



HUAWEI MC509 Series CDMA LGA Module

# **AT Command Interface Specification**

Issue	04
Date	2013-08-27

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## About This Document

### Revision History

Document Version	Date	Chapter	Descriptions
01	2011-08-26		Creation
02	2012-08-23	2.16	Added the command: ^IOCTRL – Control the GPIO
		3.11	Updated the command: ^MDN – Setting the MDN
		3.12	Added the command: ^SIQ–Querying Signal Source Information
		3.13	Added the command: ^NSI –Querying Cell Information
		3.14	Added the command: ^BSINFO – Querying Base Station ID and Protocol Version
		3.15	Added the command: ^HDRINFO – Querying EVDO Information
		6.7	Added the command: ^RFSWITCH – Reporting the RFSWITCH State
		6.9	Added the command: ^CSQLVL – Querying the Signal Bar
		6.10	Added the command: ^HDRCSQLVL – Querying the HDR Signal Bar
		6.14	Deleted the command: ^COTKSLACT – Defining a Subscriber in issue 01
		7.10	Added the command: ^HFEEPO –Billing Reverse Polarity
		7.11.3	Added Table 7-1 The values of <end_status>



Document Version	Date	Chapter	Descriptions
		7.14	Updated the command: ^DTMF – Two-Stage Dialing Command
		7.16	Updated the command: +CTA – Setting the Time to Enter into Dormancy
		7.17	Added the command: +CCWA – Setting the Status of Call Waiting
		7.18	Added the command: ^HFLASH/^FLASH – Sending Flash/Flash with Information
		10	Updated Chapter 10: Internet Service Interface Commands
		11.7	Added the command: ^STN –Switching Sidetone Status
		11.8	Added the command: ^ECHO –Switching Echo Cancellor Mode
		11.9	Added the command: ^AUDIOCFG –C Configuring Tone Parameter
		11.10	Added the command: ^KEYTONE- DTMF Tone Local Playback
		15.2	Updated CMS ERROR List
		15.4	Updated Table 15-4 Initial parameter values after startup
		15.6	Updated AT Commands That Are Allowed to Be Executed in PIN Code Limit Mode
		15.7	Added List of Unsolicited Report Command Controlled by ^CURC
03	2013-05-29	2.11	Updated the command +CFUN–Set the Operating Mode
		2.13	Updated the command ^RESET–Delay the Module Reset Function
		3.7	Added the command ^DSN–Query Module’s MEID/ESN
		3.14	Updated the command ^NSI–Query Cell Information
		6.6	Updated the command ^RFSWITCH–Set the Flight Mode



Document Version	Date	Chapter	Descriptions
		6.7	Updated the command ^RFSWITCH–Report the RFSWITCH State
		6.8	Updated the command +CSQ–Query the RSSI
		11.8.3	Updated the parameter description of <n>
		11.11	Added the command ^ECHOPARA–Set Echo Parameters
04	2013-08-27	3.17	Added the command ^BSIN–Query System Basic Information
		5.7	Added the command ^STRIPUSB–Shield USB Communication
		6.20	Added the command ^SHDRMODE–Configure S-HDR Mode
		6.21	Added the command ^ANTDTCT–Query the Status of ANTDET
		6.22	Added the command ^ANTDTCT–Indicate the Status of ANTDET When It Changes
		15	Added the chapter Update Commands

## Scope

MC509

MC509-a

## Firmware Version

MC509TCPU- 11.106.22.00.00

Please read the Release Notes released with the firmware before using  
MC509/MC509-a module and this document.



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# 1 Overall Description

---

This chapter briefly describes the contents and organization of this document and focuses on the basic knowledge of AT command interfaces.

## 1.1 Content Description

This document describes the AT command interface specification that is supported by Huawei terminal product MC509&MC509-a module. This document describes certain AT commands (implemented by terminal devices) of international standards such as TIA/EIA/IS-707-A.3, GSM 07.07, GSM 07.05, and International Telecommunication Union-Telecommunication Standardization Sector (ITU-T) V.250 according to the requirements of terminal devices. In addition, this document describes the proprietary AT command interfaces that are implemented by terminal devices.

This document does not describe the interfaces that have been defined by standards or implemented by the mobile terminal (MT) but are not required by the MC509&MC509-a. The description of AT command interfaces covers only the data packets of interfaces and the methods and processes for the terminal equipment (TE) and the MT to use interfaces, excluding the contents that are not directly related to interfaces. In addition, this document describes only the AT command interfaces falling within the range of Rm interfaces between the TE and MT, excluding the AT command interfaces falling within the range of Um interfaces between the MT and interworking function (IWF).

## 1.2 Product Description

The MC509&MC509-a provides one external UART interface and supports functions such as short message service (SMS), phone book, data service, and embedded TCP/UDP.

## 1.3 Instructions for Use

You are not advised to use various parameter values that are not described in this document or not supported currently as described in this document.

The AT command parameters described in the following chapters are in two formats: <> and [], which are described as follows:

<...>: The parameter inside these angle brackets is mandatory. The <> does not exist in a command.

[...]: The parameter inside these square brackets is optional. The [] does not exist in a command or a response.

<CR>: Carriage return character. For details, see the description in S3.

<LF>: Line feed character. For details, see the description in S4.

When an AT command is sent, the characters contained in the name and parameters (excluding SMSs, phone book, and operator name) of the AT command are case insensitive. All the characters contained in the result returned by the AT command must be in upper case (excluding SMSs, phone book, operator name and error messages).

When an AT command is sent, string parameters can be placed inside quotation marks or not.

## 1.4 Overview of AT Command Interfaces

### 1.4.1 Description of AT Commands

An AT command controls the rules for interaction between the TE such as PC and MT such as MS. Figure 1-1 shows the interaction between the TE and MT.

**Figure 1-1** Interaction between the TE and MT

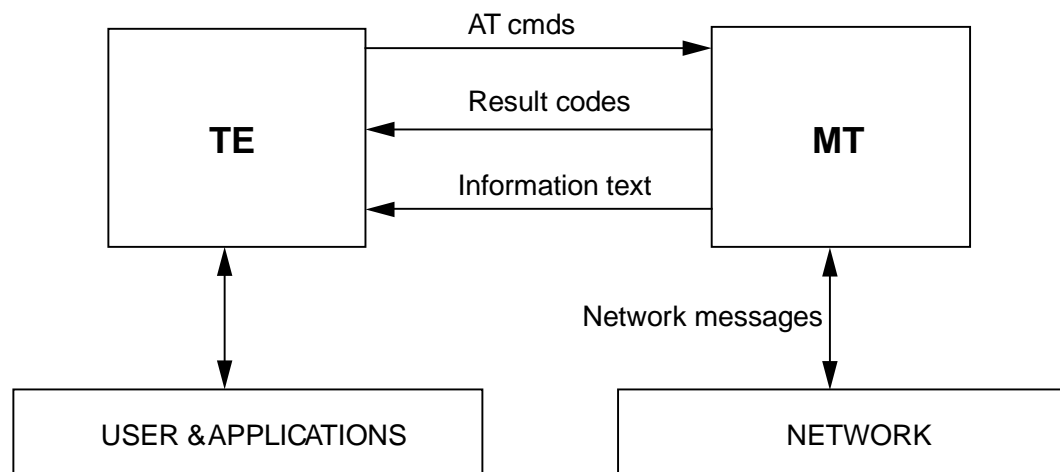
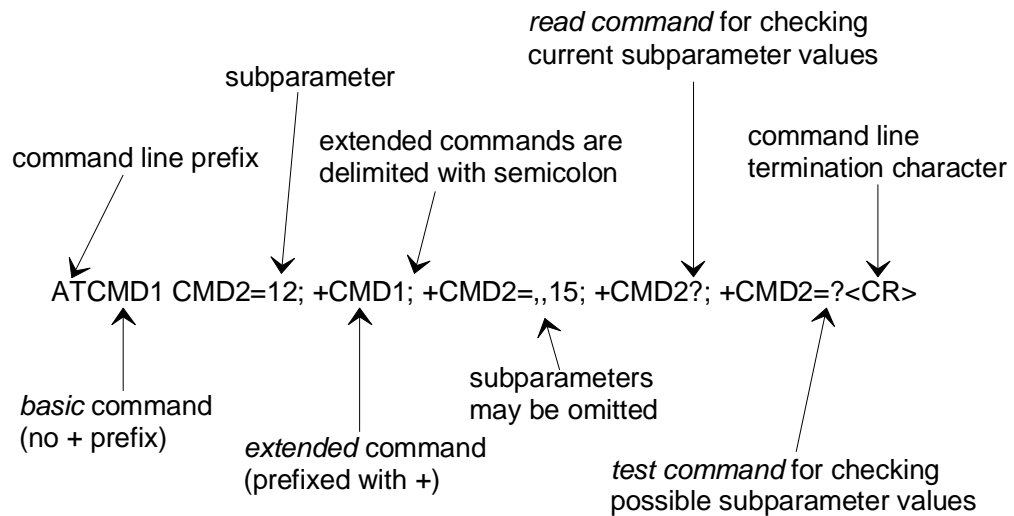




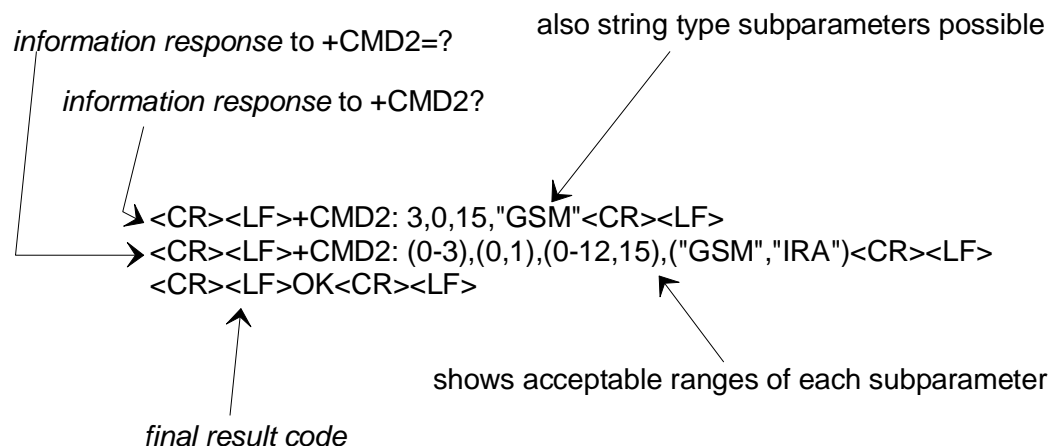
Figure 1-2 shows the basic organization format of the AT command line.

**Figure 1-2** Basic organization format the AT command line



The returned value of the AT command consists of two parts: response message and result codes. Figure 1-3 shows an example of returned value of the AT command.

**Figure 1-3** An example of returned value of the AT command



## 1.4.2 Types of AT Commands

AT commands are categorized into three types: basic commands, S register commands, and extended and vendor-defined commands.

A basic command starts with a single letter or with the & symbol plus a single letter. Table 1-1 describes the format of a basic command.

**Table 1-1** Format of a basic command

Command Format	Description
<command>[<number>]	<p>In the command format, &lt;command&gt; indicates a single letter (A–Z) or the &amp; symbol plus a single letter.</p> <p>In the command format, &lt;number&gt; indicates a decimal number with one digit or multiple digits. The digit 0 at the start of &lt;number&gt; can be ignored.</p>
<b>Notes:</b> <ul style="list-style-type: none"> <li>• If a basic command that is allowed to contain &lt;number&gt; does not contain &lt;number&gt;, the default value of &lt;number&gt; is used in the command.</li> <li>• If a basic command that is not allowed to contain &lt;number&gt; contains &lt;number&gt;, "ERROR" or "+CME ERROR : operation not allowed" is returned.</li> </ul>	

An S register command consists of the letter S and a decimal number, which is called the parameter number of the register. An S register command can be in the format of read command and set command. Table 1-2 describes the format of an S register command.

