



NE866B1/NL865B1 AT Commands Reference Guide

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APPLICABILITY TABLE

PRODUCTS

■ ■ NE866B1-E1
■ ■ NL865B1-E1

SW RELEASE

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CONTENTS

1	Introduction	8
1.1	Scope	8
1.2	Audience	8
1.3	Contact Information, Support	8
1.4	Text Conventions	9
1.6.	Related Documents	9
2	Overview	10
3	AT Commands	11
3.1	Definitions	12
3.2	AT Command Syntax	13
3.2.1	String Type Parameters	14
3.2.2	Command Lines	14
3.2.2.1	<i>ME Error Result Code - +CME ERROR: <err></i>	15
4	AT Commands References	16
1.1.	Command Line General Format	16
4.1.1	Command Line Prefixes	16
4.1.1.1	<i>Starting A Command Line - AT</i>	16
4.1.2	3GPP TS 27.007 AT Commands	16
4.1.2.1	<i>General</i>	16
4.1.2.1.1	Request Manufacturer Identification - +CGMI	16
4.1.2.1.2	Request Model Identification - +CGMM	16
4.1.2.1.3	Request Revision Identification - +CGMR	16
4.1.2.1.4	Request Product Serial Number Identification - +CGSN	16
4.1.2.1.5	Serial Number - +GSN	17
4.1.2.1.6	Request International Mobile station Equipment Identity and SW Ver- +IMEISV	17
4.1.2.1.7	Request international mobile subscriber identity (IMSI) - +CIMI	17
4.1.2.1.8	Command Echo - E	17
4.1.2.1.9	Identification Information - I	18
4.1.2.1.10	Command Line Termination Character - S3	18
4.1.2.1.11	Response Formatting Character - S4	18
4.1.2.1.12	Command Line Editing Character – S5	18
4.1.2.1.13	Extended Error Report – +CEER	19
4.1.2.1.14	Clock Management – +CCLK	19
4.1.2.2	<i>Network Service Handling</i>	20
4.1.2.2.1	EPS network registration status - +CEREG	20

4.1.2.2.2	eDRX setting - +CEDRXS	21
4.1.2.2.3	eDRX setting - +CEDRXRDP	23
4.1.2.2.4	Signalling connection status - +CSCON	23
4.1.2.2.5	Operator Selection - +COPS	25
4.1.2.3	<i>Mobile Equipment Control</i>	26
4.1.2.3.1	Set Phone functionality - +CFUN	26
4.1.2.3.2	Available AT Commands - +CLAC	26
4.1.2.3.3	Extended Signal Quality- +CESQ	27
4.1.2.3.4	Signal Quality - +CSQ	27
4.1.2.4	<i>Mobile Equipment Errors</i>	28
4.1.2.4.1	Report Mobile Equipment Error - +CMEE	28
4.1.2.5	<i>Commands for Packet Domain</i>	29
4.1.2.5.1	PDN Connection Activate Or Deactivate - +CGACT	29
4.1.2.5.2	GPRS Attach Or Detach - +CGATT	29
4.1.2.5.3	Define PDN connection- +CGDCONT	29
4.1.2.5.4	Show PDP Address - +CGPADDR	30
4.1.2.5.5	Setting of 3GPP Rel12 PSM mode run time - +CPSMS	30
4.1.3	Custom AT Commands	31
4.1.3.1	<i>General Configuration AT Commands</i>	31
4.1.3.1.1	Auto-Attach Property - #AUTOATT	31
4.1.3.1.2	Lock to single BCCH ARFCN - # BCCHLOCK	31
4.1.3.1.3	Select Band - #BND	32
4.1.3.1.4	Cell Monitor - #MONI	33
4.1.3.1.5	Serving Cell Information - #SERVINFO	34
4.1.3.1.6	Read current network status - #RFSTS	34
4.1.3.1.7	Read ICCID (Integrated Circuit Card Identification) - +CCID	35
4.1.3.1.8	Temperature monitor configuration - #TEMPCFG	35
4.1.3.1.9	Temperature Monitor – #TEMPMON	35
4.1.3.1.10	General Purpose Input/Output Pin Control – #GPIO	37
4.1.3.1.11	Read Analog/Digital Converter input - #ADC	38
4.1.3.1.12	Low Power Wake Configuration - #LPWAKE	38
4.1.3.1.13	Reboot - #REBOOT	39
4.1.3.2	<i>Multisocket AT Commands</i>	39
4.1.3.2.1	Context Activation - #SGACT	39
4.1.3.2.2	Socket Shutdown - #SH	40
4.1.3.2.3	Socket Configuration - #SCFG	40
4.1.3.2.4	Socket Configuration Extended - #SCFGEXT	42
4.1.3.2.5	Socket configuration Extended 2 - #SCFGEXT2	44
4.1.3.2.6	Socket configuration Extended 3 - #SCFGEXT3	46
4.1.3.2.7	Socket info - #SI	46
4.1.3.2.8	Socket Status - #SS	47
4.1.3.2.9	Socket Dial - #SD	50
4.1.3.2.10	Socket Listen UDP - #SLUDP	51
4.1.3.2.11	Socket Accept - #SA	51
4.1.3.2.12	Receive Data In Command Mode - #SRECV	52
4.1.3.2.13	Send UDP data to a specific remote host extended #SENDDUPEXT	52
4.1.3.2.15	Send PING request - #PING	53
4.1.3.2.16	Send data in Command Mode extended - #SENDEXT	54
4.1.3.3	<i>3GPP Rel12 PSM Commands</i>	54

5 Document History 55

5.1	Revisions	55
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1 INTRODUCTION

1.1 Scope

Purpose of this document is providing a detailed specification and a comprehensive listing as a reference for the whole set of AT command for the NE866 series (LTE cat.1 modules)

1.2 Audience

Readers of this document should be familiar with Telit modules and their ease of controlling by means of AT Commands.

1.3 Contact Information, Support

For general contact, technical support services, technical questions and report documentation errors contact Telit Technical Support at:

TS-EMEA@telit.com

TS-AMERICAS@telit.com

TS-APAC@telit.com

Alternatively, use:

<http://www.telit.com/support>

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

<http://www.telit.com>

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.

1.4 Text Conventions



Danger – This information **MUST** be followed or catastrophic equipment failure or bodily injury may occur.



Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.



Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.6. Related Documents

- 3GPP TS 27.007 specification and rules
http://www.3gpp.org/ftp/Specs/archive/27_series/27.007/
- 3GPP TS 27.005 specification and rules
http://www.3gpp.org/ftp/Specs/archive/27_series/27.005/
- Hayes standard AT command set

2 OVERVIEW

This document is to describe all AT commands implemented on the Telit wireless modules listed on the Applicability Table.



NOTICE:

(EN) The integration of the LTE **NE866B1/NL865B1** cellular module within user application shall be done according to the design rules described in this manual.

(IT) L'integrazione del modulo cellulare LTE **NE866B1/NL865B1** all'interno dell'applicazione dell'utente dovrà rispettare le indicazioni progettuali descritte in questo manuale.

(DE) Die Integration des **NE866B1/NL865B1** LTE Mobilfunk-Moduls in ein Gerät muß gemäß der in diesem Dokument beschriebenen Konstruktionsregeln erfolgen.

(SL) Integracija LTE **NE866B1/NL865B1** modula v uporabniški aplikaciji bo morala upoštevati projektna navodila, opisana v tem priločniku.

(SP) La utilización del modulo LTE **NE866B1/NL865B1** debe ser conforme a los usos para los cuales ha sido diseñado descritos en este manual del usuario.

(FR) L'intégration du module cellulaire LTE **NE866B1/NL865B1** dans l'application de l'utilisateur sera faite selon les règles de conception décrites dans ce manuel.

(HE) האינטגרציה של המודול הסלולרי **NE866B1/NL865B1** בתהליך האינטגרציה של המודם הסלולרי עם המוצר.

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3 AT COMMANDS

The Telit wireless module family can be controlled via the serial interface using the standard AT commands. The Telit wireless module family is compliant with:

- Hayes standard AT command set, in order to maintain the compatibility with existing SW programs.
- 3GPP TS 27.007 specific AT command and LTE specific commands.

Moreover Telit wireless module family supports also Telit proprietary AT commands for special purposes.

The following is a description of how to use the AT commands with the Telit wireless module family.



The AT is an ATTENTION command and is used as a prefix to other parameters in a string. The AT command combined with other parameters can be set up in the communications package or typed in manually as a command line instruction. Combined with other parameters can be set up in the communications package or typed in manually as a command line instruction.

3.1 Definitions

The following syntactical definitions apply:

<CR> Carriage return character, is the command line and result code terminator character, which value, in decimal ASCII between 0 and 255, is specified within parameter **S3**. The default value is 13.

<LF> Linefeed character, is the character recognised as line feed character. Its value, in decimal ASCII between 0 and 255, is specified within parameter **S4**. The default value is 10.

The line feed character is output after carriage return character if verbose result codes are used (**V1** option used) otherwise, if numeric format result codes are used (**V0** option used) it will not appear in the result codes.

<...> Name enclosed in angle brackets is a syntactical element. They do not appear in the command line.

[...] Optional sub parameter of a command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When sub parameter is not given in AT commands which have a Read command, new value equals to its previous value. In AT commands which do not store the values of any of their sub parameters, and so have not a Read command, which are called *action type* commands, action should be done on the basis of the recommended default setting of the sub parameter.

3.2 AT Command Syntax

The syntax rules followed by Telit implementation of either Hayes AT commands, Modem commands are very similar to those of standard basic and extended AT commands

There are two types of extended command:

Parameter type commands. This type of commands may be “set” (to store a value or values for later use), “read” (to determine the current value or values stored), or “tested” (to determine ranges of values supported). Each of them has a test command (trailing =?) to give information about the type of its sub parameters; they also have a Read command (trailing ?) to check the current values of sub parameters.

Action type commands. This type of command may be “executed” or “tested”.

“executed” to invoke a particular function of the equipment, which generally involves more than the simple storage of a value for later use

“tested” to determine:

if sub parameters are associated with the action, the ranges of sub parameters values that are supported;

if the command has no sub parameters, issuing the correspondent Test command (trailing =?) raises the result code “**ERROR**”.

Note: issuing the Read command (trailing ?) causes the command to be executed.

whether or not the equipment implements the Action Command (in this case issuing the correspondent Test command - trailing =? - returns the **OK** result code), and, if sub parameters are associated with the action, the ranges of sub parameters values that are supported.

Action commands don't store the values of any of their possible sub parameters.

Moreover:

The response to the Test Command (trailing =?) may be changed in the future by Telit to allow the description of new values/functionalities.

If all the sub parameters of a parameter type command **+CMD** are optional, issuing **AT+CMD=<CR>** causes the **OK** result code to be returned and the previous values of the omitted sub parameters to be retained.

3.2.1 String Type Parameters

A string, either enclosed between quotes or not, is considered to be a valid string type parameter input. According to V25.ter space characters are ignored on the command line and may be used freely for formatting purposes, unless they are embedded in numeric or quoted string constants; therefore a string containing a space character has to be enclosed between quotes to be considered a valid string type parameter (e.g. typing **AT+COPS=1,0,"A1"** is the same as typing **AT+COPS=1,0,A1**; typing **AT+COPS=1,0,"A BB"** is different from typing **AT+COPS=1,0,A BB**).

A string is always case sensitive.

A small set of commands requires always to write the input string parameters within quotes: this is explicitly reported in the specific descriptions.

3.2.2 Command Lines

A command line is made up of three elements: the **prefix**, the **body** and the **termination character**.

The **command line prefix** consists of the characters "AT" or "at", or, to repeat the execution of the previous command line, the characters "A/" or "a/" or **AT#**/ or **at#**/.

