AT Commands Reference Guide

4G Series
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Services & Supports

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About the Document

Revision History

Version	Summary of Change
V1.0.0	Initial release
V1.1.0	Added ML307A related information.
V1.2.0	Added ML302A related information.

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1. Introduction

1.1. Applicable model

Table 1. Applicable modules

Module Series	Sub Model
ML302A	ML302A-DCLM/ML302A-DSLM/ML302A-GCLM/ML302A-GSLM
ML307A	ML307A-DCLN/ML307A-DSLN/ML307A-GCLN/ML307A-GSLN
ML302S	ML302S-DNLM
ML307S	ML307S-DNLM

2. AT Command Overview

This chapter mainly introduces AT command definition and its syntax format.

AT command is a string that sent in a specific format from TE (Terminal Equipment) or DTE (Data Terminal Equipment) to TA (Terminal Adaptor) or DCE (Data Circuit Terminal Equipment) .TE uses TA to send AT command to control the functions of MS (Mobile Station) and interact with network services. Through AT command, users can control phone calls, short messages, phonebooks, data services, supplementary services, and faxes etc.

2.1. AT Command Syntax

AT command must start with "AT" or "at" , and end with a carriage return <CR>; the command is followed by a response with the structure "<CR><LF>response<CR><LF>". For readability, <CR><LF>are often omitted with only the response contents being displayed.

The AT command implemented by China Mobile IoT module includes 3GPP TS 27.005, 3GPP TS 27.007, ITU-TV.25ter standard command set and China Mobile IoT customized extended command set.

According to the syntax structure, AT command can be classified into three types: basic syntax, S parameter syntax and extended syntax.

Basic Syntax

The command format of basic syntax is "AT<x><n>" or "AT&<x><n>", where "<x>" is the command, and "<n>" the command parameter.

For example, the command "ATE<n>". This command determines whether DCE needs to feed back the received characters to DTE according to the value of "<n>". "<n>" is optional, and the default value is used if the value is not included.

S Parameter Syntax

The command format of S parameter syntax is "ATS<n>=<m>", where "<n>" is the index setting of S register, and "<m>" the setting value.

Extended Syntax

This type of AT command has multiple operation modes.

Table 2. AT Command and Response Type

Type	Command	Response Description
Test Command	AT+<CMD>=?	Return parameter list and parameter value range
Read Command	AT+<CMD>?	Return the current value of the parameter
Set Command	AT+<CMD>=<p1>[,<p2[,<p3>[…]]]	Set the parameter value
Execute Command	AT+<CMD>	Perform specific operation

Please note:

- <...> It is the parameter that writes in the angle brackets, and the angle brackets are not included in the actual input;
- [...] It is the optional parameter that writes in the square brackets.

2.2. AT Command Response

Table 3. AT Command Response Type

Response	Response Description
ERROR	AT command format error or other errors
+CME ERROR: <err> or +CMS ERROR: <err> or +CIS ERROR: <err>	The extended error report (+CMEE) is enabled, where <err> represents the error code or detailed error information
OK	AT command executed successfully

Note: In the AT command response result, there is a space after the colon ":" to separate the response header and the parameter list.

Note: The error response in the manual description is represented by +CME ERROR: <err> or +CMS ERROR: <err> or +CIS ERROR: <err>. The actual returns refer to the AT+CMEE command.

3. General Commands

This chapter describes in detail the AT commands and command formats related to version information, DTE configuration, etc.

3.1. ATE Set command echo mode

This setting determines whether the TA echoes characters received from TE during command state.

ATE	
Syntax	Possible Returns
Set Command **ATE**[<**value**>]	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
The DCE may echo characters received from the DTE during command state and online command state back to the DTE, depending on the setting of the E command. If so enabled, characters received from the DTE are echoed at the same rate, parity, and format as received. Echoing characters not recognized as valid in the command line or of incomplete or improperly-formed command line prefixes is manufacturer-specific.	
Defined Values	
<value> Integer type, default is 0. ***0*** Echo mode off ***1*** Echo mode on	

3.2. ATS3 Set command line termination character

This parameter setting determines the character recognized by the TA to terminate an incoming command line. The TA also returns this character in output.

ATS3	
Syntax	Possible Returns
Read Command **ATS3?**	If succeed *<n>* *OK* If fail *+CME ERROR: <err>*
Set Command **ATS3**=[**<n>**]	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This S-parameter represents the decimal IA5 value of the character recognized by the DCE from the DTE to terminate an incoming command line. It is also generated by the DCE as part of the header, trailer, and terminator for result codes and information text.	
Defined Values	
<n> Integer type, default is 13. ***0-13-127*** Command line termination character.[1]	

1. default 13 = CR; parameter <n> only 13 supported in product ML302S/ML307S/ML302A/ML307A.

3.3. ATS4 Set response formatting character

This parameter setting determines the character generated by the TA for result code and information text.

ATS4	
Syntax	Possible Returns
Read Command **ATS4?**	If succeed *<n>* *OK* If fail *+CME ERROR: <err>*
Set Command **ATS4**=[**<n>**]	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This S-parameter represents the decimal IA5 value of the character generated by the DCE as part of the header, trailer, and terminator for result codes and information text.	
Defined Values	
<n> Integer type,default is 10.	
0-10-127 Response formatting character.[2]	

2. Default 10 = LF; parameter <n> only 10 supported in product ML302S/ML307S/ML302A/ML307A.

3.4. ATS5 Command line editing character

This parameter setting determines the character recognized by TA as a request to delete from the command line the immediately preceding character.

ATS5	
Syntax	Possible Returns
Read Command **ATS5?**	If succeed *<n>* *OK* If fail *+CME ERROR: <err>*
Set Command **ATS5**=[**<n>**]	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This S-parameter represents the decimal IA5 value of the character recognized by the DCE as are quest to delete from the command line the immediately preceding character.	
Defined Values	
<n> Integer type,default is 8.	
0-8-127 Command line editing character.[3]	

3. Default 8 = Backspace; parameter <n> only 8 supported in product ML302S/ML307S/ML302A/ML307A.

3.5. +++ Escape from data mode

This command is used to transfer from in-call data mode to in-call command mode without disconnecting from the remote modem.

+++	
Syntax	Possible Returns
Execute Command `+++`	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
The escape sequence is used to transfer from in-call data mode to in-call command mode without disconnecting from the remote modem. After a pause, responds with OK. Register S2 can be used to alter the escape character from ‘+’, the default, to any decimal value in the range 0 to 255.	
Reference V.250	
This command is not preceded by AT and does not require a line terminator.	

3.6. AT&F Set all current parameters to manufacturer defaults

TA sets all current parameters to the manufacturer defined profile.

AT&F	
Syntax	Possible Returns
Execute Command **AT&F**[<**value**>]	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This command instructs the DCE to set all parameters to default values specified by the manufacturer, which may take into consideration hardware configuration switches and other manufacturer-defined criteria.	
Defined Values	
<value> Integer type. 0 Set all TA parameters to manufacturer defaults.	
Scope	
Channel Specific and Generic: each parameter may be Channel Specific or Generic (see command for individual parameter).	

3.7. ATV Set result code format mode

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

ATV	
Syntax	Possible Returns
Set Command **ATV**[<**value**>]	If succeed When <value>=0 *0* When <value>=1 *OK* If fail *+CME ERROR: <err>*
Description	
The setting of this parameter determines the contents of the header and trailer transmitted with result codes and information responses. It also determines whether result codes are transmitted in a numeric form or an alphabetic (or "verbose") form. The text portion of information responses is not affected by this setting.	
Defined Values	
<value> Integer type, default is 1.[4]	
0 Information response: <text><CR><LF> Short result code format: <numeric code><CR>	
1 Information response: <CR><LF><text><CR><LF> Long result code format: <CR><LF><verbose code><CR><LF>	

4. In product ML302S/ML307S, default is 0.

3.8. ATQ Set result code presentation mode

This parameter setting determines whether the TA transmits any result code to the TE. Information text transmitted in response is not affected by this setting.

ATQ	
Syntax	Possible Returns
Set Command **ATQ[n]**	If succeed If <n>=0 *OK* If <n>=1 *(none)* If fail *+CME ERROR: <err>*
Description	
The setting of this parameter determines whether or not the DCE transmits result codes to the DTE. When result codes are being suppressed, no portion of any intermediate, final, or unsolicited result code#header, result text, line terminator, or trailer is transmitted. Information text transmitted in response to commands is not affected by the setting of this parameter.	
Defined Values	
<n> Integer type, default is 0. 0 TA transmits result code. 1 Result codes are suppressed and not transmitted.	

3.9. ATZ Set current parameters to user defined profile

TA sets all current parameters to the user defined profile.

ATZ	
Syntax	Possible Returns
Execute Command **ATZ[<value>]**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This command instructs the DCE to set all parameters to their factory defaults as specified by the manufacturer. This may include taking into consideration the settings of hardware configuration switches or non-volatile parameter storage (if implemented). If the DCE is connected to the line, it is disconnected from the line, terminating any call in progress. All of the functions of the command shall be completed before the DCE issues the result code. The DTE should not include additional commands on the same command line after the Z command because such commands may be ignored.	
Defined Values	
<value> Integer type.	
Implementation of this command is mandatory. Interpretation of ***<value>*** is optional and manufacturer-specific.	

3.10. ATX Set connect result code format and call monitoring

This parameter setting determines whether or not the TA detected the presence of dial tone and busy signal and whether or not TA transmits particular result codes.

ATX	
Syntax	Possible Returns
Set Command **ATX**[<**value**>]	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
The setting of this parameter determines whether or not the DCE transmits particular result codes to the DTE. It also controls whether or not the DCE verifies the presence of a dial tone when it first goes off-hook to begin dialling, and whether or not engaged tone (busy signal) detection is enabled. However, this setting has no effect on the operation of the W dial modifier, which always checks for a dial tone regardless of this setting, nor on the busy signal detection capability of the W and @dial modifiers.	
Defined Values	
<value> Integer type, default is 4.	
0 CONNECT result code only returned, dial tone and busy detection are both disabled.	
1 CONNECT<text> result code only returned, dial tone and busy detection are both disabled.	
2 CONNECT<text> result code returned, dial tone detection is enabled, busy detection is disabled.	
3 CONNECT<text> result code returned, dial tone detection is disabled,busy detection is enabled.	
4 CONNECT<text> result code returned, dial tone and busy detection are both enabled.	

3.11. ATI Display product identification information

This command is used to query manufacturer information, product model and version information.

ATI	
Syntax	Possible Returns
Execute Command **ATI**	If succeed *<manufacturer>* *<model>* *<Revision>* *OK* If fail *+CME ERROR: <err>*
Description	
This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, followed by a final result code. ***<value>*** may optionally be used to select from among multiple types of identifying information, specified by the manufacturer. NOTE: The responses to this command may not be reliably used to determine the DCE manufacturer, revision level, feature set, or other information, and should not be relied upon for software operation. In particular, expecting a specific numeric response to an I0 command to indicate which other features and commands are implemented in a DCE dooms software to certain failure, since there are widespread differences in manufacturer implementation among devices that may, coincidentally, respond with identical values to this command. Software implementors should use commands with extreme caution, since the amount of data returned by particular implementations may vary widely from a few bytes to several thousand bytes or more, and should be prepared to encounter ERROR responses if the value is not recognized.	
Example	
ATI *CMCC* *MN316* *MN316-DBRS-MBRH0C00* *OK*	

3.12. AT+GMI Request manufacturer identification

TA returns manufacturer identification text.

AT+GMI	
Syntax	Possible Returns
Execute Command **AT+GMI**	If succeed *<manufacturer>* *OK* If fail *+CME ERROR: <err>*
Description	
Execution command causes the TA to return one or more lines of information text ***<manufacturer>***, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the manufacturer of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired.	
Defined Values	
<manufacturer> String type. Manufacturer identification	
Scope	
Channel specific (response output only on channel which entered the command).	

3.13. AT+CGMI Request manufacturer identification

TA returns manufacturer identification text.

AT+CGMI	
Syntax	Possible Returns
Execute Command **AT+CGMI**	If succeed *<manufacturer>* *OK* If fail *+CME ERROR: <err>*
Description	
Execution command causes the TA to return one or more lines of information text ***<manufacturer>***, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the manufacturer of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired.	
Defined Values	
<manufacturer> String type. Manufacturer identification	
Example	
AT+CGMI *CMCC* *OK*	

3.14. AT+GMM Request model identification

TA returns product model identification text.

AT+GMM	
Syntax	Possible Returns
Execute Command **AT+GMM**	If succeed *<model>* *OK* If fail *+CME ERROR: <err>*
Description	
Execution command causes the TA to return one or more lines of information text ***<model>***, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the specific model of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide more information if desired.	
Defined Values	
<model> String type. Product model identification	
Scope	
Channel specific (response output only on channel which entered the command)	

3.15. AT+CGMM Request model identification

TA returns product model identification text.

AT+CGMM	
Syntax	Possible Returns
Execute Command **AT+CGMM**	If succeed *<model>* *OK* If fail *+CME ERROR: <err>*
Description	
Execution command causes the TA to return one or more lines of information text ***<model>***, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the specific model of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide more information if desired.	
Defined Values	
<model> String type.	
Product model identification	

3.16. AT+GMR Request revision identification

TA reports one or more lines of information text that permit the user to identify the version, revision level or data or other information of the device.

AT+GMR	
Syntax	Possible Returns
Execute Command **AT+GMR**	If succeed[5] *<revision>* *OK* *Revision:<revision>* *OK* If fail *+CME ERROR: <err>*
Description	
Execution command causes the TA to return one or more lines of information text ***<revision>***, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the version, revision level or date, or other pertinent information of the MT to which it is connected to. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide more information if desired.	
Defined Values	
<revision> String type. Product software version identification.	
Scope	
Channel specific (response output only on channel which entered the command)	

5. The keyword "Revision:" is not available to ML302A/ML307A.

3.17. AT+CGMR Request revision identification

TA returns product software version identification text.

AT+CGMR	
Syntax	Possible Returns
Execute Command **AT+CGMR**	If succeed[6] *Revision:<revision>* *OK* If fail *+CME ERROR: <err>*
Description	
Execution command causes the TA to return one or more lines of information text ***<revision>***, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the version, revision level or date, or other pertinent information of the MT to which it is connected to. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide more information if desired.	
Defined Values	
<revision> String type. Product software version identification	
Example	
AT+CGMR *MN316-DBRS-MBRH0C00* *OK*	

6. The keyword "Revision:" is not available to ML302A/ML307A.

3.18. AT+GSN Request product serial number identification

This command request TA serial number identification/IMEI number.

AT+GSN	
Syntax	Possible Returns
Test Command **AT+GSN=?**	*+GSN: (list of supported <snt>s)* *OK*
Execute Command **AT+GSN**	If succeed *<sn>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+GSN=<snt>**	If succeed when <snt>=0 and command successful *<sn>* *OK* when <snt>=1 and command successful *+GSN: <imei>* *OK* If fail *+CME ERROR: <err>*

Description

Execution command causes the TA to return IMEI (International Mobile station Equipment Identity number) and related information to identify the MT that the TE is connected to. Test command returns values supported as a compound value. For a TA which does not support ***<snt>***, only OK is returned.

Defined Values

<snt> Integer type, indicating serial number type that has been requested.

0

Returns <sn>

1

Returns <imei>

<sn> String type.

AT+GSN
The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.
<imei> String type.
International mobile equipment identity.
Reference V.250

3.19. AT+CGSN Request product serial number identification

This command request TA serial number identification | IMEI number.

AT+CGSN	
Syntax	Possible Returns
Test Command **AT+CGSN=?**	*+CGSN: (list of supported <snt>s)* *OK*
Execute Command **AT+CGSN**	If succeed *<sn>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CGSN=<snt>**	If succeed when ***<snt>***=0 and command successful *<sn>* *OK* when ***<snt>***=1 and command successful *+CGSN: <imei>* *OK* when ***<snt>***=2 and command successful *+CGSN: <imeisv>* *OK* when ***<snt>***=3 and command successful *+CGSN: <svn>* *OK* If fail *+CME ERROR: <err>*

Description

Execution command causes the TA to return IMEI (International Mobile station Equipment Identity number) and related information to identify the MT that the TE is connected to. Test command returns values supported as a compound value. For a TA which does not support ***<snt>***, only OK is returned.

Defined Values

AT+CGSN
<snt> Integer type, indicating serial number type that has been requested.[7]
0 Returns *<sn>*
1 Returns *<imei>*
2 Returns *<imeisv>*
3 Returns *<svn>*
<sn> String type, the total number of characters, including line terminators, in the information text shall not exceed 2048 characters.
<imei> String type, international mobile equipment identity.
<imeisv> String type, in decimal format indicating the IMEISV.
<svn> String type, in decimal format indicating the current SVN which is a part of IMEISV.
Example
AT+CGSN=1 *+CGSN: 869975033574370* *OK*

7. ML302S/ML307S/ML302A/ML307A does not support parameters 2, 3.

3.20. AT+IPR Set fixed DTE rate

The set command parameter setting determines the data rate of the TA on the serial interface.

AT+IPR	
Syntax	Possible Returns
Test Command **AT+IPR=?**	*+IPR: (list of supported auto detectable <rate>s),(list of supported fixed only <rate>s)* *OK*
Read Command **AT+IPR?**	If succeed *+IPR: <rate>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+IPR=<rate>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This numeric extended-format parameter specifies the data rate at which the DCE will accept commands, in addition to 1200 bit/s or 9600 bit/s. It may be used to select operation at rates at which the DCE is not capable of automatically detecting the data rate being used by the DTE. Specifying a value of 0 disables the function and allows operation only at rates automatically detectable by the DCE. The specified rate takes effect following the issuance of any result code(s) associated with the current command line. The ***<rate>*** specified does not apply in online data state if Direct mode of operation is selected.	
Defined Values	
<rate> Integer type, baud-rate per second.[8]	
0 (auto baud rate),110,300,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600	
Example	
AT+IPR=115200 *OK*	

8. ML302S/ML307S: Default is 115200 and dose not support auto baud rate. Please use the test command to query the support range of ***<rate>***.

