  - If <paramType> = 1, <param> indicates the numbers of call rings after that the event occurs. The range is 1- 50. **Default: 1.**
- If <label> is STARTUP, <paramType> can assume only the value 0. The event under monitoring is the module start-up.
- If <label> is REGISTERED, <paramType> can assume only the value 0. The event under monitoring is the network registration (to home network or in roaming) after the start-up and the SMS ordering.
- If <label> is GPIOX, <paramType> can assume values in the range 0 - 3.
  - if <paramType> = 1, <param> indicates the GPIO pin number; supported range is from 1 to a value that depends on the hardware. **Default: 1.**
  - if <paramType> = 2, <param> indicates the status high or low under monitoring. The values are 0 (low) and 1 (high). **Default: 0.**
  - if <paramType> = 3, <param> indicates the time interval in seconds after that the selected GPIO pin in the status specified with <paramType> = 1 causes the event. The range is 0 – 255. **Default: 0.**
- If <label> is ADCH1, <paramType> can assume values in the range 0 - 3.
  - if <paramType> = 1, <param> indicates the ADC pin number; supported range is from 1 to a value that depends on the hardware. **Default: 1.**
  - if <paramType> = 2, <param> indicates the ADC High voltage threshold in the range 0 – 2000 mV. **Default: 0.**
  - if <paramType> = 3, <param> indicates the time interval in seconds after that the selected ADC pin above the value specified with <paramType> = 1 causes the event. The range is 0 – 255. **Default: 0.**
- If <label> is ADCL1, <paramType> can assume values in the range 0 - 3.
  - If <paramType> = 1, <param> indicates the ADC pin number; supported range is from 1 to a value that depends on the hardware. **Default: 1.**
  - If <paramType> = 2, <param> indicates the ADC Low voltage threshold in the range 0 – 2000 mV. **Default: 0.**
  - If <paramType> = 3, <param> indicates the time interval in seconds after that the selected ADC pin under the value specified with <paramType> = 1 causes the event. The range is 0 – 255. **Default: 0.**
- If <label> is DTMFX, <paramType> can assume values in the range 0 - 2.
  - If <paramType> = 1, <param> indicates the DTMF string; the single DTMF characters have to belong to the range ((0-9),#,*,(A-D)); the maximum number of characters in the string is 15
  - If <paramType> = 2, <param> indicates the timeout in milliseconds. It is the maximum time interval within which a DTMF tone must be detected after detecting the previous one, to be considered as belonging to the DTMF string. The range is (500 – 5000). **Default: 1000.**

- If <label> is SMSIN, <paramType> can assume values in the range 0-1.
    - If <paramType> = 1, <param> indicates the text that must be received in incoming SMS to trigger AT command execution rings after that the event occurs; the maximum number of characters in the SMS text string is 15

Notes

- DTMF string monitoring is available only if the DTMF decode is enabled. See #DTMF command.

Send Message #CMGS

For both Text mode and PDU mode, Execute command sends a message to the network.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CMGS=<length>,<pdu>	Execute PDU mode.
AT#CMGS=<da>,<text>	Execute Text mode.
AT#CMGS=?	Test

Parameters and values for PDU mode

<length>

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<pdu>

PDU in hexadecimal format—each octet of the PDU is given as two IRA character long hexadecimal number—and given in one line.

Note: When the length octet of the SMSC address (given in the <pdu>) equals zero, the SMSC address set with command +CSCA is used; in this case the SMSC Type-of- Address octet is not present in the <pdu>.

If message is successfully sent to the network, then the result is sent in the format:

#CMGS: <mr>

where

<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.

Note: If message sending fails for some reason, an error code is reported.

Parameters and values for Text mode

<da>

String type, destination address represented in the currently selected character set. See +CSCS.

<text>   Text to send.

Enclose entered text between double quotes. Format text as follows:

If current <dcs> indicates that GSM03.38 default alphabet is used and current <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header- Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A. For more information about <dcs> and <fo>, see +CSMP.

If current <dcs> indicates that 8-bit or UCS2 data coding scheme is used or current <fo> indicates that 3GPP TS 23.040 TP-User-Data- Header-Indication is set. For more information about <dcs> and <fo>, see +CSMP.

Entered text consists of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet. For example the 'asterisk' is entered as 2A (IRA50 and IRA65) and this is converted to an octet with integer value 0x2A.

If message is successfully sent to the network, then the result is sent in the format:

#CMGS: <mr>

where

<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.

Note: If message sending fails, an error code is reported.

Notes

- To avoid malfunctions, wait for the #CMGS: <mr> or #CMS ERROR: <err> response before issuing further commands.
- Reference: GSM 27.005.

Examples

SMS text mode example

```
AT+CMGF=1
AT#CMGS=6125553333,"this is my message"
<CR LF>
#CMGS: 2
OK
```

SMS PDU mode example

```
AT+CMGF=0
AT#CMGS=30,07913121139418F011000A9155454433330000AA13C27A1EC47EDF59A06999CD0621D3677408
<CR LF>
#CMGS: 3
OK
```

Write Message to Memory #CMGW

For both PDU mode and text mode, Execute command writes a new message in the <memw> memory storage.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CMGW=<length>,<pdu>	Execute, PDU mode
AT#CMGW=<da>,<text>	Execute, Text mode
AT#CMGW=?	Test

Parameters and values for PDU Mode

<length>   length in bytes of the PDU to be written.

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<pdu>

PDU in hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line.

If message is successfully written in the memory, then the result is sent in the format:

#CMGW: <index>

where:

<index> - message location index in the memory <memw>. If message storing fails for some reason, an error code is reported.

Parameters and values for Text Mode

<da>   String type, destination address represented in the currently selected character set. See +CSCS.

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\<text\>　　　　　Text to write. Enclose entered text between double quotes. Format text as follows:

If current \<dcs\> indicates that GSM03.38 default alphabet is used and current \<fo\> indicates that 3GPP TS 23.040 TP-User-Data- Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A. For more information about \<dcs\> and \<fo\>, see +CSMP.

If current \<dcs\> indicates that 8-bit or UCS2 data coding scheme is used or current \<fo\> indicates that 3GPP TS 23.040 TP-User-Data- Header-Indication is set. For more information about \<dcs\> and \<fo\>, see +CSMP.

Entered text consists of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet. For example the 'asterisk' is entered as 2A (IRA50 and IRA65) and this is converted to an octet with integer value 0x2A.

If message is successfully written in memory, the result is sent in the format:

#CMGW: \<index\>

where:

\<index\> - message location index in the memory \<memw\>.

If message storing fails for some reason, an error code is reported.

Notes

- To avoid malfunctions, wait for the #CMGW: \<index\> or +CMS ERROR: \<err\> response before issuing further commands.
- Reference: GSM 27.005

Examples

Examples Text mode

```
AT#CMGW=6124241372,"My  Message  here"
<CR><LF>
#CMGW:  5
OK
```

Make reference to send message

AT+CMSS=X where X is value given through #CMGW: X response to message write.

SMS text mode example

```
AT+CMGF=1
AT#CMGW=6125553333,"this  is  my  message"
<CR  LF>
#CMGW:  2
OK
```

SMS PDU mode example

```
AT+CMGF=0
```

AT#CMGW=30,07913121139418F011000A9155454433330000AA13C27A1EC47EDF59A06999CD0621D367740 8
<CR LF>
#CMGW: 3
OK

MultiSocket AT Commands

Socket Status #SS

Execute command reports the current status of the socket.

Test command reports the range for parameter <connId>.

Syntax

Command	Command type
AT#SS[=<connId>]	Execute
AT#SS=?	Test

Parameters and values

The response format is: #SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort> where:

<connId>	Socket connection identifier.
1-6	
<connId>	Socket connection identifier.
<state>	Actual state of the socket.
0	Socket closed.
1	Socket with an active data transfer connection.
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.
<locIP>	IP address associated by the context activation to the socket.
<locPort>	If the socket is placed in listen mode, the listening port. If the socket is used to connect to a remote machine, the local port for the connection.
<remIP>	When connected to a remote machine, this is the remote IP address.
<remPort>	The port connected to on the remote machine.

Notes

- Issuing #SS<CR> causes getting information about status of all the sockets; the response format is:
  #SS:<connId1>,<state1>,<locIP1>,<locPort1>,<remIP1>,<remPort1>

<CR><LF>
#SS: <connId6>,<state6>,<locIP6>,<locPort6>,<remIP6>,<remPort6>

Examples

AT#SS
#SS: 1,3,91.80.90.162,61119,88.37.127.146,10510
#SS: 2,4,91.80.90.162,1000
#SS: 3,0
#SS: 4,0
#SS: 5,3,91.80.73.70,61120,88.37.127.146,10509
#SS: 6,0

OK

Socket 1: opened from local IP 91.80.90.162/local port 61119 to remote IP 88.37.127.146/remote port 10510 is suspended with pending data

Socket 2: listening on local IP 91.80.90.162/local port 1000

Socket 5: opened from local IP 91.80.73.70/local port 61120 to remote IP 88.37.127.146/remote port 10509 is suspended with pending data

AT#SS=2
#SS: 2,4,91.80.90.162,1000

OK

Information only about socket number 2

Socket Info #SI

Execute command gets information about socket data traffic.

Test command reports the range for parameter <connId>.

Syntax

Command	Command type
AT#SI[=<connId>]	Execute
AT#SI=?	Test

Parameters and values

The response format is: #SI: <connId>,<sent>,<received>,<buff_in>,<ack_waiting> where:

<connId>	Socket connection identifier.
1-6	
<connId>	Socket connection identifier.
<sent>	Total amount (in bytes) of sent data since the last time the socket connection identified by <connId> is opened.
<received>	Total amount (in bytes) of received data since the last time the socket connection identified by <connId> is 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> is opened. Note: Not yet acknowledged data are available only for TCP connections; the value <ack_waiting> is always 0 for UDP connections.

Notes

- Issuing #SI<CR> causes getting information about data traffic of all the sockets; the response format is:

```
#SI:  <connId1>,<sent1>,<received1>,<buff_in1>,<ack_waiting1>
<CR><LF>
…
#SI:  <connId6>,<sent6>,<received6>,<buff_in6>,<ack_waiting6>
```

Examples

Sockets 1,2,3,6 are opened with some data traffic.

For example socket 1 has 123 bytes sent, 400 bytes received, 10 byte waiting to be read and 50 bytes waiting to be acknowledged from the remote side.

```
AT#SI
#SI:  1,123,400,10,50
#SI:  2,0,100,0,0
#SI:  3,589,100,10,100
#SI:  4,0,0,0,0
#SI:  5,0,0,0,0
#SI:  6,0,98,60,0

OK
```

Information only about socket number 1

```
AT#SI=1
#SI:  1,123,400,10,50

OK
```

Socket Type #ST

Set command reports the current type of the socket (TCP/UDP) and its direction (Dialer / Listener).

Test command reports the range for parameter <connId>.

Syntax

Command	Command type
AT#ST[=<ConnId>]	Set
AT#ST=?	Test

Parameters and values

The response format is:#ST:<connId>,<type>,<direction> where:

<ConnId>	Socket connection identifier.
1-6	
<connId>	Socket connection identifier.
<type>	Socket type:
0	No socket.
1	TCP socket.
2	UDP socket.
<direction>	Direction of the socket.
0	No.
1	Dialer.
2	Listener.

Notes

- Issuing #ST<CR> gets information about type of all the sockets; the response format is:

#ST: <connId1>,<type1>,<direction1> <CR><LF>

…
#ST: <connId6>,< type 6>,< direction 6>
#ST: <connId6>,< type 6>,< direction 6>

Examples

Single socket:

AT#ST=3
#ST: 3,2,1

Socket 3 is an UDP dialer.

All sockets:

AT#ST
#ST: 1,0,0
#ST: 2,0,0
#ST: 3,2,1
#ST: 4,2,2
#ST: 5,1,1
#ST: 6,1,2

Socket 1 is closed.

Socket 2 is closed.

Socket 3 is UDP dialer.

Socket 4 is UDP listener.

Socket 5 is TCP dialer.

Socket 6 is TCP listener.

Socket Shutdown #SH

This command closes a socket.

Test command reports the range for parameter <connId>.

Syntax

Command	Command type
AT#SH=<connId>	
AT#SH=?	Test

Parameters and values

<connId>   Socket connection identifier.

1-6

Notes

- Socket cannot be closed in states "resolving DNS" and "connecting" (see AT#SS command)

Socket Configuration #SCFG

Set command sets the socket configuration parameters.

Read command returns the current socket configuration parameters values for all the six sockets, in the format:

#SCFG: <connId1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1>
<CR><LF>
. . .
#SCFG: <connId6>,<cid6>,<pktsz6>,<maxTo6>,<connTo6>,<txTo6>
<CR><LF>

Test command returns the range of supported values for all the subparameters

Syntax

Command	Command type
AT#SCFG=<connId>,<cid>,<pktSz>,<maxTo>,<connTo>,<txTo>	Set
AT#SCFG?	Read
AT#SCFG=?	Test

Parameters and values

Note: Values are automatically saved in non-volatile memory.

<connId>   Socket connection identifier.

1-6

<cid>   PDP context identifier.

0   Specifies the GSM context.

1-5	Numeric parameter which specifies a PDP context definition.
\<pktSz\>	Packet size used by the TCP/UDP/IP stack for data sending.
0	Select default value of 300 automatically.
1-1500	Packet size in bytes.
\<maxTo\>	Exchange timeout or socket inactivity timeout. If there is no data exchange within this timeout period the connection is closed.
0	No timeout.
1-65535	Timeout value in seconds. **Default: 90**.
\<connTo\>	Connection timeout; if cannot connect to the remote within this period, an error is raised.
10-1200	Timeout value in hundreds of milliseconds. **Default: 600**.
\<txTo\>	Data sending timeout. After this period data is sent also if less than maximum packet size.
0	No timeout.
1-255	Timeout value in hundreds of milliseconds. **Default: 50**.
256	Set timeout value in 10 milliseconds
257	Set timeout value in 20 milliseconds
258	Set timeout value in 30 milliseconds
259	Set timeout value in 40 milliseconds
260	Set timeout value in 50 milliseconds
261	Set timeout value in 60 milliseconds
262	Set timeout value in 70 milliseconds
263	Set timeout value in 80 milliseconds
264	Set timeout value in 90 milliseconds

Notes

- You must set the parameters with #SCFG before establishing a data connection using the AT+SGACT command.
- If DNS resolution is required, max DNS resolution time(20 sec) has to be considered in addition to \<connTo\>

Examples

```
at#scfg?
#SCFG: 1,1,300,90,600,50
#SCFG: 2,2,300,90,600,50
#SCFG: 3,2,250,90,600,50
#SCFG: 4,1,300,90,600,50
#SCFG: 5,1,300,90,600,50
#SCFG: 6,1,300,90,600,50
OK
```

Socket Configuration Extended #SCFGEXT

Set command sets the socket configuration extended parameters

Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:

#SCFGEXT:<connId1>, <srMode1>,<dataMode1>,<keepalive1>, <ListenAutoRsp1>,0<CR><LF>
. . .
#SCFGEXT:<connId6>, <srMode6>,<dataMode6>,<keepalive6>, <ListenAutoRsp6>,0<CR><LF>

Test command returns the range of supported values for all the subparameters

Syntax

Command	Command type
AT#SCFGEXT=<conned>,<srMode>,<recvDataMode>,<keepalive>, [,<ListenAutoRsp> [,<sendDataMode>]]	Set
AT#SCFGEXT?	Read
AT#SCFGEXT=?	Test

Parameters and values

<connId>	Socket connection identifier.
1-6	Disables command echo.
<srMode>	SRing unsolicited mode.
0	Normal. **Default: 0**.
	SRING : <connId> where <connId> is the socket connection identifier
1	Data amount.
	SRING : <connId>,<recData> where <recData> is the amount of data received on the socket connection number <connId>
2	Data view.
	SRING : <connId>,<recData>,<data> same as before and <data> is data received displayed following <dataMode> value.
3	Data view with UDP datagram informations: SRING : <sourceIP>,<sourcePort><connId>,<recData>, <dataLeft>,<data> same as before with <sourceIP>,<sourcePort> and <dataLeft> that means the number of bytes left in the UDP datagram
<recvDataMode>	Data view mode for received data in command mode(AT#SRECV or <srMode> = 2).

0	Text mode. **Default: 0**.
1	Hexadecimal mode.
<keepalive>	Set the TCP Keepalive value in minutes.
0	Deactivated. **Default: 0**.
1-240	Keepalive time in minutes.
<ListenAutoRsp>	Set the listen auto-response mode, that affects the commands AT#SL and AT#SLUDP.
0	Deactivated. **Default: 0**.
1	Deactivated. Default: 0.
<sendDataMode>	Data mode for sending data in command mode(AT#SSEND).
0	Data represented as text. **Default: 0**.
1	Data represented as sequence of hexadecimal numbers (from 00 to FF). Each octet of the data is given as two IRA character long hexadecimal number.

Notes

- You must set the parameters with #SCFGEXT before establishing a data connection using the AT+SGACT command.
- These values are automatically saved in non-volatile memory.
- Keepalive is available only on TCP connections.
- For the behavior of AT#SL and AT#SLUDP in case of auto-response mode or in case of no auto-response mode, see the description of the two commands.

Examples

Socket 1 set with data view sring, text data mode, a keepalive time of 30 minutes and listen auto-response set.

Socket 3 set with data amount sring, hex recv data mode, no keepalive and listen auto-response not set.

Socket 4 set with hex recv and send data mode.

```
at#scfgext?
#SCFGEXT:  1,2,0,30,1,0
#SCFGEXT:  2,0,0,0,0,0
#SCFGEXT:  3,1,1,0,0,0
#SCFGEXT:  4,0,1,0,0,1
#SCFGEXT:  5,0,0,0,0,0
#SCFGEXT:  6,0,0,0,0,0
OK
```

Socket Configuration Extended 2 #SCFGEXT2

Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command.

Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:

#SCFGEXT2:<connId1>,<bufferStart1>,0,0,0,0<CR><LF>

...
#SCFGEXT2:<connId6>,<bufferStart6>,0,0,0,0<CR><LF>

Test command returns the range of supported values for all the subparameters.

Syntax

Command	Command type
AT#SCFGEXT2= <connId>,<bufferStart>, [,<abortConnAttempt> [,<unused_B > [,<unused_C >[,<noCarrierMode>]]]]	Set
AT#SCFGEXT2?	Read
AT#SCFGEXT2=?	Test

Parameters and values

Note: Values are automatically saved in non-volatile memory.

<connId>	Socket connection identifier.
1-6	
<bufferStart>	Set the sending timeout method based on new data received from the serial port. (<txTo> timeout value is set by #SCFG command). Transmission timer restarts when new data are received from the serial port.
0	Old behavior for transmission timer (#SCFG command 6th parameter old behavior, start only first time if new data are received from the serial port).
1	New behavior for transmission timer: Restart when new data received from serial port. Note: Necessary to avoid overlapping of the two methods. Enabling new method, the old method for transmission timer(#SCFG) is automatically disabled to avoid overlapping. Note: Check if new data have been received from serial port is done with a granularity that is directly related to #SCFG <txTo> setting with a maximum period of 1 sec
<abortConnAttempt>	Enable connection attempt (#SD/#SKTD) abort before CONNECT (online mode) or OK (command mode).
0	Not possible to interrupt connection attempt.

1		It is possible to interrupt the connection attempt (<connTo> set by #SCFG or DNS resolution running if required) and give back control to AT interface by reception of a character.
		As soon as the control is given to the AT interface the ERROR message is received on the interface itself.
<noCarrierMode>		permits to choose NO CARRIER indication format when the socket is closed as follows
	0	NO CARRIER Indication is sent as usual, without additional information. **Default: 0**
	1	NO CARRIER:<connId> Indication of current <connId> socket connection identifier is added
	2	NO CARRIER:<connId>,<cause> Indication of current <connId> socket connection identifier and closure <cause> are added For possible <cause> values, see also #SLASTCLOSURE

Notes

- You must set the parameters with #SCFGEXT2 before establishing a data connection using the AT+SGACT command.
- Like #SLASTCLOSURE, in case of subsequent consecutive closure causes are received, the original disconnection cause is indicated.
- In the case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data(#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote.

Examples

```
AT#SCFGEXT2=1,1
OK
AT#SCFGEXT2=2,1
OK
AT#SCFGEXT2?
#SCFGEXT2:  1,1,0,0,0,0
#SCFGEXT2:  2,1,0,0,0,0
#SCFGEXT2:  3,0,0,0,0,0
#SCFGEXT2:  4,0,0,0,0,0
#SCFGEXT2:  5,0,0,0,0,0
#SCFGEXT2:  6,0,0,0,0,0
OK
AT#SCFG?
#SCFG:  1,1,300,90,600,50
#SCFG:  2,1,300,90,600,50
#SCFG:  3,1,300,90,600,50
#SCFG:  4,2,300,90,600,50
#SCFG:  5,2,300,90,600,50
#SCFG:  6,2,300,90,600,50
OK
```

AT#SCFG=1,1,300,90,600,30
OK

Current configuration: socket with connId 1 and 2 are configured with new transmission timer behavior.

<txTo> corresponding value is changed(#SCFG) for connId 1, for connId 2 is left to default value.

Socket Configuration Extended 3 #SCFGEXT3

Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command nor in #SCFGEXT2 command.

Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:

#SCFGEXT3:<connId1>,<immRsp1>,0,0,0,0<CR><LF>
. . .
#SCFGEXT3:<connId6>,<immRsp6>,0,0,0,0<CR><LF>

Test command returns the range of supported values for all the subparameters.

Syntax

Command	Command type
AT#SCFGEXT3= <connId >,<immRsp> [,<unused_A>[,<unus ed_B>[,<unused_C>[, <unused_D>]]]]]]	Set
AT#SCFGEXT3?	Read
AT#SCFGEXT3=?	Test

Parameters and values

Note: Values are automatically saved in non-volatile memory.

<connId>	Socket connection identifier
1-6	
<immRsp>	Enables AT#SD command mode immediate response
0	Factory default, means that AT#SD in command mode (see AT#SD) returns after the socket is connected
1	Means that AT#SD in command mode returns immediately. Then the state of the connection can be read by the AT command AT#SS

Socket Dial #SD

Execute command opens a remote connection through socket.

Test command reports the range of values for all parameters.

Syntax

Command	Command type
AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>[,<closureType> [,<lPort>[,<connMode>]]]	Execute
AT#SD=?	Test

Parameters and values

<connId>	Socket connection identifier
1-6	
<txProt>	Transmission protocol.
0	TCP.
1	UDP.
<rPort>	Remote host port to contact.
1-65535	
<IPaddr>	String type, address of the remote host. Can be: any valid IP address in the format: "xxx.xxx.xxx.xxx". any host name to be solved with a DNS query.
<closureType>	Socket closure behavior for TCP when remote host has closed.
0	Local host closes immediately when remote host has closed. **Default: 0**.
255	Local host closes after an escape sequence (+++) or immediately in case of an abortive disconnect from remote.
<lPort>	UDP connections local port.
1-65535	
<connMode>	Connection mode.
0	Online mode connection. **Default: 0**.
1	Command mode connection.

Notes

- ■ <closureType> parameter is valid for TCP connections only and has no effect (if used) for UDP connections.
- ■ <lPort> parameter is valid for UDP connections only and has no effect (if used) for TCP connections.
- ■ Note: If <connMode> is set to online mode connection and the command is successful online data mode is entered, with the intermediate result code CONNECT. After the CONNECT you can suspend the direct interface to the socket connection (the socket stays open) using the escape sequence (+++): the module moves back to command mode and you receive the final result code OK after the suspension. After such a suspension, it's possible to resume it in every moment (unless the socket inactivity timer timeouts, see #SCFG) by using the #SO command with the corresponding <connId>.
- ■ If you set <connMode> to command mode connection and the command is successful, the socket is opened, you remain in command mode and the result code OK appears.
- ■ If there are input data arrived through a connected socket and not yet read because the module entered command mode before reading them (after an escape sequence or after #SD is issued with <connMode> set to command mode connection), these data are buffered and the SRING URC is received. The SRING

presentation format depends on the last #SCFGEXT setting. It is possible to read these data afterwards issuing #SRECV. Under the same hypotheses it is possible to send data while in command mode issuing #SSEND

■ Resume of the socket(#SO) after suspension or closure(#SH) has to be done on the same instance on which the socket was opened through #SD. In fact, suspension is done on the instance itself

Examples

Open socket 1 in online mode

AT#SD=1,0,80,"www.google.com",0,0,0
CONNECT

Open socket 1 in command mode

AT#SD=1,0,80,"www.google.com",0,0,1
OK

Socket Restore #SO

Execute command resumes the direct interface to a socket connection which is suspended by the escape sequence.

Test command reports the range of values for <connId> parameter.

Syntax

Command	Command type
AT#SO=<connId>	Execute
AT#SO=?	Test

Parameters and values

<connId>   Socket connection identifier.

1-6

Socket Listen #SL

This command opens/closes a socket listening for an incoming TCP connection on a specified port.

Read command returns all the actual listening TCP sockets.

Test command returns the range of supported values for all the subparameters.

Syntax

Command	Command type
AT#SL=<connId>,<listenState>,<listenPort>>[,<closure type>]	
AT#SL?	Read
AT#SL=?	Test

Parameters and values

<connId>	Socket connection identifier.
1-6	
<listenState>	
0	Closes socket listening.
1	Starts socket listening.
<listenPort>	Local listening port.
1-65535	
<closure type>	Socket closure behavior for TCP.
0	Local host closes immediately when remote host has closed. **Default: 0**.
255	Local host closes after an escape sequence (+++).

Notes

- If successful, the command returns a final result code OK.
- If the ListenAutoRsp flag has not been set through the command AT#SCFGEXT (for the specific connId), then, when a TCP connection request comes on the input port, if the sender is not filtered by internal firewall (see #FRWL), an URC is received:

+SRING : <connId>

You must use #SA command to accept the connection or #SH command to refuse it.