The **termination character** may be selected by a user option (parameter S3), the default being **<CR>**.

The basic structures of the command line are:

- **ATCMD1<CR>** where **AT** is the command line prefix, **CMD1** is the body of a **basic command** (nb: the name of the command never begins with the character "+") and **<CR>** is the command line terminator character **ATCMD2=10<CR>** where 10 is a sub parameter
- **+CMD1?<CR>** This is a Read command for checking current sub parameter values
- **+CMD1=?<CR>** This is a test command for checking possible sub parameter values



The set of proprietary AT commands differentiates from the standard one because the name of each of them begins with either "@", "#", "\$" or "*". Proprietary AT commands follow the same syntax rules as extended commands.

In case of errors depending on ME operation, **ERROR** (or **4**) response may be replaced by **+CME ERROR: <err>** or **+CMS ERROR: <err>**.

3.2.2.1 ME Error Result Code - +CME ERROR: <err>

This is NOT a command, it is the error response to +Cxxx 3GPP TS 27.007 commands.

Syntax: +CME ERROR: <err>

Parameter: <err> - error code can be either numeric or verbose (see +CMEE). The possible values of <err> are reported in the table:

General Errors	
Numeric Format	Verbose Format
4	operation not supported
23	memory failure
30	no network service
50	Incorrect parameters
51	Operation not allowed
159	Uplink busy
512	Required parameter not configured
513	Not registered
514	FOTA updating
515	Socket busy

4 AT COMMANDS REFERENCES

1.1. Command Line General Format

4.1.1 Command Line Prefixes

4.1.1.1 Starting A Command Line - AT

AT - Starting A Command Line		SELINT 2
AT	The prefix AT , or at , is a two-character abbreviation (ATtention), always used to start a command line to be sent from TE to TA, with the only exception of AT#/prefix	
Reference	3GPP TS 27.007	

4.1.2 3GPP TS 27.007 AT Commands

4.1.2.1 General

4.1.2.1.1 Request Manufacturer Identification - +CGMI

+CGMI - Request Manufacturer Identification		SELINT 2
AT+CGMI	Execution command returns the device manufacturer identification code without command echo.	
AT+CGMI=?	Test command returns OK result code.	
Reference	3GPP TS 27.007	

4.1.2.1.2 Request Model Identification - +CGMM

+CGMM - Request Model Identification		SELINT 2
AT+CGMM	Execution command returns the device model identification code without command echo.	
AT+CGMM=?	Test command returns OK result code.	
Reference	3GPP TS 27.007	

4.1.2.1.3 Request Revision Identification - +CGMR

+CGMR - Request Revision Identification		SELINT 2
AT+CGMR	Execution command returns device software revision number without command echo.	
AT+CGMR=?	Test command returns OK result code.	
Reference	3GPP TS 27.007	

4.1.2.1.4 Request Product Serial Number Identification - +CGSN

+CGSN - Request Product Serial Number Identification		SELINT 2
AT+CGSN	Execution command returns the product serial number, identified as the IMEI of the mobile, without command echo.	
AT+CGSN=?	Test command returns OK result code.	
Reference	3GPP TS 27.007	

4.1.2.1.5 Serial Number - +GSN

+GSN - Serial Number		SELINT 2
AT+GSN	Execution command returns the device board serial number. Note: The number returned is not the IMSI, it is only the board number	
Reference	V.25ter	

4.1.2.1.6 Request International Mobile station Equipment Identity and SW Ver- +IMEISV

+IMEISV –Request International Mobile station Equipment Identity and SW Version		SELINT 2
AT+IMEISV	Execution command returns the International Mobile station Equipment Identity and Software Version Number, identified as the IMEISV of the mobile, without command echo. The IMEISV is composed of the following elements (each element shall consist of decimal digits only): <ul style="list-style-type: none"> • Type Allocation Code (TAC). Its length is 8 digits; • Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC. Its length is 6 digits; • Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits. • 	
AT+IMEISV=?	Test command returns OK result code.	
Reference	3GPP TS 23.003	

4.1.2.1.7 Request international mobile subscriber identity (IMSI) - +CIMI

+CIMI - Request International Mobile Subscriber Identify (IMSI)		SELINT 2
AT+CIMI	Execution command returns the value of the Internal Mobile Subscriber Identity stored in the SIM without command echo. Note: a SIM card must be present in the SIM card housing, otherwise the command returns ERROR .	
AT+CIMI=?	Test command returns OK result code.	
Reference	3GPP TS 27.007	

4.1.2.1.8 Command Echo - E

E - Command Echo		SELINT 2
ATE[<n>]	Set command enables/disables the command echo. Parameter: <n> 0 - disables command echo 1 - enables command echo (factory default) , hence command sent to the device are echoed back to the DTE before the response is given. Note: if parameter is omitted, the command has the same behavior of ATE0	
Reference	V25ter	

4.1.2.1.9 Identification Information - I

I - Identification Information		SELINT 2
ATI[<n>]	<p>Execution command returns one or more lines of information text followed by a result code.</p> <p>Parameter:</p> <p><n></p> <ul style="list-style-type: none"> 0 - numerical identifier 1 - module checksum 2 - checksum check result 3 - manufacturer 4 - product name 5 - DOB version <p>Note: if parameter is omitted, the command has the same behaviour of ATI0</p>	
Reference	V25ter	

4.1.2.1.10 Command Line Termination Character - S3

S3 - Command Line Termination Character		SELINT 2
ATS3=[<char>]	<p>Set command sets the value of the character either recognized by the device as command line terminator and generated by the device as part of the header, trailer, and terminator for result codes and information text, along with S4 parameter.</p> <p>Parameter:</p> <p><char> - command line termination character (decimal ASCII)</p> <p>0..127 - factory default value is 13 (ASCII <CR>)</p> <p>Note: the “previous” value of S3 is used to determine the command line termination character for entering the command line containing the S3 setting command. However, the result code issued shall use the “new” value of S3 (as set during the processing of the command line)</p>	
ATS3?	<p>Read command returns the current value of S3 parameter.</p> <p>Note: the format of the numbers in output is always 3 digits, left-filled with 0s</p>	
Reference	V25ter	

4.1.2.1.11 Response Formatting Character - S4

S4 - Response Formatting Character		SELINT 2
ATS4=[<char>]	<p>Set command sets the value of the character generated by the device as part of the header, trailer, and terminator for result codes and information text, along with the S4 parameter.</p> <p>Parameter:</p> <p><char> - response formatting character (decimal ASCII)</p> <p>0..127 - factory default value is 10 (ASCII LF)</p> <p>Note: if the value of S4 is changed in a command line the result code issued in response of that command line will use the new value of S4.</p>	
ATS4?	<p>Read command returns the current value of S4 parameter.</p> <p>Note: the format of the numbers in output is always 3 digits, left-filled with 0s</p>	
Reference	V25ter	

4.1.2.1.12 Command Line Editing Character – S5

S5 - Command Line Editing Character		SELINT 2
ATS5=[<char>]	<p>Set command sets the value of the character recognized by the device as a request to delete from the command line the immediately preceding character.</p> <p>Parameter:</p> <p><char> - command line editing character (decimal ASCII)</p> <p>0..127 - factory default value is 8 (ASCII BS)</p>	

S5 - Command Line Editing Character		SELINT 2
ATS5?	Read command returns the current value of S5 parameter . Note: the format of the numbers in output is always 3 digits, left-filled with 0s	
Reference	V25ter	

4.1.2.1.13 Extended Error Report – +CEER

+CEER - Extended Error Report		SELINT 2
AT+CEER	Execution command returns one or more lines of information text <report> offering the TA user an extended error report, in the format: +CEER: <report> This report regards some error condition that may occur: the failure in the last unsuccessful call setup (originating or answering) or in-call modification; - the last call release; - the last unsuccessful PDP context activation; - the last PDP context deactivation. Note: if none of the previous conditions has occurred since power up then “Normal, unspecified” condition is reported	
AT+CEER=?	Test command returns OK result code.	

4.1.2.1.14 Clock Management – +CCLK

+CCLK - Clock Management		SELINT 2
AT+CCLK=<time>	Set command sets the real-time clock of the ME . Parameter: <time> - current time as quoted string. The actual format depends on +CSDF <auxmode> parameter. For <auxmode>=0(default) - the format is: "yy/MM/dd,hh:mm:ss±zz" For <auxmode>=1 – the format is: "yyyy/MM/dd,hh:mm:ss±zz" yy - year, range is 00..99, which translates to years 2000-2099 yyyy – year, range is 1970-2105 MM - month (two last digits are mandatory), range is 01..12 dd - day (two last digits are mandatory); The range for dd(day) depends on the month and on the year it refers to. Available ranges are: (01..28) (01..29) (01..30) (01..31) Trying to enter an out of range value will raise an error hh - hour (two last digits are mandatory), range is 00..23 mm - minute (two last digits are mandatory), range is 00..59 ss - seconds (two last digits are mandatory), range is 00..59 ±zz - time zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT; two last digits are mandatory), range is -47..+48.	
AT+CCLK?	Read command returns the current setting of the real-time clock, in the format <time>. Note: the three last characters of <time>, i.e. the time zone information, are returned by +CCLK? only if the #NITZ URC 'extended' format has been enabled (see #NITZ).	
AT+CCLK=?	Read command returns the current setting of the real-time clock, in the format <time>. Note: the three last characters of <time>, i.e. the time zone information, are returned by +CCLK? only if the #NITZ URC 'extended' format has been enabled (see #NITZ).	

+CCLK - Clock Management		SELINT 2
Example	AT+CCLK="02/09/07,22:30:00+00" OK AT+CCLK? +CCLK: "02/09/07,22:30:25" OK	

4.1.2.2 Network Service Handling

4.1.2.2.1 EPS network registration status - +CEREG

+CEREG – EPS network registration status		SELINT 2
+CEREG=[<n>]	<p>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.</p> <p>+CEREG: <stat>[,<tac>],[<ci>],[<AcT>] when <n>=2 and there is a change of the network cell in E-UTRAN. The parameters <AcT>, <tac> and <ci> are sent only if available. The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value of <stat> changes.</p> <p>+CEREG:<n>,<stat>[,<lac>],[<ci>],[<AcT>],[<rac>],[<cause_type>],[<reject_cause>],[<Active-Time>],[<Periodic-TAU>]]] when <n>=4,5 the URC also provides information about PSM timings.</p> <p>Note: If the EPS MT in 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.</p>	
+CEREG?	<p>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.</p> <p>Defined values: <n>: integer type 0 - disable network registration unsolicited result code 1 - enable network registration unsolicited result code +CEREG: <stat> 2 - enable network registration and location information unsolicited result code +CEREG: <stat>[,<tac>],[<ci>],[<AcT>] 3 - enable network registration, location information and EMM cause value information unsolicited result code +CEREG: <stat>[,<tac>],[<ci>],[<AcT>],[<cause_type>,<reject_cause>] 4 - For a UE that wants to apply PSM, enable network registration and location information unsolicited result code +CEREG: <stat>[,<tac>],[<ci>],[<AcT>],[,<Active-Time>],[<Periodic-TAU>]]] 5 - For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code +CEREG: <stat>[,<tac>],[<ci>],[<AcT>],[<cause_type>],[<reject_cause>],[<Active-Time>],[<Periodic-TAU>]]]</p> <p><stat>: integer type; indicates the EPS registration status 0 - not registered, MT is not currently searching an operator to register to. 1 - registered, home network. 2 - not registered, but MT is currently trying to attach or searching an operator to register to. 3 - registration denied. 4 - unknown (e.g. out of E-UTRAN coverage).</p>	