3.21. AT+CSCS Set TE character set

This command is used to set TE character set.

AT+CSCS	
Syntax	Possible Returns
Test Command **AT+CSCS=?**	*+CSCS: (list of supported <chset>s)* *OK*
Read Command **AT+CSCS?**	If succeed *+CSCS: <chset>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CSCS=<chset>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
Write command informs DCE which character set ***<chset>*** is used by the TE. DCE is then able to convert character strings correctly between TE and ME character sets.	
Defined Values	
<chset> String type.[9]	

GSM

GSM default alphabet

HEX

Hexadecimal numbers in character strings

IRA

International reference alphabet (ITU-T T.50)

PCCP

PC character set Code Page

PCDN

PC Danish/Norwegian character set

UCS2

UCS2 alphabet

8859-1

9. ML302S/ML307S only supports parameters GSM and IRA.ML302A/ML307A only supports parameters GSM, IRA, UCS2 and HEX.

AT+CSCS
ISO 8859 Latin (1) character set
Example
AT+CSCS? *+CSCS: "IRA"* *OK*

Note:

In ML302S/ML307S/ML302A/ML307A, when parameter ***<dcs>*** of command **AT+CSMP** is set 4 or 8, Ignore the value of **AT+CSCS,** input or output a hex string similar to PDU mode. So only support characters ‘0’ – ‘9’ and ‘A’ – ‘F’.

In ML302S/ML307S/ML302A/ML307A, when received short message is UCS2 code, Ignore the value of **AT+CSCS**, input or output a hex string similar to PDU mode. So only support characters ‘0’ – ‘9’ and ‘A’ – ‘F’.

4. Call Control Commands

This chapter describes in detail the AT commands and command formats related to Call control, etc.

4.1. ATS0 Automatic answer

This command is used to set automatic answer.

ATS0	
Syntax	Possible Returns
Read Command **ATS0?**	If succeed *<n>* *OK* If fail *+CME ERROR: <err>*
Set Command **ATS0=<n>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This S-parameter controls the automatic answering feature of the DCE. If set to 0, automatic answering is disabled. If set to a non-zero value, the DCE shall cause the DCE to answer when the incoming call ringing has occurred the number of times indicated by the value.	
Defined Values	
<n> Integer type, the auto answering times, range from 0~255.	
Remark	
If set to 0, auto answering is disabled. This command is specially used on data service in GPRS mode.	
In ML302S/ML307S/ML302A/ML307A, If <n> is set too high, the calling party may hang up before the call is answered automatically; For VoLTE call, only support <n>=0; Test command not supported currently.	

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support the command. The unit of <n> is second in ML302A/ML307A.

4.2. ATA Answer incoming call

This command is used to answer an incoming call.

ATA	
Syntax	Possible Returns
Execute Command **ATA**	If succeed *OK* If fail *+CME ERROR: <err>* *NO CARRIER*
Description	
This command instructs the DCE to immediately connect to the line and start the answer sequence as specified for the underlying DCE. Any additional commands that appear after A on the same command line are ignored. NOTE: The behaviour of the A command may be modified if DTE control of V.8 or V.8 bis is enabled; refer to Annex A in this case.	
Remark	
This command should be used only when there is one call. When there are several calls, please use the **AT+CHLD** to answer a new call.	

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support the command.

4.3. ATD Mobile originated call to dial a number

This command is used to make an outgoing call.

ATD	
Syntax	Possible Returns
Execute Command **ATD<number>**	If succeed *When the call is in progress* *OK* *and* *NO ANSWER* *or* *NO CARRIER* *Connection be released* *NO DAIL TONE* *or* *BUSY* If fail *+CME ERROR: <err>*
Description	
This command instructs the DCE to originate a call. This may include several steps, depending upon the DCE type, such as: connecting to the line (going off-hook), waiting for the network to indicate readiness to receive call addressing information (wait for dial tone), signalling call addressing information to the network (dialling the number), monitoring the line for call progress signals (e.g., busy), and instructing the underlying DCE to start the call origination procedure (modulation handshaking). All characters appearing on the same command line after the "D" are considered part of the call addressing information to be signalled to the network, or modifiers used to control the signalling process (collectively known as a "dial string"), up to a semicolon character (IA5 3/11) or the end of the command line. If the dial string is terminated by a semicolon, the DCE does not start the call origination procedure as defined for the underlying DCE, but instead returns to command state after completion of the signalling of call addressing information to the network. Any characters appearing in the dial string that the DCE does not recognize as a valid part of the call addressing information or as a valid modifier shall be ignored. This permits characters such as parentheses and hyphens to be included that are typically used in formatting of telephone numbers. NOTE 1: The behaviour of the D command may be modified if DTE control of V.8 or V.8 bis is enabled; refer to Annex A in this case.	
Defined Values	
<Number> Dialing digits, include 1,2,3,4,5,6,7,8,9,0,*,#,+,A,B,C,. .	

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support the command.

4.4. ATH Disconnect existing connection

Hang up all existing connected calls, including active, waiting and hold calls.

ATH	
Syntax	Possible Returns
Execute Command **ATH**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This command instructs the DCE to disconnect from the line, terminating any call in progress. All of the functions of the command shall be completed before the DCE issues any result code. NOTE: When used with modem-on-hold procedures per V.92, the call may be terminated without disconnecting from the line. Other V.250 commands such as **AT+PMHF** may then be used to cause the PSTN to switch to another line for placing another outgoing call or accepting another incoming call.	
Unsolicited Result Codes	
URC1 *CIEV: SOUNDER 0* *CIEV: CALL 0*	
Remark	
When the link is established or ringing, the command will get OK. But for the establishing, the command will get error.	

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support the command.

4.5. AT+CHUP Hang up call

Hang up all existing connected calls.

AT+CHUP	
Syntax	Possible Returns
Test Command **AT+CHUP=?**	*OK*
Execute Command **AT+CHUP**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
Hang up all existing connected calls, including active, waiting and hold calls.	
Remark	
This command implements the same behavior as ATH.	

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support the command.

4.6. AT+CEER Extended error report

This command is used to report extended error.

AT+CEER	
Syntax	Possible Returns
Test Command **AT+CEER=?**	*OK*
Execute Command **AT+CEER**	If succeed *+CEER: <report>* *OK* If fail *+CME ERROR: <err>*
Description	
This command causes the TA to return one or more lines of information text ***<report>***, determined by the MT manufacturer,which should offer the user of the TA an extended report of the reason for − the failure in the last unsuccessful call setup (originating or answering) or in call modification; − the last call release; − the last unsuccessful GPRS attach or unsuccessful PDP context activation; − the last GPRS detach or PDP context deactivation. Typically, the text will consist of a single line containing the cause information given by GSM/UMTS network in textual format.	
Defined Values	
<report> Integer type, the total number of characters, including line terminators, in the information text shall not exceed 2041 characters. Text shall not contain the sequence 0<CR> or OK<CR>.	

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support this command.

4.7. AT+CRC Cellular result codes and ring

This command is to control whether the extended format of incoming call indication or GPRS network request for PDP context activation or notification for VBS/VGCS calls is used.

AT+CRC	
Syntax	Possible Returns
Test Command **AT+CRC =?**	*+CRC: (list of supported <mode>s)* *OK*
Read Command **AT+CRC?**	If succeed *+CRC: <mode>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CRC=<mode>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This command is to control whether the extended format of incoming call indication or GPRS network request for PDP context activation or notification for VBS/VGCS calls is used. When enabled, an incoming cal is indicated to the TE with unsolicited result code +CRING: <type> instead of the normal RING.	
Defined Values	
<mode> Integer type.	
0 Disables extended format (default)	
1 Enables extended format	

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support the command.

5. Network Service Commands

This chapter describes in detail the AT commands and command formats related to Network service and configuration, etc.

5.1. AT+CREG Network registration

This command be used to query the register status.

AT+CREG	
Syntax	Possible Returns
Test Command **AT+CREG=?**	*+CREG: (list of supported <n>s)* *OK*
Read Command **AT+CREG?**	If succeed *+CREG: <n>,<stat>[,<lac>,<ci>,<act>]* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CREG=<n>**	If succeed *OK* If fail *+CME ERROR: <err>*

Description

Set command controls the presentation of an unsolicited result code +CREG: <stat> when <n>=1 and there is a change in the MT’s circuit mode network registration status in GERAN/UTRAN/E-UTRAN, or unsolicited result code +CREG: <stat>[,[<lac>],[<ci>],[<AcT>]] when <n>=2 and there is a change of the network cell in GERAN/UTRAN/E-UTRAN. The parameters <AcT>, <lac> and <ci> are sent only if available. The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value of <stat> changes. NOTE 1: If the MT also supports one or more of the GPRS services, EPS services or 5G services, the +CGREG command and +CGREG: result codes, the +CEREG command and +CEREG: result codes and the +C5GREG command and +C5GREG: result codes apply to the registration status and location information for those services. Read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac>, <ci> and <AcT>, if available, are returned only when <n>=2 and MT is registered in the network. The parameters [,<cause_type>,<reject_cause>], if available, are returned when <n>=3. Refer subclause 9.2 for possible <err> values. Test command returns values supported as a compound value.

Defined Values

<n> Integer type.

0

Disable network registration unsolicited result code

1

AT+CREG	
	Enable network registration unsolicited result code +CREG: <stat>
2	Enable network registration and location information unsolicited result code +CREG:<stat>[,<lac>,<ci>,<act>]
3	Enable network registration, location information and cause value information unsolicited result code +CREG: <stat>[,[<lac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]

<stat> Integer type.

0	Not registered, MT is not currently searching a new operator to register to
1	Registered, home network
2	Not registered, but MT is currently searching a new operator to register to
3	Registration denied
4	Unknown
5	Registered, roaming
6	registered for "SMS only", home network (applicable only when <AcT> indicates E-UTRAN)
7	registered for "SMS only", roaming (applicable only when <AcT> indicates E-UTRAN)
8	attached for emergency bearer services only (see NOTE 2) (not applicable)
9	registered for "CSFB not preferred", home network (applicable only when <AcT> indicates E-UTRAN)

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

<lac> String type, two-byte location area code (when <AcT> indicates value 0 to 6), or tracking area code (when<AcT> indicates value 7). In hexadecimal format (e.g. “00C3” equals 195 in decimal).

<ci> String type, two-byte cell ID in hexadecimal format.

AT+CREG	
<act> Integer type, access technology of serving cell.[10]	
0	GSM
1	GSM Compact
2	UTRAN
3	GSM w/GPRS
4	UTRAN w/HSDPA
5	UTRAN w/HSUPA
6	UTRAN w/HSDPA and HSUPA
7	E-UTRAN
8	EC-GSM-IoT (A/Gb mode)

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support this command.

10. ML302S/ML307S/ML302A/ML307A does not support parameters 1,8.

5.2. AT+COPS Operator Selection

This command be used to select the operator.

AT+COPS	
Syntax	Possible Returns
Test Command **AT+COPS=?**	*+COPS: [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>[,<AcT>])s][,(list of supported <mode>s),(list of supported <format>s)]* *OK*
Read Command **AT+COPS?**	If succeed *+COPS: <mode>[,<format>,<oper>[,<AcT>]]* *OK* If fail *+CME ERROR: <err>*
Set Command **AT +COPS=<mode>[,<format>[,<oper>[,<AcT>]]]**	If succeed *OK* If fail *+CME ERROR: <err>*

Description

Set command forces an attempt to select and register to the GSM/UMTS/EPS/5GS network operator using the SIM/USIM card installed in the currently selected card slot. ***<mode>*** is used to select whether the selection is done automatically by the MT or is forced by this command to operator ***<oper>*** (it shall be given in format ***<format>***) to a certain access technology, indicated in ***<AcT>***. If the selected operator is not available, no other operator shall be selected (except ***<mode>***=4). If the selected access technology is not available, then the same operator shall be selected in other access technology. The selected operator name format shall apply to further read commands (+COPS?) also. ***<mode>***=2 forces an attempt to deregister from the network. The selected mode affects to all further network registration (e.g. after ***<mode>***=2, MT shall be unregistered until ***<mode>***=0 or 1 is selected). This command should be abortable when registration/deregistration attempt is made. Read command returns the current mode, the currently selected operator and the current Access Technology. If no operator is selected, ***<format>***, ***<oper>*** and ***<AcT>*** are omitted. Test command returns a set of five parameters, each representing an operator present in the network. A set consists of an integer indicating the availability of the operator ***<stat>***, long and short alphanumeric format of the name of the operator, numeric format representation of the operator and access technology. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM or active application in the UICC (GSM or USIM) in the following order: HPLMN selector, User controlled PLMN selector, Operator controlled PLMN selector and PLMN selector (in the SIM or GSM application), and other networks. It is recommended (although optional) that after the operator list TA returns lists of supported ***<mode>***s and ***<format>***s. These lists shall be delimited from the operator list by two commas. The access technology selected parameters,

AT+COPS

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

Defined Values

<mode> Integer type.

0

Automatic (*<oper>* field is ignored)

1

Manual (*<oper>* field shall be present)

2

Deregister from network

3

Set only *<format>* (for read command +COPS?), do not attempt registration/deregistration (*<oper>* field is ignored); this value is not applicable in read command response

4

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

<format> Integer type.

0

Long format alphanumeric *<oper>*

1

Short format alphanumeric *<oper>*

2

Numeric *<oper>*

<oper> String type; *<format>* indicates if the format is alphanumeric or numeric; long alphanumeric format can be up to 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]); numeric format is the GSM Location Area Identification number (refer GSM 04.08 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU T E.212 Annex A [10], plus a two BCD digit network code, which is administration specific;returned *<oper>* shall not be in BCD format, but in IRA characters converted from BCD; hence the number has structure: (country code digit 3)(country code digit 2)(country code digit1)(network code digit 2)(network code digit 1).

<stat> Integer type.

0

Unknown

1

Available

AT+COPS
2
Current
3
Forbidden
<AcT> Integer type.[11]
0
GSM
1
GSM Compact
2
UTRAN
3
GSM w/EGPRS
4
UTRAN w/HSDPA
5
UTRAN w/HSUPA
6
UTRAN w/HSDPA and HSUPA
7
E-UTRAN
8
EC-GSM-IoT (A/Gb mode)
9
E-UTRAN (NB-S1 mode)
11
NR connected to a 5GCN
13
E-UTRA-NR dual connectivity
Remark
Set command forces an attempt to select and register the GSM/UMTS network ***<oper>***. Mode is used to decide the register should be automatic or manual. If the selected mode is manual or manual first, the network should return with a list from which user can select one to register on. Read command returns the current mode and the currently selected operator. If no operator is selected, ***<format>***, ***<oper>*** and ***<AcT>*** are omitted. Test command returns a list of quadruplets, each representing an operator present in the network. Quadruplet consists of an integer indicating the availability of the operator ***<stat>***, long and short

11. ML302S/ML307S/ML302A/ML307A not supports parameters 1, 9, 11, 13, and parameter 8 is UTRAN HSPA+.

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alphanumeric format of the name of the operator, and numeric format representation of the operator. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM/UICC, and other networks.

5.3. AT+CHLD Call related supplementary services

This command allows the control of the call related services.

AT+CHLD	
Syntax	Possible Returns
Test Command **AT+CHLD=?**	*+CHLD: (list of supported <n>s)* *OK*
Set Command **AT+CHLD=<n>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
This command allows the control of the following call related services: − a call can be temporarily disconnected from the MT but the connection is retained by the network; − multiparty conversation (conference calls); − the served subscriber who has two calls (one held and the other either active or alerting) can connect the other parties and release the served subscriber's own connection. Calls can be put on hold, recovered, released, added to conversation, and transferred similarly as defined in 3GPP TS 22.030 [19]. Refer subclause 9.2 for possible `<err>` values. This is based on the supplementary services HOLD (Call Hold; refer 3GPP TS 22.083 [5] clause 2 and 3GPP TS 24.610 [135]), MPTY / CONF (MultiParty; refer 3GPP TS 22.084 [22] and Conference; refer 3GPP TS 24.605 [133]) and ECT (Explicit Call Transfer; refer 3GPP TS 22.091 [30] and 3GPP TS 24.629 [139]). NOTE 1: In the CS−domain, Call Hold, MultiParty and Explicit Call Transfer are only applicable to teleservice 11. Test command returns a list of operations which are supported. The call number required by some operations shall be denoted by "x" (e.g. +CHLD: (0,1,1x,2,2x,3)).	
Defined Values	
<n> Integer type, equals to numbers entered before SEND button in 3GPP TS 22.030 [19] subclause 6.5.5.1.	
NOTE 2: The "directory number" case shall be handled with dial command D, and the END case with hangup command H (or +CHUP). The 4*"directory number" case is handled with +CTFR command.	
Implementation	
Optional.	

Note: ML302A/ML307A does not support the command.

5.4. AT+CLCC List current calls of ME

Returns list of current calls of MT.

AT+CLCC	
Syntax	Possible Returns
Test Command **AT+CLCC=?**	*OK*
Execute Command **AT+CLCC**	If succeed *[+CLCC:* *<ccid1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>[,<priority>[,<CLI validity>]]]][<CR><LF>+CLCC:* *<ccid2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>[,<priority>[,<CLI validity>]]]][...]]]* *OK* If fail *+CME ERROR: <err>*

Description

Returns list of current calls of MT. If command succeeds but no calls are available, no information response is sent to TE. Refer subclause 9.2 for possible <err> values. See also AT command +CLCCS.

