Cinterion® MV31-W

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1. Introduction

1.1 Scope of the document

This document presents the AT Command Set for

MV31-W 5G Data Card, Release 00.058.

Before using the MV31-W or upgrading to a new firmware version please read the latest product information provided in “MV31-W Release Note” (see [1]).

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TLS/IP/UDP	Transport Security Layer	Source	Note 2
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1.3 Related documents

[1] MV31-W Release Notes, Version 00.058

[2] MV31-W Hardware Interface Description, Version 00.058

[3] 3GPP TR 21.905 Technical Specification Group Services and System Aspects; Vocabulary for 3GPP Specifications

[4] 3GPP TS 31.101 UICC-terminal interface; Physical and logical characteristics

[5] 3GPP TS 22.002 (descendant of 3GPP TS 22.02): Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)

[6] 3GPP TS 23.038 TS 23.038 Technical Specification Group Core Network and Terminals; Alphabets and language-specific information

[7] 3GPP TS 23.203 Technical Specification Group Services and System Aspects; Policy and charging control architecture

[8] GPP TS 24.301 Technical Specification Group Core Network and Terminals; Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3

[9] ETSI TS 102 310 Smart Cards; Extensible Authentication Protocol support in the UICC

[10] ETSI TS 102.221 Smart Cards; UICC-Terminal interface; Physical and logical characteristics

[11] ISO/IEC 10646:2017 Information technology — Universal Coded Character Set (UCS)

[12] ITU T T.50 International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) - Information technology - 7-bit coded character set for information interchange

[13] RFC 3748 Extensible Authentication Protocol (EAP), http://www.ietf.org

[14] 3GPP TS 22.088Technical Specification Group Services and System Aspects; Call Barring (CB) supplementary services; Stage 1

[15] 3GPP TS 22.022 Technical Specification Group Services and System Aspects; Personalisation of Mobile Equipment (ME); Mobile functionality specification

[16] 3GPP TS 22.030 Technical Specification Group Services and System Aspects; Man-Machine Interface (MMI) of the User Equipment (UE)

[17] 3GPP TS 51.011 Technical Specification Group Terminals; Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface

[18] 3GPP TS 44.065 Technical Specification Group Core Network and Terminals; Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)

[19] 3GPP TS 25.323 Technical Specification Group Radio Access Network; Packet Data Convergence Protocol (PDCP) specification

[20] 3GPP TS 23.060 Technical Specification Group Services and System Aspects; General Packet Radio Service (GPRS); Service description; Stage 2

[21] 3GPP TS 24.008 Technical Specification Group Core Network and Terminals; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3

[22] RFC1144 Compressing TCP/IP Headers for Low-Speed Serial Links, http://www.ietf.org

[23] RFC2507 IP Header Compression, http://www.ietf.org

[24] RFC3095 Robust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed, http://www.ietf.org

1.4 Document Conventions

Throughout this document MV31-W is also referred to as GSM/UMTS/LTE Mobile Engine or short ME, MS (Mobile Station) or Mobile Terminal (MT). In related documents the equivalent term DCE (Data Communication Equipment) may be found.

AT commands are used to control the MV31-W. The controlling device is referred to as Customer Application or short TE. Related documents may use the equivalent term DTE (Data Terminal Equipment).

All abbreviations and acronyms used throughout this document are based on 3GPP specifications. For definitions please refer to 3GPP TR 21.905 [3].

1.5 AT Command Syntax

The “AT” or “at” prefix must be set at the beginning of each command line. To terminate command line enter

<CR>. Commands are usually followed by a response that includes “<CR> <LF> <response> <CR> <LF>”. Throughout this document, only the responses are presented <CR> <LF> are omitted intentionally.

Table 1.4: Types of AT command sand responses

AT command type	Syntax	Function
Test command	AT+CXXX=?	The mobile equipment returns the list of parameter sand value ranges set with the corresponding Write command or by internal processes.
Read command	AT+CXXX?	This command returns the currently set value of the parameter or parameters.
Write command	AT+CXXX=<…>	This command sets user-definable parameter values.
Exec command	AT+CXXX	The execution command reads non-variable parameters determined by internal processes in the UE.

2. Basic Commands

2.1 A/ - Repeat Previous Command Line

Repeat Previous AT command line.

In general, after beginning a command line with character “a” or “A”, a second character “t”, “T” or “/” has to follow. In case of using a wrong second character, it is necessary to start again with character “a” or “A”

Syntax

Type	Command	Possible Return Result	Instruction
Exec command	A/	OK	

Parameter Description

Parameter	Value	Instruction
NULL		

3. ITU-T V.25ter DTE-DCE Interface Command

3.1 ATS3 - Command Line Termination

ATS3 determines the character recognized by the device to terminate an incoming command line. It is also generated for result codes and information text, along with character value set via ATS4. If have not insert SIM card, this command will return error.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	ATS3?	<n> OK	-
Write Command	ATS3=<n>	OK	-

Parameter Description

Parameter	Value	Instruction
<n>	0~127	Default value is 13 (Corresponding ASCII character CR carriage return) Notice: if change this value, it possible to affect the execution of the AT command.

Example

ATS3=32 OK ATS3? 32 OK	In this point, the AT command line terminator has become a space instead of the previous carriage return

3.2 ATS4 - Response Formatting

ATS4 determines the character generated by the device for result code and information text, along with the command line termination character set via ATS3. If have not insert SIM card, this command will return error.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	ATS4?	<n>	-
		OK	
Write Command	ATS4=<n>	OK	-

Parameter Description

Parameter	Value	Instruction
<n>	0~127	Default value is 10 (Corresponding ASCII character LF carriage return) Response formatting character. It is not recommended to change this value.

3.3 ATS5 - Command Line Editing

ATS5 determines the character value used by the device to delete the immediately preceding character from the AT command line (i.e. equates backspace key). If have not insert SIM card, this command will return error.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	ATS5?	<n> OK	-
Write Command	ATS5=<n>	OK	-

Parameter Description

Parameter	Value	Instruction
<n>	0~127	Default value is 8. Command line editing character. It is not recommended to change this value.

3.4 ATE - AT Command Echo

ATE controls if the device echoes characters received from TE during AT command state.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	ATE[<value>]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	0	Echo mode off
	1	Echo mode on

3.5 ATQ - Result Code Presentation Mode

ATQ controls if the device transmits any result code to the TE. Other information text transmitted as response is not affected.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	ATQ[n]	OK	-

Parameter Description

Parameter	Value	Instruction
<n>	[0]	UE transmits result code. It is not recommended to change this value.
	1	Result codes are suppressed and not transmitted.

3.6 ATV - Result Code Format Mode

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

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	ATV[<value>]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	0	Information response: <text><CR><LF> Short result code format: <numeric code><CR>
	1	Information response: <CR><LF><text><CR><LF> Long result code format: <CR><LF><verbose code><CR><LF>

3.7 ATX - Connect Result Code Format

ATX determines whether or not the device transmits particular result codes to the TE.

ATX also controls whether or not the UE verifies the presence of a dial tone when it begins dialing, and if engaged tone (busy signal) detection is enabled.

The CONNECT result code indicates that the UE has changed from command state to online data state.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	ATX[<value>]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	[0]	CONNECT result code returned. Dial tone and busy detection are disabled.
	1	CONNECT <text> result code returned. Dial tone and busy detection are disabled.
	2	CONNECT <text> result code returned. Dial tone detection is enabled, busy detection is disabled.
	3	CONNECT <text> result code returned. Dial tone detection is disabled, busy detection is enabled.
	4	CONNECT <text> result code returned. Dial tone and busy detection are both enabled.

3.8 AT&W - Store AT Command Setting to User Defined Profile

AT&W stores the current AT command settings to a user defined profile in non-volatile memory of device. The AT command settings will automatically be restored from the user defined profile during power-up or if ATZ is used. AT&F restores AT command factory default settings. Hence, until first use of AT&W, ATZ works as AT&F.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT&W[<value>]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	[0]	User Profile Number

3.9 AT&E - Store AT Command Setting to User Defined Profile

Controls the display of data rate to be either serial rate or wireless connection speed.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT&E[<value>]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	[0]	Serial/DTE rate
	1	wireless connection speed

3.10 AT+ICF - DTE-Modem Character Framing

This set command defines the asynchronous character framing to be used whenautobauding is disabled.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ICF=?	+ICF: (3),(0-3) OK	-
Read Command	AT+ICF?	+ICF: <value>,<parity> OK	-
Write Command	AT+ICF=[<format>, [<parity>]]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	Determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame.	
	[3]	8 data bit, 1 stop bit
<parity>	Determines how the parity bit is generated and checked, if present; this sub parameter has no meaning.	
	0	Odd (not supported)
	1	Even (not supported)
	2	Mark
	[3]	None

3.11 AT+IFC - DTE-Modem Local Flow Control

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+IFC=?	+IFC: =(<by_te>list), (<by_ta>list) OK	-
Read Command	AT+IFC?	+IFC: =<by_te>, <by_ta> OK	-
Write Command	AT+IFC=<by_te>, <by_ta>	OK	-

Parameter Description

Parameter	Value	Instruction
<by_te>	Flow control option for the data received by DTE	
	0	flow control None
	1	XON/XOFF filtered
	[2]	C105 (RTS) (factory default)
	3	XON/XOFF not filtered
<by_ta>	Flow control option for the data sent by modem	
	0	flow control None
	1	XON/XOFF
	[2]	C106 (CTS) (factory default)

3.12 ATZ - Restore AT Command Settings from User Defined Profile

First ATZ resets the AT command settings to their factory default values, similar to AT&F. Afterwards the AT command settings are restored from a user defined profile in non-volatile memory, if one was stored with AT&W before. Any additional AT command on the same command line may be ignored. A delay of 300 ms is required before next AT command is sent.

However, ATZ does not change the current bit rate of asynchronous serial interface (UART).

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	ATZ[<value>]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	[0]	User Profile Number

3.13 AT&F - Reset AT Command Settings to Factory Default Values

AT&F resets AT command settings to their factory default values.

However, the command does not change the current bit rate of asynchronous serial interface (UART).

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT&F[<value>]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	[0]	Reset parameters to their factory default values

3.14 ATI - Display Product Identification Information

The ATI execute command delivers a product identification information text.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	ATI	Manufacturer: XXX Model: XXX Revision: XXX IMEI: XXX +GCAP: XXXXX OK	Display production information

3.15 AT+GMI - Display Manufacturer Identification

The AT+GMI returns the Manufacturer Identification

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+GMI	XXX OK	Display Manufacturer Identification
Test Command	AT+GMI=?	OK	-

3.16 AT+GMM - Display Model Identification

The AT+GMM returns the model information.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+GMM	XXX OK	Display Model Identification
Test Command	AT+GMM=?	OK	-

3.17 AT+GMR - Display Revision Identification

The AT+GMR returns the revision identification.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+GMR	XXX OK	Display Revision Identification
Test Command	AT+GMR=?	OK	-

3.18 AT+GSN - Display Serial Number

The AT+GSN returns the serial number.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+GSN	<sn> OK	-
Test Command	AT+GSN=?	OK	-

Parameter Description

Parameter	Value	Instruction
<sn>		The serial number of device.

3.19 AT+GCAP - Display Product Capabilities List

The AT+GCAP returns the Capabilities List.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+GCAP	+GCAP: <name> OK	-
Test Command	AT+GCAP=?	OK	-

Parameter Description

Parameter	Value	Instruction
<name>		Additional function list, such as +CGSM

Example:

```
AT+GCAP
+GCAP: +CGSM
OK
```

3.20 ATS2 - Escape Character

The command sets the ASCII character to be used as escape character.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	ATS2?	<value> OK	-
Write Command	ATS2=[value]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	1-255	43(+) is default value

3.21 ATS7 - Connection Completion Time-Out

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

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	ATS7?	<value> OK	-
Write Command	ATS7=[value]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	0-[1]-255	Number of rings, 1 is default value, the value shows clearly time out seconds

3.22 ATS8 - Comma Dial Pause Time

ATS8 is implemented for compatibility reasons only, and has no effect.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	ATS8?	<value> OK	-
Write Command	ATS8=[value]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	1-[2]-255	2 is default value

3.23 ATS10 - Set Disconnect Delay after Indicating the Absence of Data Carrier

ATS10 determines the amount of time that the UE remains connected in absence of a data carrier. If the data carrier is detected before disconnect, the UE remains connected.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	ATS10?	<value> OK	-
Write Command	ATS10=[value]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	1-[14]-255	14 is default value. Number of tenths of seconds to wait before disconnecting after UE has indicated the absence of received line signal

3.24 ATS30 - Disconnect Inactivity Timer

Setting of an inactive timer value for disconnection when no user data is exchanged during a data call.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	ATS30?	<value> OK	-
Write Command	ATS30=[value]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	[0]-1-255	0 is default value. Number of disconnect inactivity time.

3.25 AT\V - Single Line Connect Message

Enables/disables the display of extended result code in response to a data call.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT\V	OK	-
Write Command	AT\V[value]	OK	-

Parameter Description

Parameter	Value	Instruction
<value>	[0]	Off
	1	On

3.26 AT\S - Requests AT Command Settings

Prints the AT command settings.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT\S	E1 Q0 V1 X1 &C2 &D2 &S0 &E0 \V0 S000=000 S002=043 S003=013 S004=010 S005=008 S006=002 S007=000 S008=002 S010=014 S030=000 S103=001 S104=001 OK	-

3.27 AT%V - Requests Revision Identification

AT%V delivers product firmware version identification.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT%V	XXX OK	Display product firmware version identification.

4. UMTS General Commands

4.1 AT+CGMI - Request Manufacturer Identification

AT+CGMI returns a manufacturer identification text.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CGMI=?	OK	-
Exec Command	AT+CGMI	xxx	Display manufacturer identification.

4.2 AT+CGMM - Request Model Identification

AT+ CGMM returns a product model identification text.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CGMM=?	OK	-
Exec Command	AT+CGMM	xxx	Display product model identification.

4.3 AT+CGMR - Request Revision Identification of Software Status

AT+ CGMR delivers a product firmware version identification.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CGMR=?	OK	-
Exec Command	AT+CGMR	xxx	Display product firmware version identification.

4.4 AT+CGSN - Request International Mobile Equipment Identity

AT+ CGSN returns the International Mobile Equipment Identity (IMEI).

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CGSN=?	OK	-
Exec Command	AT+CGSN	xxx	Display IMEI.

4.5 AT+CSCS - Character Set

AT+CSCS write command informs the device which character set is used by the TE. This enables the UE to convert character strings correctly between TE and UE character sets.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSCS=?	+CSCS: (<ChSet> value list) OK	List all supported character.
Exec Command	AT+CSCS	OK	Set to default character set (IRA).
Write Command	AT+CSCS=[<ChSet>]	+CSCS: <ChSet> OK	Set TE character which used by the TE.

Parameter Description

Parameter	Value	Instruction
<ChSet >	[IRA]	Default character set.International reference alphabet (ITU T T.50 [11]).
	GSM	GSM default alphabet (3GPP TS 23.038 [6], subclause 6.2.1).
	UCS2	16-bit universal multiple-octet coded character set (ISO/IEC10646 [10]). UCS2 character strings are converted to hexadecimal numbers in the range 0000 to FFFF; e.g. “004100620063” equates three 16-bit characters with decimal values 65, 98 and 99.

4.6 AT+CIMI - Request International Mobile Subscriber Identity

AT+CIMI delivers the International Mobile Subscriber Identity (IMSI). The IMSI permits the TE to identify the individual SIM attached to the UE.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CIMI=?	OK	-
Exec Command	AT+CIMI	XXX OK	Display IMSI. If failed. It maybe that SIM card is not initiated or locked. If locked, need to input PIN code or PUK code.

5. UMTS Call Control Commands

5.1 AT+WS46 - Select Wireless Network

Only query command supported, values accepted but no action taken. If you want to change the RAT preference, you can use AT+COPS command.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+WS46=?	+ WS46: (<n> value list) OK	-
Read Command	AT+ WS46?	+ WS46: <n> OK	-

Parameter Description

Parameter	Value	Instruction
<n>	12	GSM Digital Cellular Systems (GERAN only)
	22	UTRAN only
	25	3GPP Systems (both GERAN and UTRAN)
	28	LTE only
	29	GERAN + UTRAN
	30	GERAN + LTE
	31	UTRAN + LTE

5.2 AT+CSTA - Select Type of Address

This set command selects the type of number for further dialing commands ATD according to 3GPP Technical Specifications. Test command returns values supported a compound value.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSTA=?	+CSTA: (<type> value list) OK	-
Read Command	AT+CSTA?	+CSTA: <type> OK	-
Write Command	AT+CSTA=<type>	OK	-
Exec Command	AT+CSTA	OK	-

Parameter Description

Parameter	Value	Instruction
<type>	145	when dialing string includes international access code character “+”
	[129]	Otherwise.Default value.

5.3 AT+CMOD - Set Call Mode

This set command selects the type of call mode. Test command returns values supported a compound value.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMOD=?	+CMOD: (<mode> value list) OK	-
Read Command	AT+CMOD?	+CMOD: <mode> OK	-
Write Command	AT+CMOD=[<mode>]	OK	-
Exec Command	AT+CMOD	OK	-

Parameter Description

Parameter	Value	Instruction
<mode>	[0]	single mode

5.4 AT+CBST - Select Bearer Service Type

AT+CBST write command selects the bearer service <name>, the data rate <speed> and the connection element <ce> to be used when data calls are originated. The settings also apply to mobile terminated data calls. See 3GPP TS 22.002 [5].

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CBST=?	+CBST: (<speed> value list), (<name> value list), (<ce > value list) OK	-
Read Command	AT+CBST?	+CBST: <speed >,<name>, <ce > OK	-
Write Command	AT+CBST= [<speed>[,<name> [,<ce>]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<speed>	0	Automatic Speed Selection
	7	9600 bps (V.32)
	12	9600 bps bps (V.34)
	14	14400 bps (V.34)
	16	28800 bps (V.34)
	17	33600 bps (V.34)
	39	9600 bps (V.120)
	43	14400 bps (V.120)
	48	28800 bps (V.120)
	51	48000 bps (V.120)
	71	9600 bps (V.110)
	75	14400 bps (V.110)
	80	28800 bps (V.110)
	81	38400 bps (V.110)

	83	56000 bps (V.110 or X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI or RDI service in order to get FTM)
	84	64000 bps (X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI service in order to get FTM)
	116	64000 bps (bit transparent)
	134	64000 bps (multimedia)
<name>	0	Data circuit asynchronous (UDI or3.1 kHz modem)
	1	Data circuit synchronous (UDI or3.1 kHz modem)
	4	Data circuit asynchronous (RDI)
<ce>	0	Data transparent
	1	Data nontransparent

Example:

```
AT+CBST =14,0,1
OK
AT+CBST=?
+CBST: (0,7,12,14,16,17,39,43,48,51,71,75,80,81,83,84,116,134),(0,1,4),(0,1)
 OK
```

5.5 AT+CRLP - Configure RLP Parameters for Outgoing Non-Transparent Data Calls

AT+CRLP write command sets radio link protocol (RLP) parameters used when non-transparent data calls are originated. The read command returns the current settings for the supported RLP version 0 till 2.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CRLP=?	+CRLP: (list of supported <iws>s), (list of supported <mws>s), (list of supported <T1>s), (list of supported <N2>s) [,<ver1> [,(list of supported <T4>s)]] [<CR><LF>+CRLP: (list of supported <iws>s), (list of supported <mws>s), (list of supported <T1>s), (list of supported <N2>s)[,<ver1> [,(list of supported <T4>s)]] […]] OK	-
Read Command	AT+CRLP?	+CRLP: <iws>,<mws>,<T1>,<N2>[,<ver1>[,<T4>]] [<CR><LF>+CRLP: <iws>,<mws>,<T1>,<N2>[,<ver2>[,<T4>]] […]] OK	-
Write Command	AT+CRLP=[<iws> [,<mws>[,<T1> [,<N2>[,<ver> [,<T4>]]]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<iws>	0…61	Interworking window size (IWF to MS)
	0…240…488 for <ver>=2	
<mws>	0…61	Mobile window size (MS to IWF)
	0…240…488 for <ver>=2	

<T1>	38…48…255	Acknowledgement timer (T1 in 10 ms units)
	42…52…255 for <ver>=2	
<N2>	1…6…255	Re-transmission attempts N2
<ver>	0…2	RLP version number

Example:

```
AT+CRLP?
+CRLP: 61,61,48,6,0
+CRLP: 61,61,48,6,1
+CRLP: 240,240,52,6,2
OK
AT+CRLP =?
+CRLP: (0-61),(0-61),(38-255),(1-255),0
+CRLP: (0-61),(0-61),(38-255),(1-255),1
+CRLP: (0-488),(0-488),(42-255),(1-255),2
OK
AT+CRLP =60,60,48,6,1
OK
AT+CRLP?
+CRLP: 61,61,48,6,0
+CRLP: 60,60,48,6,1
+CRLP: 240,240,52,6,2
OK
```

5.6 AT+CR - Service Reporting Control

AT+CR configures the MV31-W whether or not to transmit an intermediate result code +CR: <serv> to the TE when a call is being set up. <mode>=1 may lead to connection failure, if the application waits for default result code/URC.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CR=?	+CR: <mode> list OK	-
Read Command	AT+CR?	+CR: <mode> OK	-
Write Command	AT+CR=<mode>	OK	-

Parameter Description

Parameter	Value	Instruction
<mode>	[0]	Disable
	1	Enable

5.7 AT+CEER - Service Reporting Control

Execution command causes the TA to return the information text <report>, which should offer the user of the TA an extended report of the reason.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CEER=?	OK	-
Exec Command	AT+CEER	+CEER: <report> OK	-

Parameter Description

Parameter	Value	Instruction
<report>	-	Failure information, which is possibly occurred.

5.8 AT+CRC - Set Cellular Result Codes for Incoming Call Indication

AT+CRC controls whether or not to use the extended format of incoming call indication.