+CEREG – EPS network registration status	SELINT 2
	<p>5 - registered, roaming.</p> <p><tac>: string type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal).</p> <p><ci>: string type; four byte E-UTRAN cell ID in hexadecimal format.</p> <p><Act>: integer type; indicates the access technology of the serving cell.</p> <p>0 - GSM 1 - GSM Compact 2 - UTRAN 3 - GSM w/EGPRS (see NOTE 3) 4 - UTRAN w/HSDPA (see NOTE 3) 5 - UTRAN w/HSUPA (see NOTE 3) 6 - UTRAN w/HSDPA and HSUPA (see NOTE 3) 7 - E-UTRAN</p> <p><cause_type>: integer type; indicates the type of <reject_cause>.</p> <p>0 - Indicates that <reject_cause> contains an EMM cause value 1 - Indicates that <reject_cause> contains a manufacturer-specific cause</p> <p><reject_cause>: integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.</p> <p><Active-Time>: string type; one byte in an 8 bit format. Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401</p> <p><Periodic-TAU>: string type; one byte in an 8 bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401</p> <p>Note 2: 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.</p> <p>Note 3: 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.</p> <p>Note 4: The NE866 supports only the value 7 (E-UTRAN) on <Act></p>
+CEREG=?	Test command returns values supported as a compound value. +CEREG: (list of supported <n>s)
Reference	3GPP TS 27.007

4.1.2.2.2 eDRX setting - +CEDRXS

+CEDRXS - eDRX setting	
AT+CEDRXS=[<mode>],[<Act-type>],[<Requested_eDRX_value>]]]	<p>The set command controls the setting of the UEs eDRX parameters.</p> <p>The command controls whether the UE wants to apply eDRX or not, as well as the requested eDRX value for each specified type of access technology.</p> <p>The set command also controls the presentation of an unsolicited result code +CEDRXP:<Act-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] when <n>=2 and there is a change in the eDRX parameters provided by the network.</p>

	<p>A special form of the command can be given as +CEDRXS=3. In this form, eDRX will be disabled and data for all parameters in the command +CEDRXS will be removed or, if available, set to the manufacturer specific default values.</p> <p><mode>: integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>.</p> <p>0 Disable the use of eDRX 1 Enable the use of eDRX 2 Enable the use of eDRX and enable the unsolicited result code +CEDRXP:<AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]]</p> <p>3 Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.</p> <p><AcT-type>: integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.</p> <p>0 Access technology is not using eDRX. This parameter value is only used in the unsolicited result code. 1 EC-GSM-IoT (A/Gb mode) 2 GSM (A/Gb mode) 3 UTRAN (Iu mode) 4 E-UTRAN (WB-S1 mode) 5 E-UTRAN (NB-S1 mode)</p> <p><Requested_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.</p> <p><NW-provided_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.</p> <p><Paging_time_window>: string type; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.</p> <p>Note: only access type <AcT-type>=5 is supported.</p>
+CEDRXS?	<p>The read command returns the current settings for each defined value of <AcT-type>.</p> <p>[+CEDRXS:<AcT-type>,<Requested_eDRX_value> [<CR><LF>+CEDRXS:<AcT-type>,<Requested_eDRX_value> [...]]]</p>
+CEDRXS=?	<p>The test command returns the supported <mode>s and the value ranges for the access technology and the requested eDRX value as compound values.</p>
Example	<pre>at+cedrxs=1,5,"0101" OK at+cedrxs? +CEDRXS: 5,"0101"</pre>

	OK
--	----

4.1.2.2.3 eDRX setting - +CEDRXRDP

+CEDRXRDP - eDRX read dynamic parameters	
AT+CEDRXRDP	<p>The execution command returns <AcT-type> and <Requested_eDRX_value>, <NW-provided_eDRX_value> and <Paging_time_window> if eDRX is used for the cell that the MS is currently registered to. If the cell that the MS is currently registered to is not using eDRX, AcT-type=0 is returned.</p> <p><AcT-type>: integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.</p> <p>0 Access technology is not using eDRX 1 EC-GSM-IoT (A/Gb mode) 2 GSM (A/Gb mode) 3 UTRAN (Iu mode) 4 E-UTRAN (WB-S1 mode) 5 E-UTRAN (NB-S1 mode)</p> <p><Requested_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.</p> <p><NW-provided_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.</p> <p><Paging_time_window>: string type; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.</p>
+CEDRXRDP=?	Test command returns OK

4.1.2.2.4 Signalling connection status - +CSCON

+CSCON - Signalling connection status		SELINT 2
AT+CSCON=[<n>]	<p>This command gives details of the terminal's perceived radio connection status (i.e. to the base-station). It returns an indication of the current state. Note, however, that this state is only updated when radio events, such as send and receive, take place. This means that the current state may be out of date. The terminal may think it is "Connected" yet cannot currently use a base station due to a change in the link quality.</p> <p>The set command controls the presentation of an unsolicited result code +CSCON.</p> <p><n>: integer type 0 disable unsolicited result code 1 enable unsolicited result code</p>	

+CSCON - Signalling connection status	SELINT 2
	<p>+CSCON: <mode> 2 enable unsolicited result code +CSCON: <mode>[,<state>] 3 enable unsolicited result code +CSCON: <mode>[,<state>[,<access>]]</p> <p>If <n>=1, +CSCON: <mode> is sent from the MT when the connection mode of the MT is changed. The set command controls the presentation of an unsolicited result code +CSCON. If <n>=1, +CSCON: <mode> is sent from the MT when the connection mode of the MT is changed. If <n>=2 and there is a state within the current mode, +CSCON: <mode>[,<state>] is sent from the MT. If <n>=3, +CSCON: <mode>[,<state>[,<access>]] is sent from the MT. If setting fails, an MT error, +CME ERROR: <err> is returned.</p> <p>Refer to Chapter 5: Error Values for possible <err> values. When the MT is in UTRAN or E-UTRAN, the mode of the MT refers to idle when no PS signaling connection and to connected mode when a PS signaling connection between UE and network is setup. When the UE is in GERAN, the mode refers to idle when the MT is in either the IDLE state or the STANDBY state and to connected mode when the MT is in READY state. The <state> value indicates the state of the MT when the MT is in GERAN, UTRAN connected mode or EUTRAN.</p> <p>Note: Unsolicited notifications are not currently supported. This functionality will be added in a future release. Note: Only <n>=0 and <n>=1 are supported. <n>=0 is the default value.</p>
<p>AT+CSCON?</p>	<p>The read command returns the status of result code presentation <n> and an integer <mode> which shows whether the MT is currently in idle mode or connected mode. State information <state> is returned only when <n>=2. Radio access type information <access> is returned only when <n>=3.</p> <p>Format is: +CSCON:<n>,<mode>[,<state>[,access]]</p> <p><n>: integer type; unsolicited configuration (see above for valid values)</p> <p><mode>: integer type; indicates the signaling connection status 0 idle 1 connected 2-255 <reserved for future use></p> <p><state>: integer type; indicates the CS or PS state while in GERAN and the RRC state information if the MT is in connected Mode while in UTRAN and E-UTRAN. 0 UTRAN URA_PCH state 1 UTRAN Cell_PCH state 2 UTRAN Cell_FACH state 3 UTRAN Cell_DCH state 4 GERAN CS connected state 5 GERAN PS connected state 6 GERAN CS and PS connected state 7 E-UTRAN connected state</p> <p><access>: integer type; indicates the current radio access type. 0 Indicates usage of radio access of type GERAN</p>

+CSCON - Signalling connection status		SELINT 2
	1 Indicates usage of radio access of type UTRAN TDD 2 Indicates usage of radio access of type UTRAN FDD 3 Indicates usage of radio access of type E-UTRAN TDD 4 Indicates usage of radio access of type E-UTRAN FDD	
AT+CSCON=?	Test command returns supported values as a compound value. +CSCON: (list of supported <n>s)	
Reference	3GPP TS 27.007	

4.1.2.2.5 Operator Selection - +COPS

+COPS - Operator Selection		SELINT 2
AT+COPS= [<mode> [,<format> [,<oper>[,< AcT>]]]	Set command forces an attempt to select and register the network operator. <mode> parameter defines whether the operator selection is done automatically or it is forced by this command to operator <oper> . The operator <oper> shall be given in format <format> . Parameters: <mode> 0 - automatic choice (the parameter <oper> will be ignored) (factory default) 1 - manual choice (<oper> field shall be present) 2 - deregister from network; the MODULE is kept unregistered until a +COPS with <mode>=0, 1 or 4 is issued 3 - set only <format> parameter (the parameter <oper> will be ignored) 4 - manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered <format> 0 - alphanumeric long form (max length 16 digits) 2 - Numeric 5 or 6 digits [country code (3) + network code (2 or 3)] <oper> network operator in format defined by <format> parameter. <AcT> access technology selected: 7 E-UTRAN Note: module supports <AcT> parameter value 7 only. Note: currently values not saved in NVM, and not available after reboot.	
AT+COPS?	Read command returns current value of <mode> , <format> , <oper> and <AcT> in format <format> ; if no operator is selected, <format> , <oper> and <AcT> are omitted +COPS: <mode>[, <format>, <oper>,< AcT>] Where <AcT> access technology selected: 7 E-UTRAN Note: module supports <AcT> parameter value 7 only	

+COPS - Operator Selection		SELINT 2
AT+COPS=?	<p>Test command returns a list of quadruplets, each representing an operator present in the network. The quadruplets in the list are separated by commas:</p> <p>+COPS: [list of supported (<stat> ,<oper (in <format>=0)>,, <oper (in <format>=2)>,< AcT>)s][,,(list of supported <mode>s), (list of supported<format>s)]</p> <p>where <stat> - operator availability 0 - unknown 1 - available 2 - current 3 - forbidden <AcT> access technology selected: 7 E-UTRAN</p> <p>Note: module supports <AcT> parameter value 7 only</p> <p>Note: since with this command a network scan is done, this command may require some seconds before the output is given.</p>	
Reference	3GPP TS 27.007	

4.1.2.3 Mobile Equipment Control

4.1.2.3.1 Set Phone functionality - +CFUN

+CFUN - Set Phone Functionality		SELINT 2
AT+CFUN=[<fun>,<rst>]	<p>Set command selects the level of functionality in the ME. Parameters: <fun> - is the power saving function mode 0 - minimum functionality, NON-CYCLIC SLEEP mode. The first wake-up event, or rising RTS line, stops power saving and takes the ME back to full functionality level <fun>=1. 1 - mobile full functionality with power saving disabled (factory default) 4 - disable both TX and RX 5 - mobile full functionality with power saving enabled <rst> - reset flag 0 - do not reset the ME before setting it to <fun> functionality level 1 - reset the device. The device is fully functional after the reset. This value is available only for <fun> = 1 Note: Only <fun> = 0 & 1 are supported. Note:<rst> is not supported and will be ignored.</p>	
AT+CFUN?	Read command reports the current setting of <fun> .	
AT+CFUN=?	Test command returns the list of supported values for <fun> and <rst> .	
Reference	3GPP TS 27.007	

4.1.2.3.2 Available AT Commands - +CLAC

+CLAC - Available AT Commands		SELINT 2
AT+CLAC	Execution command causes the ME to return the AT commands that are available	

+CLAC - Available AT Commands		SELINT 2
	for the user, in the following format: <AT cmd1>[<CR><LF><AT cmd2>[...]] where: <AT cmdn> - defines the AT command including the prefix AT	
AT+CLAC=?	Test command returns the OK result code	
Reference	3GPP TS 27.007	