Defined Values

<ccidx> Integer type. Call identification number as described in 3GPP TS 22.030 [19] subclause 6.5.5.1. This number can be used in +CHLD command operations. Value range is from 1 to N. N, the maximum number of simultaneous call control processes is implementation specific.

<dir> Integer type.

0
mobile originated (MO) call

1
mobile terminated (MT) call

<stat> Integer type (state of the call).

0
active

1
held

2
dialing (MO call)

AT+CLCC
3 alerting (MO call) 4 incoming (MT call) 5 waiting (MT call)
<mode> Integer type (bearer/teleservice).[12]
0 voice 1 data 2 fax 3 voice followed by data, voice mode 4 alternating voice/data, voice mode 5 alternating voice/fax, voice mode 6 voice followed by data, data mode 7 alternating voice/data, data mode 8 alternating voice/fax, fax mode 9 unknown
<mpty> Integer type.
0 call is not one of multiparty (conference) call parties ***1*** call is one of multiparty (conference) call parties

12. ML302S/ML307S/ML302A/ML307A only support parameters 1, 2, 3

AT+CLCC

<number> String type phone number in format specified by <type>.

<type> Type of address octet in integer format (refer 3GPP TS 24.008 [8] subclause 10.5.4.7).

<alpha> string type alphanumeric representation of <number> corresponding to the entry found in phone book; used character set should be the one selected with command select TE character set +CSCS.

<priority> Integer type parameter indicating the eMLPP priority level of the call, values specified in 3GPP TS 22.067 [54].

<CLI validity> Integer type. This parameter can provide details why <number> does not contain a calling party BCD number (refer 3GPP TS 24.008 [8] subclause 10.5.4.30). The parameter is not present for MO call types.

0

CLI valid

1

CLI has been withheld by the originator (refer 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Reject by user")

2

CLI is not available due to interworking problems or limitations of originating network (refer 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Interaction with other service")

3

CLI is not available due to calling party being of type payphone (refer 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Coin line/payphone")

4

CLI is not available due to other reasons (refer 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Unavailable")

When CLI is not available (<CLI validity>=2, <CLI validity>=3 or <CLI validity>=4), <number> shall be an empty string ("") and <type> value will not be significant. Nevertheless, TA may return the recommended value 128 for <type> (TON/NPI unknown in accordance with 3GPP TS 24.008 [8] subclause 10.5.4.7). When CLI has been withheld by the originator, (<CLI validity>=1) and the CLIP is provisioned with the "override category" option (refer 3GPP TS 22.081 [3] and 3GPP TS 23.081 [40]), <number> and <type> is provided. Otherwise, TA shall return the same setting for <number> and <type> as if the CLI was not available.

Implementation

Optional. Recommended when +CHLD command is implemented. When +CDU is supported and SIP URIs are used in the MT, the AT command +CLCC is fully replaced by +CLCCS.

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support the command.

5.5. AT+CPOL Preferred operator list

This command is used to edit the user preferred list of networks in the active application on the UICC(GSM or USIM) or preferred list of networks in the SIM card.

AT+CPOL	
Syntax	Possible Returns
Test Command **AT+CPOL=?**	*+CPOL: (list of supported <index>s),(list of supported <format>s)* *OK*
Read Command **AT+CPOL?**	If succeed *+CPOL: <index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<E-UTRAN_AcT1>][+CPOL:<index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>, <E-UTRAN_AcT2>][...]]* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CPOL=<index>[,<format>[,<oper>[,<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>, <E-UTRAN_AcT>]]]**	If succeed *OK* If fail *+CME ERROR: <err>*

Description
Execute command writes an entry in the SIM list of preferred operators (EFPLMNsel), when the SIM card is present or when the UICC is present with an active GSM application. When UICC is present with an active USIM application, execute commands writes an entry in the User controlled PLMN selector with Access Technology list (EFPLMNwAcT), only the PLMN field could be entered, the Access Technologies for each PLMN in this list is not accesible with this command (Note: new command for accessing the Access Technologies for each PLMN in this list is FFS). If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed. Note: when adding preferred operater, <format> can only be 2. Read command returns all used entries from the active application in the UICC (GSM or USIM) user preferred list of networks or SIM card list of preferred operators. If <format> is 0, but there is no relevant long format alphanumeric <oper>, the numeric <oper> will be returned. Test command returns the whole index range supported by the active application in the UICC (GSM or USIM) user preferred list of networks or SIM card.
Defined Values

AT+CPOL
<index> Integer type; the order number of operators in the active application in the UICC (GSM or USIM) user preferred list of networks or SIM card preferred operator list.
<format> Integer type.
0 Long format alphanumeric <oper> ***1*** Short format alphanumeric <oper> ***2*** Numeric <oper>
<oper> String type. Indicates if the format is alphanumeric or numeric. (see +COPS)
<GSM_AcTn> Integer type. GSM access technology.
0 Access technology not selected ***1*** Access technology selected
<GSM_Compact_AcTn> Integer type. GSM compact access technology.
0 Access technology not selected ***1*** Access technology selected
<UTRAN_AcTn> Integer type. UTRAN access technology.
0 Access technology not selected 1 Access technology selected
<E-UTRAN_AcTn> Integer type. E-UTRAN access technology.
0 Access technology not selected 1 Access technology selected
Remark
ML302S/ML307S/ML302A/ML307A does not support to select *<GSM_AcTn>*,*<GSM_Compact_AcTn>*,*<UTRAN_AcTn>*,*<E-UTRAN_AcTn>* at the same time.

5.6. AT+COPN Read operator names

This command is used to read operator names.

AT+COPN	
Syntax	Possible Returns
Test Command **AT+COPN=?**	*OK*
Execute Command **AT+COPN**	If succeed *+COPN: <numeric1>,<alpha1>* *+COPN: <numeric2>,<alpha2>* *[...]]* *OK* If fail *+CME ERROR: <err>*
Description	
Execute command returns the list of operator names from the MT. Each operator code <numericn> that has an alphanumeric equivalent <alphan> in the MT memory shall be returned.	
Defined Values	
<numeric> String type; operator in numeric format. (See +COPS).	
<alphan> String type; operator in long alphanumeric format. (See +COPS).	
Unsolicited Result Codes	
URC1 *+CALA: <text>* *URC2* *+SYSSTART ALARM MODE+CALA: <text>*	
Remark	
Execute command returns the list of operator names from the MT. Each operator code ***<numericn>*** that has an alphanumeric equivalent ***<alphan>*** in the MT memory shall be returned.	
Reference	
3GPP TS 27.007 V3.12.0	

6. ME Control and Status Commands

This chapter describes in detail the AT commands and command formats related to ME control and status query, etc.

6.1. AT+CPAS Mobile equipment activity status

This command is used to query mobile equipment activity status.

AT+CPAS	
Syntax	Possible Returns
Test Command **AT+CPAS=?**	*+CPAS: (list of supported <pas>s)* *OK*
Execute Command **AT+CPAS**	If succeed *+CPAS: <pas>* *OK* If fail *+CME ERROR: <err>*

Description

Execution command returns the activity status ***<pas>*** of the MT. It can be used to interrogate the MT before requesting action from the phone. Refer subclause 9.2 for possible ***<err>*** values. Test command returns values supported by the MT as a compound value.

Defined Values

<pas> Integer type.[13]

0
ready (MT allows commands from TA/TE)

1
unavailable (MT does not allow commands from TA/TE)

2
unknown (MT is not guaranteed to respond to instructions)

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

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

5
asleep (MT is unable to process commands from TA/TE because it is in a low functionality state)

6
call in active

All other values below 128 are reserved by the present document.

Implementation

13. ML302S/ML307S does not support parameters 1, 5, 6.

AT+CPAS
Mandatory when MT can be operated from TE (refer subclause "Mobile termination control mode +CMEC").

6.2. AT+CFUN Set phone functionality

This command is used to set phone functionality.

AT+CFUN	
Syntax	Possible Returns
Test Command **AT+CFUN=?**	*+CFUN: (list of supported <fun>s),(list of supported <rst>s)* *OK*
Read Command **AT+CFUN?**	If Succeed *+CFUN: <fun>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CFUN=<fun>[,<rst>]**	If Succeed *OK* If fail *+CME ERROR: <err>*

Description

Set command selects the level of functionality ***<fun>*** in the MT. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn. Level of functionality between these may also be specified by manufacturers. When supported by manufacturers, MT resetting with ***<rst>*** parameter may be utilized. NOTE 1: It is manufacturer specific if this command affects network registration. Command Operator Selection +COPS is used to force registration/de−registration. Read command returns the current setting of ***<fun>***. Test command returns values supported by the MT as compound values.

Defined Values

<fun> Integer type.[14]

0

Minimum functionality

1

Full functionality

4

Disable phone both transmit and receive RF circuits

5

Disable SIM

14. ML302S/ML307S does not support 5.

AT+CFUN

<rst> Integer type. This shall be always default when <rst> is not given.

0

Do not reset the MT before setting it to *<fun>* power level (default value)

1

Reset the MT before setting it to *<fun>* power level

Implementation

Optional. When *<fun>*=128, is supported, +CSRA is required.

6.3. AT+CSQ Signal quality

This command be used to query the quality of the signal.

AT+CSQ	
Syntax	Possible Returns
Test Command **AT+CSQ=?**	*+CSQ: (list of supported <rssi>s),(list of supported <ber>s)* *OK*
Execute Command **AT+CSQ**	If succeed *+CSQ: <rssi>,<ber>* *OK* If fail *+CME ERROR: <err>*
Description	
Execution command returns received signal strength indication ***<rssi>*** and channel bit error rate ***<ber>*** from the MT. Test command returns values supported as compound values.	
Defined Values	
<rssi> Integer type.	
0 −113 dBm or less ***1*** −111 dBm ***2..30*** −109. . . −53 dBm ***31*** −51 dBm or greater ***99*** Not known or not detectable	
<ber> Integer type (in percent).	
0...7 As RXQUAL values in the table in GSM 05.08 [20] sub clause 8.2.4 ***99*** Not known or not detectable	

6.4. AT+CESQ Extended signal quality

This command is used to query extended signal quality.

AT+CESQ	
Syntax	Possible Returns
Test Command **AT+CESQ=?**	*+CESQ: (list of supported <rxlev>s),(list of supported <ber>s),(list of supported <rscp>s),(list of supported <ecno>s),(list of supported <rsrq>s),(list of supported <rsrp>s)* *OK*
Execute Command **AT+CESQ**	If succeed *+CESQ:<rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>* *OK* If fail *+CME ERROR: <err>*

Description

Execution command returns received signal quality parameters. If the current serving cell is not a GERAN cell,<rxlev> and <ber> are set to value 99. If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rscp> is set to 255. If the current serving cell is not a UTRA FDD cell, <ecno> is set to 255. If the current serving cell is not an E-UTRA cell, <rsrq> and <rsrp> are set to 255.

Defined Values

<rxlev> Integer type; received signal strength level. (see 3GPP TS 45.008 [20] subclause 8.1.4)

0

rssi < −110 dBm

1

−110 dBm <= rssi < −109 dBm

2

−109 dBm <= rssi < −108 dBm

::::

61

−50 dBm <= rssi < −49 dBm

62

−49 dBm <= rssi < −48 dBm

63

−48 dBm <= rssi

99

Not known or not detectable

<ber> Integer type; channel bit error rate. (in percent)

AT+CESQ

0..7

As RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4

99

Not known or not detectable

<rscp> Integer type; received signal code power. (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS25.123 [96] subclause 9.1.1.1.3)

0

rscp < −120 dBm

1

−120 dBm <= rscp < −119 dBm

2

−119 dBm <= rscp < −118 dBm

::::

94

−27 dBm <= rscp < −26 dBm

95

−26 dBm <= rscp < −25 dBm

96

− 25 dBm <= rscp

255

Not known or not detectable

<ecno> Integer type; ratio of the received energy per PN chip to the total received power spectral density.(see 3GPP TS 25.133 [95] subclause)

0

Ec/Io < −24 dB

1

−24 dB <= Ec/Io < −23.5 dB

2

−23.5 dB <= Ec/Io < −23 dB

::::

47

−1 dB <= Ec/Io < −0.5 dB

48

−0.5 dB <= Ec/Io < 0 dB

AT+CESQ

49

0 dB <= Ec/Io

255

Not known or not detectable

<rsrq> Integer type; reference signal received quality. (see 3GPP TS 36.133 [96] subclause 9.1.7)

0

rsrq < −19.5 dB

1

−19.5 dB <= rsrq < −19 dB

2

−19 dB <= rsrq < −18.5 dB

::::

32

−4 dB <= rsrq < −3.5 dB

33

−3.5 dB <= rsrq < −3 dB

34

−3 dB <= rsrq

255

Not known or not detectable

<rsrp> Integer type, reference signal received power. (see 3GPP TS 36.133 [96] subclause 9.1.4)

0

rsrp < −140 dBm

1

−140 dBm <= rsrp < −139 dBm

2

−139 dBm <= rsrp < −138 dBm

::::

95

−46 dBm <= rsrp < −45 dBm

96

−45 dBm <= rsrp < −44 dBm

97

−44 dBm <= rsrp

AT+CESQ

255

Not known or not detectable

6.5. AT+CCLK Real time clock

This command is used to query real time clock.

AT+CCLK	
Syntax	Possible Returns
Test Command **AT+CCLK=?**	*OK*
Read Command **AT+CCLK?**	If succeed *+CCLK: <time>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CCLK=<time>**	If succeed *OK* If fail *+CME ERROR: <err>*

Description

Set command sets the real-time clock of the MT. If setting fails in an MT error, +CME ERROR: <err> is returned. Reboot will not take effect.

Defined Values

<time> String type value, the format is "yy/mm/dd,hh:mm:ss+zz", where characters indicate year (two last digits),month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour,between the local time and GMT; range -96. . . +96). E.g. 6th of Jan 2020, 22:10:00 GMT+2 hours equals to “20/01/06,22:10:00+08”.

Remark

If MT does not support time zone information then the three last characters of <time> are not returned by +CCLK? The format of <time> is specified by use of the +CSDF command. The range of the year is from1970 to 2069.

In ML302S/ML307S, the time set by AT+CCLK is GMT time. If the time zone is not 0, need to use AT+CTZU=3 to update to the local time of the corresponding time zone.

6.6. AT+CLAC List all available AT commands

This command is used to query all available AT commands.

AT+CLAC	
Syntax	Possible Returns
Test Command **AT+CLAC=?**	*OK*
Execute Command **AT+CLAC**	If succeed *<AT Command1>* *[<AT Command2>* *[...]]* *OK* If fail *+CME ERROR: <err>*
Description	
Execution command causes the MT to return one or more lines of AT Commands.	
Defined Values	
<AT Command> Defines the AT command including the prefix AT. Text shall not contain the sequence 0<CR> or OK<CR>.	

Note: ML302A/ML302S/ML307A/ML307S does not support this command.

6.7. AT+CTZU Automatic time zone update

This command is used to enable and disable automatic time zone update.

AT+CTZU	
Syntax	Possible Returns
Test Command **AT+CTZU=?**	*+CTZU: (list of supported <mode>s)* *OK*
Read Command **AT+CTZU?**	If succeed *+CTZU: <mode>* *OK* If fail *+CME ERROR: <err>*
Execute Command **AT+CTZU=<mode>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
Set command enables and disables automatic time zone update via NITZ. If setting fails in an MT error, +CME ERROR: <err> is returned. Read command returns the current settings in the MT. Test command returns supported on- and off-values as a compound value.	
Defined Values	
<mode> Integer type.	
0 NITZ not update system time	
1 NITZ update local time to system[15]	
2 NITZ update GMT time to system[16]	

15. ML302S/ML307S/ML302A/ML307A parameter ***<mode>*** 1 is Enable automatic time zone update via NITZ and update GMT time to URC.
16. ML302S/ML307S parameter ***<mode>*** not supported 2, and 3 is NITZ update GMT time to system. ML302A/ML307A parameter ***<mode>*** not supported 2.

6.8. AT+CTZR Time zone report

This command is used to control the time zone change event reporting.

AT+CTZR	
Syntax	Possible Returns
Test Command **AT+CTZR=?**	*+CTZR: (list of supported <reporting>s)* *OK*
Read Command **AT+CTZR?**	If succeed *+CTZR: <reporting>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CTZR=<reporting>**	If succeed *OK* If fail *+CME ERROR: <err>*

Description

This set command controls the time zone change event reporting. If reporting is enabled the MT returns the unsolicited result code +CTZV: <tz>, +CTZE: <tz>,<dst>,[<time>], or +CTZEU: <tz>,<dst>,[<utime>]whenever the time zone is changed. The MT also provides the time zone upon network registration if provided by the network. If setting fails in an MT error, +CME ERROR: <err> is returned. Read command returns the current reporting settings in the MT. Test command returns supported <reporting> values as a compound value.

Defined Values

<reporting> Integer type value indicating.[17]

0

Disable time zone change event reporting.

1

Enable time zone change event reporting by unsolicited result code +CTZV:<tz>.

2

Enable extended time zone and local time reporting by unsolicited resultcode +CTZE: <tz>,<dst>,[<time>].

3

Enable extended time zone and universal time reporting by unsolicited resultcode +CTZEU: <tz>,<dst>,[<utime>].

17. ML302S/ML307S does not support parameters 3.

AT+CTZR

<tz> String type value representing the sum of the local time zone (difference between the local time and GMT expressed in quarters of an hour) plus daylight saving time. The format is "zz", expressed as a fixed width,two−digit integer with the range −48 . . . +56. To maintain a fixed width, numbers in the range −9 . . . +9 are expressed with a leading zero, e.g. “−09”, “+00” and “+09”.