- If the ListenAutoRSP flag is set when a TCP connection request is received on the local listening port, the connection is automatically accepted as long as the IP address of the device originating the connection has been defined in the internal firwewall (see #FRWL.) Once accepted the CONNECT indication is given and the modem goes into online data mode.
- When closing the listening socket you do not need to specify the <listenPort> value.

Examples

Next command opens a socket listening for TCP on port 3500 without.

AT#SL=1,1,3500
OK

Socket Listen UDP #SLUDP

This command opens or closes a socket listening for an incoming UDP connection on a specified port.

Read command returns all the actual listening UDP sockets.

Test command returns the range of supported values for all the subparameters.

Syntax

Command	Command type
AT#SLUDP=<connId>,<listenState>,<listenPort>	
AT#SLUDP?	Read

Command	Command type
AT#SLUDP=?	Test

Parameters and values

<connId>	Socket connection identifier.	
1-6		
<listenState>		
0	Closes socket listening.	
1	Starts socket listening.	
<listenPort	Local listening port.	
1-65535		

Notes

■ If successful, the command returns a final result code OK.

If the ListenAutoRsp flag is not set through the command AT#SCFGEXT (for the specific connId), then, when an UDP connection request comes on the input port, if the sender is not filtered by internal firewall (see #FRWL), a URC is received:

+SRING : <connId>

Afterwards, use #SA to accept the connection or #SH to refuse it.

If the ListenAutoRsp flag is set, then, when an UDP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command #FRWL), the connection is automatically accepted: the CONNECT indication is given and the modem goes into online data mode.

If the network closes the socket the following URC is received:

#SLUDP: ABORTED

■ When closing the listening socket you do not need to specify the <listenPort> value.

Examples

Next command opens a socket listening for UDP on port 3500.

AT#SLUDP=1,1,3500
OK

Socket Accept #SA

Execute command accepts an incoming socket connection after an URC SRING: <connId>.

Test command reports the range of values for all the parameters.

Syntax

Command	Command type
AT#SA=<connId>[,<connMode>]	Execute

Command	Command type
AT#SA=?	Test

Parameters and values

      <connID>   Socket connection identifier.

         1-6

     <connMode>   Connection mode, as for command #SD.

         0   Online mode connection. **Default: 0**.

         1   Command mode connection.

Notes

- The SRING URC has to be a consequence of a #SL issue.
- Setting the command before to having received a SRING results in an ERROR indication, giving the information that a connection request has not yet been received.

Detect the cause of a Socket disconnection #SLASTCLOSURE

Execution command reports socket disconnection cause.

Read command reports the currently selected <mode> in the format:

#PADCMD: mode

Test command reports the supported range of values for parameter <mode>.

Syntax

Command	Command type
AT#SLASTCLOSURE= [<connId>]	Execution
AT#PADCMD?	Read
AT#PADCMD=?	Test

Parameters and values

      <connId>   Socket connection identifier 1..6 The response format is:

              #SLASTCLOSURE: <connId>,<cause> where: <connId> - socket connection identifier, as before

             -

      <cause>   socket disconnection cause:

         0   Not available. Ssocket has not yet been closed.

         1   Remote host TCP connection close due to FIN/END: normal remote disconnection decided by the remote application

2	Remote host TCP connection close due to RST, all others cases in which the socket is aborted without indication from peer (for instance because peer doesn't send ack after maximum number of retransmissions/peer is no more alive). All these cases include all the "FATAL" errors after recv or send on the TCP socket(named as different from EWOULDBLOCK)
3	Docket inactivity timeout
4	Network deactivation(PDP context deactivation from network)

Notes

- Any time socket is re-opened, last disconnection cause is reset. Command report 0(not available).
- User closure cause(#SH) is not considered and if a user closure is performed after remote disconnection, remote disconnection cause remains saved and is not overwritten.
- If more consecutive closure causes are received, the original disconnection cause is saved. (For instance: if a TCP FIN is received from remote and later a TCP RST because we continue to send data, FIN cause is saved and not overwritten)
- Also in case of <closureType>(#SD) set to 255, if the socket has not yet been closed by user after the escape sequence, #SLASTCLOSURE indicates remote disconnection cause if it has been received.
- In case of UDP, cause 2 indicates abnormal(local) disconnection. Cause 3 and 4 are still possible. (Cause 1 is obviously never possible)
- In case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data(#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote.

Receive Data In Command Mode #SRECV

Execute command permits the user to read data arrived through a connected socket, but buffered and not yet read because the module entered command mode before reading them; the module is notified of these data by a SRING URC, whose presentation format depends on the last #SCFGEXT setting.

Test command returns the range of supported values for <connId> <maxByte> and <UDPInfo>.

Syntax

Command	Command type
AT#SRECV= <connId>, <maxByte>,[<UDPInf o>]	Execute
AT#SRECV=?	Test

Parameters and values

<connId>	Socket connection identifier.
1-6	
<maxByte>	Maximum number of bytes to read.
1-1500	
<UDPInfo>	
0	UDP information disabled. **Default: 0**

| 1 | UDP information enabled: data are read just until the end of the UDP datagram and the response carries information about the remote IP address and port and about the remaining bytes in the datagram. AT#SRECV=<connId>,<maxBytes>,1 #SRECV: <sourceIP>,<sourcePort><connId>,<recData>, <dataLeft> data |

Notes

- Issuing #SRECV when there's no buffered data raises an error.

Examples

SRING URC (<srMode> be 0, <dataMode> be 0) telling data have just come through connected socket identified by <connId>=1 and are now buffered
SRING: 1

Read in text format the buffered data

AT#SRECV=1,15
#SRECV: 1,15
stringa di test

OK

SRING URC (<srMode> be 1, <dataMode> be 1) telling 15 bytes data have just come through connected socket identified by <connId>=2 and are now buffered
SRING: 2,15

Read in hexadecimal format the buffered data

AT#SRECV=2,15
#SRECV: 2,15
737472696e67612064692074657374

OK

SRING URC (<srMode> be 2, <dataMode> be 0) displaying (in text format) 15 bytes data that have just come through connected socket identified by <connId>=3. It is not necessary to issue #SRECV to read the data; no data remain in the buffer after this URC.
SRING: 3,15, stringa di test

Or: if the received datagram, received from <IPaddr and <IPport> is of 60 bytes

AT#SRECV=2,15 #SRECV: <IPaddr>,<IPport>,2,15,45 737472696e67612064692074657374
OK

Send Data in Command Mode #SSEND

Execute command permits, while the module is in command mode, to send data through a connected socket.

Test command returns the range of supported values for parameter <connId>.

Syntax

Command	Command type
AT#SSEND=<connId>	Execute
AT#SSEND=?	Test

Parameters and values

<connId>   Socket connection identifier.

1-6

The device responds to the command with the prompt <greater_than><space> and waits for the data to send.

To complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex).

If data is successfully sent, then the response is OK.

If data sending fails for some reason, an error code is reported.

Notes

- The maximum number of bytes to send is 1500 bytes. Trying to send more data causes the surplus to be discarded and lost.
- It is possible to use #SSEND only if the connection was opened by #SD, else the ME is raising an error.
- A byte corresponding to BS char(0x08) is treated with its corresponding meaning; therefore previous byte is cancelled (and BS char itself is not sent)

Examples

Send data through socket number 2

AT#SSEND=2
>Test<CTRL-Z>

OK

Send UDP Data to a Specific Remote Host #SSENDUDP

While the module is in command mode, this command sends data over UDP to a specific remote host.

UDP connection has to be previously completed with a first remote host through #SLUDP / #SA.

Then, if data is received from this or another host, data can be sent to it.

Like command #SSEND, the device responds with '> ' and waits for the data to send.

Test command reports the supported range of values for <connId>,<remoteIP> and <remotePort>

Syntax

Command	Command type
AT#SSENDUDP=<connId>,<remoteIP>,<remotePort>	

Command	Command type
AT#SSENDUDP=?	Test

Parameters and values

<connID>	Socket connection identifier.
1-6	
<remoteIP>	String type, IP address of the remote host in dotted decimal notation "xxx.xxx.xxx.xxx".
<remotePort>	Remote host port.
1-65535	

Notes

■ After SRING that indicates incoming UDP data and issuing #SRECV to receive data itself, through #SS is possible to check last remote host (IP/Port).

■ If successive resume of the socket to online mode Is performed(#SO), connection with first remote host is restored.

Examples

Starts listening on <LocPort>(previous setting of firewall through #FRWL has to be done)

```
 AT#SLUDP=1,1,<LocPort>
OK
SRING: 1 // UDP data from a remote host available
AT#SA=1,1

OK

SRING: 1
AT#SI=1
#SI: 1,0,0,23,0 // 23 bytes to read

OK

AT#SRECV=1,23
#SRECV:1,23
message from first host

OK

AT#SS=1
#SS: 1,2,<LocIP>,<LocPort>,<RemIP1>,<RemPort1>
OK
AT#SSENDUDP=1,<RemIP1>,<RemPort1>
>response to first host

OK
```

SRING: 1 // UDP data from a remote host available
AT#SI=1
 #SI: 1,22,23,24,0 // 24 bytes to read

OK

AT#SRECV=1,24
 #SRECV:1,24

OK
message from second host
AT#SS=1
#SS: 1,2,<LocIP>,<LocPort>,<RemIP2>,<RemPort2>

OK

Remote host has changed, you want to send a reponse:

AT#SSENDUDP=1,<RemIP2>,<RemPort2>
>response to second host
OK

Send UDP Data to a Specific Remote Host Extended

While the module is in command mode, this command allows the sending of data over UDP to a specific remote host including all possible octets (from 0x00 to 0xFF).

As indicated about #SSENDUDP:

UDP socket has to be previously opened through #SLUDP / #SA, then you can send data to different remote hosts.

Like #SSENDEXT, the device responds with the prompt '> ' and waits for the data to send, operation is automatically completed when <bytestosend> are sent.

Test command reports the supported range of values for:

<connId>,<bytestosend>,<remoteIP> and <remotePort>

Send Data in Command Mode Extended #SSENDEXT

While the module is in command mode, this Execute command sends data through a connected socket including all possible octets (from 0x00 to 0xFF).

Test command returns the range of supported values for <connId> and <bytestosend>.

Syntax

Command	Command type
AT#SSENDEXT=<connId>,<bytestosend>	Execute
AT#SSENDEXT=?	Test

Parameters and values

<connId>	Socket connection identifier.
1-6	Disables command echo.
<bytestosend>	Number of bytes to be sent.

To obtain the range use test command.

The device responds to the command with the prompt '>' <greater_than><space> and waits for the data to send.

When <bytestosend> bytes is sent, operation is automatically completed.

If data are successfully sent, then the response is OK.

If data sending fails for some reason, an error code is reported.

Notes

- You can only use #SSENDEXT if #SD opened the connection. Otherwise, the ME raises an error.
- All special characters are sent like a generic byte. For example, 0x08 is sent through the socket and does not behave like a BS, that is, previous character is not deleted.

Examples

Open the socket in command mode:

at#sd=1,0,<port>,"IP address",0,0,1

OK

Give the command specifying total number of bytes as second parameter:

at#ssendext=1,256
> .... ; // Terminal echo of bytes sent is displayed here

OK

All possible bytes(from 0x00 to 0xFF) are sent on the socket as generic bytes.

IP Stack Authentication Type #SGACTAUTH

Set command sets the authentication type for IP Stack

This command has effect on the authentication mode used on AT#SGACT or AT#GPRS commands.

Read command reports the current IP Stack authentication type, in the format:

#SGACTAUTH: <type>

Test command returns the range of supported values for parameter <type>.

Syntax

Command	Command type
AT#SGACTAUTH=<type>	Set

Command	Command type
AT#SGACTAUTH?	Read
AT#SGACTAUTH=?	Test

Parameters and values

        <type>

        0   No authentication.

        1   PAP authentication. **Default: 1**.

        2   CHAP authentication.

Notes

- The parameter is not saved in NWM (Non-volatile memory non-volatile memory).

Context Activation and Configuration #SGACTCFG

Execute command enables or disables the automatic activation/reactivation of the context for the specified PDP context, to set the maximum number of attempts and to set the delay between an attempt and the next one. The context is activated automatically after every GPRS Attach or after a NW PDP CONTEXT deactivation if at least one socket is configured to this context. See AT#SCFG.

Read command reports the state of all the five contexts, in the format:

#SGACTCFG: <cid1>,<retry1>,<delay1>, <urcmod >CR><LF>

...
#SGACTCFG: <cid1>,<retry1>,<delay1>, <urcmod >CR><LF>

where

        <cidn> - as <cid> before

        <retryn> - as <retry> before

        <delayn> - as <delay> before

        <urcmode> - as < urcmode > before

Test command reports supported range of values for <cid>, <retry>, <delay> and <urcmode>.

Syntax

Command	Command type
AT#SGACTCFG=<cid>,<retry>,[,<delay>[,<urcmode >]]	Execute
AT#SGACTCFG?	Read
AT#SGACTCFG=?	Test

Parameters and values

        <cid>   PDP context identifier. See +CGDCONT.

1-5	Numeric parameter which specifies a particular PDP context definition.
\<retry>	Numeric parameter which specifies the maximum number of context activation attempts in case of activation failure. Range is 0 – 15.
0	Disable the automatic activation/reactivation of the context. **Default: 0**.
\<delay>	Numeric parameter which specifies the delay in seconds between an attempt and the next one. Range is 180 – 3600.
\<urcmode>	URC presentation mode.
0	Disable unsolicited result code. **Default: 0**.
1	Enable unsolicited result code, after an automatic activation/reactivation, of the local IP address obtained from the network. It has meaning only if \<auto>=1. The unsolicited message is in the format:

> #SGACT: \<ip_address>

reporting the local IP address obtained from the network.

Notes

- The URC presentation mode \<urcmode> is related to the current AT instance only. Last \<urcmode> setting is saved for every instance as extended profile parameter. You cannot restore it even if the multiplexer control channel is released and set up, back and forth.
- \<retry> and \<delay> setting are global parameter saved in non-volatile memory.
- If the automatic activation is enabled on a context, then you cannot use the command AT#SCFG to modify the association between the context itself and the socket connection identifier. If the socket is not connected you can modify all the other parameters of command AT#SCFG.

Context Activation and Configuration Extended #SGACTCFGEXT

Execute command enables new features related to context activation.

Read command reports the state of all the five contexts, in the format:

#SGACTCFGEXT: \<cid1>,\<abortAttemptEnable1>,0,0,0\<CR>\<LF>

…
#SGACTCFGEXT: \<cid5>,\<abortAttemptEnable5>,0,0,0\<CR>\<LF>

where:

> \<cidn> - PDP context identifier.
>
> \<abortAttemptEnable n> - See \<abortAttemptEnable> in the Parameters and Values section that follows.

Test command reports supported range of values for all parameters.

Syntax

Command	Command type
AT#SGACTCFGEXT=cid>,\<abortAttemptEnable>[,\< unused> [,\<unused>[,\<unused>]]]	Execute

Command	Command type
AT#SGACTCFGEXT?	Read
AT#SGACTCFGEXT=?	Test

Parameters and values

<cid>	PDP context identifier. See +CGDCONT.
1-5	Numeric parameter that specifies a PDP context definition.
<abortAttempt Enable>	
0	Old behavior. Abort not possible while attempting context activation.
1	Abort during context activation attempt is possible by sending a byte on the serial port.
	It takes effect on successive GPRS context activation attempt through #SGACT command in the following manner.
	While waiting for AT#SGACT=<cid>,1 response (up to 150 s) is possible to abort attempt by sending a byte and get back AT interface control (NO CARRIER indication).

Notes

- Values are automatically saved in non-volatile memory.
- If you receive delayed CTXT ACTIVATION ACCEPT after abort, network is automatically informed of the aborted attempt through relative protocol messages (SM STATUS) and also closes on its side.

Otherwise, if no ACCEPT is received after abort, network is informed later of PDP state through other protocol messages; for example, routing area update.

- Reference: V.25ter.

PAD Command Features #PADCMD

This command sets features of the pending data flush to socket, opened with AT#SD command.

Read command reports the currently selected <mode> in the format:

#PADCMD: mode

Test command reports the supported range of values for parameter <mode>.

Syntax

Command	Command type
AT#PADCMD=<mode>	Set
AT#PADCMD?	Read
AT#PADCMD=?	Test

Parameters and values

<mode>

Bit 1:

1   Enable forwarding.

0   Disable forwarding.

        Other bits reserved.

Notes

- Forwarding depends on character defined by AT#PADFWD.

PAD Forward Character #PADFWD

This command sets the char that immediately flushes pending data to socket, opened with AT#SD command.

Read command reports the currently selected <char> and <mode> in the format:

#PADFWD: <char>,mode

Test command reports the supported range of values for <char> and <mode>.

Syntax

Command	Command type
AT#PADFWD=<char>[,<mode>]	Set
AT#PADFWD?	Read
AT#PADFWD=?	Test

Parameters and values

<char>   A number, from 0 to 255, that specifies the asci code of the char used to flush data.

<mode>   Flush mode.

0   Normal mode. **Default: 0**.

1   Reserved.

Notes

- Use AT#PADCMD to enable the socket char-flush activity.

Base64 Encoding/Decoding of Socket Sent/Received Data #BASE64

Set command enables base64 encoding and/or decoding of data sent/received to/from the socket in online or in command mode.

Read command returns the current <enc>/<dec> settings for all the six sockets, in the format:

#BASE64:<connId1><enc1>,<dec1>,0,0<CR><LF>

...
#BASE64:<connId6>,<enc6>,<dec6>,0,0<CR><LF>

Test command returns the range of supported values for all the subparameters.

Syntax

Command	Command type
AT#BASE64=<connId>,<enc>,<dec> [,<unused_B > [,<unused_C >]]	Set
AT#BASE64?	Read
AT#BASE64=?	Test

Parameters and values

<connId>   Socket connection identifier.

1-6

<enc>

0   No encoding of data received from serial port.

1
> MIME RFC2045 base64 encoding of data received from serial port that have to be sent to <connId> socket.
>
> Note: As indicated from RFC2045 the encoded output stream is represented in lines of no more than 76 characters each.
>
> Lines are defined as sequences of octets separated by a CRLF sequence.

2
> RFC 3548 base64 encoding of data received from serial port that have to be sent to <connId> socket.
>
> Note: As indicated from RFC3548 CRLF have not to be added.

<dec>

0   No decoding of data received from socket <connId>.

1
> MIME RFC2045 base64 decoding of data received from socket <connId> and sent to serial port.
>
> Same rule as for <enc> regarding line feeds in the received file that has to be decoded.

2
> RFC3548 base64 decoding of data received from socket <connId> and sent to serial port.
>
> Same rule as for <enc> regarding line feeds in the received file that has to be decoded.

Notes

- You can use the command to change current <enc>/<dec> settings for a socket already opened in command mode or in online mode after suspending it. You must set AT#SKIPESC=1.
- To use #BASE64 in command mode, if data to send exceeds maximum value for #SSENDEXT command, you must divide the data into multiple parts.

These parts have to be a multiple of 57 bytes, except for the last one, to distinguish EOF condition.

(Base64 encoding rules)

For the same reason if #SRECV command is used by the application to receive data, a multiple of 78 bytes has to be considered.

- ■ To use #SRECV to receive data with <dec> enabled, it is necessary to consider that:

reading <maxByte> bytes from socket, user gets less due to decoding that is performed.

- ■ Values are automatically saved in non-volatile memory.
- ■ Read command returns the current <enc>/<dec> settings for all the six sockets, in the format: #BASE64:<connId1><enc1>,<dec1>,0,0<CR><LF>
  ...
  #BASE64:<connId6>,<enc6>,<dec6>,0,0<CR><LF>

Examples

AT#SKIPESC=1
OK
AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>
CONNECT

//Data sent without modifications. Default.

………
+++ (suspension)
OK
at#base64=<connId>,1,0
OK
AT#SO=<connId>
CONNECT

// Data received from serial port is base64 encoded before sent on the socket.

………………
+++ (suspension)
OK
at#base64=<connId>,0,1
OK
AT#SO=<connId>
CONNECT

// Data received from socket is base64 decoded before sent on the serial port.

+++ (suspension)
…………………

SSL Commands

Open a socket SSL to a remote server #SSLD

Execution command opens a remote connection via socket secured through SSL. Both command and online modes can be used. In the first case 'OK' is printed on success, and data exchange can be performed by means of #SSLSEND and #SSLRECV commands. In online mode 'CONNECT' message is printed, and data can be sent/received

directly to/by the serial port. Communication can be suspended by issuing the escape sequence (by default +++) and restored with #SSLO command.

Test command returns the range of supported values for all the parameters: #SSLD: (1),(1-65535),,(0),(0,1),(10-5000)

Syntax

Command	Command type
AT#SSLD=<SSId>, <rPort>,<IPAddress>, <ClosureType>[, <connMode>[, <Timeout>]]	Set
AT#SSLD=?	Test

Parameters and values

<SSId>	Secure Socket Identifier
1	Until now SSL block manage only one socket
<rport>	Remote TCP port to contact
1..65535	
<IPAddress>	Address of the remote host, string type. 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
<ClosureType>	Only value 0 supported
<connMode>	Connection mode 0 – TCP inter-packet delay. It means that, when more data is expected during the handshake, the module awaits
0	Online mode connection.
1	Command mode connection (factory default).
<Timeout>	Time-out in 100 ms units. It represents the maximum allowed TCP inter-packet delay. It means that, when more data is expected during the handshake, the module awaits <Timeout> * 100 msecs for the next packet. If no more data can be read, the module gives up the handshake and raises an ERROR response. Note: IT'S NOT the total handshake timeout or, in other words, it's not the absolute maximum time between the #SSLD issue and the CONNECT/OK/ERROR response. Though by changing this parameter you can limit the handshake duration (for example in case of congested network or busy server), there's no way to be sure to get the command response within a certain amount of time, because it depends on the TCP connection time, the handshake time and the computation time (which depends on the authentication mode and on the size of keys and certificates). 10..5000 - hundreds of ms (factory default is 100).

Notes

■ If secure socket is not enabled using AT#SSLEN only test requests can be made.

■ If timeout is not set for SSL connection the default timeout value, set by AT#SSLCFG, is used.

■ In online mode the socket is closed after an inactivity period (configurable with #SSLCFG, with a default value of 90 seconds), and the 'NO CARRIER' message is printed.

- In online mode data are transmitted as soon as the data packet size is reached or as after a transmission timeout. Both these parameters are configurable by using #SSLCFG.

- Before opening a SSL connection the GPRS context must have been activated by AT#SGACT=x,1.

- Before opening a SSL connection, make sure to have stored the needed secure data (CA certificate), using AT#SSLSECDATA.

- In case of CA Certificate already stored(for instance: SUPL), it could be possible to avoid #SSLSECDATA command.

Enable a SSL socket #SSLEN

This command enables a socket secured by SSL.

Read command reports the currently enable status of secure socket in the format: #SSLEN: <SSId>,<Enable><CR><LF> <CR><LF> OK

Test command returns the range of supported values for all the parameters: #SSLEN: (1),(0,1)

Syntax

Command	Command type
AT#SSLEN=<SSId>, <Enable>	
AT#SSLEN?	Read
AT#SSLEN =?	Test

Parameters and values

<SSId>	<SSId> - Secure Socket Identifier
1	Until now SSL block manages only one socket.
<Enable>	
0	Deactivate secure socket [default]
1	Activate secure socket

Notes

- If secure socket is not enabled only test requests can be made for every SSL command except #SSLS (SSL status) which can be issued also if the socket is disabled. Read commands can be issued if at least a <SSId> is enabled.

- These values are automatically saved in NVM.

- An error is raised if #SSLEN=X,1 is issued when the socket 'X' is already enabled and if #SSLEN=X,0 is issued when the socket 'X' is already disabled. Note: a SSL socket cannot be disabled by issuing #SSLEN=1 if it is connected.

Close a SSL socket #SSLH

This command allows closing the SSL connection.

Test command returns the range of supported values for all the parameters: #SSLH: (1),(0)

Syntax

Command	Command type
AT#SSLH=<SSId>[, <ClosureType>]	
AT#SSLH=?	Test

Parameters and values

> **<SSId>**
>
> > **1**   Until now SSL block manage only one socket
>
> **<ClosureType>**
>
> > **0**   Only value 0 is supported

Notes

- ■ If secure socket is not enabled using AT#SSLEN only test requests can be made.

Restore a SSL socket after a +++ #SSLO

This command allows to restore a SSL connection (online mode) suspended by an escape sequence (+++). After the connection restore, the CONNECT message is printed. This is possible even if the connection has been started in command mode (#SSLD with <connMode> parameter set to 1).

Test command returns the range of supported values for all the parameters: #SSLO: (1).

Syntax

Command	Command type
AT#SSLO=<SSId>	
AT#SSLO=?	Test

Parameters and values

> **<SSId>**   Secure Socket Identifier
>
> > **1**   Until now SSL block manage only one socket.

Notes

- ■ If secure socket is not enabled using AT#SSLEN only test requests can be made.
- ■ Before opening a SSL connection the GPRS context must have been activated by AT#SGACT=X,1. Note: if an error occur during reconnection the socket can not be reconnected then a new connection has to be done.

Read Data from a SSL socket #SSLRECV

This command allows receiving data from a secure socket.

Test command returns the range of supported values for all the parameters: #SSLRECV: (1),(1-1000),(10-5000)

Syntax

Command	Command type
AT#SSLRECV=<SSId>, <MaxNumByte> [,<TimeOut>]	Execution
AT#SSLRECV=?	Test

Parameters and values

<SSId>	Secure Socket Identifier
1	Until now SSL block manage only one socket.
<MaxNumByte >	max number of bytes to read
1..1000	
<Timeout >	Time-out in 100 ms units
10..5000	Hundreds of ms (factory default is 100)
	If no data are received the device respondes: #SSLRECV: 0<CR><LF> TIMEOUT<CR><LF> <CR><LF> OK
	If the remote host closes the connection the device respondes: #SSLRECV: 0<CR><LF> DISCONNECTED<CR><LF> <CR><LF> OK
	If data are received the device respondes: #SSLRECV: NumByteRead<CR><LF> ...(Data read)... <CR><LF> <CR><LF> OKThe ordinal number of the cell, in the neighbor list of the serving cell..