4.1.2.3.3 Extended Signal Quality- +CESQ

+CESQ – Extended Signal Quality		SELINT 2
AT+CESQ	Execution command reports received signal quality parameters in the form: +CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> Where <rxlev > - received received signal strength level 99 - not known or not detectable <ber> - bit error rate (in percent) 99 - not known or not detectable <rscp> - received signal code power 255 - not known or not detectable <ecno> - ratio of the received energy per PN chip to the total received power spectral density 255 - not known or not detectable <rsrq> - reference signal received quality (see 3GPP TS 36.133 subclause 9.1.7). 0 - $rsrq < -19.5 \text{ dB}$ 1 - $-19.5 \text{ dB} < rsrq < -19 \text{ dB}$ 2 - $-19 \text{ dB} < rsrq < -18.5 \text{ dB}$... 32 - $-4 \text{ dB} < rsrq < -3.5 \text{ dB}$ 33 - $-3.5 \text{ dB} < rsrq < -3 \text{ dB}$ 34 - $-3 \text{ dB} < rsrq$ 255 - not known or not detectable <rsrp> - type, reference signal received power (see 3GPP TS 36.133 subclause 9.1) 0 - $rsrp < -140 \text{ dBm}$ 1 - $-140 \text{ dBm} < rsrp < -139 \text{ dBm}$ 2 - $-139 \text{ dBm} < rsrp < -138 \text{ dBm}$... 95 - $-46 \text{ dBm} < rsrp < -45 \text{ dBm}$ 96 - $-45 \text{ dBm} < rsrp < -44 \text{ dBm}$ 97 - $-44 \text{ dBm} < rsrp$ 255 not known or not detectable	
AT+CESQ =?	Test command returns the supported range of values of the parameters <rxlev> , <ber> , <rscp> , <ecno> , <rsrq> , <rsrp> .	
Reference	3GPP TS 27.007	

4.1.2.3.4 Signal Quality - +CSQ

+CSQ - Signal Quality		SELINT 2
AT+CSQ	Execution command reports received signal quality indicators in the form: +CSQ: <rssi>,<ber> where <rssi> - received signal strength indication 0 - (-113) dBm or less 1 - (-111) dBm 2..30 - (-109)dBm..(-53)dBm / 2 dBm per step 31 - (-51)dBm or greater 99 - not known or not detectable <ber> - bit error rate (in percent) 0 - less than 0.2%	

+CSQ - Signal Quality		SELINT 2
	1 - 0.2% to 0.4% 2 - 0.4% to 0.8% 3 - 0.8% to 1.6% 4 - 1.6% to 3.2% 5 - 3.2% to 6.4% 6 - 6.4% to 12.8% 7 - more than 12.8% 99 - not known or not detectable Note: <ber> is currently not implemented, and will always be 99.	
AT+CSQ=?	Test command returns the supported range of values of the parameters <rssi> and <ber>. Note: although +CSQ is an execution command without parameters, ETSI 07.07 requires the Test command to be defined.	
Reference	3GPP TS 27.007	

4.1.2.4 Mobile Equipment Errors

4.1.2.4.1 Report Mobile Equipment Error - +CMEE

+CMEE - Report Mobile Equipment Error		SELINT 2
AT+CMEE=[<n>]	Set command enables/disables the report of result code: +CME ERROR: <err> as an indication of an error relating to the +Cxxx commands issued. When enabled, device related errors cause the +CME ERROR: <err> final result code instead of the default ERROR final result code. ERROR is anyway returned normally when the error message is related to syntax, invalid parameters, or DTE functionality. Parameter: <n> - enable flag 0 - disable +CME ERROR:<err> reports, use only ERROR report. 1 - enable +CME ERROR:<err> reports, with <err> in numeric format 2 - enable +CME ERROR: <err> reports, with <err> in verbose format	
AT+CMEE?	Read command returns the current value of subparameter <n> : +CMEE: <n>	
AT+CMEE=?	Test command returns the range of values for subparameter <n>	
Note	+CMEE has no effect on the final result code +CMS	
Reference	3GPP TS 27.007	

4.1.2.5 Commands for Packet Domain

4.1.2.5.1 PDN Connection Activate Or Deactivate - +CGACT

+CGACT - PDN Connection Activate Or Deactivate		SELINT 2
AT+CGACT= [<state>,<cid> [,<cid>[,...]]]	Execution command is used to activate or deactivate the specified PDN Connection(s) Parameters: <state> - indicates the state of PDN Connection activation 0 - deactivated 1 - activated <cid> - a numeric parameter which specifies a particular PDN Connection definition (see +CGDCONT command)	
AT+CGACT?	Read command returns the current activation state for all the defined PDN Connections in the format: +CGACT: <cid>,<state>[<CR><LF>+CGACT: <cid>,<state>[...]]	
AT+CGACT=?	Test command reports information on the supported PDN Connection activation states parameters in the format: +CGACT: (0,1)	
Example	AT+CGACT=0,1 OK AT+CGACT? +CGACT: 1,0 OK	
Reference	3GPP TS 27.007	

4.1.2.5.2 GPRS Attach Or Detach - +CGATT

+CGATT -PS Attach Or Detach		SELINT 2
AT+CGATT= [<state>]	Execution command is used to attach the terminal to, or detach the terminal from, the Packet Domain service depending on the parameter <state> . Parameter: <state> - state of Packet Domain attachment 0 - detached 1 - attached	
AT+CGATT?	Read command returns the current Packet Domain service state.	
AT+CGATT=?	Test command requests information on the supported Packet Domain service states.	
Example	AT+CGATT? +CGATT: 0 OK AT+CGATT=? +CGATT: (0,1) OK AT+CGATT=1 OK	
Reference	3GPP TS 27.007	

4.1.2.5.3 Define PDN connection- +CGDCONT

+CGDCONT - Define PDN connection		SELINT 2
AT+CGDCONT= [<cid> [,<PDP_type> [,<APN>]]]	Set command specifies PDN connection parameter values for a PDN connection identified by the (local) context identification parameter, <cid>. Parameters:	

+CGDCONT - Define PDN connection		SELINT 2
	<p><cid> - (PDN connection Identifier) numeric parameter which specifies a particular PDN connection definition. 1..max - where the value of max is returned by the Test command. <cid>=0 is initial PDP context, read only, cannot be set.</p> <p><PDP_type> - (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. Supports only "IP" - Internet Protocol.</p> <p><APN> - (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 empty ("") or omitted, then the subscription value will be requested. APN name can contain up to 80 characters.</p> <p>Note: Only IPV4 is supported through <PDP_type>="IP". Note: Only <hcomp> and <dcomp> values of 0 are supported. Note: values not saved in NVM, should be set in every power up.</p>	
AT+CGDCONT?	Read command returns the current settings for each defined context in the format: +CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[<CR><LF>+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[...]]	
AT+CGDCONT=?	Test command returns values supported as a compound value	
Reference	3GPP TS 27.007	

4.1.2.5.4 Show PDP Address - +CGPADDR

+CGPADDR - Show PDP Address		SELINT 2
AT+CGPADDR= [<cid>,<cid>[...]]]	<p>Execution command returns a list of PDN addresses for the specified context identifiers in the format: +CGPADDR: <cid>,<PDP_addr>[<CR><LF>+CGPADDR: <cid>,<PDP_addr>[...]]</p> <p>Parameters: <cid> - a numeric parameter which specifies a particular PDN connection definition (see +CGDCONT command). If no <cid> is specified, the addresses for all defined contexts are returned. <PDP_addr> - a string that identifies the terminal in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined. For a dynamic address it will be the one assigned during the last PDN connection activation that used the context definition referred to by <cid>; if no address is available the empty string ("") is represented as <PDP_addr></p>	
AT+CGPADDR=?	Test command returns a list of defined <cid> s.	
Example	<pre>AT+CGPADDR=1 +CGPADDR: 1,"xxx.yyy.zzz.www" OK AT+CGPADDR=? +CGPADDR: (1) OK</pre>	
Reference	3GPP TS 27.007	

4.1.2.5.5 Setting of 3GPP Rel12 PSM mode run time - +CPSMS

+CPSMS – 3GPP Rel12 PSM mode enable/disable		SELINT 2
AT+CPSMS= <En>,<T3412Default>,<T3324Default>,<En>	<p>This command enables and disables PSM mode at run time. PSM enabled allows to the module to go into Power Saving Mode according to the timer values.</p> <p>Parameters: <En> - PSM Feature enabling/disabling</p>	

+CPSMS – 3GPP Rel12 PSM mode enable/disable		SELINT 2
<T3412>, <T3324>	0 – Disable 1 – Enable < T3412Default> - Default timer value (timer disable) < T3324Default> - Default timer value (timer disable) <T3412> - Timer Value, how long the module stay in PSM mode <T3324> - Timer value, after how long the module goes into PSM mode Note: dummy command implementation	
AT+CPSMS?	Read command returns the current CPSMS configuration, in the format: +CPSMS: <En>,< T3412Default >,< 3324Default >,<T3412>,<T3324>	
AT+CPSMS=?	Test command reports supported range of values for all parameters.	
Example	AT+CPSMS? +CPSMS: 0,224,224,224,224 OK It means that PSM is disabled but it is possible to activate it at run time. Note: 224 represents timer disable. AT+CPSMS=1,,162,33 OK It means that Power Saving Mode is set to enabled and module enters in PSM after a minute (T3324 = 33) and stay in this mode for two minute (T3412 = 162). AT+CPSMS=0 OK	

4.1.3 Custom AT Commands

4.1.3.1 General Configuration AT Commands

4.1.3.1.1 Auto-Attach Property - #AUTOATT

#AUTOATT - Auto-Attach Property		SELINT 2
AT#AUTOATT= [<auto>]	Set command enables/disables the TE GPRS auto-attach property. Parameter: <auto> 0 - disables GPRS auto-attach property 1 - enables GPRS auto-attach property (factory default): after the command #AUTOATT=1 has been issued (and at every following startup) the terminal will automatically try to attach to the GPRS service. Note: the auto value is automatically saved to NVM.	
AT#AUTOATT?	Read command reports whether the auto-attach property is currently enabled or not, in the format: #AUTOATT: <auto>	
AT#AUTOATT=?	Test command reports available values for parameter <auto>	

4.1.3.1.2 Lock to single BCCH ARFCN - # BCCHLOCK

#BCCHLOCK – Lock to single BCCH ARFCN		SELINT 2
AT#BCCHLOCK=<LockedBc ch>[,<LockedUarfcn>[,<Loc kedPsc>[,<LockedEarfcn>[,<Lo ckedPci>]]]]	This command allows to set the single BCCH EARFCN the device must be locked to, selectable within those allowed for the specific product. Parameters: <LockedBcch> : dummy variable, not used – will print 0.	