**Table 1-2** Format of an S register command

Command Format		Description
Read command	S<parameter number>?	Returns the ASCII code of characters currently saved in the S register. The ASCII code is expressed by a 3-digit decimal number. The digit 0 is added in the front of the number in case of insufficient digits.
Set command	S<parameter number>=<value>	Replaces the characters saved in the S register with the characters related to the value of <value>.
<b>Note:</b> <p>If the parameter number of the register is not identified, this indicates that the command does not exist. In this case, ERROR is returned.</p>		

All extended commands start with the + symbol. Vendor-defined commands start with a special symbol such as ^ and %. In this document, all vendor-defined commands start with the ^ symbol. Extended and vendor-defined commands are further categorized into action commands and parameter commands. Table 1-3 describes the types and formats of extended and vendor-defined commands.

An action command refers to a command that performs a specific action in addition to interacting with the local parameters of the MS, including +CPBR and ^HCMGS. An action command may or may not contain parameters. Action commands are categorized into execution (write) command and test command. A parameter command refers to a command that interacts with the local parameters of the MT only, certain of which may affect the execution of action commands. Parameter commands are categorized into set command, read command, and test command.

**Table 1-3** Types and formats of extended and vendor-defined commands

Command Type	Command Format		Description
Action command	Execution (write) command	Contains no parameter: <name> Contains one parameter: <name>[=<value>] Contains multiple parameters: <name>[=<compound_value>]	In the command format, <compound_value> indicates multiple parameters that are separated by a comma. A parameter having a default value can be omitted from the command. In this case, the default value is used instead.
		<b>Note:</b> If all parameters are omitted, the = symbol following <name> should be omitted. If <name> is not identified, this command does not exist. In this case, the ERROR is returned. When <name> is identified, if a command that is not allowed to contain parameters contains parameters or a command that is allowed to contain parameters contains more parameters than the defined ones, "ERROR" or "+CME ERROR: operation not allowed" is returned.	
	test command	<name>=?	A test command is executed to query the parameter range.
		<b>Note:</b> If the MS fails to identify <name>, the MT returns ERROR. If the MT can identify <name> and the contents returned by the command do not contain parameters, the MS returns OK. If the contents returned by the command contain parameters, the MS returns the available value range of each parameter, and then returns OK.	
Parameter command	Set command	Contains one parameter: <name>[=<value>] Contains multiple parameters: <name>[=<compound_value>]	A set command is executed to set parameters. In the command format, <compound_value> indicates multiple parameters that are separated by a comma. A parameter with a default value can be omitted from the command. In this case, the default value is used instead.

Command Type	Command Format		Description
		<b>Note:</b> If all parameters are omitted, the = symbol following <name> should be omitted. If <name> is not identified, this command does not exist. In this case, ERROR is returned. When <name> is identified, if a command that is not allowed to contain parameters contains parameters or a command that is allowed to contain parameters contains more parameters than the defined ones, "ERROR" or "+CME ERROR : operation not allowed" is returned.	
	Read command	<name>?	A read command is executed to read the current value of a parameter.
	test command	<name>=?	A test command is executed to check the parameter range.
		<b>Note:</b> If the MS fails to identify <name>, the MT returns ERROR. If the MT can identify <name> and the contents returned by the command do not contain parameters, the MS returns OK. If the contents returned by the command contain parameters, the MS returns the value range of each parameter, and then returns OK.	

### 1.4.3 Abort Attributes of AT Commands

Abort means that the TE sends an instruction to abort a command when the command is being executed. An abort instruction must be sent before a command is completely executed. Therefore, the abort instruction is valid for a command whose execution consumes certain time; however, not all commands of this kind can be aborted. Whether a command can be aborted depends on the abort attribute of the command. Each AT command has its abort attribute, which is alternative. That is, the command is either abortive or not abortive. Abortive commands include certain basic commands and execution commands of action commands. Within 125 ms after the abortive commands are sent, no abort request is accepted. After 125 ms and before the commands are completely executed, if the module receives any character sent by the TE, the commands are aborted immediately.

### 1.4.4 Rules for Running AT Commands

- Each command line contains only one AT command and ends with a carriage return character, in addition to the basic standard commands such as 1, V, S3 etc. In principle, users are not allowed to run S3/S4 format modification commands. This rule is applicable to the communication between the MT and TE programs.
- To increase the readability and regularity of command and response formats, in addition to the original interfaces specified in standards and protocols, all new interfaces must observe the following rule: No space is added to the end of commands such as the AT^XXX=<arg0>,<arg1> commands, or added to the end of the ^ symbol, colon, and comma. No redundant space is added ahead of

or to the end of a command. This rule is applicable to the communication between the MT and TE programs.

3. For an uninterruptible AT command, after sending the AT command, the TE must wait until the MT responds to the AT command before sending the second AT command.
4. A string used by the TE to send a command cannot contain the combination of quotation marks and commas (confusing a parameter with a string). The current version does not support escape character. The code value of a data format in the UCS2 encoding is reported as characters. For example, if the UCS2 code of a Chinese character is 0x553a, the 553a is reported.
5. A possible response sent by the MT to the TE consists of Information text and Result code, in which Information text is optional and Result code is mandatory. The format of a possible response is controlled by the ATV command. For details, see the description of the ATV Command. In this document, all possible responses listed in tables follow the ATV1 format.

## 1.5 Organization of This Document

This document consists of 15 chapters, covering the following contents:

Chapter	Description
Chapter 1 Overall Description	The contents and organization of this document and the basic knowledge of AT command interfaces.
Chapter 2 Basic Configuration Commands	The AT commands used to configure the basic data of the module.
Chapter 3 Identity Information Query Commands	The AT commands used to query the identity information.
Chapter 4 Security Control Commands	The AT commands used to control the security of the module.
Chapter 5 Serial Port Control Commands	The AT commands used to control the serial ports of the module.
Chapter 6 Network Service Interface Commands	The AT commands related to the network services of the module.
Chapter 7 Call Control Commands	The AT commands used to control the calls on the module.
Chapter 8 SMS Interface Commands	The AT commands related to the short messages of the module.
Chapter 9 Phonebook Interface Commands	The AT commands related to the phonebook interface of the module.
Chapter 10 Internet Service Interface Commands	The AT commands related to the internet services of the module.
Chapter 11 Audio Commands	The AT commands related to the audio interface of the module.



Chapter	Description
Chapter 12 Wakeup Commands	The AT commands related to wakeup interface of the module.
Chapter 13 SAR Commands	The AT commands related to control the SAR of the module.
Chapter 14 GPS Commands	The AT commands related to the GPS of the module.
Chapter 15 Update Commands	The AT commands related to the update commands of the module.
Chapter 16 Appendix	Appendix

# 2 Basic Configuration Commands

## 2.1 E-Echo Command

### 2.1.1 Syntax

Command	Possible Response(s)
E[<value>]	<CR><LF>OK<CR><LF>

### 2.1.2 Interface Description

This command sets whether the MT echoes the characters received from the TE.

**Note:**

The dial-up network, especially the automatic processing software automatically sends the ATE0 command to disable the echo mode, thus shortening the time for the client to parse the AT command.

### 2.1.3 Parameter Description

<value>:

0: The MT does not echo the characters received from the TE.

1: The MT echoes the characters received from the TE (default value after startup).

In case of using the command without <value>, <value> is set to 1.

**Note:**

After restart, <value> is set to 1.

## 2.2 S3-Command Line Termination Character

### 2.2.1 Syntax

Command	Possible Response(s)
S3=<value>	<CR><LF>OK<CR><LF>
S3?	<CR><LF><value><CR><LF><CR><LF>OK<CR><LF>

### 2.2.2 Interface Description

This command sets the command line termination character S3. S3 saves the command line termination character in the ASCII code format. The character is sent by the TE to indicate the termination of a command line, which is identified and confirmed by the MT. The character is also sent by the MT to compose the headers, tails, and end flags of the result code and response information.

When running S3=<value> to set S3, use the current S3 as the termination character. The new S3 will be immediately returned with the result code.

### 2.2.3 Parameter Description

<value>: a decimal number ranges from 000 to 127, indicating the ASCII code of the character. The default value is 013.

**Note:**

ATS3=1 is equivalent to ATS3=001.

## 2.3 S4-Response Format Character

### 2.3.1 Syntax

Command	Possible Response(s)
S4=<value>	<CR><LF>OK<CR><LF>
S4?	<CR><LF><value><CR><LF><CR><LF>OK<CR><LF>



## 2.3.2 Interface Description

This command sets the response format character S4. S4 saves the response format character in the ASCII code format. The character is sent by the MT to compose the headers, tails, and end flags of the result code and response information.

If the S4 character is changed by the command, the new S4 will be immediately returned with the result code of the command.

## 2.3.3 Parameter Description

<value>: a decimal number ranges from 000 to 127, indicating the ASCII code of the character. The default value is 010.

**Note:**

ATS4=1 is equivalent to ATS4=001.

## 2.4 S5-Backspace Character

### 2.4.1 Syntax

Command	Possible Response(s)
S5=<value>	<CR><LF>OK<CR><LF>
S5?	<CR><LF><value><CR><LF><CR><LF>OK<CR><LF>

## 2.4.2 Interface Description

This command sets the backspace character S5. S5 saves the backspace character in the ASCII code format. The character is sent by the TE as a request to delete the previous character and is identified and confirmed by the MT.

## 2.4.3 Parameter Description

<value>: a decimal number ranges from 000 to 127, indicating the ASCII code of the character. The default value is 008.

**Note:**

ATS5=1 is equivalent to ATS5=001.

## 2.5 V-Set the Response Format

### 2.5.1 Syntax

Command	Possible Response(s)
V[<value>]	<CR><LF>OK<CR><LF>

### 2.5.2 Interface Description

This command sets the format of the result code and information field in response to an AT command, including the composition of the header and the tail and the form of the returned result code content. The returned result code content has two formats, namely, digit, and detailed string.

The following table describes the impact of the format setting on the format of the result code and the response information field. <CR> indicates the S3 character and <LF> indicates the S4 character.

	V0	V1
Response information field	<text><CR><LF>	<CR><LF><text><CR><LF>
Result code	<numeric code><CR>	<CR><LF><verbose code><CR><LF>

The following table describes the format comparison of the returned result code content.

String Format (V1)	Digit Format (V0)	Meaning
OK	0	The command is successfully executed.
CONNECT	1	The connection is successfully established.
RING	2	The MT rings.
NO CARRIER	3	The connection fails to be established or the MT hangs up.
ERROR	4	The command is unavailable or the line of commands is too long; therefore, an error is returned.
NO DIALTONE	6	There is no dialing tone.
BUSY	7	The called subscriber is busy.
NO ANSWER	8	There is no answer.

## 2.5.3 Parameter Description

<value>:

0: The MT sends an abbreviated header and tail and adopts the result code in the digit format.

1: The MT sends a complete header and tail and adopts the result code in the detailed string format (default value after startup).

In case of using the command without <value>, <value> is set to 0.

## 2.6 Q-Control Return of the Execution Result

### 2.6.1 Syntax

Command	Possible Response(s)
Q[<value>]	<CR><LF>OK<CR><LF>

### 2.6.2 Interface Description

This command sets whether the MT returns the execution result to the TE.

### 2.6.3 Parameter Description

<value>:

0: The MT returns the execution result (default value after startup).

1: The MT does not return the execution result.

In case of using the command without <value>, <value> is set to 0.

## 2.7 &F-RestoreFactory Settings

### 2.7.1 Syntax

Command	Possible Response(s)
&F	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>

## 2.7.2 Interface Description

This command sets the related parameters to the default values set by the manufacturer.

The following parameters can be specified by running this command:

Command	Parameter
E	1
V	1
Q	0
&C	1
&D	2
&S	0
S0	000
S3	013
S4	010
S5	008
+IFC	0,0
+ICF	3,3
+CMEE	2

## 2.8 &V-Query the Current Configuration

### 2.8.1 Syntax

Command	Possible Response(s)
&V	<CR><LF>Parameter list<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>

## 2.8.2 Interface Description

This command queries the values of currently configured parameters.