<dst> Integer type value indicating whether *<tz>* includes daylight savings adjustment.

0

<tz> includes no adjustment for Daylight Saving Time.

1

<tz> includes +1 hour (equals 4 quarters in *<tz>*) adjustment for daylightsaving time.

2

<tz> includes +2 hours (equals 8 quarters in *<tz>*) adjustment for daylightsaving time.

<time> String type value representing the local time. The format is "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). The local time can be derived by the MT from information provided by the network at the time of delivering time zone information and will be present in the unsolicited result code for extended time zone and local time reporting if the universal time is provided by the network.

<utime> String type value representing the universal time. The format is "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). The universal time can be provided by the network at the time of delivering time zone information and will be present in the unsolicited result code for extended time zone and universal time reporting if provided by the network.

7. Packet Domain Commands

This chapter describes in detail the AT commands and command formats related to Packet domain control and query, etc.

7.1. AT+CGDCONT Define PDP context

This command is used to defined PDP context.

AT+CGDCONT	
Syntax	Possible Returns
Test Command **AT+CGDCONT=?**	*+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported<d_comp>s), (list of supported <h_comp>s),* *(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <PCSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported <securePCO>s),(list of supported <IPv4_MTU_discovery>s),(list of supported <Local_Addr_Ind>s),(list of supported <NonIP_MTU_discovery>s),(list of supported <Reliable_Data_Service>s)* *[<CR><LF>+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported<d_comp>s), (list of supported <h_comp>s),* *(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <PCSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported <securePCO>s),(list of supported <IPv4_MTU_discovery>s),(list of supported <Local_Addr_Ind>s),(list of supported <NonIP_MTU_discovery>s),(list of supported <Reliable_Data_Service>s)* *[...]]* *OK*
Read Command **AT+CGDCONT?**	If succeed *[+CGDCONT:* *<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,request_type>[,<PCSCF_discovery>[,IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,securePCO>[,<IPv4_MTU_discovery>[,Local_Addr_Ind>[,<NonIP_MTU_discovery>[,Reliable_Data_Service>]]]]]]]]]* *[<CR><LF>+CGDCONT:* *<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<PCSCF_discovery>[,IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,Local_Addr_Ind>[,<NonIP_MTU_discovery>[,<Reliable_Data_Service>]]]]]]]]]]* *[...]]* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<I**	If succeed *OK* If fail *+CME ERROR: <err>*

AT+CGDCONT

Pv4_MTU_discovery>][,<Local_Addr_Ind>][,<NonIP_MTU_discovery>][,<Reliable_Data_Service>]]]]]]]]]]

Description

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, ***<cid>*** and also allows the TE to specify whether security protected transmission of ESM information is requested, because the PCO can include information that requires ciphering. There can be other reasons for the UE to use security protected transmission of ESM information, e.g. if the UE needs to transfer an APN. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. For EPS the PDN connection and its associated EPS default bearer is identified herewith. For 5GS the PDU session and its associated QoS flow of the default QoS rule is identified herewith. A special form of the set command, +CGDCONT=<cid> causes the values for context number ***<cid>*** to become undefined. If the initial PDP context is supported, the context with ***<cid>***=0 is automatically defined at startup, see subclause 10.1.0. As all other contexts, the parameters for ***<cid>***=0 can be modified with +CGDCONT. If the initial PDP context is supported, +CGDCONT=0 resets context number 0 to its particular default settings. The read command returns the current settings for each defined context. The test command returns values supported as compound values. If the MT supports several PDP types, ***<PDP_type>***, the parameter value ranges for each ***<PDP_type>*** are returned on a separate line.

Defined Values

<cid> Integer type;(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE–MT interface and is used in other PDP context related commands. The range of permitted values (minimum value = 1 or ifthe initial PDP context is supported, minimum value = 0) is returned by the test form of the command. [18]

<PDP_type> String type; specifies the type of packet data protocol. The default value is manufacturer specific.[19]

IP

Internet Protocol (IETF STD 5 [103])

IPV6

Internet Protocol, version 6 (see RFC 2460 [106])

IPV4V6

Virtual <PDP_type>introduced to handle dual IP stack UE capability. (See 3GPP TS 24.301 [83])

PPP

Point to Point Protocol (IETF STD 51 [104])

Non-IP

18. ML302S/ML307S/ML302A/ML307A support the range of ***<cid>*** from 1 to 7 and 9 to 15, but only supports saving up to 8 PDP contexts at the same time(include cid8).
19. ML302S/ML307S/ML302A/ML307A dose not support PPP and Non-IP.

AT+CGDCONT

Transfer of Non-IP data to external packet data network (see 3GPP TS 23.401 [82])[20]

<APN> String type;(Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.

<PDP_address> [21]String type; a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP start up procedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP start up procedure. The allocated address may be read using the +CGPADDR command.[22]

<d_comp> Integer type; a numeric parameter that controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 04.65 [59]); other values are reserved.

0

Off (default if value is omitted)

1

On (manufacturer preferred compression)

2

V.42bis

3

V.44bis

<h_comp> Integer type; a numeric parameter that controls PDP header compression (refer 3GPP TS 04.65[59]); other values are reserved.

0

Off (default if value is omitted)

1

On (manufacturer preferred compression)

2

RFC1144

3

RFC2507

4

RFC3095

<IPv4AddrAlloc> Integer type; controls how the MT/TA requests to get the IPv4 address information.[23]

20. Only IP, IPV6, IPV4V6 and Non-IP values are supported for EPS services.
21. ML302A/ML307A does not support the configuration of ***<PDP_address>***
22. The value of this parameter is ignored with the set command. The parameter is included in the set command for backwards compatibility reasons only.
23. ML302A/ML307A does not support the configuration of ***<IPv4AddrAlloc>***

AT+CGDCONT

0

IPv4 address allocation through NAS signalling(default if value is omitted)

1

IPv4 address allocated through DHCP

<request_type>[24] Integer type; indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2) and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is supported (see subclause 10.1.0) it is not allowed to assign ***<cid>***=0 for emergency bearer services. According to 3GPP TS 24.008 [8] (subclause 4.2.4.2.2 and subclause 4.2.5.1.4) and 3GPP TS 24.301 [83] (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context must be established for emergency bearer services. [25]

0

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

1

PDP context is for emergency bearer services

2

PDP context is for new PDP context establishment(default if value is omitted)

3

PDP context is for handover from a non-3GPP access network

4

PDP context is for handover of emergency bearer services from a non-3GPP access network

<PCSCF_discovery> Integer type; influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L.[26]

0

Preference of P-CSCF address discovery not influenced by +CGDCONT(default if value is omitted)

1

Preference of P-CSCF address discovery through NAS signalling

2

Preference of P-CSCF address discovery through DHCP

<IM_CN_Signalling_Flag_Ind> Integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not. [27]

0

24. ML302S/ML307S/ML302A/ML307A does not support the configuration of ***<request_type>***.
25. If the PDP context for emergency bearer services is the only activated context, only emergency calls are allowed, see 3GPP TS 23.401 [82] subclause 4.3.12.9.
26. ML302A/ML307A does not support the configuration of ***<PCSCF_discovery>***
27. ML302A/ML307A does not support the configuration of ***<IM_CN_Signalling_Flag_Ind>***

AT+CGDCONT

UE indicates that the PDP context is not for IM CN subsystem-related signalling only(default if value is omitted)

1

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

<NSLPI> Integer type; indicates the NAS signalling priority requested for this PDP context.[28]

0

indicates that this PDP context is to be activated with the value for the low priority indicator configured in the MT.(default if value is omitted)

1

indicates that this PDP context is is to be activated with the value for the low priority indicator set to "MS is not configured for NAS signalling low priority". [29]

<securePCO> Integer type. Specifies if security protected transmission of PCO is requested or not (applicable for EPS only, see 3GPP TS 23.401 [82] subclause 6.5.1.2).[30]

0

Security protected transmission of PCO is not requested (default if value is omitted)

1

Security protected transmission of PCO is requested

<IPv4_MTU_discovery> Integer type; influences how the MT/TA requests to get the IPv4 MTU size, see 3GPP TS 24.008 [8] subclause 10.5.6.3. [31]

0

Preference of IPv4 MTU size discovery not influenced by +CGDCONT(default if value is omitted)

1

Preference of IPv4 MTU size discovery through NAS signalling

<Local_Addr_Ind> Integer type; indicates to the network whether or not the MS supports local IP address in TFTs (see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3). [32]

0

indicates that the MS does not support local IP address in TFTs(default if value is omitted)

1

indicates that the MS supports local IP address in TFTs

<Non-IP_MTU_discovery> Integer type; influences how the MT/TA requests to get the Non-IP MTU size, see 3GPP TS 24.008 [8] subclause 10.5.6.3. [33]

0

28. ML302S/ML307S/ML302A/ML307A dose not support this parameter.
29. The MT utilises the provide NSLPI information as specified in 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8].
30. ML302S/ML307S/ML302A/ML307A dose not support this parameter.
31. ML302S/ML307S/ML302A/ML307A dose not support this parameter.
32. ML302S/ML307S/ML302A/ML307A does not support this parameter.
33. ML302S/ML307S/ML302A/ML307A does not support this parameter.

AT+CGDCONT	
	Preference of Non-IP MTU size discovery not influenced by +CGDCONT(default if value is omitted)
1	Preference of Non-IP MTU size discovery through NAS signalling
<Reliable_Data_Service> Integer type; indicates whether the UE is using Reliable Data Service for a PDN connection or not, see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3.[34]	
0	Reliable Data Service is not being used for the PDN connection(default if value is omitted)
1	Reliable Data Service is being used for the PDN connection

Note: ML302A/ML307A, changes on CID1 cannot be saved after power-off.

34. ML302S/ML307S/ML302A/ML307A does not support this parameter.

7.2. AT+CGTFT Traffic flow template

This command allows the TE to specify a Packet Filter − PF for a Traffic Flow Template − TFT that is used in the GGSN in UMTS/GPRS and Packet GW in EPS for routing of packets onto different QoS flows towards the TE.

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

AT+CGTFT
mask>[,<flow label (ipv6)>[,<direction>[,<local address and subnet mask>]]]]]]]]]

Description

The set command specifies a Packet Filter that is to be added to the TFT stored in the MT and used for the context identified by the (local) context identification parameter, <cid>. The specified TFT will be stored in the GGSN in UMTS/GPRS and Packet GW in EPS only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGTFT command is effectively an extension to these commands. The Packet Filters consist of a number of parameters, each of which may be set to a separate value. A special form of the set command, +CGTFT=<cid> causes all of the Packet Filters in the TFT for context number <cid> to become undefined. At any time, there may exist only one PDP context with no associated TFT amongst all PDP contexts associated to one PDP address. At an attempt to delete a TFT, which would violate this rule, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. The read command returns the current settings for all Packet Filters for each defined context. The test command returns values supported as compound values. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line. TFTs shall be used for PDP-type IP and PPP only. For PDP-type PPP a TFT is applicable only when IP traffic is carried over PPP. If PPP carries header-compressed IP packets, then a TFT cannot be used.

Defined Values

<cid> Integer type; which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command. Note:The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDCONT and +CGDSCONT.

<PDP_type> String type; specifies the type of packet data protocol (see the +CGDCONT command).

<packet filter identifier> Integer type; value range is from 1 to 16.

<evaluation precedence index> Integer type; value range is from 0 to 255.

<remote address and subnet mask> String type; the string is given as dot-separated numeric (0-255) parameters on the form: “a1.a2.a3.a4.m1.m2.m3.m4” for IPv4 or for IPv6. | When +CGPIAF is supported, its settings can influence the format of this parameter returned with the read form of +CGTFT.

<protocol number (ipv4) / next header (ipv6)> Integer type; value range is from 0 to 255.

<local port range> String type; the string is given as dot-separated numeric (0-65535) parameters on the form “f.t”.

<remote port range> String type; the string is given as dot-separated numeric (0-65535) parameters on the form “f.t”.

AT+CGTFT
<ipsec security parameter index (spi)> Integer type; numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.
<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> String type; the string is given as dot-separated numeric (0-255) parameters on the form “t.m”.
<flow label (ipv6)> Numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.
<direction> Integer type. Specifies the transmission direction in which the packet filter shall be applied. *0* Pre-Release 7 TFT filter (see 3GPP TS 24.008 [8], table 10.5.162) *1* Uplink *2* Downlink *3* Birectional (Up & Downlink)
<local address and subnet mask> String type;the string is given as dot-separated numeric(0-255) parameters on the form: “a1.a2.a3.a4.m1.m2.m3.m4” for IPv4 or “a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 .m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16”, for IPv6.When +CGPIAF is supported, its settings can influence the format of this parameter returned with the read form of +CGTFT.
Remark
Some of the above listed attributes may coexist in a Packet Filter while others mutually exclude each other, the possible combinations are shown in 3GPP TS 23.060 [47].

7.3. AT+CGATT Attachment or detachment of PS

This command is used to attach or detach the MT from the Packet Domain service.

AT+CGATT	
Syntax	Possible Returns
Test Command **AT+CGATT=?**	*+CGATT: (list of supported <state>s)* *OK*
Read Command **AT+CGATT?**	If succeed *+CGATT: <state>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CGATT=<state>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.250 command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. NOTE 1: If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup. Any active PDP contexts will be automatically deactivated when the attachment state changes to detached. The read command returns the current Packet Domain service state. The test command is used for requesting information on the supported Packet Domain service states. NOTE 2: This command has the characteristics of both the V.250 action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.	
Defined Values	
<state> Integer type; indicates the state of PS attachment.	
0 Detached	
1 Attached	

7.4. AT+CGACT Activate or deactivate PDP context

This command is used to activate or deactivate the specified PDP context (s).

AT+CGACT	
Syntax	Possible Returns
Test Command **AT+CGACT=?**	*+CGACT: (list of supported<state>s)* *OK*
Read Command **AT+CGACT?**	If succeed *+CGACT: <cid>,<state>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CGACT=<state>[,<cid>[,<cid>[]]]**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	

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

NOTE: If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup. For EPS, the activation request for an EPS bearer resource will be answered by the network by either an EPS dedicated bearer activation or EPS bearer modification request. The request must be accepted by the MT before the PDP context can be set in to established state. For 5GS, the command is used to request or delete the specified QoS flow. The request for a specific QoS flow will be answered by the network by a PDU session establishment accept message or a PDU session modification command message. The PDU session establishment accept message or a PDU session modification command message must be accepted by the MT before the QoS flow can be set to active state. If no <cid>s are specified the activation form of the command activates all defined non-emergency contexts. If no <cid>s are specified the deactivation form of the command deactivates all active contexts. The read command returns the current activation states for all the defined PDP contexts. The test command is used for requesting

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information on the supported PDP context activation states. NOTE: This command has the characteristics of both the V.250 action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.

Defined Values

<state> Integer type; State indicates the state of PS attachment. Other values are reserved and will result in an ERROR response to the execution command.

0

Deactivated

1

Activated

<cid> Integer type; a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). Range from 1 to 7.[35]

Remark

Before activating, use command **AT+CGATT=1** first to attach to the network. Currently, only 3 active PDP contexts are allowed to exist simultaneity. So the number of cid in this command is limited to 3. And if you have defined more than 3 cids with command **AT+CGDCONT**, only the first 3 will be acted on when you use **AT+CGACT=1** to activate all cids.[36]

Note: ML302A/ML307A must activate at least one PDP context.

35. ML302S/ML307S/ML302A/ML307A support the range of ***<cid>*** from 1 to 7 and 9 to 15, but only supports saving up to 8 PDP contexts at the same time(include cid8). .
36. ML302S/ML307S/ML302A/ML307A does not support AT+CGACT=1 to activate all cids.

7.5. AT+CGPADDR Show PDP address

This command is used to show PDP address.

AT+CGPADDR	
Syntax	Possible Returns
Test Command **AT+CGPADDR=?**	*+CGPADDR: (list of defined <cid>s)* *OK*
Set Command **AT+CGPADDR**[=<**cid**>[,<**cid**>[,...]]]	If succeed *[+CGPADDR: <cid>,<PDP_addr1>[,<PDP_addr2>]* *[+CGPADDR: <cid>,<PDP_addr1>[,<PDP_addr2>]* *[...]]]* *OK* If fail *+CME ERROR: <err>*
Description	
The execution command returns a list of PDP addresses for the specified context identifiers. If no ***<cid>*** is specified, the addresses for all defined contexts are returned. The test command returns a list of defined ***<cid>s***.	
Defined Values	
<cid> Integer type; a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). If no ***<cid>*** is specified, the addresses for all defined contexts are returned.	
<PDP_address1> and ***<PDP_address2>*** String type[37].	
A string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by ***<cid>***. Both ***<PDP_address1>*** and ***<PDP_address2>*** are omitted if none is available. Both ***<PDP_address1>*** and ***<PDP_address2>*** are included when both IPv4 and IPv6 addresses are assigned, with ***<PDP_address1>*** containing the IPv4 address and ***<PDP_address2>*** containing the IPv6 address. In dual-stack terminals (***<PDP_type>*** IPV4V6), the IPv6 address will be provided in ***<PDP_address2>***.For terminals with a single IPv6 stack (***<PDP_type>*** IPV6) or due to backwards compatibility, the IPv6 address can be provided in parameter ***<PDP_address1>***.[38]	
Example	

37. The string is given as dot-separated numeric (0-255) parameter of the form:a1.a2.a3.a4 for IPv4 and the string is given as colon-separated numeric (0-FFFF) parameter of the form:a1:a2:a3:a4:a5:a6:a7:a8 for IPv6.When **+CGPIAF** is supported, its settings can influence the format of the IPv6 address in parameter ***<PDP_address1>*** or ***<PDP_address2>*** returned with the execute form of +CGPADDR.
38. In ML302S/ML307S/ML302A/ML307A, the ip and dns addresses in ipv6 format are not affected by the **+CGPIAF** command.