	<p><LockedUarfcn>: dummy variable, not used – will print 0. <LockedPsc>: dummy variable, not used – will print 0. <LockedEarfcn>: A number in the range 0-65535 representing the earfcn to search. An <earfcn> value of 0 will remove the earfcn restriction and any associated Physical Cell ID lock. <LockedPci>: string type; E-UTRAN physical cell ID in hexadecimal format. Valid range 0 - 1F7.</p> <p>Note: AT#BCCHLOCK setting has higher priority than PLMN selection, that is why it is not recommended to use this command together with manual PLMN selection AT+COPS=1,... .</p>
AT#BCCHLOCK?	<p>Read command reports the currently stored parameter <LockedBcch>, <LockedUarfcn>, <LockedPsc>, <LockedEarfcn> and <LockedPci> in the format: #BCCHLOCK: <LockedBcch>,<LockedUarfcn>,<LockedPsc>,<LockedEarfcn>,<LockedPci></p>
AT#BCCHLOCK=?	Test command returns the OK result code

4.1.3.1.3 Select Band - #BND

#BND - Select Band	SELINT 2
AT#BND=<band>[,<UMTS band>[,<LTE band>]]	<p>Set command selects the current LTE bands.</p> <p>Parameter <band>: 0 - (default value)</p> <p><UMTS band>: 0 - (default value)</p> <p><LTE band> values in the range 1 – 4294967295 as a sum of: 128 - B8 524288 - B20</p> <p>Note: This setting is effective after power cycle.</p> <p>Note: not all products support all the values of parameter <band>: please refer to test command to find the supported range of values.</p> <p>Note: not all products support all the values of parameter <UMTS band>: please refer to test command to find the supported range of values.</p> <p>Note: not all products support all the values of parameter <LTE band>: please refer to test command to find the supported range of values (maximum value is the sum representation of supported bands).</p> <p>Note: the LTE_band is automatically stored in NVM.</p>
AT#BND?	<p>Read command returns the current selected band in the format: #BND: <band>,<UMTS band>,<LTE band></p>
AT#BND=?	<p>Test command returns the supported range of values of parameters <band>, <UMTS band> and <LTE band></p> <p>LTE bands shown as maximal bit mask for model in DEC.</p>
Example	

4.1.3.1.4 Cell Monitor - #MONI

#MONI - Cell Monitor	SELINT 2
AT#MONI=[<number>]	<p>#MONI is both a set and an execution command. Set command sets the cells, from which extract network related information. Parameter: <number> 0 – it is the serving cell (default) 1 – neighbor cells 2..7 – it is not available Execution command (AT#MONI<CR>) reports LTE related information for selected cell or cells: a) When extracting data for the serving cell and the network name is known the format is:</p> <p>#MONI: <netname> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm> DRX:<drx></p> <p>b) When the network name is unknown, the format is:</p> <p>#MONI: Cc:<cc> Nc:<nc> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm> DRX:<drx></p> <p>c) When extracting data for a neighbor cell, the format is:</p> <p>#MONI: RSRP:<rsrp> RSRQ:<rsrq> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm (currently neighbor cell monitoring not available, return OK)</p> <p>where: <netname> - name of network operator (currently not available) <cc> - country code <nc> - network operator code <rsrp> - Reference Signal Received Power <rsrq> - Reference Signal Received Quality <tac> - Tracking Area Code <id> - cell identifier <earfcn> - E-UTRA Assigned Radio Channel <dBm> - received signal strength in dBm <drx> - Discontinuous reception cycle length (dummy, always 0)</p>
AT#MONI=?	<p>Test command reports the maximum number of cells from which we can extract information, along with the ordinal number of the current selected cell, in the format: #MONI: (<MaxCellNo>,<CellSet>) where: <MaxCellNo> - maximum number of cells from which we can extract network related information. (dummy, always 0) <CellSet> - the last setting done with command #MONI.</p>
Examples	<p><i>Set command selects the cell 0 in the network</i> <i>at#moni=0</i> <i>OK</i></p>

4.1.3.1.5 Serving Cell Information - #SERVINFO

#SERVINFO - Serving Cell Information		SELINT 2
AT#SERVINFO	<p>Execution command reports information about serving cell, in the format: #SERVINFO: <EARFCN>,<dBM>,[<NetNameAsc>],<NetCode>,<PhysicalCellId>,<TAC>,<DRX>,<SD>,<RSRP> where: <EARFCN> - E-UTRA Assigned Radio Channel <dBM> - received signal strength in dBm <NetNameAsc> - operator name, quoted string type <NetCode> - string representing the network operator in numeric format: 5 or 6 digits [country code (3) + network code (2 or 3)] <PhysicalCellId> - Physical Cell ID <TAC> - Tracking Area Code <DRX> - Discontinuous reception cycle length (dummy, always 0) <SD> - Service Domain 0 – No Service 1 – CS Only 2 – PS Only 3 – CS & PS <RSRP> - Reference Signal Received Power</p>	
AT#SERVINFO=?	Test command tests for command existence.	

4.1.3.1.6 Read current network status - #RFSTS

#RFSTS – Read current network status		SELINT 2
AT#RFSTS	<p>Execution command reads current network status, in the format: #RFSTS: <PLMN>,<EARFCN>,<RSRP>,<RSSI>,<RSRQ>,<TAC>,<RAC>,[<TXPWR>],<DRX>,<MM>,<RRC>,<CID>,<IMSI>,[<NetNameAsc>],<SD>,<ABND> Where: <PLMN> - Country code and operator code(MCC, MNC) <EARFCN> - E-UTRA Assigned Radio Channel <RSRP> - Reference Signal Received Power <RSSI> - Received Signal Strength Indication <RSRQ> - Reference Signal Received Quality (dummy, always 0) <TAC> - Tracking Area Code <RAC> - Routing Area Code (dummy, always FFFF) <TXPWR> - Tx Power (In traffic only) <DRX> - Discontinuous reception cycle Length (cycle length in ms) (dummy, always 0) <MM> - Mobility Management state (dummy) <RRC> - Radio Resource state (dummy) <CID> - Cell ID <IMSI> - International Mobile Station ID <NetNameAsc> - Operator name, quoted string type (currently not available) <SD> - Service Domain (dummy, always 0) 0 - No Service 1 - CS only 2 - PS only 3 - CS+PS <ABND> - Active Band 1..63 according to 3GPP TS 36.101 (dummy, always 0)</p>	
AT#RFSTS=?	Test command tests for command existence.	

4.1.3.1.7 Read ICCID (Integrated Circuit Card Identification) - +CCID

+CCID - Read ICCID		SELINT 2
AT+CCID	Execution command reads on SIM the ICCID (card identification number that provides a unique identification number for the SIM)	
AT+CCID=?	Test command returns the OK result code.	

4.1.3.1.8 Temperature monitor configuration - #TEMPCFG

#TEMPCFG – Temperature monitor configuration		SELINT 2
AT#TEMPCFG= <TempExLowBound> [,<TempOpLowBound > [,<TempOpUpBound> [,<TempExUpBound>]]]	<p>This parameter command manages the temperature range used by the TEMPMON command</p> <p>Parameters:</p> <p><TempExLowBound> - the extreme temperature lower limit <TempOpLowBound> - the operating temperature lower limit <TempOpUpBound> - the operating temperature upper limit <TempExUpBound> - the extreme temperature upper limit</p> <p>Note 1: The extreme temperature lower limit must not be lower than lower limit (see TEMPMON for temperature limits); Note 2: the operating temperature lower limit must be bigger than the extreme temperature lower limit, and not lower than its minimum admitted value (see TEMPMON for temperature limits); Note 3: the operating temperature upper limit must be bigger than the operating temperature lower limit, and not lower than its minimum admitted value (see TEMPMON for temperature limits); Note 4: the extreme temperature upper limit must be bigger than the operating temperature upper limit Note 5: The extreme temperature upper limit must be lower than its upper limit (see TEMPMON for temperature limits). Note 5: currently the values are not saved to NVM Note 6: a factory reset restores the factory default values. (currently not supported)</p>	
AT#TEMPCFG?	read the currently active temperature range : #TEMPCFG: <TempExLowBound>, <TempOpLowBound>, <TempOpUpBound>, <TempExUpBound>	
AT#TEMPCFG =?	Test command returns the supported range of <TempExLowBound>, <TempOpLowBound>, <TempOpUpBound>, <TempExUpBound> parameters.	
Example	<pre>//test the currently set values AT#TEMPCFG? #TEMPCFG: -30,-10,55,80 OK //set a new temperature range AT#TEMPCFG=-40,-15,55,85 OK //read the currently set values AT#TEMPCFG? #TEMPCFG: -40,-15,55,85 OK</pre>	

4.1.3.1.9 Temperature Monitor – #TEMPMON

#TEMPMON - Temperature Monitor		SELINT 2
AT#TEMPMON= <mod> [,<urcmode>	Set command sets the behaviour of the module internal temperature monitor. Parameters: <mod>	

#TEMPMON - Temperature Monitor	SELINT 2										
<p>[,<action> [,<hyst_time> [,<GPIO>]]]]</p>	<p>0 - sets the command parameters. 1 - triggers the measurement of the module internal temperature, reporting the result in the format: #TEMPMEAS: <level>,<value> where: <level> - threshold level (see Note) -2 - extreme temperature lower bound (see Note) -1 - operating temperature lower bound (see Note) 0 - normal temperature 1 - operating temperature upper bound (see Note) 2 - extreme temperature upper bound (see Note) <value> - actual temperature expressed in Celsius degrees.</p> <p>Setting of the following optional parameters has meaning only if <mod>=0 <urcmode> - URC presentation mode. (see Note) 0 - it disables the presentation of the temperature monitor URC 1 - it enables the presentation of the temperature monitor URC, whenever the module internal temperature reaches either operating or extreme levels; the unsolicited message is in the format: #TEMPMEAS: <level>,<value> where: <level> and <value> are as before <action> - sum of integers, each representing an action to be done whenever the module internal temperature reaches either operating or extreme levels (default is 0). If <action> is not zero, it is mandatory to set the <hyst_time> parameter too. 0..7 - as a sum of: 0 - no action 1 - automatic shut-down when the temperature is beyond the extreme bounds 2 - RF RX and TX circuits automatically disabled (using +CFUN=4) when operating temperature bounds are reached. When the temperature is back to normal the module is brought back to the previous state, before RF RX and TX disabled. 4 - the output pin <GPIO> is tied HIGH when operating temperature bounds are reached; when the temperature is back to normal the output pin <GPIO> is tied LOW. If this <action> is required, it is mandatory to set the <GPIO> parameter too. <hyst_time> - hysteresis time: all the actions happen only if the extreme or operating bounds are maintained at least for this period. This parameter is needed and required if <action> is not zero. 0..255 - time in seconds <GPIO> - GPIO number. valid range is "any output pin" (see "Hardware User's Guide"). This parameter is needed and required only if <action>=4 is required.</p> <p>Note: <level> output is not supported – always zero. Note: currently <urcmode>, <level>, <action>, <hyst_time> and <GPIO> are dummy variables and their values are ignored. Note: in case that action 4 is set, the chosen GPIO has to be configured in alternate function ALT3 through AT#GPIO command Note: last <action>, <hyst_time> and <GPIO> settings are saved in NVM too, but they are not related to the current CMUX instance only (see +cmux).</p>										
<p>AT#TEMPMON?</p>	<p>Test command reports the supported range of values for parameters <mod>, <=0>, <action>, <hyst_time> and <GPIO></p>										
<p>Note</p>	<p>The following table is describing the temperature levels.</p> <table border="1" data-bbox="536 1805 1513 1989"> <tbody> <tr> <td>Extreme Temperature Lower Bound</td> <td>-30°C</td> </tr> <tr> <td>Operating Temperature Lower Bound</td> <td>-10°C</td> </tr> <tr> <td>Operating Temperature</td> <td></td> </tr> <tr> <td>Operating Temperature Upper Bound</td> <td>55°C</td> </tr> <tr> <td>Extreme Temperature Upper Bound</td> <td>80°C</td> </tr> </tbody> </table>	Extreme Temperature Lower Bound	-30°C	Operating Temperature Lower Bound	-10°C	Operating Temperature		Operating Temperature Upper Bound	55°C	Extreme Temperature Upper Bound	80°C
Extreme Temperature Lower Bound	-30°C										
Operating Temperature Lower Bound	-10°C										
Operating Temperature											
Operating Temperature Upper Bound	55°C										
Extreme Temperature Upper Bound	80°C										