<mode>=1 may lead to connection failure, if the application waits for default result code/URC.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CRC=?	+CRC: <mode> list OK	-
Read Command	AT+CRC?	+CRC: <mode> OK	-
Write Command	AT+CRC=<mode>	OK	-
Exec Command	AT+CRC	OK	-

Parameter Description

Parameter	Value	Instruction
<mode>	[0]	Disable extended format
	1	Enable extended format

5.9 AT+CHSN - HSCSD Non-Transparent Call Configuration

This set command controls parameters for originating non-transparent HSCSD calls. Values may also be used during mobile terminated data call setup. In GERAN, changing <topRx> or <codings> value during a call does not affect the current call. In GERAN, changing of <wAiur> or <wRx> affects the current call only if <topRx> was non-zero when call was established textual format.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CHSN=?	+CHSN: (list of supported <wAiur>s), (list of supported <wRx>s), (list of supported <topRx>, (list of supported <codings>s) OK	-
Read Command	AT+CHSN?	+CHSN: <wAiur>,<wRx>,<topRx>,<codings> OK	-
Write Command	AT+CHSN= [<wAiur>[,<wRx> [,<topRx> [,<codings>]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<wAiur>	0	TA shall calculate a proper value from currently selected fixed network user rate(<speed> Sub parameter from +CBST command)
	2	14400(bps)
	4	28800(bps)
	7	57600(bps)
<wRx>	0	TA shall calculate a proper value from currently selected<wAiur> and <codings>
<topRx>	0	TA shall calculate a proper value from currently selected<wAiur> and <codings>
<codings>	0	All supported codings are accepted

5.10 AT+CGPIAF - IPV6 Format

Reads IP Address Format, determines what format to print IPV6 address parameters of other AT commands, and reports Mobile Termination Error Change result code to numeric value

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGPIAF =?	+ CGPIAF: (list of supported <Ipv6_AddressFormat >s), (list of supported <Ipv6_SubnetNotation >s), (list of supported <Ipv6_LeadingZeros >, (list of supported <Ipv6_CompressZeros >s) OK	-
Read Command	AT+ CGPIAF?	+ CGPIAF: <Ipv6_AddressFormat>, <Ipv6_SubnetNotation>, <Ipv6_LeadingZeros>, <Ipv6_CompressZeros> OK	-
Write Command	AT+ CGPIAF = [<Ipv6_AddressFor mat> [,<Ipv6_Subn etNotation> [,<Ipv6_LeadingZeros> [,< Ipv6_CompressZeros>]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<Ipv6_AddressFormat>	0	Disable
	1	Enable
<Ipv6_SubnetNotation>	0	Disable
	1	Enable
<Ipv6_LeadingZeros>	0	Disable
	1	Enable
<Ipv6_CompressZeros>	0	Disable
	1	Enable

5.11 AT+CSTF - Settings Time Format

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

Read commands reads the current setting. Test command reads the supported <modes>s.

Before executing read command (AT+CSTF?), you must executing write command (AT+CSTF=<mode>) firstly.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSTF=?	+CSTF: <mode> list OK	-
Read Command	AT+CSTF?	+CSTF: <mode> OK	
Write Command	AT+CSTF=<mode>	OK	-

Parameter Description

Parameter	Value	Instruction
<mode>	1	HH:MM (24 hour clock)
	2	HH:MM a.m./p.m.

5.12 AT+CSDF - Settings Date Format

This command sets the date format via MMI of the date information presented to the user, which is specified by use of the <mode> parameter. The <mode> affects the date format on the phone display and doesn't affect the date format of the AT command serial interface. The command also sets the date format of the TE-TA interface, which is specified by use of the <auxmode> parameter (e.g. the <auxmode> affects the <time> of +CCLK). If the parameter is omitted ("+CSDF =","+CSDF =<mode>","+CSDF=,<auxmode>"),then this sets the default value.

Before executing read command (AT+CSDF?), you must executing write command to set the date format firstly.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSDF=?	+CSDF: (<mode> list), (<auxmode> list) OK	-
Read Command	AT+CSDF?	+CSDF: <mode>,<auxmode> OK	-
Write Command	AT+CSDF=[[<mode>] [,<auxmode>]]	OK	-

Parameter Description

Parameter	Value	Instruction
<mode>	1	**Note**: It is manufacturer specific which modes that are supported. Presentation of MMM is language dependent. DD-MMM-YYYY
	2	DD-MM-YY
	3	MM/DD/YY
	4	DD/MM/YY
	5	DD.MM.YY
	6	YYMMDD
	7	YY-MM-DD
<auxmode>	1	yy/MM/dd
	2	yyyy/MM/dd

Example:

```
at+csdf =7,2
OK
at+cclk?
+cclk: “1980/01/06,01:11:47”
OK
```

5.13 AT+CUAD - UICC Application Discovery

This command asks the MT to discover what applications are available for selection on the UICC. According to TS 102.221 [10], the ME shall access and read the EF_{DIR} file in the UICC and return the values that are stored in its records. Each record contains the AID and optionally application parameters of one of the applications available on the UICC.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+CUAD	+CUAD: <response> OK	-

Parameter Description

Parameter	Value	Instruction
<response>	XXX	String type in hexadecimal character format.

Example:

```
AT+CUAD
+CUAD: “611D4F10A0000000871002FF86FFFF89FFFFFFFF5009556E6976657253494DFF”
  OK
```

5.14 AT+CEAP - EAP authentication

This command allows a TE to exchange EAP packets with the UICC or the ME.

Prior to the execution of this command, the TE shall retrieve the available AIDs using the +CUAD command. The TE shall select one appropriate AID to be addressed. Selection may include asking the user, and considering EAP methods supported by the AIDs. The TE shall set the <dfname> value using the selected AID and shall set the <EAP Method> value to the requested EAP method. The TE may set the <Dfeap> value to the directory file identifier that is applicable to the <EAP Method>; which is derived from the discretionary data returned by +CUAD. The parameter is mandatory for EAP terminated in UICC.

If the targeted application on the UICC does support the requested EAP method, the MT shall use the value provided in <Dfeap>, and it shall transmit the <EAP packet data> to the UICC application using the Authenticate APDU command as defined in ETSI TS 102 310 [66]. The appropriate DF_{EAP} in the ADF must be selected prior to the submission of an EAP Authenticate command with the <EAP packet data>. Then the EAP Response data sent by the UICC application in its response to the Authenticate command shall be provided to the TE in <EAP packet response>.

If the targeted application on the UICC does not support the requested EAP method and if the MT does support this method then the <EAP packet data> shall be handled by the MT. During the handling of the EAP method, the MT shall run the authentication algorithm on the SIM or USIM, respectively.

Also the MT has to allocate an <EAP sessionid> in order to identify an EAP session and its corresponding keys and parameters.

If neither the MT nor the appropriate UICC application supports the requested EAP method, the MT shall respond with CME ERROR: 49 (EAP method not supported).

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT+CEAP =<dfname>, <EAP Method>, <EAP packet data> [,<Dfeap>]	+CEAP: <EAP sessionid>, <EAP parameter response> OK	-

Parameter Description

Parameter	Value	Instruction
<dfname>	XXX	<dfname>: string type in hexadecimal character format. All selectable applications are represented in the UICC by an AID coded on 1 to 16 bytes.

<EAP Method>	XXX	String type in hexadecimal character format. This is the EAP Method Type as defined in RFC 3748 [13] in 1 byte format or 8 bytes expanded format. The value range for 1 byte format and for 8 bytes expanded format is defined in RFC 3748 [13].
<EAP packet data>	XXX	<EAP packet data>: string type in hexadecimal character format. This is the EAP packet data in hexadecimal character as defined in ETSI TS 102 310 [9].
<Dfeap>	XXX	<Dfeap>: string type in hexadecimal character format. Contains the DF(EAP) associated with the specified <EAPMethod> on the SIM/UICC as defined in ETSI TS 102 310 [9] (e.g. “6D34”).
<EAP sessionid>	1-4294967295	Integer type. This is the identifier of the EAP session to be used in order to retrieve the EAP parameters with EAP Retreive Parameters +CERP command. Value range is from 1 to 4294967295.
<EAP parameter response>	XXX	String type in hexadecimal character format. Defined in ETSI TS 102 310 [9].

5.15 AT+CERP - EAP Retrieve Parameters

This command allows a TE to retrieve EAP session parameters / derived keys after a run of the +CEAP command. If the EAP session is handled by the UICC then the MT shall return the content of the elementary file corresponding to the indicated <EAP parameter>. Those Efs are defined in ETSI TS 102 310 [9].

If the MT handles the EAP session then the MT shall return the corresponding parameter encoded as defined for EAP files, see ETSI TS 102 310 [9].

For example, the keys shall be retrieved in the TLV format described in ETSI TS 102 310 [9].

If neither the MT nor the appropriate UICC application can provide the requested information (e.g. because the requested EAP session ID does not exist), the MT shall respond with CME ERROR: 50 (Incorrect parameters).

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT+CERP=<EAP sessionid>, <EAP parameter>	+CERP: <EAP parameter response> OK	-

Parameter Description

Parameter	Value	Instruction
<EAP sessionid>	1-4294967295	This is the identifier of the EAP session to be used in order to retrieve the EAP parameters corresponding to an active EAP session.
<EAP parameter>	1	Keys
	2	Status
	3	Identity
	4	Pseudonym
<EAP parameter response>	XXX	String type in hexadecimal character format. The format of th parameter is defined in ETSI TS 102 310 [66]. The <EAP parameter response> depends on the value of the <EAP parameter>.

Example:

```
AT+CUAD
+CUAD:
"61244F10A0000000871002FF86FFFF89FFFFFFFF5010434D43434543505553494D322E304120"
OK
AT+CEAP = "4F10", "12", "0101000BA0000000871002"
+CEAP: 531871624,"020100060312"
OK
AT+CERP=531871624,3
+CERP: "34363030323031333633373536"
OK
AT+CERP = 531871624,2
+CERP: “01”
OK
```

6. ITU-T V.25ter Call Control Commands

6.1 ATH - Disconnect Existing Data Connection

ATH disconnects circuit switched data calls. For voice calls use AT+CHUP or AT^SHUP.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	ATH[<n>]	OK	-

Parameter Description

Parameter	Value	Instruction
<n>	[0]	Disconnect from line and terminate data call.

7. Network Service-related Commands

7.1 AT+CNUM - Subscriber Number

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

Syntax

Type	Command	Possible Return Result	Instruction
Execute Command	AT+CNUM	<n> OK	-
Test Command	AT+CNUM=?	OK	-

Example

AT+CNUM +CNUM:“test”,”13012345678”,129 OK	Before you first execute this command, you should execute these settings: AT$QCPBMPREF=1 AT+CPBS=”ON” AT+CPBW=1,”13012345678”,,”test”

7.2 AT+CREG - Network Registration Report

Set command controls the presentation of an unsolicited result.

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.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CREG=?	+CREG: (0-2) OK	-
Read Command	AT+CREG?	+CREG: <n>,<stat>[,<lac>,<ci>,<AcT>] OK	-
Write Command	AT+CREG=<mode>	OK	-

Parameter Description

Parameter	Value	Instruction
<mode>	0	Disable network registration unsolicited result code.
	1	Enable network registration unsolicited result code.
	2	Enable network registration and location information unsolicited result code.
<stat>	0	Not registered, not searching
	1	Registered on home Network
	2	Not registered, searching
	3	Registration denied
	4	Unknown registration state
<lac>		Location Area Code
<ci>		Cell ID
<AcT>	2	WCDMA access technology
	4	HSDPA accesstechnology
	5	HSUPA access technology
	6	HSDPA+ HSUPA
	7	LTE access technology
	10	LTE connected to 5G Core Network
	11	NR connected to 5G Core Networl
	12	NG-RAN access technology
	13	Dual connectivity of LTE with NR

Example

```
AT+CREG=1
OK

AT+CREG?
+CREG: 1,1
OK

AT+CREG=2
OK

AT+CREG?
+CREG: 2,1,”247C”,D0FE535”, 7
```

7.3 AT+COPS - PLMN Selection

Set command forces an attempt to select and register the GSM/UMTS/EPS/5G network operator. Test Command (AT+COPS=?) need wait 20 second to return result.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+COPS=?	+COPS: (2,”CHN-UNICOM”,”UNICOM”,”46001”,7), (1,”CHN-UNICOM”,”UNICOM”,”46001”,2), (3,”CHINA MOBILE”,”CMCC”,”46000”,7), (1,”CHN-CT”,”CT”,”46011”,7),, (0,1,2,3,4),(0,1,2) OK	-
Read Command	AT+COPS?	+COPS: <mode>,<format>,<oper>,<eons>,<AcT> OK	-
Write Command	AT+COPS=<mode>[,<format>[,<oper>[,<AcT>]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<mode>	0	Automatic (<oper> field is ignored).
	1	Manual (<oper> field shall be present, and <AcT> optionally).
	2	Deregister from network.
	3	Set only <format>, do not attempt registration/deregistration.
<format>	0	Long format alphanumeric <oper>, for example, CHN-UNICOM.
	1	Short format alphanumeric <oper>,for example, UNICOM
	2	Numeric, for example, 46001
<oper>	String type	-
<eons>	String type	Enhanced Operator Name String
<AcT>	0	GSM
	1	GSM Compact
	2	UTRAN
	3	GSM w/EGPRS
	4	UTRAN w/HSDPA

	5	UTRAN w/HSUPA
	6	UTRAN w/HSDPA and HSUPA
	7	E-UTRAN
	8	EC-GSM-IoT
	9	NB-IoT
	10	LTE connected to 5G Core Network
	11	NR connected to 5G Core Network
	12	NG-RAN access technology
	13	Dual connectivity of LTE with NR

Example

```
AT+COPS=1,2,”46001”,7
OK
```

///// EONS vs v14

7.4 AT+CLCK - Facility Lock/Unlock

Execute command is used to lock, unlock or interrogate a MT or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. This command should be abortable when network facilities are set or interrogated. Call barring facilities are based on GSM/UMTS supplementary services (refer 3GPP TS 22.088 [14]). The interaction of these with other commands based on other GSM/UMTS supplementary services is described in the GSM/UMTS standard.

Test command returns facility values supported as a compound value.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CLCK=?	+CLCK: (“AB”,”AC”,”AG”,”AI”,”AO”,”IR”,”OI”,”OX”,” SC” ,”FD”,”PN”,”PU”,”PP”,”PC”,”PF”) OK	-
Write Command	AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	OK	-

Parameter Description

Parameter	Value	Instruction
<fac>	“AB”	All Barring services (refer 3GPP TS 22.030 [16]) (applicable only for <mode>=0)
	“AC”	All 46uarante barring services (refer 3GPP TS 22.030 [16]) (applicable only for <mode>=0)
	“AG”	All 46uarante barring services (refer 3GPP TS 22.030 [16]) (applicable only for <mode>=0)
	“AI”	BAIC (Barr All Incoming Calls) (refer 3GPP TS 22.088 [14] clause 2)
	“AO”	BAOC (Barr All Outgoing Calls) (refer 3GPP TS 22.088 [14] clause 1)
	“IR”	BIC-Roam (Barr Incoming Calls when Roaming outside the home country) (refer 3GPP TS 22.088 [14] clause 2)
	“OI”	BOIC (Barr Outgoing International Calls) (refer 3GPP TS 22.088 [14] clause 1)
	“OX”	BOIC-exHC(BarrOutgoing InternationalCallsexcepttoHomeCountry)(refer3GPPTS22.088 [14] clause 1)
	“SC”	SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power-up and when this lock command issued)

	“FD”	SIM card or active application in the UICC (GSM or USIM) fixed 46uarant memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)
	“PN”	Network Personalization (refer 3GPP TS 22.022 [15])
	“PU”	Network sUbset Personalization (refer 3GPP TS 22.022 [15])
	“PP”	Service Provider Personalization (refer 3GPP TS 22.022 [15])
	“PC”	Corporate Personalization (refer 3GPP TS 22.022 [15])
	“PF”	Lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PH-FSIM) (MT asks password when other than the first SIM/UICC card is inserted)
<mode>	0	Unlock
	1	Lock
	2	Query status
<passwd>	string type	Shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD
<class>		A sum of integers each representing a class of information (default 7 – voice, data and fax)
	1	voice (telephony)
	2	data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)
	4	fax (facsimile services)
	8	short message service
	16	data circuit sync
	32	data circuit async
	64	dedicated packet access
	128	dedicated PAD access

Example

```
AT+CLCK=”SC”,1,”1234”
OK
```

7.5 AT+CPWD - Set New Password

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CPWD=?	+CPWD: (“AB”,4),(“AC”,4),(“AG”,4),(“AI”,4),(“AO”,4),(“IR”,4),(“OI”,4),(“OX”,4),(“SC”,8),(“P2”,8) OK	-
Write Command	AT+ CPWD =<fac>,<oldpwd>,<newpwd>	OK	-

Parameter Description

Parameter	Value	Instruction
<fac>	“SC”	RUIM (PIN request)
	“P2”	RUIM PIN2
<oldpwd>	string type	Shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD.
<newpwd>	string type	The new password

7.6 AT+COPN - Read Operator Names

The execute command returns the list of operator names from the MT.

Syntax

Type	Command	Possible Return Result	Instruction
Execute Command	AT+COPN	- OK	-
Test Command	AT+ COPN=?	OK	-

7.7 AT+CPLS - Selection of Preferred PLMN List

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

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+ CPLS?	+CPLS: 0 OK	-
Test Command	AT+ CPLS =?	+CPLS: 0,1,2 OK	-
Write Command	AT+CPLS=<list>	OK	-

Parameter Description

Parameter	Value	Instruction
<list>	0	User controlled PLMN selector with Access Technology EFPLMNwAcT,if not found in the SIM/UICC then PLMN preferred list EFPLMNsel (this file is only available in SIM card or GSM application selected in UICC)
	1	Operator controlled PLMN selector with Access Technology EFOPLMNwAcT
	2	HPLMN selector with Access Technology EFHPLMNwAcT

7.8 AT+C5GREG - NR5G(SA) Network Registration Status Report

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.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+C5GREG?	+C5GREG: <n>,<stat> OK	-

Parameter Description

Parameter	Value	Instruction
<n>	0	Disable network registration unsolicited result code.
	1	Enable network registration unsolicited result code.
	2	Enable network registration and location information unsolicited result code.
<stat>	0	Not registered, not searching
	1	Registered on home network
	2	Not registered, searching

8. Mobile Equipment Commands

8.1 AT+CPAS - Phone Activity Status

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Execute Command	AT+ CPAS	+CPAS: <stat> OK	-
Test Command	AT+ CPAS =?	+CPAS: (0,3,4) OK	-

Parameter Description

Parameter	Value	Instruction
<stat>	0	Ready (MT allows commands from TA/TE)
	3	Ringing (MT is ready for commands from TA/TE, but the ringer is active)
	4	Call in progress (MT is ready for commands from TA/TE, but a call is in progress)

8.2 AT+CFUN - Set Phone Functionality

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

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+ CFUN?	+CFUN: 1 OK	-
Test Command	AT+ CFUN=?	+CFUN: (0-1,4-7),(0-1) OK	-
Write Command	AT+CFUN=<fun>[,<rst>]	-	-

Parameter Description

Parameter	Value	Instruction
<fun>	0	Minimum functionality.
	1	Full functionality.
	4	Disable phone both transmit and receive RF circuits.
	5	Set Factory Test Mode.
	6	Set it Reset.
	7	Set it Offline.
<rst>	0	Do not reset the MT before setting it to <fun> power level.
	1	UE resets and restarts.

8.3 AT+CPIN - Enter PIN

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

Note: SIM PIN, SIM PUK, PH-SIM PIN, PH-FSIM PIN, PH-FSIM PUK, SIM PIN2 and SIM

PUK2 refer to the PIN of the selected application on the UICC. For example, in an UTRAN context, the selected application on a UICC should be a USIM and the SIM PIN then represents the PIN of the selected USIM. See TS 31.101 [4] for further details on application selection on the UICC.

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

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+CPIN?	+CPIN: READY OK	-
Test Command	AT+ CPIN =?	OK	-
Write Command	AT+ CPIN= <pin>[,<newpin>]	- OK	-

Parameter Description

Parameter	Value	Instruction
<pin>	string type values	
<newpin>	string type values	

8.4 AT+CSQ - Signal Quality

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

Test command returns values supported as compound values.

Syntax

Type	Command	Possible Return Result	Instruction
Execute Command	AT+ CSQ	+CSQ: <rssi>,<ber> OK	-
Test Command	AT+ CSQ =?	+CSQ: (0-31,99),(0-7,99) OK	-

Parameter Description

Parameter	Value	Instruction
<rssi>	0	-113 dBm or less
	1	-111 dBm
	2-30	-109… -53 dBm
	31	-51 dBm or greater
	99	Not known or not detectable
<ber>	0-7	As RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4
	99	Not known or not detectable

8.5 AT+CCLK - Sets Clock

This set command sets the real-time clock of the MT.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+ CCLK?	+CCLK: “80/01/06,04:40:36” OK	-
Test Command	AT+ CCLK =?	OK	-
Write Command	AT+ CCLK = <time>	OK	-

Parameter Description

Parameter	Value	Instruction
<time>	string type	Format is “yy/MM/dd,hh:mm:ss±zz”

8.6 AT+CSIM - Generic SIM Access

This set command transmits to the MT the <command> it then shall send as it is to the SIM. In the same manner the SIM <response> shall be sent back by the MT to the TA as it is. This command allows a direct control of the SIM by a distant application on the TE. The TE shall then take care of processing SIM information within the frame specified by GSM/UMTS. Need to set NV6253 as 1 befor executing this AT command.Otherwise, it will return error directly.

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CSIM =?	OK	-
Write Command	AT+ CSIM = <length>,<command>	OK	-

Parameter Description

Parameter	Value	Instruction
<length>	Integer type	length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response)
<command>		Command passed on by the MT to the SIM in the format as described in GSM 51.011 [17] (hexadecimal character format; refer +CSCS)

Example

```
AT+CSIM=?
OK
  AT+CSIM=14,"00A40004023F00"
+CSIM: 4,”612E”
OK
```

8.7 AT+CRSM - Restricted SIM Access

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CRSM =?	OK	-
Write Command	AT+ CRSM = <command>[,<fileid> [,<P1>,<P2>,<P3> [,<data>[,<pathid>]]]]	+CRSM: 144,0,”6232820278218410A0000000871002FF86FFFF89FFFFFFFF8A01058B062F0601010001C60F9001A0950100830111830101830181” OK	-

Parameter Description

Parameter	Value	Instruction
<command>		Command passed on by the MT to the SIM; refer GSM 51.011 [17]
	176	READ BINARY
	178	READ RECORD
	192	GET RESPONSE
	214	UPDATE BINARY
	220	UPDATE RECORD
	242	STATUS
<fileid>	Integer type	This is the identifier of a elementary datafile on SIM. Mandatory for every command except STATUS
<p1>/<p2>/<p3>	Integer type	Parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 51.011 [17]
<data>	String type	Information which shall be written to the SIM (hexadecimal character format; refer +CSCS)
<pathid>	String type	Contains the path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102 221 [10] (e.g. “7F205F70” in SIM and UICC case). The <pathid> shall only be used in the mode “select by path from MF” as defined in ETSI TS 102 221 [10].

8.8 AT+CLAC - Available AT Commands

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CLAC =?	OK	-
Execute Command	AT+ CLAC	… ^VERSION ^BodySaron ^VERINFO ^SBFS … OK	-

8.9 AT+CTZU - Automatic Time Zone Update

This set command enables and disables automatic time zone update via NITZ.