AT+CGPADDR

In dual-stack terminals(<PDP_type> IP):

```
AT+CGPADDR=0
+CGPADDR: 0,"10.89.2.181"
OK
```

In dual-stack terminals(<PDP_type> IPV4V6):

```
AT+CGPADDR=0
+CGPADDR: 0,"10.54.228.217","2409:8D80:6021:A18::1"
OK
```

7.6. AT+CGCLASS GPRS mobile station class

This command is used to set GPRS mobile station class.

AT+CGCLASS	
Syntax	Possible Returns
Test Command **AT+CGCLASS=?**	*+CGCLASS: (list of supported <class>s)* *OK*
Read Command **AT+CGCLASS?**	If succeed *+CGCLASS: <class>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CGCLASS=<class>**	If succeed *OK* If fail *+CME ERROR: <err>*

Description

The set command is used to set the MT to operate according to the specified mode of operation, see 3GPP TS 23.060 [47]. If the requested mode of operation is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. The read command returns the mode of operation set by the TE, independent of the current serving cell capability and independent of the current serving cell Access Technology. If no value has been set by the TE previously, the return value shall be the highest mode of operation that can be supported by the MT. The test command is used for requesting information on the supported MT modes of operation as a compound value.

Defined Values

<class> String type; a string parameter which indicates the mode of operation.

B

Class-B mode of operation (A/Gb mode), (not applicable in Iu mode).It means that the MT would operate PS and CS services but not simultaneously.

CG

Class-C mode of operation in PS only mode (A/Gb mode), or PS mode of operation (Iu mode). It means that the MT would only operate PS services.

Note: Other values are reserved and will result in an ERROR response to the set command. If the MT is attached to the PS domain when the set command is issued with a <class> = CC specified, a PS detach shall be performed by the MT.

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support this command.

7.7. AT+CGEREP Packet domain event reporting

This command is used to set packet domain event reporting.

AT+CGEREP	
Syntax	Possible Returns
Test Command **AT+CGEREP=?**	*+CGEREP: (list of supported <mode>s),(list of supported <bfr>s)* *OK*
Read Command **AT+CGEREP?**	If succeed *+CGEREP: <mode>,<bfr>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CGEREP=<mode>[,<bfr>]**	If succeed *OK* If fail *+CME ERROR: <err>*

Description

Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. ***<mode>*** controls the processing of unsolicited result codes specified within this command. ***<bfr>*** controls the effect on buffered codes when ***<mode>*** 1 or 2 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned. Read command returns the current mode and buffer settings. Test command returns the modes and buffer settings supported by the MT as compound values.

Defined Values

<mode> Integer type.

0

Buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.

1

Discard unsolicited result codes when MT TE link is reserved (e.g. in on line data mode); otherwise forward them directly to the TE.

2

Buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flushthem to the TE when MT-TE link becomes available; otherwise forward them directly to the TE.

<bfr> Integer type.

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0

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

1

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

Unsolicited Result Codes

URC1

+CGEV: REJECT <PDP_type>, <PDP_addr> A network request for PDP context activation occurred when the MT was unable to report it tothe TE with a +CRING unsolicited result code and was automatically rejected.

URC2

+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>] The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT.

URC3

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

URC4

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

URC5

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

URC6

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

URC7

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

URC8

+CGEV: ME CLASS <class> The mobile termination has forced a change of UE class. The highest available class is reported (see+CGCLASS).

Note: ML302A/ML307A, ***<bfr>*** is invalid and will be set to 0 when ***<mode>*** 0 is entered.

7.8. AT+CGREG Network registration status

This command is used to set and show the register information of MT and the position information of the MT.

AT+CGREG	
Syntax	Possible Returns
Test Command **AT+CGREG=?**	*+CGREG: (list of supported <n>s)* *OK*
Read Command **AT+CGREG?**	If succeed *+CGREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>],[<rac>][,<cause_type>,<reject_cause>]]* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CGREG=<n>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	

The set command controls the presentation of an unsolicited result code +CGREG: <stat> when <n>=1 and there is a change in the MT's GPRS network registration status in GERAN/UTRAN, or unsolicited result code +CGREG: <stat>[,[<lac>],[<ci>],[<AcT>],[<rac>]] when <n>=2 and there is a change of the network cell in GERAN/UTRAN. The parameters <AcT>, <lac>, <rac> and <ci> are provided only if available. The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value of <stat> changes. If the UE wants to apply PSM for reducing its power consumption, see +CPSMS command and 3GPP TS 23.682 [149], the set command controls the presentation of an unsolicited result code +CGREG: <stat>[,[<lac>],[<ci>],[<AcT>],[<rac>][,[<cause_type>],[<reject_cause>][,[<Active-Time>],[<Periodic-RAU>],[<GPRS-READY-timer>]]]]. When <n>=4 the unsolicited result code will provide the UE with additional information for the Active Time value, the extended periodic RAU value and the GPRS READY timer value if there is a change of the network cell in GERAN/UTRAN. The value <n>=5 further enhances the unsolicited result code with <cause_type> and <reject_cause> when the value of <stat> changes. The parameters <AcT>, <lac>, <rac>, <ci>, <cause_type>, <reject_cause>, <Active-Time>, <Periodic-RAU> and <GPRS-READY-timer> are provided only if available. Refer subclause 9.2 for possible <err> values. NOTE 1: If the GPRS MT also supports one or more of the circuit mode services in GERAN/UTRAN, EPS services in E-UTRAN or 5G services in NG-RAN, the +CREG command and +CREG: result codes, the +CEREG command and +CEREG: result codes and the +C5GREG command and +C5GREG: result codes apply to the registration status and location information for those services. The read command returns the status of result code presentation and an integer <stat> which shows whether the

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network has currently indicated the registration of the MT. Location information elements <lac>, <ci>, <AcT> and <rac>, if available, are returned only when <n>=2 and MT is registered in the network. The parameters [,<cause_type>,<reject_cause>], if available, are returned when <n>=3. Test command returns values supported as a compound value.

Defined Values

<n> Integer type.

0

Disable network registration unsolicited result code.

1

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

2

Enable network registration and location information unsolicited result code +CGREG:<stat>[,[<lac>],[<ci>],[<AcT>]]

3

Enable network registration, location information and GMM cause value information unsolicited result code +CGREG: <stat>[,[<lac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]

<stat> Integer type.

0

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

1

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

2

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

3

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

4

Unknown

5

Registered, roaming. The UE is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED on a visited PLMN.

6

Registered for "SMS only", home network (not applicable)

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7

Registered for "SMS only", roaming (not applicable)

8

Attached for emergency bearer services only (see NOTE 2) (applicable only when <AcT> indicates 2,4,5,6)

9

Registered for "CSFB not preferred", home network (not applicable)

10

Registered for "CSFB not preferred", roaming (not applicable)

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

<lac> String type; two-byte location area code in hexadecimal format (e.g. “00C3” equals 195 in decimal).

<ci> String type; two-byte cell ID in hexadecimal format.

<AcT> Integer type; indicates the access technology of the serving cell.

0

GSM

1

GSM Compact

2

UTRAN

3

GSM w/EGPRS (see NOTE 3)

4

UTRAN w/HSDPA (see NOTE 4)

5

UTRAN w/HSUPA (see NOTE 4)

6

UTRAN w/HSDPA and HSUPA (see NOTE 4)

7

E-UTRAN (not applicable)

NOTE 3: 3GPP TS 44.018 [156] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

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

<cause_type> Integer type; indicates the type of ***<reject_cause>***.

0

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	Indicates that *<reject_cause>* contains a GMM cause value, see 3GPP TS 24.008 [8] Annex G.
1	
	Indicates that *<reject_cause>* contains a manufacturer-specific cause.
<reject_cause> Integer type; contains the cause of the failed registration. The value is of type as defined by *<cause_type>*.	

Note: ML302A-DCLM/ML302A-GCLM/ML307A-DCLN/ML307A-GCLN does not support this command.

7.9. AT+CEREG EPS network registration status

This command is used to set and show the EPS network registration status of MT and the position information of the MT.

AT+CEREG	
Syntax	Possible Returns
Test Command **AT+CEREG=?**	*+CEREG: (list of supported<n>s)* *OK*
Read Command **AT+CEREG?**	If succeed When <n>=0, 1, 2 or 3, stat=0,3 or 4, and command successful *+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>[,<cause_type>,<reject_cause>]]]* *OK* When <n>=0, 1, 2 or 3, stat=1or 5, and command successful *+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>]]* *OK* When <n>=4 or 5 and command successful *+CEREG:* *<n>,<stat>[,[<tac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,* *[<Active-Time>],[<Periodic-TAU>]]]]* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CEREG=<n>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	

The set command controls the presentation of an unsolicited result code +CEREG: <stat> when <n>=1 and there is a change in the MT's EPS network registration status in E−UTRAN, or unsolicited result code +CEREG:<stat>[,[<tac>],[<ci>],[<AcT>]] when <n>=2 and there is a change of the network cell in E−UTRAN. The parameters <AcT>, <tac> and <ci> are provided only if available. The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value of <stat> changes. If the UE wants to apply PSM for reducing its power consumption, see +CPSMS command and 3GPP TS 23.682 [149], the set command controls the presentation of an unsolicited result code+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,[<Active−Time>],[<Periodic−TAU>]]]]. When <n>=4 the unsolicited result code will provide the UE with additional information for the Active Time

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value and the extended periodic TAU value if there is a change of the network cell in E-UTRAN. The value <n>=5 further enhances the unsolicited result code with <cause_type> and <reject_cause> when the value of <stat> changes. The parameters <AcT>, <tac>, <ci>, <cause_type>, <reject_cause>, <Active-Time> and <Periodic-TAU> are provided only if available. Note 1: If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services. The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <tac>, <ci> and <AcT>, if available, are returned only when <n>=2 and MT is registered in the network. The parameters [,<cause_type>,<reject_cause>], if available, are returned when <n>=3. Test command returns values supported as a compound value.

Defined Values

<n> Integer type.[39]

0

Disable network registration unsolicited result code.

1

Enable network registration unsolicited result code +CEREG: <stat>

2

Enable network registration and location information unsolicitedresult code +CEREG:<stat>[,[<tac>],[<ci>],[<AcT>]]

3

Enable network registration, location information and EMM cause value information unsolicited result code +CEREG:<stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]

4

For a UE that wants to apply PSM, enable network registration and location information unsolicited result code +CEREG:<stat>[,[<tac>],[<ci>],[<AcT>][#[,[<Active-Time>],[<Periodic-TAU>]]]]

5

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

<stat> Integer type; indicates the EPS registration status.[40]

0

Not registered, MT is not currently searching an operator to register to.

1

Registered, home network.

2

39. ML302S/ML307S does not support parameter 3, 4, 5.
40. ML302S/ML307S/ML302A/ML307A does not support parameter 6, 7, 8, 9, 10.

AT+CEREG

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

3

Registration denied

4

Unknown (e.g. out of E-UTRAN coverage)

5

Registered, roaming.

6

Registered for "SMS only", home network (not applicable)

7

Registered for "SMS only", roaming (not applicable)

8

Attached for emergency bearer services only (See NOTE 2)

9

Registered for "CSFB not preferred", home network (not applicable)

10

Registered for "CSFB not preferred", roaming (not applicable)

11

Attached for access to RLOS (See NOTE 2a) (applicable only when ***<AcT>*** indicates E-UTRAN)

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

NOTE 2a: 3GPP TS 24.301 [83] specifies the condition when the MT is considered as attached for access to RLOS.

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

<ci> String type; four-byte E-UTRAN cell ID in hexadecimal format.

<AcT> Integer type; indicates the access technology of the serving cell.[41]

0

GSM (not applicable)

1

GSM Compact (not applicable)

2

UTRAN (not applicable)

3

GSM w/EGPRS (see NOTE 3) (not applicable)

4

41. ML302S/ML307S/ML302A/ML307A does not support parameter 1, 8, 9.

AT+CEREG
UTRAN w/HSDPA (see NOTE 4) (not applicable) ***5*** UTRAN w/HSUPA (see NOTE 4) (not applicable) ***6*** UTRAN w/HSDPA and HSUPA (see NOTE 4) (not applicable) ***7*** E-UTRAN ***8*** EC-GSM-IoT (A/Gb mode) (see NOTE 5) (not applicable) ***9*** E-UTRAN (NB-S1 mode) (see NOTE 6)
NOTE 3: 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS. NOTE 4:3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA. NOTE 5: 3GPP TS 44.018 [156] specifies the EC-SCH INFORMATION message which, if present, indicates that the serving cell supports EC-GSM-IoT. NOTE 6: 3GPP TS 36.331 [86] specifies the System Information blocks which give the information about whether the serving cell supports NB-IoT, which corresponds to E-UTRAN (NB-S1 mode).
<cause_type> Integer type; indicates the type of ***<reject_cause>***.[42]
0 Indicates that ***<reject_cause>*** contains an EMM cause value, see3GPP TS 24.301 [83] AnnexA. ***1*** Indicates that ***<reject_cause>*** contains a manufacturer-specific cause.
<reject_cause> Integer type; contains the cause of the failed registration. The value is of type as defined by<cause_type>.[43]
<Active-Time> String type; one byte in an 8-bit format. Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one-byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g."00100100" equals 4minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 [8] Table10.5.163/3GPPTS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82].[44]
<Periodic-TAU> String type; one byte in an 8-bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008[8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS23.682 [149]and 3GPP TS 23.401 [82].[45]

42. ML302S/ML307S/ML302A/ML307A does not support this parameter.
43. ML302S/ML307S/ML302A/ML307A does not support this parameter.
44. ML302S/ML307S/ML302A/ML307A does not support this parameter.
45. ML302S/ML307S/ML302A/ML307A does not support this parameter.

7.10. AT+CGCONTRDP PDP context read dynamic

This command is used to read PDP context dynamic.

AT+CGCONTRDP	
Syntax	Possible Returns
Test Command **AT+CGCONTRDP=?**	*+CGCONTRDP: (list of <cid>s associated with active contexts)* *OK*
Set Command **AT+CGCONTRDP=<cid>**	If succeed *[+CGCONTRDP: <cid>,<bearer_id>,<apn>* *[,<local_addr and subnet_mask>* *[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>* *[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>* *[,<IM_CN_Signalling_Flag>[,<LIPA_indication>* *[,<IPv4_MTU>[,<WLAN_Offload>* *[,<Local_Addr_Ind>[,<Non-IP_MTU>* *[,<Serving_PLMN_rate_control_value>* *[,<Reliable_Data_Service>* *[,<PS_Data_Off_Support>* *[,<PDU_session_id>,<QFI>[,<SSC_mode>* *[,<S-NSSAI>[,<Access_type>* *[,<RQ_timer>* *[,<Always-on_ind>]]]]]]]]]]]]]]]]]]]]* *[<CR><LF>+CGCONTRDP: <cid>,* *<bearer_id>,<apn>[,<local_addr and subnet_mask>* *[,<gw_addr>[,<DNS_prim_addr>* *[,<DNS_sec_addr>[,<P-CSCF_prim_addr>* *[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>* *[,<LIPA_indication>* *[,<IPv4_MTU>[,<WLAN_Offload>* *[,<Local_Addr_Ind>[,<Non-IP_MTU>* *[,<Serving_PLMN_rate_control_value>* *[,<Reliable_Data_Service>* *[,<PS_Data_Off_Support>* *[,<PDU_session_id>,<QFI>[,<SSC_mode>* *[,<S-NSSAI>[,<Access_type>* *[,<RQ_timer>* *[,<Always-on_ind>]]]]]]]]]]]]]]]]]]]]* *[. . .]]* *OK* If fail *+CME ERROR: <err>*
Description	

The execution command returns the relevant information <bearer_id>, <apn>, <local_addr and subnet_mask>, <gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr>, <P-CSCF_sec_addr>, <IM_CN_Signalling_Flag>, <LIPA_indication>, <IPv4_MTU>, <WLAN_Offload>, <Non-IP_MTU>,<Serving_PLMN_rate_control_value>,<Reliable_Data_Service>, <PS_Data_Off_Support>,

AT+CGCONTRDP
<PDU_session_id>, <QFI>, <SSC_mode>, <S-NSSAI>, <Access_type>, <RQ_timer> and <Always-on_ind> for an active non secondary PDP context or a QoS flow of the default QoS rule with the context identifier <cid>. If the MT indicates more than two IP addresses of P-CSCF servers or more than two IP addresses of DNS servers, multiple lines of information per <cid> will be returned. If the MT has dual stack capabilities, at least one pair of lines with information is returned per <cid>. First one line with the IPv4 parameters followed by one line with the IPv6 parameters. If this MT with dual stack capabilities indicates more than two IP addresses of P-CSCF servers or more than two IP addresses of DNS servers, multiple of such pairs of lines are returned. Note: If the MT doesn't have all the IP addresses to be included in a line, e.g. in case the UE received four IP addresses of DNS servers and two IP addresses of P-CSCF servers, the parameter value representing an IP address that can not be populated is set to an empty string or an absent string. If the parameter <cid> is omitted, the relevant information for all active non secondary PDP contexts is returned. The test command returns a list of <cid>s associated with active non secondary contexts.
Defined Values
<cid> Integer type; specifies a particular non secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).
<bearer_id> Integer type; identifies the bearer, i.e. the EPS bearer and the NSAPI.
<apn> String type; a logical name that was used to select the GGSN or the external packet data network.
<local_addr and subnet_mask> String type; shows the IP address and subnet mask of the MT. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13. m14.m15.m16" for IPv6.[46]
<gw_addr> String type; shows the Gateway Address of the MT. The string is given as dot-separated numeric (0-255)parameters.
<DNS_prim_addr> String type; shows the IP address of the primary DNS server.
<DNS_sec_addr> String type; shows the IP address of the secondary DNS server.
<P_CSCF_prim_addr> String type; shows the IP address of the primary P-CSCF server.
<P_CSCF_sec_addr> String type; shows the IP address of the secondary P-CSCF server.
<IM_CN_Signalling_Flag> Integer type; shows whether the PDP context is for IM CN subsystem-related signalling only or not.
0 PDP context is not for IM CN subsystem-related signalling only.
1 PDP context is for IM CN subsystem-related signalling only.