Notes

- If secure socket is not enabled using AT#SSLEN only test requests can be made.
- If timeout is not set for SSL connection the default timeout value, set through AT#SSLCFG, is used.
- Before receiving data from the SSL connection it has to be established using AT#SSLD.

Report the status of a SSL socket #SSLS

This command reports the status of secure sockets

Test command returns the range of supported values for all the parameters. #SSLS: (1)

Syntax

Command	Command type
AT#SSLS=<SSId>	
AT#SSLS=?	Test

Parameters and values

<SSId>	Secure Socket Identifier 1 -

1 Until now SSL block manages only one socket

If secure socket is connected the device responds to the command:

#SSLS: <SSId>,2,<CipherSuite>

where <CipherSuite> can be as follows:

0 - unknown

1 - TLS_RSA_WITH_RC4_128_MD5

2 - TLS_RSA_WITH_RC4_128_SHA

3 - TLS_RSA_WITH_AES_128_CBC_SHA

4 - TLS_RSA_WITH_NULL_MD5

otherwise:

#SSLS: <SSId>,<ConnectionStatus>

<ConnectionStatus> available values are:

0 – Socket Disabled

1 – Connection closed

2 – Connection open

Note: this command can be issued even if the <SSId> is not enabled

.

Manage the security data #SSLSECDATA

This command allows to store, delete and read security data (Certificate, CAcertificate, private key) into NVM.

Read command reports what security data are stored in the format: #SSLSECDATA: <SSId 1>,<CertIsSet>,<CAcertIsSet>,<PrivKeyIsSet> <CertIsSet>, <CAcertIsSet>, <PrivKeyIsset> are 1 if related data are stored into NVM otherwise 0.

Test command returns the range of supported values for all the parameters: #SSLSECDATA: (1),(0-2), ,(0-2),(1-2047)

Syntax

Command	Command type
AT#SSLSECDATA =<SSId>,<Action>, <DataType>[,<Size>]	
AT#SSLSECDATA?	Read
AT#SSLSECDATA =?	Test

Parameters and values

<SSId> Secure Socket Identifier

1	1 - Until now SSL block manages only one socket.
<Action>	Action to do.
0	Delete data from NVM.
1	Store data into NVM.
2	Read data from NVM .
<DataType>	
0	Certificate
1	CA certificate
2	RSA Private key
<Size>	Size of security data to be stored If the <Action> parameter is 1 (store data into NVM) the device responds to the command with the prompt '>' and waits for the data to store.
1..2047	

Notes

■ Note: secured data have to be in PEM or in DER format, depending on < cert_format > chosen with #SSLSECCFG. If no < cert_format> has been specified with #SSLSECCFG, PEM format is assumed. PEM format(see #SSLSECCFG command):To complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex). DER format(see #SSLSECCFG command):: When <size> bytes are entered, the certificate is automatically stored. ESC or Ctrl-Z don't take effect, because they are considered as possible octets contained in the certificate. If data are successfully stored, then the response is OK; if it fails for some reason, an error code is reported. If the <Action> parameter is 2 (read data from NVM), data specified by <DataType> parameter is shown in the following format: #SSLSECDATA: <connId>,<DataType><DATA> OK If <DataType> data has not been stored (or it has been deleted) the response has the following format: #SSLSECDATA: <connId>,<DataType> No data stored OK Note: <size> parameter is mandatory if the <write> action is issued, but it has to be omitted for <delete> or <read> actions are issued.

■ Note: if secure socket is not enabled using AT#SSLEN only test requests can be made. Note: If socket is connected an error code is reported. Note: in case of CA Certificate already stored(for instance: SUPL), it could be possible to avoid #SSLSECDATA command.

Send data through a SSL socket #SSLSEND

Execution command opens a remote connection via socket secured through SSL. Both command and online modes can be used. In the first case 'OK' is printed on success, and data exchange can be performed by means of #SSLSEND and #SSLRECV commands. In online mode 'CONNECT' message is printed, and data can be sent/received directly to/by the serial port. Communication can be suspended by issuing the escape sequence (by default +++) and restored with #SSLO command.

Test command returns the range of supported values for all the parameters: #SSLSEND: (1),(10-5000)

Syntax

Command	Command type
AT#SSLSEND=<SSId>[, < Timeout >]	Execution

Command	Command type
AT#SSLSEND=?	Test

Parameters and values

<SSId>	Secure Socket Identifier 1 - Until now SSL block manage only one socket.
< Timeout >	Socket send timeout, in 100 ms units.
10..5000	Hundreds of ms. **Default: 100**The device responds to the command with the prompt '>' and waits for the data to send. To complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex). If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported

Notes

- The maximum number of bytes to send is 1023. Trying to send more data causes the surplus to be discarded and lost.
- If secure socket is not enabled using AT#SSLEN only test requests can be made.
- If timeout is not set for SSL connection the default timeout value, set by AT#SSLCFG, is used.
- In online mode the socket is closed after an inactivity period (configurable with #SSLCFG, with a default value of 90 seconds), and the 'NO CARRIER' message is printed.
- In online mode data are transmitted as soon as the data packet size is reached or as after a transmission timeout. Both these parameters are configurable by using #SSLCFG.
- Before opening a SSL connection the GPRS context must have been activated by AT#SGACT=x,1.
- Before opening a SSL connection, make sure to have stored the needed secure data (CA certificate), using AT#SSLSECDATA.
- In case of CA Certificate already stored (for instance: SUPL), it could be possible to avoid #SSLSECDATA command.

Configure security parameters of a SSL socket #SSLSECCFG

This command allows configuring SSL connection parameters

Read command reports the currently selected parameters in the format: #SSLSECCFG: <SSId1>,<CipherSuite>,<auth_mode>[,<cert_format>]

Test command returns the range of supported values for all the parameters.

Syntax

Command	Command type
AT#SSLSECCFG= <SSId>, <CipherSuite>, <auth_mode> [,<cert_format>]	
AT#SSLSECCFG?	Read
AT#SSLSECCFG=?	Test

Parameters and values

<SSId>	Secure Socket Identifier

1	Until now SSL block manage only one socket
<CipherSuite>	Note: TLS_RSA_WITH_NULL_SHA is not included as default(0), but it is possible to set it(4) if required.
0	0 - Chiper Suite is chosen by remote Server [default]
1	1 - TLS_RSA_WITH_RC4_128_MD5
2	2 - TLS_RSA_WITH_RC4_128_SHA
3	3 - TLS_RSA_WITH_AES_128_CBC_SHA
3	4 - TLS_RSA_WITH_NULL_SHA
<auth_mode>	
0	SSL Verify None[default]
1	Manage server authentication
2	Manage server and client authentication if requested by the remote server
<cert_format>	is an optional parameter. It selects the format of the certificate to be stored via #SSLSECDATA command
0	DER format
1	PEM format [default]

Notes

■ It is supposed that the module is just powered on and the AT#SSLSECCFG command is entered without <cert_format> parameter, the default format is PEM. In this case the AT#SSLSECCFG? read command does not return the setting of the format in order to meet retro compatibility with other families. Now, let's assume that AT#SSLSECCFG command is entered again, but using the <cert_format> parameter for the first time: if the read command is entered, it reports the parameter value just used. If subsequently the <cert_format> is omitted, the AT#SSLSECCFG? read command reports the parameter value entered the last time.

■ Server CAcertificate has to be stored through AT#SSLSECDATA.

■ If secure socket is not enabled using #SSLEN only test requests can be made. Read command can be issued if at least a <SSId> is enabled.

■ These values are automatically saved in NVM.

Configure general parameters of a SSL socket #SSLCFG

This command lets you configure SSL connection parameters.

Read command reports the currently selected parameters in the format: #SSLSECCFG: <SSId1>,<CipherSuite>,<auth_mode>[,<cert_format>]

Test command returns the range of supported values for all the parameters.

Syntax

Command	Command type
AT#SSLCFG=<SSId>, <cid>,<pktSz>, <maxTo>, <defTo>,<txTo>[, <UNUSED_1>[, <UNUSED_2>[, <UNUSED_3>[, <UNUSED_4>]]]]	
AT#SSLCFG?	Read
AT#SSLCFG =?	Test

Parameters and values

<SSId>	Parameters: <SSId> - Secure Socket Identifier 1 - Until now SSL block manages only one socket
1	Until now SSL block manage only one socket
<cid>	PDP Context Identifier.
1	Until now only context one is supported.
<pktSz>	Packet size to be used by the SSL/TCP/IP stack for data sending.
0	Select automatically default value (300).
1..1500	Packet size in bytes.
<maxTo>	Exchange timeout (or socket inactivity timeout); in online mode, if there's no data exchange within this timeout period the connection is closed.
	0 - no timeout
	1..65535 - timeout value in seconds (default 90 s.)
<defTo>	Timeout to be used by default when the corresponding parameter of each command is not set.
10…5000	- Timeout in tenth of seconds (default 100).
<txTo>	Data sending timeout. In online mode after this period data are sent also if they're less than max packet size.
0	No timeout
1..255	Timeout value in hundreds of milliseconds (default 50).

Notes

- If secure socket is not enabled using #SSLEN only test requests can be made. Read command can be issued if at least a <SSId> is enabled.
- These values are automatically saved in NVM.

FTP AT Commands

FTP Time-Out #FTPTO

Set command sets the time-out used when opening either the FTP control channel or the FTP traffic channel.

Read command returns the current FTP operations time-out, in the format:

#FTPTO: <tout>

Test command returns the range of supported values for parameter <tout>

Syntax

Command	Command type
AT#FTPTO=[<tout>]	Set
AT#FTPTO?	Read
AT#FTPTO=?	Test

Parameters and values

      <tout>

100-5000   Time out in 100 ms units.

      1   Hundreds of ms. **Default: 100**.

Notes

■ The parameter is not saved in non-volatile memory.

FTP Open #FTPOPEN

Execute command opens an FTP connection toward the FTP server.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPOPEN=[<server:port>,<username>,<password>[,<mode>]]	Execute
AT#FTPOPEN=?	Test

Parameters and values

  <server:port>   String type, address and port of FTP server. **Default: port 21.**

    <username>   String type, authentication user identification string for FTP.

    <password>   String type, authentication password for FTP.

      <mode>

      0   Active mode. **Default: 0.**

      1   Passive mode.

Notes

■ Before opening an FTP connection the PDP context #1 must have been activated by AT#GPRS=1.

FTP Close #FTPCLOSE

Execute command closes an FTP connection.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPCLOSE	Execute
AT#FTPCLOSE=?	Test

FTP Config #FTPCFG

Set command sets the time-out used when opening either the FTP control channel or the FTP traffic channel.

Note: The parameter is not saved in NVM.

Read command reports the currently selected parameters in the format: #FTPCFG: <tout>,<IPPignoring>,<FTPSEn>

Test command reports the supported range of values for parameter(s) <tout>,<IPPignoring> and <FTPSEn>

Syntax

Command	Command type
AT#FTPCFG=<tout>,<IPPign oring>[,<FTPSEn>]	Set
AT#FTPCFG?	Read
AT+FTPCFG=?	Test

Parameters and values

<IPPignoring>

0   No IP Private ignoring. During a FTP passive mode connection client uses the IP address received from server, even if it is a private IPV4 address.

1   IP Private ignoring enabled. During a FTP passive mode connection if the server sends a private IPV4 address the client doesn't consider this and connects with server using the IP address used in AT#FTPOPEN.

[,<FTPSEn>]

0   Disable FTPS security. All FTP commands will perform plain FTP connections.

1   Enable FTPS security. From now on any FTP session opened through FTP commands will be compliant to FTPS protocol, providing authentication and encrypted communication.

Notes

- In FTPS mode, FTP commands response time is generally bigger than in normal FTP mode. This latency is mainly due to the SSL handshake that has to be done at the opening of the FTP session (#FTPOPEN) and whenever a data exchange is required (#FTPPUT, #FTPGET etcetera).

- FTP security cannot be enabled if an SSL socket has been activated by means of #SSLD or #SSLFASTD. Moreover, trying to dial an SSL socket when <enable>=1 raises an error.

- Any <enable> change is forbidden during an open FTP connection (with or without security). Furthermore, SSL configuration settings are forbidden during FTPS connections

FTP Put #FTPPUT

Execute command, issued during an FTP connection, opens a data connection and starts sending <filename> file to the FTP server.

If the data connection succeeds, a CONNECT indication is sent. When the socket is closed, a NO CARRIER indication is sent.

Test command reports the maximum length of <filename> and the supported range of values of <connMode>. The format is:

#FTPPUT: <length>, (list of supported <connMode>s)>

where: <length> - integer type value indicating the maximum length of <filename>

Syntax

Command	Command type
AT#FTPPUT=[[<filename>],[<connMode>]]	Execute
AT#FTPPUT=?	Test

Parameters and values

<filename>	String type, name of the file. Maximum length 200 characters.
<connMode>	Time out in 100 ms units.
0	Online mode.
1	Command mode.

Notes

- To close the data connection, use the escape sequence +++.
- If no FTP connection is open, the command returns an ERROR result code.
- If you set <connMode> to 1, the data connection is opened. You remain in command mode and see the result code OK, instead of CONNECT.

FTP Get #FTPGET

Execute command, issued during an FTP connection, opens a data connection and starts getting a file from the FTP server. If the data connection succeeds a CONNECT indication is sent. The file is received on the serial port.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPGET=[<filename>]	Execute
AT#FTPGET=?	Test

Parameters and values

<filename>	String type, file name.

Notes

- The Execute command causes an ERROR result code to be returned if no FTP connection is open.

- The application must always handle command closure. To avoid download stall situations, the application can implement a timeout.

FTP GET in Command Mode #FTPGETPKT

Execute command, issued during an FTP connection, opens a data connection and starts getting a file from the FTP server while remaining in command mode.

The data port is opened, the device remains in command mode, and the result code OK is seen.

Retrieval from FTP server of "remotefile" is started, but data is only buffered in the module.

It is possible to read data afterwards issuing #FTPRECV command

Read command reports current download state for <filename> with <viewMode> chosen, in the format:

#FTPGETPKT: <remotefile>,<viewMode>,<eof>
<eof> 0 = file currently being transferred
1 = complete file is transferred to FTP client

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPGETPKT=<filename>[,<viewMode>]	Execute
AT#FTPGETPKT?	Read
AT#FTPGETPKT=?	Test

Parameters and values

<filename>	String type, file name. Maximum length is 200 characters.
<viewMode>	Permit to choose view mode.
0	Text format **Default=0**
1	Hexadecimal format

Notes

- The Execute command causes an ERROR result code if no FTP connection is open.

- The application always handles command closure. To avoid download stall situations ensure the application implements a timeout.

FTP Type #FTPTYPE

Set command, issued during an FTP connection, sets the file transfer type.

Read command returns the current file transfer type, in the format:

#FTPTYPE: <type>

Test command returns the range of available values for parameter <type>:

#FTPTYPE: (0,1)

Syntax

Command	Command type
AT#FTPTYPE=[<type>]	Set
AT#FTPTYPE?	Read
AT#FTPTYPE=?	Test

Parameters and values

<type> File transfer type.

0 Binary.

1 Ascii.

Notes

- The command causes an ERROR result code if no FTP connection is opened.

FTP Read Message #FTPMSG

Execute command returns the last response from the server.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPMSG	Execute
AT#FTPMSG=?	Test

FTP Delete #FTPDELE

Execute command, issued during an FTP connection, deletes a file from the remote working directory.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPDELE=[<filename>]	Execute
AT#FTPDELE=?	Test

Parameters and values

<filename> String type indicating the name of the file to delete.

Notes

- The Execute command causes an ERROR result code if no FTP connection is open.

- If the server response is delayed, check if ERROR indication is temporary due to timing out while waiting. In this case #FTPMSG response results temporary empty. Checking later #FTPMSG response matches with delayed server response.

FTP Print Working Directory #FTPPWD

Execute command, issued during an FTP connection, shows the current working directory on FTP server.

Test command returns the OK result code

Syntax

Command	Command type
AT#FTPPWD	Execute
AT#FTPPWD=?	Test

Notes

- The Execute command causes an ERROR result code if no FTP connection is open.

FTP Change Working Directory #FTPCWD

Execute command, issued during an FTP connection, changes the working directory on FTP server.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPCWD=[<dirname>]	Execute
AT#FTPCWD=?	Test

Parameters and values

<dirname>   String type, name of the new working directory.

Notes

- The Execute command casuses an ERROR result code if no FTP connection is open.

FTP List #FTPLIST

Execute command, issued during an FTP connection, opens a data connection and starts getting from the server the list of contents of the specified directory or the properties of the specified file.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPLIST=[<name>]	Execute
AT#FTPLIST=?	Test

Parameters and values

    <name>   Sting type, name of the directory or file.

Notes

- The Execute command causes an ERROR result code to be returned if no FTP connection is opened yet.
- Issuing AT#FTPLIST<CR> opens a data connection and starts getting from the server the list of contents of the working directory.

Get File Size #FTPFSIZE

Execute command, issued during an FTP connection, permits to get file size of <filename> file.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPFSIZE=<filename>	Execute
AT#FTPFSIZE=?	Test

Notes

- Issue FTPTYPE=0 command before FTPFSIZE command, to set file transfer type to binary mode.

FTP Append #FTPAPP

Execute command, issued during an FTP connection, opens a data connection and append data to existing <filename> file.

If the data connection succeeds, a CONNECT indication is sent. Afterward a NO CARRIER indication is sent when the socket is closed.

Test command reports the maximum length of <filename> and the supported range of values of <connMode>. The format is:

#FTPAPP: <length>, (list of supported <connMode>s)

where:

<length> - integer type value indicating the maximum length of <filename>

Syntax

Command	Command type
AT#FTPAPP=[[<filename>],<connMode>]	Execute
AT#FTPAPP=?	Test

Parameters and values

    <filename>   String type, name of the file.

    <connMode>

        0   Online mode.

1   Command mode.

Notes

- If you set <connMode> to 1, the data connection is opened, you remain in command mode and you see the result code OK (instead of CONNECT).
- Use the escape sequence +++ to close the data connection.
- The command causes an ERROR result code to be returned if no FTP connection is opened yet.

FTPAPPEXT #FTPAPPEXT

This command sends data on a FTP data port while the module is in command mode. FTP data port must be previously opened through #FTPPUT (or #FTPAPP) with <connMode> parameter set to command mode connection.

Test command reports the supported range of values for <bytestosend> and <eof>.

Syntax

Command	Command type
AT#FTPAPPEXT=<bytestosend>[,<eof>]	
AT#FTPAPPEXT=?	Test

Parameters and values

<bytestosend>   Number of bytes to be sent.

  1-1500

  <eof>   Data port closure.

  0   Normal sending of data chunk.

  1   Close data port after sending data chunk.

The device responds to the command with the prompt <greater_than><space> and waits for the data to send. When <bytestosend> bytes have been sent, operation is automatically completed.

If (all or part of the) data are successfully sent, then the response is:

#FTPAPPEXT:<sendbytes>
OK

Where <sentbytes> are the number of sent bytes.

Notes

- <sentbytes> can be less than <bytestosend>
- If data sending fails for some reason, an error code is reported.

Examples

AT#FTPOPEN="IP",username,password
OK
AT#FTPPUT=<filename>,1 -> the new param 1 means that we open the connection in command mode

OK

// Here data socket will stay opened, but interface is available (command mode)

AT#FTPAPPEXT=Size

>… write here the binary data. As soon Size byte are written, data are sent and OK is returned

#FTPAPPEXT: <SentBytes>
OK
………

// Last #FTPAPPEXT will close the data socket, because second (optional) parameter has this meaning:

AT#FTPAPPEXT=Size,1
>…write the binary data. As soon Size byte is written, data is sent and OK is returned.
#FTPAPPEXT: <SentBytes>
OK

// If the user has to reopen the data port to send another (or append to the same) file, he can restart with the FTPPUT(or FTPAPP.)

//Then FTPAPPEXT,… to send the data chunks on the reopened data port.

// Note: If while sending the chunks the data port is closed from remote, user will be aware of it because #FTPAPPEXT indicates ERROR and cause (available if previously issued the command AT+CMEE=2) will indicate that socket has been closed. Also in this case obviously, data port must be reopened with FTPPUT and so on…(same sequence)

Set Restart Position # FTPREST

Set command sets the restart position for successive FTPGET (or FTPGETPKT) command. It allows you to restart a previously interrupted FTP download from the selected position in byte.

Read command returns the current <restartposition>

#FTPREST: <restartposition>

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPREST=<restartposition>	Set
AT#FTPREST?	Read
AT#FTPREST=?	Test

Parameters and values

<restartposition>	Position in byte of restarting for successive FTPGET (or FTPGETPKT).

Notes

■ Issue FTPTYPE=0 before successive FTPGET (or FTPGETPKT command) to set binary file transfer type.

- Setting <restartposition> has effect on successive FTP download. After successive successfully initiated FTPGET(or FTPGETPKT) command <restartposition> is automatically reset.
- Value set for <restartposition> has effect on next data transfer(data port opened by FTPGET or FTPGETPKT). Then <restartposition> value is automatically assigned to 0 for next download.

Receive Data in Command Mode #FTPRECV

Execute command permits the user to transfer at most <blocksize> bytes of remote file, provided that retrieving from the FTP server is started with a previous #FTPGETPKT command, onto the serial port.

This number is limited to the current number of bytes of the remote file transferred from the FTP server.

Read command reports the number of bytes currently received from FTP server, in the format:

#FTPRECV: <available>

Test command returns the range of supported values for <blocksize> parameter.

Syntax

Command	Command type
AT#FTPRECV=<blocksize>	Execute
AT#FTPRECV?	Read
AT#FTPRECV=?	Test

Parameters and values

<blocksize>   Maximum number of bytes to read.

1-3000

Notes

- You must have previously opened FTP data port and started download and buffering of remote file through #FTPGETPKT command.
- Issuing #FTPRECV when there is no FTP data port opened raises an error.
- Data port stays open if socket is temporary waiting to receive data(FTPRECV returns 0 and FTPGETPKT gives a EOF 0 indication).

Enhanced IP Easy Stack Extension AT Commands

Query DNS #QDNS

Execute command executes a DNS query to resolve the host name into an IP address.

Test command returns the OK result code.

Syntax

Command	Command type
AT#QDNS=[<host name>]	Execute
AT#QDNS=?	Test

Parameters and values

<host name> String type, host name.

If the DNS query is successful, the IP address is reported in the result code, as follows:

#QDNS: <host name>,<IP address>

Where:

<host name> - string type.

<IP address> - string type, in the format "xxx.xxx.xxx.xxx".

Notes

- The command has to activate the GPRS context if it was not previously activated. In this case the context is deactivated after the DNS query. It also works with GSM context, but the GSM context has to be activated before.
- This command requires correct settings for authentication parameters and that the GPRS network is present (or GSM, if GSM context is used).
- This command is available only on the first virtual port of CMUX and works on the PDP context 1 and on the first ConnId. See AT#SCFG.

DNS Response Caching #CACHEDNS

Set command enables caching a mapping of domain names to IP addresses, as does a resolver library.

Read command reports whether the DNS Response Caching is currently enabled or not, in the format:

#CACHEDNS: <mode>

Test command returns the currently cached mapping along with the range of available values for parameter <mode>, in the format:

#CACHEDNS: [<hostn1>,<IPaddr1>,[…,[<hostnn>,<IPaddrn>,]]](0,1)

where:

<hostnn> Hostname, string type.

<IPaddrn> IP address, string type, in the format "xxx.xxx.xxx.xxx".

Syntax

Command	Command type
AT#CACHEDNS=[<mode>]	Set
AT#CACHEDNS?	Read
AT#CACHEDNS=?	Test

Parameters and values

<mode>

| **0** | Caching disabled or clear current cache. |
| **1** | Caching enabled. |

Notes

- The validity period of each cached entry—that is, how long a DNS response remains valid—is determined by a value called the Time To Live (TTL), set by the administrator of the DNS server handing out the response.
- If the cache is full (8 elements) and a new IP address is resolved, an element is deleted from the cache. The deleted element is the one not used for the longest time.
- It is recommended that you clean the cache, if command +CCLK is issued while the DNS Response Caching was enabled.

Manual DNS Selection #DNS

Set command allows to manually set primary and secondary DNS servers either for a PDP context defined by +CGDCONT or for a GSM context defined by #GSMCONT.

Read command returns the manual DNS servers set either for every defined PDP context and for the single GSM context (only if defined), in the format:

[#DNS: <cid>,<primary>,<secondary>[<CR><LF>
#DNS: <cid>,<primary>,<secondary>]]

Test command reports the supported range of values for the <cid> parameter only, in the format:

#DNS: (0-5),,

Syntax

Command	Command type
AT#DNS=<cid>,<primary>,<secondary>	Set
AT#DNS?	Read
AT#DNS=?	Test

Parameters and values

<cid>	Context identifier.
0	Specifies the GSM context.
1-5	Numeric parameter that specifies a particular PDP context definition.
<primary>	String type, manual primary DNS server, in the format "xxx.xxx.xxx.xxx" used for the specified cid. Use this value instead of the primary DNS server from the network. **Default: "0.0.0.0".**
<secondary>	String type, manual secondary DNS server, in the format "xxx.xxx.xxx.xxx" used for the specified cid. Use this value instead of the secondary DNS server from the network. **Default: "0.0.0.0".**

Notes

- If <primary> is "0.0.0.0" and <secondary> is not "0.0.0.0", then issuing AT#DNS=… raises an error.

- If <primary> is "0.0.0.0" you are using the primary DNS server from the network as consequence of a context activation.

- If <primary> is not "0.0.0.0" and <secondary> is "0.0.0.0", then only the manual primary DNS server is used.