Read command returns the current settings in the MT.

Test command returns supported on- and off-values.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CTZU =?	+CTZU: (0-1) OK	-
Read Command	AT+ CTZU?	+CTZU: 1 OK	-
Write Command	AT+CTZU=<onoff>	OK	

Parameter Description

Parameter	Value	Instruction
<onoff>	0	Disable automatic time zone update via NITZ (default).
	1	Enable automatic time zone update via NITZ.

8.10 AT+CTZR - Time Zone Reporting

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

Read command returns the current reporting settings in the MT. Test command returns supported <onoff>-values.

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CTZR =?	+CTZR: (0-2) OK	-
Read Command	AT+ CTZR?	+CTZR: 0 OK	-
Write Command	AT+CTZR=<onoff>	OK	

Parameter Description

Parameter	Value	Instruction
<onoff>	0	Disable time zone change event reporting (default).
	1	Enable time zone change event reporting

8.11 AT+CMEE - Report Mobile Termination error

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

Test command returns values supported as a compound value.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CMEE =?	+CMEE: (0,1,2) OK	-
Read Command	AT+ CMEE?	+CMEE: 2 OK	-
Write Command	AT+ CMEE =<n>	OK	

Parameter Description

Parameter	Value	Instruction
<n>	0	Disable +CME ERROR: <err> result code and use ERROR instead
	1	Enable +CME ERROR: <err> result code and use numeric <err> values (refer next subclause)
	2	Enable +CME ERROR: <err> result code and use verbose <err> values (refer next subclause)

8.12 AT+CVMOD - Report Voice Domain Preference

This command can set/get current setting about voice domain preference.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CVMOD =?	+CVMOD:(0-3) OK	-
Read Command	AT+CVMOD?	+CVMOD: <n> OK	-
Write Command	AT+CVMOD=<n>	OK	

Parameter Description

Parameter	Value	Instruction
<n>	0	CS Voice only
	1	IMS PS Voice only
	2	CS voice preferred, IMS PS Voice as secondary
	3	IMS PS voice preferred, CS Voice as secondary

8.13 AT+CEMODE - Report UE Modes of Operation for EPS

This command can get current setting about UE's usage setting.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CEMODE=?	+CEMODE:(0-3) OK	-
Read Command	AT+CEMODE?	+CEMODE: <n> OK	-

Parameter Description

Parameter	Value	Instruction
<n>	0	UE registers only to EPS ,UE's usage setting is Data centric
	1	UE registers only to EPS and Non-EPS ,UE's usage setting is Voice centric
	2	UE registers only to EPS and Non-EPS ,UE's usage setting is Data centric
	3	UE registers only to EPS ,UE's usage setting is Voice centric

9. UMTS-specific Packet Domain Commands

9.1 AT+CGDCONT - Define PDP Context

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

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

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGDCONT =?	+CGDCONT: (1-42),”IP”,,,(0-3),(0-4),(0-1),(0-1) +CGDCONT: (1-42),”PPP”,,,(0-3),(0-4),(0-1),(0-1) +CGDCONT: (1-42),”IPV6”,,,(0-3),(0-4),(0-1),(0-1) +CGDCONT: (1-42),”IPV4V6”,,,(0-3),(0-4),(0-1),(0-1) OK	-
Read Command	AT+ CGDCONT?	+CGDCONT: 1,”IPV4V6”,””,”0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0”,0,0,0,0 OK	-
Write Command	AT+ CGDCONT =[<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp>]]]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	(PDP Context Identifier) A numeric parameter, which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command
<PDP_type>	String type	“IP”,”IPV6”,”IPV4V6”,”PPP”
<APN>	String type	(Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.

<PDP_addr>	String type	A string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return thenull string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command
<d_comp>		A numeric parameter that controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 44.065 [18])
	0	off(default if value is omitted)
	1	on (manufacturer preferred compression)
	2	V.42bis
<h_comp>		A numeric parameter that controls PDP header compression (refer 3GPP TS 44.065 [18] and 3GPP TS 25.323 [19])
	0	off (default if value is omitted)
	1	on (manufacturer preferred compression)
	2	RFC1144 [22] (applicable for SNDCP only)
	3	RFC2507 [23]
	4	RFC3095 [24] (applicable for PDCP only)

Example

```
AT+CGDCONT=2,”IP”
OK
```

9.2 AT+CGDSCONT - Define Secondary PDP Context

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

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CGDSCONT=?	+CGDSCONT: (1-42),(1,2,3,4,5),"IP",(0-3),(0-4) +CGDSCONT: (1-42),(),”PPP”,(0-3),(0-4) +CGDSCONT: (1-42),(),”IPV6”,(0-3),(0-4) +CGDSCONT: (1-42),(),”IPV4V6”,(0-3),(0-4) OK	-
Read Command	AT+CGDSCONT?	[+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>] […] OK	-
Write Command	AT+ CGDSCONT =[<cid>, <p_cid>[,<d_comp> [,<h_comp>]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	(PDP Context Identifier) A numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command
<p_cid>	1-5	(Primary PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.
<PDP_type>	String type	“IP”,”IPV6”,”IPV4V6”,”PPP”

<d_comp>		A numeric parameter that controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 44.065 [18])
	0	off(default if value is omitted)
	1	on (manufacturer preferred compression)
	2	V.42bis
<h_comp>		A numeric parameter that controls PDP header compression (refer 3GPP TS 44.065 [18] and 3GPP TS 25.323 [19])
	0	off (default if value is omitted)
	1	on (manufacturer preferred compression)
	2	RFC1144 [22] (applicable for SNDCP only)
	3	RFC2507 [23]
	4	RFC3095 [24] (applicable for PDCP only)

9.3 AT+CGTFT - Traffic Flow Template

This command allows the TE to specify a Packet Filter – PF for a Traffic Flow Template – TFT that is used in the GGSN for routing of down-link packets onto different QoS flows towards the TE. The concept is further described in the 3GPP TS 23.060 [20]. A TFT consists of from one and up to eight Packet Filters, each identified by a unique <packet filter identifier>. A Packet Filter also has an <evaluation precedence index> that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGTFT =?	-	-
Read Command	AT+ CGTFT?	+CGTFT: OK	-
Write Command	AT+ CGTFT =[<cid>, [<packet filter identifier>, <evaluation precedence index> [,<source address and subnet mask> [,<protocol number (ipv4) / next header (ipv6)> [,<destination port range> [,<source port range> [,<ipsec security parameter index (spi)> [,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> [,<flow label (ipv6)>]]]]]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
<packet filter identifier>	1-2	-
<evaluation precedence index>	0-255	-
<source address and subnet mask>	-	0.0.0.0.0.0.0.0 to 255. 255. 255. 255. 255. 255. 255. 255 ‘a1.a2.a3.a4.m1.m2.m3.m4’, for Ipv4, ‘a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16. m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16’, for Ipv6.
<protocol number (ipv4) / next header (ipv6)>	0-255	-
<destination port range>	-	0.0 to 65535.65535 Consists of dot-separated numeric (0-65535) parameters on the form ‘f.t’.
<source port range>	-	0.0 to 65535.65535 Consists of dot-separated numeric (0-65535) parameters on the form ‘f.t’.

<ipsec security parameter index (spi)>	-	Hexadecimal parameter, value range from 00000000 to FFFFFFFF.
<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>	-	0.0 to 255.255 Dot-separated numeric (0-255) parameters on the form ‘t.m’.
<flow label (ipv6)>	-	Hexadecimal parameter, value range from 00000 to FFFFF.Valid for Ipv6 only

9.4 AT+CGQREQ - Quality Of Service Profile (Requested)

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGQREQ command is effectively an extension to these commands.

The QoS profile consists of a number of parameters, each of which may be set to a separate value. A special form of the set command, +CGQREQ= <cid> causes the requested profile for context number <cid> to become undefined. The read command returns the current settings for each defined context.

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGQREQ =?	+CGQREQ: “IP”,(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: “PPP”,(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: “IPV6”,(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: “IPV4V6”,(0-3),(0-4),(0-5),(0-9),(0-18,31) OK	-
Read Command	AT+ CGQREQ?	+CGQREQ: OK	-
Write Command	AT+ CGQREQ =[<cid> [,<precedence > [,<delay> [,<reliability> [,<peak> [,<mean>]]]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
<precedence>	1-3	A numeric parameter which specifies the precedence class.
<delay>	1-4	A numeric parameter which specifies the delay class.
<reliability>	1-5	A numeric parameter which specifies the reliability class.
<peak>	1-4	A numeric parameter which specifies the peak throughput class.
<mean>	1-18,31	A numeric parameter which specifies the mean throughput class.

9.5 AT+CGQMIN - Quality Of Service Profile (Minimum acceptable)

This command allows the TE to specify a minimum acceptable profile, which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.

The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGQMIN command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case, no check is made against the negotiated profile.

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGQMIN =?	+CGQMIN: “IP”,(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: “PPP”,(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: “IPV6”,(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: “IPV4V6”,(0-3),(0-4),(0-5),(0-9),(0-18,31) OK	-
Read Command	AT+ CGQMIN?	+CGQMIN: OK	-
Write Command	AT+ CGQMIN =[<cid> [,<precedence > [,<delay> [,<reliability> [,<peak> [,<mean>]]]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
<precedence>	1-3	A numeric parameter which specifies the precedence class.
<delay>	1-4	A numeric parameter which specifies the delay class.
<reliability>	1-5	A numeric parameter which specifies the reliability class.
<peak>	1-4	A numeric parameter which specifies the peak throughput class.
<mean>	1-18,31	A numeric parameter which specifies the mean throughput class.

9.6 AT+CGEQREQ - 3G Quality Of Service Profile (Requested)

This command allows the TE to specify a UMTS Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. The specified profile will be stored in the MT and sent to the network only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGEQREQ command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

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

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

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

Syntax

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

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
< Traffic class>		A numeric parameter that indicates the type of application for which the UMTS bearer service is guarantee.
	0	conversational
	1	streaming
	2	interactive
	3	background
	4	subscribed value

< Maximum bitrate UL>	0-384	A numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as ‘32’ (e.g. AT+CGEQREQ=…,32, …). This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
< Maximum bitrate DL>	0-384	A numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as ‘32’ (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to ‘0’ the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
< Guaranteed bitrate UL>	0-384	A numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as ‘32’ (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to ‘0’ the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
< Guaranteed bitrate DL>	0-384	A numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as ‘32’ (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to ‘0’ the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
<Delivery order>		A numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not..
	0	No
	1	Yes
	2	subscribed value
<Maximum SDU size>	0-1520	A numeric parameter (1,2,3,…) that indicates the maximum allowed SDU size in octets. If the parameter is set to ‘0’ the subscribed value will be requested (refer 3GPP TS 24.008 [21] subclause 10.5.6.5)
<SDU error ratio>	String type	A string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as ‘mEe’. As an example a target SDU error ratio of 5•10-3 would be specified as ‘5E3’ (e.g. AT+CGEQREQ=…,’5E3’,…). ‘0E0’ means subscribed value (refer 3GPP TS 24.008 [21] subclause 10.5.6.5). ‘0E0’,’1E1’,’1E2’,’7E3’,’1E3’,’1E4’,’1E5’,’1E6’
<Residual bit error ratio>	String type	A string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as ‘mEe’. As an example a target SDU error ratio of 5•10-3 would be specified as ‘5E3’ (e.g. AT+CGEQREQ=…,’5E3’,…). ‘0E0’ means subscribed value (refer 3GPP TS 24.008 [21] subclause 10.5.6.5). ‘0E0’,’1E2’,’1E3’,’1E4’,’1E5’,’1E6’ ,’4E3’, ’5E2’,’5E3’,’6E8’

<Delivery erroneous SDUs>		A numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.
	0	No
	1	Yes
	2	no detect
	3	subscribed value
<Transfer delay>	0, 100-400	A numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to ‘0’ the subscribed value will be requested (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
<Traffic handling priority>	0-3	A numeric parameter that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to ‘0’ the subscribed value will be requested (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
<Source Statistics Descriptor>		Specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
	0	Characteristics of SDUs is unknown
	1	Characteristics of SDUs corresponds to a speech source
<Signalling Indication>		Indicates 67uarantee content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
	0	PDP context is not optimized for signaling.
	1	PDP context is optimized for signaling<PDP_type> (see +CGDCONT and +CGDSCONT commands).

9.7 AT+CGEQMIN - 3G Quality Of Service Profile (Minimum acceptable)

This command allows the TE to specify a minimum acceptable profile, which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept message.

The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. The specified profile will be stored in the MT and checked against the negotiated profile only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGEQMIN command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGEQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.

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

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

Syntax

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

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
< Traffic class>		A numeric parameter that indicates the type of application for which the UMTS bearer service is guarantee.
	0	conversational
	1	streaming
	2	interactive
	3	background
	4	subscribed value

< Maximum bitrate UL>	0-384	A numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as ‘32’ (e.g. AT+CGEQREQ=…,32, …). This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
< Maximum bitrate DL>	0-384	A numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as ‘32’ (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to ‘0’ the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
< Guaranteed bitrate UL>	0-384	A numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as ‘32’ (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to ‘0’ the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
< Guaranteed bitrate DL>	0-384	A numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as ‘32’ (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to ‘0’ the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
<Delivery order>		A numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.
	0	No
	1	Yes
	2	subscribed value
<Maximum SDU size>	0-1520	A numeric parameter (1,2,3,…) that indicates the maximum allowed SDU size in octets. If the parameter is set to ‘0’ the subscribed value will be requested (refer 3GPP TS 24.008 [21] subclause 10.5.6.5)
<SDU error ratio>	String type	A string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as ‘mEe’. As an example a target SDU error ratio of 5•10-3 would be specified as ‘5E3’ (e.g. AT+CGEQREQ=…,’5E3’,…). ‘0E0’ means subscribed value (refer 3GPP TS 24.008 [21] subclause 10.5.6.5). ‘0E0’,’1E1’,’1E2’,’7E3’,’1E3’,’1E4’,’1E5’,’1E6’
<Residual bit error ratio>	String type	A string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as ‘mEe’. As an example a target SDU error ratio of 5•10-3 would be specified as ‘5E3’ (e.g. AT+CGEQREQ=…,’5E3’,…). ‘0E0’ means subscribed value (refer 3GPP TS 24.008 [21] subclause 10.5.6.5). ‘0E0’,’1E2’,’1E3’,’1E4’,’1E5’,’1E6’ ,’4E3’, ’5E2’,’5E3’,’6E8’

<Delivery erroneous SDUs>		A numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.
	0	No
	1	Yes
	2	no detect
	3	subscribed value
<Transfer delay>	0, 100-400	A numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to ‘0’ the subscribed value will be requested (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
<Traffic handling priority>	0-3	A numeric parameter that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to ‘0’ the subscribed value will be requested (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
<Source Statistics Descriptor>		Specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
	0	Characteristics of SDUs is unknown
	1	Characteristics of SDUs corresponds to a speech source
<Signalling Indication>		Indicates 70uarantee content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive (refer 3GPP TS 24.008 [21] subclause 10.5.6.5).
	0	PDP context is not optimized for signaling.
	1	PDP context is optimized for signaling<PDP_type> (see +CGDCONT and +CGDSCONT commands).

9.8 AT+CGATT PS - Attach Or Detach

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

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

The read command returns the current Packet Domain service state.

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGATT=?	+CGATT: (0,1) OK	-
Read Command	AT+ CGATT?	+CGATT: 1 OK	-
Write Command	AT+ CGATT =<state>	OK	-

Parameter Description

Parameter	Value	Instruction
<state>		Indicates the state of PS attachment
	0	Detached
	1	Attached

9.9 AT+CGDATA - Enter Data State

The execution command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more Packet Domain PDP types. This may include performing a PS attach and one or more PDP context activations. If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.250 online data state.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGDATA=?	CGDATA: (“PPP”) OK	-
Write Command	AT+ CGDATA = [<L2P> ,[<cid> [,<cid> [,…]]]]	CONNECT 150000000	-

Parameter Description

Parameter	Value	Instruction
<L2P>		A string parameter that indicates the layer 2 protocol to be used between the TE and MT
	NULL	none, for PDP type OSP:IHOSS (Obsolete)
	PPP	Point-to-point protocol for a PDP such as IP
	PAD	character stream for X.25 character (triple X PAD) mode (Obsolete)
	X25	X.25 L2 (LAPB) for X.25 packet mode (Obsolete).
	M-xxx	manufacturer-specific protocol (xxxx is an alphanumeric string).
<cid>	1-42	Specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

9.10 AT+CGPADDR - Show PDP Address

The execution command returns a list of PDP addresses for the specified context identifiers. The test command returns a list of defined <cid>s.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGPADDR=?	+CGPADDR: (1) OK	-
Write Command	AT+ CGPADDR = [<cid> [,<cid> [,…]]]	+CGPADDR: 1,10.226.85.88 OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	Specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

9.11 AT+CGEREP - Packet Domain Event Reporting

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGEREP=?	+CGEREP: (0-2),(0-1) OK	-
Read Command	AT+ CGEREP?	+CGEREP: 0,0 OK	-
Write Command	AT+ CGEREP=[<mode>[,<bfr>]]	OK	-

Parameter Description

Parameter	Value	Instruction
<mode>	0	Buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.
	1	Discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE.
	2	Buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE.
<bfr>	0	MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered
	1	MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes).

9.12 AT+CGSMS - Select Service for MO SMS Messages

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

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGSMS =?	+CGSMS: (0-3) OK	-
Read Command	AT+CGSMS?	+CGSMS: 1 OK	-
Write Command	AT+CGSMS=[<service>]	OK	-

Parameter Description

Parameter	Value	Instruction
<service>	0	Packet Domain.
	1	Circuit switched.
	2	Packet Domain preferred (use circuit switched if GPRS not available).
	3	Circuit switched preferred (use Packet Domain if circuit switched not available).

10. LTE-specific Packet Domain Modem Compatibility Commands

10.1 AT+CEREG - EPS Network Registration Status

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

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

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <tac>, <ci> and <AcT> are returned only when <n>=2 and MT is registered in the network.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CEREG=?	+CEREG: (0-2) OK	-
Read Command	AT+CEREG?	+CEREG: 0,1 OK	-
Write Command	AT+CEREG =[<n>]	OK	-

Parameter Description

Parameter	Value	Instruction
<n>	0	Disable network registration unsolicited result code
	1	Enable network registration unsolicited result code
	2	Enable network registration and location information unsolicited result code

10.2 AT+CGACT - Activates or Deactivates Specified PDP

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

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

If no <cid>s are specified the deactivation form of the command deactivates all active contexts. The read command returns the current activation states for all the defined PDP contexts.

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGACT=?	+CGACT: (0,1) OK	-
Read Command	AT+ CGACT?	+CGACT: 1,0 +CGACT: 2,0 +CGACT: 3,0 +CGACT: 4,0 +CGACT: 5,0 OK	-
Write Command	AT+ CGACT = [<state>[,<cid>[,<cid>[,…]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<state>		Indicates the state of PDP context activation
	0	Deactivated
	1	Activated
<cid>	1-42	Specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

10.3 AT+CGEQOS - Define EPS Quality of Service

The set command allows the TE to specify the EPS Quality of Service parameters <cid>, <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>] for a PDP context or Traffic Flows. When in UMTS/GPRS the MT applies a mapping function to UTMS/GPRS Quality of Service. Refer subclause 9.2 for <err> values.

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

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

The test command returns the ranges of the supported parameters.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CGEQOS=?	+CGEQOS: (1-42),(0-9),(0-150000),(0-50000),(0-150000),(0-50000) OK	-
Read Command	AT+CGEQOS?	OK	-
Write Command	AT+CGEQOS=[<cid>[,<QCI>[,<DL_GBR>,<UL_GBR>[,<DL_MBR>,<UL_MBR]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	A numeric parameter which specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT and +CGDSCONT commands).
<QCI>		A numeric parameter that specifies a class of EPS QoS. (see 3GPP TS 23.203 [7])
	0	QCI is selected by network
	1-4	Value range for garanteed bit rate Traffic Flows
	5-9	Value range for non-guarenteed bit rate Traffic Flows
<DL_GBR>	-	A numeric parameter, which indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [8])
<UL_GBR>	-	A numeric parameter, which indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [8])
<DL_MBR>	-	A numeric parameter, which indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [8])
<UL_MBR>	-	A numeric parameter, which indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [8])

10.4 AT+CGCONTRDP - PDP Context Read Dynamic Parameters

The execution command returns the relevant information <bearer_id>, <apn>, <ip_addr>, <subnet_mask>, <gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr>, <P-CSCF_sec_addr> and <IM_CN_Signalling_Flag> for a non secondary PDP Context established by the network with the primary context identifier <cid>. If the context cannot be found an ERROR response is returned.

If the MT has dual stack capabilities, two lines of information are returned per <cid>. First one line with the Ipv4 parameters followed by one line with the Ipv6 parameters.

If the parameter <cid> is omitted, the relevant information for all established PDP contexts are returned.

Note: The dynamic part of the PDP context will only exist if established by the network.

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGCONTRDP=?	+CGCONTRDP: (1) OK	-
Write Command	AT+ CGCONTRDP =[<cid>]	+CGCONTRDP: 1,5,3gnet,10.227.12.5,,210.21.196.6,221.5.88.88 OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	A numeric parameter, which specifies a particular non secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).

10.5 AT+CGSCONTRDP - Secondary PDP Context Read Dynamic Parameters

The execution command returns <p_cid>, <bearer_id> and <IM_CN_Signalling_Flag> for a given <cid>. If the context cannot be found an ERROR response is returned.

If the parameter <cid> is omitted, the <cid>, <p_cid>, <bearer_id> an<IM_CN_Signalling_Flag> are returned for all established PDP contexts.In EPS, the Traffic Flow parameters are returned.

Note: Parameters for network initiated PDP contexts are returned as well. The dynamic part of the PDP context will only exist if established by the network.

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGSCONTRDP=?	OK	-
Write Command	AT+ CGSCONTRDP =[<cid>]	OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	A numeric parameter, which specifies a particular PDP context or Traffic Flows definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).

10.6 AT+CGTFTRDP - Traffic Flow Template Read Dynamic Parameters

The execution command returns the relevant information about Traffic Flow Template of <cid> together with the additional network assigned values when established by the network. If the context cannot be found an ERROR response is returned.

If the parameter <cid> is omitted, the Traffic Flow Templates for all established PDP contexts are returned.Parameters of both network and MT/TA initiated PDP contexts will be returned.