The following parameters can be queried by running this command:

Command	Parameter
E	<value>
V	<value>
Q	<value>
&C	<value>
&D	<value>
&S	<value>
S0	<value>
S3	<value>
S4	<value>
S5	<value>
+CNMI	<mode>,<mt>,<bm>,<ds>,<bfr>
+IPR	<rate>
+CMEE	<n>

## 2.9 A/-Repeat the Previous Command

### 2.9.1 Syntax

Command	Possible Response(s)
A/	Repeats the responses returned by the previous AT command.

### 2.9.2 Interface Description

This command repeats the previous AT command. This command does not require the user to press **Enter**.

### 2.9.3 Example

If the last command is:

AT+CGSN

81042940

OK

A/

81042940

OK

## 2.10 +CMEE–Set the Error Report Format

### 2.10.1 Syntax

Command	Possible Response(s)
+CMEE=<n>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
+CMEE?	<CR><LF>+CMEE:<n><CR><LF><CR><LF>OK<CR><LF>
+CMEE=?	<CR><LF>+CMEE: (list of supported <n>s)<CR><LF><CR><LF>OK<CR><LF>

### 2.10.2 Interface Description

This command sets whether the returned value uses "+CME ERROR:<err>" to indicate an error related to the MT. If the returned value uses "+CME ERROR:<err>" to indicate an error related to the MT, the error related to the MT generates "+CME ERROR:<err>" to replace "ERROR". When the error cause is unrelated to the MT, "ERROR" is returned.

### 2.10.3 Parameter Description

<n>:

0: The returned value of "+CME ERROR:<err>" is not used, and only "ERROR" is returned in the case of an error.

1: The returned value of "+CME ERROR:<err>" is used, and <err> uses the number value of the error.

2: The returned value of "+CME ERROR:<err>" is used, and <err> uses the detailed string value of the error (default value after startup).

After restart, the value of <n> is 2.

<err>: for its value, see section 16.1 "CME ERROR List."

## 2.11 +CFUN-Set the Operating Mode

### 2.11.1 Syntax

Command	Possible Response(s)
+CFUN[=<fun>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CFUN?	<CR><LF>+CFUN:<fun><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CFUN=?	<CR><LF>+CFUN:(list of supported <fun>s)<CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 2.11.2 Interface Description

The EXECUTION command sets the operating mode of the MT.

The current operating mode is returned when the READ command is executed.

The supported parameter value is returned when the TEST command is executed.

### 2.11.3 Parameter Description

<fun>:

0: The operating mode is set to the low power consumption (LPM) mode (the previous operating mode of the MT must be the non-offline mode).

1: The operating mode is set to the online mode (the previous operating mode of the MT must be the non-offline mode) (default value after startup).

4: The operating mode is set to the offline mode (the previous operating mode of the MT must be the non-FTM mode).

5: The operating mode is set to the FTM mode (the previous operating mode of the MT must be the online mode).

6: Reset the MT (the previous operating mode of the MT must be the offline mode).

**Note:**

If the AT+CFUN command is executed without parameters, the operating mode is set to the LPM mode.

## 2.12 ^VOLT-Query the Voltage

### 2.12.1 Syntax

Command	Possible Response(s)
^VOLT	<CR><LF>^VOLT: <voltage><CR><LF><CR><LF>OK<CR><LF>  In case of an MT-related error: <CR><LF>ERROR<CR><LF>

### 2.12.2 Interface Description

This command queries the current voltage.

### 2.12.3 Parameter Description

<voltage>: units of mV.

## 2.13 ^RESET-Delay the Module Reset Function

### 2.13.1 Syntax

Command	Possible Response(s)
^RESET[=<delay_time>]	<CR><LF>OK<CR><LF>  In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^RESET?	<CR><LF>^RESET:<delay_time><CR><LF><CR><LF> >OK<CR><LF>
^RESET=?	<CR><LF>^RESET:(list of supported <delay_time>s)<CR><LF><CR><LF>OK<CR><LF>

### 2.13.2 Interface Description

This command restarts the MT.

### 2.13.3 Parameter Description

<delay\_time>: delay time.

0: Module reset immediately.

1–65535: Delay time in second.



**Note:**

AT^RESET without a parameter is equivalent to AT^RESET=0.

## 2.14 ^MSO-Shutdown Command

### 2.14.1 Syntax

Command	Possible Response(s)
^MSO	<CR><LF>OK<CR><LF>

### 2.14.2 Interface Description

This command powers off the MT. When the command is executed, the MT logs out of the network, saves subscriber data, and then is shut down.

## 2.15 ^HS-Shake Hands with the TE

### 2.15.1 Syntax

Command	Possible Response(s)
^HS=<id>,<action>	<CR><LF>^HS:<id>,<protocol>,<is_offline>,<product_class>,<product_id>[,<software_id>]<CR><LF><CR><LF>OK<CR><LF>

### 2.15.2 Interface Description

This command initiates a handshake between the TE and the MT.

### 2.15.3 Parameter Description

<id>: consists of eight hex digits. It indicates the ID reported by the MT for identifying the MT. When the TE sends this command for the first time, id is set to 0, and then id is set to the value reported by the MT.

<action>: specifies the action type of the TE.

0: The TE is active (If the TE sends this command for the first time, it indicates startup).

1: The TE is stopped.

<protocol>: specifies the current communication protocol status of the MT.

0: The MT runs in the APP state.

<is\_offline>:

0: Online state

1: Offline state (reserved and not supported currently)

2: LPM

<product\_class>: specifies the product type.

2: Code division multiple access (CDMA) 1X + EVDO

<product\_id>: specifies the product ID.

0: MC509

<software\_id>: reserved and not supported currently.

## 2.15.4 Example

```
AT^HS=0,0
```

```
^HS:494BBC7E,0,0,2,0
```

```
OK
```

## 2.16 ^IOCTRL-Control the GPIO

### 2.16.1 Syntax

Command	Possible Response(s)
<code>^IOCTRL=&lt;sel&gt;,&lt;options&gt;,&lt;value&gt;</code>	<code>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</code> In case of an MT-related error: <code>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</code>
<code>^IOCTRL?</code>	<code>&lt;CR&gt;&lt;LF&gt;^IOCTRL:&lt;options&gt;,&lt;value&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</code>
<code>^IOCTRL=?</code>	<code>&lt;CR&gt;&lt;LF&gt;^IOCTRL:(list of supported &lt;sel&gt;s),(list of supported &lt;options&gt;s),(list of supported &lt;value&gt;s)&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</code>

### 2.16.2 Interface Description

The interface is provided to the GPIO pins on the AT command to the guest operating.

The TEST command is used to return the parameters and the range of the AT commands supported.

This command controls 7 GPIO pins, set the command for each parameter (from left to right) corresponding to the LGA pins are as follows:



GPIO PIN:	7	6	5	4	3	2	1
LGA PIN:	113	109	105	55	51	46	44

**Note:**

Resetting the module will reset the value to default value.

## 2.16.3 Parameter Description

<sel>: enable GPIOs.

0000000: Disable any GPIO.

0000001: Enable GPIO1

0000010: Enable GPIO2

... ...: Enable or disable some GPIO.

1111111: Enable ALL GPIO.

<options>: set the GPIO's mode.

0000000: All GPIO are set to input mode.

0000001: GPIO1 is set to output mode, others are set to input mode.

0000010: GPIO2 is set to output mode, others are set to input mode

... ...: Set some GPIO's mode.

1111111: All GPIO are set to output mode.

<value>: if the GPIO mode is output, the value can be set.

0000000: All GPIO are set LOW .

0000001: GPIO1 is set HIGH, others are LOW

0000010: GPIO2 is set HIGH, others are LOW

... ...: Set some GPIO's value.

1111111: All GPIO are set HIGH.

## 2.16.4 Example

```
AT+IOCTRL=0000001,0000001,0000001
```

```
OK
```

# 3 Identity Information Query Commands

## 3.1 I-Query Product Identity Information

### 3.1.1 Syntax

Command	Possible Response(s)
I[<value>]	<CR><LF><module info><CR><LF><CR><LF>OK<CR><LF>

### 3.1.2 Interface Description

This command queries identity information related to the MT, including manufacturer information (+GMI), product model (+GMM), software version (+GMR), and electronic serial number (ESN)/international mobile equipment identity (IMEI) (+GSN).

### 3.1.3 Parameter Description

<value>:

0: The preceding identity information is queried.

In case of using the command without <value>, <value> is set to 0.

### 3.1.4 Example

ATI

Manufacturer: +GMI: Huawei Technologies Co., Ltd.

Model: MC509

Revision: 11.106.02.00.000

ESN: +GSN: 80761abd

+GCAP: +CIS707-A,CIS-856-A,+MS, +ES, +DS, +FCLASS

OK

## 3.2 +CGMI/+GMI-Query Manufacturer Information

### 3.2.1 Syntax

Command	Possible Response(s)
+CGMI or +GMI	<CR><LF><manufacturer><CR><LF><CR><LF>OK<CR><LF>
+CGMI=? or +GMI=?	<CR><LF>OK<CR><LF>

### 3.2.2 Interface Description

This command queries manufacturer information.

### 3.2.3 Parameter Description

<manufacturer>: a string without double quotation marks, indicating the manufacturer information.

### 3.2.4 Example

AT+CGMI

Huawei Technologies Co., Ltd.

OK

## 3.3 +CGMM/+GMM-Query Product Name

### 3.3.1 Syntax

Command	Possible Response(s)
+CGMM or +GMM	<CR><LF><production_name><CR><LF><CR><LF>OK<CR><LF>
+CGMM=? or +GMM=?	<CR><LF>OK<CR><LF>

### 3.3.2 Interface Description

This command queries product name information. The product name information can be presented in one or more lines of text, depending on the manufacturer. It is used to identifying the equipment model and may include the product name and any information provided by the manufacturer. The number of returned characters (including the termination character '\0') cannot exceed 2048.

### 3.3.3 Parameter Description

<production\_name>: a string without double quotation marks, indicating the product name.

### 3.3.4 Example

AT+CGMM

MC509

OK

## 3.4 +CGMR/+GMR-Query the Software Version

### 3.4.1 Syntax

Command	Possible Response(s)
+CGMR or +GMR	<CR><LF><softversion><CR><LF><CR><LF>OK<CR><LF>
+CGMR=? or +GMR=?	<CR><LF>OK<CR><LF>

### 3.4.2 Interface Description

This command queries the software version of the MT.

### 3.4.3 Parameter Description

<softversion>: indicates the software version. It is a string without double quotation marks, consisting of 31 characters at most.

### 3.4.4 Example

AT+CGMR

11.105.01.00.000

OK

## 3.5 +GSN-Query the ESN

### 3.5.1 Syntax

Command	Possible Response(s)
+GSN	<CR><LF>+GSN:<ESN><CR><LF><CR><LF>OK<CR><LF>
+GSN=?	<CR><LF>OK<CR><LF>

### 3.5.2 Interface Description

This command queries the ESN of the MT.

**Notes:**

- The MT supports three UIM modes: R-UIM mode, ROM-UIM mode, and self-adaptive mode. When the MT is in ROM-UIM mode, only the ESN of the ROM-UIM in the MT is returned in response to this command. When the MT is in either of the other two modes, if an R-UIM card is inserted and successfully unblocked with the PIN, only the ESN of the R-UIM card is returned in response to this command. If no R-UIM card is inserted or unblocking the R-UIM card fails, the ESN of the ROM-UIM in the MT is returned.
- Unless otherwise specified, the MT is in self-adaptive mode by default.

### 3.5.3 Parameter Description

<ESN>: indicates the ESN. It is a string without double quotation marks, consisting of eight hex digits.

### 3.5.4 Example

AT+GSN

+GSN:80469bb7

OK

## 3.6 +CGSN-Query the ESN

### 3.6.1 Syntax

Command	Possible Response(s)
+CGSN	<CR><LF><ESN><CR><LF><CR><LF>OK<CR><LF>
+CGSN=?	<CR><LF>OK<CR><LF>

## 3.6.2 Interface Description

This command queries the ESN of the MT.