- If the PDP context <cid> being specified in the #DNS command is not previously defined using the +CGDCONT command the #DNS command results in ERROR indication.

- If the PDP context <cid> being specified in the #DNS command is currently active (in use) the #DNS command results in ERROR.

GPRS Context Activation #GPRS

Execute command deactivates or activates the PDP context #1. Eventually the authentication proceeds by using the parameters given with #PASSW and #USERID.

Read command reports the current status of the PDP context #1, in the format:

#GPRS: <status>

where:

<status>
0 -PDP context #1 deactivated.
1 - PDP context #1 activated.
2 - PDP context #1 activation pending.

Test command returns the allowed values for parameter <mode>.

Syntax

Command	Command type
AT#GPRS=[<mode>]	Execute
AT#GPRS?	Read
AT#GPRS=?	Test

Parameters and values

<mode>   PDP context activation mode.

0   PDP context #1 deactivation request.

1
PDP context #1 activation request.

If the PDP context #1 is activated, the result code OK is preceded by the intermediate result code:

+IP: <ip_address_obtained>

reporting the local IP address obtained from the network.

Notes

- It is recommended you use the same command—for example #GPRS—to activate the context, deactivate it and interrogate its status.

- You must associate at least a socket identifier with PDP context #1 so that every #GPRS action can be effective. By default the PDP context #1 is associated with socket identifiers 1, 2 and 3, but it is possible to modify these associations through #SCFG. Trying to issue a #GPRS action when no socket identifier is associated with PDP context #1 raises an error.

- This command is not allowed if GSM context is activated.

- If the PDP context #1 is activated issuing AT#GPRS=1, then if you request to deactivate the PDP context #1 during a call issuing AT#GPRS=0 and then, after the call termination, you want to activate the PDP context #1 again through #GPRS, you need to issue the following sequence of three commands

AT#GPRS=1
OK
AT#GPRS=0
OK
AT#GPRS=1
OK

Examples

PDP Context #1 is activated, IP is 129.137.1.1

AT#GPRS=1
+IP: 129.137.1.1
OK

Now PDP Context #1 is deactivated, IP is lost.

AT#GPRS=0
OK

Socket Listen Ring Indicator #E2SLRI

Set command enables or disables the Ring Indicator pin response to a Socket Listen connect and, if enabled, the duration of the negative going pulse generated on receipt of connect.

Read command reports whether the Ring Indicator pin response to a Socket Listen connect is currently enabled or not, in the format:

#E2SLRI: <n>

Test command returns the allowed values for parameter <status>.

Syntax

Command	Command type
AT#E2SLRI=[<n>]	Set
AT#E2SLRI?	Read
AT#E2SLRI=?	Test

Parameters and values

<n>	Enable or disable RI. **Default:RI disabled for Socket Listen connect.**
50-1150	RI enabled for Socket Listen connect; a negative going pulse is generated on receipt of connect and <n> is the duration in ms of this pulse.

Firewall Setup #FRWL

Execute command controls the internal firewall settings.

Read command reports the list of all ACCEPT chain rules registered in the Firewall settings in the format:

#FRWL: <ip_addr>,<net_mask>
#FRWL: <ip_addr>,<net_mask>
….
OK

Test command returns the allowed values for parameter <action>.

Syntax

Command	Command type
AT#FRWL=[<action>,<ip_address>,<net mask>]	Execute
AT#FRWL?	Read
AT#FRWL=?	Test

Parameters and values

<action>	Command action.
0	Remove selected chain.
1	Add an ACCEPT chain.
2	Remove all chains (DROP everything); <ip_addr> and <net_mask> has no meaning in this case.
<ip_addr>	String type, remote address to be added into the ACCEPT chain. Can be any valid IP address in the format: xxx.xxx.xxx.xxx.
<net_mask>	String type, mask to be applied on the <ip_addr>. Can be any valid IP address mask in the format: xxx.xxx.xxx.xxx.

Command returns OK result code if successful.

Note: The firewall applies for incoming (listening) connections only.

Firewall general policy is DROP, therefore all packets that are not included into an ACCEPT chain rule is silently discarded.

When a packet comes from the IP address incoming_IP, the firewall chain rules are scanned for matching with the following criteria: .

incoming_IP & <net_mask> = <ip_addr> & <net_mask>

If criteria is matched, then the packet is accepted and the rule scan is finished. If criteria is not matched for any chain the packet is silently dropped.

Notes

- For outgoing connections made with #SKTD the remote host is dynamically inserted into the ACCEPT chain for the entire connection duration. Therefore the #FRWL command is used only for defining the #SKTL behavior, deciding which hosts are allowed to connect to the local device.

■ Rules are not saved in non-volatile memory. At startup the rules list is empty.

Examples

To accept connections only from devices that are on the IP addresses ranging from 197.158.1.1 to 197.158.255.255, add the following chain to the firewall:

AT#FRWL=1,"197.158.1.1","255.255.0.0"
OK

GPRS Data Volume #GDATAVOL

Execute command reports, for every active PDP context, the amount of data the last GPRS session (and the last GSM session, if GSM context is active) received and transmitted, or it reports the total amount of data received and transmitted during all past GPRS (and GSM) sessions, since last reset.

Test command returns the range of supported values for parameter <mode>.

Syntax

Command	Command type
AT#GDATAVOL=[<mode>]	Execute
AT#GDATAVOL=?	Test

Parameters and values

<mode>

0   Resets the GPRS data counter for the all the available PDP contexts (1-5) and GSM data counter for GSM context 0.

1   Reports the last GPRS session data counter for the all the set PDP contexts—that is, all the PDP contexts with APN parameter set using +CGDCONT. Also reports the last GSM session data counter for the GSM context, if set through #GSMCONT

Format is:

#GDATAVOL: <cidn>,<totn>,<sentn>,<receivedn>[<CR><LF>#GDATAVOL: <cidm>,<totm>,<sentm>,<receivedm>[…]]

2   Reports the total GPRS data counter, since last reset, for the all the set PDP contexts (that is, all the PDP context with APN parameter set using +CGDCONT) and the total GSM data counter for the GSM context, if set through #GSMCONT.

Format is:

#GDATAVOL: <cidn>,<totn>,<sentn>,<receivedn>[<CR><LF>
#GDATAVOL: <cidm>,<totm>,<sentm>,<receivedm>[…]]

Reporting parameters are as follows:

<cidn>   PDP context identifier.

0   Specifies the GSM context.

1-5	Numeric parameter which specifies a particular PDP context definition.
<totn>	Number of bytes either received or transmitted in the last GPRS (or GSM) session for <cidn> PDP context.
<sentn>	Number of bytes transmitted in the last GPRS (or GSM) session for <cidn> PDP context.
<received>	<receivedn> - number of bytes received in the last GPRS (or GSM) session for <cidn> PDP context.

Notes

- Last GPRS and GSM session counters are not saved in non-volatile memory so they are lost at power off.
- Total GPRS and GSM session counters are saved in non-volatile memory.

ICMP Ping Support #ICMP

Set command enables or disables the ICMP ping support.

Read command returns whether the ICMP ping support is currently enabled or not, in the format:

#ICMP: <mode>

Test command reports the supported range of values for the <mode> parameter.

Syntax

Command	Command type
AT#ICMP=<mode>	Set
AT#ICMP?	Read
AT#ICMP=?	Test

Parameters and values

<mode>

0	Disable ICMP ping support. **Default: 0**.
1	Enable firewalled ICMP ping support. The module is sending a proper ECHO_REPLY only to a subset of IP Addresses pinging it. The #FRWL specifies is subset of IP addresses.
2	Enable free ICMP ping support. The module is sending a proper ECHO_REPLY to every IP address pinging it.

PING Request #PING

Use this command to send ping echo request messages and to receive the corresponding echo reply.

Test command reports the supported range of values for the #PING command.

Syntax

Command	Command type
AT#PING=<IPaddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>]]]]	Execute
AT#PING=?	Test

Parameters and values

<IPaddr>

String type. Address of the remote host. 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.

<retryNum>

The number of ping echo request to send.

Range is 1-64. **Default: 4**.

<len>

The length of ping echo request message.

Range is 32-1460. **Default: 32**.

<timeout>

The timeout, in 100 ms units, waiting a single echo reply.

Range is 1-600. **Default: 50**.

<ttl>

Time to live.

Range is 1-255. **Default: 128**.

Once the single echo reply message is received, a string like the following is displayed:

#PING: <replyId>,<Ip Address>,<replyTime>,<ttl>

where:

<replyId> - Echo reply number.

<IP Address> - IP address of the remote host

<replyTime> - Time, in 100 ms units, required to receive the response.

<ttl> - Time to live of the echo reply message.

Notes

■ When the echo request timeout expires (no reply received on time) the response contains <replyTime> set to 600 and <ttl> set to 255.

■ To receive the corresponding echo reply is not required to enable separately AT#ICMP.

Examples

AT#PING="www.telit.com"
#PING: 01,"81.201.117.177",6,50
#PING: 02,"81.201.117.177",5,50

#PING: 03,"81.201.117.177",6,50
#PING: 04,"81.201.117.177",5,50
OK

DNS from Network #NWDNS

Execution command returns either the primary and secondary DNS addresses for the GSM context (if specified) and/or a list of primary and secondary DNS addresses for the specified PDP context identifiers

The command returns a row of information for every specified <cid> whose context has been already defined. No row is returned for a <cid> whose context has not been defined yet. Response format is: #NWDNS: <cid>,<PDNSaddress>,<SDNSaddress>[<CR><LF> #NWDNS: <cid>,<PDNSaddress>,<SDNSaddress> […]] where: <cid> - context identifier, as before <PDNSaddress>,<SDNSaddress> - primary and secondary DNS addresses set through AT#DNS command. If not set, they are the primary and secondary DNS addresses assigned during the PDP(or GSM) context activation.

Test command returns a list of defined <cid>s.

Syntax

Command	Command type
AT#NWDNS= [<cid>[,<cid> [,…]]]	Set
AT#NWDNS=?	Test

Parameters and values

<cid>	Context identifier	
0	Specifies the GSM context (see +GSMCONT).	
1-5	Numeric parameter which specifies a particular PDP context definition (see +CGDCONT command).	

Notes

- ■ If no <cid> is specified, the DNS addresses for all defined contexts are returned.
- ■ Issuing the command with more than 6 parameters raises an error.
- ■ The command returns only one row of information for every specified <cid>, even if the same <cid> is present more than once.

SMS AT Commands

Move Short Message to other memory - #SMSMOVE

Execution command moves selected Short Message from current memory to destination memory.

Read command reports the message storage status of the current memory and the destination memory in the format: #SMSMOVE: <curr_mem>,<used_curr_mem>,<total_curr_mem>,<dest_mem>,<used_dest_mem>,<total_dest_mem>

Where:

<curr_mem>	Current memory, selected by +CPMS command. It can assume the values "SM" or "ME"

<used_curr_mem>	Number of SMs stored in the current memory
<total_curr_mem>	Maximum number of SMs that the current memory can contain
<dest_mem>	Destination memory. It can assume the values "SM" or "ME"
<used_dest_mem>	Number of SMs stored in the destination memory
<total_dest_mem>	Maximum number of SMs that the destination memory can contain

Test command reports the supported values for parameter <index>

Syntax

Command	Command type
AT#SMSMOVE= <index>	Execution
AT#SMSMOVE?	Read
AT#SMSMOVE=?	Test

Parameters and values

<index> Message index in the memory selected by +CPMS command.

1 to N where N depends on the available space. See +CPMS.

Note: if the destination memory is full, an error is returned.

Examples

AT#SMSMOVE? #SMSMOVE: "ME",3,100,"SM",0,50   OK
//the current memory is ME where 3 SMs are stored; the destination memory is SIM that is empty AT+CMGL=ALL   +CMGL: 1,"STO UNSENT","32XXXXXXXX","",   test 1
+CMGL: 2,"STO UNSENT","32XXXXXXXX","",   test 2 +CMGL: 3,"STO UNSENT","32XXXXXXXX","",t est 3 OK
//list the SMs to discover the memory index AT#SMSMOVE=1 OK //move the SM in the first position of ME to SIM AT#SMSMOVE? #SMSMOVE: "ME",2,100,"SM",1,50 OK
//now we have 2 SMs in ME and 1 in SIM

SMS Commnads Operation Mode #SMSMODE

Set command enables/disables the check for presence of SMS Service Centre Address in the FDN phonebook

Read command reports whether the check of SMS SCA in FDN is enabled or not, in the format: #SMSMODE: <mode> (<mode> described above)

Test command reports the supported range of values for parameter <mode>

Syntax

Command	Command type
AT#SMSMODE= <mode>	Set
AT#SMSMODE?	Read

Command	Command type
AT#SMSMODE=?	Test

Parameters and values

<mode>

1   Disables the check for presence of SMS SCA in FDN

2   Enables the check for presence of SMS SCA in the FDN phonebook when FDN are enabled; if the SMS SCA is not present, then a SMS cannot be sent (default) **Default: 2.**

Email Management AT Commands

E-mail SMTP Server #ESMTP

Set command sets the SMTP server address, used to send e-mails. SMTP server can be specified as IP address or as a nickname.

Read command reports the current SMTP server address, in the format:

#ESMTP: <smtp>

Test command returns the maximum length for the parameter <smtp>.

Syntax

Command	Command type
AT#ESMTP=[<smtp>]	Set
AT#ESMTP?	Read
AT#ESMTP=?	Test

Parameters and values

<smtp>   String type, server address. This parameter can be either:

Valid IP address in the format: xxx.xxx.xxx.xxx.

Host name to be solved with a DNS query in the format: <host name>

Default: empty string "".

Note: The maximum length for <smtp> is the output of Test command.

Notes

■ The SMTP server is used inside the APN space (the smtp server provided by the network operator) or it must allow the Relay, otherwise it refuses to send e-mail.

Examples

AT#ESMTP="smtp.mydomain.com"
OK

E-mail Sender Address #EADDR

Set command sets the sender address string used for sending e-mail.

Read command reports the current sender address, in the format:

#EADDR: <e-addr>

Test command returns the maximum allowed length of the string parameter <e-addr>.

Syntax

Command	Command type
AT#EADDR=[<e-add>]	Set
AT#EADDR?	Read
AT#EADDR=?	Test

Parameters and values

<e-addr>   String type, sender address. Any string value up to the maximum length reported by the Test command. **Default: empty string "".**

Examples

AT#EADDR="me@email.box.com"
OK
AT#EADDR?
#EADDR: "me@email.box.com"
OK

E-mail Authentication User Name #EUSER

Set command sets the user identification string used during the authentication step of the SMTP.

Read command reports the current user identification string, in the format:

#EUSER: <e-user>

Test command returns the maximum allowed length of the string parameter <e-user>.

Syntax

Command	Command type
AT#EUSER=[<e-user>]	Set
AT#EUSER?	Read
AT#EUSER=?	Test

Parameters and values

<e-user>
String type, e-mail authentication User ID.

Any string value up to maximum length reported in the Test command.

Default: empty string "".

Note: If no authentication is required then the <e-user> parameter is empty "".

Notes

■ This is a different user field than the one used for GPRS authentication. See #USERID.

Examples

```
AT#EUSER="myE-Name"
OK
AT#EUSER?
#EUSER:  "myE-Name"
OK
```

E-mail Authentication Password #EPASSW

Set command sets the password string used during the authentication step of the SMTP.

Test command returns the maximum allowed length of the string parameter <e-pwd>.

Syntax

Command	Command type
AT#EPASSW=[<e-pwd>]	Set
AT#EPASSW=?	Test

Parameters and values

<e-pwd>
String type, e-mail authentication password.

Any string value up to the maximum length reported by the Test command. **Default: empty string "".**

Note: If no authentication is required then the <e-pwd> parameter is empty "".

Notes

■ This is a different password field than the one used for GPRS authentication. See #PASSW.

Examples

```
AT#EPASSW="myPassword"
OK
```

E-mail Sending #EMAILD

Execute command sends an e-mail message if GPRS context is already activated by AT#GPRS=1.

Test command returns the OK result code.

Syntax

Command	Command type
AT#EMAILD=[<da>,<subj>]	Execute
AT#EMAILD=?	Test

Parameters and values

<da>   String type, destination address. Maximum length 100 characters.

<subj>   String type, subject of message. Maximum length 100 characters.

The device responds to the command with the prompt '>' and waits for the message body text.

To complete the operation send Ctrl-Z char (0x1A hex). To exit without writing the message send ESC char (0x1B hex).

If e-mail message is successfully sent, the response is OK.

If message sending fails for some reason, an error code is reported.

Notes

- If the length of one of the string type parameters exceeds the maximum, the string is truncated.
- Ensure that no other commands are issued during command execution.
- To avoid malfunctions, wait for the OK or ERROR / +CMS ERROR:<err> response before issuing further commands.
- Maximum length for message body is 1500. Data in excess of the maximum is discarded.

Examples

AT#EMAILD="me@myaddress.com","subject of the mail"
>message body… this is the text of the mail message…
CTRL-Z
..wait..
OK

Message has been sent.

E-mail Parameters Save #ESAV

Execute command stores the e-mail parameters in the device's non-volatile memory. Parameters stored are:

- E-mail user name
- E-mail password
- E-mail sender address
- E-mail SMTP server

Test command returns the OK result code.

Syntax

Command	Command type
AT#ESAV	Execute
AT#ESAV=?	Test

Notes

- If some parameters are not previously specified a default value is used.

E-mail Parameters Reset #ERST

Execute command resets the e-mail parameters to the "Default " configuration and stores them in the non-volatile memory of the device. Parameters reset are:

- E-mail User Name
- E-mail Password
- E-mail Sender Address
- E-mail SMTP server

Test command returns the OK result code.

Syntax

Command	Command type
AT#ERST	Execute
AT#ERST=?	Test

SMTP Read Message #EMAILMSG

Execute command returns the last response from SMTP server.

Test command returns the OK result code.

Syntax

Command	Command type
AT#EMAILMSG	Execute
AT#EMAILMSG=?	Test

Send Mail with Attachment #SMTPCL

This command permits to send an email with different types of attachments if GPRS context has already been activated. See #GPRS.

After sending message body text (as with #EMAILD), the command switches to online mode if attachment must be sent.

While in online mode, data received on the serial port istransmitted on the SMTP socket as MIME attachment.

The escape sequence must be sent to close the SMTP connection.

Encoding of data received on the serial port is performed if required (binary data), before transmission on the SMTP socket.

Test command reports the supported range of values for <da>,<subj>,<att>[,<filename>,<encod>].

Syntax

Command	Command type
AT#SMTPCL=<da>,<subj>,<att>[,<filename>,<encod>]	
AT#SMTPCL=?	Test

Parameters and values

<da>	String type, destination address. Maximum length 100 characters.
<subj>	String type, subject of message. Maximum length 100 characters.
<att>	Attached file flag.
0	No attachment.
1	Attach a txt file.
2	Attach a binary file, for example jpg, bin, or pdf.
<filename>	Attached file name. Maximum length 50 characters.
<encod>	Content-Transfer-Encoding used for attachment.
0	"7bit" means data all represented as short lines of US-ASCII data.
1	"base64" designed to represent arbitrary sequences of octets in a form that need not be humanly readable.
	Note: If no attachment (<att> 0) has to be sent, the behavior is the same as with #EMAILD.
	OK after CTRL-Z is returned (if connection was successful), the switch to online mode is not performed.

Notes

■ If a txt file (<att>=1) is attached, only <encod>0 ("7bit") is possible. If a binary file (<att>=2) is attached, only <encod>1 ("base64") is possible.

■ If <att>=0 and <filename> is present and not empty, the attachment is not considered.

■ If <att> 1 or 2 and <filename> is not present, command returns an ERROR.

Examples

at#smtpcl="me@myaddress.com","test1",1,"sample.txt",0
>message body...this is the text of the mail message…
Send CTRL-Z
CONNECT

…data received on the serial port is sent as attachment….

Send escape sequence to close the SMTP connection

+++
NO CARRIER
at#smtpcl="me@myaddress.com","test2",2,"image.jpg",1
>message body...this is the text of the mail message…
Send CTRL-Z
CONNECT

…data received on the serial port is base64

encoded and sent as attachment….

+++
NO CARRIER

HTTP Client AT Commands

Configure HTTP Parameters #HTTPCFG

This command sets the parameters needed to the HTTP connection

Read command returns the current settings for each defined profile in the format: #HTTPCFG: <prof_id>,<server_address>,<server_port>,<auth_type>,<username> ,<password>,<ssl_enabled>,<timeout>,<cid>< CR><LF>[<CR><LF># HTTPCFG: <prof_id>,<server_address>,<server_port>,<auth_type>,<username> ,<password>,<ssl_enabled>,<timeout>,<cid>] <CR><LF>[…]]:

Test command returns the supported range of parameters <prof_id>, <server_port>, <auth_type>, <ssl_enabled>, <timeout> and <cid> and the maximum length of <server_address>, <username> and <password> parameters in the format: # HTTPCFG: (list of supported <prof_id>s),<s_length>,(list of supported <server_port>s), (list of supported <auth_type>s),<u_length>,<p_length>,(list of supported <ssl_enabled>s),(list of supported <timeout>s),(list of supported <cid>s) where: <s_length> - integer type value indicating the maximum length of parameter <server_address>. <u_length> - integer type value indicating the maximum length of parameter <username>. <p_length> - integer type value indicating the maximum length of parameter <password>

Syntax

Command	Command type
AT#HTTPCFG=<prof_id>[,<s erver_address>[,<server_port >[,<auth_type>[,<username>[, <password>[,<ssl_enabled>[,< timeout> [,<cid>]]]]]]]]	
AT#HTTPCFG?	Read
AT#HTTPCFG =?	Test

Parameters and values

<prof_id>	Numeric parameter indicating the profile identifier. Range: 0-2

\<server_address\>	String parameter indicating the 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: "" for first and second profile; "m2mlocate.telit.com" for third profile.
\<server_port\>	Numeric parameter indicating the TCP remote port of the HTTP server to connect to. Default: 80 for first and second profile; 9978 for third profile. Range 1...65535.
\<auth_type\>	Numeric parameter indicating the HTTP authentication type.
0	No authentication (default)
1	Basic authentication
\<username\>	String parameter indicating authentication user identification string for HTTP.
\<password\>	String parameter indicating authentication password for HTTP.
\<ssl_enabled\>	Numeric parameter indicating if the SSL encryption is enabled.
0	SSL encryption disabled (default)
1	SSL encryption enabled (not yet implemented and not available for setting)
\<timeout\>	Numeric parameter indicating the time interval in seconds to wait for receiving data from HTTP server. Range: (1- 65535). Default: 120.
\<cid\>	Numeric parameter indicating the PDP Context Identifier. Range: (1-5). Default: 1

Notes

- A special form of the Set command, #HTTPCFG=\<prof_id\>, causes the values for profile number \<prof_id\> to reset to default values.
- If the SSL encryption is enabled, the \<cid\> parameter has to be set to 1.
- Only one profile can use the SSL encryption. Note: values are automatically saved in NVM.

Send HTTP GET, HEAD or DELETE request #HTTPQRY

Execution command performs a GET, HEAD or DELETE request to HTTP server.

Test command reports the supported range of values for the parameters \<prof_id\> and \<command\> and the maximum length of \<resource\> parameter in the format: #HTTPQRY: (list of supported \<prof_id\>s),(list of supported \<command\>s),\<r_length\>,\<m_length\> where: \<r_length\> - integer type value indicating the maximum length of parameter \<resource\>. \<m_length\> - integer type value indicating the maximum length of parameter \<extra_header_line\>.

Syntax

Command	Command type
AT#HTTPQRY=\<prof_id\>,\<command\>,\<resource\>[,\<extra _header_line\>]	Execution

Command	Command type
AT#HTTPQRY=?	Test

Parameters and values

<prof_id>	Numeric parameter indicating the profile identifier. Range: 0-2
<command>:	Numeric parameter indicating the command requested to HTTP server: <extra_header_line>: String parameter indicating optional HTTP header line If sending ends successfully, the response is OK; otherwise an error code is reported.
	0 – GET
	1 – HEAD TE
	2 – DELE
<resource>	String parameter indicating the HTTP resource (uri), object of the request

Notes

- Note: if there are no data from server or the server doesn't answer within the time interval specified in <timeout> parameter of #HTTPCFG command, then the URC #HTTPRING <http_status_code> parameter has value 0.

-

Send HTTP POST or PUT request #HTTPSND

Execution 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.

Test command returns the supported range of parameters <prof_id>, <command> and <data_len> and the maximum length of <resource>, <post_param> and <extra_header_line> parameters in the format: # HTTPSND: (list of supported <prof_id>s),(list of supported <command>s), <r_length>, (list of supported <data_len>s),<p_length>,<m_length> where: <r_length> - integer type value indicating the maximum length of parameter <resource>. <p_length> - integer type value indicating the maximum length of parameter <post_param>. <m_length> - integer type value indicating the maximum length of parameter <extra_header_line>

Syntax

Command	Command type
AT#HTTPSND=<prof_id>,<c ommand>,<resource>,<data_l en>[,<post_param>[,<extra_h eader_line>]]	Execution
AT#HTTPSND=?	Test

Parameters and values

<prof_id>	Numeric parameter indicating the profile identifier. Range: 0-2

\<command>	Numeric parameter indicating the command requested to HTTP server:
0	POST
1	PUT
\<resource>	String parameter indicating the HTTP resource (uri), object of the request
\<data_len>	Numeric parameter indicating the data length to input in bytes .
\<post_param>	Numeric/string parameter indicating the HTTP Contenttype identifier, used only for POST command, optionally followed by colon character (:) and a string that extends with sub-types the identifier:
"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 other content – free string corresponding to other content type and possible sub-types
\<extra_header_line>	String parameter indicating optional HTTP header line If sending ends successfully, the response is OK; otherwise an error code is reported

Notes

- The HTTP request header sent with #HTTPSND always contains the "Connection: close" line, and it can not be removed. When the HTTP server answer is received, then the following URC is put on the serial port: #HTTPRING: \<prof_id>,\<http_status_code>,\<content_type>,\<data_size> Where: \<prof_id> is defined as above \<http_status_code> is the numeric status code, as received from the server (see RFC 2616) \<content_type> is a string reporting the "Content-Type" header line, as received from the server (see RFC 2616) \<data_size> is the byte amount of data received from the server. If the server doesn't report the "Content-Length:" header line, the parameter value is 0.