46. In ML302S/ML307S/ML302A/ML307A, subnet mask in parameter<local_addr and subnet_mask> is not supported.

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

0

Indication not received that the PDP context provides connectivity using a LIPA PDN connection.

1

Indication received that the PDP context provides connectivity using a LIPA PDN connection.

<IPv4_MTU> Integer type; shows the IPv4 MTU size in octets.[47]

<WLAN_Offload> Integer type; indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bits 1 and 2 of the WLAN offload acceptability IE as specified in3GPP TS 24.008 [8] subclause 10.5.6.20.[48]

0

Offloading the traffic of the PDN connection via a WLAN when in S1mode or when in Iu mode is not acceptable.

1

Offloading the traffic of the PDN connection via a WLAN when in S1mode is acceptable, but not acceptable in Iu mode.

2

Offloading the traffic of the PDN connection via a WLAN when in Iu mode is acceptable, but not acceptable in S1 mode.

3

Offloading the traffic of the PDN connection via a WLAN when in S1mode or when in Iu mode is acceptable.

<Local_Addr_Ind> Integer type; indicates whether the MS and the network support local IP address in TFTs(see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3).[49]

0

Undicates that the MS or the network or both do not support local IP address in TFTs.

1

Indicates that the MS and the network support local IP address in TFTs.

<Non-IP_MTU> Integer type; shows the Non-IP MTU size in octets.[50]

<Serving_PLMN_rate_control_value> Integer type; indicates the maximum number of uplink messages the UE is allowed to send in a 6-minuteinterval. This refers to octet 3 to 4 of the Serving PLMN rate control IE as specified in 3GPP TS 24.301 [8] subclause 9.9.4.28.[51]

47. ML302S/ML307S/ML302A/ML307A dose not support this parameter.
48. ML302S/ML307S/ML302A/ML307A does not support this parameter.
49. ML302S/ML307S/ML302A/ML307A does not support this parameter.
50. ML302S/ML307S/ML302A/ML307A does not support this parameter.
51. ML302S/ML307S/ML302A/ML307A does not support this parameter.

AT+CGCONTRDP

<Reliable_Data_Service> Integer type; indicates whether the UE is using Reliable Data Service for a PDN connection or not, see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3.[52]

0

Reliable Data Service is not being used for the PDN connection.

1

Reliable Data Service is being used for the PDN connection.

<PS_Data_Off_Support> Integer type; indicates whether the network supports PS data off or not, see 3GPPTS 24.301 [83] subclause 6.3.10 and 3GPP TS 24.501 [161] subclause 6.2.10.[53]

0

Indicates that the network does not support PS data off.

1

Indicates that the network supports PS data off.

<PDU_session_id> Integer type; identifies the PDU session, see 3GPP TS 24.501 [161].[54]

<QFI> Integer type; identifies the QoS flow, see 3GPP TS 24.501 [161].[55]

<SSC_mode> Integer type; indicates the session and service continuity (SSC) mode for the PDU session in 5GS, see 3GPP TS 23.501 [165].[56]

0

Indicates that the PDU session is associated with SSC mode 1.

1

Indicates that the PDU session is associated with SSC mode 2.

2

Indicates that the PDU session is associated with SSC mode 3.

<S-NSSAI> String type; indicates the S-NSSAI associated with the PDU session for identifying a network slice in 5GS, see3GPP TS 23.501 [165] and 3GPP TS 24.501 [161]. Refer parameter <S-NSSAI> in subclause 10.1.1.[57]

<Access_type> Integer type; indicates the access type over which the PDU session is established in 5GS, see3GPP TS 23.501 [165] and 3GPP TS 24.501 [161].[58]

0

Indicates that the preferred access type is 3GPP access.

1

Indicates that the preferred access type is non-3GPP access.

52. ML302S/ML307S/ML302A/ML307A does not support this parameter.
53. ML302S/ML307S/ML302A/ML307A does not support this parameter.
54. ML302S/ML307S/ML302A/ML307A does not support this parameter.
55. ML302S/ML307S/ML302A/ML307A does not support this parameter.
56. ML302S/ML307S/ML302A/ML307A does not support this parameter.
57. ML302S/ML307S/ML302A/ML307A does not support this parameter.
58. ML302S/ML307S/ML302A/ML307A does not support this parameter.

AT+CGCONTRDP

<RQ_timer> Integer type; indicates the timer for reflective QoS, see 3GPP TS 23.501 [165] and 3GPP TS 24.501 [161].[59]

<Always-on_ind> Integer type; indicates whether the PDU session is an always-on PDU session, see 3GPP TS24.501[161].[60]

0

Indicates that the PDU session is not an always-on PDU session.

1

Indicates that the PDU session is an always-on PDU session.

Example

In dual-stack terminals(<PDP_type> IP):

AT+CGCONTRDP

+CGCONTRDP:0,5,"cmiot.mnc008.mcc460.gprs","10.137.191.141.255.0.0.0","","","","","",,,,,,,

OK

In dual-stack terminals(<PDP_type> IPV4V6):

AT+CGCONTRDP

+CGCONTRDP:0,5,"cmiot.mnc008.mcc460.gprs","10.54.174.145.255.0.0.0","","","","","",,,,,,,

+CGCONTRDP:0,5,"cmiot.mnc008.mcc460.gprs","2409:8D80:502A:F0FB::1 ::","","","","","",,,,,,,

OK

59. ML302S/ML307S/ML302A/ML307A does not support this parameter.
60. ML302S/ML307S/ML302A/ML307A does not support this parameter.

8. SIM Related Commands

This chapter describes in detail the AT commands and command formats related to SIM configuration and status query, etc.

8.1. AT+CPIN PIN authentication

This command is used to authenticate PIN.

AT+CPIN	
Syntax	Possible Returns
Test Command **AT+CPIN=?**	*OK*
Read Command **AT+CPIN?**	If succeed *+CPIN: <code>* *OK* If fail *+CME ERROR: <err>*
Set Command **AT+CPIN=<pin>[,<newpin>]**	If succeed *OK* If fail *+CME ERROR: <err>*

Description

Set command sends to the MT a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken towards MT and an error message, +CME ERROR, is returned to TE. NOTE 1: SIM PIN, SIM PUK, PH-SIM PIN, PH-FSIM PIN, PH-FSIM PUK, SIM PIN2 and SIM PUK2 refer to the PIN of the selected application on the UICC. For example, in an UTRAN context, the selected application on the currently selected UICC should be a USIM and the SIM PIN then represents the PIN of the selected USIM. See 3GPP TS 31.101 [65] for further details on application selection on the UICC. If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin, <newpin>, is used to replace the old pin in the SIM. NOTE 2: Commands which interact with MT that are accepted when MT is pending SIM PIN, SIM PUK, or PH-SIM are: +CGMI, +CGMM, +CGMR, +CGSN, D112; (emergency call), +CPAS, +CFUN, +CPIN, +CPINR, +CDIS (read and test command only), and +CIND (read and test command only). It is implementation specific whether additional commands can be accepted when MT is pending SIM PIN, SIM PUK, or PH-SIM. Read command returns an alphanumeric string indicating whether some password is required or not.

Defined Values

<pin> String type values.

<newpin> String type values, new PIN after ***<pin>*** check pass.

<code> String type.

AT+CPIN
Values reserved by the present document: −READY MT is not pending for any password; −SIM PIN MT is waiting UICC/SIM PIN to be given; −SIM PUK MT is waiting UICC/SIM PUK to be given; −SIM PIN2 MT is waiting active application in the UICC (GSM or USIM)or SIM card PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that MT does not block its operation); −SIM PUK2 MT is waiting active application in the UICC (GSM or USIM)or SIM card PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that MT does not block its operation).
Remark
Commands which interact with MT that are accepted when MT is pending SIM PIN, SIM PUK, or PH SIM are:+CGMI, +CGMM, +CGMR, D112; (emergency call), +CPAS, +CFUN, +CPIN, +CDIS (read and test command only), and +CIND (read and test command only).
Notes: After input three times wrong PIN, SIM card will be locked.

8.2. AT+CPWD Change password

This command is used to change password [PIN/PIN2].

AT+CPWD	
Syntax	Possible Returns
Test Command **AT+CPWD=?**	*+CPWD: list of supported (<fac>,<pwdlength>)* *OK*
Set Command **AT+CPWD=<fac>,<oldpwd>,<newpwd>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
Action command sets a new password for the facility lock function defined by command Facility Lock +CLCK. Test command returns a list of pairs which present the available facilities and the maximum length of their password.	
Defined Values	
<fac> String type; values reserved by the present document. ***SC*** SIM ***P2*** SIM PIN2 refer Facility Lock +CLCK for other values.	
<oldpwd>,<newpwd> String type; ***<oldpwd>*** shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD and ***<newpwd>*** is the new password; maximum length of password can be determined with ***<pwdlength>***.	
<pwdlength> Integer type; maximum length of the password for the facility.	

8.3. AT+CRSM Restricted SIM access

This command supports limited access to SIM database.

AT+CRSM	
Syntax	Possible Returns
Test Command **AT+CRSM=?**	*OK*
Set Command **AT+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]**	If succeed *+CRSM:<sw1>,<sw2>[,<response>]* *OK* If fail *+CME ERROR: <err>*

Description

By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database. Set command transmits to the MT the SIM ***<command>*** and its required parameters. If a SIM installed in the currently selected card slot, the MT handles internally all SIM#MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in ***<sw1>*** and ***<sw2>*** parameters. Coordination of command requests to SIM and the ones issued by GSM/UMTS application inside the MT is implementation dependent. However the TE should be aware of the precedence of the GSM/UMTS application commands to the TE commands.

Defined Values

<command> Integer type, following commands are used for SIM card.[61]

176

READ BINARY

178

READ RECORD

192

GET RESPONSE

214

UPDATE BINARY

220

UPDATE RECORD

242

STATUS

61. ML302S/ML307S/ML302A/ML307A does not support parameters 203, 219.

AT+CRSM
203 RETRIEVE DATA ***219*** SET DATA
NOTE1: The MT internally executes all commands necessary for selecting the desired file, before performing the actual command. All other values are reserved.
<fileid> For SIM card, it is integer type, e.g. read ADN file id is 28474 (6F3A in hex).For USIM card, it is string type, e.g. read ADN file id is 5F3A4F3A (5F3A is the path, 4F3A is the file id).This is the identifier of an elementary datafile on SIM. Mandatory for every command except STATUS.
<P1>,<P2>,<P3> Integer type; parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 11.11 [28].
<data> Information which shall be written to the SIM (hexadecimal character format; refer +CSCS).
<pathid>string type; contains the path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102 221 [60] (e.g. "7F205F70" in SIM and UICC case). The ***<pathid>*** shall only be used in the mode "select by path from MF" as defined in ETSI TS 102 221 [60]. NOTE2: Since valid elementary file identifiers may not be unique over all valid dedicated file identifiers the ***<pathid>*** indicates the targeted UICC/SIM directory path in case of ambiguous file identifiers. For earlier versions of this specification or if ***<pathid>*** is omitted, it could be implementation specific which one will be selected.
<SW1>,<SW2> Integer type; information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command.
<response> Response of a successful completion of the command previously issued (hexadecimal character format; refer+CSCS). STATUS and GET RESPONSE return data, which gives information about the current elementary data field. This information includes the type of file and its size (refer GSM 11.11 [28]). After READ BINARY or READ RECORD command the requested data will be returned. ***<response>*** is not returned after a successful UPDATE BINARY or UPDATE RECORD command.

8.4. AT+CNUM Subscriber number

This command read some records of certain files on (U)SIM.

AT+CNUM	
Syntax	Possible Returns
Test Command **AT+CNUM=?**	*OK*
Execute Command **AT+CNUM**	If succeed *+CNUM:[<alpha1>],<number1>,<type1>[,<speed>,<service>[,<itc>]][<CR><LF>]* *OK* If fail *+CME ERROR: <err>*

Description

Action command returns the MSISDNs related to the subscriber (this information can be stored in the SIM/UICC or in the MT). When storing information in the SIM/UICC, if the currently selected card slot contains a SIM card or a UICC with an active GSM application, the information is stored in the EF_{MSISDN} under DFTelecom. If the currently selected card slot contains a UICC with an active USIM application, the information is stored in the EFMSISDN under ADFUSIM). If subscriber has different MSISDN for different services, each MSISDN is returned on a separate line.

Defined Values

<alphax> Optional alphanumeric string associated with <numberx> used character set should be the one selected with command Select TE Character Set +CSCS.

<numberx> String type phone number of formats specified by <typex>.

<typex> Type of address octet in integer format.

<speed> integer type.

0

autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and nontransparent service)

1

300 bps (V.21)

2

1200 bps (V.22)

3

1200/75 bps (V.23)

4

AT+CNUM

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)

34

1200 bps (V.120)

36

2400 bps (V.120)

38

4800 bps (V.120)

39

9600 bps (V.120)

43

14400 bps (V.120)

47

19200 bps (V.120)

48

28800 bps (V.120)

49

38400 bps (V.120)

50

48000 bps (V.120)

51

56000 bps (V.120)

AT+CNUM

65

300 bps (V.110)

66

1200 bps (V.110)

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 (V.110 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; this setting can be used in conjunction with asynchronous nontransparent UDI or RDI service in order to get FTM)

84

64000 bps (X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparentUDI service in order to get FTM)

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)

AT+CNUM

132

33600 bps (multimedia)

133

56000 bps (multimedia)

134

64000 bps (multimedia)

reserved

all other values below 256

<service> integer type.(service related to the phone number)

0

asynchronous modem

1

synchronous modem

2

PAD Access (asynchronous)

3

Packet Access (synchronous)

4

voice

5

fax

reserved

all other values below 256

<itc> integer type.(information transfer capability)

0

3,1 kHz

1

UDI

8.5. AT+CIMI Request international mobile subscriber identity

This command is used to request international mobile subscriber identity.

AT+CIMI	
Syntax	Possible Returns
Execute Command **AT+CIMI**	If succeed *<IMSI>* *OK* If fail *+CME ERROR: <err>*
Description	
This command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual active application in the UICC (GSM or USIM) or SIM card which is attached to MT.	
Defined Values	
<IMSI> International Mobile Subscriber Identity (string without double quotes)	

9. SMS Related Commands

9.1. AT+CSMS Select message service

This command is used to select message service.

AT+CSMS	
Syntax	Possible Returns
Test Command **AT+CSMS=?**	*+CSMS: (list of supported <service>s)* *OK*
Read Command **AT+CSMS?**	If succeed *+CSMS: <service>,<mt>,<mo>,<bm>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Set Command **AT+CSMS=<service>**	If succeed *+CSMS: <mt>,<mo>,<bm>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description

Set command selects messaging service <service>. It returns the types of messages supported by the ME: <mt> for mobile terminated messages, <mo> for mobile originated messages and <bm> for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: <err> or +CME ERROR: <err> shall be returned. See chapter Message Service Failure Result Code for a list of <err> values. Also read command returns supported message types along the current service setting. Test command returns a list of all services supported by the TA.

Defined Values

<service> Integer type.[62]

0

3GPP TS 23.040 [3] and 3GPP TS 23.041 [4]

1

3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] the requirement of<service> setting 1 is mentioned under corresponding command descriptions).

2...127

62. ML302S/ML307S/ML302A/ML307A does not support parameters 2~128.

AT+CSMS	
	Reserved
128...	
	Manufacturer specific
<mt>,<mo>,<bm>	Integer type.
0	
	Type not supported
1	
	Type supported

9.2. AT+CMGF Select SMS message format

This command is used to set SMS message format.

AT+CMGF	
Syntax	Possible Returns
Test Command **AT+CMGF=?**	*+CMGF:list of supported <mode>s* *OK*
Read Command **AT+CMGF?**	If succeed *+CMGF:<mode>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Set Command **AT+CMGF=<mode>**	If succeed *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description

Set command tells the TA, which input and output format of messages to use. ***<mode>*** indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters). Text mode uses the value of parameter ***<chset>*** specified by command Select TE Character Set +CSCS to inform the character set to be used in the message body in the TA−TE interface. Test command returns supported modes as a compound value.

Defined Values

<mode> Integer type.

0

PDU mode (default when implemented)

1

Text mode

9.3. AT+CSMP Set SMS text mode parameters

This command is used to set SMS text mode parameters.

AT+CSMP	
Syntax	Possible Returns
Test Command **AT+CSMP=?**	*OK*
Read Command **AT+CSMP?**	If succeed *+CSMP: <fo>,<vp>,<pid>,<dcs>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Set Command **AT+CSMP=<fo>[,<vp>[,pid>[,<dcs>]]]**	If succeed *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description

Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>. If TA supports the EVPF, see 3GPP TS 23.040 [3], it shall be given as a hexadecimal coded string (refer e.g. <pdu>) with double quotes. NOTE: When storing a SMS-DELIVER from the TE to the preferred memory storage in text mode (refer command Write Message to Memory +CMGW), <vp> field can be used for <scts>.

Defined Values

<fo> Depending on the command or result code: first octet of 3G TS 23.040 [3] SMS-DELIVER[mt],SMSSUBMIT[mo] (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format.