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGTFTRDP=?	OK	-
Write Command	AT+ CGTFTRDP =[<cid>]	OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	Specifies a particular secondary or non secondary PDP context definition or Traffic Flows definition (see +CGDCONT and +CGDSCONT commands).

10.7 AT+CGEQOSRDPEPS - Quality of Service Read Dynamic Parameters

The execution command returns the Quality of Service parameters <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>] of the established PDP Context associated to the provided context identifier <cid>. If the context cannot be found an ERROR response is returned.

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

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

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

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ CGEQOSRDP=?	OK	-
Write Command	AT+ CGEQOSRDP =[<cid>]	OK	-

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	Specifies a particular Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT and +CGDSCONT commands).

11. SMS Text and PDU Mode Commands

11.1 AT+CSMS - Select Message Service

This set command selects messaging service <service>. It returns the types of messages supported by the ME.

Read command reports current service setting along with supported message.

Test command reports the supported value of the parameter <service>.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSMS=?	+CSMS: (<service> list) OK	0,1
Read command	AT+CSMS?	+CSMS:<service>,<mt>,<mo>,<bm> OK	-
Write Command	AT+CSMS=<service>	+CSMS:<mt>,<mo>,<bm> OK	TA return ME support service type

Parameter Description

Parameter	Value	Instruction
<service>	0	The syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2 version 4.7.0
	1	The syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2+ version.
<mt>	0	Mobile terminated messages support, Type not supported
	1	Mobile terminated messages support, Type supported
<mo>	0	Mobile originated messages support, Type not supported
	1	Mobile originated messages support, Type supported
<bm>	0	Broadcast type messages support, Type not supported. Default: 0.
	1	Broadcast type messages support, Type supported.

Example

AT+CSMS=0 +CSMS: 1,1,1 OK AT+CSMS? +CSMS: 0,1,1,1 OK AT+CSMS=? +CSMS: (0-1) OK	Set the syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2 version 4.7.0

11.2 AT+CPMS - Preferred SMS Message Storage

The write command selects memory storages <mem1>, <mem2>, <mem3> to be used for reading, writing, etc.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CPMS=?	+CPMS: (list of supported <mem1>s), (list of supported <mem2>s), (list of supported <mem3>s) OK	-
Read command	AT+CPMS?	+CPMS: <mem1>,<used1>,<total1>, <mem2>,<used2>,<total2>, <mem3>,<used3>,<total3> OK	-
Write Command	AT+CPMS=<mem1> [, <mem2>[, <mem3>]]	+CPMS: <used1>,<total1>,<used2> ,<total2>,<used3>,<total3> OK	-

Parameter Description

Parameter	Value	Instruction
<mem1> Reading and deleting messages storage	“ME”,”MT”,”SM”,”SR”	“SM”: SIM card messages storage “ME”: messages storage
<mem2> saving and sending messages storage	“ME”,”MT”,”SM”,”SR”	“SM”: SIM card messages storage “ME”: messages storage
<mem3> Receiving messages storage	“ME”,”MT”,”SM”,”SR”	“SM”: SIM card messages storage “ME”: messages storage
<usedX>	-	Number of SMS stored in <memX>
<totalX>	-	Number of SMS that <memX> can contain

Example

AT+CPMS=”ME”,”ME”,”SM” +CPMS: 0,23,0,23,45,50 OK AT+CPMS?	Set the messages storage is “ME”,”ME”,”SM” 0 SMS stored in <mem1>, 23 <mem1> can contain and so on

+CPMS: “ME”,0,23,”ME”,0,23,”SM”,45,50 OK AT+CPMS=? +CPMS: (“ME”,”MT”,”SM”,”SR”),(“ME”,”MT”,”SM”,”SR”),(“ME”,”MT”,”SM”,”SR”) OK	

11.3 AT+CMGF - Select SMS Message Format

The AT+CMGF command specifies the input and output format of the short messages.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMGF=?	+CMGF: (list of supported <mode>s)	0,1
Read Command	AT+CMGF?	+CMGF: <mode> OK	-
Write Command	AT+CMGF=[<mode>]	OK	-

Parameter Description

Parameter	Value	Instruction
<mode>	0	PDU mode, as defined in GSM 3.40 and GSM 3.41. Default: 0.
	1	Text mode

11.4 AT+CSCA - SMS Service Centre Address

The command is used to update the SMSC address, through which mobile originated SMS are transmitted.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSCA=?	OK	
Read Command	AT+CSCA?	+CSCA:<sca>,<tosca> OK	
Write Command	AT+CSCA=<sca> [,<tosca>]	OK	

Parameter Description

Parameter	Value	Instruction
<sca>	-	Service Center Address, value field in string format, BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to command AT+CSCS), type of address given by <tosca>
<tosca>	-	SC address Type-of-Address octet in integer format, when first character of <sca> is + (IRA 43) default is 145, otherwise default is 129.

Example

AT+CSCA=”+8613010888500”,145 OK AT+CSCA? +CSCA: “+8613010888500”,145 OK	Set the Service Center Address is 8613010888500 and SC address Type-of-Address is 145 CMCC : ShenZhen City 8613800755500 CUCC : ShenZhen City 8613010888500

11.5 AT+CSMP - Set Text Mode Parameters

The command is used to select values for additional parameters needed when SM is sent to the network or placed in storage when text format message mode is selected.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSMP=?	OK	
Read Command	AT+CSMP?	+CSMP:<fo>,<vp>,<pid>,<dcs> OK	-
Write Command	AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	OK	-

Parameter Description

Parameter	Value	Instruction
<fo>	-	Depending on the Command or result code: first octet of GSM 03.40 SMS-DELIVER,SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. SMS status report is supported under text mode if <fo> is set to 49.
<vp>	-	Depending on SMS-SUBMIT <fo> setting: GSM 03.40, TP-Validity-Period either in integer format (default 167), in time-string format, or if is supported, in enhanced format (hexadecimal coded string with quotes), (<vp> is in range 0… 255).
<pid>	-	GSM 03.40 TP-Protocol-Identifier in integer format (default 0).
<dcs>	-	GSM 03.38 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format depending on the command or result code

Example

AT+CSMP=17,167,0,0 OK AT+CSMP? +CSMP: 17,167,0,0 OK	Set SMS effective time is one day (167-166) *1 day

11.6 AT+CSDH - Show Text Mode Parameters

The command is used to control whether detailed header information is shown in text mode result codes.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSDH=?	+CSDH: (list of supported <show>s) OK	
Read Command	AT+CSDH?	+CSDH: <show> OK	
Write Command	AT+CSDH=[<show>]	OK	

Parameter Description

Parameter	Value	Instruction
<show>	0	Do not show header values defined in commands AT+CSCA and AT+CSMP (<sca>,<tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in+CMT, AT+CMGL, AT+CMGR result codes for SMS-DELIVERs and SMS-SUBMITs intext mode; for SMS-COMMANDs in AT+CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <data>
	1	Show the values in result codes

Example

at+cmgw=”18576408172” > rose hello +CMGW: 0 OK	In index 0, restore a message
at+cmgl=”all” +CMGL: 0,”STO UNSENT”,”18576408172”,,,129,10 rose hello	Show this message
at+csdh=1 OK	Set Text Mode Parameters
at+cmgr=0 +CMGR: “STO UNSENT”,”18576408172”,,129,17,0,0,167,”+8613800755500”,145,10 rose hello	Read the index 0 message

at+csdh=0 OK at+cmgr=0 +CMGR: “STO UNSENT”,”18576408172”, rose hello	Set Text Mode Parameters

- The test command returns the supported <operation>s as a compound value.

The read command displays the accepted message types.

Depending on the <operation> parameter, the write command adds or deletes the message types accepted.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSCB=?	+CSCB: (list of supported <mode>s) OK	
Read Command	AT+CSCB?	+CSCB:<mode>,<mids>,<dcss> OK	
Write Command	AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	OK	

Parameter Description

Parameter	Value	Instruction
<mode>	[0]	message types specified in <mids> and <dcss> are accepted.
	1	message types specified in <mids> and <dcss> are not accepted.
<mids>	-	String type, all different possible combinations of CBM message identifiers.
<dcss>	-	String type; all different possible combinations of CBM data coding schemes(default is empty string)

11.7 AT+CNMI - New Message Indications to TE

The command is used to select the procedure how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF). If set <mt>=2, <mt>=3 or <ds>=1, make sure <mode>=1, otherwise it will return error.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CNMI=?	+CNMI: (list of supported <mode>s), (list of supported <mt>s), (list of supported <bm>s), (list of supported <ds>s), (list of supported <bfr>s) OK	
Read Command	AT+CNMI?	+CNMI:<mode>,<mt>,<bm>, <ds>,<bfr> OK	
Write Command	AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	OK	

Parameter Description

Parameter	Value	Instruction
<mode>	[0]	Buffer unsolicited result codes in the modem. When the buffer is full, indications may be discarded.
	1	Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise, forward them directly to the TE.
	2	Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise, forward them directly to the TE.
<mt> The rules for storing received SMS depend on its data coding scheme, preferred memory storage (AT+CPMS) setting and this value:	[0]	No SMS-DELIVER indications are routed to the TE.
	1	If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem3>,<index>.
	2	SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the DTE using unsolicited result code +CMT: class 2 messages and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1

	3	class 3 SMS-DELIVERs are routed directly to DTE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1
<bm> The rules for storing received CBMs depend on its data coding scheme, the setting of Select CBM Types (AT+CSCB) and this value:	[0]	no CBM indications are routed to the DTE
	2	New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled); or +CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled)
<ds>	[0]	No SMS-STATUS-REPORTs are routed to the TE.
	1	SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: +CDS: <length><CR><LF><pdu> (PDU mode enabled); or +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)
<bfr>	[0]	modem buffer of unsolicited result codes defined within this command is flushed to the DTE when <mode> 1 – 3 is entered (OK response shall be given before flushing the codes)
	1	modem buffer of unsolicited result codes defined within this command is cleared when <mode> 1 – 3 is entered

Example

AT+CPMS="SM","SM","SM" +CPMS: 50,50,50,50,50,50 OK	
AT+CNMI=1,2 OK	New message indications to TE
	Send a message to SIM
+CMT: “+8618576408172”,,”16/10/10,11:21:05+32”	Receive a message and show the message content
test cnmi	

11.8 AT+CMGL - List SMS Messages from Preferred Store

This command is used to return messages with status value <stat> from message storage <mem1> to the TE. If the status of the message is not received unread', the status in the storage changes to 'received read'.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMGL=?	+CMGL: (list of supported <stat>s) OK	
Write Command	AT+CMGL[=<stat>]	SMS-DELIVERs; +CMGL: <index>,<stat>,<oa/da>, [<alpha>],[<scts>][,<tooa/toda>, <length>] <CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>, [<alpha>],[<scts>][,<tooa/toda>, <length>] <CR><LF><data>[…]] OK If PDU mode, command successful; +CMGL: <index>,<stat>,[<alpha>], <length> <CR><LF><pdu>[<CR><LF> +CMGL:<index>,<stat>,[<alpha>], <length><CR><LF><pdu>[…]] OK	

Parameter Description

Parameter	Value	Instruction
<stat> Text Mode	"REC UNREAD"	Received unread message (i.e. new message)
	"REC READ"	Received read message
	"STO UNSENT"	Stored unsent message
	"STO SENT"	Stored sent message
	"ALL"	All messages
<stat> PDU Mode	0	Received unread message (i.e. new message)
	1	Received read message
	2	Stored unsent message
	3	Stored sent message
	4	All messages

11.9 AT+CMGS - Send Message

The command is used to send message from a TE to the network (SMS-SUBMIT).

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMGS=?	OK	-
Write Command	If text mode; AT+CMGS=<da> [,<toda>]<CR> text is entered <CTRL+Z/ESC> If PDU mode; AT+CMGS=<length> <CR> PDU mode is given <CTRL+Z/ESC>	If text mode and sending successful; +CMGS: <mr> OK If PDU mode and sending successful; +CMGS: <mr> OK	

Parameter Description

Parameter	Value	Instruction
<da>	-	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit defaultalphabetcharacters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	-	TP-Destination-Address, Type-of-Address octet in integer format.(when first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255.

Example

AT+CMGS="18576408172"	Sends message
> hellow rose	Input message content
+CMGS: 37	
OK	

11.10 AT+CMSS - Send Message from Storage

The command is used to send message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND).

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMSS=?	OK	-
Write Command	AT+CMSS=<index> [,<da>[,<toda>]]	If text mode and sending successful; +CMSS: <mr> OK If PDU mode and sending successful; +CMSS: <mr> OK	

Parameter Description

Parameter	Value	Instruction
<index>	-	In the message storage <memw>, the location value of the message to send.
<da>		Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	-	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255.

11.11 AT+CMGW - Write Message to Memory

The command is used to store message (either SMS-DELIVER or SMS-SUBMIT) to memory storage <mem2>.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMGW=?	OK	-
Write Command	If text mode; AT+CMGW[=<oa/da> [,<t ooa/toda>[,<stat>]]] <CR> text is entered <CTRL+Z> If PDU mode; AT+CMGW=<length> [,<stat>]<CR> PDU is given <CTRL+Z>	+CMGW: <index> OK	

Parameter Description

Parameter	Value	Instruction
<oa>	-	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<da>		Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	-	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255.
<stat> Text Mode	“STO UNSENT”	stored unsent message
	“STO SENT”	stored sent message
<stat> PDU Mode	2	stored unsent message
	3	stored sent message

Example

AT+CMGW=”18576408172” > Rose +CMGW: 0 OK	Writes message to memory, the index is 0
AT+CMGL=”all” +CMGL: 0,”STO UNSENT”,”18576408172”,, Rose OK	Lists all message
AT+CMSS=0 +CMSS: 36 OK	Send a message from memory index 0

11.12 AT+CMGD - Deletes Message

The command is used to delete message from preferred message storage <mem1> location <index>. If <del_flag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <del_flag> shown below.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMGD=?	+CMGD:(),(0-4) OK	-
Write Command	AT+CMGD=<index>, [<del_flag>]	OK	

Parameter Description

Parameter	Value	Instruction
<index>	-	Integer type; value in the range of location numbers supported by the associated memory and start with zero
<del_flag>	0	If 0 or value omitted, delete message specified in <index>.
	1	Delete all read messages from <memr> storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched.
	2	Delete all read messages from <memr> storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched.
	3	Delete all read messages from <memr> storage, sent and unsent mobile originated messages, leaving unread messages untouched.
	4	Delete all messages from <memr> storage.

Example

AT+CMGL="all"	Lists all message
+CMGL: 1,"STO UNSENT","18576408172",,	Index 1 message
P!AA	
+CMGL: 0,"STO SENT","18576408172",,	Index 0 message
Rose	
OK	
AT+CMGD=1	Delete Index1 message
OK	

AT+CMGL =”all” +CMGL: 0,”STO SENT”,”18576408172”,, Rose	The index1 message have been delete

11.13 AT+CMGC - Send An SMS Command

This command used to send an SMS command.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMGC=?	OK	-
Write Command	PDU mode; AT+CMGC=<length> <CR> PDU is given <CTRL+Z/ESC>	+CMGC: <mr>[,<ackpdu>] OK	

Parameter Description

Parameter	Value	Instruction
<length>	-	Integer type, 8 bit TP data unit length

Example

AT+CPMS=”ME”,”ME”,”ME”	
+CPMS: 0,23,0,23,0,23	
OK	
AT+CMGF=1	
OK	
AT+CMGW= “18576408172”	Create an SMS message with AT+CMGW
> test cnma test5	
+CMGW: 0	
OK	
AT+CSCS =”IRA”	Set the TE character set to IRA
OK	
AT+CSDH=1	Set to show text mode parameter headers
OK	
AT+CMGF =0	Set to PDU mode
OK	
AT+CMGR=0	Reads message for PDU mode and message length
+CMGR: 2,,28	
0891683108705505F011640B818175468071F20000A70FF4F2	

9C0E1ABBDB6110BD3CA7D700 OK AT+CMGC=28 > 0891683108705505F011640B818175468071F20000A70FF4F2 9C0E1ABBDB6110BD3CA7D700 +CMGC: 51 OK	Send an SMS command

11.14 AT+CMMS - More Messages to Send

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

Test command returns supported values as a compound value.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMMS=?	<n> OK	
Read Command	AT+CMGC?	OK	-
Write Command	AT+CMMS=<n>	OK	

Parameter Description

Parameter	Value	Instruction
<n>	0	Disable
	1	Keep enabled until the time between the response of the latest message send command (+CMGS,+CMSS, etc.) and the next send command exceeds 1-5 seconds (the exact value is up to Meimplementation), then ME shall close the link and TA switches <n> automatically back to 0
	2	Enable (if the time between the response of the latest message send command and the nextsendcommand exceeds 1-5 seconds (the exact value is up to ME implementation), ME shall close the linkbut TA shall not switch automatically back to <n>=0)

11.15 AT+CSAS - Save Settings

Execution command saves active message service settings to a non-volatile memory. A TA can contain several profiles of settings. Settings specified in commands Service Center Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are saved. Certain settings may not be supported by the storage (e.g. SIM SMS parameters) and therefore can not be saved.

Test command shall display the supported profile numbers for reading and writing of settings.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CSAS=?	+CSAS: 0 OK	-
Write Command	AT+CSAS=[<profile>]	OK	

Parameter Description

Parameter	Value	Instruction
<profile>	0	0…255 Manufacturer specific profile number where settings are to be stored. Currently only one profile (0) is supported

11.16 AT+CRES - Restore Settings

Execution command restores message service settings from non-volatile memory to active memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are restored. Certain settings may not be supported by the storage (e.g. SIM SMS parameters) and there for can not be restored.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT+CRES=[<profile>]	OK	
Test Command	AT+CRES=?	+CRES: 0 OK	-

Parameter Description

Parameter	Value	Instruction
<profile>	0	0…255 Manufacturer specific profile number where settings stored. Currently only one profile (0) is supported

11.17 AT+CMGR - Read Message

Execution command returns message with location value <index> from message storage <mem1> to the TE. If status of the message is “received unread” status in the storage changes to “received read”. If reading fails, final result code +CMS ERROR: <err> is returned.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+CMGR=?	OK	-
Write Command	AT+CMGR=<index>	SMS-DELIVER: +CMGR: <stat>,<oa>,[<alpha>],<scts> [,<tooa>,<fo>,<pid>,<dcs>,<sca>, <tosca>,<length>]<CR><LF> <data> SMS-SUBMIT: +CMGR: <stat>,<da>,[<alpha>][,<toda>, <fo>,<pid>,<dcs>,[<vp>],<sca>, <tosca>,<length>]<CR><LF> <data> SMS-STATUS-REPORT: +CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>], <scts>,<dt>,<st> SMS-COMMAND: +CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>], [<da>],[<toda>],<length> <CR><LF> <data>] OK	If text mode (AT+CMGF=1)

Parameter Description

Parameter	Value	Instruction
<index>	-	Integer type; value in the range of location numbers supported by the associated memory and start with zero
If text mode <stat>	“REC UNREAD”	Received unread message (i.e. new message)
	“REC READ”	Received read message
	“STO UNSENT”	Stored unsent message

	“STO SENT”	Stored sent message
	“ALL”	All messages
<oa>	-	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<fo>	-	Depending on the Command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. SMS status report is supported under text mode if <fo> is set to 49.
<pid>	-	GSM 03.40 TP-Protocol-Identifier in integer format (default 0).
<da>		Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	-	TP-Destination-Address, Type-of-Address octet in integer format. (When first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255.

Example

```
AT+CMGR=0
+CMGR: "STO SENT","13713752589",1
OK
```

12. Vendor-specific Commands

12.1 AT$QCCLR - Clear Mobile Error Log

AT$QCCLR is used to clear mobile error log.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT$QCCLR	OK	

Parameter Description

Parameter	Value	Instruction
Null		

12.2 AT&V - Display Dumps Configuration Parameters

AT&V command is used to display dumps configuration parameters.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT&V	Dumps the status of all AT parameters applicable to the current operating mode, including the single-letter parameters not otherwise readable. Accepts no arguments. OK	

Parameter Description

Parameter	Value	Instruction
Null		

12.3 AT$QCTER - Set TE-DCE Baud Rate

AT$QCTER command is used to set TE-DCE baud rate. Sets the TE-DCE rate at which DCE will accept commands; this data rate also becomes the default and is stored in NV RAM, changing the +IPR command default rate.

Test command, i.e., $QCTER=?, returns the rates supported and query command, i.e., $QCTER?, returns the rate last issued by the $QCTER command or the default rate.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCTER=?	$QCTER: (),(list of supported <rate>) OK	
Read Command	AT$QCTER?	$QCTER: <rate> OK	
Write Command	AT$QCTER=<rate>	OK	

Parameter Description

Parameter	Value	Instruction
<rate>	300,600,1200,2400,4800,9600, 19200,38400,57600,115200, 230400,921600,2000000, 2900000,3000000,3200000, 3686400,4000000	

12.4 AT$QCDNSP - Set Primary DNS IP ADDR

AT$QCDNSP command is used to set primary DNS IP address.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCDNSP=?	$QCDNSP: OK	
Read Command	AT$QCDNSP?	$QCDNSP: <address> OK	
Write Command	AT$QCDNSP=<address>	OK	

Parameter Description

Parameter	Value	Instruction
< address >	0-254>.<0-254>.<0-254>. <0-254>	

12.5 AT$QCDNSS - Set Second DNS IP ADDR

AT$QCDNSS command is used to set secondary DNS IP address.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$ QCDNSS =?	$ QCDNSS: OK	
Read Command	AT$ QCDNSS?	$ QCDNSS: <address> OK	
Write Command	AT$ QCDNSS= <address>	OK	

Parameter Description

Parameter	Value	Instruction
<address>	<0-254>.<0-254>.<0-254>.<0-254>	

12.6 AT$QCPDPP - Set Authentication for PDP-IP

AT$QCPDPP command is used to set authentication for PDP-IP packet data calls.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCPDPP=?	$QCPDPP: (1-42),(0-3),, OK	
Read Command	AT$QCPDPP?	$QCPDPP: <cid>,<auth_type> OK	
Write Command	AT$QCPDPP=<cid>,<auth_type>,<password>,<username>	OK	

Parameter Description

Parameter	Value	Instruction
<cid>	1 to 42	Parameter specifies a particular PDP context definition. This is also used in other PDP context-related commands.
<auth_type>	0	None
	1	PAP
	2	CHAP
<password>		Parameter specifies the password used for authentication. It is required for the authentication types PAP and CHAP.
<username>		Parameter specifies the user name used for authentication. It is required for the authentication types PAP.