- If there are no data from server or the server doesn't answer within the time interval specified in \<timeout> parameter of #HTTPCFG command, then the URC #HTTPRING \<http_status_code> parameter has value 0.

Examples

Post 100 byte without "Content-type" header
AT#HTTPSND=0,0,"/",100
>>>
Post 100 byte with "application/x-www-form-urlencoded"
AT#HTTPSND=0,0,"/",100,0
>>>
Post 100 byte with "multipart/form-data" and extension
AT#HTTPSND=0,0,"/",100,"3:boundary=----FormBoundary"
>>>

receive HTTP server data #HTTPRCV

Execution 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 #HTTPRING 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

Test command reports the supported range of values for <prof_id> parameter in the format: # HTTPRCV: (list of supported <prof_id>s)

Syntax

Command	Command type
AT#HTTPRCV=<prof_id>	Execution
AT#HTTPRCV=?	Test

Parameters and values

<prof_id>   Numeric parameter indicating the profile identifier. Range: 0-2

Notes

- Note: If the data are not present or the #HTTPRING <http_status_code> parameter has value 0, an error code is reported.
- ■

■ Easy Script Extension Python Interpreter AT Commands

Write Script #WSCRIPT

Execute command causes the module to store a file in the Easy Script related non-volatile memory, naming it <script_name>.

The file should be sent using RAW ASCII file transfer.

It is important to set properly the port settings.

In particular:

Flow control: hardware.

Baud rate: 115200 bps

Test command returns OK result code.

Syntax

Command	Command type
AT#WSCRIPT=[<script_name>,<size>,[,<hidden>]]	Set
AT#WSCRIPT=?	Test

Parameters and values

<script_name>   String type, name of the file in non-volatile memory. Maximum 16 characters, case sensitive.

<size>	File size in bytes.
<hidden>	File hidden attribute.
0	File content is readable with #RSCRIPT. **Default: 0.**
1	File content is readable with #RSCRIPT. No effect.

Notes

- Place the file name in quotes. Every textual script file must have .py extension. Every pre-compiled executable script file must have .pyo extension. File names are case sensitive.
- When sending the script be sure that the line terminator is <CR><LF> and that your terminal program does not change it.
- It's recommended to use the extension .py only for textual script files and the extension .pyo only for precompiled executable script files.

Examples

AT#WSCRIPT="First.py ",54,0

>>> here receive the prompt; then type or send the textual script, sized 54 bytes.

OK

Textual script has been stored.

Select Active Script #ESCRIPT

Set command selects either:

- The name of the textual script file that is compiled and executed by the Easy Script® compiler at startup according to last #STARTMODESCR setting, or
- The name of the pre-compiled executable file that is executed at startup according to last #STARTMODESCR setting.

This file, either textual or pre-compiled, is called the current script.

Read command reports as a quoted string the file name of the current script.

Test command returns OK result code.

Syntax

Command	Command type
AT#ESCRIPT=[<script_name>]	Set
AT#ESCRIPT?	Read
AT#ESCRIPT=?	Test

Parameters and values

<script_name> String type, file name. Maximum 16 characters, case sensitive.

Notes

- All textual script files must have .py extension. All pre-compiled executable files must have .pyo extension.
- <script_name> must match to the name of a file written by #WSCRIPT to have it run.
- The command does not check whether a textual script named <script_name> does exist or not in the Easy Script related non-volatile memory. If the file <script_name> is not present at startup then the compiler does not execute.

Script Execution Start Mode #STARTMODESCR

Set command sets the current script (see #ESCRIPT) execution start mode.

Read command reports the current script start mode and the current script start time-out, in the format:

#STARTMODESCR= <script_start_mode>,<script_start_timeout>

Test command returns the range of available values for <script_start_mode> and <script_start_timeout>, in the format:

#STARTMODESCR: (0,1),(10-60)

Syntax

Command	Command type
AT#STARTMODESCR=<script_start_mode>[,<script_start_to>]	Set
AT#STARTMODESCR?	Read
AT#STARTMODESCR=?	Test

Parameters and values

<script_start_mode>   Current e script execution start mode.

0   Current script is executed at startup only if the DTR line is found Low (that is: COM is not open on a PC), otherwise the Easy Script interpreter does execute and the module behaves normally answering only to AT commands on the serial port. **Default: 0**.

1   Current script is executed at startup only if the user does not send any AT command on the serial port for the time interval specified in <script_start_to> parameter. Otherwise, the Easy Script interpreter does not execute and the module behaves normally answering only to AT commands on the serial port. The DTR line is not tested.

<script_start_to>   Current script start time-out.

10-60 - time interval in seconds. This parameter is used only if parameter <script_start_mode> is set to 1. It is the waiting time for an AT command on the serial port to disable active script execution start. If the user does not send any AT command on the serial port for the time specified in this parameter active script is not be executed. **Default: 10**.

Execute Active Script #EXECSCR

Execute command causes the current script (see #ESCRIPT) execution not at startup.

This command is useful when the execution at startup is blocked deliberately and the user wants to control execution start.

Test command returns OK result code.

Syntax

Command	Command type
AT#EXECSCR	Set
AT#EXECSCR=?	Test

Read Script #RSCRIPT

Execute command reports the content of file <script_name>.

Test command returns OK result code.

Syntax

Command	Command type
AT#RSCRIPT=[<script_name>]	Set
AT#RSCRIPT=?	Test

Parameters and values

<script_name>   String type, file name. Maximum 16 characters, case sensitive. The device prompts a five character sequence <CR><LF><less_than><less_than><less_than>(IRA 13, 10, 60, 60, 60) followed by the file content.

Notes

- If the file <script_name> was saved with the hidden attribute, then an empty file is reported with the OK result code.
- If the file <script_name> is not present an error code is reported.

Examples

```
AT#RSCRIPT="First.py  "
hereafter  receive  the  prompt;  then  the  script  is  displayed,  immediately  after  the
prompt
<<<import  MDM
MDM.send('AT\r',10)
Ans=MDM.receive(20)
OK
```

List Script Names #LSCRIPT

Execute command reports either the list of file names for the files currently stored in the Easy Script related nonvolatile memory and the available free non-volatile memory memory in the format:

[#LSCRIPT: <script_name1>,<size1>…

[<CR><LF>#LSCRIPT: <script_namen>,<sizen>]]
<CR><LF>#LSCRIPT: free bytes: <free_non-volatile memory>

where:

<script-namen>	File name, quoted string type. Maximum 16 characters, case sensitive.
<sizen>	Size of script in bytes.
<free_non-volatile memory>	Size of available non-volatile memory memory in bytes.

Test command returns OK result code.

Syntax

Command	Command type
AT#LSCRIPT	Execute
AT#LSCRIPT=?	Test

Examples

AT#LSCRIPT
#LSCRIPT: "First.py",51
#LSCRIPT: "Second.py",178
#LSCRIPT: "Third.py",95
#LSCRIPT: free bytes: 20000
OK

List Script Names #LCSCRIPT

Execute command reports the list of file names for the files currently stored in the Easy Script related non-volatile memory, adding CRC16 information, and the available free non-volatile memory memory in the format:

[#LCSCRIPT: <script_name1>,<size1>[,<crc1>]…
[<CR><LF>#LCSCRIPT: <script_namen>,<sizen>[,<crcn>]]]
<CR><LF>#LCSCRIPT: free bytes: <free_non-volatile memory>

where:

<script-namen>	File name, quoted string type. Maximum 16 characters, case sensitive.
<sizen>	Size of script in bytes.
<crcn>	CRC16 poly (x^16+x^12+x^5+1) of script in hex format.
<free_non-volatile memory>	Size of available non-volatile memory memory in bytes.

Note: CRC16 is calculated using the standard CRC16-CCITT x^16+x^12+x^5+1 polynomial (0x1021 representation) with initial value FFFF.

Note: If one file currently stored in non-volatile memory is in use, then CRC16 cannot be calculated and Execute command does not report <crcn> for that file. This is always true if command is executed by a Python script because at least the file pointed by #ESCRIPT is in use.

Execute command reports size and CRC16 information of file <script_name> in the format:

[#LCSCRIPT: <script_name>,<size>[,<crc>]]

where:

<script-name>	file name, quoted string type. Maximum 16 characters, case sensitive.
<sizen>	Size of script in bytes.
<crc>	CRC16 poly (x^16+x^12+x^5+1) of script in hex format.

Parameter:

<script-name>	String type, file name. Maximum 16 characters, case sensitive.

Note: CRC16 is calculated using the standard CRC16-CCITT x^16+x^12+x^5+1 polynomial (0x1021 representation) with initial value FFFF.

Note: If file <script_name> is in use, CRC16 cannot be calculated. Execute command does not report <crc>.

Note: If file <script_name> is not in the list of files stored in non-volatile memory Execute command exits with error message.

Test command returns OK result code. Syntax

Syntax

Command	Command type
AT#LCSCRIPT	Execute
AT#LCSCRIPT=<sript_name>	Execute
AT#LCSCRIPT=?	Test

Parameters and values

<script_name> String type, file name. Maximum 16 characters, case sensitive. The device prompts a five character sequence <CR><LF><less_than><less_than><less_than>(IRA 13, 10, 60, 60, 60) followed by the file content.

Examples

```
AT#LCSCRIPT
#LCSCRIPT: "First.py",51,8FD6
#LCSCRIPT: "Second.py",178,A034
#LCSCRIPT: "Third.py",120,7C48
#LCSCRIPT: free bytes: 20000
OK
```

To list a specific script by name AT#LSCRIPT="name.py" rather than just listing all scripts via AT#LSCRIPT command.

AT#LCSCRIPT="Second.py"
#LCSCRIPT: "Second.py",178,A034
OK

If file Third.py is already in use, CRC value is not displayed in response.

AT#LCSCRIPT
#LCSCRIPT: "First.py",51,8FD6
#LCSCRIPT: "Second.py",178,A034
#LCSCRIPT: "Third.py",120
#LCSCRIPT: free bytes: 20000
OK

Delete Script #DSCRIPT

Execute command deletes a file from Easy Script related non-volatile memory memory.

Test command returns OK result code.

Syntax

Command	Command type
AT#DSCRIPT=[<script_name>]	Execute
AT#DSCRIPT=?	Test

Parameters and values

<script_name>
String type, name of the file to delete. Maximum 16 characters, case sensitive.

Notes

■ If the file <script_name> is not present an error code is reported.

Examples

AT#DSCRIPT="Third.py"
OK

Reboot #REBOOT

Execute command immediately reboots the unit. Use the command to reboot the system after a remote update of the script in order to have the new one running.

Test command returns OK result code.

Syntax

Command	Command type
AT#REBOOT	Execyute
AT#REBOOT=?	Test

Notes

■ If AT#REBOOT follows an AT command that stores some parameters in non-volatile memory, it is recommended to insert a delay of at least 5 seconds before to issue AT#REBOOT, to permit the complete non-volatile memory storing

■ AT#REBOOT is an obsolete AT command; please refer to AT#ENHRST to perform a module reboot.

Examples

AT#REBOOT
OK

Module reboots.

SIM Toolkit AT Commands

SIM Tookit Interface Activation #STIA

Set command activates the SAT sending of unsolicited indications when a proactive command is received from SIM.

Read command can be used to get information about the SAT interface in the format:

#STIA: <state>,<mode>,<timeout>,<SatProfile>

where:

<state>	State the device is in.
0	SIM has not started its application yet.
1	SIM has started its application (SAT main menu ready).
<mode>	SAT and unsolicited indications enabling status. See above.
<timeout>	Time-out for user responses. See above.
<SatProfile>	SAT Terminal Profile according to GSM 11.14, that is, the list of SIM Application Toolkit facilities that are supported by the ME. The profile cannot be changed by the TA.

Note: In SAT applications usually an SMS message is sent to the network provider containing service requests, for example to send the latest news. The provider returns a message with the requested information.

Before activating SAT it is recommended to set the SMS text mode with command AT+CMGF=1 and to enable unsolicited indications for incoming SMS messages with command +CNMI.

Test command returns the range of available values for the parameters <mode> and <timeout>.

Syntax

Command	Command type
AT#STIA=[<mode>[,<timeout>]]	Set

Command	Command type
AT#STIA?	Read
AT#STIA=?	Test

Parameters and values

<mode>

0   Disable SAT.

1   Enable SAT without unsolicited indication #STN. **Default: 1**.

2   Enable SAT and extended unsolicited indication #STN. See #STGI.

3   Enable SAT and reduced unsolicited indication #STN. See #STGI.

17   Enable SAT without unsolicited indication #STN and 3GPP TS 23.038 alphabet used.

18   Enable SAT and extended unsolicited indication #STN (see #STGI) and 3GPP TS 23.038 alphabet used.

19   Enable SAT and reduced unsolicited indication #STN (see #STGI)and 3GPP TS 23.038 alphabet used.

33   Enable SAT without unsolicited indication #STN and UCS2 alphabet used.

34   Enable SAT and extended unsolicited indication #STN (see #STGI)and UCS2 alphabet used.

35   Enable SAT and reduced unsolicited indication #STN (see #STGI)and UCS2 alphabet used.

Note: An unsolicited result code—#STN: 254—is sent if the user has indicated the need to end the proactive SIM application session: AT#STSR=<cmdType>, 16— that is, "proactive SIM application session terminated by the user" according to GSM 11.14.

The TA does not need to respond directly, that is, AT#STSR is not required. It is possible to restart the SAT session from the main menu again with the command AT#STGI=37.

Note: The settings are saved on user profile and available on following reboot.

SIM Toolkit activation/deactivation is only performed at power on.

<timeout>   Time out for user responses.

1-2

Time-out in minutes. Default: 2. Any ongoing (but unanswered) proactive command is aborted automatically after <timeout> minutes. In this case, the terminal response is either "ME currently unable to process command", or if applicable, "No response from user". In addition an unsolicited indication is sent to the external application:

#STN: <cmdTerminateValue>

where: <cmdTerminateValue> is defined as <cmdType> + terminate offset; the terminate offset equals 100.

Note: Every time the SIM application issues a proactive command that requires user interaction an unsolicited code is sent, if enabled with #STIA command, as follows:

If <mode> parameter of #STIA command is set to 3 (reduced unsolicited indication) an unsolicited indication is sent, indicating the type of proactive command issued by the SIM:

#STN: <cmdType>

If <mode> parameter of #STIA command is set to 2 (extended unsolicited indication) the format of the unsolicited indication depends on the specific command:

if <cmdType>=1 (REFRESH)

an unsolicited notification is sent to the user:

#STN: <cmdType>,<refresh type>

where:

<refresh type>

0 - SIM Initialization and Full File Change Notification.

1 - File Change Notification.

2 - SIM Initialization and File Change Notification.

3 - SIM Initialization.

4 - SIM Reset.

In this case neither #STGI nor #STSR commands are required:
- AT#STGI is accepted anyway.
- AT#STSR=<cmdType>,0 answers OK but does nothing.

if <cmdType>=17 (SEND SS)

if <cmdType>=19 (SEND SHORT MESSAGE)

if <cmdType>=20 (SEND DTMF)

if <cmdType>=32 (PLAY TONE)

an unsolicited notification is sent if allowed by SIM (see GSM 11.14):

#STN: <cmdType>[,<text>]

where: <text> - (optional) text to be displayed to user.

In these cases neither #STGI nor #STSR commands are required:
- AT#STGI is accepted anyway.
- AT#STSR=<cmdType>,0 answers OK but does nothing.

In case of SEND SHORT MESSAGE (<cmdType>=19) command if sending to network fails an unsolicited notification is sent.

#STN: 119

if <cmdType>=33 (DISPLAY TEXT)

an unsolicited notification is sent if allowed by SIM (see GSM 11.14):

#STN: <cmdType>[,<cmdDetails>[,<text>]]

where: <cmdDetails> - unsigned Integer used as a bit field.

0-255 - used as a bit field:

bit 1: 0 - normal priority.

1 - high priority. bits 2 to 7:

reserved for future use.

bit 8:

0 - clear message after a delay.

1 - wait for user to clear message.

<text> - (optional) text to be displayed to user.

In this case:

1. if <cmdDetails>/bit8 is 0 neither #STGI nor #STSR commands are

required:

AT#STGI is accepted anyway.

AT#STSR=<cmdType>,0 answers OK but does nothing.

2. If <cmdDetails>/bit8 is 1 #STSR command is required.

if <cmdType>=40 (SET UP IDLE MODE TEXT) an unsolicited notification is sent:

#STN: <cmdType>[,<text>]

where:<text> - (optional) text to be displayed to user.

In these cases neither #STGI nor #STSR commands are required:
- AT#STGI is accepted anyway.

- AT#STSR=<cmdType>,0 answers OK but does nothing.

if <cmdType>=18 (SEND USSD)

an unsolicited notification is sent to the user:

#STN: <cmdType>[,<text>]

where:<text> - optional text string sent by SIM.

In this case:
- AT#STSR=18,20 can be sent to end USSD transaction.
- AT#STGI is accepted anyway.
- AT#STSR=<cmdType>,0 answers OK but does nothing.

if <cmdType>=5 (SET UP EVENT LIST) an unsolicited notification is sent:

#STN: <cmdType>[,<event list mask>]

where:

<event list mask> - (optional) hexadecimal number representing the list of events to monitor (see GSM 11.14).

- '00' = MT call.

- '01' = Call connected.

- '02' = Call disconnected.

- '03' = Location status.

- '04' = User activity.

- '05' = Idle screen available.

- '06' = Card reader status (if class "a" is supported).

- '07' = Language selection.

- '08' = Browser Termination (if class "c" is supported).

- '09' = Data available (if class "e" is supported).

- '0A' = Channel status (if class "e" is supported).

The hexadecimal number is actually a bit mask, where each bit, when set, indicates that the corresponding event has to be monitored (for example, if <event list mask> is 0x0001, it means that MT call has to be monitored). In these cases neither #STGI nor #STSR commands are required:
- AT#STGI is accepted anyway.
- AT#STSR=<cmdType>,0 answers OK but does nothing.

All other commands:

the unsolicited indication reports just the proactive command type:

#STN: <cmdType>

Note: If the call control or SMS control facility in the SIM is activated, when the customer application makes an outgoing call, or sends an SS or USSD, or an SMS, the following #STN unsolicited indication can be sent, according to GSM 11.14, to indicate whether the outgoing call is accepted, rejected or modified by the SIM, or if the SMS service centre address or destination is changed:

#STN: <cmdTerminateValue>,<Result>[,<TextInfo>[,<Number>[,<MODestAddr>]]]

where

<cmdTerminateValue>

150 - SMS control response.

160 - call/SS/USSD response.

<Result>

0 - Call/SMS not allowed.

1 - Call/SMS allowed.

2 - Call/SMS allowed with modification.

<Number> - Called number, Service Center Address or SS String in ASCII format.

<MODestAddr> - MO destination address in ASCII format.

<TextInfo> - alpha identifier provided by the SIM in ASCII format.

Notes

- Only one instance at a time—the one which first issued AT#STIA=n (with n different from zero)—is allowed to issue SAT commands. This is valid until the same instance issues AT#STIA=0.
- After power cycle another instance can enable SAT.
- A typical SAT session on AT interface starts after an #STN: 37 unsolicited code is received, if enabled (see above). At that point usually an AT#STGI=37 command is issued (see #STGI), and after the SAT main menu is displayed on TE an AT#STSR=37,0,x command is issued to select an item in the menu. See #STSR.

SIM Tookit Get Information #STGI

#STGI set command requests the parameters of a proactive command from the ME.

The read command can be used to request the currently ongoing proactive command and the SAT state in the format

#STGI: <state>,cmdType>

where:

<state>	SAT interface state. See #STIA.
<cmdType>	Ongoing proactive command.

An error message is returned if there is no pending command.

Test command returns the range for the parameters <state> and <cmdType>.

Syntax

Command	Command type
AT#STGI=[<cmdType>]	Set
AT#STGI?	Read
AT#STGI=?	Test

Parameters and values

<cmdType>

Proactive command ID according to GSM 11.14 (decimal). These are only those command types that use the AT interface.

SAT commands that are not using the AT interface (not MMI related SAT commands, for example PROVIDE LOCAL INFORMATION) are executed without sending any indication to the user.

1	REFRESH.
5	SET UP EVENT LIST.
16	SET UP CALL.
17	SEND SS.
18	SEND USSD.
19	SEND SHORT MESSAGE.
20	SEND DTMF.
32	PLAY TONE.
33	DISPLAY TEXT.
34	GET INKEY.
35	GET INPUT.
36	SELECT ITEM.
37	SET UP MENU.

40

SET UP IDLE MODE TEXT.

Requested command parameters are sent using an #STGI indication:

#STGI: <parameters>

where <parameters> depends upon the ongoing proactive command as follows:

if <cmdType>=1 (REFRESH)

#STGI: <cmdType>,<refresh type>

where: <refresh type>

0 - SIM Initialization and Full File Change Notification;

1 - File Change Notification;

2 - SIM Initialization and File Change Notification;

3 - SIM Initialization;

4 - SIM Reset

if <cmdType>=5 (SET UP EVENT LIST)

#STGI: <cmdType>,<event list mask>

where: <event list mask> - hexadecimal number representing the list of events to monitor (see GSM 11.14):

- '00' = MT call

- '01' = Call connected

- '02' = Call disconnected

- '03' = Location status

- '04' = User activity

- '05' = Idle screen available

- '06' = Card reader status (if class "a" is supported)

- '07' = Language selection

- '08' = Browser Termination (if class "c" is supported)

- '09' = Data available (if class "e" is supported)

- '0A' = Channel status (if class "e" is supported)

The hexadecimal number is actually a bit mask, where each bit, when set, indicates that the corresponding event has to be monitored (for example, if <event list mask> is 0x0001, it means that MT call has to be monitored).

if <cmdType>=16 (SET UP CALL)

#STGI: <cmdType>,<commandDetails>,[<confirmationText>], <calledNumber>

where: <commandDetails> - unsigned integer, used as an enumeration

0 Set up call, but only if not currently busy on another call

1 Set up call, but only if not currently busy on another call, with redial

2 Set up call, putting all other calls (if any) on hold

3 Set up call, putting all other calls (if any) on hold, with redial

4 Set up call, disconnecting all other calls (if any)

5 Set up call, disconnecting all other calls (if any), with redial

<confirmationText> - string for user confirmation stage

<calledNumber> - string containing called number

if <cmdType>=17 (SEND SS)

if <cmdType>=18 (SEND USSD)

if <cmdType>=19 (SEND SHORT MESSAGE)

if <cmdType>=20 (SEND DTMF)

if <cmdType>=32 (PLAY TONE)

if <cmdType>=40 (SET UP IDLE MODE TEXT)

#STGI: <cmdType>[,<text>]

where: <text> - text to be displayed to user

if <cmdType>=33 (DISPLAY TEXT)

#STGI: <cmdType>,<cmdDetails>[,<text>]

where: <cmdDetails> - unsigned Integer used as a bit field.

0-255 - used as a bit field:

bit 1:

0 - normal priority

1 - high priority

bits 2 to 7: reserved for future use

bit 8:

0 - clear message after a delay

1 - wait for user to clear message

<text> - text to be displayed to user

if <cmdType>=34 (GET INKEY)

#STGI: <cmdType>,<commandDetails>,<text>

where:

<commandDetails> - unsigned Integer used as a bit field.

0-255 - used as a bit field:

bit 1:

0 - Digits only (0-9, *, # and +)

1 - Alphabet set;

bit 2:

0 - SMS default alphabet (GSM character set)

1 - UCS2 alphabet

bit 3:

0 - Character sets defined by bit 1 and bit 2 are enabled

1 - Character sets defined by bit 1 and bit 2 are disabled and the "Yes/No" response is requested

bits 4 to 7:

0

bit 8:

0 - No help information available

1 - Help information available

<text> - String as prompt for text

if <cmdType>=35 (GET INPUT)

#STGI: <cmdType>,<commandDetails>,<text>,<responseMin>, <responseMax>[,<defaultText>]

where: <commandDetails> - unsigned Integer used as a bit field.

0-255 - used as a bit field:

bit 1:

0 - Digits only (0-9, *, #, and +)

1 - Alphabet set

bit 2:

0 - SMS default alphabet (GSM character set)

1 - UCS2 alphabet

bit 3:

0 - ME may echo user input on the display

1 - User input is not revealed in any way. Hidden entry mode (see GSM 11.14) is only available when using digit input. In hidden entry mode only characters ('0'-'9', '*' and '#') are allowed.

bit 4:

0 - User input to be in unpacked format

1 - User input to be in SMS packed format

bits 5 to 7:

0

bit 8:

0 - No help information available

1 - Help information available

<text> - string as prompt for text

<responseMin> - minimum length of user input 0-255

<responseMax> - maximum length of user input 0-255

<defaultText> - string supplied as default response text

if <cmdType>=36 (SELECT ITEM)

The first line of output is:

#STGI: <cmdType>,<commandDetails>,<numOfItems>[,<titleText>] <CR><LF>

One line follows for every item, repeated for <numOfItems>:

#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]

where:

<commandDetails> - unsigned Integer used as a bitfield

0-255 - used as a bit field:

bit 1:

0 - Presentation type is not specified

1 - Presentation type is specified in bit 2

bit 2:

0 - Presentation as a choice of data values if bit 1 = '1'

1 - Presentation as a choice of navigation options if bit 1 is '1'

bit 3:

0 - No selection preference

1 - Selection using soft key preferred

bits 4 to 7:

0

bit 8:

0 - No help information available

1 - Help information available

<numOfItems> - number of items in the list

<titleText> - string giving menu title

<itemId> - item identifier

1..<numOfItems>

<itemText> - title of item

<nextActionId> - the next proactive command type to be issued upon execution of the menu item.