<vp> Depending on SMS-SUBMIT <fo> setting: 3G TS 23.040 [3] TP-Validity-Period either in integer format(default 167), in time-string format (refer to <dt>), or if EVPF is supported, in enhanced format. (hexadecimal coded string with double quotes)

<pid> 3G TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0)-protocol identity. [Different data storage protocol according to which services protocol used]

AT+CSMP
<dcs> Depending on the command or result code: 3G TS 23.038 [2] SMS Data Coding Scheme (default0),or Cell Broadcast Data Coding Scheme in integer format.[supported three types of csw allowed,0,4,8]
Remark
Parameter *<fo><vp><pid>* and *<dcs>*, we recommend to set default value of them, but can use other values if need according to spec definite;
If setting “fo” value for MO message, we must make sure the “mti” segment of “fo” (as 03.40 description)is “01”, meanings that bit1 is “0” and bit0 is “1”, otherwise exception would happen;
If setting “dcs” value for MO message, we must make sure that the dcs is equal to 0, or 4, or 8, other values are not allowed now.

9.4. AT+CSCA Service center address

This command is used to set service center address.

AT+CSCA	
Syntax	Possible Returns
Test Command **AT+CSCA=?**	*OK*
Read Command **AT+CSCA?**	If succeed *+CSCA:<sca>,<tosca>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Set Command **AT+CSCA=<sca>[,<tosca>]**	If succeed *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Description	
Execution command saves active message service settings to a non-volatile memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are saved. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be saved. See chapter Message Service Failure Result Code for <err> values. Test command shall display the supported profile numbers for reading and writing of settings.	
Defined Values	
<sca> GSM 04.11 RP SC address Address-Value field in string format.	
<tosca> GSM 04.11 RP SC address Type-of-Address octet in integer format.	

9.5. AT+CSDH Show SMS text mode parameters

This command is used to show SMS text mode parameters.

AT+CSDH	
Syntax	Possible Returns
Test Command **AT+CSDH=?**	*+CSDH: list of supported <show>s* *OK*
Read Command **AT+CSDH?**	If succeed *+CSDH: <show>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Set Command **AT+CSDH=<show>**	If succeed *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description

Set command controls whether detailed header information is shown in text mode result codes. Test command returns supported values as a compound value.

Defined Values

<show> Integer type.

0

Do not show the values in result codes.

1

Show the values in result codes.

9.6. AT+CNMI SMS event reporting configuration

This command is used to set SMS event reporting configuration.

AT+CNMI	
Syntax	Possible Returns
Test Command **AT+CNMI=?**	*+CNMI: (list of supported <mode>s),(list of supported <mt>s), (list of supported <bm>s), (list of supported <ds>s), (list of supported <bfr>s)* *OK*
Read Command **AT+CNMI?**	If succeed *+CNMI:<mode>,<mt>,<bm>,<ds>,<bfr>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Execute Command **AT+CNMI=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]**	If succeed *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Description	
Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF), message receiving should be done as specified in 3GPP TS 23.038 [2]. NOTE 1: When DTR signal is not available or the state of the signal is ignored (V.25ter command &D0), reliable message transfer can be assured by using +CNMA acknowledgement procedure. <mode> controls the processing of unsolicited result codes specified within this command, <mt> sets the result code indication routing for SMS-DELIVERs, <bm> for CBMs and <ds> for SMS-STATUS-REPORTs. <bfr> defines the handling method for buffered result codes when <mode> 1, 2 or 3 is enabled. If ME does not support requested item (although TA does), final result code +CMS ERROR: <err> or +CME ERROR: <err> is returned. See chapter Message Service Failure Result Code for a list of <err> values. Test command gives the settings supported by the TA as compound values.	
Defined Values	
<mode> Integer type. The default value is 0. [63]	
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.	

63. ML302S/ML307S does not support parameters 3.

AT+CNMI

1

Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode).Otherwise forward them directly to the TE.

2

Buffer unsolicited result codes in the TA when TA-TE link is reserved(e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.

3

Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode.

<mt> Integer type (the rules for storing received SMs depend on its data coding scheme (refer 3GPP TS 23.038 [2]), preferred memory storage (+CPMS) setting and this value. The default value is0.

0

No SMS DELIVER indications are routed to the TE.

1

If SMS DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI:<mem>,<index>

2

SMS DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the TE using unsolicited result code: +CMT:[<alpha>],<length><CR><LF><pdu> (PDU mode enabled) or +CMT:<oa>, [<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>

3

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

<bm> Integer type (the rules for storing received CBMs depend on its data coding scheme (refer 3GPP TS 23.038 [2]), the setting of Select CBM Types (+CSCB) and this value. The default value is0.[64]

0

No CBM indications are routed to the TE.

1

If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI:<mem>,<index>

2

New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled)or +CBM:<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled) If ME supports data coding groups which define special routing also for messages other than class.

3

Class 3 CBMs are routed directly to TE using unsolicited result codes defined in<bm>=2. If CBMstorage is supported, messages of other classes result in indication as defined in <bm>=1.

64. ML302S/ML307S does not support parameters 1, 3. ML302A/ML307A does not support parameters 1.

AT+CNMI

<ds> Integer type. The default value is0.

0

No SMS TATUS-REPORTs are routed to the TE.

1

SMS STATUS-REPORTs are routed to the TE using unsolicited result code:

```
+CDS: <length><CR><LF><pdu> (PDU mode enabled) or
+CDS:<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)
```

2

If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TEusing unsolicited result code:

```
+CDSI: <mem>,<index>
```

<bfr> Integer type. The default value is 0.

0

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

1

TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1... 3 is entered.

Remark

If PDU mode, each bit meaning of DCS byte are reference in chapter 11.10,5, CMGW remark.

9.7. AT+CMGR Read message

This command is used to read message.

AT+CMGR	
Syntax	Possible Returns
Test Command **AT+CMGR=?**	*OK*
Set Command **AT+CMGR=<index>**	If succeed *+CMGR:<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]* *<data>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Description	
Execution command returns message with location value <index> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR: <err> or +CME ERROR: <err> is returned.	
Defined Values	
<index> Integer type, indicate which message will be read.	
Remark	
<alpha> and ***<scts>*** is not supported now; can't read short message report now. When DTE character set is "GSM" (set by +CSCS command),the SMS content will be output by an ASCII string form if it is an pure ASCII SMS, otherwise it will be output in an UCS2 hex string form. If the DET character set is "UCS2" it will always be output in UCS2 hex string form.	

9.8. AT+CMGC Send command

This command is used to send command.

AT+CMGC	
Syntax	Possible Returns
Set Command If text mode (+CMGF=1) **AT +CMGC=<fo>,<ct>[,<pid>[,<mn> [,<da>[,<toda>]]]]<CR>** If pdu mode (+CMGF=0) **AT+CMGC=<length><CR> text is entered<ctrl-Z/ESC>**	If succeed *+CMGC: <mr>[,<scts>]* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Description	
Set command selects messaging service <service>. It returns the types of messages supported by the ME:<mt> for mobile terminated messages, <mo> for mobile originated messages and <bm> for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: <err> or +CME ERROR: <err> shall be returned. See chapter Message Service Failure Result Code for a list of <err> values. Also read command returns supported message types along the current service setting. Test command returns a list of all services supported by the TA.	
Defined Values	
<fo> Depending on the command or result code: first octet of 3GPP TS 23.040 SMS-DELIVER, SMS-SUBMIT(default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format.	
<ct> 3GPP TS 23.040 [3] TP-Command-Type in integer format (default 0).	
<pid> 3GPP TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0).	
<mn> 3GPP TS 23.040 [3] TP-Message-Number in integer format. The <mn> value is the <mr> value of a previously submitted SM.	
<da> 3GPP TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in3GPP TS 27.007 [9]); Type of address given by <toda>.	
<toda> 3GPP TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of<da> is + (IRA 43) default is 145, otherwise default is 129).	

9.9. AT+CMGL List messages

This command is used to list SMS Messages from Preferred Store.

AT+CMGL	
Syntax	Possible Returns
Test Command **AT+CMGL=?**	*+CMGL: (list of supported <stat>s)* *OK*
Set Command **AT+CMGL=<state>**	If succeed TEXT Mode *[+CMGL: <index>,<stat>,<oa/da>,[<scts>]<CR><LF><data>* *[<CR><LF>* *+CMGL: <index>,<stat>,<da/oa>, [<scts>]<CR><LF><data>[...]]]* *OK* PDU Mode *[+CMGL: <index>,<stat>,<length><CR><LF><pdu><CR><LF>* *[+CMGL: <index>,<stat>,<length><CR><LF><pdu><CR><LF>[...]]]* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description

Execution command returns messages with status value <stat> from message storage ***<mem1>*** to the TE.

Defined Values

<index> Integer type, the index number of the short message in the storage area. Turn on from 1. The maximum value is the number of entries in the specified storage area.

<stat> Integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values.[65]

0

"REC UNREAD" Received unread message. (i.e. new message)

1

"REC READ" Received read message.

2

"STO UNSENT" Stored unsent message. (only applicable to SMs)

3

65. ML302S/ML307S/ML302A/ML307A does not support parameters 8.

AT+CMGL
"STO SENT" Stored sent message. (only applicable to SMs) ***4*** "ALL" All messages. (only applicable to +CMGL command) ***8*** "RESEND" After use cmss to send the unsent message.
<oa/da> String type, SMS sender/receiver address (sender address for received SMS, receiver address for sent SMS), parameter content is controlled by +CSCS command.
<scts> String type, saves the TP service center time stamp, which is the time when the service center receives the message. Sms-submit SMS does not have this item. It uses "time string" format: "YY/mm/DD, HH: mm: SS +ZZ".
<length> Integer type, indicating the length of data segment. If UCS2 encoding is adopted, ***<pdu>***=4f5b0206, then ***<length>***=4; the number of octets of the remaining content after the head of SC address is removed from the corresponding PDU string of ***<pdu>*** in PDU mode. For example: ***<pdu>***: 0891683105200905f051000d91683184529157f70000050500030002, after removing the SC address header, each two numbers correspond to one octet, then ***<length>***=20.
Remark
If PDU mode, each bit meaning of DCS byte are reference in chapter 11.10,5, CMGW remark. If have no message we specific to list, just return "OK" only. Don't care about the dcs value with at+CSMP setting or char set value with AT+CSCS setting here, the display is only depending to formats when the message store.

9.10. AT+CMGD Delete message

This command is used to delete message.

AT+CMGD	
Syntax	Possible Returns
Test Command **AT+CMGD=?**	*+CMGD: (list of supported <index>s),(list of supported <delflag>s)* *OK*
Set Command **AT+CMGD=<index>[,<delflag>]**	If succeed *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description

Execution command deletes message from preferred message storage <mem1> location <index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag> shown below. If deleting fails, final result code +CMS ERROR: <err> or +CME ERROR: <err> is returned. See chapter Message Service Failure Result Code for <err> values. Test command shows the valid memory locations and optionally the supported values of <delflag>.

Defined Values

<Index> Integer type, indicate which message will be deleted.

<delflag> An integer indicating multiple message deletion request as following.

0 (or omitted)

Delete the message specified in <index>.

1

Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched.

2

Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched.

3

Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched.

4

Delete all messages from preferred message storage including unread messages.

Remark

AT+CMGD

Test command. List of supported *<index>*s.

9.11. AT+CMGW Write message to memory

This command is used to write message to memory.

AT+CMGW	
Syntax	Possible Returns
Test Command **AT+CMGW=?**	*OK*
Set Command **AT+CMGW=<oa/da>[,<tooa/toda>[,<stat>]]]<CR> text is entered <CTRL-Z/ESC>**	If succeed *+CMGW: <index>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description

Execution command stores message (either SMS-DELIVER or SMS-SUBMIT) to memory storage ***<mem2>***. Memory location ***<index>*** of the stored message is returned. By default message status will be set to 'stored unsent', but parameter ***<stat>*** allows also other status values to be given. The entering of text is done similarly as specified in command Send Message +CMGS. If writing fails, final result code +CMS ERROR: <err> or +CME ERROR: <err> is returned. NOTE: SMS-COMMANDs and SMS-STATUS-REPORTs can not be stored in text mode.

Defined Values

<index> Integer type; value in the range of location numbers supported by the associated memory.

<da> 3G TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007 [9]); type of address given by <toda>.

<toda> 3G TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129 or 161).

<length> Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).

<stat> Integer type in PDU mode (default 2 for +CMGW), or string type in text mode, indicates the status of message in memory.

Remark

AT+CMGW

ML302S/ML307S/ML302A/ML307A not support long message.

In ML302S/ML307S/ML302A/ML307A, if pdu mode, each bit meaning of the dcs byte are following:

Dcs byte: bit7..bit0.

In ML302S/ML307S/ML302A/ML307A and at PDU mode, if we want to write MT message at storage, we must specify the status of UNREAD or READ. And at PDU mode, we can't write MT message which has the status of UNSENT or SENT.

9.12. AT+CMGS Send message

This command is used to send message.

AT+CMGS	
Syntax	Possible Returns
Test Command **AT+CMGS=?**	*OK*
Set Command **AT** **+CMGS=<da>[,<toda>]<CR>** **text is entered <ctrl-Z/ESC>**	If succeed *+CMGS:<mr>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description
The write command transmits a short message from TE to network (SMS-SUBMIT). After invoking the write command wait for the prompt ">" and then start to write the message. To send the message, simply enter <CTRL-Z>.

Defined Values
<da> 3G TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bitdefault alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007 [9]); type of address given by <toda>.
<toda> 3G TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129.)
<length> Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) PDU is given: we can send pdu message depending to the dcs value of oct in the pdu header. The PDU shall be hexadecimal format (similarly as specified for <pdu>) and given in one line; ME/TA converts this coding into the actual octets of PDU.text is entered. we should care about the dcs of at+csmp setting, if we set 7bit encode of dcs, we can send 7bit encode message with text mode. If we set 8bit or 16bit encode of dcs, we can send 8bit or 16bit message with text mode. The entered text should be formatted as follows: -If <dcs> (set with +CSMP) indicates that 3GPP TS 23.038 [2] GSM 7-bit default alphabet is used and <fo> indicates that 3GPP TS 23.040 [3] TP-User-Data-Header-Indication is not set; -If TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3GPP TS 27.007 [9]): ME/TA converts the entered text into the GSM 7 bit default alphabet according to rules; backspace can be used to delete last character and carriage returns can be used (previously mentioned four character sequence shall be sent to the TE after every carriage return entered by the user); -If TE character set is "HEX": the entered text should consist of two IRA character long

AT+CMGS
hexadecimal numbers which ME/TA converts into the GSM 7-bit default alphabet characters. (e.g. 17 (IRA 49 and 55) will be converted to character. (GSM 7-bit default alphabet 23).
<mr> Integer type; 3GPP TS 23.040 [3] TP-Message-Reference in integer format.
Remark
Not support long short message. *<toda>* has three values: 161,145,129. At PDU mode, it can't send MT message.

9.13. AT+CMSS Send message from storage

This command is used to send message from storage.

AT+CMSS	
Syntax	Possible Returns
Test Command **AT+CMSS=?**	*OK*
Set Comamnd **AT+CMSS=<index>[,<da>[,<toda>]]**	If succeed *+CMSS: <mr>[,<ackpdu>]* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Description	
Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> or +CME ERROR: <err> is returned. This command should be abortable.	
Defined Values	
<index> Integer type; value in the range of location numbers supported by the associated memory.	
<da> 3GPP 23.040 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS); type of address given by <toda>.	
<toda> 3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129).	
<mr> 3GPP 23.040 TP-Message-Reference in integer format.	
Scope	
Channel Specific for test command; Generic for execute command.	
Reference 3GPP TS 27.005	

9.14. +CMT/+CMTI Indication new short message (For SMS)

This command is used to indication new short message (For SMS).

+CMT/+CMTI
Possible Returns

If succeed

```
+CMTI: <mem>,<index>
+CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled)
+CMT:<oa>, [<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>, <length>]<CR><LF><data>
(Text mode enbaled)
```

If fail

```
+CME ERROR: <err>
```

Description

When receive new short message, the module will report +CMTI or +CMT[+CDS] message.

Defined Values

<mem> String type; memory for storage new messages.

<index> Integer type; value in the range of location numbers supported by the associated memory.

<length> Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data>(or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets(i.e. the RP layer SMSC address octets are not counted in the length).

<fo> Depending on the command or result code: first octet of 3G TS 23.040 [3] SMS-DELIVER, SMS-SUBMIT(default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format.

<vp> Depending on SMS-SUBMIT is supported, in enhanced format (hexadecimal coded string with double quotes).

<pid> 3G TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0).

<dcs> Depending on the command or result code: 3G TS 23.038 [2] SMS Data Coding Scheme (default0), or Cell Broadcast Data Coding Scheme in integer format.

<sca> 3G TS 24.011 [6] RP SC address Address-Value field in string format.

<tosca> 3G TS 24.011 [6] RP SC address Type-of-Address octet in integer format.

<scts> 3G TS 23.040 [3] TP-Service-Centre-Time-Stamp in time-string format (refer <dt>).

<alpha> String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phone book; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character.

Note: ML302S/ML307S/ML302A/ML307A do not support SC address in +CTI.

9.15. +CDS/+CDSI Indicates SMS status report has been received

This command is used to#indicates SMS status report has been received.

+CDS/+CDSI
Possible Returns

If succeed

```
+CDS: <length><CR><LF><pdu> (PDU mode enabled)
+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)
+CDSI: <mem>,<index>
```

If fail

```
+CME ERROR: <err>
```

Description

Indicates that SMS status report has been received.

Defined Values

<pdu> In the case of SMS: 3G TS 24.011 [6] SC address followed by 3G TS 23.040 [3] TPDU in hexadecimal format:ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).

<length> Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or<cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).