### Notes:

- The MT supports three UIM modes: R-UIM mode, ROM-UIM mode, and self-adaptive mode. When the MT is in ROM-UIM mode, only the ESN of the ROM-UIM in the MT is returned in response to this command. When the MT is in either of the other two modes, if an R-UIM card is inserted and successfully unblocked with the PIN, only the ESN of the R-UIM card is returned in response to this command. If no R-UIM card is inserted or unblocking the R-UIM card fails, the ESN of the ROM-UIM in the MT is returned.
- Unless otherwise specified, the MT is in self-adaptive mode by default.

## 3.6.3 Parameter Description

<ESN>: indicates the ESN. It is a string without double quotation marks, consisting of eight hex digits.

## 3.6.4 Example

AT+CGSN

80469bb7

OK

## 3.7 ^DSN-Query Module's MEID/ESN

### 3.7.1 Syntax

Command	Possible Response(s)
^DSN	<CR><LF>^DSN:[<meid>,<esn><CR><LF><CR><LF>OK<CR><LF>
^DSN=?	<CR><LF>OK<CR><LF>

## 3.7.2 Interface Description

This command queries the module's MEID/ESN. Unlike +GSN and ^MEID command, the module's MEID/ESN rather than the UIM card's MEID/ESN will be returned even if there is a UIM card.

## 3.7.3 Parameter Description

<esn>: module's ESN with hex.



<meid>: module's MEID with hex. It will not be returned when MEID is not written.

## 3.8 ^HWVER-Query the Hardware Version

### 3.8.1 Syntax

Command	Possible Response(s)
^HWVER	<CR><LF>^HWVER: <hardversion><CR><LF><CR><LF>OK<CR><LF>

### 3.8.2 Interface Description

This command queries the hardware version of the MT.

### 3.8.3 Parameter Description

<hardversion>: indicates the hardware version. It is a string without double quotation marks, consisting of 30 characters at most.

## 3.9 ^MEID-Query the MEID

### 3.9.1 Syntax

Command	Possible Response(s)
^MEID	<CR><LF>^MEID:<meid><CR><LF><CR><LF>OK<CR><LF>
^MEID=?	<CR><LF>OK<CR><LF>

### 3.9.2 Interface Description

This command queries the mobile equipment identifier (MEID) of the R-UIM card. If the R-UIM card is unavailable, the MEID of the MT is returned.

### 3.9.3 Parameter Description

<meid>: a string without double quotation marks, consisting of 14 hex digits. If the MEID does not exist, "00000000000000" is displayed.

### 3.9.4 Example

AT^MEID

^MEID:A0C72311111111

OK

## 3.10 +CIMI-Query the IMSI

### 3.10.1 Syntax

Command	Possible Response(s)
+CIMI	<CR><LF><IMSI><CR><LF><CR><LF>OK<CR><LF>
+CIMI=?	<CR><LF>OK<CR><LF>

### 3.10.2 Interface Description

This command queries the IMSI of the R-UIM card. If the R-UIM card is unavailable, the IMSI of the MT is returned.

### 3.10.3 Parameter Description

<IMSI>: a string consisting of decimal digits 0–9. Its structure is as follows:

There are a maximum of 15 characters.		
3 chars	2 or 3 chars	
MCC	MNC	MSIN

MCC: mobile country code

MNC: mobile network code

MSIN: mobile subscriber identification number

## 3.11 ^ICCID-Query the ICCID

### 3.11.1 Syntax

Command	Possible Response(s)
^ICCID?	<CR><LF>^ICCID:<uim_iccid><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
^ICCID=?	<CR><LF>OK<CR><LF>



### 3.11.2 Interface Description

This command queries the integrated circuit card identity (ICCID) of the R-UIM card.

**Note:**

The ICCID can also be queried when the R-UIM card is locked. If no R-UIM card is available, "ERROR" is returned.

### 3.11.3 Parameter Description

<uim\_iccid>: a string without double quotation marks, consisting of 20 hex digits.

### 3.11.4 Example

AT+ICCID?

+ICCID:89860309907552584689

OK

## 3.12 ^MDN-Set the MDN

### 3.12.1 Syntax

Command	Possible Response(s)
^MDN	<CR><LF>^MDN:<number><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^MDN=<number>	<CR><LF>^MDN: <number><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^MDN=?	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 3.12.2 Interface Description

The READ command queries the mobile directory number (MDN) of the R-UIM card. If no R-UIM card is available, the MDN of the MT is returned.



The SET command is used to set the mobile directory number (MDN) and storage into EF-MDN of R-UIM card. If the R-UIM card is not inserted, the mobile directory number (MDN) will be written into NV.

### 3.12.3 Parameter Description

<MDN\_num>: a string without double quotation marks, consisting of a maximum of 15 decimal digits, valid character include the '0'-'9', '\*', '#' and '+'.

### 3.12.4 Example

```
AT^MDN=123
```

```
^MDN:123
```

```
OK
```

```
AT^MDN
```

```
^MDN: 123
```

```
OK
```

## 3.13 ^SIQ-Query Signal Source Information

### 3.13.1 Syntax

Command	Possible Response(s)
^SIQ	<CR><LF>^SIQ: <band class>,<chan>,<sid>,<nid>,<pn>,<sci>,<ecio>,<rx_power>,<tx_power>,<tx_adj>,<fer>,<t_add>,<t_drop>,<t_comp>,<t_tdrop><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 3.13.2 Interface Description

This command queries the current signal source information of the MT.

Before the module registers with a network, some signal source information (such as <band\_class>, <chan>, <sci>, <ecio>, <rx\_power>, <tx\_power>, and <tx\_adj>) can be obtained when the module is searching for networks.

### 3.13.3 Parameter Description

<band class>: an integer indicating the ME's current frequency band.

0: 800 MHz

1: 1900 MHz

<chan>: an integer indicating the channel number of the ME's current primary cell.

<sid>: an integer indicating the system ID.

<nid>: an integer indicating the network ID.

<pn>: an integer indicating the pilot offset of the ME's current primary cell.

<sci>: an integer indicating the slot cycle index.

<ecio>: a floating-point value indicating the ME's pilot strength in dBm.

<rx\_power>: an integer indicating the strength (dBm) of the signals received by the ME.

<tx\_power>: an integer indicating the strength (dBm) of the signals transmitted by the ME.

<tx\_adj>: an integer indicating the ME's transmitted power adjustment.

<fer>: an integer indicating the ME's error rate in %.

<t\_add>: an integer; threshold of energy at which a pilot should be moved up to the Candidate Set.

<t\_drop>: an integer; threshold of energy at which a pilot should be dropped from the Active Set or Candidate Set.

<t\_comp>: an integer; margin by which a pilot must exceed an active set pilot to trigger a new power measurement report.

<t\_tdrop>: an integer; index of the duration for which a pilot must be below t\_drop before being dropped or reported.

## 3.14 ^NSI-Query Cell Information

### 3.14.1 Syntax

Command	Possible Response(s)
^NSI[=<nset_number>]	<p>&lt;CR&gt;&lt;LF&gt;^NSI: &lt;Active set number&gt;,&lt;ASPn1&gt;,&lt;ASECIO1&gt;[, ...,][ASPnN, ASECIOn],&lt;Candidate set number&gt;,&lt;CSPn1&gt;,&lt;CSECIOn&gt;[, ...,][CSPnN, CSECIOn],&lt;Neighbor set number&gt;,&lt;NSPN1&gt;,&lt;NSECIOn&gt;[, ...,][NSPNn, NSECIOn]&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</p> <p>In case of an MT-related error: &lt;CR&gt;&lt;LF&gt;+CME ERROR:&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</p>

### 3.14.2 Interface Description

This command queries the pilot frequency offsets and strengths of cell active sets, candidate sets, and neighbor sets (up to 20 neighbor sets).

AT<sup>^</sup>NSI is equivalent to AT<sup>^</sup>NSI=6.

If no pilot sets exist, 'N' is returned for the PN (such as <ASPN1>) and ECIO (such as <ASECIO1>) parameters.

If the number of neighbor cells queried is less than the number of neighbor cells set by AT<sup>^</sup>NST or the number of neighbor cells by default, the actual number of neighbor cells will be returned;

If the number of neighbor cells queried is greater than the the number of neighbor cells set by AT<sup>^</sup>NST or the number of neighbor cells by default, the number of neighbor cells set by AT<sup>^</sup>NST or the number of neighbor cells by default will be returned.

### 3.14.3 Parameter Description

<nset\_number>: an integer indicating the number of neighbor cells to be queried. The value ranges from 1 to 20.

<Active set number>: an integer indicating the number of active sets. If the value is 0, the corresponding PN and ECIO values are displayed as 'N', indicating that the values are null.

<ASPN1>: an integer indicating the PN value of active set 1.

<ASECIO1>: a floating-point value indicating the pilot strength (dBm) of active set 1.

<ASPNn>: an integer indicating the PN value of active set n.

<ASECION>: a floating-point indicating the pilot strength (dBm) of active set n.

<Candidate set number>: an integer indicating the number of candidate sets. If the value is 0, the corresponding PN and ECIO values are displayed as 'N', indicating that the values are null.

<CSPN1>: an integer indicating the PN value of candidate set 1.

<CSECIO1>: a floating-point indicating the pilot strength (dBm) of candidate set 1.

<CSPNn>: an integer indicating the PN value of candidate set n.

<CSECION>: a floating-point indicating the pilot strength (dBm) of candidate set n.

<Neighbor set number>: an integer indicating the number of neighbor cells. If the value is 0, the corresponding PN and ECIO values are displayed as 'N', indicating that the values are null.

<NSPN1>: an integer indicating the PN value of neighbor set 1.

<NSECIO1>: a floating-point indicating the pilot strength (dBm) of neighbor set 1.

<NSPNn>: an integer indicating the PN value of neighbor set n.

<NSECION>: a floating-point indicating the pilot strength (dBm) of neighbor set n.

## 3.15 ^BSINFO-Query Base Station ID and Protocol Version

### 3.15.1 Syntax

Command	Possible Response(s)
^BSINFO	<CR><LF>^BSINFO:<bs_id>,<protocol_ver><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 3.15.2 Interface Description

This command queries the current base station ID and protocol version.

### 3.15.3 Parameter Description

<bs\_id>: an integer indicating the base station ID.

<protocol\_ver>: an integer indicating the base station protocol version.

1: P\_REV\_JSTD008

3: P\_REV\_IS95A

4: P\_REV\_IS95B

6: P\_REV\_IS2000

7: P\_REV\_IS2000\_REL\_A

8: P\_REV\_IS2000\_REL\_B

9: P\_REV\_IS2000\_REL\_C

10: P\_REV\_IS2000\_REL\_C\_MI

11: P\_REV\_IS2000\_REL\_D

## 3.16 ^HDRINFO-Query EVDO Information

### 3.16.1 Syntax

Command	Possible Response(s)
^HDRINFO	<CR><LF>^HDRINFO: <band class>,<chan>,<bsid>,<rx_power><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 3.16.2 Interface Description

This command queries the current EVDO system information.

### 3.16.3 Parameter Description

<band class>: an integer indicating system band class.

<chan>: an integer indicating the channel number of the current serving system.

<bsid>: an integer indicating the base station ID.

<rx\_power>: an integer indicating the signal strength (dBm) received by the MT.

## 3.17 ^BSIN-Query System Basic Information

### 3.17.1 Syntax

Command	Possible Response(s)
^BSIN?	<CR><LF>^BSIN:<bsid>,<sid>,<nid>,<bslat>,<bslong><CR><LF><CR><LF>OK<CR><LF> In case of an error: <CR><LF>ERROR<CR><LF>

### 3.17.2 Interface Description

This command queries the current system basic information, including Base ID, System ID, Network ID, Base station latitude and Base station longitude. Only read command is supported.

### 3.17.3 Parameter Description

<bsid>: base station ID. The value range is from 0 to 65535. The value with null indicates that the MT is not registered with the network.



<sid>: current system ID. The value range is from 0 to 32767. The value with null indicates that the MT is not registered with the network.

<nid>: current Network ID. The value range is from 0 to 65535. The value with null indicates that the MT is not registered with the network.