0 - no next action information available.

if <cmdType>=37 (SET UP MENU)

The first line of output is:

#STGI: <cmdType>,<commandDetails>,<numOfItems>,<titleText> <CR><LF>

One line follows for every item, repeated for <numOfItems>:

#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]

where: <commandDetails> - unsigned Integer used as a bitfield

0-255 - used as a bit field:

bit 1:

0 - no selection preference

1 - selection using soft key preferred

bit 2 to 7:

0

bit 8:

0 - no help information available

1 - help information available

<numOfItems> - number of items in the list

<titleText> - string giving menu title

<itemId> - item identifier

1..<numOfItems>

<itemText> - title of item

<nextActionId> - the next proactive command type to be issued upon execution of the menu item.

0 - no next action information available.

Note: Upon receiving the #STGI response, the TA must send #STSR command (see below) to confirm the execution of the proactive command and provide any required user response, for example selected menu item.

Notes

- The unsolicited notification sent to the user:

#STN: 37

Indicates that the main menu of the SIM Application is sent to the TA. It is stored by the TA so that it can be displayed later at any time by issuing an AT#STGI=37 command.

A typical SAT session on AT interface starts after a #STN: 37 unsolicited code is received, if enabled. At that point usually an AT#STGI=37 command is issued, and after the SAT main menu is displayed on TE an AT#STSR=37,0,x command is issued to select an item in the menu (see below). The session usually ends with a SIM action like sending an SMS, or starting a call. After this, to restart the session from the beginning going back to SAT main menu it is usually required an AT#STSR=37,16 command.

- The unsolicited notification sent to the user:

#STN:237

Indicates that the main menu of the SIM Application is removed from the TA, and it is no longer available. In this case AT#STGI=37 command response is always ERROR.

SIM Tookit Send Response #STSR

The write command provides, to the SIM, a user's response to a command and any required user information, for example a selected menu item.

Read command requests the currently ongoing proactive command and the SAT state in the format:

#STSRI: <state>,<cmdType>

where

<state>	SAT interface state. See #STIA.
<cmdType>	On-going proactive command.

An error message is returned if there is no pending command.

Test command returns the range for the parameters <state> and <cmdType>.

Syntax

Command	Command type
AT#STSR=[<cmdType>,<userResponse>[,<data>]]	Write
AT#STSR?	Read
AT#STSR=?	Test

Parameters and values

<cmdType>	Integer type; proactive command ID according to GSM 11.14. See #STGI.
<userResponse >	Action performed by the user.
0	Command performed successfully. Call accepted in case of call setup.
16	Proactive SIM session terminated by user.
17	Backward move in the proactive SIM session requested by the user.
18	No response from user.
19	Help information required by the user.
20	USSD/SS Transaction terminated by user.
32	TA currently unable to process command.
34	User denied SIM call setup request.
35	User cleared down SIM call before connection or network release.
<data>	Data entered by user, depending on <cmdType>, only required if <Result> is 0.
Get Inkey	<data> contains the key that is user pressed. Used character set is selected with +CSCS. Note: If, as a user response, a binary choice (Yes/No) is requested by the SIM application using bit 3 of the <commandDetails> parameter the valid content of the <inputString> is: a) "IRA", "8859-1", "PCCP437" charsets: "Y" or "y" (positive answer) and "N" or "n" (negative answer) b) UCS2 alphabet "0079" or "0059" (positive answer) and "006E" or "004E" (negative answer)
Get Input	<data> - contains the string of characters entered by the user (see above).
Select Item	<data> - contains the item identifier selected by the user. Note: Use of icons is not supported. All icon related actions respond with no icon available.

SIM Tookit Terminal Attach #STTA

This command attaches/detaches the SIM Toolkit application to the AT instance reserved for this use.

Read command reports the current <state> in the format: .

#STTA: <state>

Test command reports the supported range of values for <state>

Syntax

Command	Command type
AT#STTA=<state>	
AT#STTA?	Read
AT#STTA=?	Test

Parameters and values

<state>	Attached state.	
0	SIM Toolkit detaches.	
1	SIM Toolkit attaches.	
	If SIM Toolkit application is already attached/detached the command does nothing and returns OK.	

Notes

- The AT instance reserved for the SIM Toolkit application is the #3.
- Issuing AT#STTA=<state> when the AT instance is already attached to another service (CMUX, SMSATRUN/TCPATRUN) causes an ERROR result code to be returned.

Phone Book AT Commands

Read Group Entries #CPBGR

Execution command returns Grouping information Alpha String (GAS) USIM file entries in location number range <index1>...<index2>. If <index2> is omitted, only location <index1> is returned. These strings are the names used for groups an ADN entry could belong to.

Test command returns the supported range of values for parameters <indexn> and the maximum length of <text> field, in the format: #CPBGR: (<minIndex> - <maxIndex>),<tlength> where: <minIndex> - the minimum <index> number, integer type <maxIndex>- the maximum <index> number, integer type <tlength> - maximum <text> field length, integer type

Syntax

Command	Command type
AT#CPBGR= <index1> [,<index2>]	Set
AT#CPBGR=?	Test

Parameters and values

<index1>	Integer type, value in the range of location numbers of GAS.

<index2>	Integer type, value in the range of location numbers of GAS.

The response format is:

> [#CPBGR: <index1>,<text>[<CR><LF>
>
> #CPBGR: <index2>,<text>[…]]]
>
> where: <indexn> - the location number of the GAS entry <text> - the alphanumeric text associated to the entry

Write Group Entries #CPBGW

Execution command writes Grouping information Alpha String (GAS) USIM file entry in location number <index>.

Test command returns location range supported by the current storage as a compound value, and maximum length of <text> field. The format is: +CPBGW: (list of supported <index>s),<tlength> where: <tlength> - integer type value indicating the maximum length of field <text> in bytes; actual maximum number of characters that can be stored depends upon <text> coding (see +CSCS)

Syntax

Command	Command type
AT#CPBGW= <index>,<text>	Execution
AT#CPBGW=?	Test

Parameters and values

<index>	Integer type, value in the range of location numbers of the GAS file.
<text>	The text associated to the entry, string type Note: If record number <index> already exists, it is overwritten.

GPS AT Commands

GPS Controller Power Management $GPSP

Set command allows to manage power-up or down of the GPS controller.

Read command reports the current value of the <status> parameter, in the format:

$GPSP: <status>

Test command reports the range of supported values for <status>.

Syntax

Command	Command type
AT$GPSP=<status>	Set
AT$GPSP?	Read
AT$GPSP=?	Test

Parameters and values

<status>

0   GPS controller is powered down.

1   GPS controller is powered up.

Notes

■ Power up clears GPS memory and then starts the GPS receiver. GPS data cleaning is performed on the base of the current value of the <reset_type> parameter. See $GPSR.

■ The current setting is stored through $GPSSAV.

Examples

AT$GPSP=0
OK

GPS Reset $GPSR

Execute command resets the GPS controller.

Test command reports the range of supported values for <reset_type>.

Syntax

Command	Command type
AT$GPSR=<reset_type>	Set
AT$GPSR=?	Test

Parameters and values

<reset_type>

0   Factory reset. This option clears all GPS memory including clock drift.

1   Coldstart, no almanac, no ephemeris. This option clears all data that is currently stored in the internal memory of the GPS receiver including position, almanac, ephemeris, and time. The stored clock drift however, is retained.

2   Warmstart, no ephemeris. This option clears all initialization data in the GPS receiver and subsequently reloads the data that is currently displayed in the Receiver Initialization Setup screen. The almanac is retained but the ephemeris is cleared.

3   Hotstart, with stored almanac and ephemeris. The GPS receiver restarts by using the values stored in the internal memory of the GPS receiver, validated ephemeris and almanac.

Notes

■ The current setting is stored through $GPSSAV.

Examples

AT$GPSR=0
OK

GPS Software Version $GPSSW

Execute command provides GPS Module software version in the format: $GPSSW:

<majorVersion:minorVersion:patchVersion>

Read command provides same information as Execute command.

Test command returns the OK result code.

Syntax

Command	Command type
AT$GPSSW	Execute
AT$GPSSW?	Read
AT$GPSSW=?	Test

Unsolicited NMEA Data Configuration $GPSNMUN

Set command permits to activate an unsolicited streaming of GPS data (in NMEA format) through the standard GSM serial port and defines which NMEA sentences are available.

Read command returns whether the unsolicited GPS NMEA data streaming is currently enabled or not, along with the NMEA sentences availability status, in the format:

$GPSNMUN:<enable>,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG >

Test command returns the supported range of values for <enable>, <GGA>, <GLL>, <GSA>, <GSV>, <RMC>, <VTG>

Syntax

Command	Command type
AT$GPSNMUN=<enable>[,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG >]	Set
AT$GPSNMUN?	Read
AT$GPSNMUN=?	Test

Parameters and values

<enable>

0	NMEA data stream de-activated. **Default: 0.**
1	NMEA data stream activated with the following unsolicited response syntax: $GPSNMUN:<CR><NMEA SENTENCE><CR>.
2	NMEA data stream activated with the following unsolicited response syntax: <NMEA SENTENCE><CR>.
3	Dedicated NMEA data stream; it is not possible to send AT commands; with the escape sequence '+++' the user can return to command mode.

<GGA> Global Positioning System fix data.

| 0 | Disable. **Default: 0**. |

1	Enable.
<GLL>	Geographical position - latitude/longitude.
0	Disable. **Default: 0**.
1	Enable.
<GSA>	GPS DOP and active satellites.
0	Disable. **Default: 0**.
1	Enable.
<GSV>	GPS satellites in view.
0	Disable. **Default: 0**.
1	Enable.
<RMC>	Recommended minimum specific GPS data.
0	Disable. **Default: 0**.
1	Enable.
<VTG>	Course over ground and ground speed.
0	Disable. **Default: 0**.
1	Enable.

Examples

Sets the GSA as available sentence in the unsolicited message

AT$GPSNMUN=1,0,0,1,0,0,0
OK

Turn-off the unsolicited mode

AT$GPSNMUN=0
OK

Give the current frame selected (GSA)

AT$GPSNMUN?
$GPSNMUN: 1,0,0,1,0,0,0
OK

The unsolicited message is:

$GPSNMUN:
$GPGSA,A,3,23,20,24,07,13,04,02,,,,,,2.4,1.6,1.8*3C

Get Acquired Position $GPSACP

Execute command returns information about the last GPS position in the format:

$GPSACP: <UTC>,<latitude>,<longitude>,<hdop>,<altitude>,<fix>,<cog>,<spkm>,<spkn>,<date>,<nsat>

See the Parameters and Values section for a description of these formats.

Read command supplies the same information as the Execute command.

Test command returns the OK result code.

Syntax

Command	Command type
AT$GPSACP	Execute
AT$GPSACP?	Read
AT$GPSACP=?	Test

Parameters and values

This section describes the information displayed when you use the Execute command.

<UTC> UTC time (hhmmss.sss) referred to GGA sentence.

<latitude> Format is ddmm.mmmm N/S, referred to GGA sentence.

where:.

dd - degrees

00-90

mm.mmmm - minutes

00.0000-59.9999

N/S - North / South

<longitude> Format is dddmm.mmmm E/W, referred to GGA sentence.

where:

ddd - degrees

000-180

mm.mmmm - minutes

00.0000-59.9999

E/W: East / West

<hdop> x.x - Horizontal Dilution of Precision, referred to GGA sentence.

<altitude> x.x Altitude - mean-sea-level (geoid) in meters, referred to GGA sentence.

<fix>

0 or 1 Invalid fix.

2 2D fix.

3 3D fix.

<cog> ddd.mm - Course over Ground (degrees, True), referred to VTG sentence, where:

ddd Degrees 000-360

mm	Minutes 00-59
<spkm>	x.x Speed over ground (Km/hr), referred to VTG sentence.
<spkn>	x.x- Speed over ground (knots), referred to VTG sentence.
<date>	ddmmyy Date of Fix, referred to RMC sentence.
	where:
	dd - day 01-31
	mm - month
	01-12
	yy - year
	00-99 - 2000 to 2099
<nsat>	nn - Total number of satellites in use, referred to GGA sentence.
00-12	

Examples

AT$GPSACP
$GPSACP:
122330.000,4542.8106N,01344.2720E,2.25,338.0,3,0.0,0.02,0.01,2
40613,04
OK

Save GPS Parameters Configuration $GPSSAV

Execute command stores the current GPS parameters in the non-volatile memory of the device.

Test command returns the OK result code.

Syntax

Command	Command type
AT$GPSSAV	Execute
AT$GPSSAV=?	Test

Notes

- ■ To use the new configuration, restart the module.

Examples

AT$GPSSAV
OK

Restore to Default GPS Parameters $GPSRST

Execute command resets the GPS parameters to default configuration and stores them in the non-volatile memory of the device.

Test command returns the OK result code.

Syntax

Command	Command type
AT$GPSRST	Execute
AT$GPSRST=?	Test

Notes

- To use the new configuration, restart the module.

Examples

AT$GPSRST
OK

GPS NVRAM Parameters Delete $GPSNVRAM

Execute command deletes the GPS information stored in NVRAM.

Read command reports the current value of the <bitfield> parameter, in the format:

$GPSNVRAM: <bitfield>

Test command returns the supported range of values for <bitfield>,<action>.

Syntax

Command	Command type
AT$GPSNVRAM=<bitfield>,<action>	Execute
AT$GPSNVRAM?	Read
AT$GPSNVRAM=?	Test

Parameters and values

<bitfield>		Integer format. Assistance data mask for the types of GPS-data to read/delete, as follows:
	1	Ephemeris.
	2	Location.
	4	Time.
	8	Almanac.
<action>		
	0	Delete data described in bitfield.

Notes

- The current setting is stored through $GPSSAV.

Examples

AT$GPSNVRAM=15,0
OK

GPS Quality of Service $GPSQOS

Command used to set the location's quality of service (QoS).

Read command returns the current QoS values, in the format:

AT$GPSQOS: <horiz_accuracy>,<vertic_accuracy>,<rsp_time>
,<age_of_location_info>,<location_type>,<nav_profile>,<velocity_request>

Test command returns the list of supported QoS values for each field.

$GPSQOS: (0-1800000),(0-990),(0-14400),(0-1966020),(0-2),(0-3),(0,1)

Syntax

Command	Command type
AT$GPSQOS=[<horiz_accuracy>[,<vertic_accuracy>[,<rsp_time>[,<age_of_location_info>[,<location_type>[,<nav_profile>[,<velocity_reques t>]]]]]]]	Execute
AT$GPSQOS?	Read
AT$GPSQOS=?	Test

Parameters and values

<horiz_accuracy>	Horizontal accuracy in meters.
0 – 1800000	0 is highest accuracy. 1800000 is lowest accuracy. **Default: 1800000.**
<vertic_accuracy>	Vertical accuracy in meters.
0 - 990	0 is highest accuracy. 990 is lowest accuracy. **Default: 990**.
<rsp_time>	Response time in seconds.
0-14400	0 is the low delay. 14400 is the highest delay. **Default: 14400** seconds.
<age_of_location_info>	Maximum age of location.
0-1966020	0 indicates stored location information is not used. **Default: 0**. Value 1966020 indicates the maximum tolerable age of the stored location information. The valid range of interval for SUPL (Transport protocol) is [0 - 65535] seconds and [0 - 1966020] seconds for C-plane (Transport protocol).
<location_type>	Type of location required. Used only in case of C-Plane.
0	Current location. **Default: 0**.
1	Current or last known location.
2	Invalid location, indicates parameter is not used.
<nav_profile>	Navigation profile.
0	Car navigation profile. **Default: 0.**

1	Personal profile.
2	Low speed profile.
3	Invalid profile, indicates parameter is not used.
\<velocity_requ est\>	Velocity information needed.
0	FALSE.
1	TRUE. **Default: 1**

Notes

- The current setting is stored through $GPSSAV.

Examples

AT$GPSQOS=1800000,990,150,0,0,0
OK

GPS Start Location Service Request $GPSSLSR

Command starts the Receiver in Autonomous or A-GPS mode.

Read command returns the current settings, in the format:

$GPSSLSR: <transport_protocol>[,<pos_mode
>[,<client_id>,<clientid_type>[,<mlc_number>,<mlcnumber_type>[,<interval> [,<service_type_id>
[,<pseudonym_indicator>]]]]]] $GPSSLSR: (0-2),(0-3),(40),(0,1),(40),(0,1),(0-7200),(0-255),(0,1)

Syntax

Command	Command type
$GPSSLSR= <transport_protocol>[,<pos_mode>[,<client_id>,<clientid_type> [,<mlc_number>,<mlcnumber_type>[,<interval>[, <service_type_ id> [,<pseudonym_indicator>]]]]]]]	
AT$GPSSLSR?	Read
AT$GPSSLSR=?	$GPSSLSR: (0-2),(0-3),(64),(0,1),(64),(0,1),(0-7200),(0-255),(0,1)

Parameters and values

\<transport_pro tocol\>	
0	CPlane.
1	SUPL.
2	Invalid.
	Note: If <pos_mode > is Autonomous the <transport_protocol> is invalid.
\<pos_mode\>	

0	Pure MS Assisted - Location estimate from the network (MS Assisted mode).
1	MS Based - Assistance Data from the network (MS Based mode).
2	MS Assisted Based - Combination of MS-A and MS-B modes, location estimate computed both at UE and Network.
3	Autonomous – Autonomous GPS mode of operation.
	Note: If <pos_mode> is Autonomous set the <transport_protocol> to invalid.
<client_id>	String parameter containing the ID of the LCS-Client to which the location estimate is transferred.
	Note: <client_id> is mandatory for A-GPS. The <transport_protocol> is Cplane.
<clientid_type>	
0	MSISDN.
1	Invalid. Default: 1.
	Note: <client_id> and <clientid_type> are mandatory for A-GPS mode.
<mlc_number>	String parameter containing the address of the GMLC through which the location estimate is to be sent to the LCS-Client.
	Note: <mlc_number> is mandatory in case of A-GPS.
<mlcnumber_type>	
0	MSISDN.
1	Invalid. **Default: 1.**
	Note: <mlc_number> and <mlcnumber_type> are mandatory for A-GPS mode.
<interval>	GPS reporting period in seconds. Is sent unsolicited.
0 - 7200	If 0, then a single shot NMEA Message is provided Value other than 0 sets the period, in seconds, between each NMEA sentence.
	Note: Use AT$GPSNMUN to enable the Unsolicited NMEA sentences.
	NOTE: If this value is not set, it is assumed to be 0.
<service_type_id>	
0-255	255 indicates that this parameter is not used.
	Note: <service_type_id> is mandatory with A-GPS.
<pseudonym_indicator>	
0	FALSE: display user name at the external client. **Default: 0**.
1	TRUE: display user name as anonymous at the external client.

If C-plane or Supl session is not successfully completed then an unsolicited indication reports the error cause in the following formats: $GPSSLSR: C-PLANE ERROR,NETWORK ERROR, <error_code> where