#TEMPMON - Temperature Monitor	SELINT 2

4.1.3.1.10 General Purpose Input/Output Pin Control – #GPIO

#GPIO - General Purpose Input/Output Pin Control	SELINT 2
<p>AT#GPIO=[<pin>, <mode>[,<dir>[,<save>]]]</p>	<p>Execution command sets the value of the general purpose output pin GPIO<pin> according to <dir> and <mode> parameter. Not all configurations for the three parameters are valid. Parameters: <pin> - GPIO pin number; supported range is from 1 to a value that depends on the hardware. <mode> - its meaning depends on <dir> setting: 0 - if <dir>=0 – INPUT, remove any Pull-up/Pull-down - output pin cleared to 0 (Low) if <dir>=1 - OUTPUT - no meaning if <dir>=2 - ALTERNATE FUNCTION - no meaning if <dir>=3 – TRISTATE PULL DOWN 1 - if <dir>=0 – INPUT, if <dir>=0 – INPUT, remove any Pull-up/Pull-down - output pin set to 1 (High) if <dir>=1 - OUTPUT - no meaning if <dir>=2 - ALTERNATE FUNCTION - no meaning if <dir>=3 – TRISTATE PULL DOWN 2 - Reports the read value from the input pin if <dir>=0 - INPUT - Reports the read value from the input pin if <dir>=1 - OUTPUT - Reports a no meaning value if <dir>=2 - ALTERNATE FUNCTION 3 - if <dir>=0 – INPUT, enable Pull-Up (see Note) 4 - if <dir>=0 – INPUT, enable Pull-Down <dir> - GPIO pin direction 0 - pin direction is INPUT 1 - pin direction is OUTPUT 2,3,4,5,6 - pin direction is Alternate Function ALT1, ALT2, ALT3, ALT4, ALT5 respectively (see Note). <save> - GPIO pin save configuration – dummy parameter, value is ignored. 0 – pin configuration is not saved 1 – pin configuration is saved Note: when <save> is omitted the configuration is stored only if user set or reset ALTx function on <dir> parameter. Note: if GPIO is not set previously and not saved, it's status is undefined. Note: Pull up is currently not supported and will cause unknown idle voltage. Note: Currently there are no supported Alternate Function. Note: when <mode>=2 (and <dir> is omitted) the command reports the direction and value of pin GPIO<pin> in the format: #GPIO: <dir>,<stat> where: <dir> - current direction setting for the GPIO<pin> <stat> - logic value read from pin GPIO<pin> in the case the pin <dir> is set to input; - logic value present in output of the pin GPIO<pin> in the case the pin <dir> is currently set to output; - no meaning value for the pin GPIO<pin> in the case the pin <dir> is set to alternate function or Tristate pull down</p>

#GPIO - General Purpose Input/Output Pin Control		SELINT 2
AT#GPIO?	Read command reports the read direction and value of all GPIO pins, in the format: #GPIO: <dir>,<stat>[<CR><LF>#GPIO: <dir>,<stat>[...]] where <dir> - as seen before <stat> - as seen before If <mode> = 3,4 the output format is #GPIO:<dir>,<stat>,<mode>[<CR><LF>#GPIO:<dir>,<stat>,<mode>[...]]	
AT#GPIO=?	Test command reports the supported range of values of the command parameters <pin> , <mode> , <dir> and <save> .	
Example	AT#GPIO=3,0,1 OK AT#GPIO=3,2 #GPIO: 1,0 OK AT#GPIO=4,1,1 OK AT#GPIO=5,0,0 OK AT#GPIO=6,2 #GPIO: 0,1 OK	

4.1.3.1.11 Read Analog/Digital Converter input - #ADC

#ADC - Read Analog/Digital Converter input		SELINT 2
AT#ADC= [<adc>,<mode> [,<dir>]]	Execution command reads pin<adc> voltage, converted by ADC, and outputs it in the format: #ADC: <value> where: <value> - pin<adc> voltage, expressed in mV Parameters: <adc> - index of pin 1 – default pin <mode> - required action 2 - query ADC value <dir> - direction; its interpretation is currently not implemented 0 - no effect. Note: The command returns the last valid measure.	
AT#ADC?	Read command reports all pins voltage, converted by ADC, in the format: #ADC: <value>[<CR><LF>#ADC: <value>[...]]	
AT#ADC=?	Test command reports the supported values of the command parameters <adc> , <mode> and <dir> .	

4.1.3.1.12 Low Power Wake Configuration - #LPWAKE

#LPWAKE – Low Power Wake Configuration		SELINT 2
#LPWAKE=<cond>[,<action>]	LP_WAKE input line can be configured to trigger an interrupt with certain conditions . When an interrupt occurs, an action will be carried out. Set command applies configuration of low power wake function. <cond> : condition for interrupt to occur. 0 – Interrupt will never occur (disable LP_WAKE). This is the default state. 1 – interrupt will occur on a rising edge	

#LPWAKE – Low Power Wake Configuration		SELINT 2
	2 – interrupt will occur on a falling edge 3 – interrupt will occur on a both edges <action> : an action to be carried out when an interrupt is triggered. This parameter is mandatory if <cond> is not 0. 1 – send a URC over the UART. The URC format is: #LPUART	
#LPWAKE?	Read command reports the current configuration of low power wake function. The format is: #LPUART: <cond>,<action> Where <cond> is as above. <action> : 0 – no action will be done 1 – URC over UART	
#LPWAKE=?	Test command reports the range for parameters <cond> and <action>	

4.1.3.1.13 Reboot - #REBOOT

#REBOOT - Reboot		SELINT 2
AT#REBOOT	Execution command reboots immediately the unit. It can be used to reboot the system after a remote update of the script in order to have the new one running. Note: if AT#REBOOT follows an AT command that stores some parameters in NVM, it is recommended to insert a delay of at least 5 seconds before to issue AT#REBOOT, to permit the complete NVM storing	
AT#REBOOT=?	Test command returns OK result code.	
Example	AT#REBOOT OK ... Module Reboots ...	

4.1.3.2 Multisocket AT Commands

4.1.3.2.1 Context Activation - #SGACT

#SGACT - Context Activation		SELINT 2
AT#SGACT=<cid>,<stat>[,<userId>,<pwd>]	Execution command is used to activate or deactivate the specified PDN connection. Parameters: <cid> - PDN connection identifier 1..5 - numeric parameter which specifies a particular PDN connection definition <stat> 0 - deactivate the context 1 - activate the context <userId> - string type, used only if the context requires it <pwd> - string type, used only if the context requires it Note: context activation/deactivation returns ERROR if there is not any socket associated to it (see AT#SCFG).	

#SGACT - Context Activation		SELINT 2
	<p>Note: In LTE network, default PDN connection(cid 1) is activated by piggybacking on LTE attach procedure and maintained until detached from NW. This command with cid 1 is just binding or unbinding application to the default PDN connection.</p> <p>NOTE: userID and password are currently not supported</p>	
AT#SGACT?	<p>Returns the state of all the contexts that have been defined</p> <p>#SGACT: <cid1>,<Stat1><CR><LF></p> <p>...</p> <p>#SGACT: <cid5>,<Stat5></p> <p>where:</p> <p><cidn> - as <cid> before</p> <p><statn> - context status</p> <p>0 - context deactivated</p> <p>1 - context activated</p>	
AT#SGACT=?	Test command reports the range for the parameters <cid> and <stat>	
Note	It is strongly recommended to use the same command (e.g. #SGACT) to activate the context, deactivate it and interrogate about its status.	

4.1.3.2.2 Socket Shutdown - #SH

#SH - Socket Shutdown		SELINT 2
AT#SH=<connId>	<p>This command is used to close a socket.</p> <p>Parameter:</p> <p><connId> - socket connection identifier</p> <p>1..6</p> <p>Note: socket cannot be closed in states "resolving DNS" and "connecting"</p>	
AT#SH=?	Test command reports the range for parameter <connId>.	

4.1.3.2.3 Socket Configuration - #SCFG

#SCFG - Socket Configuration		SELINT 2
AT#SCFG= <connId>,<cid>, <pktSz>,<maxTo>,<connTo>,<txTo>	<p>Set command sets the socket configuration parameters.</p> <p>Parameters:</p> <p><connId> - socket connection identifier</p> <p>1..6</p> <p><cid> - PDN connection identifier</p> <p>0..10 - numeric parameter which specifies a particular PDN connection definition</p> <p><pktSz> - packet size to be used by the TCP/UDP/IP stack for data sending.</p> <p>Dummy parameter, not used.</p> <p>0 - select automatically default value(300).</p> <p>1..512 - packet size in bytes.</p> <p><maxTo> - exchange timeout (or socket inactivity timeout); if there's no data exchange within this timeout period the connection is closed. Dummy parameter, not used.</p> <p>0 - no timeout</p> <p>1..65535 - timeout value in seconds (default 90 s.)</p> <p><connTo> - connection timeout; if we can't establish a connection to the remote within this timeout period, an error is raised. Dummy parameter, not used.</p> <p>10..1200 - timeout value in hundreds of milliseconds (default 600)</p> <p><txTo> - data sending timeout; after this period data are sent also if they're less than max packet size. Dummy parameter, not used.</p> <p>0 - no timeout</p> <p>1..255 - timeout value in hundreds of milliseconds (default 50)</p> <p>256 – set timeout value in 10 milliseconds</p> <p>257 – set timeout value in 20 milliseconds</p> <p>258 – set timeout value in 30 milliseconds</p> <p>259 – set timeout value in 40 milliseconds</p>	

#SCFG - Socket Configuration	SELINT 2
	<p>260 – set timeout value in 50 milliseconds 261 – set timeout value in 60 milliseconds 262 – set timeout value in 70 milliseconds 263 – set timeout value in 80 milliseconds 264 – set timeout value in 90 milliseconds</p> <p>Note: if DNS resolution is required, max DNS resolution time(20 sec) has to be considered in addition to <connTo></p> <p>NOTE: connection timeout is not supported (only relevant to TCP connections) NOTE2: max (exchange), connection and tx timeout are not supported</p>
AT#SCFG?	<p>Read command returns the current socket configuration parameters values for all the six sockets, in the format:</p> <p>#SCFG: <connId1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1> <CR><LF></p> <p>...</p> <p>#SCFG: <connId6>,<cid6>,<pktsz6>,<maxTo6>,<connTo6>,<txTo6> <CR><LF></p>
AT#SCFG=?	<p>Test command returns the range of supported values for all the subparameters.</p>
<p>Example</p>	<pre>at#scfg? #SCFG: 1,1,300,90,600,50 #SCFG: 2,2,300,90,600,50 #SCFG: 3,2,250,90,600,50 #SCFG: 4,1,300,90,600,50 #SCFG: 5,1,300,90,600,50 #SCFG: 6,1,300,90,600,50 OK</pre>

4.1.3.2.4 Socket Configuration Extended - #SCFGEXT

#SCFGEXT - Socket Configuration Extended	SELINT 2
<p>AT#SCFGEXT= <connId>,<srMode>,<recvDataMode>,<keepalive>,<ListenAutoRsp>,<sendDataMode>]</p>	<p>Set command sets the socket configuration extended parameters. Parameters: <connId> - socket connection identifier 1..6 <srMode> - SRing unsolicited mode 0 - Normal (default): SRING : <connId> where <connId> is the socket connection identifier 1 – Data amount: SRING : <connId>,<recData> where <recData> is the amount of data received on the socket connection number <connId> 2 - Data view: SRING : <connId>,<recData>,<data> same as before and <data> is data received displayed following <dataMode> value 3 – Data view with UDP datagram informations: SRING : <sourceIP>,<sourcePort><connId>,<recData>,<dataLeft>,<data> same as before with <sourceIP>,<sourcePort> and <dataLeft> that means the number of bytes left in the UDP datagram <recvDataMode> - data view mode for received data in command mode(AT#SRECV or <srMode> = 2) 0- text mode (default) 1- hexadecimal mode <keepalive> - Set the TCP Keepalive value in minutes. Dummy parameter – not used, and will always return 0. 0 – Deactivated (default) 1 – 240 – Keepalive time in minutes <ListenAutoRsp> - Set the listen auto-response mode, that affects the command AT#SLUDP. Dummy parameter – not used, and will always return 0. 0 - Deactivated (default) 1 – Activated <sendDataMode> - data mode for sending data in command mode(AT#SEND) 0 - data represented as text (default) 1 - data represented as sequence of hexadecimal numbers (from 00 to FF) Each octet of the data is given as two IRA character long hexadecimal number Note: Keepalive is available only on TCP connections. Note: for the behaviour of AT#SL and AT#SLUDP in case of auto-response mode or in case of no auto-response mode, see the description of the two commands.</p> <p>Note: the SRING indication are only indicative on the first package in the queue. The next packages will cause SRING indications only after the preceding packages were read using #SRECV (or with <srMode> 2 and 3).</p> <p>NOTE: keepalive timer is not supported (relevant only to TCP). NOTE2: listen auto response is currently not supported (since ODM is not supported).</p>
<p>AT#SCFGEXT?</p>	<p>Read command returns the current socket extended configuration parameters values for all the six sockets, in the format: #SCFGEXT: <connId1>,<srMode1>,<dataMode1>,<keepalive1>,<ListenAutoRsp1>,<sendDataMode1>,<CR><LF> ... #SCFGEXT: <connId6>,<srMode6>,<dataMode6>,<keepalive6>,<ListenAutoRsp6>,<sendDataMode6>,<CR><LF></p>
<p>AT#SCFGEXT=?</p>	<p>Test command returns the range of supported values for all the subparameters.</p>
<p>Example</p>	<p>Socket 1 set with data amount sring, hex receive data mode, 1 min keepalive</p>