<bslong>: Base station longitude. The unit is 0.25s. The value range is from –2592000 to 2592000 (that is, –180 degree to 180 degree). The positive number indicates east longitude, and the negative number indicates west longitude. The value with null indicates that the MT is not registered with the network.

<bslat>: Base station latitude. The unit is 0.25s. The value range is from –1296000 to 1296000 (that is, –90 degree to 90 degree). The positive number indicates north latitude, and the negative number indicates south latitude. The value with null indicates that the MT is not registered with the network.

### 3.17.4 Example

AT^BSIN?

^BSIN:11505,13844,2,0,0

OK

# 4 Security Control Commands

## 4.1 +CLCK-Enable the PIN and Querying the Status

### 4.1.1 Syntax

Command	Possible Response(s)
+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	When <mode>=2 and the command is successfully executed: <CR><LF>+CLCK:<status><CR><LF><CR><LF>OK<CR><LF> When <mode>≠2 and the command is successfully executed: <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CLCK=?	<CR><LF>+CLCK:(list of supported <fac>s)<CR><LF><CR><LF>OK<CR><LF>

### 4.1.2 Interface Description

The EXECUTION command locks or unlocks the R-UIM card and queries the locking status.

The TEST command queries the equipment supported by this command.

### 4.1.3 Parameter Description

<fac>: specifies the equipment on which this command is executed.

"SC": R-UIM card

<mode>: specifies the operation mode. The values are as follows:

0: Unlocking

1: Locking

2: Status query

<status>:

0: Deactivated

1: Activated

<passwd>: a string with double quotation marks. It should be the same as the password set by running the +CPWD command. This item is mandatory when mode is set to 0 or 1. The parameter value must be a string consisting of digits 0–9. Otherwise, "+CME ERROR" is returned.

<class>: reserved and not supported currently

## 4.2 +CPIN–PIN Management Command

### 4.2.1 Syntax

Command	Possible Response(s)
+CPIN=<pin>[,<newpin>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CPIN?	<CR><LF>+CPIN:<code><CR><LF><CR><LF>OK<CR><LF>
+CPIN=?	<CR><LF>OK<CR><LF>

### 4.2.2 Interface Description

The EXECUTION command verifies and unlocks the PIN and PIN2 codes.

If PIN or PIN2 is requested, run +CPIN=<pin> for verification.

If PUK or PUK2 is requested, run +CPIN=<pin>,<newpin> for unlocking. The first parameter is R-UIM PUK or R-UIM PUK2. The second parameter is the new PIN or PIN2 code.

If the PIN is not requested and the EXECUTION command is run, the error information +CME ERROR is returned.

**Notes:**

- If an emergency call is being originated, the emergency call may be disconnected when the PIN or PUK code is verified.
- Operation on PIN2 and PUK2 is not supported currently.
- The READ command queries whether the password is requested.

## 4.2.3 Parameter Description

<pin>, <newpin>: strings with double quotation marks. The string consists of digits 0–9 only. Otherwise, "+CME ERROR" is returned.

<code>: string (without quotation marks)

READY: The MT does not have a password entry request.

R-UIM PIN: UICC/R-UIM PIN password request.

R-UIM PUK: UICC/R-UIM PUK password request, and used to unlock the locked PIN code.

R-UIM PIN2: PIN2 password request (not supported currently).

R-UIM PUK2: PUK2 password request, and used to unlock the locked PIN2 code (not supported currently).

## 4.3 ^CPIN–PIN Extension Management Command

### 4.3.1 Syntax

Command	Possible Response(s)
^CPIN=<pin>[,<newpin>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^CPIN?	<CR><LF>^CPIN:<code>[,<times>],<puk_times>,<pin_times>[,<puk2_times>,<pin2_times>]<CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^CPIN=?	<CR><LF>OK<CR><LF>

### 4.3.2 Interface Description

The EXECUTION command verifies and unlocks the PIN and PIN2 codes.

If PIN or PIN2 is requested, run ^CPIN=<pin> for verification.

If PUK or PUK2 is requested, run ^CPIN=<pin>,<newpin> for unlocking. The first parameter is R-UIM PUK or R-UIM PUK2. The second parameter is the new PIN or PIN2 code.

If the PIN is not requested and the EXECUTION command is run, the error information +CME ERROR is returned.

**Notes:**

- If an emergency call is being originated, the emergency call may be disconnected when the PIN or PUK code is verified.
- Operation on PIN2 and PUK2 is not supported currently.
- The READ command queries whether the password is requested. The remaining number of password entry attempts is provided.

### 4.3.3 Parameter Description

<pin>, <newpin>: strings with double quotation marks. The characters in the string contain only 0–9. Otherwise, "+CME ERROR" is returned.

<code>: string (without quotation marks)

READY: The MT does not have a password entry request.

R-UIM PIN: UICC/R-UIM PIN password request.

R-UIM PUK: UICC/R-UIM PUK password request, and used to unlock the locked PIN code.

R-UIM PIN2: PIN2 password request (not supported currently).

R-UIM PUK2: PUK2 password request, and used to unlock the locked PIN2 code (not supported currently).

<times>: specifies the remaining number of entry attempts. For the PIN and PIN2 codes, the maximum number of entry attempts is 3. For the PUK and PUK codes, the maximum number of entry attempts is 10.

**Notes:**

- If the password is requested, the <times> field specifies the remaining number of entry attempts. If the password is not requested, this field is null.
- The PIN2 and PUK2 codes are not supported currently. Therefore, the remaining number of entry attempts for them is not displayed.

<puk\_times>: specifies the remaining number of PUK entry attempts, and the maximum number of entry attempts is 10.

<pin\_times>: specifies the remaining number of PIN entry attempts, and the maximum number of entry attempts is 3.

<puk2\_times>: specifies the remaining number of PUK2 entry attempts, and the maximum number of entry attempts is 10 (not supported currently).

<pin2\_times>: specifies the remaining number of PIN2 entry attempts, and the maximum number of entry attempts is 3 (not supported currently).

## 4.4 +CPWD-Change the Password

### 4.4.1 Syntax

Command	Possible Response(s)
+CPWD=<fac>,<oldpwd>,<newpwd>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CPWD=?	<CR><LF>+CPWD:(list of supported <fac>s),(list of supported <pwdlength>s)<CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 4.4.2 Interface Description

The EXECUTION command changes the PIN and PIN2 codes of the equipment.

The TEST command queries the supported equipment and the maximum length of the equipment password.

**Note:**

The password can be changed only when the PIN is enabled (that is, 1 is returned when the +CLCK command is executed for query).

### 4.4.3 Parameter Description

<fac>: a string with double quotation marks. <fac> specifies the equipment (only the R-UIM card is supported, with the value of SC) operated by this command.

"SC": Specifies the PIN code of the R-UIM card.

"P2": Specifies the PIN2 code of the R-UIM card (reserved and not supported currently).

<oldpwd>,<newpwd>: a string with double quotation marks, specifying the old password and new password. The maximum length is specified by <pwdlength>. The string consists of digits 0–9 only. Otherwise, "+CME ERROR" is returned.

<pwdlength>: specifies the maximum length of the password of the equipment lock.

### 4.4.4 Example

```
AT+CLCK="SC",2
+CLCK:1
```



OK

AT+CPWD="SC","1111","2222"

OK

# 5

## Serial Port Control Commands

### 5.1 &C-Set the Changing Mode of DCD Signals

#### 5.1.1 Syntax

Command	Possible Response(s)
&C[<value>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>

#### 5.1.2 Interface Description

This command sets the changing mode of DCD signals.

#### 5.1.3 Parameter Description

<value>:

0: DCD signals are always ON.

1: DCD signals are ON when there is a data carrier (default value after startup).

**Note:**

In case of using the command without <value>, <value> is set to 0.



## 5.2 &D-Set the MT Action in Response to the DTR Signals

### 5.2.1 Syntax

Command	Possible Response(s)
&D[<value>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>

### 5.2.2 Interface Description

This command sets the MT action when data terminal ready (DTR) signals change from ON to OFF.

### 5.2.3 Parameter Description

<value>:

0: The MT ignores the DTR status.

1: When DTR signals changes from ON to OFF, the MT switches to the command mode and maintains the current conversation (reserved and not supported currently).

2: When DTR signals changes from ON to OFF, the MT switches to the command mode and interrupts the current data conversation (CSD, packet-switched (PS) data service); when DTR=OFF, automatic answer is disabled (default value after startup).

**Note:**

In case of using the command without <value>, <value> is set to 0.

## 5.3 &S-Set the Changing Mode of DSR Signals

### 5.3.1 Syntax

Command	Possible Response(s)
&S[<value>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>

## 5.3.2 Interface Description

This command sets the changing mode of DSR signals.

## 5.3.3 Parameter Description

<value>:

0: DSR signals are always ON (default value after startup).

1: DSR signals are ON after the connection is established (reserved and not supported currently).

**Note:**

In case of using the command without <value>, <value> is set to 0.

## 5.4 +ICF–Set the Character Frame Format

### 5.4.1 Syntax

Command	Possible Response(s)
+ICF[=<format>[,<parity>]]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
+ICF?	<CR><LF>+ICF:<format>[,<parity>]<CR><LF><CR><LF>OK<CR><LF>
+ICF=?	<CR><LF>+ICF:(list of supported <format>s),(list of supported <parity>s)<CR><LF><CR><LF>OK<CR><LF>

## 5.4.2 Interface Description

The SET command is used to set the start and end (asynchronous) frame format of the current physical serial port on the MT. This format is used when the MT receives the command, information, and result code from the TE.

The READ command is used to query the start and end (asynchronous) frame format of the current physical serial port on the MT.

The TEST command is used to query the parameter value supported by AT+ICF.

## 5.4.3 Parameter Description

<format>:

3: Eight data bits and one stop bit (default value after startup)

<parity>:

0: Odd parity (reserved and not supported currently)

1: Even parity (reserved and not supported currently)

2: MARK (reserved and not supported currently)

3: SPACE (default value after startup)

**Notes:**

- AT+ICF is equivalent to AT+IFC=3,3.
- When the check bit of the physical serial port on the TE is set to None or Space, the TE can properly communicate with the MT.
- Currently, only "AT+ICF=3,3" is supported.

## 5.5 +IPR–Set the Fixed Baud Rate

### 5.5.1 Syntax

Command	Possible Response(s)
+IPR[=<rate>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
+IPR?	<CR><LF>+IPR:<rate><CR><LF><CR><LF>OK<CR><LF>
+IPR=?	<CR><LF>+IPR:(list of supported automatic detection baud rate),(list of supported <rate>s)<CR><LF><CR><LF>OK<CR><LF>

### 5.5.2 Interface Description

The SET command is used to set the baud rate of the current physical serial port on the MT and the baud rate takes effect immediately. The baud rate setting by this command will be stored when MT is powered down.

The READ command is used to query the baud rate of the current physical serial port on the MT.

The TEST command is used to query the parameter value supported by AT+IPR. Automatic detection of the baud rate is not supported currently. Therefore, the first returned parameter list is blank when the test command is executed.

**Notes:**

- Automatic detection of the baud rate is not supported currently. Therefore, the first returned parameter list is blank when the test command is executed. For example:  
+IPR:(),(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400)
- If the physical serial port baud rate is higher than the radio bearer rate, data may be lost when being transmitted.
- After the baud rate is changed, wait for a period of time (for example, 100 ms) before continuing the communication.

## 5.5.3 Parameter Description

<rate>: specifies the baud rate. It is a decimal integer. The values are as follows:

300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400.

**Note:**

AT+IPR without a parameter is equivalent to AT+IPR=115200.

## 5.6 +IFC–Set Flow Control

### 5.6.1 Syntax

Command	Possible Response(s)
+IFC[=<DCE_by_DTE>[,<DTE_by_DCE>]]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
+IFC?	<CR><LF>+IFC:<DCE_by_DTE>,<DTE_by_DCE><CR><LF><CR><LF>OK<CR><LF>
+IFC=?	<CR><LF>+IFC:(list of supported <DCE_by_DTE>s),(list of supported <DTE_by_DCE>s)<CR><LF><CR><LF>OK<CR><LF>

### 5.6.2 Interface Description

This command sets and queries bidirectional flow control.