<error_code>

0 SS_NET_ERROR_INTERNAL_SS_ERROR

1 SS_NET_ERROR_UNKNOWN_SUBSCRIBER

9 SS_NET_ERROR_ILLEGAL_SUBSCRIBER

10 SS_NET_ERROR_BEARERSERVICE_NOT_ PROVISIONED

11 SS_NET_ERROR_TELESERVICE_NOT_PROVISIONED

12 SS_NET_ERROR_ILLEGAL_EQUIPMENT

13 SS_NET_ERROR_CALL_BARRED

16 SS_NET_ERROR_ILLEGAL_SS_OPERATION

17 SS_NET_ERROR_ERROR_STATUS

18 SS_NET_ERROR_NOT_AVAILABLE

19 SS_NET_ERROR_SUBSCRIPTION_VIOLATION

20 SS_NET_ERROR_INCOMPATABILITY

21 SS_NET_ERROR_FACILITY_NOT_SUPPORTED

27 SS_NET_ERROR_ABSENT_SUBSCRIBER

29 SS_NET_ERROR_SHORT_TERM_DENIAL

30 SS_NET_ERROR_LONG_TERM_DENIAL

34 SS_NET_ERROR_SYSTEM_FAILURE

35 SS_NET_ERROR_DATA_MISSING

36 SS_NET_ERROR_UNEXPECTED_DATA_VALUE

37 SS_NET_ERROR_PW_REGISTRATION_FAILURE

38 SS_NET_ERROR_NEGATIVE_PW_CHECK

43 SS_NET_ERROR_NUMBER_OF_PW_ATTEMPTS_VIOLATION

54 SS_NET_ERROR_POS_METHOD_FAILURE

71 SS_NET_ERROR_UNKNOWN_ALPHABET

72 SS_NET_ERROR_USSD_BUSY

121 SS_NET_ERROR_REJECTED_BY_USER

122 SS_NET_ERROR_REJECTED_BY_NETWORK

123 SS_NET_ERROR_DEFLECTION_TO_SERVED_ SUBSCRIBER

124 SS_NET_ERROR_SPECIAL_SERVICE_CODE

125 SS_NET_ERROR_INVALID_DEFLECTED_TO_NUMBER

126 SS_NET_ERROR_MAX_NUMBER_OF_MPTY_ PARTICIPANTS_EXCEEDED

127 SS_NET_ERROR_RESOURCES_NOT_AVAILABLE

255 SS_NET_ERROR_INTERNAL_SS_TIME_OUT

or

$GPSSLSR: C-PLANE ERROR,NETWORK REJECT CAUSE, <error_code>

where

<error_code>

0 SS_NET_REJECT_UNRECOGNIZED_COMPONENT

1 SS_NET_REJECT_MISTYPED_COMPONENT

2 SS_NET_REJECT_BADLY_STRUCTURED_COMPONENT

3 SS_NET_REJECT_DUPLICATE_INVOKE_ID

4 SS_NET_REJECT_UNRECOGNIZED_OPERATION

5 SS_NET_REJECT_MISTYPED_PRO_PARAMETER

6 SS_NET_REJECT_RESOURCE_LIMITATION

7 SS_NET_REJECT_INITIATING_RELEASE

8 SS_NET_REJECT_UNRECOGNIZED_LINKED_ID

9 SS_NET_REJECT_LINKED_RESPONSE_UNEXPECTED

10 SS_NET_REJECT_UNEXPECTED_LINKED_OPERATION

11 SS_NET_REJECT_UNRECOGNIZED_INVOKE_ID

12 SS_NET_REJECT_RETURN_RESULT_UNEXPECTED

13 SS_NET_REJECT_MISTYPED_RES_PARAMETER

14 SS_NET_REJECT_UNRECOGNIZED_ERROR_ INVOKE_ID

15 SS_NET_REJECT_RETURN_ERROR_UNEXPECTED

16 SS_NET_REJECT_UNRECOGNIZED_ERROR

17 SS_NET_REJECT_UNEXPECTED_ERROR

18 SS_NET_REJECT_MISTYPED_ERROR_PARAMETER

19 SS_NET_REJECT_UNKNOWN

or

$GPSSLSR: C-PLANE ERROR,NETWORK GSM CAUSE, <error_code>

where

<error_code>

1 SS_GSM_ERROR_UNASSIGNED_NUMBER

3 SS_GSM_ERROR_NO_ROUTE

6 SS_GSM_ERROR_CHANNEL_UNACCEPTABLE

8 SS_GSM_ERROR_OPERATOR_BARRING

16 SS_GSM_ERROR_NORMAL_CALL_CLEARING

17 SS_GSM_ERROR_USER_BUSY

18 SS_GSM_ERROR_NO_USER_RESPONDING

19 SS_GSM_ERROR_USER_ALERTING_NO_ANSWER

21 SS_GSM_ERROR_CALL_REJECTED

22 SS_GSM_ERROR_NUMBER_CHANGED

26 SS_GSM_ERROR_NON_SELECTED_USER_CLEARING

27 SS_GSM_ERROR_DESTINATION_OUT_OF_ORDER

28 SS_GSM_ERROR_INVALID_NUMBER_FORMAT

29 SS_GSM_ERROR_FACILITY_REJECTED

30 SS_GSM_ERROR_RESPONSE_TO_STATUS_ENQUIRY

31 SS_GSM_ERROR_NORMAL_UNSPECIFIED

34 SS_GSM_ERROR_NO_CIRCUIT_AVAILABLE

38 SS_GSM_ERROR_NETWORK_OUT_OF_ORDER

41 SS_GSM_ERROR_TEMPORARY_FAILURE

42 SS_GSM_ERROR_SWITCH_CONGESTION

43 SS_GSM_ERROR_ACCESS_INFORMATION_ DISCARDED

44 SS_GSM_ERROR_REQUESTED_CIRCUIT_NOT_ AVAILABLE

47 SS_GSM_ERROR_RESOURCES_UNAVAILABLE

49 SS_GSM_ERROR_QUALITY_UNAVAILABLE

50 SS_GSM_ERROR_FACILITY_NOT_SUBSCRIBED

55 SS_GSM_ERROR_INCOMING_CALLS_BARRED_IN_ CUG

57 SS_GSM_ERROR_BEARER_CAPABILITY_NOT_ ALLOWED

58 SS_GSM_ERROR_BEARER_CAPABILITY_NOT_AVAILABLE

63 SS_GSM_ERROR_SERVICE_NOT_AVAILABLE

65 SS_GSM_ERROR_BEARER_SERVICE_NOT_ IMPLEMENTED

68 SS_GSM_ERROR_ACM_GREATER_OR_EQUAL_TO_ ACM_MAX

69 SS_GSM_ERROR_FACILITY_NOT_IMPLEMENTED

70 SS_GSM_ERROR_ONLY_RESTRICTED_DIGITAL

79 SS_GSM_ERROR_SERVICE_NOT_IMPLEMENTED

81 SS_GSM_ERROR_INVALID_TI

87 SS_GSM_ERROR_USER_NOT_IN_CUG

88 SS_GSM_ERROR_INCOMPATIBLE_DESTINATION

91 SS_GSM_ERROR_INVALID_TRANSIT_NETWORK

95 SS_GSM_ERROR_SEMANTICS_INCORRECT

96 SS_GSM_ERROR_INVALID_MANDATORY_ INFORMATION

97 SS_GSM_ERROR_UNKNOWN_MESSAGE_TYPE1

98 SS_GSM_ERROR_UNEXPECTED_MESSAGE_TYPE

99 SS_GSM_ERROR_UNEXPECTED_IE

100 SS_GSM_ERROR_CONDITIONAL_IE_ERROR

101 SS_GSM_ERROR_UNKNOWN_MESSAGE_TYPE2

102 SS_GSM_ERROR_RECOVERY_ON_TIMER_EXPIRY

111 SS_GSM_ERROR_PROTOCOL_ERROR

127 SS_GSM_ERROR_INTERWORKING

or

$GPSSLSR: C-PLANE ERROR,SS LCS CAUSE,<error_code>

where <error_code>

257 SS_LCS_OUTOF_MEMORY

258 SS_LCS_INVALID_PARAM

or

$GPSSLSR: SUPL ERROR,<error_code>

where <error_code>

0 LCS_ERROR_SUPL_UNSPECIFIED

1 LCS_ERROR_SUPL_SYSTEM_FAILURE

2 LCS_ERROR_SUPL_UNEXPECTED_MESSAGE

3 LCS_ERROR_SUPL_PROTOCOL_ERROR

4 LCS_ERROR_SUPL_DATA_MISSING

5 LCS_ERROR_SUPL_UNEXPECTED_DATA_VALUE

6 LCS_ERROR_SUPL_POS_METHOD_FAILURE

7 LCS_ERROR_SUPL_POS_METHOD_MISMATCH

8 LCS_ERROR_SUPL_POS_PROTOCOL_MISMATCH

9 LCS_ERROR_SUPL_TARGET_SET_NOT_REACHABLE

10 LCS_ERROR_SUPL_VERSION_NOT_SUPPORTED

11 LCS_ERROR_SUPL_RESOURCE_SHORTAGE

12 LCS_ERROR_SUPL_INVALID_SESSION_ID

15 LCS_ERROR_SUPL_POSITIONING_NOT_PERMITTED

16 LCS_ERROR_SUPL_AUTH_NET_FAILURE

or

$GPSSLSR: SOCKET ERROR,<error_code>

where <error_code>

-1 INET_RES_SOCKET_ERROR

-114 INET_RES_UNDEFINED

-115 INET_RES_ACCESS

-116 INET_RES_ADDRINUSE

-117 INET_RES_ADDRNOTAVAIL

-118 INET_RES_AFNOSUPPORT

-119 INET_RES_ALREADY

-120 INET_RES_BADF

-121 INET_RES_CONNABORTED

-122 INET_RES_CONNREFUSED

-123 INET_RES_CONNRESET

-124 INET_RES_DESTADDRREQ

-125 INET_RES_FAULT

-126 INET_RES_HOSTDOWN

-127 INET_RES_HOSTUNREACH

-128 INET_RES_INPROGRESS

-129 INET_RES_INTR

-130 INET_RES_INVAL

-131 INET_RES_ISCONN

-132 INET_RES_MFILE

-133 INET_RES_MSGSIZE

-134 INET_RES_NETDOWN

-135 INET_RES_NETRESET

-136 INET_RES_NETUNREACH

-137 INET_RES_NOBUFS

-138 UTA_INET_RES_NOPROTOOPT

-139 UTA_INET_RES_NOTCONN

-140 UTA_INET_RES_NOTSOCK

-141 UTA_INET_RES_OPNOTSUPP

-142 UTA_INET_RES_PFNOSUPPORT

-143 UTA_INET_RES_PROTONOSUPPORT

-144 UTA_INET_RES_PROTOTYPE

-145 UTA_INET_RES_SHUTDOWN

-146 UTA_INET_RES_SOCKTNOSUPPORT

-147 UTA_INET_RES_TIMEDOUT

-148 UTA_INET_RES_WOULDBLOCK

-149 UTA_INET_RES_SEC_SSLERROR

-150 UTA_INET_RES_SEC_ERRFILE

151 UTA_INET_RES_SPECIFIC

Other ERROR

or

$GPSSLSR: ERROR

Notes

■ The current setting is stored through $GPSSAV.

■ Note: If <transport_protocol> is CPlane and <pos_mode > is Pure MS Assisted, then <interval> should be 0 (or omitted).

Examples

AT$GPSSLSR= 2,3,,,,,1
OK

GPS Stop Location Service Request $GPSSTOP

Command stops the Receiver in Autonomous or A-GPS mode initiated through $GPSSLSR set command.

Read command returns the current value of parameter <abourt_cause>.

Syntax

Command	Command type
$GPSSTOP=[<abort_cause>]	
$GPSSTOP?	Read
$GPSSTOP=?	Test

Parameters and values

<abort_cause>

0   User denies request.

1   Unspecified cause for abort. **Default: 1**.

2   Cause invalid.

Notes

■ The current setting is stored through $GPSSAV.

Examples

AT$GPSSTOP=1
OK

Update SLP Address $LCSSLP

Set command allows updating the SLP address and SLP port number.

Read command returns the current SLP address.

Test command returns the range of values for parameter <slp_address_type>.

Syntax

Command	Command type
AT$LCSSLP=<slp_address_type>[,<slp_address>[,< slp_port_number>]]	Set
AT$LCSSLP?	Read
AT$LCSSLP=?	Test

Parameters and values

<slp_address_type>	SLP address type.	
	0	IPv4.
	1	FQDN.
	2	IMSI **Default: 2**.
<slp_address>	SLP address in FQDN format or IPv4 format.	
<slp_port_number>	SlP Port number. Integer parameter. **Default: 7275.**	

Notes

- If <slp_address_type> is 0 or 1, then <slp_address> is a mandatory parameter.
- The current setting is stored in NVM.

Update Location Information $LCSLUI

Set command allows updating the location information.

Test command returns the range of values for <update_type>.

Syntax

Command	Command type
AT$LCSLUI=<update_type>	Set
AT$LCSLUI=?	Test

Parameters and values

<update_type>	Current access technology.	
	0	GSM.
	1	WCDMA.

Notes

- To read the current access technology, use AT+COPS?.

Update Terminal Information #LCSTER

Set command updates the terminal information like IMSI, MSISDN or IPv4 address.

Syntax

Command	Command type
AT$LCSTER=<id_type>[,<id_value>[,<pref_pos_mode>[,<tls_mode>]]]	Set

Parameters and values

<id_type>	A number.

0	MSIDSN.
1	IMSI **Default: 1**.
2	IPv4 address.
3	Invalid.
<id_value>	A string, as defined in <id_type>.
<pref_pos_mode>	Preferred position mode.
0	Default position mode.
1	None preferred position mode.
<tls_mode>	Indicates if TLS mode is used by the SET.
0	Non-TLS mode.
1	TLS mode. **Default: 1**.

Notes

- If <id_type> is MSISDN or IPv4 address then <id_value> is entered.

Enable/Disable Unsolicited Response $LICLS

Set command enables or disables unsolicited $LICLS response.

Read command returns the current value of parameter <mode>.

Test command returns the range of values for parameter <mode>.

Syntax

Command	Command type
AT$LICLS =<mode>	Set
AT$LICLS?	Read
AT$LICLS=?	Test

Parameters and values

<mode>	
0	Disable unsolicited. .

1	Enable unsolicited.**Default: 1**

The unsolicited result code is in the format: $LICLS: <request_type>[,<cid>]

where

<request_type>

0 – Setup request to setup the control link.

1 – Release request to release the control link.

<cid> : ID associated to the context that is deactivated (see +CGDCONT).

If the <request_type> is a setup request, the unsolicited indication is sent/used to request the client to define, setup, activate and prepare the pdp-context. If <request_type> is a release request, the unsolicited indication is sent/used to inform the client that the pdp-context (associated with this command type) including the associated terminal is not used any more, and is deactivated.

Notes

∎ Note: The current setting is stored in NVM.

MT Location Request Mode $LCSLRMT

Set command enables or disables unsolicited $LCSLRMT response.

Read command returns the current value of parameter <mode>.

Test command returns the range of values for parameter <mode>.

Syntax

Command	Command type
AT$LCSLRMT=<mode>	Set
AT$LCSLRMT?	Read
AT$LCSLRMT=?	Test

Parameters and values

<mode>

0   Disable unsolicited. **Default: 0.**

1   Enable unsolicited.

Notes

∎ The unsolicited result code is in the format:

$LCSLRMT: <transport_protocol>,<Notif_type>,<Loc_estimate_type>,<Client_Id>,<Client_NameEncoding_type>, <Client_Name_Type>,<Client_Name>,<Requestor_Id_Encoding_type>,<Requestor_Id_Type>, <Requestor_Id>,<Codeword>,<Service_Type_id>,<reqid>

where:

0 C-Plane protocol.

1 SUPL protocol.

2 Invalid.

<Notif_type>

0 Notify.

1 Verify request. No response is treated as permission granted. See $LCSLRV.

2 Verify request. No response is treated as permission denied. See $LCSLRV.

<Loc_estimate_type>

0 Current location.

1 Current or last location known.

2 Initial location.

<Requestor_Id_Encoding_type>

<Client_Name _Encoding_type>

0 UCS2.

1 GSM default format.

2 UTF-8 format.

3 invalid format.

<Client_Name_Type>

<Requestor_Id_Type>

0 MSISDN.

1 IMSI.

2 IPV4.

3 IPV6.

4 Logical name.

5 Email address.

6 URL.

7 SIP URL.

8 IMS Public Identity.

9 USSD type.

10 Invalid type.

<Client_Name>

<Requestor_Id>

<Codeword> Displayed as per data coding scheme.

<Service_Type_id>

0-127

<reqid> Integer that identifies the request. Note: <reqid> uniquely identifies the MT-LR sent by the network and the same <reqid> is returned in AT$LCSLRV command if <Notif_type> is of type "Verify request".

Location Request Verification $LCSLRV

Set command verifies a location request coming from the network.

The verification is sent back to the network with request id. Test command returns the range of values for <permission>.

Syntax

Command	Command type
AT$LCSLRV=<permission>,<reqid>	Set
AT$LCSLRV=?	Test

Parameters and values

<permission>

0	Permission denied. **Default: 0**.
1	Permission granted.
<reqid>	Uniquely identifies the MT-LR sent by the network.

LCS Certificate $LTC

Set command passes the security objects (for example certificate, key) to the Transport Layer Security Protocol (binary string).

Execution command deletes the certificates stored in NVM.

Read command provides the first 300 characters of each valid certificate stored in NVM in the format: $LTC: <string>,<total_message_length>,1, <Security_Object_Type> If no certificate is stored the read command provides: $LTC: "",0,1 ,<Security_Object_Type>

Test command returns the range of values for <total_message_length> <seq_no> and <Security_Object_type>.

Syntax

Command	Command type
AT$LTC=<string>,<total_message_length>,<seq_no>,<Security_ Object_Type>	Set
AT$LTC	Execution

Command	Command type
AT$LTC?	Read
AT$LTC=?	Test

Parameters and values

<string>	The string certificate segment. Maximum 300 bytes per segment.
<total_message _length>	The total size of the certificate to be received.
1-4096	
<seq_no>	The sequence number of the segment.
1-13	
<Security_Obje ct_Type>	0: Root Certificate.

Lock Context for LCS Use $LCSLK

Set command reserves a cid for LCS. Note: The set command returns ERROR if the current cid or the previously set are in use.

Read command returns the current value of parameters <mode> and <cid>, if <mode> is lock.

Test command returns the range of values for <mode> and <cid>.

Syntax

Command	Command type
AT$LCSLK=<mode>[,<cid>]	Set
AT$LCSLK?	Read
AT$LCSLK=?	Test

Parameters and values

<mode>	
0	Unlock the current cid available for LCS use.
1	Lock the specified cid to setup/release a control link for LCS use only.
<cid>	PDP context identifier.
1-5	Numeric parameter which specifies a particular PDP context definition. Note: <cid> is mandatory if <mode> is set to lock, otherwise omitted.

Notes

- <cid> is mandatory if <mode> is set to lock, otherwise shall be omitted.
- The set command returns ERROR if the current cid and/or the previously set are in use.
- The current setting is stored in NVM.

Audio AT Commands

Tone Configuration

Audio Basic Configuration

You can use audio commands for MTPCIE H5 and MTCBA H5/EV3.

Select Ringer Sound #SRS

Set command sets the ringer sound. Read command reports current selected ringing and its status in the form:

#SRS: <n>,<status>

where:

<n>	Ring tone number.
1-max	
<status>	Ringing status.
0	Selected but not playing.
1	Currently playing.

Test command reports the supported values for <n> and <tout>.

Syntax

Command	Command type
AT#SRS=[<n>,<tout>]	Set
AT#SRS?	Read
AT#SRS=?	Test

Parameters and values

<n>	Ringing tone.
0	Current ringing tone.
1-max	Ringing tone number. To determine the maximum, issue the Test command AT#SRS=?.
<tout>	Ringing tone playing timer in units of seconds.
0	Ringer is stopped (if present) and current ringer sound is set.
1-60	Ringer sound playing for <tout> seconds and, if <n> > 0, ringer sound <n> is set as default ringer sound.

Notes

- When the command is issued with <n> > 0 and <tout> > 0, the <n> ringing tone is played for <tout> seconds and stored as default ringing tone.
- If command is issued with <n> > 0 and <tout> = 0, the playing of the ringing is stopped (if present) and <n> ringing tone is set as current.

- If command is issued with <n> = 0 and <tout> > 0 then the current ringing tone is played for <tout> seconds.
- If both <n> and <tout> are 0 then the default ringing tone is set as current and ringing is stopped.
- If all parameters are omitted then the behavior of Set command is the same as Read command

Handset Microphone Gain #HSMICG

Set command sets the handset microphone input gain.

Read command returns the current handset microphone input gain, in the format:

#HSMICG: <level>

Test command returns the supported range of values for <level>.

Syntax

Command	Command type
AT#HSMICG=[<level>]	Set
AT#HSMICG?	Read
AT#HSMICG=?	Test

Parameters and values

<level>   Handset microphone input gain.

0-7   Handset microphone gain (+6dB/step). **Default: 0.**

Handset Receiver Gain #HSRECG

Set command sets the handset analogue output gain.

Read command returns the current handset analog output gain, in the format:

#HSRECG: <level>

Test command returns the supported range of values of <level>.

Syntax

Command	Command type
AT#HSRECG=<level>	Set
AT#HSRECG?	Read
AT#HSRECG=?	Test

Parameters and values

<level>   Handset analogue output gain.

0-6   Handset analogue output -3dB/step. **Default: 0.**

Notes

- To save the value of <level> in non-volatile memory, use the AT&W command.

Set Handset Sidetone #SHSSD

Set command enables or disables the sidetone on handset audio output.

Read command reports whether the headset sidetone is currently enabled or not, in the format:

#SHSSD: <mode>

Test command returns the supported range of values of <mode>.

Syntax

Command	Command type
AT#SHSSD=<mode>	Set
AT#SHSSD?	Read
AT#SHSSD=?	Test

Parameters and values

<mode>

0   Disables the handset sidetone.

1   Enables the handset sidetone. **Default: 1.**

Notes

■ To save the value of <mode> in non-volatile memory issue the AT&W command.

Speaker Mute Control #SPKMUT

Set command enables or disables the global muting of the speaker audio line, for every audio output—ring, incoming sms, voice, network coverage.

Read command reports whether the muting of the speaker audio line during a voice call is enabled or not, in the format:

#SPKMUT: <n>

Test command reports the supported values for <n>.

Syntax

Command	Command type
AT#SPKMUT=<n>	Set
AT#SPKMUT?	Read
AT#SPKMUT=?	Test

Parameters and values

<n>

0   Mute off, speaker active. **Default: 0.**

1   Mute on, speaker muted.

Notes

- Set command mutes/activates both speaker audio paths, internal speaker and external speaker.

Echo Reducer Configuration - #ECHOCFG

Set command writes values in echo reducer parameters. It is not allowed if active audio profile is 0. The module responds to the set command with the prompt '>' and waits for the data to send.

Read command reports the currently set parameters in the format: #ECHOCFG: <par_1><par2>…<parN> <par_i>: Full set of registers values dumped in hexadecimal form, 39 words (156 characters). It is not allowed if active audio profile is 0.

Test command reports supported range of values for all parameters in the format: #ECHOCFG: <i>, (<low_i>-<high_i>) Where <i>: Parameter index <low_i>: Lower limit of <par_i> <high_i>: High limit of <par_i>

Syntax

Command	Command type
AT#ECHOCFG=<par_1> [,<par_2>[,…,<par_N>]]	Set
AT#ECHOCFG?	Read
AT#ECHOCFG=?	Test

Parameters and values

<par_1>

0 – configure all parameters, module awaits 39 values

Parameters: <par_1> 1,2,..,39 – configure single parameters, module awaits 1 value

<par_i> with i = {2;N} Configure every parameter specified after '>' to complete the operation send Ctrl-Z char (0x1A hex). To exit without writing the message send ESC char (0x1B hex). Data is written in hexadecimal form with 4 digits for every <par_i> value provided by set command. If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Parameters can be saved in NVM using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed. Note: Configuring single parameters, it is allowed to enter a maximum of 32 parameters.

1,2,..,39

Signaling Tones Mode #STM

Set command enables or disables the signaling tones output on the audio path.

Read command reports whether the current signaling tones status is enabled or not, in the format:

#STM: <mode>

Test command reports supported range of values for <mode>.

Syntax

Command	Command type
AT#STM=[<mode>]	Set

Command	Command type
AT#STM?	Read
AT#STM=?	Test

Parameters and values

<mode>	Signaling tones status.
0	Signaling tones disabled.
1	Signaling tones enabled.
2	All tones disabled.

Notes

- ■ AT#STM=0 has the same effect as AT+CALM=2.
- ■ AT#STM=1 has the same effect as AT+CALM=0.

Tone Playback #TONE

Execute command allows the reproduction of DTMF tones, standard free tone, standard busy tone and a set of user defined tones for a certain time.

Test command returns the supported range of values for <tone> and <duration>.

Syntax

Command	Command type
AT#TONE=<tone>[,<duration>]	Execute
AT#TONE=?	Test

Parameters and values

<tone>	ASCII characters. Range: ((0-9),#,*,(A-D),(G-L),Y,Z).
(0-9), #,*,(A-D)	DTMF tone.
G-L	User-defined tones.
Y	Free tone.
Z	Busy tone.
<duration>	Duration of current tone in 1/10 of second.
1-300	Tenth of seconds **Default: 30.**

Notes

- ■ For more information about setting user-defined tones see AT#UDTSET.

Extended Tone Generation #TONEEXT

Execute command allows the reproduction of DTMF tones, standard free tone, standard busy tone and a set of user defined tones for a infinite time, or stop the running tone.

Test command returns the range of supported values for <toneId>,<AcT>.

Syntax

Command	Command type
AT# TONEEXT=<toneId>,<AcT>	Execute
AT# TONEEXT=?	Test

Parameters and values

<toneId>	ASCII characters in the set (0-9), #,*,(A-D),(G-L),Y,Z.
(0-9), #,*,(A-D)	DTMF tone.
G-L	User-defined tones.
Y	Free tone.
Z	Busy tone.
<AcT>	Action to be performed.
0	Stop the <toneId> if running.
1	Start the <toneId>.

Tone Classes Volume #TSVOL

Set command selects the volume mode for one or more tone classes.

Read command returns for each class of tones the last setting of <mode> and, if <mode> is not 0, of <volume> too, in the format:

#TSVOL: 1,<mode1>[,<volume1>]<CR><LF>

...

  #TSVOL:128,<mode128>[,<volume128>]

Test command returns the supported range of values of <class>, <mode> and <volume>.

Syntax

Command	Command type
AT#TSVOL=<class>,<mode>[,<volume>]	Set
AT#TSVOL?	Read
AT#TSVOL=?	Test

Parameters and values

<class>	Sum of integers, each representing a class of tones to which the command refers.
1	GSM tones.
2	Ringer tones.
4	Alarm tones.
8	Signaling tones.
16	DTMF tones.

32	SIM toolkit tones.
64	User-defined tones.
128	Dial tones.
255	All classes.
<mode>	Indicates volume that is used for the classes of tones represented by <class>.
0	Default volume is used.
1	The volume <volume> is used.
<volume>	Volume to be applied to the set of classes of tones represented by <class>; it is mandatory if <mode> is 1.
0-max	To get the value of max, issue the Test command AT#TSVOL=?.

Notes

■ The class DTMF Tones (<class>=16) refers only to the volume for locally generated DTMF tones. It does not affect the level of the DTMF generated by the network as result of AT+VTS command.

Examples

AT#TSVOL=64,1,5
OK
AT#TSVOL?
#TSVOL:1,0
#TSVOL:2,0
#TSVOL:4,1,5
#TSVOL:8,0
#TSVOL:16,1,5
#TSVOL:32,0
#TSVOL:64,1,5
#TSVOL:128,0
OK

User Defined Tone SET #UDTSET

command Set command sets frequency and amplitude composition for a user-defined tone. Read command returns the current settings for the tones:

#UDTSET: G,<F1>,<A1>,<F2>,<A2>,<F3>,<A3>
#UDTSET: H, <F1>,<A1>,<F2>,<A2>,<F3>,<A3>
#UDTSET: I, <F1>,<A1>,<F2>,<A2>,<F3>,<A3>
#UDTSET: J, <F1>,<A1>,<F2>,<A2>,<F3>,<A3>
#UDTSET: K, <F1>,<A1>,<F2>,<A2>,<F3>,<A3>
#UDTSET: L, <F1>,<A1>,<F2>,<A2>,<F3>,<A3>

Test command returns the supported range of values for <tone>, <Fi> and <Ai>.

Syntax

Command	Command type
AT#UDTSET=<tone> ,<F1>,<A1>[,<F2>,<A2>[,<F3>,<A3>]]	Set
AT#UDTSET?	Read
AT#UDTSET=?	Test

Parameters and values

<tone> Tone index (G,H,I,J,K,L).

<Fi> Frequency in Hz. Range: (300,3000) in step of 1 Hz.

<Ai> Amplitude in dB. Range: (10,100) in step of 1 dB.

Notes

■ Ai = 100 is equal to the maximum value of the single tone. Lower values attenuate output to the difference between 100 and the selected amplitude (ex: Ai = 80 is equal to 100-80 = -20dB).

■ Issuing AT&F1 or AT&Z has the effect to set the parameters with the last saved in non-volatile memory values

■ Ai = 0 and Fi = 0 are only values for uninitialized parameters and cannot be issued by AT command. Every time the set command is issued, the unspecified parameters are automatically reset to zero.

■ (Ai,Fi) issuing needs also (Aj,Fj) with j<i.

User Defined Tone SAVE #UDTSAV

command Execute command saves the actual values of frequency and amplitude that are set with #UDTSET.

Test command returns the OK result code.

Syntax

Command	Command type
AT#UDTSAV	Execute
AT#UDTSAV=?	Test

Examples

Current tones are saved in non-volatile memory.

AT#UDTSAV
OK

User Defined Tone Reset #UDTRST command

Execute command resets to default values for frequency and amplitude, which you can set by using #UDTSET.

Test command returns the OK result code.

Syntax

Command	Command type
AT#UDTRST	Execute
AT#UDTRST=?	Test

Examples

The default value tones are restored in non-volatile memory.

AT#UDRST
OK

Audio Profiles

Audio Profile Factory Configuration #PRST

Execute command resets the actual audio parameters in the non-volatile memory of the device to the default set. It is not allowed if active audio profile is 0. The audio parameters reset are:

- Uplink path biquad filters.
- Downlink path biquad filters.

Test command returns the OK result code.

Syntax

Command	Command type
AT#PRST	Execute
AT#PRST=?	Test

Examples

Current audio profile is reset.

AT#PRST
OK

Audio Profile Configuration Save #PSAV

Execute command saves the actual audio parameters in the non-volatile memory of the device. Saving is not allowed if active audio profile is 0.

The audio parameters to store are:

- Uplink path biquad filters.
- Downlink path biquad filters.

Test command returns the OK result code.

Syntax

Command	Command type
AT#PSAV	Execute
AT#PSAV=?	Test

Examples

To save current audio profile in non-volatile memory:

AT#PSAV
OK

Audio Profile Selection #PSEL

Set command selects the active audio profile.

The Read command returns the active profile in the format:

#PSEL:<prof>

Test command returns the supported range of values of parameter <prof>.

Syntax

Command	Command type
AT#PSEL=<prof>	Set
AT#PSEL?	Read
AT#PSEL=?	Test

Parameters and values

<prof>	Current profile.
0	Standard profile.
1-3	Extended profile, modifiable.

Notes

■ To save <prof> value in non-volatile memory, use the AT&W command.

Audio Filters

Uplink Path Biquad Filters #BIQUADIN

Set command allows to configure the parameters of the two cascaded digital biquad filters H(first)(z) x H(second)(z) in Uplink path (sending). It is not allowed if active audio profile is 0.

Read command returns the parameters for the active profile in the format:

#BIQUADIN: <aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<aS2>,<bS1>,<bS2>

It is not allowed if active audio profile is 0. Test command returns the supported range of values for <aF0>, <aF1>, <aF2>, <bF1>, <bF2>, <aS0>, <aS1>, <aS2>, <bS1>, <bS2>

Syntax

Command	Command type
AT# BIQUADIN=<aF0>[,<aF1>[,<aF2>[,<bF1>[,<bF2>[,<aS0> [,<aS1>[,<aS2>[,<bS1>[,<bS2>]]]]]]]]]	Set

Command	Command type
AT# BIQUADIN?	Read
AT# BIQUADIN=?	Test

Parameters and values

<aFn>,<bFn>,<aSn>,<bSn>

They all are specific parameters for the calculation of digital biquad filters as follows:

$$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

$$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$

-32768-32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15).