	<p>(ignored), no auto response and hex send data mode.</p> <pre>at#scfgext? #SCFGEXT: 1,1,1,1,0,1 #SCFGEXT: 2,0,0,0,0,0 #SCFGEXT: 3,0,0,0,0,0 #SCFGEXT: 4,0,0,0,0,0 #SCFGEXT: 5,0,0,0,0,0 #SCFGEXT: 6,0,0,0,0,0</pre> <p>OK</p>
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4.1.3.2.5 Socket configuration Extended 2 - #SCFGEXT2

#SCFGEXT2 - Socket Configuration Extended	
<p>AT#SCFGEXT2= <connId>[,<bufferStart> [,<abortConnAttempt> [,<unused_B > [,<unused_C >[,<noCarrierMode>]]]]]</p>	<p>Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command. Parameters: <connId> - socket connection identifier 1..6 <bufferStart> - Set the sending timeout method based on new data received from the serial port – used for online mode only (not supported). Dummy parameter – not used, and will always return 0. (<txTo> timeout value is set by #SCFG command) Restart of transmission timer will be done when new data are received from the serial port. 0 - old behaviour for transmission timer (#SCFG command 6th parameter old behaviour, start only first time if new data are received from the serial port) 1 - new behaviour for transmission timer: restart when new data received from serial port Note: is necessary to avoid overlapping of the two methods. Enabling new method, the old method for transmission timer(#SCFG) is automatically disabled to avoid overlapping. Note: check if new data have been received from serial port is done with a granularity that is directly related to #SCFG <txTo> setting with a maximum period of 1 sec. <abortConnAttempt> - Enable connection attempt(#SD) abort before CONNECT(online mode (not supported)) or OK(command mode). Dummy parameter – not used. 0 – Not possible to interrupt connection attempt 1 – It is possible to interrupt the connection attempt and give back control to AT interface by reception of a character. As soon as the control has been given to the AT interface the ERROR message will be received on the interface itself. <noCarrierMode> - Dummy parameter – not used. permits to choose NO CARRIER indication format when the socket is closed as follows: 0 – NO CARRIER (default) Indication is sent as usual, without additional information 1 – NO CARRIER:<connId> Indication of current <connId> socket connection identifier is added 2 – NO CARRIER:<connId>,<cause> Indication of current <connId> socket connection identifier and closure <cause> are added Note: in case of subsequent consecutive closure causes are received, the original disconnection cause is indicated. Note: in the case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data(#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote. NOTE: bufferstart is not used since ODM is not supported. NOTE2: abortConnAttempt is not used since TCP and DNS are not supported</p>
<p>AT#SCFGEXT2?</p>	<p>Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:</p>

	<pre>#SCFGEXT2:<connId1>,<bufferStart1>,0,0,0,0<CR><LF> ... #SCFGEXT2:<connId6>,<bufferStart6>,0,0,0,0<CR><LF></pre>
AT#SCFGEXT2=?	Test command returns the range of supported values for all the subparameters.
Example	<pre>at#scfgext2=2,0,0,0,0,1 OK at#scfgext2? #SCFGEXT2: 1,0,0,0,0,0 #SCFGEXT2: 2,0,0,0,0,1 #SCFGEXT2: 3,0,0,0,0,0 #SCFGEXT2: 4,0,0,0,0,0 #SCFGEXT2: 5,0,0,0,0,0 #SCFGEXT2: 6,0,0,0,0,0 OK</pre>

4.1.3.2.6 Socket configuration Extended 3 - #SCFGEXT3

#SCFGEXT3 - Socket Configuration Extended 3	SELINT 2
AT#SCFGEXT3= <connId >,<immRsp>[, <closureTypeCmdModeEnabling > [,<fastsring>[,<unused _C>[,<unused_D>]]]	Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command nor in #SCFGEXT2 command Parameters: <connId> - socket connection identifier 1..6 <immRsp> - Enables AT#SD command mode immediate response. Dummy parameter – not used, and will always return 0. 0 – factory default, means that AT#SD in command mode (see AT#SD) returns after the socket is connected 1 – means that AT#SD in command mode returns immediately. Then the state of the connection can be read by the AT command AT#SS <closureTypeCmdModeEnabling> - Setting this parameter, successive #SD or #SL with <closureType> parameter 255 setting takes effect in command mode. It has been introduced due to retrocompatibility reason regarding. Dummy parameter – not used, and will always return 0. <closureType> behaviour in command mode. Dummy parameter – not used. 0 – factory default, #SD or #SL <closureType> 255 in command mode has no effect 1 – #SD or SL <closureType> 255 in command mode takes effect <fastsring> - Enables the fast SRING (active only when AT#SCFGEXT parameter <srmode> =2) in TCP and UDP sockets. Dummy parameter – not used (see note). 0 – means that SRING unsolicited is received periodically if data are available every 200ms. 1 – means that if data are available SRING unsolicited is received asynchronous as fast as possible NOTE1: immRsp not supported since TCP and DNS are not supported NOTE2: closureTypeCmdModeEnabling not supported since TCP is not supported. NOTE3: fastsring mode 0 is not supported yet. Currently mode 1 is the default.
AT#SCFGEXT3?	Read command returns the current socket extended configuration parameters values for all the six sockets, in the format: #SCFGEXT3: <connId1>,<immRsp1>,0,0,0,0<CR><LF> ... #SCFGEXT3: <connId6>,<immRsp6>,0,0,0,0<CR><LF>
AT#SCFGEXT3=?	Test command returns the range of supported values for all the parameters.

4.1.3.2.7 Socket info - #SI

#SI – socket info	SELINT 2
AT#SI[=<connId>]	Execution command is used to get information about socket data traffic. Parameters: <connId> - socket connection identifier 1..6 The response format is: #SI: <connId>,<sent>,<received>,<buff_in>,<ack_waiting> where: <connId> - socket connection identifier, as before <sent> - total amount (in bytes) of sent data since the last time the socket connection identified by <connId> has been opened

#SI – socket info	SELINT 2
	<p><received> - total amount (in bytes) of received data since the last time the socket connection identified by <connld> has been opened</p> <p><buff_in> - total amount (in bytes) of data just arrived through the socket connection identified by <connld> and currently buffered, not yet read</p> <p><ack_waiting> - total amount (in bytes) of sent and not yet acknowledged data since the last time the socket connection identified by <connld> has been opened (not supported on LE866)</p> <p>Note: not yet acknowledged data are available only for TCP connections; the value <ack_waiting> is always 0 for UDP connections.</p> <p>Note: issuing #SI<CR> causes getting information about data traffic of all the sockets; the response format is: #SI: <connld1>,<sent1>,<received1>,<buff_in1>,<ack_waiting1> <CR><LF> ... #SI: <connld6>,<sent6>,<received6>,<buff_in6>,<ack_waiting6></p>
AT#SI=?	Test command reports the range for parameter <connld> .
Example	<pre>AT#SI #SI: 1,123,400,10,50 #SI: 2,0,100,0,0 #SI: 3,589,100,10,100 #SI: 4,0,0,0,0 #SI: 5,0,0,0,0 #SI: 6,0,98,60,0 OK Sockets 1,2,3,6 are opened with some data traffic. For example socket 1 has 123 bytes sent, 400 bytes received, 10 byte waiting to be read and 50 bytes waiting to be acknowledged from the remote side. AT#SI=1 #SI: 1,123,400,10,50 OK We have information only about socket number 1</pre>

4.1.3.2.8 Socket Status - #SS

#SS – socket Status	SELINT 2
AT#SS[=<connld>]	<p>Execution command reports the current status of the socket:</p> <p>Parameters: <connld> - socket connection identifier 1..6</p> <p>The response format is: #SS: <connld>,<state>,<locIP>,<locPort>,<remIP>,<remPort></p> <p>where:</p> <p><connld> - socket connection identifier, as before</p> <p><state> - actual state of the socket:</p> <ul style="list-style-type: none"> 0 - Socket Closed. 1 - Socket with an active data transfer connection. 2 - Socket suspended. 3 - Socket suspended with pending data. 4 - Socket listening. 5 - Socket with an incoming connection. Waiting for the user accept or shutdown command. 6 - Socket resolving DNS. 7 - Socket connecting. <p><locIP> - IP address associated by the context activation to the socket.</p> <p><locPort> - two meanings: - the listening port if we put the socket in listen mode.</p>

#SS – socket Status	SELINT 2
	<p>- the local port for the connection if we use the socket to connect to a remote machine.</p> <p><remIP> - when we are connected to a remote machine this is the remote IP address.</p> <p><remPort> - it is the port we are connected to on the remote machine.</p> <p>Note: issuing #SS<CR> causes getting information about status of all the sockets; the response format is:</p> <p>#SS: <connId1>,<state1>,<locIP1>,<locPort1>,<remIP1>,<remPort1> <CR><LF></p> <p>...</p> <p>#SS: <connId6>,<state6>,<locIP6>,<locPort6>,<remIP6>,<remPort6></p> <p>NOTE: currently only states 0, 1 and 4 are supported.</p>
AT#SS=?	Test command reports the range for parameter <connId>.
Example	<pre> AT#SS #SS: 1,3,91.80.90.162,61119,88.37.127.146,10510 #SS: 2,4,91.80.90.162,1000 #SS: 3,0 #SS: 4,0 #SS: 5,3,91.80.73.70,61120,88.37.127.146,10509 #SS: 6,0 OK Socket 1: opened from local IP 91.80.90.162/local port 61119 to remote IP 88.37.127.146/remote port 10510 is suspended with pending data Socket 2: listening on local IP 91.80.90.162/local port 1000 Socket 5: opened from local IP 91.80.73.70/local port 61120 to remote IP 88.37.127.146/remote port 10509 is suspended with pending data AT#SS=2 #SS: 2,4,91.80.90.162,1000 OK We have information only about socket number 2 </pre>