The SET command is used to set up and down flow control.

The READ command is used to query up and down flow control.

The TEST command is used to query the parameter value supported by AT+IFC.

## 5.6.3 Parameter Description

<DCE\_by\_DTE>:

0: None (default value after startup)

1: Software flow control (XON/XOFF) (not supported currently)

2: Request to send (RTS) signal

3: XON/XOFF, and the XON/XOFF is sent to the remote TS to supplement local flow control (not supported currently).

<DTE\_by\_DCE>:

0: None (default value after startup)

1: XON/XOFF (not supported currently)

2: Clear to send (CTS) signal

**Note:**

AT+IFC is equivalent to AT+IFC=0,0.

## 5.7 ^STRIPUSB-Shield USB Communication

### 5.7.1 Syntax

Command	Possible Response(s)
^STRIPUSB[=<stripusb_status>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
^STRIPUSB?	<CR><LF>^STRIPUSB:<stripusb_status><CR><LF><CR><LF>OK<CR><LF>
^STRIPUSB=?	<CR><LF>^STRIPUSB:(list of supported <stripusb_status>s)<CR><LF><CR><LF>OK<CR><LF>

### 5.7.2 Interface Description

The SET command is used to shield the USB communication. The command is supported only in UART port. If the parameter is omitted, the default value is 1. If the value is 0, restore the USB communication (reserved, not supported currently). The USB communication can be restored only through resetting module.

The READ command returns the parameters value.

The TEST command returns the value range it supports.



**Note:**

If this command is executed before the asynchronous command processing is complete, it cannot be run successfully.

## 5.7.3 Parameter Description

<stripusb\_status>:

0: Restore USB communication (not supported currently).

1: Shield USB communication.

## 5.7.4 Example

```
AT^STRIPUSB=1
```

```
OK
```

```
AT^STRIPUSB?
```

```
^STRIPUSB:0
```

```
OK
```

```
AT^STRIPUSB=?
```

```
^STRIPUSB:(0-1)
```

```
OK
```

# 6 Network Service Interface Commands

## 6.1 ^SIMST-Change of UIM State Instructions

### 6.1.1 Syntax

Command	Possible Response(s)
	<CR><LF>^SIMST:<sim_state><CR><LF>

### 6.1.2 Interface Description

When the UIM state changes, the MT automatically reports the new state to the TE.

### 6.1.3 Parameter Description

<sim\_state>: UIM card state

1: UIM card status is valid

240: ROMSIM version

255: UIM card not exist

## 6.2 ^SYSINFO-Query System Information

### 6.2.1 Syntax

Command	Possible Response(s)
^SYSINFO	<CR><LF>^SYSINFO:<srv_status>,<srv_domain>,<roam_status>,<sys_mode>,<sim_state>[,<lock_state>,<sys_submode>]<CR><LF><CR><LF>OK<CR><LF>



## 6.2.2 Interface Description

This command queries the current system information, such as the system service state, domain, whether to roam, system mode, and state of the R-UIM card.

## 6.2.3 Parameter Description

<srv\_status>: indicates the system service state. The values are as follows:

- 0: No service
- 1: Restricted service (not supported by this product)
- 2: Valid service
- 3: Restricted regional service (not supported by this product)
- 4: Power-saving and deep sleep state

<srv\_domain>: indicates the service domain of the system. The values are as follows:

- 0: No service domain
- 1: Only CS service
- 2: Only PS service
- 3: PS+CS service
- 4: CS and PS are not registered, searching

255: This fixed value is always returned because the product does not support this parameter.

<roam\_status>: indicates the roaming state. The values are as follows:

- 0: Non-roaming state
- 1: Roaming state

<sys\_mode>: indicates the system mode. The values are as follows:

- 0: No service
- 2: CDMA mode
- 4: HDR mode
- 6: GPS mode
- 8: CDMA/HDR HYBRID

<sim\_state>: indicates the state of the R-UIM card. The values are as follows:

- 0: The state of the R-UIM card is invalid or the PIN code is locked.
- 1: The state of the R-UIM card is valid.
- 240: ROMSIM version
- 255: The R-UIM card does not exist.

<lock\_state>: not supported currently.



<sys\_submode>:

0: NOSRV

10: REV0

11: REVA

13: 1XRTT

## 6.3 ^DSDORMANT-Instructions into the Dormant

### 6.3.1 Syntax

Command	Possible Response(s)
	<CR><LF>^DSDORMANT:<dormant_state><CR><LF>

### 6.3.2 Interface Description

This command automatically reports whether MT is in dormant state or not.

If, for a specified period of time, no uplink or downlink data is transmitted over an established data service connection, either the network or the MT triggers the dormant mode and initiates this indication.

### 6.3.3 Parameter Description

<dormant\_state>: dormant state

0: Not dormant state

1: Dormant state

2–255: Reservations

## 6.4 ^MODE-Indicate the System Mode Change

### 6.4.1 Syntax

Command	Possible Response(s)
	<CR><LF>^MODE: <sys_mode>[,<sys_submode>]<CR><LF>

### 6.4.2 Interface Description

When the system mode changes, the MT automatically reports the change to the TE.

## 6.4.3 Parameter Description

<sys\_mode>: indicates the system mode. The values are as follows:

0: No service

2: CDMA mode

4: HDR mode

6: GPS mode

8: CDMA/HDR HYBRID

<sys\_submode>: indicates the system sub-mode. This parameter is not used in the product.

## 6.5 ^PREFMODE-Set the Network Mode

### 6.5.1 Syntax

Command	Possible Response(s)
^PREFMODE=<pref_mode>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^PREFMODE?	<CR><LF>^PREFMODE:<pref_mode><CR><LF> <CR><LF>OK<CR><LF>
^PREFMODE=?	<CR><LF>^PREFMODE:(list of supported <pref_mode>s)<CR><LF><CR><LF>OK<CR><LF> >

### 6.5.2 Interface Description

This command forced to set priorities network mode for the user.

### 6.5.3 Parameter Description

<pref\_mode>:

2: CDMA mode

4: HDR mode

8: CDMA/HDR HYBRID mode

## 6.6 ^RFSWITCH-Set the Flight Mode

### 6.6.1 Syntax

Command	Possible Response(s)
^RFSWITCH[=<SW state>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^RFSWITCH?	<CR><LF>^RFSWITCH:<SW state>,<HW state><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^RFSWITCH=?	<CR><LF>^RFSWITCH:(0-1),(0-1)<CR><LF><CR><LF>OK<CR><LF>

### 6.6.2 Interface Description

This command switches the RF and saves the corresponding value, the query features including pin LGA interface pin 45 status query which determines the state of the hardware switch.

^RFSWITCH feature is equivalent to +CFUN function (the two values are 0 and 1), based on the values save the corresponding value.

AT^RFSWITCH=0 equivalent to AT+CFUN=0

AT^RFSWITCH=1 equivalent to AT+CFUN=1

### 6.6.3 Parameter Description

<SW state>: state of RF software switch, the value for the two values: 0 and 1.

0: The state of RF software switch is set to off.

1: The state of RF software switch is set to on.

<HW state>: state of RF hardware switch, the value for the two values: 0 and 1.

0: The state of RF hardware switch is set to off.

1: The state of RF hardware switch is set to on.

### 6.6.4 Example

Query the current state of RF switch: (return information for the current state of the hardware switch is open, the software switch is off)

AT^RFSWITCH?

^RFSWITCH: 0,1

OK

## 6.7 ^RFSWITCH-Report the RFSWITCH State

### 6.7.1 Syntax

Command	Possible Response(s)
	<CR><LF>^RFSWITCH: <SW state>,<HW state><CR><LF>

### 6.7.2 Interface Description

This command reports the status of the W\_DISABLE# pin (pin 45) and RF software switch. Once the W\_DISABLE# pin or RF software switch changes, this command is reported.

### 6.7.3 Parameter Description

<SW state>: state of RF software switch, the value for the two values: 0 and 1.

0: The state of RF software switch is set to off.

1: The state of RF software switch is set to on.

<HW state>: state of RF hardware switch, the value for the two values: 0 and 1.

0: The state of RF hardware switch is set to off.

1: The state of RF hardware switch is set to on.

### 6.7.4 Example

When RF software and hardware are on and the status of RF software changes from on to off, the device will report the following:

^RFSWITCH: 0, 1

When RF software and hardware are on and the status of RF hardware changes from on to off, the device will report the following:

^RFSWITCH: 1, 0

## 6.8 +CSQ-Query the RSSI

### 6.8.1 Syntax

Command	Possible Response(s)
+CSQ or +CSQ?	<CR><LF>+CSQ:<rss>,<ber><CR><LF><CR><LF>OK <CR><LF>

Command	Possible Response(s)
+CSQ=?	<CR><LF>+CSQ:(list of supported <rss>s),(list of supported <ber>s)<CR><LF><CR><LF>OK<CR><LF>

## 6.8.2 Interface Description

The EXECUTION command queries the current receive signal strength indicator (RSSI) and bit error rate (BER) values.

The TEST command queries the current RSSI and BER values.

## 6.8.3 Parameter Description

<rss>: indicates the received signal strength. The values are as follows:

0: The strength is equal to or less than -124 dBm.

1: The strength is equal to -122 dBm or -123 dBm.

2-30: The strength is between -121 and -76 dBm.

31: The strength is equal to or greater than -75 dBm.

99: The strength is unknown or cannot be measured.

<ber>: a percentage value. BER query is not supported currently. "99" is returned when the execution command and the test command are executed.

## 6.9 ^CSQLVL-Query the Signal Bar

### 6.9.1 Syntax

Command	Possible Response(s)
^CSQLVL	<CR><LF>^CSQLVL:<rss>,<ber>,<rss_csq>,<ecio>,<sinr> <CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
^CSQLVL=?	<CR><LF>^CSQLVL:(list of supported <rss>s),(list of supported <ber>s),(list of supported <rss_csq>s),(list of supported <ecio>s),(list of supported <sinr>s)<CR><LF><CR><LF>OK<CR><LF>

## 6.9.2 Interface Description

The EXECUTION command returns the CDMA mode current RSSI, BER, RSSI\_CSQ, ECIO and SINR values.

The TEST command returns the list of supported RSSI, BER, RSSI\_CSQ, ECIO and SINR values.

### 6.9.3 Parameter Description

<rss>:indicates the received signal strength.

0: No signal

20: One bar

40: Two bars

60: Three bars

80: Four bars

99: Five bars

<ber>: a percentage value. BER query is not supported currently. "99" is returned when the execution command and the test command are executed.

<rss\_csq>: values of the received signal strength. The values are from -20 dBm to -125 dBm. When the value is -125 dBm, it has no signal (set by operator).

<ecio>(Energy Chip Interfere Other Cell): ranges from 5 to 512.

<sinr>(Signal to Noise Ratio): ranges from 0 to 8, Level 8 represents the highest SNR.

## 6.10 ^HDRCSQLVL-Query the HDR Signal Bar

### 6.10.1 Syntax

Command	Possible Response(s)
^HDRCSQLVL	<code>&lt;CR&gt;&lt;LF&gt;^HDRCSQLVL:&lt;rss&gt;,&lt;hdr_rssi&gt;,&lt;ecio&gt;,&lt;sinr&gt;</code> <code>&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</code> In case of an MT-related error: <code>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</code>
^HDRCSQLVL=?	<code>&lt;CR&gt;&lt;LF&gt;^HDRCSQLVL:(list of supported &lt;rss&gt;s),(list of supported &lt;hdr_rssi&gt;s),(list of supported &lt;ecio&gt;s),(list of supported &lt;sinr&gt;s)&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</code>

### 6.10.2 Interface Description

The EXECUTION command returns the HDR mode current RSSI, HDR\_RSSI, ECIO and SINR values.

The TEST command returns the list of supported RSSI, BER, RSSI\_CSQ, ECIO and SINR values.

## 6.10.3 Parameter Description

<rss>: indicates the received signal strength.