<fo> Depending on the command or result code: first octet of 3G TS 23.040 [3] SMS-DELIVER, SMS-SUBMITSMSSTATUS-REPORT, or SMS-COMMAND in integer format is supported, in enhanced format (hexadecimal coded string with double quotes).

<scts> 3G TS 23.040 [3] TP-Service-Centre-Time-Stamp in time-string format (refer <dt>).

<st> 3G TS 23.040 [3] TP-Status in integer format.

<mr> 3G TS 23.040 [3] TP-Message-Reference in integer format.

<ra> 3G TS 23.040 [3] TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3G TS 27.007 [9]); type of address given by <tora>.

<dt> 3G TS 23.040 [3] TP-Discharge-Time in time-string format: “yy/MM/dd,hh:mm:ss:zz”, where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. E.g. 6th of May 1994,22:10:00 GMT+2 hours equals to “94/05/06,22:10:00+08”.

<tora> 3G TS 24.011 [6] TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>).

+CDS/+CDSI
<mem> String type; memory for storage new messages.
<index> Integer type; value in the range of location numbers supported by the associated memory.
Remark
Please refer to +CNMI. In ML302S/ML307S, only PDU mode supported.

Note: ML302S/ML307S does not support +CDSI.

9.16. AT+CPMS Preferred SMS message storage

This command is used to set preferred SMS message storage.

AT+CPMS	
Syntax	Possible Returns
Test Command **AT+CPMS=?**	*+CPMS: (list of supported <mem1>s),(list of supported <mem2>s) ,(list of supported <mem3>s)* *OK*
Read Command **AT+CPMS?**	If succeed *+CPMS:* *<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Set command **AT+CPMS =<mem1>[,<mem2>[,<mem3>]]**	If succeed *+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>* *OK* If error is related to ME functionality *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR: <err> or +CME ERROR: <err> shall be returned. Test command returns lists of memory storages supported by the TA.

Defined Values

<mem1> String type, messages to be read and deleted from this memory storage.[66]

SM

SIM message storage

ME

ME message storage

SR

Status Report message storage (EF-SMR if available on SIM).SR in SIM are only associated with SMSs stored on SIM.

66. ML302S/ML307S/ML302A/ML307A do not support parameters SR.

AT+CPMS

If EF-SMR not available and MMI is present then status reports are stored in NVRAM. In addition, MMI can store status reports in NVRAM as well as ones stored on SIM (EF-SMR file), if available.

<mem2> String type, messages will be written and sent to this memory storage.

SM

SIM message storage

ME

ME message storage

<mem3> Received messages will be placed in this memory storage if routing to PC is not set ("+CNMI").

SM

SIM message storage

ME

ME message storage

<usedx> Integer type, number of messages currently in *<memx>*.

<totalx> Integer type, number of messages storable in *<memx>*.

Scope

Channel Specific for test command. Generic for execute command.

9.17. AT+CMMS Set SMS concat

This command is used to set SMS concat.

AT+CMMS	
Syntax	Possible Returns
Test Command **AT+CMMS=?**	*+CMMS: list of supported <n>s*
Read Command **AT+CMMS?**	If succeed *+CMMS: <n>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Set Command **AT+CMMS**[=<n>]	If succeed *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*

Description

Set command controls the continuity of SMS relay protocol link. When feature is enabled (and supported by network) multiple messages can be sent much faster as link is kept open. Test command returns supported values as a compound value.

Defined Values

<n> Integer type, default value is 0.

0

Disable.

1

Keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.)and the next send command exceeds 1–5 seconds (the exact value is up to ME implementation), then ME shall close the link and TA switches <n> automatically back to 0.

2

Enable (if the time between the response of the latest message send command and the next send command exceeds 1–5 seconds (the exact value is up to ME implementation), ME shall close the link but TA shall not switch automatically back to <n>=0).

10. ME Error Codes Related Commands

This chapter describes in detail the error codes used in all commands in this manual.

10.1. AT+CMEE Error message format

This command is used to disable or enable the use of result code +CME ERROR: <err> or +CMS ERROR: <err> or +CIS ERROR: <err> as an indication of an error relating to the functionality of the ME.

AT+CMEE	
Syntax	Possible Returns
Test Command **AT+CMEE=?**	*+CMEE: (list of supported <n>s)* *OK*
Read Command **AT+CMEE?**	If succeed *+CMEE: <n>* *OK* If fail *+CMS ERROR: <err>* *or* *+CME ERROR: <err>*
Set Command **AT+CMEE=<n>**	If succeed *OK* If fail *+CME ERROR: <err>*
Description	
Set command disables or enables the use of final result code +CME ERROR: <err> or +CMS ERROR: <err> or +CIS ERROR: <err> as an indication of an error relating to the functionality of the MT. When enabled, MT related errors cause +CME ERROR: <err> or +CMS ERROR: <err> or +CIS ERROR: <err> final result code instead of the regular ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality. Read command returns the current setting of <n>. Test command returns values supported as a compound value.	
Defined Values	
<n> Integer type. The default value is 1.[67]	
0 Disable result code	
1 Enable result code and use numeric values	
2 Enable result code and use verbose values	

67. ML302S/ML307S only support parameter 1.

10.2. +CME ERROR ME Error code reporting

Code of CME ERROR Meaning.

Table 4. General errors

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
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted (See NOTE 1)
11	SIM PIN required
12	SIM PUK required
13	SIM failure (See NOTE 1)
14	SIM busy (See NOTE 1)
15	SIM wrong (See NOTE 1)
16	incorrect password
17	SIM PIN2 required
18	

Table 4. General errors (continued)

General errors	
	SIM PUK2 required
20	
	memory full
21	
	invalid index
22	
	not found
23	
	memory failure
24	
	text string too long
25	
	invalid characters in text string
26	
	dial string too long
27	
	invalid characters in dial string
30	
	no network service
31	
	network timeout
32	
	network not allowed − emergency calls only
40	
	network personalization PIN required
41	
	network personalization PUK required
42	
	network subset personalization PIN required
43	
	network subset personalization PUK required
44	
	service provider personalization PIN required
45	
	service provider personalization PUK required
46	

Table 4. General errors (continued)

General errors	
	corporate personalization PIN required
47	
	corporate personalization PUK required
48	
	hidden key required (See NOTE 2)
49	
	EAP method not supported
50	
	Incorrect parameters
51	
	command implemented but currently disabled
52	
	command aborted by user
53	
	not attached to network due to MT functionality restrictions
54	
	modem not allowed − MT restricted to emergency calls only
55	
	operation not allowed because of MT functionality restrictions
56	
	fixed dial number only allowed − called number is not a fixed dial number (refer 3GPP TS 22.101 [147])
57	
	temporarily out of service due to other MT usage
58	
	language/alphabet not supported
59	
	unexpected data value
60	
	system failure
61	
	data missing
62	
	call barred
63	
	message waiting indication subscription failure
100	

Table 4. General errors (continued)

General errors
unknown

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

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

Errors related to a failure to perform an attach.

Table 5. Errors for CS, GPRS and UMTS

Errors for CS, GPRS and UMTS
102
IMSI unknown in HLR (See NOTE 2)
103
Illegal MS
104
IMSI unknown in VLR (See NOTE 2)
105
IMEI not accepted (See NOTE 2)
106
Illegal ME
107
GPRS services not allowed
108
GPRS services and non-GPRS services not allowed
109
MS identity cannot be derived by the network (See NOTE 2)
110
Implicitly detached (See NOTE 2)
111
PLMN not allowed
112
Location area not allowed
113
Roaming not allowed in this tracking area
114
GPRS services not allowed in this PLMN
115
No suitable cells in tracking area

Table 5. Errors for CS, GPRS and UMTS (continued)

Errors for CS, GPRS and UMTS
116
MSC temporarily not reachable (See NOTE 2)
117
Network failure (See NOTE 2)
122
Congestion
125
Not authorized for this CSG
132
Service option not supported (See NOTE 2)
133
Requested service option not subscribed (See NOTE 2)
134
Service option temporarily out of order (See NOTE 2)
138
Call cannot be identified (See NOTE 2)
148
Unspecified GPRS error (See NOTE 2)
150
Invalid mobile class
172
Semantically incorrect message
173
Invalid mandatory information
174
Message type non-existent or not implemented
175
Conditional IE error
176
Protocol error, unspecified
183
SMS provided via GPRS in this routing area (See NOTE 2)
185
No PDP context activated (See NOTE 2)
186
Message not compatible with protocol state

Table 5. Errors for CS, GPRS and UMTS (continued)

Errors for CS, GPRS and UMTS
187
Recovery on timer expiry (See NOTE 2)
208
Message type not compatible with protocol state (See NOTE 2)
209
Information element non-existent or not implemented (See NOTE 2)

NOTE 1: Values in parentheses are 3GPP TS 24.008 [8] cause codes.

NOTE 2: This error code was given a numeric value in 3GPP Rel-15, but was introduced in an earlier release.

Table 6. Errors for EPS

Errors for EPS
102
IMSI unknown in HLR (See NOTE 2)
103
Illegal MS
105
IMEI not accepted (See NOTE 2)
106
Illegal ME
107
EPS services not allowed
108
EPS services and non-GPRS services not allowed
109
UE identity cannot be derived by the network (See NOTE 2)
110
Implicitly detached (See NOTE 2)
111
PLMN not allowed
112
Tracking area not allowed
113
Roaming not allowed in this tracking area
114
EPS services not allowed in this PLMN

Table 6. Errors for EPS (continued)

Errors for EPS
115
No suitable cells in tracking area
117
Network failure (See NOTE 2)
118
CS domain not available
119
ESM failure
122
Congestion
125
Not authorized for this CSG
139
CS service temporarily not available (See NOTE 2)
172
Semantically incorrect message
173
Invalid mandatory information
174
Message type non-existent or not implemented
175
Conditional IE error
176
Protocol error, unspecified
185
No EPS bearer context activated (See NOTE 2)
186
Message not compatible with protocol state
189
Requested service option not authorized in this PLMN (See NOTE 2)
204
Severe network failure (See NOTE 2)
208
Message type not compatible with protocol state (See NOTE 2)
209
Information element non-existent or not implemented (See NOTE 2)

Table 6. Errors for EPS (continued)

Errors for EPS
226
Redirection to 5GCN required

NOTE 1: Values in parentheses are 3GPP TS 24.301 [83] cause codes.

NOTE 2: This error code was given a numeric value in 3GPP Rel-15, but was introduced in an earlier release.

Errors related to a failure to activate a context.

Table 7. Errors for GPRS and UMITS

Errors for GPRS and UMTS
124
MBMS bearer capabilities insufficient for the service (See NOTE 2)
126
Insufficient resources
127
Missing or unknown APN
128
Unknown PDP address or PDP type
129
User authentication or authorization failed
130
Activation rejected by GGSN, Serving GW or PDN GW
131
Activation rejected, unspecified
132
Service option not supported
133
Requested service option not subscribed
134
Service option temporarily out of order
135
NSAPI already used (See NOTE 2)
136
Regular deactivation (See NOTE 2)
140
Feature not supported

Table 7. Errors for GPRS and UMITS (continued)

Errors for GPRS and UMTS
141
Semantic error in the TFT operation
142
Syntactical error in the TFT operation
143
Unknown PDP context
144
Semantic errors in packet filter(s)
145
Syntactical errors in packet filter(s)
146
PDP context without TFT already activated
147
Multicast group membership time-out (See NOTE 2)
148
Unspecified GPRS error
149
PDP authentication failure
150
Invalid mobile class
172
Semantically incorrect message (See NOTE 2)
173
Invalid mandatory information (See NOTE 2)
174
Message type non-existent or not implemented (See NOTE 2)
175
Conditional IE error (See NOTE 2)
176
Protocol error, unspecified (See NOTE 2)
177
Operator determined barring
178
Maximum number of PDP contexts reached
179
Requested APN not supported in current RAT and PLMN combination

Table 7. Errors for GPRS and UMITS (continued)

Errors for GPRS and UMTS
180
Request rejected, bearer control mode violation
182
User data transmission via control plane is congested
186
Message not compatible with protocol state (See NOTE 2)
188
Invalid transaction identifier value (See NOTE 2)
190
Network failure (See NOTE 2)
191
Reactivation requested (See NOTE 2)
192
PDP type IPv4 only allowed (See NOTE 2)
193
PDP type IPv6 only allowed (See NOTE 2)
194
Single address bearers only allowed (See NOTE 2)
195
Collision with network initiated request (See NOTE 2)
196
PDP type IPv4v6 only allowed (See NOTE 2)
197
PDP type non IP only allowed (See NOTE 2)
198
Bearer handling not supported (See NOTE 2)
199
APN restriction value incompatible with active PDP context (See NOTE 2)
200
Multiple accesses to a PDN connection not allowed (See NOTE 2)
208
Message type not compatible with protocol state (See NOTE 2)
209
Information element non-existent or not implemented (See NOTE 2)

NOTE 1: Values in parentheses are 3GPP TS 24.008 [8] cause codes.

Table 7. Errors for GPRS and UMITS (continued)

Errors for GPRS and UMTS
NOTE 2: This error code was given a numeric value in 3GPP Rel-15, but was introduced in an earlier release.

Table 8. Errors for EPS

Errors for EPS
126
Insufficient resources
127
Missing or unknown APN
128
Unknown PDN type
129
User authentication or authorization failed
130
Activation rejected by Serving GW or PDN GW
131
Request rejected, unspecified
132
Service option not supported
133
Requested service option not subscribed
134
Service option temporarily out of order
135
PTI already in use
136
Regular deactivation (See NOTE 2)
137
EPS QoS not accepted (See NOTE 2)
141
Semantic error in the TFT operation
142
Syntactical error in the TFT operation
143
Invalid EPS bearer identity
144

Table 8. Errors for EPS (continued)

Errors for EPS
Semantic errors in packet filter(s)
145
Syntactical errors in packet filter(s)
171
Last PDN disconnection not allowed (See NOTE 3)
172
Semantically incorrect message (See NOTE 2)
173
Invalid mandatory information (See NOTE 2)
174
Message type non-existent or not implemented (See NOTE 2)
175
Conditional IE error (See NOTE 2)
176
Protocol error, unspecified (See NOTE 2)
177
Operator determined barring
178
Maximum number of EPS bearers reached
179
Requested APN not supported in current RAT and PLMN combination
181
unsupported QCI value
184
Invalid PTI value
186
Message not compatible with protocol state (See NOTE 2)
190
Network failure (See NOTE 2)
191
Reactivation requested (See NOTE 2)
192
PDN type IPv4 only allowed (See NOTE 2)
193
PDN type IPv6 only allowed (See NOTE 2)
194

Table 8. Errors for EPS (continued)

Errors for EPS
Single address bearers only allowed (See NOTE 2)
195
Collision with network initiated request (See NOTE 2)
196
PDN type IPv4v6 only allowed (See NOTE 2)
197
PDN type non IP only allowed (See NOTE 2)
198
Bearer handling not supported (See NOTE 2)
199
APN restriction value incompatible with active EPS bearer context (See NOTE 2)
200
Multiple accesses to a PDN connection not allowed (See NOTE 2)
201
ESM information not received (See NOTE 2)
202
PDN connection does not exist (See NOTE 2)
203
Multiple PDN connections for a given APN not allowed (See NOTE 2)
208
Message type not compatible with protocol state (See NOTE 2)
209
Information element non-existent or not implemented (See NOTE 2)
221
PTI mismatch
230
PDN type Ethernet only allowed

NOTE 1: Values in parentheses are 3GPP TS 24.301 [83] cause codes.

NOTE 2: This error code was given a numeric value in 3GPP Rel-15, but was introduced in an earlier release.

NOTE 3: The numeric error code for "Last PDN disconnection not allowed" is returned when the MT detects an attempt to disconnect the last PDN or the network returns a response message with cause value. The numeric error code was changed to 171 in 3GPP Rel-11.

Table 9. VBS, VGCS and eMLPP-related errors

VBS, VGCS and eMLPP-related errors
151
VBS/VGCS not supported by the network
152
No service subscription on SIM
153
No subscription for group ID
154
Group Id not activated on SIM
155
No matching notification
156
VBS/VGCS call already present
157
Congestion
158
Network failure
159
Uplink busy
160
No access rights for SIM file
161
No subscription for priority
162
operation not applicable or not possible
163
Group Id prefixes not supported
164
Group Id prefixes not usable for VBS
165
Group Id prefix value invalid

10.3. +CMS ERROR ME Error code reporting

Code of CMS ERROR Meaning.

General errors
1
unassigned (unallocated) number
8
operator determined barring
21
Short message transfer rejected
27
Destination out of service
28
Unidentified subscriber
29
Facility rejected
30
Unknown subscriber
38
Network out of order
41
Temporary failure
42
Congestion
47
Resources unavailable,unspecified
50
Requested facility not subscribed
69
Requested facility not implemented
81
Invalid short message transfer reference value
95
Invalid message, unspecified
96
Invalid mandatory information
97
Message type non-existent or not implemented

General errors

98

Message not compatible with short message protocol state

99

Information element non-existent or not implemented

111

Protocol error, unspecified

127

Interworking, unspecified

300

ME failure

301

SMS 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 necessary

312

PH SIM pin necessary

313

SIM failure

314

SIM busy

315

SIM wrong

316

SIM PUK required

317

SIM PIN2 required

318

General errors

SIM PUK2 required

320

memory failure

321

invalid memory index

322

memory full

330

SMSC address unknown

331

no network

332

network timeout

340

no +CNMA acknowledgment expected

500

Unknown

512

SIM not ready

513

unread records on SIM

515

PS busy

516

Couldn't read SMS parameters from SIM

517

SM BL not ready

518

invalid parameter

519

ME temporary not available

528

Invalid (non-hex) chars in PDU

529

Incorrect PDU length

530

Invalid MTI