12.7 AT$QCPWRDN - Power-down the UE

AT$QCPWRDN command is used to power-down the UE.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCPWRDN=?	OK	
Exec Command	AT$QCPWRDN	OK	

Parameter Description

Parameter	Value	Instruction
Null		

12.8 AT$QCSIMSTAT - Display the Status of SIM

AT$QCSIMSTAT is used to disable/enable the display of the status of the SIM.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCSIMSTAT=?	$QCSIMSTAT: (0-2) OK	
Read Command	AT$QCSIMSTAT?	$QCSIMSTAT: <n>,SIM INIT COMPLETED OK	
Write Command	AT$QCSIMSTAT=<n>	OK	

Parameter Description

Parameter	Value	Instruction
<n>	0	Disables the feature
	1	Enables the feature

12.9 AT$QCCNMI - New Message Indication

This is a special case of [S2] CNMI. The behavior is exactly same for all the parameters except for <mt>=2 where the route configuration will be set as similar to <mt>=0; it does not change the NV-830 settings.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCCNMI=?	$QCCNMI: (list of supported <mode>s), (list of supported <mt>s), (list of supported <bm>s), (list of supported <ds>s), (list of supported <bfr>s) OK	
Read Command	AT$QCCNMI?	$QCCNMI:<mode>,<mt>,<bm>, <ds>,<bfr> OK	
Write Command	AT$QCCNMI=[<mode>[,<mt >[, <bm>[,<ds>[,<bfr>]]]]]	OK	

Parameter Description

Parameter	Value	Instruction
<mode>	0 to 2	please refer to the command +CNMI
<mt>	0 to 3	
<bm>	0, 2	
<ds>	0, 1, 2	
<bfr>	0, 1	

12.10 AT$QCPINSTAT - Retrieve All PIN

AT$QCPINSTAT is used to retrieve all PIN.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT$QCPINSTAT?	$QCPINSTAT: READY,READY,READY,READY, READY,READY,SIM PIN2 OK	

Parameter Description

Parameter	Value	Instruction
Null		

12.11 AT$QCPDPLT - Control Delays

AT$QCPDPLT is used to enable/disable tolerance for long delays is PDP (Packet data protocol) call setup.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCPDPLT=?	$QCPDPLT: (0-1) OK	
Read Command	AT$QCPDPLT?	$QCPDPLT: <n> OK	
Write Command	AT$QCPDPLT=<n>	OK	

Parameter Description

Parameter	Value	Instruction
<n>	0	Disables waiting
	1	Enables waiting

12.12 AT$QCSYSMODE - Current System Mode

AT$QCSYSMODE is used to return current system mode of ME.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT$QCSYSMODE?	<mode> OK	

Parameter Description

Parameter	Value	Instruction
<mode>	LTE/HSUPA/HSDPA	Provides details about the support of LTE/HSUPA/ HSDPA; only the Read command is valid;

12.13 AT$QCPDPCFGE - Set PDN Teardown Time Interval

AT$QCPDPCFGE is used to set PDN teardown time interval.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCPDPCFGE=?	$QCPDPCFGE: (1-42),(0-1),(0-122820),(0-16),(1-15,255),(0-1023),(0-3600),(0-1023),(0-1),(65280-65535),(0-999),(0-999) OK	
Read Command	AT$QCPDPCFGE?	$QCPDPCFGE: 1,0,0,0,255,20,300,0,0,0,0,0 OK	
Write Command	AT $QCPDPCFGE= <profile_id>, < APN disable flag>, <timer_value>, <APN class>, <APN bearer >, <max_pdn_conn_per_block>, <max_pdn_conn_timer>, <pdn_req_wait_timer>, <emergency_calls_supported>, <operator_reserved _pco>, <mcc>, <mnc>	OK	

Parameter Description

Parameter	Value	Instruction
<profile_id>	1 to 42	
<APN disable flag>	0	Enable
	1	Disable
<timer_value>	0 – 122820	
<APN class>	0 – 5	
<APN bearer>	0x1	GSM type
	0x2	UMTS type
	0x4	LTE type
	0x8	TDS type
	FF	All types
<max_pdn_conn_per_block>	0 – 1023	
<max_pdn_conn_timer>	0 – 3600	

<pdn_req_wait_timer>	0 – 1023	
<emergency_calls_ supported>	0 – 1	
<operator_reserved_ pco>	65280 – 65535	
<mcc>	0 – 999	
<mnc>	0 – 999	

12.14 AT$QCCTM - Network Selection Menu Availability

This command used to Enable/disable cellular text telephone modem support:

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCCTM=?	$QCCTM: (0-1) OK	
Read Command	AT$ QCCTM?	$QCCTM: <n> OK	
Write Command	AT$QCCTM=<n>	OK	

Parameter Description

Parameter	Value	Instruction
<n>	0	Disable
	1	Enable

12.15 AT$QCBANDPREF - Provide the Ability to Band Preferences

AT$QCBANDPREF is used to provide the ability to set/get the band preferences.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCBANDPREF =?	$QCBANDPREF: (0-1),” list of all support <pref_term > and <band_pref>” OK	
Read Command	AT$QCBANDPREF?	$QCBANDPREF: (list of set support <pref_term > and <band_pref>) OK	
Write Command	AT$QCBANDPREF= <pref_term >, <band_pref>	OK	

Parameter Description

Parameter	Value	Instruction
<pref_term >	0	Until a power cycle
	1	Permanent mode change
<band_pref>	“1,2,3..”	Band

Example

AT$QCBANDPREF=1,"27,28,30,31,34" OK AT$QCBANDPREF? $QCBANDPREF: "27.WCDMA_I_IMT_2000" "28.WCDMA_II_PCS_1900" "30.WCDMA_IV_1700" "31.WCDMA_V_850" "34.WCDMA_VIII_900" "36.WLAN_US_2400" "37.WLAN_JAPAN_2400" "38.WLAN_EUROPE_2400" "39.WLAN_SPAIN_2400" "40.WLAN_FRANCE_2400"	Set the band pref

“41.WLAN_US_5000" "42.WLAN_JAPAN_5000" "43.WLAN_EUROPE_5000" "44.WLAN_SPAIN_5000" "45.WLAN_FRANCE_5000" OK AT$QCBANDPREF =? $QCBANDPREF: (0-1), “1.BC0_A” “2.BC0_B” ….... “46.Any” OK	

12.16 AT*CNTI - Controls the Listing of the Technologies UE

AT*CNTI is used to Controls the listing of the technologies UE is capable of <n>: 0,1,2

Note: The command only support WCDMA mode.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT*CNTI =?	*CNTI: (0-2) OK	
Read Command	AT*CNTI?	*CNTI: <n>,<tech> OK	
Write Command	AT*CNTI=<n>	OK	

Parameter Description

Parameter	Value	Instruction
<n>	0	Technology currently in use to access the network
	1	The available technologies on the current network.
	2	All technologies supported by the device.
<tech>	GSM/GPRS/EDGE/UMTS/ HSDPA/HSUPA	

12.17 AT$QCDEFPROF - Set Profile Number

AT$QCDEFPROF is used to set the default profile number for specific subscription and family.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCDEFPROF=?	$QCDEFPROF: (0-1),(1-2),(1-16) OK	
Read Command	AT$QCDEFPROF?	$QCDEFPROF: 0,1,1 $QCDEFPROF: 1,1,1 OK	
Write Command	AT$QCDEFPROF= <family>, <subs id>, <profile id>	OK	

Parameter Description

Parameter	Value	Instruction
<family>	1 to 16	
<subs id>	1 to 3	For non-DSDS target SUBS ID is limited to 1.
<profile id>	1 to 16	

12.18 AT$QCMRUE - Edit MRU Database

AT$QCMRUE is used to edit MRU database.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCMRUE=?	$QCMRUE: (list of support <index>, <rat>,<band>,<channel>) OK	
Read Command	AT$QCMRUE?	$QCMRUE: <index>,<rat>, <band>,<channel> OK	
Write Command	AT $QCMRUE=<index>, <rat>,<band>,<channel> or <PLMN>	OK	

Parameter Description

Parameter	Value	Instruction
<index>	0 to 11	
<rat>	0	CDMA
	1	HDR
	2	GSM
	3	WCDMA
	4	LTE
<band>	CDMA/ HDR – 0 to 19 (except 2)	
	GSM – 0 to 8	
	UMTS – 0 to 9	
	LTE – 0 to 26	
<channel>	0 to 2047	
<PLMN>	String type PLMN ID	

Example

AT$QCMRUE=0,4,17,”46000” OK AT$QCMRUE? $QCMRUE: 0,4,”17”,”46000”	LTE,BC17, CNCC

Note:

- This command edits the MRU database on the UE. When <rat> is not CDMA/HDR then fourth argument is PLMN id. For entering automatic 3GPP MRU entries, PLMN ID should be a NULL string.
- For CDMA/HDR mode, the write cmd is: AT$QCMRUE=<0-11>,<0-1>,<0,1,10>,<0-2047>.
  For the rest: AT$QCMRUE=<0-11>,<2-4>,<BAND_VALUE>,<PLMN ID>. Remember takes a quotes in the PLMN id, for example, China Unicom, AT$QCMRUE=0,2,8,”46001” .

12.19 AT$QCMRUC - Clear/Delete MRU Database

AT$QCMRUC is used to clear/delete MRU database

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT$QCMRUC	OK	

Parameter Description

Parameter	Value	Instruction
NULL		

12.20 AT$QCAPNE - Edit APN VALUE

AT$QCAPNE is used to edit APN values in APN table.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCAPNE=?	$QCAPNE: (1-42),(0-16),,(IPV6 and IPV4V6),LTE,(0-1),(0-122820) OK	
Read Command	AT$QCAPNE?	$QCAPNE: <Profile ID>, <APN Class>,<APN Name>, <PDP Type>,<APN Bearer type>, <APN Flag>,<APN Timer> OK	
Write Command	AT$QCAPNE= <Profile ID>, <APN Class>, <APN Name>, <PDP Type>, <APN Bearer type>, <APN Flag>, <APN Timer>	OK	

Parameter Description

Parameter	Value	Instruction
<Profile ID>	1 to 42	
<APN Class>	0 to 16	
<APN Name>	String type, maximum length is 100	
<PDP Type>	String type, maximum length is 8	
<APN Bearer type>	String type, maximum length is 3	
<APN Flag>	0 to 1	
<APN Timer>	0 to 122820	

12.21 AT$QCPDPIMSCFGE - Edit PDP Profile Registry

AT$QCPDPIMSCFGE is used to edit PDP profile registry.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCPDPIMSCFGE=?	$QCPDPIMSCFGE: (1-42),(0-1),(0-1),(0-1) OK	
Read Command	AT$QCPDPIMSCFGE?	$QCPDPIMSCFGE: <Profile ID>, <P-CSCF Address Flag>, <DHCP Flag>, <CN Flag> OK	
Write Command	AT$QCPDPIMSCFGE= <Profile ID>, <P-CSCF Address Flag>, <DHCP Flag>, <CN Flag>	OK	

Parameter Description

Parameter	Value	Instruction
<Profile ID>	1 to 42	
<P-CSCF Address Flag>	0,1	Disable, enable
<DHCP Flag>	0,1	Disable, enable
<CN Flag>	0,1	Disable, enable

12.22 AT$QCCLAC - List Available AT Commands

AT$QCCLAC is used to list all available AT commands.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT$QCCLAC	List all available AT commands OK	

Parameter Description

Parameter	Value	Instruction
NULL		

12.23 AT^SPN - Display the Brand Information

AT^SPN is used to display the brand information from EF-SPN.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT^SPN	^SPN:<disp_rplmn>,<coding>, <spn_name> OK	

Parameter Description

Parameter	Value	Instruction
<disp_rplmn>	0	RPLMN will not be displayed
	1	RPLMN is required to be displayed
	9	this field is noneffective, and there is no need for reading spn_name field again
<coding>	0	GSM 7 bit Default Alphabet
	1	USC2 mode
<spn_name>		character string, the length will not exceed 16 bytes

12.24 AT$QCRMCALL - Trigger A RmNet Call

AT$QCRMCALL is used to trigger an RmNet call via AT command.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCRMCALL=?	$QCRMCALL: (0-1),(1,2,3,4,5,6,7,8),(1-3),(1-2),(1- 42),, OK	
Read Command	AT$QCRMCALL?	OK	
Write Command	AT $QCRMCALL= <Action>,<Instance> [,<IP Type> [,<Tech Pref > [,<umts profile number> [,<cdma profile number > [,<APN>]]]]]	$QCRMCALL:<Instance>, <V4> $QCRMCALL:<Instance>, <V6> OK	

Parameter Description

Parameter	Value	Instruction
<Action>	0	
	1	
<Instance>	1 to 8	
<IP Type>	1	IPV4
	2	IPV6
	3	IPV4V6
<Tech Pref >	2	3GPP
<umts profile number>	1-42	
<APN>		String type, maximum length is 100

Example

AT$QCRMCALL= 1,1,1,2,1 $QCRMCALL: 1, V4 OK	

Note:

AT$QCRMCALL=1,1 (For CDMA, set NV910,906)

12.25 AT$QCDRX - Provide the Ability to DRX Coefficient

AT$QCDRX is used to provide the ability to set/get the DRX coefficient.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCDRX=?	$QCDRX: (0,6-9) OK	
Read Command	AT$QCDRX?	$QCDRX: <drx coefficient> OK	
Write Command	AT$QCDRX= <drx coefficient>	OK	

Parameter Description

Parameter	Value	Instruction
<drx coefficient>	6	CN = 6, T = 32
	7	CN = 7, T = 64
	8	CN = 8, T = 128
	9	CN = 9, T = 256

12.26 AT^DSCI - Control Call Event

AT^DSCI is used to enables/disables ^DSCI URC (call event).

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT^DSCI =?	^DSCI: (0-1) OK	
Read Command	AT^DSCI?	^DSCI: <dsci_val> OK	
Write Command	AT^DSCI=<dsci_val >	OK	

Parameter Description

Parameter	Value	Instruction
<dsci_val >	0,1	

12.27 AT^CARDMODE - Return Card Mode

AT^CARDMODE is used to return the mode of the card amongst SIM or USIM.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT^CARDMODE	OK	

Parameter Description

Parameter	Value	Instruction
NULL		

12.28 AT^SYSCONFIG - Set System Configuration

AT^SYSCONFIG is used to set system configuration.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^SYSCONFIG?	^SYSCONFIG:<mode>, <acqorder>, <roam>,<srvdomain> OK	
Write Command	AT^SYSCONFIG= <mode>,<acqorder>, <roam>,<srvdomain>	OK	

Parameter Description

Parameter	Value	Instruction
<mode>	2	Automatically select
	13	GSM ONLY
	14	WCDMA ONLY
	15	TDSCDMA ONLY
	16	no change
<acqorder>	0	Automatically
	1	GSM first, UTRAN second
	2	UTRAN first, GSM second
	3	No change
<roam>	0	not support
	1	can roam
	2	No change
<srvdomain>	0	CS_ONLY
	1	PS_ONLY
	2	CS_PS
	3	ANY
	4	No change

12.29 AT^SYSINFO - Inquire Current Message

AT^SYSINFO is used to inquire current system message.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT^SYSINFO	^SYSINFO: <srv_status>, <srv_domain>, <roam_status>, <sys_mode>, <sim_stat> OK	

Parameter Description

Parameter	Value	Instruction
<srv_status>	0	no service
	1	limited service
	2	service available
	3	limited area service
	4	power saving and dormancy status.
<srv_domain>	0	no service
	1	only CS service
	2	only PS service
	3	PS+CS service
	4	CS and PS don’t register and are in the status of searching
	255	CDMA doesn’t support
<roam_status>	0	non-roaming status.
	1	roaming status
<sys_mode>	0	no service
	1	AMPS mode (not use provisionally)
	2	CDMA mode
	3	GSM/GPRS mode
	4	HDR mode
	5	WCDMA mode
	6	GPS mode
	7	GSM/WCDMA
	8	CDMA/HDR HYBRID
	9	LTE mode

<sim_stat>	1	UIM card status available
	240	ROMSIM version
	255	UIM card doesn’t exist

12.30 AT$QCSQ - Return RSCP

AT$QCSQ is used to return RSCP, ECIO, SIR, PATHLOSS, and RSSI if present.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCSQ=?	$QCSQ: (-121 25),(-31 – 0),(-10 – 20), (46 – 148),(-121 - -25) OK	
Exec Command	AT$QCSQ	$QCSQ: <rscp>,<ecio>,<sir>,<pathloss>,<rssi> OK	

Parameter Description

Parameter	Value	Instruction
<rscp>	-121 - -25	
<ecio>	-31 – 0	
<sir>	-10 – 20	
<pathloss>	46 – 14	
<rssi>	-121 - -25	

12.31 AT$QCRPW - Report the Received Radio Signal Power

AT$QCRPW is used to report the received radio signal power in a scale of 0 to 75.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCRPW=?	$QCRPW: (0-75) OK	
Exec Command	AT$QCRPW	$QCRPW: 75 OK	

Parameter Description

Parameter	Value	Instruction
NULL		

12.32 AT$QCANTE - Report Number of Antenna

AT$QCANTE is used to report number of antenna bars in a scale of 0 to 4 based on RSSI value.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCANTE=?	$QCANTE: (0-4) OK	
Exec Command	AT$QCANTE	$QCANTE: 4 OK	

Parameter Description

Parameter	Value	Instruction
NULL		

12.33 AT$QCSIMAPP - Select Active Subscription

AT$QCSIMAPP is applicable only for Multi SIM target. User can select Active subscription.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCSIMAPP=?	$QCSIMAPP: 0,”SUB1”,”L” OK	
Write Command	AT$QCSIMAPP= <QCSIMAPPVAL>	OK	

Parameter Description

Parameter	Value	Instruction
<QCSIMAPPVAL>	0	SIM slot 1
	1	SIM slot 2
	2	SIM slot 3

12.34 AT$QCPBMPREF - Choose the Application

AT$QCPBMPREF is used to choose the application and local or global phonebook type.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCPBMPREF=?	$QCPBMPREF(0-3) 0 – Slot 1 Global Phone Book 1 – Apps 1 Local Phone Book 2 – Slot 2 Global Phone Book 3 – Apps 2 Local Phone Book OK	
Read Command	AT$QCPBMPREF?	$QCPBMPREF: <Preference> <Preference> -- Slot n Global Phone Book <Preference> -- Apps 1 Local Phone Book OK	
Write Command	AT$QCPBMPREF= <Preference>	OK	

Parameter Description

Parameter	Value	Instruction
<Preference>	0	Slot 1 Global Phone Book
	1	Apps 1 Local Phone Book
	2	Slot 2 Global Phone Book
	3	Apps 2 Local Phone Book

12.35 AT$QCRSRP - Display the Cell Info

AT$QCRSRP is used to display neighbor cell information cell ID, EARFCN, RSRP.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT$QCRSRP?	$QCRSRP: cell ID, EARFCN, RSRP OK	

Parameter Description

Parameter	Value	Instruction
NULL		

12.36 AT$QCRSRQ - Display the Cell Info

AT$QCRSRQ is used to display neighbor cell information cell ID, EARFCN, RSRQ.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT$QCRSRQ?	$QCRSRQ: Cell id, EARFCN, RSRQ OK	

Parameter Description

Parameter	Value	Instruction
NULL		

12.37 AT$QCACQDBC - Clear ACQ Database

AT$QCACQDBC is used to clear ACQ database.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT$QCACQDBC	OK	

Parameter Description

Parameter	Value	Instruction
NULL		

12.38 AT$QCATMOD - Indicate the SIOLIB AT Command Processing State

AT$QCATMOD is used indicate the SIOLIB AT Command Processing State.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCATMOD=?	$QCATMOD:(0 – 12),(0 – 3) OK	
Read Command	AT$QCATMOD	$QCATMOD: <port_e_type>, <at_state> OK	

Parameter Description

Parameter	Value	Instruction
<port_e_type>	0 – 12	
<at_state>	0 – 3	

12.39 AT$QCCOPS - Operator Selection

AT$QCCOPS same as +COPS command and only exception is that PLMN can be specified in automatic PLMN selection mode as well.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCCOPS =?	$QCCOPS: (list all current operator) OK	
Read Command	AT$QCCOPS?	$QCCOPS:[<mode>[,<format>[,<oper>[,<AcT>]]]] OK	

Parameter Description

Parameter	Value	Instruction
<mode>	0 – 12	
<format>	0 – 3	

12.40 AT^MODE - Executes Parameter Register

AT^MODE is Controls the presentation of ^MODE unsolicited result code

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT^MODE=?	^MODE: (0-1) OK	
Read Command	AT^MODE?	^MODE: <present> OK	
Write Command	AT^MODE= <present>	OK	

Parameter Description

Parameter	Value	Instruction
<present>	0	Disable
	1	Enable

12.41 AT$QCSIMT - Indicate SIM Type

AT$QCSIMT is used to indicate SIM type

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT$QCSIMT?	$QCSIMT: <SIM type> OK	

Parameter Description

Parameter	Value	Instruction
<SIM type>	RUIM	
	USIM	
	SIM	

12.42 AT$QCNSP - Network Selection

AT$QCNSP is used to configure the network selection preferences

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCNSP=?	$QCNSP: (list of support <mode_pref>,<net_sel_pref>, <acq_ order_pref>) OK	
Read Command	AT$QCNSP?	$QCNSP:<mode_pref>, <net_sel_pr ef>,<acq_order_pref> OK	
Write Command	AT$QCNSP= <mode_pref>, <net_sel_pref>, <acq_or der_pref>	OK	

Parameter Description

Parameter	Value	Instruction
<mode_pref>	0	Automatic
	2	WCDMA
	6	LTE
<net_sel_pref>	0	Automatic
	1	Manual
	2	Limited
<acq_order_pref>	0	Automatic
	2	WCDMA
	3	LTE

12.43 AT$QCRCIND - Remote Call Indications

AT$QCRCIND is used to controls the presentation of unsolicited remote call indications

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCRCIND=?	$QCRCIND: (0-1) OK	
Read Command	AT$QCRCIND?	$QCRCIND: <present> OK	
Write Command	AT$QCRCIND= <present>	OK	

Parameter Description

Parameter	Value	Instruction
<present>	0	Disable
	1	Enable

12.44 AT$QCPDPCFGEXT - Set and Get MBIM Context Type

AT$QCPDPCFGEXT is used to set and get MBIM context type

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT$QCPDPCFGEXT=?	$QCRCIND: (list of <cid>, <mbim_context>, <roaming disable flag value>, <roaming disable timer value>) OK	
Read Command	AT$QCPDPCFGEXT?	$QCRCIND:<cid>, <mbim_context>, <roaming disable flag value>, <roaming disable timer value> OK	
Write Command	AT$QCPDPCFGEXT =<cid>,<mbim_context>, <roaming disable flag value>, <roaming disable timer value>	OK	