0: No signal

20: One bar

40: Two bars

60: Three bars

80: Four bars

99: Five bars

<hdr\_rssi >: values of the received signal strength. The values are from –20 to –125 dBm. when the value is –125 dBm, it has no signal (set by operator).

<ecio>(Energy Chip Interfere Other Cell): ranges from 5 to 512.

<snr>(Signal to Noise Ratio): ranges from 0 to 8, Level 8 represents the highest SNR.

## 6.11 ^RSSILVL–Report the RSSI

### 6.11.1 Syntax

Command	Possible Response(s)
	<CR><LF>^RSSILVL:<rss><CR><LF>

### 6.11.2 Interface Description

When the RSSI change exceeds a threshold, the MT automatically reports the RSSI to the TE.

### 6.11.3 Parameter Description

<rss>: indicates the received signal strength. The values are as follows:

0: No signal

20: One bar

40: Two bars

60: Three bars

80: Four bars

99: Five bars

## 6.12 ^HRSSILVL-Report the HDR RSSI

### 6.12.1 Syntax

Command	Possible Response(s)
	<CR><LF>^HRSSILVL:<rss><CR><LF>

### 6.12.2 Interface Description

When the HDR RSSI change exceeds a threshold, the MT automatically reports the RSSI to the TE.

### 6.12.3 Parameter Description

<rss>: indicates the received signal strength. The values are as follows:

0: No signal

20: One bar

40: Two bars

60: Three bars

80: Four bars

99: Five bars

## 6.13 ^RSSIREP-Set the Reporting of the RSSI

### 6.13.1 Syntax

Command	Possible Response(s)
^RSSIREP=<value>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^RSSIREP?	<CR><LF>^RSSIREP:<value><CR><LF><CR><LF> OK<CR><LF>
^RSSIREP=?	<CR><LF>^RSSIREP:(list of supported <value>s)<CR><LF><CR><LF>OK<CR><LF>

### 6.13.2 Interface Description

This command sets whether the signal strength is automatically reported.



The SET command is used to set whether the signal strength is automatically reported.

The READ command is used to query whether the signal strength is automatically reported.

The TEST command is used to query the current RSSI and BER values supported by AT^RSSIREP.

### 6.13.3 Parameter Description

<value>:

0: The signal strength is not reported.

1: The signal strength is reported (default value after startup).

## 6.14 ^CRSSI-Report the RSSI

### 6.14.1 Syntax

Command	Possible Response(s)
^CRSSI	<CR><LF>^CRSSI:<rssi><CR><LF><CR><LF>OK<CR><LF>
	<CR><LF>^CRSSI: <rssi><CR><LF>

### 6.14.2 Interface Description

The EXECUTION command queries the current receive signal strength indicator (RSSI).

When the RSSI change exceeds a threshold, the MT automatically reports the RSSI to the TE.

### 6.14.3 Parameter Description

<rssi>: indicates the received signal strength. The values are as follows:

0: The strength is equal to or less than -113 dBm.

1: The strength is equal to -111 dBm.

2-30: The strength is between -109 and -53 dBm.

31: The strength is equal to or greater than -51 dBm.

99: The strength is unknown or cannot be measured.

## 6.15 ^HDDRSSI-Report the HDR RSSI

### 6.15.1 Syntax

Command	Possible Response(s)
^HDDRSSI	<CR><LF>^HDDRSSI:<hdrssi><CR><LF><CR><LF>OK<CR><LF>
	<CR><LF>^HDDRSSI: <hdrssi><CR><LF>

### 6.15.2 Interface Description

The EXECUTION command queries the current receive signal strength indicator (RSSI).

When the HDR RSSI change exceeds a threshold, the MT automatically reports the HDR RSSI to the TE.

### 6.15.3 Parameter Description

<hdrssi>: indicates the received signal strength. The values are as follows:

0: The strength is equal to or less than -113 dBm.

1: The strength is equal to -111 dBm.

2-30: The strength is between -109 and -53 dBm.

31: The strength is equal to or greater than -51 dBm.

99: The strength is unknown or cannot be measured.

## 6.16 ^TIME-Query the System Time on the Network Side

### 6.16.1 Syntax

Command	Possible Response(s)
^TIME	<CR><LF>^TIME: <yyyy/mm/dd hh:mm:ss><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>

### 6.16.2 Interface Description

This command reads the current system time from the network. If the system time cannot be obtained, "ERROR" is returned.

## 6.16.3 Parameter Description

<yyyy>: year

<MM>: month

<dd>: day

<hh>: hour

<mm>: minute

<ss>: second

## 6.16.4 Example

AT^TIME

^TIME: 2010/07/24 17:35:04

OK

## 6.17 ^OTAACED-Query the OTA Activation Status

### 6.17.1 Syntax

Command	Possible Response(s)
^OTAACED?	<CR><LF>^OTAACED:<value><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>

### 6.17.2 Interface Description

This command queries whether the over-the-air (OTA) interface is activated. The initial value of <value> is 1. If the MT is activated through the OTA interface, the value is 1.

### 6.17.3 Parameter Description

<value>: specifies the OTA status.

0: Not activated

1: Activated

## 6.18 ^OTACMSG-Indicate the OTA Update Status

### 6.18.1 Syntax

Command	Possible Response(s)
	<CR><LF>^OTACMSG:<status><CR><LF>

### 6.18.2 Interface Description

This command reports the OTA update status.

### 6.18.3 Parameter Description

<status>: indicates the OTA update status.

0: Initialized

1: Over-the-air service provisioning (OTASP) programming started

2: Service Programming Lock unlocked

3: NAM parameters downloaded

4: MDN downloaded

5: IMSI downloaded

6: Preferred roaming list (PRL) file downloaded

7: OTASP commit successful

8: OTASP programming successful

9: OTASP programming unsuccessful

## 6.19 ^CURRSID-Query SID of The Current System

### 6.19.1 Syntax

Command	Possible Response(s)
^CURRSID? or ^CURRSID	<CR><LF>^CURRSID:<curr_sid>,<curr_nid>,<curr_evdo_subnetid><CR><LF><CR><LF>OK<CR><LF>
^CURRSID=?	<CR><LF>OK<CR><LF>

### 6.19.2 Interface Description

This command is used to query the SID/NID of the current system. If the current system is at EVDO only mode, the command can get the EVDO's sub net ID.

## 6.19.3 Parameter Description

<curr\_sid>: the system's current sid.

Decimal number, 0–32767

<curr\_nid>: the system's current nid.

Decimal number, 0–65534

<curr\_evdo\_subnetid>: the evdo's sub-net ID.

Hex number, 0-FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF

## 6.19.4 Example

- a) If there is a usable 1x system, the command could not return the <curr\_evdo\_subnetid>:

```
AT^CURRSID
```

```
^CURRSID:14844,4001,0
```

```
OK
```

- b) If there is only EVDO system, the command could return like that:

```
AT^CURRSID
```

```
^CURRSID:0,0,8E4FC
```

```
OK
```

- c) If there is not exited system, the command could return like that:

```
AT^CURRSID
```

```
^CURRSID:0,0,0
```

```
OK
```

## 6.20 ^SHDRMODE-Configure S-HDR Mode

### 6.20.1 Syntax

Command	Possible Response(s)
^SHDRMODE=<s1xhdr_mode>	In case of successful execution: <CR><LF>OK<CR><LF>  In case of an MT-related error: <CR><LF>ERROR<CR><LF>

Command	Possible Response(s)
^SHDRMODE?	<p>In case of successful execution:</p> <p>&lt;CR&gt;&lt;LF&gt;^SHDRMODE:  &lt;s1xhdr_mode&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</p> <p>In case of an MT-related error:</p> <p>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</p>
^SHDRMODE=?	<p>In case of successful execution:</p> <p>&lt;CR&gt;&lt;LF&gt;^SHDRMODE: (list of supported  &lt;s1xhdr_mode&gt;s)&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</p> <p>In case of an MT-related error:</p> <p>&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</p>

## 6.20.2 Interface Description

This command configures S-HDR work mode.

The set command is used to set S-HDR word mode. The setting remains effective even after the module is powered off.

The read command is used to query the current S-HDR word mode.

The test command is used to query the parameter range supported by this command

### Note:

- For single antenna, it is suggested to set <s1xhdr\_mode> to 0 (default value); for double antenna, it is suggested to set <s1xhdr\_mode> to 2.
- This command is only applicable to the modules that support CDMA 1x and EVDO and both can receive diversity.

## 6.20.3 Parameter Description

<s1xhdr\_mode>: used for overriding the default behavior of S-HDR.

0: The default SHDR mode for the build is on (default value)

1: SHDR is off. Normal hybrid mode is turned on (not supported currently)

2: SHDR in Access, Traffic, and BCMCS is turned on

3: SHDR in BCMCS is turned on (not supported currently)

## 6.20.4 Example

To set S-HDR work mode:

```
AT^SHDRMODE=2
```

```
OK
```

To query the current S-HDR word mode:

AT^SHDRMODE?

^SHDRMODE: 2

OK

To query the parameter range supported by this command

AT^SHDRMODE=?

^SHDRMODE: (0,2)

OK

## 6.21 ^ANTDTCT-Query the Status of ANTDET

### 6.21.1 Syntax

Command	Possible Response(s)
^ANTDTCT?	<CR><LF>^ANTDTCT: <stat><CR><LF><CR><LF>OK<CR><LF> In case of an MS-related error: <CR><LF>ERROR<CR><LF>

### 6.21.2 Interface Description

This command is used to query the status of ANTDET which is connected to the antenna.

### 6.21.3 Parameter Description

<stat>: the logic value of ANTDET.

0: The antenna is connected.

1: The antenna is disconnected.

### 6.21.4 Example

AT^ANTDTCT?

^ANTDTCT: 0

OK



## 6.22 ^ANTDTCT-Indicate the Status of ANTDET When It Changes

### 6.22.1 Syntax

Command	Possible Response(s)
	<CR><LF>^ANTDTCT: <stat><CR><LF>

### 6.22.2 Interface Description

This command is used to report the status of ANTDET when the status changes.

### 6.22.3 Parameter Description

<stat>: the logic value of ANTDET

0: The antenna is connected.

1: The antenna is disconnected.



# 7

## Call Control Commands

### 7.1 D-Originate a Data Service Call

#### 7.1.1 Syntax

Command	Possible Response(s)
D[<dial_string>]	<CR><LF>OK<CR><LF> About the responses, see 16.3 Final Result Codes.

#### 7.1.2 Interface Description

This command originates a data service call.

In this product, this command supports only data service dial-up.

#### 7.1.3 Parameter Description

<dial\_string>: specifies the called number, consisting of ASCII characters. Allowed characters include only 0–9, \*, and #.

#### 7.1.4 Example

```
ATD#777  
CONNECT
```

## 7.2 H-Disconnect the Data Service

### 7.2.1 Syntax

Command	Possible Response(s)
H[<value>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>

### 7.2.2 Interface Description

This command disconnects the data service connection with a remote subscriber. To use this command on the current port, you must enter +++ to change the current port from the data mode to the command mode.

**Note:**

If this command cannot be used, you can interrupt a data connection by changing DTR signals from the ON state to the OFF state. For details, see the &D command.

### 7.2.3 Parameter Description

<value>: an integer. The connection is disconnected and "OK" is returned only when the value is 0. (The connection cannot be disconnected when the value is not 0, and the response result is "ERROR".) ATH is equivalent to ATH0.

## 7.3 +CDV-Originate a Voice Call

### 7.3.1 Syntax

Command	Possible Response(s)
+CDV<dial_string>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 7.3.2 Interface Description

This command is used by the TE to originate a voice call to the network through the MT.

### 7.3.3 Parameter Description

<dial\_string>: specifies the called number, consisting of ASCII characters. Allowed characters include only 0–9, \*, #, and +. The + symbol can only be placed at the beginning of a number. If the + is in the middle of number, it will be filtered. If the <dial\_string> includes one of 'T(t)' 'P(p)' '!' or '@', the call will fail immediately. And the characters which don't belong to allowed characters will be filtered. The maximum length of a number cannot exceed 65, which refers to after filtering and including the '+' which is placed at the beginning of a number.