4.1.3.2.9 Socket Dial - #SD

#SD - Socket Dial	SELINT 2
<p>AT#SD=<connId>, <txProt>,<rPort>, <IPAddr> [,<closureType> [,<IPort> [,<connMode>]]]</p>	<p>Execution command opens a remote connection via socket.</p> <p>Parameters:</p> <p><connId> - socket connection identifier 1..6</p> <p><txProt> - transmission protocol 0 - TCP 1 - UDP</p> <p><rPort> - remote host port to contact 1..65535</p> <p><IPAddr> - address of the remote host, string type. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query</p> <p><closureType> - socket closure behaviour for TCP when remote host has closed 0 - local host closes immediately (default) 255 - local host closes after an AT#SH or immediately in case of an abortive disconnect from remote.</p> <p><IPort> - UDP connections local port 1..65535</p> <p><connMode> - Connection mode 0 - online mode connection (default) 1 - command mode connection</p> <p>Note: <closureType> parameter is valid for TCP connections only and has no effect (if used) for UDP connections.</p> <p>Note: <IPort> parameter is valid for UDP connections only and has no effect (if used) for TCP connections.</p> <p>Note: if we set <connMode> to online mode connection and the command is successful we enter in online data mode and we see the intermediate result code CONNECT. After the CONNECT we can suspend the direct interface to the socket connection (nb the socket stays open) using the escape sequence (+++): the module moves back to command mode and we receive the final result code OK after the suspension. After such a suspension, it's possible to resume it in every moment (unless the socket inactivity timer timeouts, see #SCFG) by using the #SO command with the corresponding <connId>.</p> <p>Note: if we set <connMode> to command mode connection and the command is successful, the socket is opened and we remain in command mode and we see the result code OK.</p> <p>Note: if there are input data arrived through a connected socket and not yet read because the module entered command mode before reading them (after an escape sequence or after #SD has been issued with <connMode> set to command mode connection), these data are buffered and we receive the SRING URC (SRING presentation format depends on the last #SCFGEXT setting); it's possible to read these data afterwards issuing #SRECV. Under the same hypotheses it's possible to send data while in command mode issuing #SEND</p> <p>Note: resume of the socket(#SO) after suspension or closure(#SH) has to be done on the same instance on which the socket was opened through #SD. In fact, suspension has been done on the instance itself.</p> <p>Note: <closureType> 255 takes effect on a command mode connection(<connMode> set to 1 or online mode connection suspended with +++) only if #SCFGEXT3 <closureTypeCmdModeEnabling> parameter has been previously enabled.</p> <p>Note: if PDN connection has not properly opened then +CME ERROR: 556 (context not opened) will be given.</p> <p>NOTE: TCP protocol is not supported (So txProt only accepts 1 and closureType only accepts 0 (and is ignored)).</p> <p>NOTE2: ODM is not supported, so connMode only accepts 1.</p>

#SD - Socket Dial		SELINT 2
	NOTE3: No DNS resolution is available, only IP addresses are supported for IPaddr parameter.	
AT#SD=?	Test command reports the range of values for all the parameters.	
Example	Open socket 1 in online mode at#sd=1,1,9060,"1.1.1.1",0,9061,1 OK	

4.1.3.2.10 Socket Listen UDP - #SLUDP

#SLUDP - Socket Listen UDP		SELINT 2
AT#SLUDP=<connId> , <listenState> , <listenPort>	<p>This command opens/closes a socket listening for an incoming UDP connection on a specified port.</p> <p>Parameters:</p> <p><connId> - socket connection identifier 1..6</p> <p><listenState> - 0 - closes socket listening 1 - starts socket listening</p> <p><listenPort> - local listening port 1..65535</p> <p>Note: if successful, the command returns a final result code OK. If the ListenAutoRsp flag has not been set through the command AT#SCFGEXT (for the specific connId), then, when an UDP connection request comes on the input port, if the sender is not filtered by internal firewall (see #FRWL), an URC is received: +SRING : <connId> Afterwards we can use #SA to accept the connection or #SH to refuse it. If the ListenAutoRsp flag has been set, then, when an UDP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command #FRWL), the connection is automatically accepted: the CONNECT indication is given and the modem goes into online data mode. If the socket is closed by the network the following URC is received: #SLUDP: ABORTED Note: when closing the listening socket <listenPort> is a don't care parameter</p> <p>NOTE: ListenAutoRsp option is not supported (since ODM is not supported)</p>	
AT#SLUDP?	Read command returns all the actual listening UDP sockets.	
AT#SLUDP=?	Test command returns the range of supported values for all the subparameters.	
Example	Next command opens a socket listening for UDP on port 3500. AT#SLUDP=1,1,3500 OK	

4.1.3.2.11 Socket Accept - #SA

#SA - Socket Accept		SELINT 2
AT#SA=<connId> [,<connMode>]	<p>Execution command accepts an incoming socket connection after an URC SRING:</p> <p><connId> Parameter: <connId> - socket connection identifier 1..6</p> <p><connMode> - Connection mode, as for command #SD. 0 - online mode connection (default) 1 - command mode connection</p> <p>Note: the SRING URC has to be a consequence of a #SL issue.</p>	

#SA - Socket Accept		SELINT 2
	<p>Note: setting the command before to having received a SRING will result in an ERROR indication, giving the information that a connection request has not yet been received</p> <p>NOTE: ODM is not supported</p>	
AT#SA=?	Test command reports the range of values for all the parameters.	

4.1.3.2.12 Receive Data In Command Mode - #SRECV

#SRECV - Receive Data In Command Mode		SELINT 2
AT#SRECV=<connId>, <maxByte>,[<UDPIInfo>]	<p>Execution command permits the user to read data arrived through a connected socket, but buffered and not yet read because the module entered command mode before reading them; the module is notified of these data by a SRING URC, whose presentation format depends on the last #SCFGEXT setting.</p> <p>Parameters:</p> <p><connId> - socket connection identifier 1..6</p> <p><maxByte> - max number of bytes to read 1..1024</p> <p><UDPIInfo> 0 – UDP information disabled (default) 1 – UDP information enabled: data are read just until the end of the UDP datagram and the response carries information about the remote IP address and port and about the remaining bytes in the datagram.</p> <p>AT#SRECV=<connId>,<maxBytes>,1 #SRECV: <sourceIP>,<sourcePort><connId>,<recData>,<dataLeft> data</p> <p>Note: issuing #SRECV when there's no buffered data raises an error.</p>	
AT#SRECV=?	Test command returns the range of supported values for parameters < connId > < maxByte > and <UDPIInfo>	
Example		

4.1.3.2.13 Send UDP data to a specific remote host extended #SSENDUDPEXT

#SSENDUDPEXT – send UDP data to a specific remote host extended		SELINT 2
AT#SSENDUDPEXT=<connId>,<bytestosend>,<remoteIP>,<remotePort>	<p>This command permits, while the module is in command mode, to send data over UDP to a specific remote host including all possible octets(from 0x00 to 0xFF)</p> <p>As indicated about #SSENDUDP: UDP socket has to be previously opened through #SLUDP / #SA, then we are able to send data to different remote hosts. Like #SSENDEXT, the device responds with the prompt '>' and waits for the data to send, operation is automatically completed when <bytestosend> have been sent.</p> <p>Parameters: <connId> - socket connection identifier 1..6 <bytestosend> - number of bytes to be sent 1-1500 <remoteIP> - IP address of the remote host in dotted decimal notation, string type: "xxx.xxx.xxx.xxx" <remotePort> - remote host port 1..65535</p>	
AT#SSENDUDPEXT=?	Test command reports the supported range of values for parameters <connId>,<bytestosend>,<remoteIP> and <remotePort>	

4.1.3.2.15 Send PING request - #PING

#PING – Send PING request	SELINT 2
<p>AT#PING= <IPaddr> [,<retryNum>,<len> [,<timeout> >,<tll> [,<pdpld>]]]]]</p>	<p>This command is used to send Ping Echo Request messages and to receive the corresponding Echo Reply. Ping replies are receive asynchronously, and additional PING commands are denied (with an ERROR response) until the last Echo Reply is received or timed out.</p> <p>Parameters: <IPaddr> - address of the remote host, string type. This parameter can be any valid IP address in the format: “xxx.xxx.xxx.xxx” <retryNum> - the number of Ping Echo Request to send 1-64 (default 4) <len> - the length of Ping Echo Request message 32-1460 (default 32) <timeout> - the timeout, in 100 ms units, waiting a single Echo Reply 1-600 (default 50) <tll> - time to live 1-255 (default 128). Dummy parameter – not used. <pdpld> PDP context identifier 0..10 - numeric parameter which specifies a particular PDP context definition. Dummy parameter – not used. Once the single Echo Reply message is receive a string like that is displayed: #PING: <replyId>,<Ip Address>,<replyTime>,<tll></p> <p>Where: <replyId> - Echo Reply number <Ip Address> - IP address of the remote host <replyTime> - time, in 100 ms units, required to receive the response <tll> - time to live of the Echo Reply message</p> <p>Note 1: when the Echo Request timeout expires (no reply received on time) or the second and further echo request could not be sent, the response will contain <replyTime> set to 600 and <tll> set to 255 Note 2: Before send PING Request the GPRS context must have been activated by AT#SGACT=0,1 Note 3: Only a single ping request (along with the specified retries) can be issued at a time.</p> <p>NOTE: tll is currently currently not supported. NOTE2: pdpld assignement is currently not supported. NOTE3: String addresses are not supported for IPaddr parameter (only valid IP addresses, since DNS is not supported).</p>
<p>AT#PING=?</p>	<p>Test command reports the supported range of values for the #PING command parameters</p>
<p>Example</p>	<pre>at#ping=8.8.8.8 OK #PING: 01,8.8.8.8,33,41 #PING: 02,8.8.8.8,17,41 #PING: 03,8.8.8.8,14,41 #PING: 04,8.8.8.8,10,41</pre>

4.1.3.2.16 Send data in Command Mode extended - #SSENDEXT

#SSENDEXT - Send Data In Command Mode extended		SELINT 2
AT#SSENDEXT= <connId> , <bytetestosend>	<p>Execution command permits, while the module is in command mode, to send data through a connected socket including all possible octets (from 0x00 to 0xFF).</p> <p>Parameters: <connId> - socket connection identifier 1..6 <bytetestosend > - number of bytes to be sent Please refer to test command for range The device responds to the command with the prompt <greater_than><space> and waits for the data to send. When <bytetestosend> bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Note: it's possible to use #SSENDEXT only if the connection was opened by #SD, else the ME is raising an error. Note: all special characters are sent like a generic byte. (For instance: 0x08 is simply sent through the socket and don't behave like a BS, i.e. previous character is not deleted)</p>	
AT#SSENDEXT=?	Test command returns the range of supported values for parameters < connId > and <bytetestosend>	
Example	<p>Open the socket in command mode: at#sd=1,0,<port>,"IP address",0,0,1 OK Give the command specifying total number of bytes as second Parameter: at#ssendext=1,256 > ; // Terminal echo of bytes sent is displayed here OK All possible bytes (from 0x00 to 0xFF) are sent on the socket as generic bytes.</p>	

4.1.3.3 3GPP Rel12 PSM Commands

5 DOCUMENT HISTORY

5.1 Revisions

Revision	Date	Changes
0	2017-04-10	First issue
1	2017-06-26	Second issue
2	2017-08-16	Third issue

Revision	Date	SW release	Changes
Issue1	2017-06-26	29.00.010-B016	<p>Updated command: #BND, #AUTOATT, #PING, #RFSTS, #SCFG, #SS</p> <p>New commands: #SCFGEXT, #SCFGEXT2, #SCFGEXT3, +IMEISV, +CCID, +CESQ, #MONI, #SERVINFO, +GSN, E, S3, S4, S5, #SI, #SS, #TEMPMON, I, #GPIO, #ADC</p>
Issue2	2017-08-16	29.00.0x0-B024	<p>Updated commands: +CGDCONT, #TEMPMON, +CME ERROR, +CSCON, +COPS, +CEREG, #RFSTS, #BCCHLOCK</p> <p>New commands: +CCLK, +CEDRXS, +CEDRXRDP, +CEER, +CGACT, #TEMPCFG, #LPWAKE</p>