Parameter Description

Parameter	Value	Instruction
<cid>	1-42	
<mbim_context>	0-4	
<roaming disable flag value>	0-1	
<roaming disable timer value>	0-255	

13. ITU-T V.80ter Synchronous Data Mode Commands

13.1 AT+ES - Enable Synchronous Mode

AT+ES command is used to enable synchronous mode. Support in 3GPP.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ES=?	+ES: (6),,(8) OK	
Read Command	AT+ES?	+ES:<orig_rqst>,<orig_fbk>,<ans_fb k> OK	
Write Command	AT+ES=<orig_rqst>,<orig_fbk>,<ans_fbk>	OK	

Parameter Description

Parameter	Value	Instruction
<orig_rqst>	6	
<orig_fbk>	Undefined	
<ans_fbk>	8	

13.2 AT+ESA - Store Preferred Message

AT+ES command is used to store preferred message. Support in 3GPP.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+ESA=?	+ESA: (0),,,,(0),(0),(0-255), OK	
Read Command	AT+ESA?	+ESA: <trans_idle>, <framed_idle>, <framed_un_ov>, <hd_auto>,<crc_type>, <nrzi_en>, <sync1>, <sync2> OK	
Write Command	AT+ESA=<trans_idle>, <framed_idle>, <framed_un_ov>, <hd_auto>,<crc_type>, <nrzi_en>, <sync1>, <sync2>	OK	

Parameter Description

Parameter	Value	Instruction
<trans_idle>	0	
<framed_idle>	Undefined	
<framed_un_ov>	Undefined	
<hd_auto>	Undefined	
<crc_type>	0	
<nrzi_en>	0	
<sync1>	0 to 255	
<sync2>	Undefined	

14. Vendor Extended AT Commands

14.1 AT+SKUID - Get HW and SW Version Info

AT+SKUID command is used to get hardware version and firmware version information.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+SKUID	HW Revision: <HW version > SW Revision: <FW version> OK	

Parameter Description

Parameter	Value	Instruction
<HW vision>	-	Current HW version
<SW vision>	-	Current FW version

14.2 AT^GETIMEI - Get the IMEI Value

AT^GETIMEI command is used to get the IMEI value.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT^GETIMEI	<IMEI> OK	Success
		+CME ERROR: memory failure	Get IMEI failure

Parameter Description

Parameter	Value	Instruction
<IMEI>	-	IMEI number

Example

AT^GETIMEI 358894060069758	Get IMEI
AT^GETIMEI +CME ERROR: memory failure OK	Get IMEI failure

14.3 AT^VERSION - Get the Firmware Version.

AT^VERSION command is used to get the firmware version of module, it includes MP version and AP version.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^VERSION?	^VERSION: <ver_string> OK	Complete version information
Read Command	AT^VERSION= <ver>	^VERSION: <ver_string> OK	Part of version or All version

Parameter Description

Parameter	Value	Instruction
<ver>	1	Complete version (MP and AP version)
	2	MP version
	3	AP version

14.4 AT+FTM - Set the Operating Mode

AT+ FTM command is used to set the operating mode of module. The operating mode include “ONLINE” and “FTM” mode.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+FTM?	Device is in: <oper_mode> OK	
Write Command	AT+FTM=<oper_mode>	OK	

Parameter Description

Parameter	Value	Instruction
<oper_mode>	0	ONLINE mode
	1	FTM mode

Example

```
AT+FTM=1
OK

AT+FTM?
Device is in: 1, FTM
OK

AT+FTM=0
OK

AT+FTM?
Device is in: 0, ONLINE

OK
```

14.5 AT^RSSI - Get RSSI

AT^RSSI command is used to get current service network's RSSI.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT^RSSI=<mode>, <antenna>	EARFCN :<earfcn> RSSI:Rx Chain Indicator: < rx_chain> (< rssi0>[, rssi1]) OK	RSSI info for WCDMA
		BAND:<band> CHANNEL:<channel> BW:<bw> RSSI:Rx Chain Indicator: < rx_chain>(< rssi0>[, rssi1][, rssi2] [, rssi3]) OK	RSSI info for LTE/NR5G

Parameter Description

Parameter	Value	Instruction
<mode>	lte	LTE
	wcdma	WCDMA
	Sub	NR5G-SUB6
<antenna>	main	Main antenna
	aux1	Aux1 antenna
	main+aux1	Main+aux1 antenna
	aux2	Aux2 antenna (only for LTE and NR5G-SUB6 mode)
	aux3	Aux3 antenna (only for LTE and NR5G-SUB6 mode)
	all	all antennas (only for LTE and NR5G-SUB6 mode)
<rx_chain>	1	Enables Rx0 only
	2	Enables Rx1 only
	3	Enables Rx0 and Rx1
	4	Enables Rx2 (only for LTE and NR5G-SUB6 mode)
	8	Enables Rx3 (only for LTE and NR5G-SUB6 mode)
	15	Enables all antennas (only for LTE and NR5G-SUB6 mode)
rssi0, rssi1, rssi2, rssi3	RSSI	Signal strength

Example

AT^RSSI=WCDMA,MAIN+AUX1	Query RSSI in WCDMA mode
EARFCN:10700 RSSI:Rx Chain Indicator:0x1(-66.5dBm,0.0dBm)	Enables Rx0 only
OK	
AT^RSSI=LTE,MAIN	Query RSSI in LTE mode
BAND:40 CHANNEL:38950 BW:20.0 MHz RSSI: Rx Chain Indicator:0x1 (-82.0dBm)	Enables Rx0 only
OK	
AT^RSSI=SUB,MAIN	Query RSSI in NR5G mode
BAND:78 CHANNEL:636666 BW:100.0 MHz RSSI: Rx Chain Indicator:0x1 (-53.6dBm)	Enables Rx0 only
OK	

14.6 AT+AGC - Set RF AGC

AT+ AGC command is used to set specified configuration of RF AGC. Before send this command, must be sure the device is in FTM mode.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+AGC?	<tech>, <band>, main AGC: <value> OK	
Write Command	AT+AGC=<tech>, <band>,<channel>, <exp_agc>,<path > [,<tx_bandwidth>, <rx_bandwidth>]	OK	Set AGC config
	AT+AGC=0, <radio_setup_type>	OK	DropAGC config

Parameter Description

Parameter	Value	Instruction
<tech>	1	WCDMA
	2	LTE
	3	NR5G
<radio_setup_type>	1	WCDMA
	3	LTE
	6	NR5G
<band>	List of <band>	WCDMA: 1,2,3,4,5,6,8,19 LTE:B1,B2,B3,B4,B5,B7,B8,B12,B13,B14,B17,B18, B19,B20,B25,B26,B30,B34,B38,B39,B40,B41,B42, B46,B48,B66, B71 NR5G: B1,B2,B3,B5,B7,B8,B12,B20,B25,B28,B38, B40,B41,B66,B71,B77,B78,B79
< channel>	List of < frequency>(MHz)	WCDMA: UL Band1: 9612-9888 UL Band2: 9262-9538 UL Band3: 937-1288 UL Band4: 1312-1513 UL Band5: 4132-4233 UL Band6: 4162-4188 UL Band8: 2712-2863 UL Band9: 8762-8912 UL Band19: 312-362
		LTE: UL Band1: 18000-18599 UL Band2: 18600-19199 UL Band3: 19200-19949 UL Band4: 19950-20399

		UL Band5: 20400-20649 UL Band7: 20750-21449 UL Band8: 21450-221799 UL Band12: 23010-23179 UL Band13: 23180-23279 UL Band14: 23280-23379 UL Band17: 23730-23849 UL Band18: 23850-23999 UL Band19: 24000-24149 UL Band20: 24150-24449 UL Band25: 26040-26689 UL Band26: 26690-27039 UL Band28: 27210-27659 UL Band29: 9660-9796 UL Band30: 27660-27759 UL Band32: 9920-10359 UL Band34: 36200-36349 UL Band38: 37750-38249 UL Band39: 38250-38649 UL Band40: 38650-39649 UL Band41: 39650-41589 UL Band42: 41590-43589 UL Band46: 46790-54539 UL Band48: 55240-56739 UL Band66: 131972-132671 UL Band71: 133122-133471 NR5G: UL Band1: 384000-396000 UL Band2: 370000-382000 UL Band3: 342000-357000 UL Band5: 164800-169800 UL Band7: 500000-514000 UL Band8: 176000-183000 UL Band12: 139800-143200 UL Band20: 166400-172400 UL Band25: 370000-38300 UL Band28: 140600-149600 UL Band38: 514000-524000 UL Band40: 460000-480000 UL Band41: 499200-537999 UL Band66: 342000-356000 UL Band71: 132600-139600 UL Band77: 620000-680000 UL Band78: 620000-853333 UL Band79: 693334-733333
<exp_agc>	0-9	Expected RxAGC 0: Default valuein hard coded table 1: -100 2: -200 3: -300 4: -400 5: -500 6: -600 7: -700 8: -800 9: -900 Usualy the value of TE TX power will be same value of your expected RxAGC (if no cable loss). For

		example, if you configure TE TX power as -60dBm , expected RxAGC should be set as -600 (dBm10) which is 6 here. For WCDMA/LTE, you can use the default value, which is 0 here.
<path>	1	main antenna RSSI
	2	aux1 antenna RSSI
	3	aux2 antenna RSSI (For LTE band 1/2/3/4/7/25/30/38/40/41/42/48/66, for NR5G band 1/2/3/7/41/66/77/78/79)
	4	aux3 antenna RSSI (For LTE band 1/2/3/4/7/25/30/38/40/41/42/48/66, for NR5G band 1/2/3/7/41/66/77/78/79)
<tx_bandwidth>	0-7	Just for LTE/NR5G: 0 = 1.4MHz 1 = 3MHz 2 = 5MHz 3 = 10MHz 4 = 15MHz 5 = 20MHz 6 = 50MHz 7 = 100MHz
<rx_bandwidth>	0-5	Just for LTE/NR5G: 0 = 1.4MHz 1 = 3MHz 2 = 5MHz 3 = 10MHz 4 = 15MHz 5 = 20MHz 6 = 50MHz 7 = 100MHz

Example

AT+FTM=1 OK	
AT+AGC=1,1,9612,0,1 OK	set the WCDMA band1, UL channel 9612, Expected RxAGC 0, path 1
AT+AGC? WCDMA, band 1, MAIN RSSI: -65 OK	

AT+AGC=2,2,18000,0,1,1,1 OK AT+AGC? LTE, band 2, MAIN RSSI: -79 OK	set the LTE, band 2, UL channel 18000, Expected RxAGC 0, path 1, tx bandwidth 1 (1.4MHz), tx bandwidth 1 (1.4MHz)
AT+AGC=3,1,384000,0,1,3,3 OK AT+AGC? NR5G, band 1, MAIN RSSI: -93 OK	set the NR5G, band 1, UL channel 384000, Expected RxAGC 0, path 1, tx bandwidth 3 (10MHz), tx bandwidth 3 (10MHz)

14.7 AT^ARD_ENABLE - Enable/Disable ARD

AT^ARD_ENABLE command is used to enable/disable ARD (Adaptive Rx Diversity) function.

Note: Need reboot to take effect.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^ARD_ENABLE?	ARD Enable: TRUE OK	**Note:** Need reboot to take effect.
Write command	AT^ARD_ENABLE=<mode>	OK	

Parameter Description

Parameter	Value	Instruction
<mode>	1	Enable
	0	Disable

Example

AT^ARD_ENABLE=1 OK	Enable ARD
AT+RESET OK	Reboot
AT^ARD_ENABLE? ARD Enable: TRUE OK	Query ARD

14.8 AT^RX_CHAINS - Switch Antenna Path

AT^RX_CHAINS command is used for switching antenna RX path, the command is only working when SIM card is inserted and connected to network.

Note: Need to disable ARD by “AT^ARD_ENABLE=0” before test this AT command.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT^RX_CHAINS= <mode>,<cc_id>, <rx_chain>	OK	LTE Mode
	AT^RX_CHAINS= <mode>,<rx_chain>	OK	WCDMA Mode
		+CEM ERROR: operation not allowed	
		+CEM ERROR: Parameters error	
Read Command	AT^RX_CHAINS?	^RX_CHAINS: <mode>,<cc_id>,<rx_chain> OK	LTE Mode
		^RX_CHAINS: <mode>,<rx_chain> OK	WCDMA Mode

Parameter Description

Parameter	Value	Instruction
<mode>	1	WCDMA Mode
	2	LTE Mode
<rx_chain>	1	Enables Rx0 only (both LTE and WCDMA mode)
	2	Enables Rx1 only (both LTE and WCDMA mode)
	3	Enables Rx0 and Rx1 only (both LTE and WCDMA mode)
	4	Enables Rx2 (only for LTE mode)
	8	Enables Rx3 (only for LTE mode)
	15	Enables all chains (only for LTE mode)
<cc_id>	0	PCell
	1	SCell1
	2	SCell2
	3	SCell3
	4	SCell4

Example

AT^RX_CHAINS=2,0,1 OK	Enables Rx0 only on PCell
AT^RX_CHAINS? ^RX_CHAINS:2,0,1 OK	Get RX Chain Status

14.9 AT+BUILDTIME - Check the Build Time

AT+BUILDTIME is used to check the AP and MP build time.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+BUILDTIME?	<build time> OK	

Parameter Description

Parameter	Value	Instruction
<build time>	module build time	

Example

```
AT+BUILDTIME?

MP: Oct 29 2019, 07:09:35

AP: Oct 28 2019, 22:23:16

OK
```

14.10 AT+ICCID - Get the ICCID of the SIM card

AT+ICCID get the ICCID of the SIM card.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+ICCID	<ICCID> OK	Success
		+CME ERROR: SIM failure	Get ICCID failure

Parameter Description

Parameter	Value	Instruction
<ICCID>	-	ICCID of the SIM card

Example

AT+ICCID ICCID: 89860041191622880363 OK	Current ICCID
AT+ICCID +CME ERROR: SIM failure	Get ICCID failure

14.11 AT+SWITCHANT - Switch Antenna Path

AT+SWITCHANT is for switching antenna RX path and restore factory default value. Please refer to the picture in the AT command end for mapping relation between ANT0/ANT1/ANT2/ANT3 in module and Main/Aux1/Aux2/Aux3 in the AT command parameters.

Note: The AT command need to use test instrument (e.g. 8820C, CMW500.) to switch RX Antenna path, it doesn't support switch Rx antenna in real network.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT+SWITCHANT=<mode>, <ant>	OK	
		+CME ERROR: Parameters error	
Read Command	AT+SWITCHANT?	+SWITCHANT: WCDMA , <ant> LTE , <ant> OK	
Exec Command	AT+SWITCHANT	OK	Restore factory default value

Parameter Description

Parameter	Value	Instruction
<mode>	LTE	For LTE RX switch
	WCDMA	For WCDMA RX switch
	NR5G	For NR5G RX switch
<ant>	Main +Aux1	For LTE and WCDMA, Enable Main and Aux1 antenna
	Main	For LTE and WCDMA, Enable Main only
	Aux1	For LTE and WCDMA, Enable Aux1 only
	Aux2	For LTE only, Enable Aux2 only
	Aux3	For LTE only, Enable Aux3 only
	All	For LTE only, Enable Main + Aux1 + Aux2 + Aux3
	Rx0	For NR5G only, Enable Rx0 only
	Rx1	For NR5G only, Enable Rx1 only
	Rx2	For NR5G only, Enable Rx2 only
	Rx3	For NR5G only, Enable Rx3 only
	None	For NR5G only, all chains disabled

Example

```
AT+SWITCHANT =LTE, MAIN
OK

AT+SWITCHANT?
+SWITCHANT:
WCDMA, MAIN+AUX1
LTE, MAIN
NR5G: Rx0
OK

AT+SWITCHANT
OK
```

WCDMA	Main	Aux1
B1	ANT0	ANT3
B2	ANT0	ANT3
B4	ANT0	ANT3
B5/6	ANT0	ANT3
B8	ANT0	ANT3
B9	ANT0	ANT3
B19	ANT0	ANT3

LTE	Main	Aux1	Aux2	Aux3
B1	ANT0	ANT3	ANT2	ANT1
B2	ANT0	ANT3	ANT2	ANT1
B3	ANT0	ANT3	ANT2	ANT1
B4	ANT0	ANT3	ANT2	ANT1
B5	ANT0	ANT3		
B7	ANT0	ANT3	ANT2	ANT1
B8	ANT0	ANT3		
B12	ANT0	ANT3		
B13	ANT0	ANT3		
B14	ANT0	ANT3		
B17	ANT0	ANT3		
B18	ANT0	ANT3		
B19	ANT0	ANT3		
B20	ANT0	ANT3		
B25	ANT0	ANT3	ANT2	ANT1
B26	ANT0	ANT3		
B28	ANT0	ANT3		
B29	ANT0	ANT3		
B30	ANT0	ANT3	ANT2	ANT1
B32	ANT0	ANT3		
B34	ANT0	ANT3		
B38	ANT0	ANT3	ANT2	ANT1
B39	ANT0	ANT3		
B40	ANT0	ANT3	ANT2	ANT1
B41	ANT0	ANT3	ANT2	ANT1
B42	ANT2	ANT1	ANT0	ANT3
B46	ANT0	ANT3		
B48	ANT2	ANT1	ANT0	ANT3
B66	ANT0	ANT3	ANT2	ANT1
B71	ANT0	ANT3		

NR	Main	Aux1	Aux2	Aux3
N1	ANT2	ANT3	ANT0	ANT1
N2	ANT2	ANT3	ANT0	ANT1
N3	ANT2	ANT3	ANT0	ANT1
N5	ANT0	ANT3		
N7	ANT2	ANT3	ANT0	ANT1
N8	ANT0	ANT3		
N12	ANT0	ANT3		
N20	ANT0	ANT3		
N28	ANT0	ANT3		
N41	ANT2	ANT1	ANT0	ANT3
N66	ANT2	ANT3	ANT0	ANT1
N71	ANT0	ANT3		
N77	ANT2	ANT1	ANT0	ANT3
N78	ANT2	ANT1	ANT0	ANT3
N79	ANT2	ANT1	ANT0	ANT3

14.12 AT^UART_ENABLE - Enable/Disable UART

AT^UART_ENABLE is used to enable/disable UART log function.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^UART_ENABLE?	UART_FLAG: <mode> OK	
Write Command	AT^UART_ENABLE =<mode>	UART log is enabled, module reboot. OK	

Parameter Description

Parameter	Value	Instruction
<mode>	1	Enable
	0	Disable

Example

```
AT^UART_ENABLE=1
UART log is enabled, module reboot.
OK

AT^UART_ENABLE?
UART_FLAG: 1
OK
```

14.13 AT+RESET - Reboot module

AT+ RESET command is used reboot the module.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+RESET	OK	

Parameter Description

Parameter	Value	Instruction
NULL		

Example

AT+RESET OK	Reboot module.

14.14 AT^TEMP - Check the Sensor Temperature

AT^TEMP is used to check the temperature of TSENS, PA and Skin sensor.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^TEMP?	TSENS: <TSENS temperature> PA: <PA temperature> Skin Sensor: <Skin sensor temperature> OK	

Parameter Description

Parameter	Value	Instruction
TSENS temperature	-	Current TSENS temperature (Centigrade)
PA temperature	-	Current PA temperature (Centigrade)
Skin sensor temperature	-	Current Skin sensor temperature (Centigrade)

Example

```
AT^TEMP

TSENS: 33C

PA: 32C

Skin Sensor: 32C

OK
```

14.15 AT+GPS - Enable/Disable GPS

AT+GPS is used to enable/disable GPS function.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+GPS?	<mode> OK	
Write Command	AT+GPS=<mode>	GPS is enabled, module reboot. OK	
		GPS is disabled, module reboot. OK	
		+CME ERROR: Parameters error	

Parameter Description

Parameter	Value	Instruction
<mode>	0	Disable
	1	Enable

Example

```
AT+GPS?
1
OK

AT+GPS?
0
OK

AT+GPS=3
+CME ERROR: Parameters error

AT+GPS=0
GPS is disabled, module reboot.
OK
```

AT+GPS=1 GPS is enabled, module reboot. OK	

14.16 AT^GPS_START - START GPS

AT^GPS_START is used to start GPS with cold mode.

Note: If you have started GPS by the AT command, please don't execute the AT repeatedly, please execute command "AT^GPS_STOP" to stop GPS first, then start GPS by the AT command again.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT^GPS_START=0	OK	Cold start GPS success
		+CME ERROR: GPS status error	Cannot start GPS, send "at+gps?" to check GPS status.

Parameter Description

Parameter	Value	Instruction
<mode>	0	Cold start GPS

Example

AT^GPS_START=0 OK AT^GPS_START=0 +CME ERROR: GPS status error	Cold Start GPS success

14.17 AT+GPS_INFO - Get TTFF and CN

AT+GPS_INFO is used to get TTFF and CN value of GPS.

Note: Need to start GPS by "AT^GPS_START" before execute this AT command.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT+GPS_INFO	GPS is fixing, please wait…. OK	GPS is started and GPS is fixing position
		GPS_CN:38.000000 GPS_TTFF:30.121 OK	GPS is started and GPS has been fixed successfully.
		GPS has not started….. OK	GPS isn't started

Parameter Description

Parameter	Value	Instruction
NULL		

Example

AT+GPS_INFO GPS_CN:38.000000 GPS_TTFF:30.121 OK	//Query success
AT+GPS_INFO GPS has not started….. OK	//Query fail

14.18 AT^GPS_STOP - STOP GPS

Note: Need to start GPS by “AT^GPS_START” before execute this AT command.