Note: In the formulas pay attention to the multiplier (2) for parameters <aF1>, <aS1>, <bF1> and <bS1>.

Parameters can be saved in non-volatile memory using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.

Extended Uplink Biquad Filters #BIQUADINEX

Set command allows to configure the parameters of the two extended digital biquad filters H(first)(z) x H(second)(z) in Uplink path (sending). It is not allowed if active audio profile is 0.

Read command returns the parameters for the active profile in the format:

#BIQUADINEX: <aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<aS2>,<bS1>,<bS2>

Note: It is not allowed if active audio profile is 0; in this case an ERROR is returned. Test command returns the supported range of values for <aF0>, <aF1>, <aF2>, <bF1>, <bF2>, <aS0>, <aS1>, <aS2>, <bS1>, <bS2>

Syntax

Command	Command type
AT#BIQUADINEX=<aF0>[,<aF1>[,<aF2>[,<bF1>[,<bF2>[,<aS0> [,<aS1>[,<aS2>[,<bS1>[,<bS2>]]]]]]]]]	Set
AT#BIQUADINEX?	Read
AT#BIQUADINEX=?	Test

Parameters and values

<char>

<aFn>,<bFn>,<aSn>,<bSn> - they all are specific parameters for the calculation of digital biquad filters as follows:

$$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

$$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$

two's complement format with 15 fractional bits in a 16 bit word (Q15)

Note: In the above formulas pay attention to the multiplier (2) for parameters <aF1>, <aS1>, <bF1> and <bS1>

Parameters can be saved in non-volatile memory using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.

Cascaded Filters #BIQUADOUT

Set command allows to configure the parameters of the two cascaded digital biquad filters H(first)(z) x H(second)(z) in Downlink path (receiving). It is not allowed if active audio profile is 0.

Read command returns the parameters for the active profile in the format:

BIQUADOUT: <aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<S2>,<bS1>,<bS2>

It is not allowed if active audio profile is 0. Test command returns the supported range of values for <aF0>, <aF1>, <aF2>, <bF1>, <bF2>, <aS0>, <aS1>, <aS2>, <bS1>, <bS2>

Syntax

Command	Command type
AT#BIQUADOUT=<aF0>[,<aF1>[,<aF2>[,<bF1>[,<bF2>[,<aS0>[,<aS1>[,<aS2> [,<bS1>[,<bS2>]]]]]]]]]	Set
AT#BIQUADOUT?	Read
AT#BIQUADOUT=?	Test

Parameters and values

<aFn>,<bFn>,<aSn>,<bSn> All are specific parameters for the calculation of digital biquad filters as follows:

$$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

$$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$

-32768-32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15). Note: In the formulas, pay attention to the multiplier (2) for parameters <aF1>, <aS1>, <bF1> and <bS1>

Parameters can be saved in non-volatile memory using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.

Extended Downlink Biquad Filters #BIQUADOUTEX

Set command allows to configure the parameters of the two extended digital biquad filters H(first)(z) x H(second)(z) in Downlink path (receiving). It is not allowed if active audio profile is 0.

Read command returns the parameters for the active profile in the format:

#BIQUADOUTEX: <aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<aS2>,<bS1>,<bS2>

Note: It is not allowed if active audio profile is 0; in this case an ERROR is returned.

Test command returns the supported range of values for <aF0>, <aF1>, <aF2>, <bF1>, <bF2>, <aS0>, <aS1>, <aS2>, <bS1>, <bS2>.

Syntax

Command	Command type
AT#BIQUADOUTEX=<aF0>[,<aF1>[,<aF2>[,<bF1>[,<bF2>[,<aS0>[,<aS1> [,<aS2>[,<bS1>[,<bS2>]]]]]]]]]	Set
AT#BIQUADOUTEX?	Read
AT#BIQUADOUTEX=?	Test

Parameters and values

<aFn>,<bFn>,<aSn>,<bSn>

All are specific parameters for the calculation of digital biquad filters as follows:

$$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

$$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$

-32768-32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15).

Note: In the formulas pay attention to the multiplier (2) for parameters <aF1>, <aS1>, <bF1> and <bS1>

Parameters can be saved in non-volatile memory using AT#.PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.

Echo Canceller Configuration

Handsfree Echo Canceller #SHFEC

This command has no effect and is included for backward compatibility.

Read command reports the value of <mode>, in the format:

#SHFEC: <mode>

Test command returns the supported range of values of <mode>.

Syntax

Command	Command type
AT#SHFEC=[<mode>]	Set
AT#SHFEC?	Read
AT#SHFEC=?	Test

Parameters and values

<mode>

0-1   Default: 0.

Notes

■ Value returns to default after power off.

Handset Echo Canceller #SHSEC

Set command enables or disables the echo canceller function on audio handset output.

Read command reports whether the echo canceller function on audio handset output is currently enabled or not, in the format:

#SHSEC: <mode>

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT#SHSEC =<mode>	Set
AT#SHSEC ?	Read
AT#SHSEC =?	Test

Parameters and values

<mode>

0   Disables echo canceller for handset mode. **Default: 0**.

1   Enables echo canceller for handset mode.

Notes

■ To save <mode> value in non-volatile memory use the AT&W command.

Handsfree Automatic Gain Control #SHFAGC

This command has no effect and is included only for backward compatibility.

Read command reports the value of <mode>, in the format:

#SHFAGC: <mode>

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT# SHFAGC =<mode>	Set
AT# SHFAGC?	Read
AT# SHFAGC=?	Test

Parameters and values

<mode>

0-1   **Default: 0**.

Notes

■ To save <mode> value in non-volatile memory use the AT&W command.

Handset Automatic Gain Control #SHSAGC

Set command enables or disables the automatic gain control function on audio handset input.

Read command reports whether the automatic gain control function on audio handset input is currently enabled or not, in the format:

  #SHSAGC: <mode>

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT#SHSAGC =<mode>	Set
AT#SHSAGC?	Read
AT#SHSAGC=?	Test

Parameters and values

<mode>

0   Disables automatic gain control for handset mode. **Default: 0**.

1   Enables automatic gain control for handset mode.

Notes

■ Note: This parameter is saved in non-volatile memory issuing AT&W command.

Syntax

Command	Command type

Parameters and values

<n>

0   .

1

Notes

■

■ Embedded DTMF Decoder

Embedded DTMF Decoder Enabling #DTMF

Set command enables or disables the embedded DTMF decoder.

Read command reports the currently selected <mode> in the format:

#DTMF: <mode>

Test command reports supported range of values for all parameters.

Syntax

Command	Command type
AT#DTMF=<mode>	Set
AT#DTMF?	Read
AT#DTMF=?	Test

Parameters and values

<mode>

0   Disable DTMF decoder. **Default: 0**.

1   Enables DTMF decoder.

2   Enables DTMF decoder without URC notify.

Notes

- If <mode>=1, the receiving of a DTMF tone is pointed out with an unsolicited message through AT interface in the following format: #DTMFEV: x with x as the DTMF digit
- Ensure the duration of a tone is not less than 50ms.
- The value set by command is not saved. A software or hardware reset restores the default value.
- To store the value in non-volatile memory, use profiles.
- When DTMF decoder is enabled, PCM playing and recording are automatically disabled.AT#SPCM returns error.

Digital Voice Interface

Digital Voiceband Interface #DVI

Set command enables or disables the Digital Voiceband Interface.

Read command reports last setting, in the format:

#DVI: <mode>,<dviport>,<clockmode>

Test command reports the range of supported values for <mode>,<dviport> and <clockmode>.

Syntax

Command	Command type
AT#DVI=<mode>[,<dviport>,<clockmode>]	Set
AT#DVI?	Read
AT#DVI=?	Test

Parameters and values

<mode>   Enables or disables the DVI.

0   Disable DVI.

1   Enable DVI; audio is forwarded to the DVI block. **Default: 1**

2	Reserved.
<dviport>	2 - DVI port 2 is used.
<clockmode>	
0	DVI slave.
1	DVI master. **Default: 1.**

Examples

DVI is configured as master providing on DVI Port 2, the only available.

AT#DVI=1,2,1
OK

Extended Digital Voiceband Interface #DVIEXT

Set command configures the Digital Voiceband Interface.

Read command reports last setting, in the format:

#DVICFG: <config>,<samplerate>,< samplewidth >,<audiomode>,<edge>

Test command reports the range of supported values for:

<config>,<samplerate>,< samplewidth >,<audiomode>,<edge>

Syntax

Command	Command type
AT#DVIEXT=<config >,[<samplerate>,[< samplewidth>,[<audio mode>,>,[<edge>]]]]	Set
AT#DVIEXT?	Read
AT#DVIEXT=?	Test

Parameters and values

<config>	
0	Busrt mode.
1	Normal mode. **Default: 1**.
<samplerate>	
0	Audio scheduler sample rate 8KHz. **Default: 1**.
1	Audio scheduler sample rate 16KHz.
<samplewidth>	
0	16 bits per sample. **Default: 0**.
1	18 bits per sample.
2	20 bits per sample.
3	24 bits per sample.

4	32 bits per sample.
<audiomode>	
0	Mono mode.
1	Dual mono. **Default: 1**.
<edge>	
0	Data bit is transmitted on falling edge of clock and sampled on rising edge of clock. **Default: 0**.
1	Data bit is transmitted on rising edge of clock and sampled on falling edge of clock.

Values for <edge> are valid only in Burst Mode. Normal Mode is 0.

Miscellaneous Audio Commands

PCM Play and Receive #SPCM

Set command allows user either to send speech sample coming from microphone or downlink audio channel to serial port in PCM format, or to play a PCM stream coming from serial port to speaker or uplink audio channel. As showed in the table below if <mode> = 3 and <dir> = 1 then the speech coming from serial port with selected PCM <format> is sent to uplink and, at the same time, the speech coming from downlink is sent to serial port with selected PCM <format>.

An active speech call is needed when sending/receiving to/from audio channel.

Test command returns the supported range of values for parameters <mode>, <dir> and <format>.

#SPCM: <mode>,<dir>,<format>

Syntax

Command	Command type
AT#SPCM=<mode>, <dir>[,<format>]	Set
AT#SPCM=?	Test

Parameters and values

<mode>	Action to execute.
1	Play PCM stream from serial to selected direction <dir>.
2	Send speech from selected direction <dir> to serial.
3	Send/receive speech to/from selected direction <dir>
<dir>	Select the audio front end
0	Send/receive to/from audio front end.
1	Send/receive to/from audio channel.
2	Reserved.
<format>	PCM bits format.
0	8 bit. **Default: 0**

| 1 | | 16 bit. |

Notes

- Execute command switches module in online mode. Module moves back to command mode either after entering the escape sequence +++ or as a consequence of a DTR transition.
- If you are using 16 bit, you must set +IPR at least to 230400.

The following table summarizes the status of audio path during a speech call for different configurations and with sidetone disabled:

	mode = 1	mode = 2	mode = 3
dir = 0	Uplink off / Downlink on PCM stream on	Uplink off / Downlink off PCM stream from	Not supported
dir = 1	Uplink on / Downlink off PCM stream	Uplink off / Downlink on PCM stream from Downlink	Uplink on / Downlink on PCM stream to/from Uplink/Downlink

Sidetone is active for default.

When DTMF decoder is enabled, PCM playing and recording are automatically disabled AT#SPCM returns error.

Examples

AT#SPCM=1,0,0
CONNECT
+++
NO CARRIER

Note: After CONNECT, 8Khz 8bit PCM stream has to be sent to serial port

AT#SPCM=2,0,0
CONNECT
+++
NO CARRIER

Note: After CONNECT, 8Khz 8bit PCM stream can be read from serial port.

TeleType Writer #TTY

Set command enables or disables the TTY feature.

Read command returns whether the TTY function is currently enabled or not, in the format:

#TTY: <support>

Test command reports the supported range of values for <support>.

Syntax

Command	Command type
AT#TTY=<support>	Set
AT#TTY?	Read

Command	Command type
AT#TTY=?	Test

Parameters and values

<support>

0   Disable TTY function **Default: 0**.

1   Enable TTY function.

Notes

- The value set by this command is directly stored in non-volatile memory and does not depend on the specific AT instance.

Jammed Detect and Report AT Commands

Jammed Detect and Report - #JDR

Set command lets you control the jammed detect and report feature. The MODULE can detect if a communication jammer is active in its range and lets you know this, either on the serial line with an unsolicited code or on a dedicated GPIO by rising it.

Read command reports the current behaviour mode, Maximum Noise Power Level and Disturbed Channel Minimum Number, in the format: #JDR: <mode>,<MNPL>,<DCMN>

Test command reports the supported range of values for the parameters <mode>,<MNPL> and <DCMN>

Syntax

Command	Command type
AT#JDR= [<mode> [,<MNPL>, <DCMN>]]	Set
AT#JDR?	Read
AT#JDR=?	Test

Parameters and values

<mode>   Parameters: <mode> - behaviour mode of the Jammed Detect & Report

0   Disables Jammed Detect and Report (factory default)

1   Enables the Jammed Detect. The Jammed condition is reported on pin GPIO2/JDR GPIO2/JDR Low - Normal Operating Condition GPIO2/JDR High - Jammed Condition.

2   Enables the Jammed Detect. The Jammed condition is reported with a single unsolicited result code on serial line, in the format: #JDR: <status> where: <status> JAMMED - Jammed condition detected OPERATIVE - Normal Operating condition restored. This code will be shown only after a jammed condition has occurred.

3   Enables the Jammed Detect; the MODULE will make both the actions as for <mode>=1 and <mode>=2.

4	Enables the Jammed Detect; the Jammed condition is reported with an unsolicited code every 3s on serial line, in the format: #JDR: <status> where: <status> JAMMED - Jammed condition detected OPERATIVE - Normal Operating condition restored. This code will be shown only after a jammed condition has occurred.
5	Enables the Jammed Detect; the MODULE will make both the actions as for <mode>=1 and <mode>=4.
6	Enables the Jammed Detect (this value is available only for 10.00.xxx release); the Jammed condition is reported in the format: #JDR: <status> where: <status> JAMMED - Jammed condition detected OPERATIVE - Normal Operating condition restored. This code will be shown only after a jammed condition has occurred UNKNOWN – default state before first successful PLMN searching <MNPL> - Maximum Noise Power Level 0..127 (factory default is 70) (NOT AVAILABLE) <DCMN> - Disturbed Channel Minimum Number 0..254 (factory default is 5) (NOT AVAILABLE)

Notes

■ If the device is installed in a particular environment where the default values are not satisfactory the two parameters <MNPL> and <DCMN> permit to adapt the detection to all conditions.

Examples

AT#JDR=2 OK …jammer enters in the range…

#JDR: JAMMED …jammer exits the range…

#JDR: OPERATIVE

AT#JDR=6 #JDR: JAMMED //when jammed

OK

AT#JDR=6 #JDR: OPERATIVE //when in normal operating mode

OK

AT#JDR=6 #JDR: UNKNOWN // default state before 1st PLMN searching

OK

at#moni=0
OK

eCall AT Commands

Initiate eCall +CECALL

Set command is used to trigger an eCall to the network. Based on the configuration selected, it can be used to either trigger a test call, a reconfiguration call, a manually initiated call or an automatically initiated call.

Read command returns the type of eCall that is currently in progress in the format: +CECALL: [<type of eCall>]

Test command reports the supported range of values for parameter <type of eCall>.

Syntax

Command	Command type
AT+CECALL=<type of eCall>	Set
AT+CECALL?	Read
AT+CECALL=?	Test

Parameters and values

<type of eCall>

0	Test call
1	Reconfiguration call
2	Manually initiated eCall
3	Automatically initiated eCall

Notes

- Sending a MSD is pointed out with an unsolicited message through AT interface that can report the HL-ACK data bits or an error code in the following format: #ECALLEV: <prim>,<data> <prim>: 0 – Pull-IND 1 – Data_CNF 2 – AL-Ack 16 – sync loss <data>: Data content of Application Layer message (only with AL-Ack)

Embedded IVS inband modem enabling #ECALL

Set command enables/disables the embedded IVS modem.

Read command reports the currently selected <prim> in the format:

#ECALL: <mode>

where <mode>:

0 – IVS disabled

1 – IVS enabled.

Test command reports supported range of values for all parameters.

Syntax

Command	Command type
AT#ECALL=<mode>	Set
AT#ECALL?	Read
AT#ECALL =?	Test

Parameters and values

<mode>

0	Disable IVS **Default: 0**

1	Enables IVS Note: the sending of a MSD is pointed out with an unsolicited message through AT interface that can report the HL-ACK data bits or an error code in the following format: #ECALLEV: <prim>,<data>
<prim>	:
0	Pull-IND
1	Data_CNF (only with AL-Ack)
2	AL-Ack
16	Sync loss
<data>	Data content of Application Layer message

Notes

- The value set by command is not saved and a software or hardware reset restores the default value. The value can be stored in NVM using profiles.
- When IVS modem is enabled PCM playing, PCM recording and DTMF decoding are automatically disabled (AT#SPCM or AT#DTMF return error).
- +CECALL command supersedes this command because it enables automatically eCall function.

Dial an Emergency Call #EMRGD

This command initiates an emergency call.

The execution command initiates an emergency call without specifying the Service Category.

The read command reports the emergency numbers received from the network (Rel5 feature) and the associated service categories in the format

[#EMRGD: <num1>[,<par1>,<serv>[,<serv>..[,<serv>]]] [#EMRGD: <numn>[,<parn>,<serv>[,<serv>..[,<serv>]]]]

Where <numn> Is the emergency number (that can be dialled with ATD command).

<parn> 1..31 - sum of integers each representing a specific Emergency Service Category: 1 - Police 2 - Ambulance 4 - Fire Brigade 8 – Marine Guard 16 - Mountain Rescue 32 - Manually Initiated eCall (if eCall is supported – Rel8 feature) 64 - Automatically Initiated eCall (if eCall is supported– Rel8 feature)

Example: AT#EMRGD? #EMRGD: 123,2,"Ambul" #EMRGD: 910,5,"Police","FireBrig" OK

Test command reports the supported range of values for parameter <par>. If eCall is supported 0-32,64

If eCall is not supported 0-31

Syntax

Command	Command type
AT#EMRGD[=<par>]	Execution
AT#EMRGD	Execution Command initiates an emergency call without specifying the Service Category.
AT#EMRGD?	Read

Command	Command type
AT#EMRGD=?	Test

Parameters and values

<par>:

0   Initiates an emergency call without specifying the Service Category. (default value)

1..31   Sum of integers each representing a specific Emergency Service Category:

      1 - Police

      2 - Ambulance

      4 - Fire Brigade

      8 – Marine Guard

      16 - Mountain Rescue

32   Manually Initiated eCall (if eCall is supported – Rel8 feature)

64   Automatically Initiated eCall (if eCall is supported– Rel8 feature)

When the emergency call can initiate, an indication of the Service Categories selected is shown before the OK in the following format: #EMRGD: <serv>[,<serv>..[,<serv>]] Where <serv> "Police "Ambul" "FireBrig" "MarineGuard" "MountRescue" "MIeC" "AIeC"

    Example: AT#EMRGD=17 #EMRGD: "Police"," MountRescue " OK

IVS push mode activation #MSDPUSH

Execution command enables IVS to issue the request for MSD transmission. It reuses downlink signal format to send a initiation message to the PSAP.

Test command returns the OK result code.

Syntax

Command	Command type
AT#MSDPUSH	Execution
AT#MSDPUSH=?	Test

Sending MSD data to IVS AT#MSDSEND

Execution command allows to send 140 bytes of MSD data to the IVS embedded while modem is in command mode. The device responds to the command with the prompt '>' and waits for the MSD to send. To complete the operation send Ctrl-Z char (0x1A hex). To exit without writing the message send ESC char (0x1B hex). If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported

The maximum number of bytes to send is 140. Trying to send more data causes the surplus to be discarded and lost.

Test command returns the OK result code.

Syntax

Command	Command type
AT#MSDSEND	Execution
AT#MSDSEND=?	Test

CME Error List

General

Mobile Equipment (ME) Error Result Code - +CME ERROR: <err>

+CME ERROR: <err> is NOT a command. Rather, it is the error response to +Cxxx 3GPP TS 27.007 commands.

Syntax

Command	Command type
+CME ERROR: <err>	This is not a command.

Parameters and values

<err>	The error code can be numeric or verbose. See +CMEE.
Numeric format	**Verbose format**
General errors	
0	Phone failure.
1	No connection to phone.
2	Phone-adaptor link reserved.
3	Operation not allowed.
4	Operation not supported.
5	PH-SIM PIN required.
10	SIM not inserted.
11	SIM PIN required.
12	SIM PUK required.
13	SIM failure. .
14	SIM busy.
15	SIM wrong.
16	Incorrect password.
17	SIM PIN2 required.
18	SIM PUK2 required.
20	Memory full.
21	Invalid index.
22	Not found.
23	Memory failure.
24	Text string too long.
25	Invalid characters in text string.

26	Dial string too long.
27	Invalid characters in dial string.
30	No network service.
31	Network time-out.
32	Network not allowed - emergency calls only.
40	Network personalization PIN required.
41	Network personalization PUK required.
42	Network subset personalization PIN required.
43	Network subset personalization PUK required.
44	Service provider personalization PIN required.
45	Service provider personalization PUK required.
46	Corporate personalization PIN required.
47	Corporate personalization PUK required
General purpose error	
100	Unknown.
GPRS related errors to a failure to perform an Attach:	
103	Illegal MS (#3)*.
106	Illegal ME (#6)*.
107	GPRS service not allowed (#7)*.
111	PLMN not allowed (#11)*.
112	Location area not allowed (#12)*.
113	Roaming not allowed in this location area (#13)*.
	*(values in parentheses are GSM 04.08 cause codes)
GPRS related errors to a failure to Activate a Context and others	
132	Service option not supported (#32)*.
133	Requested service option not subscribed (#33)*.
134	Service option temporarily out of order (#34)*.
148	Unspecified GPRS error. .
149	PDP authentication failure.
150	Invalid mobile class
	*(values in parentheses are GSM 04.08 cause codes)

IP Stack related errors

550	Generic undocumented error.
551	Wrong state.
552	Wrong mode.
553	Context already activated.
554	Stack already active.
555	Activation failed.
556	Context not opened.
557	Cannot setup socket.
558	Cannot resolve DN.
559	Timeout in opening socket.
560	Cannot open socket.
561	Remote disconnected or time-out.
562	Connection failed.
563	Tx error.
564	Already listening.
566	Cannot resume socket.
567	Wrong APN.
568	Wrong PDP.
569	Service not supported.
570	QOS not accepted.
571	NSAPI already used.
572	LLC or SNDCP failure.
573	Network reject.

Custom SIM Lock related errors

586	MCL personalization PIN required.

FTP related errors

600	Generic undocumented error.
601	Wrong state.
602	Cannot activate.
603	Cannot resolve name.
604	Cannot allocate control socket.
605	Cannot connect control socket.

606	Bad or no response from server.
607	Not connected.
608	Already connected.
609	Context down.
610	No photo available.
611	Cannot send photo.
612	Resource used by other instance.

CMS Error List

General

Message Service Failure Result Code - +CMS ERROR: <err>

This is not a command. It is the error response to +Cxxx 3GPP TS 27.005 commands.

Syntax

Command	Command type
+CMS ERROR: <err>	This is not a command.

Parameters and values

<err>	Numeric error code.
0-127	GSM 04.11 Annex E-2 values.
128-255	3GPP TS 23.040 sub 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	SIM not inserted.
311	SIM PIN required.
312	PH-SIM PIN required.
313	SIM failure.
314	SIM busy.
315	SIM wrong.
316	SIM PUK required.
317	SIM PIN2 required.
318	SIM PUK2 required.
320	Memory failure.
321	Invalid memory index.
322	Memory full.
330	SMSC address unknown.
331	No network service.
332	Network time-out.

340	No +CNMA acknowledgement expected.
500	Unknown error.

List of Acronyms

List of Acronyms

ARFCN	Absolute Radio Frequency Channel Number
AT	Attention command
BA	BCCH Allocation
BCCH	Broadcast Control Channel
CA	Cell Allocation
CBM	Cell Broadcast Message
CBS	Cell Broadcast Service
CCM	Current Call Meter
CLIR	Calling Line Identification Restriction
CTS	Clear To Send
CUG	Closed User Group
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DCS	Digital Cellular System
DGPS	Differential GPS, the use of GPS measurements, which are differentially corrected
DNS	Domain Name System
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency
DTR	Data Terminal Ready
GGA	GPS Fix data
GLL	Geographic Position – Latitude/Longitude
GLONASS	Global positioning system maintained by the Russian Space Forces
GMT	Greenwich Mean Time
GNSS	Any single or combined satellite navigation system (GPS, GLONASS and combined GPS/GLONASS)
GPRS	Global Packet Radio Service
GPS	Global Positioning System
GSA	GPS DOP and Active satellites
GSM	Global System Mobile
GSV	GPS satellites in view

HDLC	High Level Data Link Control
HDOP	Horizontal Dilution of Precision
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
IRA	International Reference Alphabet
IWF	Interworking Function
MO	Mobile Originated
MT	Mobile Terminated or Mobile Terminal
NMEA	National Marine Electronics Association
NVM	Non Volatile Memory
PCS	Personal Communication Service
PDP	Packet Data Protocol
PDU	Packet Data Unit
PIN	Personal Identification Number
PPP	Point to Point Protocol
PUK	Pin Unblocking Code
RLP	Radio Link Protocol
RMC	Recommended minimum Specific data
RTS	Request To Send
SAP	SIM Access Profile
SCA	Service Center Address
SMS	Short Message Service
SMSC	Short Message Service Center
SMTP	Simple Mail Transport Protocol
TA	Terminal Adapter
TCP	Transmission Control Protocol
TE	Terminal Equipment
UDP	User Datagram Protocol
USSD	Unstructured Supplementary Service Data
UTC	Coordinated Universal Time
VDOP	Vertical dilution of precision
VTG	Course over ground and ground speed
WAAS	Wide Area Augmentation System