Syntax

Type	Command	Possible Return Result	Instruction
Exec Command	AT^GPS_STOP	OK	

Parameter Description

Parameter	Value	Instruction
NULL		

Example

AT^GPS_STOP OK	

14.19 AT^BODYSARON - Get SAR State

AT^BODYSARON command is used to get the current SAR state.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^BODYSARON?	^BodySaron:<state> OK	

Parameter Description

Parameter	Value	Instruction
<state>	0	RF_SAR_STATE_DEFAULT
	1	RF_SAR_STATE_1
	2	RF_SAR_STATE_2
	3	RF_SAR_STATE_3
	4	RF_SAR_STATE_4
	5	RF_SAR_STATE_5
	6	RF_SAR_STATE_6
	7	RF_SAR_STATE_7
	8	RF_SAR_STATE_8

Example

```
AT^BODYSARON?
^BodySaron: 5

OK
```

14.20 AT+DPR_ENABLE - Get and set the status of DPR

AT+ DPR_ENABLE command is used to get and set the status of DPR.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+DPR_ENABLE?	+DPR_ENABLE: Get DPR State success. DPR_enable= 0. OK	
		+DPR_ENABLE: Get DPR State success. DPR_enable= 1. OK	
Write Command	AT+DPR_ENABLE=<mode>	+DPR_ENABLE: set DPR state success. OK	

Parameter Description

Parameter	Value	Instruction
<mode>	0	Disable
	1	Enable

Example

AT+DPR_ENABLE=0 OK AT+DPR_ENABLE? +DPR_ENABLE: 0. OK	Disable DPR
AT+DPR_ENABLE=1 OK AT+DPR_ENABLE? +DPR_ENABLE: 1 OK	Enable DPR

14.21 AT+DPR - Set And Get DPR Value

AT+ DPR command is used to set and get DPR value. Up to 8 DSI settings are supported.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT+DPR=<tech>, <band>, <antenna>,<endc_band>, [<dsi_value1>, <dsi_value2>]	OK	For WCDMA/LTE Standalone/SA, the <endc_band> value will be ignored, just set 0.
Read Command	AT+DPR=<tech>,<band>, <antenna>, [<endc_band>]	DSI1=24.5dbm DSI2=24.5dbm DSI3=24.5dbm DSI4=24.5dbm DSI5=24.5dbm DSI6=24.5dbm DSI7=24.5dbm DSI8=24.5dbm OK	For WCDMA/LTE Standalone/SA, the <endc_band> value will be ignored, can not be set. For LTE ENDC/ NSA, the <endc_band> must be set.

Parameter Description

Parameter	Value	Instruction
<tech>	1	WCDMA
	2	LTE Standalone
	3	LTE ENDC
	4	NSA (NR5G SUB6G)
	5	SA (NR5G SUB6G)
<band>	band value	For WCDMA: Band1 → 1, Band 2→ 2, … Band19 → 19 Support band: 1,2,4,5,6,8,9,19 For LTE Standalone: Band1 → 1, Band 2→ 2 , … Band71 → 71 Support band:1,2,3,4,5,7,8,12,13,14,17,18,19,20, 25,26,28,30,34,38,39,40,41,42,48,66,71 For LTE ENDC: Band1 → 1, Band 2→ 2 , … Band71 → 71 Support band:1,2,3,4,5,7,8,12,13,18,19,20,25,26,28, 38,39,40,41,48, 66,71 For NR5G(SUB6G) NSA: n1 → 1, n2→ 2 , … n79 → 79 Support band: 1,2,3,5,7,20,28,38,41,66,71,77,78,79

		For NR5G(SUB6G) SA: n1 → 1, n2→ 2 , … n79 → 79 Support band: 1,2,3,5,7,8,12,20,25,28,38,40,41,48,66, 71,77,78,79
<antenna>	antenna	0: Main antenna 1: Aux1 antenna 2: Aux2 antenna 3: Aux3 antenna 65535: All antennas
<endc_band>	endc band number	For WCDMA/LTE Standalone/SA, the value will be ignored, just set default value 0. For LTE ENDC/NSA, the value should be ENDC band number to co-work with the basic band specified in band field of this record. E.g., for LTE B2 + NR n71 combo, when set LTE B2 DPR value, the band field should be 2 and the endc_band field should be 71; when set NR n71 DPR value, the band field should be 71 and the endc_band field should be 2.
<dsi_value>	DSI value(s)	DSI value, the unit is 0.1db.For example, set 23dBm, this value should be 23x10=230. E.g. set DSI1 to 23dBm, this parameter should be 23x10=230. If set DSI1 to 20dBm, DSI2 to 20.5dBm, DSI3 to 21dBm, DSI4 to 21.5dBm, the parameter should be 200,205,210,215.

Example

AT+DPR=1,1,65535 DSI1=24.5dbm DSI2=24.5dbm DSI3=24.5dbm DSI4=24.5dbm DSI5=24.5dbm DSI6=24.5dbm DSI7=24.5dbm DSI8=24.5dbm OK	Query DPR value of WCDMA band 1
AT+DPR=1,1,65535,0,230	Change DSI1 value of WCDMA band 1

OK AT+DPR=1,1,65535,0,200,205,210,215 OK	Change DSI1,DSI2,DSI3,DSI4 value of WCDMA band 1

14.22 AT^SMTP - Set Max Tx Power

AT^SMTP command is used to set max TX power.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^SMTP=<tech>	^SMTP: <tech> mode , Band X:< max_tx_power > OK	
Write Command	AT^SMTP=<tech>, <band>, <max_tx_power>	^SMTP: <tech>,<band>,<max_tx_power> OK	

Parameter Description

Parameter	Value	Instruction
<tech>	1	WCDMA
	2	LTE
	3	NR5G
<band>	WCDMA band	Support band range: 1,2,4,5,6,8,9,19
	LTE band	Support band range: 1,2,3,4,5,7,8,12, 13,14,17,18,19,20, 25,26,28,30,34,38,39,40,41,42,48, 66,71
	NR5G band	Support band range: 1,2,3,5,7,8,12,20, 28,41,66,71,77, 78,79
<max_tx_power>		Max TX power, the unit is 0.1db.For example, set 23dBm, this value should be 23x10=230.

Example

AT^SMTP=1 ^SMTP: WCDMA mode Band1: 23.5dbm Band2: 23.5dbm Band4: 23.5dbm Band5: 23.5dbm Band8: 23.5dbm	//Get max Tx power for all WCDMA bands

Band9: 23.5dbm Band19: 23.5dbm OK	
AT^SMTP=1,1,230 OK	//Set max Tx power to 23dBm for WCDMA band 1
AT^SMTP=1 ^SMTP: WCDMA mode Band1: 23.0dbm Band2: 23.5dbm Band4: 23.5dbm Band5: 23.5dbm Band8: 23.5dbm Band9: 23.5dbm Band19: 23.5dbm OK	//Get max Tx power for all WCDMA bands

14.23 AT^SLBAND - Enable/Disable Band(s)

AT^SLBAND is used to enable/disable band(s). Up to 15 bands settings are supported (at a time). After executing this AT command, you need to restart module to make setting take effect. We recommend you use AT^BAND_PREF, that command can take effect right away.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT^SLBAND=?	^SLBAND: <tech>,<band> OK	Get the bands range for different mode.
Read Command	AT^SLBAND?	<tech>,<status>,<band> OK	Query the current bands status for WCDMA, LTE and NR5G Sub6G, NR5G mmWave
Write Command	AT^SLBAND=<tech>, <status >, <band1> [, <band2> [, <band3>…]]	OK	Enable/Disable bands for WCDMA/LTE/NR5G Sub6G/NR5G mmWave
Exec Command	AT^SLBAND	OK	Recover the current carrier default configuration.

Parameter Description

Parameter	Value	Instruction
<tech>	WCDMA	WCDMA mode
	LTE	LTE mode
	NR5G	NR5G mode
	NR5G_MMW	NR5G FR2 bands(If you device support NR5G FR2 Bands)
<status>	1	Disable band status.
	2	Enable band status.
<band>	List of <band>	WCDMA: 1,2,4,5,6,8,9,19 LTE:1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30,32,34,38,39,40,41,42,46,48,66,71 NR5G_Sub6G: 1,2,3,5,7,8,12,20,28,41,66,71,77,78,79 NR5G_FR2:260,261(If your device support mmWave Bands)

Example

```
AT^SLBAND=LTE,1,1
OK

AT^SLBAND?
WCDMA, Enable Bands :1,2,4,5,6,8,9,19,
WCDMA, Disable Bands:
LTE, Enable Bands :2,3,4,5,7,8,12,13,14,17,18,19,
20,25,26,28,29,30,32,34,38,39,40,41,42,46,48,66,71,
LTE, Disable Bands:1,
NR5G,Enable Bands :1,2,3,5,7,8,12,20,28,41,66,
71,77,78, 79,
NR5G,Disable Bands:
OK

AT^SLBAND=LTE,2,1,2,3,4,5
OK

AT^SLBAND?
WCDMA, Enable Bands :1,2,4,5,6,8,9,19,
WCDMA, Disable Bands:
LTE, Enable Bands :1,2,3,4,5,
LTE, Disable Bands:7,8,12,13,14,17,18,19,20,25,
26,28,29,30,32,34,38,39,40,41,42,46,48,66,71,
NR5G,Enable Bands :1,2,3,5,7,8,12,20,28,41,66,
71,77,78,79,
NR5G, Disable Bands:
OK

AT^SLBAND
OK
AT^SLBAND?
WCDMA, Enable Bands :1,2,4,5,6,8,9,19,
WCDMA, Disable Bands:
LTE, Enable Bands :1,2,3,4,5,7,8,12,13,14,17,18,
19,20,25,26,28,29,30,32,34,38,39,40,41,42,46,48,66,71,
LTE, Disable Bands:
NR5G, Enable Bands :1,2,3,5,7,8,12,20,28,41,66,
71,77,78,79,
NR5G, Disable Bands:
OK
```

14.24 AT^SBFS - Enable/Disable SIM base status

AT^SBFS is used to enable/disable SIM base status in module. The SIM service in host is based on the status to decide whether trigger firmware image upgrade.

Note: If your platform doesn't install SIM service, please ignore the AT command.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT^SBFS=?	^SBFS:(0,1) OK	Get the parameter setting range
Read Command	AT^SBFS?	SIM base status: <status> OK	Get current SIM base status.
Write Command	AT^SBFS=<status>	Successfully setting SIM base status as:Enable (Disable) OK	Set SIM base status to enable or disable

Parameter Description

Parameter	Value	Instruction
<status>	1	Enable
	0	Disable

Example

```
AT^SBFS?
SIM base status: Disable

OK

AT^SBFS?
SIM base status: Enable

OK

AT^SBFS=?
^SBFS:(0,1)

OK

AT^SBFS=0
Successfully setting SIM base status as: Disable

OK
```

AT^SBFS=1 Successfully setting SIM base status as: Enable OK AT^SBFS=2 Setting Parameter value is unexpected, should be 0 or 1. OK	

14.25 AT^SLMODE - Select Preference Mode

AT^SLMODE command is used to select preference mode.

Note: Please set module to online mode by “AT+CFUN=1” before execute the command.

NR5G only doesn’t work in the SA, because current firmware version doesn’t support 5G SA mode.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT^SLMODE=?	^SLMODE:(0-1),(0-7) OK	
Read Command	AT^SLMODE?	^SLMODE:<pref_term>, <pref_mode>	
Write Command	AT^SLMODE= <pref_term >, <pref_mode>	OK	

Parameter Description

Parameter	Value	Instruction
<pref_term>	0	NON-PERMANENT (Mode settings restore to last settings after module reboot)
	1	PERMANENT (Mode settings still is valid after module reboot)
<pref_mode>	0	Automatically
	1	WCDMA Only
	2	LTE Only
	3	WCDMA And LTE
	4	NR5G Only
	5	WCDMA And NR5G
	6	LTE And NR5G
	7	WCDMA And LTE And NR5G

Example

```
AT^SLMODE?
^SLMODE:1,7
OK

AT^SLMODE=1,0
OK

AT^SLMODE=?
^SLMODE:(0-1),(0-7)
OK
```

14.26 AT^SIMDECPIN - Query the SIM detection PIN status in slot1

AT^SIMDECPIN is used to query the SIM detection PIN status in slot1.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^SIMDECPIN?	<status> OK	

Parameter Description

Parameter	Value	Instruction
<status>	High	Insert UIM card
	Low	Remove UIM card

Example

```
AT+SIMDECPIN?
High
OK

AT+SIMDECPIN?
Low
OK
```

14.27 AT^QTUNER_ENABLE - Set QAT3555 Functionality

This set command enable or disable the RFC driver with Qtuner QAT3555 (Qtuner “QAT3555” is designed in platform side). Device will auto reboot after execute set command. The read command return QAT3555 is enabled or disabled status in the RFC driver.

Note: If platform does not use QAT3555 tuner, please ignore the AT command.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^QTUNER_ENABLE?	QAT3555 Enable: TRUE OK	
Write Command	AT^QTUNER_ENABLE= <mode>	OK	

Parameter Description

Parameter	Value	Instruction
<mode>	0	Disable QAT3555 in RFC driver. Device will auto reboot after execute set command
	1	Enable QAT3555 in RFC driver. Device will auto reboot after execute set command

Example

AT^QTUNER_ENABLE =1 OK	Enable QAT3555, device will reboot after execute set command
AT^QTUNER_ENABLE? QAT3555 Enable: TRUE OK	QAT3555 is enabled in RFC driver

14.28 AT^CA_ENABLE - Enable/Disable CA

AT^CA_ENABLE is used to enable/disable CA function.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^CA_ENABLE?	CA_FLAG: DISABLE OK	
Write Command	AT^CA_ENABLE= <mode>	You have succeeded to ENABLE/DISABLE the CA function! OK	
Test Command	AT^CA_ENABLE=?	0:Enable 1-255:Disable OK	

Parameter Description

Parameter	Value	Instruction
<mode>	0	Enable
	1-255	Disable

Example

```
AT^CA_ENABLE=1
You have succeeded to DISABLE the CA function!
OK

AT^CA_ENABLE?
CA_FLAG: DISABLE
OK

AT^CA_ENABLE=?
0:Enable
1-255:Disable
OK
```

14.29 AT^ABAND - Get active band and channel Information

AT^ABAND is used to get the active band and channel information.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^ABAND?	Radio interface: LTE Active band: LTE_BAND_39 Active channel: 38400 OK	

Parameter Description

Parameter	Value	Instruction
NULL		

Example

AT^ABAND? Radio interface: LTE Active band: LTE_BAND_39 Active channel: 38400 OK	

14.30 AT^CA_INFO - Get Band Information of LTE CA Combination/5G ENDC

AT^CA_INFO is used to get the PCC and SCC information.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^CA_INFO?	PCC info: Band is xxx, Band_with is xxx SCC1 info: Band is xxx, Band_with is xxx SCC2 info: Band is xxx, Band_with is xxx PCC info: Band is NR5G_xxx, Band_with is xxx OK	Support LTE and NR5G CA info

Parameter Description

Parameter	Value	Instruction
NULL		

Example

AT^CA_INFO?	
PCC info: Band is LTE_B40, Band_width is 10.0MHz	LTE 1 CA Information
OK	
AT^CA_INFO?	
PCC info: Band is LTE_B12, Band_width is 10.0MHz	LTE 2 CA Information
SCC1 info: Band is LTE_B25, Band_width is 10.0MHz	
OK	
AT^CA_INFO?	
LTE serving information:	5G ENDC: band information
PCC info: Band is LTE_B1, Band_width is 20.0MHz	
SCC1 info: Band is LTE_B3, Band_width is 20.0MHz	
SCC2 info: Band is LTE_B7, Band_width is 20.0MHz	
PCC info: Band is NR5G_N5G, Band_width is 100.0MHz	
OK	

14.31 AT^ULCA - Query ULCA state and enable ULCA function

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^ULCA?	ULCA is enabled OK	
Exec command	AT^ULCA	OK	

Example

AT^ULCA? ULCA is disabled OK	Query ULCA
AT^ULCA OK	Enable ULCA function
AT^ULCA? ULCA is enabled OK	Query ULCA

14.32 AT^BAND_PRI - Set Band Attach Priority

AT^BAND_PRI is used to set LTE band attach priority.

Note: Need to execute “at+reset” to take effect when execute the “AT^BAND_PRI” write command. Band priority means, band scan is done based on priority you set by “AT^BAND_PRI” command. Nevertheless, band priority does not guarantee which is the serving band.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^BAND_PRI?	^BAND_PRI: <band> OK	
Write command	AT^BAND_PRI= <band1> [, <band2> [, <band3>…]]	OK	Enable/Disable band(s) for WCDMA, LTE and NR5G.

Parameter Description

Parameter	Value	Instruction
<band>	List of <band>	LTE:1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30, 32,34,38,39,40,41,42,46,48,66,71

Example

```
AT^BAND_PRI=40,38

OK

AT^BAND_PRI?
^BAND_PRI:40,38
OK
```

14.33 AT^QTUNER_INIT - Query tuner initial state

AT^QTUNER_INIT is used to query Qtuner initial state. (Qtuner “QAT3555” is designed in platform side)

Note: If platform does not use QAT3555 tuner, please ignore the AT command.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^QTUNER_INIT?	Qtuner is not enabled OK	Qtuner function is not enabled
		Main and Aux tuner initial success OK	Qtuner function is enabled and both Main and Aux Qtuner HW component exists.
		Main and Aux tuner initial failed OK	Qtuner function is enabled and both Main and Aux Qtuner HW component does not exist.
		Main tuner initial failed OK	Qtuner function is enabled and Main Qtuner HW component does not exist.
		Aux tuner initial failed OK	Qtuner function is enabled and Aux Qtuner HW component does not exist.

Example

AT^QTUNER_INIT? Qtuner is not enabled OK	Query Qtuner function
AT^QTUNER_ENABLE=1 … reboot ….	Enable Qtuner function, module will reset
AT^QTUNER_INIT” Main and Aux tuner initial success OK	Query Qtuner function When Qtuner function is enabled and both main and aux Qtuner HW component exist
AT^QTUNER_INIT? Main and Aux tuner initial failed OK	When Qtuner function is enabled but both main and aux HW Qtuner doesn’t exist
AT^QTUNER_INIT? Main tuner initial failed OK	When Qtuner function is enabled but main HW Qtuner doesn’t exist
AT^QTUNER_INIT? Aux tuner initial failed OK	When Qtuner function is enabled but aux HW Qtuner doesn’t exist

14.34 AT^RFPIN_STATUS - Query the RF key status

AT^RFPIN_STATUS is used to query status of “W_DISABLE” PIN in Golden finger.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^RFPIN_STATUS?	RF HW key is pull up OK	

Example

AT^RFPIN_STATUS? RF HW key is pull up OK	Query status of “W_DISABLE” pin The status of “W_DISABLE” pin is high
AT^RFPIN_STATUS? RF HW key is pull down OK	Query status of “W_DISABLE” pin The status of “W_DISABLE” pin is low

14.35 AT^BAND_PREF - Enable/Disable Band(s)

AT^BAND_PREF is used to enable/disable band(s). Up to 15 band settings are supported (at a time). The difference between AT^BAND_PREF and AT^SLBAND: AT^BAND_PREF can enable/disable band(s) without reboot.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^BAND_PREF?	<tech>,<status>,<band> OK	Query the current band status for WCDMA, LTE, NR5G and NR5G mmWave.
Write command	AT^BAND_PREF= <tech>, <status>, <band1> [, <band2> [, <band3>…]]	OK	Enable/Disable band(s) for WCDMA, LTE, NR5G and NR5G mmWave.
Exec Command	AT^BAND_PREF	OK	Recover the default configuration about band preference

Parameter Description

Parameter	Value	Instruction
<tech>	WCDMA	WCDMA mode
	LTE	LTE mode
	NR5G	NR5G mode
	NR5G_MMW	NR5G FR2 bands(If your device supports NR5G FR2 Bands)
<status>	1	Disable band status.
	2	Enable band status.
<band>	List of <band>	WCDMA: 1,2,4,5,6,8,9,19 LTE:1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30, 32,34,38,39,40,41,42,46,48,66,71 NR5G_Sub6G: 1,2,3,5,7,8,12,20,28,41,48,66,71,77,78, 79 NR5G_FR2: 257,258,260,261(If your device supports mmWave Bands)

Example

AT^BAND_PREF? WCDMA, Enable Bands :1,2,4,5,6,8,9,19,	Query current band status (If your device not supports NR5G mmWave Bands)

WCDMA, Disable Bands: LTE, Enable Bands :1,2,3,4,5,7,8,12,13,14,17, 18,19,20,25,26,28,29,30,32,34,38,39,40,41,42,46, 48,66,71, LTE, Disable Bands: NR5G,Enable Bands : 1,2,3,5,7,8,12,20,25,28,38,40,41,48,66,71,77,78,79 NR5G,Disable Bands: OK	
AT^BAND_PREF=LTE,1,3 OK	Disable LTE Band3
AT^BAND_PREF?	Query current band status (If your device not supports NR5G mmWave Bands)
WCDMA, Enable Bands :1,2,4,5,6,8,9,19, WCDMA, Enable Bands :1,2,4,5,6,8,9,19, WCDMA, Disable Bands: LTE, Enable Bands :1,2,4,5,7,8,12,13,14,17, 18,19, 20,25,26,28,29,30,32,34,38,39,40,41,42,46,48,66, 71, LTE, Disable Bands: 3 NR5G,Enable Bands :1,2,3,5,7,8,12,20,25,28,38,40,41,48, 66,71,77,78,79, NR5G,Disable Bands: OK	
AT^BAND_PREF=NR5G,1,78 OK	Disable NR5G n78
AT^BAND_PREF?	Query current band status (If your device not supports NR5G mmWave Bands)
WCDMA, Enable Bands :1,2,4,5,6,8,9,19, WCDMA, Enable Bands :1,2,4,5,6,8,9,19, WCDMA, Disable Bands: LTE, Enable Bands :1,2,4,5,7,8,12,13,14,17, 18,19, 20,25,26,28,29,30,32,34,38,39,40,41,42,46,48,66, 71, LTE, Disable Bands: 3 NR5G,Enable Bands :1,2,3,5,7,8,12,20,25,28,38,40,41,48, 66,71,77,79, NR5G,Disable Bands: 78 OK	
AT^BAND_PREF=NR5G,2,78 OK	Enable NR5G n78

AT^BAND_PREF OK	Enable NR5G n78 Recover default seting about band preference
AT^BAND_PREF? WCDMA, Enable Bands :1,2,4,5,6,8,9,19, WCDMA, Disable Bands: LTE, Enable Bands :1,2,3,4,5,7,8,12,13,14,17,18, 19,20,25,26,28,29,30,32,34,38,39,40,41,42,46,48, 66,71, LTE, Disable Bands: NR5G,Enable Bands :1,2,3,5,7,8,12,20,25,28,38, 40,41,48, 66,71,77,78,79, NR5G,Disable Bands: NR5G_MMW,Enable Bands :260,261, NR5G_MMW,Disable Bands: OK	Query current bands status (if your device supports NR5G mmWave Bands)
AT^BAND_PREF=NR5G_MMW,1,260 OK	Disable NR5G FR2 band 260 (if your device supports NR5G mmWave Bands)

14.36 AT^DEBUG - Get serving cell information

AT^DEBUG is used to get serving cell information.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^DEBUG?	Some serving cell information in current network OK	

Parameter Description

Parameter	Value	Instruction
RAT	WCDMA/LTE/LTE+NR/NR5G_SA	Radio access technology
Mcc	-	Mobile Country Code
Mnc	-	Mobile Network Code
Band	-	Active band of the current system
band_width	-	Bandwidth
channel	-	EARFCN/Active channel of the current system
cell_id	-	Cell ID
Lac	-	Location Area Code
Psc	-	Primary Synchronization Code
Rscp	-	Receive Signal Channel Power
Ecio	-	Energy Chip/Interference Other cell
Rssi	-	Receive Signal Channel Power
tx_pwr	-	Device Tx Power
wcdma_ant_rscp	-	RSCP value on each antenna
rx_diversity	1	Diversity bitmask to show which Rx chain has valid signal information. For example, if rx_diversity=1+2=3, that means signal information is available on both Rx chain 0 and Rx chain 1.
	2	
	4	
	8	
lte_tac	-	Tracking Area Code
pcell	-	Primary Cell Information
scell	-	Secondary Cell Information
Pci	-	Physical Cell ID
Rsrp	-	Reference Signal Receiving Power
Rsrq	-	Reference Signal Receiving Quality

Rssi	-	Receive Signal Strength Indication
Snr	-	Signal to Noise Ratio
lte_ant_rsrp	-	RSRP value on each antenna

Example

AT^DEBUG?	
RAT: WCDMA	Current Network is WCDMA
mcc:460,mnc:01	
band:1	
band_width:5.0MHz	
channel:10663	
cell_id:228535243	
lac:42282	
cell1:psc:240,rscp:-101.0dBm,ecio:-15.5dB	
rssi:-106dBm	
tx_pwr:7dB	
wcdma_ant_rscp: rx_diversity: 3	
(-101.5dBm, -536.0dBm)	
OK	
AT^DEBUG?	
RAT:LTE	Current Network is LTE
mcc:460,mnc:01	
lte_cell_id:114885122	
lte_tac:9514	
lte_tx_pwr:2.0dB	
lte_ant_rsrp:rx_diversity:15	
(-77.0dBm,-256.0dBm,-256.0dBm,-256.0dBm)	
pcell:lte_band:3,lte_band_width:20.0MHz	
channel:1650 pci:434	
lte_rsrp:-76.5dBm,rsrq:-5.8dBm	
lte_rssi:-53.1dBm,lte_snr:28.0dBm	
OK	
AT^DEBUG?	
RAT:LTE+NR	Current Network is LTE+NR 5G (b1+b3+b7+n38)
mmc:001,mnc:01	
lte_cell_id:2	

lte_tac:1 lte_tx_pwr:17.0dB lte_ant_rsrp:rx_diversity:15 (-75.9dBm,-117.7dBm,-140.0dBm,-135.0dBm) pcell:lte_band:1,lte_band_width:20.0MHz channel:300 pci:2 lte_rsrp:-75.8dBm,rs rq:-10.4dBm lte_rssi:-45.5dBm,lte_snr:30.0dBm scell: lte_band:3 lte_band_width:20.0MHz channel:1575 pci:2 lte_rsrp:-74.9dBm,rs rq:-10.4dBm lte_rssi:-44.6dBm,lte_snr:30.0dBm scell: lte_band:7 lte_band_width:20.0MHz channel:3100 pci:3 lte_rsrp:-75.1dBm,rs rq:-10.4dBm lte_rssi:-44.9dBm,lte_snr:30.0dBm nr_band:n78 nr_band_width:100.0MHz nr_channel:636666 nr_pci:4 nr_rsrp:82dBm rx_diversity: 15 (-82.1dBm,-110.6dBm,-140dBm,-125.8dBm) nr_rsrq:-11dB nr_snr:16.5dB OK	

14.37 AT+VZWRSRP - Display Neighbor Cell Info

AT+VZWRSRP is used to display neighbor cell info like Cell id, EARFCN, RSRP. RSRP – Reference Signal Received Power.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+VZWRSRP?	+VZWRSRP: Cell ID, EARFCN, RSRP OK	

Parameter Description

Parameter	Value	Instruction
NULL		

Example

AT+VZWRSRP? +VZWRSRP: 347,1650,”-1027” 346,1650,”-1004” 319,1650,”-1021” OK	

14.38 AT+VZWRSRQ - Display Neighbor Cell Info

AT+VZWRSRQ is used to display neighbor cell info like Cell id, EARFCN, RSRQ. RSRQ Reference Signal Received Quality.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+VZWRSRQ?	+VZWRSRQ: Cell ID, EARFCN, RSRQ OK	

Parameter Description

Parameter	Value	Instruction
NULL		

Example

AT+VZWRSRQ? +VZWRSRQ: 346,1650,”-149”,319,1650,”-176”,098,1650,”-200”,386,1650,”-158” OK	

14.39 AT+VZWAPNE - Edit APN Value

AT+VZWAPNE is used to edit APN values in APN table.

Syntax

Type	Command	Possible Return Result	Instruction
Test Command	AT+VZWAPNE=?	+VZWAPNE: (1-24),(0-16),,(IPV6 and IPV4V6), LTE,(0-1),(0-122820) OK	
Read Command	AT+VZWAPNE?	+VZWAPNE: <Profile ID> ,<APN Class>,<APN Name>,<PDP Type>,<APN Bearer type> ,<APN Flag>,< APN Timer> OK	
Write Command	AT+VZWAPNE = <Profile ID>, <APN Class>, <APN Name>, <PDP Type>, <APN Bearer type>, <APN Flag>, <APN Timer>	OK	

Parameter Description

Parameter	Value	Instruction
<Profile ID>	1 to 24	
<APN Class>	0 to 4	
<APN Name>	String type, maximum length is 100	
<PDP Type>	String type, maximum length is 8	
<APN Bearer type>	String type, maximum length is 3	
<APN Flag>	0 to 1	
<APN Timer>	0 to 122820	

Example

AT+VZWAPNE=? +VZWAPNE: (1-24),(0-16),,(IPV6 and IPV4V6), LTE, (0-1),(0-122820) OK	
AT+VZWAPNE? +VZWAPNE: 1 , 0 ,"","IPV4V6","LTE", 0, 0 +VZWAPNE: 2 , 0 ,"ims","IPV4V6","LTE", 0, 0 OK	
AT+VZWAPNE=1,0,"ims","IPV6","LTE",0,0 OK	Modify APN values in APN table
AT+VZWAPNE? +VZWAPNE: 1 , 0 ,"ims","IPV6","LTE", 0, 0 +VZWAPNE: 2 , 0 ,"ims","IPV4V6","LTE", 0, 0 OK	

14.40 AT+HOSTMAN - Show and modify Host manufacture name for OTADM

Note: The AT command only can be used in Verizon carrier image.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+HOSTMAN?	+HOSTMAN: HostMan is: Manufacture name OK	
Exec Command	AT+HOSTMAN=<Manufacture name>	OK	(For Verizon)

Parameter Description

Parameter	Value	Instruction
<Manufacture name>	String type, maximum length is 64	

14.41 AT+HOSTMOD - Show and modify Host model name for OTADM

Note: The AT command only can be used in Verizon carrier image.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+HOSTMOD?	+HOSTMOD: HostMod is: Model name OK	
Exec Command	AT+HOSTMOD=<Model name>	OK	: (For Verizon)

Parameter Description

Parameter	Value	Instruction
<Model name>	String type, maximum length is 64	

14.42 AT^PDFLAG - Set module allow enter to Sahara mode

AT^PDFLAG is used to set module allow enter to Sahara mode for capture dump when happen crash.

Note: The AT command only is used for debug module crash issue's purpose.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^PDFLAG?	^PDFLAG: <pdflag> OK	
Exec Command	AT^PDFLAG=<pdflag>	at^pdflag=1 Memory dump is enabled, module reboot. OK at^pdflag=0 Memory dump is disabled, module reboot. OK	

Parameter Description

Parameter	Value	Instruction
< pdflag >	0	Module reboot directly when happen crash
	1	Module will enters to Sahara mode when happens crash.

Example

at^pdflag=1 Memory dump is enabled, module reboot. OK	Enable PDFLAG
at^pdflag=0 Memory dump is disabled, module reboot. OK	Disable PDFLAG

14.43 AT^CLIENTID - Get and Set client ID information

AT^CLIENTID is used to get or set module client ID information. Please ignore the AT command for Mobile broadband product.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^CLIENTID?	client id: <ID> OK	The length of ID must be less than or equal to 64 Bytes. Every character's ASCII value must between 0x20 to 0x7E. There are some special characters are not allow, for example: “,”, ”;”, ”>”, ”?”.
Write Command	AT^CLIENTID=<ID>	OK	

Parameter Description

Parameter	Value	Instruction
<ID>	String type, the length must be less or equal to 64 bytes	

Example

AT^CLIENTID? client id is blank, please set it first OK	Before you set the client id information,
AT^CLIENTID=QAZWSXEDCRFVTGBYHNUJMIKOPLQAZWSXEDCRFVTGBYHNUJMIKOPL0123456789QA OK	Set or modify client id information
AT^CLIENTID? client id: QAZWSXEDCRFVTGBYHNUJMIKOPLQAZWSXEDCRFVTGBYHNUJMIKOPL0123456789QA OK	Query client id information

14.44 AT+USBSWITCH - Set RmNet Mode (USB Variant only)

With this command, it can be switched between RmNet and MBIM interface on USB Interface.

Note: This command should be used only once and only by the customers who are launching RmNet based devices in the products. Requires reboot before setting takes effect.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT+USBSWITCH=<PID>	OK	

Parameter Description

Parameter	Value	Instruction
<PID>	00B7	RmNet
	00B3	MBIM

14.45 AT^TX_PWR - Set and Get transmit power under non signaling mode

This command can set/get continuous transmit power under non signaling mode.

Note: When you change the band from LTE to NR5G or form NR5G to LTE, you need to restart device. Otherwise, the setting of power is not expected. Because continuous transmit power produce a lot of heat, we suggest you do not test for a long time.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT^TX_PWR=<band>,<bandwidth>,<antenna_num>,<power_dBm10>	OK	
Read Command	AT^TX_PWR?	tx_pwr: Total_Tx_Power: 18.0 dBm OK	
Exec Command	AT^TX_PWR	OK	When you want to stop the test process, you can execute this command. Then, you can switch device to normal (Online) mode.

Parameter Description

Parameter	Value	Instruction
<band>	1	LTE Band1, Frequency:1950MHz
	2	LTE Band2, Frequency:1880MHz
	3	LTE Band3, Frequency:1750MHz
	77	NR5G N77, Frequency: 3600MHz
	78	NR5G N78, Frequency: 3600MHz
	79	NR5G N79, Frequency: 4700MHz
<bandwidth>	0	1.4MHz. Supported band: B2, B3
	1	3MHz. Supported band: B2,B3
	2	5MHz. Supported band: B1,B2, B3
	3	10MHz. Supported band: B1,B2, B3
	4	15MHz. Supported band: B1,B2, B3
	5	20MHz. Supported band: B1,B2, B3,N78
	6	40MHz. Supported band: N77,N79
	7	50MHz. Supported band: N77,N78,N79
	8	60MHz. Supported band: N77,N78,N79
	9	80MHz. Supported band: N77,N78,N79

	10	90MHz. Supported band: N77,N78
<antenna_num>	Range:0-2	0:Antenna 0,Supported band:B1,B2,B3 1:Antenna 1,Supported band:N77,N78, N79 2:Antenna 2,Supported band:B1,B2,B3, N77,N78,N79
< power_dBm10>		Expected power dBm*10. If you want to set 20 dBm, this value should be 20*10=200.

Example

AT+FTM=1 OK	Make device into non signaling mode(FTM) mode
AT^TX_PWR=1,2,0,110 OK	Set LTE Band 1,bandwidth:5MHz,Antenna 0,11dBm
AT^TX_PWR? ^tx_pwr: Total_Tx_Power: 11.0 dBm OK	Query current TX power
AT^TX_PWR OK	Stop test process
AT+RESET OK	Change the band from LTE to NR5G or from NR5G to LTE, we need to restart device.
AT+FTM=1 OK	Make device into non signaling mode(FTM) mode
AT^TX_PWR=77,6,2,220 OK	Set NR5G Band 77, bandwidth:40MHz,Antenna 2,22dBm
AT^TX_PWR? ^tx_pwr: Total_Tx_Power: 21.7 dBm OK	Query current TX power
AT^TX_PWR OK	Stop test process
AT+FTM=0 OK	Make device recover to normal(Online) mode

14.46 AT^SET_PLMN - Select PLMN Manually

AT^SET_PLMN command is used to select PLMN manually. Sometime it will take about 10 seconds to attach specific PLMN network. Besides, after insert different SIM card or restart device, setting will lose.

Note: Write command and Exec command can take effect right now. Besides, after insert different SIM card or restart device, before setting will lose.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT^SET_PLMN=<mcc>,<mnc>	OK	Select a specific PLMN
Read Command	AT^SET_PLMN?	^SET_PLMN:(<mcc>,<mnc>) OK	Query PLMN setting
Exec Command	AT^SET_PLMN	OK	Make device select PLMN automatically

Parameter Description

Parameter	Value	Instruction
<mcc>	-	Mobile Country Code
<mnc>	-	Mobile Nework Code

Example

AT^SET_PLMN? ^SET_PLMN:Have not set PLMN before OK	If have not set PLMN before
AT^SET_PLMN=460,00 OK	Make device attach to specific PLMN network
AT^DEBUG? RAT:LTE mcc:460,mnc:00 lte_cell_id:213931652 lte_tac:9340 lte_tx_pwr:-11.0dB lte_ant_rsrp:rx_diversity:15 (-83.7dBm,-256.0dBm,-256.0dBm,-256.0dBm) pcell: lte_band:40 lte_band_width:20.0MHz channel:38950 pci:304 lte_rsrp:-83.7dBm,rsrq:-6.7dB lte_rssi:-57.1dBm,lte_snr:30.0dB OK	Query current network information to verify PLMN

AT^SET_PLMN OK	Make device select PLMN automatically

14.47 AT^WCDMA_LOCK - Lock UARFCN and PSC in WCDMA network

AT^WCDMA_LOCK command is used to lock UARFCN (DownLink) and PSC in WCDMA network. After lock UARFCN and PSC, mode preference will set to WCDMA-only. If you want to lock UARFCN and PSC, please set it according to current network environment. If current network do not exist such an available UARFCN and PSC, device will stay in “no service” status. Besides, this command just support lock one group of UARFCN and PSC.

Note: Write command and Exec command needs to restart device to take effect.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT^WCDMA_LOCK =<dl_uarfcn >,<psc>	OK	Lock UARFCN and PSC
Read Command	AT^WCDMA_LOCK?	^WCDMA_LOCK: (<dl_uarfcn>, <psc>) OK	Query current setting about UARFCN and PSC
Exec Command	AT^WCDMA_LOCK	OK	Delete lock on UARFCN and PSC

Parameter Description

Parameter	Value	Instruction
<dl_earfcn>	-	Downlink E-UTRA Absolute Radio Frequency Channel Number
<psc>	-	Physical Scramble Code

Example

AT^WCDMA_LOCK? Have not lock UARFCN and PSC before OK	Query current lock about UARFCN and PSC
AT^WCDMA_LOCK=10663,143 OK	Lock UARFCN (Downlink) to 10663, PSC to 143
AT+RESET OK	Restart device to take effect
AT^DEBUG? RAT:WCDMA mcc:460,mnc:01 band:1 band_width:5.0MHz channel:10663 cell_id:228537163 lac:42282 cell1: psc:143,rscp:-73.0dBm,ecio:-13.0dB	Query current network information

rssi:-74dBm tx_pwr:0dB wcdma_ant_rscp: rx_diversity: 1 (-73.0dBm,-214748364.8dBm) OK	
AT^WCDMA_LOCK OK	Delete lock on UARFCN and PSC
AT+RESET OK	

14.48 AT^LTE_LOCK - Lock EARFCN and PCI in LTE network

AT^LTE_LOCK command is used to lock EARFCN (DownLink) and PCI in LTE network. After lock EARFCN and PCI, mode preference will set to LTE-only. If you want to lock EARFCN and PCI, please set it according to current network environment. If current network do not exist such an available EARFCN and PCI, device will stay in “no service” status. Besides, for Qualcomm AT command mechanism support the parameter number to 17 almost, this command support lock 8 pair of EARFCN and PCI.

Note: Write command and Exec command needs to restart device to take effect.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT^LTE_LOCK= [<pci>1,<dl_earfcn>1 [,<pci>2,< dl_earfcn>2 … [,<pci>8,< dl_earfcn >8]]]	OK	Support 8 pair of EARFCN and PCI almost
Read Command	AT^LTE_LOCK?	^LTE_LOCK: (<pci>1,< dl_earfcn>1), … (<pci>n, < dl_earfcn>n) OK	Query current lock setting about EARFCN and PCI
Exec Command	AT^LTE_LOCK	OK	Make device recover to normal mode

Parameter Description

Parameter	Value	Instruction
<pci>	0-503	Physical-layer Cell Identifier
<dl_earfcn>	-	Downlink E-UTRA Absolute Radio Frequency Channel Number

Example

AT^LTE_LOCK? ^LTE_LOCK: Have not set cell lock before OK	Query current lock about EARFCN and PCI
AT^LTE_LOCK =405,40936 OK	Lock EARFCN (Downlink) to 40936, PCI to 405
AT+RESET OK	Restart device to take effect
AT^DEBUG? RAT:LTE mcc:460,mnc:00 lte_cell_id:9658433	Query current network information

lte_tac:9340 lte_tx_pwr:26.0dB lte_ant_rsrp:rx_diversity:15 (-118.3dBm,-140.0dBm,-140.0dBm,-140.0dBm) pcell: lte_band:41 lte_band_width:20.0MHz channel:40936 pci:405 lte_rsrp:-118.1dBm,rsrq:-15.3dB lte_rssi:-82.9dBm,lte_snr:-2.6dB OK	
AT^LTE_LOCK=405,40936,477,1300,169,36275 OK	Set 3 pairs of EARFCN and PCI
AT+RESET OK	Restart device to take effect
AT^DEBUG? RAT:LTE mcc:460,mnc:00 lte_cell_id:224636231 lte_tac:9340 lte_tx_pwr:0.0dB lte_ant_rsrp:rx_diversity:3 (-106.9dBm,-127.5dBm,-256.0dBm,-256.0dBm) pcell: lte_band:34 lte_band_width:15.0MHz channel:36275 pci:169 lte_rsrp:-106.9dBm,rsrq:-12.0dB lte_rssi:-76.2dBm,lte_snr:3.4Db OK	Query current network information
AT^LTE_LOCK OK	Delete lock on EARFCN and PCI
AT+RESET OK	Restart device to take effect

14.49 AT^SWITCH_SLOT - Switch the physical slot

AT^ SWITCH_SLOT is used to switch the physical slot.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT^SWITCH_SLOT?	SIM1 ENABLE OK or SIM2 ENABLE OK	
Write Command	AT^SWITCH_SLOT =<mode>	OK	

Parameter Description

Parameter	Value	Instruction
<mode>	0	Enable SIM1
	1	Enable SIM2

Example

```
AT^SWITCH_SLOT=0
OK

AT^SWITCH_SLOT?
SIM1 ENABLE
OK

AT^SWITCH_SLOT=1
OK

AT^SWITCH_SLOT?
SIM2 ENABLE
OK
```

14.50 AT^NR5G_LOCK - Lock NR-ARFCN and PCI in NR5G SA network

AT^NR5G_LOCK command is used to lock NR-ARFCN(DownLink) and PCI in SA network. After lock NR-ARFCN and PCI, mode preference will set to NR5G-only. If you want to lock NR-ARFCN and PCI, please set it according to current network environment. If current network do not exist such an available combination of NR-ARFCN and PCI, device will stay in “no service” status. Besides, this command just support lock one group of NR-ARFCN and PCI.

Note: If your device do not support NR5G SA network, this command will return error. Besides, write command and Exec command needs to restart device to take effect.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT^NR5G_LOCK= <band>, <scs_type>,<nr_arfcn>, <pci>	OK	Lock NR-ARFCN and PCI
Read Command	AT^NR5G _LOCK?	^NR5G _LOCK: (<band>, <scs_type>,<nr_arfcn>,<pci>) OK	Query current lock of NR-ARFCN and PCI
Exec Command	AT^NR5G _LOCK	OK	Delete lock of NR-ARFCN and PCI

Parameter Description

Parameter	Value	Instruction
<band>	-	NR5G Operation Band
<scs_type>	0	Sub-carrier space 15kHz
	1	Sub-carrier space 30kHz
	2	Sub-carrier space 60kHz
	3	Sub-carrier space 120kHz
<nr_arfcn>	-	New Radio Absolute Radio Frequency Channel Number (Downlink)
<pci>	-	Physical-layer Cell Identifier

Example

AT^NR5G_LOCK? NR5G_LOCK:Have not set cell lock before OK	Query current lock about NR-ARFCN and PCI
AT^NR5G_LOCK =78,1,627264,148 OK	Lock the UE to PCI 148 with NR-ARFCN 627264, SCS of 30 kHz, and band n78
AT^NR5G_LOCK? ^NR5G_LOCK:(78,1,627264,148) OK	Query current lock about NR-ARFCN and PCI
AT+RESET OK	Restart device to take effect

AT^DEBUG? RAT:NR5G_SA mcc:460,mnc:11 nr_cell_id:31676792833 nr_tac:7768587 nr_band:n78 nr_band_width:100.0MHz nr_channel:627264 nr_pci:148 nr_rsrp:-102.0dBm nr_rsrq:-12.0dB nr_snr:11.5dB OK	Query current network information
AT^NR5G_LOCK OK	Delete lock of NR-ARFCN and PCI
AT+RESET OK	Restart device to take effect

14.51 AT+WOWWAN_ENABLE – Enable WoWWAN feature

AT+WOWWAN_ENABLE is used to enable assertion of Wake_On_WWAN# Pin Low for 1 Second, when module receives SMS that matches perfectly with “password” set by AT+WOWWAN_PASSWORD.

The SMS for wake is handled at the very beginning of processing incoming SMS. It will be discarded after handling. Therefore, it can be received even when memory is full and no need to delete it.

It does not depend on PC status (S0/S3/S4/S5), but PC should provide power to module when in these status.

Syntax

Type	Command	Possible Return Result	Instruction
Read Command	AT+WOWWAN_ENABLE?	WoWWAN_ENABLE: <state> OK	Query status
Write Command	AT+WOWWAN_ENABLE=<stat>	OK	Set status

Parameter Description

Parameter	Value	Instruction
<stat>	0	Disable WoWWAN feature
	1	Enable WoWWAN feature

14.52 AT+WOWWAN_PASSWORD – Set WoWWAN password

AT+WOWWAN_PASSWORD to set the password for WoWWAN feature. The password is stored non-volatile.

Syntax

Type	Command	Possible Return Result	Instruction
Write Command	AT+WOWWAN_PASSWORD=<pw>	OK	Set password

Parameter Description

Parameter	Value	Instruction
<pw>		The length of the password cannot exceed 160 characters. Only upper and lower case English characters and numbers are supported. The default password is “hello”.

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