### 7.3.4 Example

```
AT+CDV13372311111
```

```
OK
```

```
^ORIG:1,0
```

## 7.4 +CHV-Disconnect a Voice Call

### 7.4.1 Syntax

Command	Possible Response(s)
+CHV[<value>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 7.4.2 Interface Description

This command disconnects a voice call.

### 7.4.3 Parameter Description

<value>: an integer. The connection is interrupted and "OK" is returned only when the value is 0. (The connection cannot be interrupted when the value is not 0, and the response result is "ERROR".) If there is no voice connection, "OK" is returned.

In case of using the command without <value>, <value> is set to 0.

## 7.5 A-Answer a Call

### 7.5.1 Syntax

Command	Possible Response(s)
A	<CR><LF>OK<CR><LF>

### 7.5.2 Interface Description

When a call is originated to the MT, the TE uses this command to notify the MT to answer the call. If there is an incoming call from the third party at this time, this command can also be used to answer the incoming call. If there is no incoming call, "NO CARRIER" is returned.

## 7.6 RING-Indicate A Call

### 7.6.1 Syntax

Command	Possible Response(s)
	RING

### 7.6.2 Interface Description

When a call is originated to the MT, the MT periodically (T is about 5s) reports the indication to the TE.

## 7.7 S0-Set Automatic Answer

### 7.7.1 Syntax

Command	Possible Response(s)
S0=<value>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
S0?	<CR><LF><value><CR><LF><CR><LF>OK<CR><LF>



## 7.7.2 Interface Description

This command sets the automatic answer function. After the automatic answer function is enabled, the MT starts automatic answer when there is a new incoming call.

## 7.7.3 Parameter Description

<value>:

0: Automatic answer is disabled (default value after startup).

1–255: Automatic answer is enabled. An incoming call will be answered after the number of rings set by <value>.

**Note:**

The returned value is a three-digit number.

## 7.7.4 Example

ATS0=0

OK

ATS0?

000

OK

ATS0=60

OK

ATS0?

060

OK

## 7.8 ^ORIG—Indicate the Origination of A Call

### 7.8.1 Syntax

Command	Possible Response(s)
	<CR><LF>^ORIG:<call_x>,<call_type><CR><LF>

## 7.8.2 Interface Description

This command indicates that the MT is originating a call.

## 7.8.3 Parameter Description

<call\_x>: specifies the call ID, uniquely identifying the call. The value ranges from 1 to 9.

<call\_type>: specifies the call type. The values are as follows:

0: Voice call

2: PS domain data call (not supported currently)

3: CDMA SMS call (not supported currently)

7: OTA call (standard OTASP numbers)

8: OTA call (non-standard OTASP numbers)

9: Emergency call

## 7.9 ^CONN-Indicate a Call Connection

### 7.9.1 Syntax

Command	Possible Response(s)
	<CR><LF>^CONN:<call_x>,<call_type><CR><LF>

### 7.9.2 Interface Description

If the MT is the caller, when a call request is successfully sent to the network and a response from the network is received, the MT reports the response to the TE even when the call is not answered. If the MT receives an incoming call, the MT reports this indication to the TE when the MT answers the call.

### 7.9.3 Parameter Description

<call\_x>: specifies the call ID, uniquely identifying the call. The value ranges from 1 to 9.

<call\_type>: specifies the call type. The values are as follows:

0: Voice call

2: PS domain data call (not supported currently)

3: CDMA SMS call (not supported currently)

7: OTA call (standard OTASP numbers)

8: OTA call (non-standard OTASP numbers)

## 9: Emergency call

## 7.10 ^HFEEPO–Bill Reverse Polarity

### 7.10.1 Syntax

Command	Possible Response(s)
	<CR><LF>^HFEEPO:<pol_inc>,<tgl_mod>,<rev_pol>,<pow_dtm><CR><LF>

### 7.10.2 Interface Description

This command is used to indicate the current reverse polarity billing mode and provide how to reverse the polarity information.

### 7.10.3 Parameter Description

Parameter	Values	Description
<pol_inc>	1: indicates reverse polarity 0: indicates no reverse polarity	Polarity included, indicates terminal polarity is reverse.
<tgl_mod>	1: indicates switch polarity to the polarity that is opposite to the current polarity 0: indicates absolute value of REVERSE_POLARITY	If Polarity included is 1 (reverse polarity), Toggle mode is 0 and 1.
<rev_pol>	1: indicates that switch polarity to reverse polarity no matter the current polarity is reverse polarity or normal polarity. 2: indicates that switch polarity to normal polarity no matter the current polarity is reverse polarity or normal polarity.	If Polarity included is 1 (reverse polarity) and Toggle mode is 0, the value of Reverse polarity is 0 and 1.
<pow_dtm>	Power denial timeout Unit: ms	

### 7.10.4 Example

AT+CDV075536836298

OK

^ORIG:3,0

^CONN:3,0

^HFEEPO:1,0,0,0

AT^TIME

^TIME:2012/02/13 16:42:22

OK

^CEND:3,15,25

AT^TIME

^TIME:2012/02/13 16:42:37

OK

## 7.11 ^CEND-Indicate the End of A Call

### 7.11.1 Syntax

Command	Possible Response(s)
	<CR><LF>^CEND:<call_x>,<duration>,<end_status>[,<cc_cause>]<CR><LF>

### 7.11.2 Interface Description

After a call is terminated, the MT reports this indication to the TE to notify the TE of the call end cause and the call duration.

### 7.11.3 Parameter Description

<call\_x>: specifies the call ID, uniquely identifying the call. The value ranges from 1 to 9.

<duration>: specifies the call duration in the unit of second. The time starts from reporting of the ^CONN command until the call is complete.



<end\_status>: the reason for ending a call.

<cc\_cause>: specifies call control information (not supported currently).

**Table 7-1** The values of <end\_status>

Parameter	Values	Descriptions
<end_status>	0	Phone is offline
	20	Phone is CDMA locked until power cycle
	21	Phone has no service
	22	Call has ended abnormally
	23	Received intercept from BS
	24	Received reorder from BS
	25	Received release from BS-no reason given.
	26	Received release from BS-SO reject
	27	Received incoming call from BS
	28	Received alert stop from BS-incoming only.
	29	Client ended the call
	30	Received end activation-OTASP call only.
	31	Aborts the origination/conversation
	32	Max access probes transmitted
	33	Persistence test failure
	34	RUIM is not present
	35	Access attempt already in progress
	36	Access failure for reason other than the above
	37	Received retry order-orig only
	38	Concurrent service is not supported by base station
	39	No response received from base station
	40	Call rejected by the base station
	41	Concurrent services requested were not compatible
	42	Access is blocked by base station.
	43	There already is a traffic channel

Parameter	Values	Descriptions
	44	Call is ended due to Emergency call is flashed over this call
	45	Used if CM is ending a GPS call in favor of a user call
	46	Used if CM is ending a SMS call in favor of a user call
	47	Used if CM is ending a DATA call in favor of an emergency call
	48	Call rejected because of redirection or handoff
	49	Access is blocked by base station for all mobiles. KDDI specific
	50	To Support OTASP SPC Error indication
	51	Max Access Probes for IS-707B call.

## 7.12 +CLIP–Set the Presentation of Caller ID

### 7.12.1 Syntax

Command	Possible Response(s)
+CLIP[=<n>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CLIP?	<CR><LF>+CLIP:<n><CR><LF><CR><LF>OK<CR><LF>
+CLIP=?	<CR><LF>+CLIP:(list of supported <n>s)<CR><LF><CR><LF>OK<CR><LF>

### 7.12.2 Interface Description

The SET command sets whether reporting of the caller ID unsolicited result code (URC) is allowed. If the caller ID URC is allowed to be reported, when there is an incoming call, the caller ID indication is provided following the RING indication and periodically (every five seconds) reported to the TE.

### 7.12.3 Parameter Description

<n>:

0: Caller ID URC reporting is not allowed (default value after startup).

1: Caller ID URC reporting is allowed.

**Note:**

In case of using the command without <n>, <n> is set to 0.

## 7.12.4 Example

AT+CLIP=1

OK

## 7.13 +CLIP-CLI URC Presentation

### 7.13.1 Syntax

Command	Possible Response(s)
	<CR><LF>+CLIP:<number>,<type>,,,,<CLI validity><CR><LF>

### 7.13.2 Interface Description

This command enables or disables the URC presentation of the calling line identification (CLI). If it is enabled, the +CLIP response is returned to the TE every 5s after the RING result code is sent.

### 7.13.3 Parameter Description

<number>: specifies a calling number. It is a string with double quotation marks. Allowed characters include only 0–9, \*, #, and +.

<type>: specifies the number type. "145" indicates an international number, and "129" indicates a national number. For details, see section 16.5 "Phone Number Type."

<CLI validity>:

0: The call line identity (CLI) is valid.

1: The CLI is rejected by the call originator.

2: The CLI is unavailable because of the limitation of the originating network or a network problem.

Three fields are reserved between <type> and <CLI validity>.

### 7.13.4 Example

If CLIP is enabled, the following is returned:

+CLIP: "82882690",129,,,,0

If CLIR is enabled by the other party and so the number cannot be presented, the following is returned:

+CLIP:129,,,1

If the number cannot be presented due to a network problem, the following is returned:

+CLIP:129,,,2

## 7.14 +CLCC-Query the Call Status

### 7.14.1 Syntax

Command	Possible Response(s)
+CLCC	[<CR><LF>+CLCC:<id1>,<dir>,<stat>,<mode>,<empty>[,<number>,<type>]<CR><LF>[<CR><LF>+CLCC:<id2>,<dir>,<stat>,<mode>,<empty>[,<number>,<type>]<CR><LF>[...]]<CR><LF>>OK<CR><LF>  In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CLCC=?	<CR><LF>OK<CR><LF>

### 7.14.2 Interface Description

This command queries the number of current calls and the state of each call.

If there are no calls, "OK" is returned when this command is executed.

### 7.14.3 Parameter Description

<idx>: specifies the call ID. The value ranges from 1 to 9 (2–9 are not supported currently).

<dir>: specifies the call direction. The values are as follows:

0: MO

1: MT

<stat>: specifies the call state. The values are as follows:

0: Active

1: Held (not supported currently)

2: Dialing

3: Alerting (not supported currently)

4: Incoming

5: Waiting (not supported currently)

<mode>: specifies the call type. The values are as follows:

0: Voice

1: Data

<mpty>: specifies the multiparty call. The values are as follows:

0: Non-multiparty call

1: Multiparty call (not supported currently)

<number>: specifies a call number. It is a string with double quotation marks. Allowed characters include only 0–9, \*, #, and +. In addition, the + symbol can only be at the start of the number.

<type>: specifies the type of a call number. "145" indicates an international number, and "129" indicates a national number. For details, see section 16.5 "Phone Number Type."

## 7.14.4 Example

AT+CLCC

+CLCC:1,0,0,0,0,"13801000841",129

OK

## 7.15 ^DTMF-Two-Stage Dialing Command

### 7.15.1 Syntax

Command	Possible Response(s)
^DTMF=<call_x>,<dtmf_digit>[,<on_length>,<off_length>]]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 7.15.2 Interface Description

This command sends a dual tone multiple frequency (DTMF) key value to the network through signaling in the call status.

### 7.15.3 Parameter Description

<call\_x>: specifies a call ID. The value ranges from 1 to 9.

<dtmf\_digit>: ASCII characters, indicating a DTMF key value. Allowed characters include only 0–9, \*, and #. Only one character is allowed each time.

<on\_length>:

1: Start continuous DTMF.

0: If send the DTMF tone by burst, do nothing; if send the DTMF tone by continuous, stop sending.

95,150,200,250,300,350: The time of sending the DTMF tone by burst (unit: ms).

<off\_length>: the interval of sending the DTMF tone by burst (unit: ms). Reserved currently.

## 7.15.4 Example

```
AT+CDV10000
```

```
OK
```

```
^ORIG:2,0
```

```
^CONN:2,0
```

```
AT^DTMF=2,1
```

```
OK
```

```
AT^DTMF=2,#
```

```
OK
```

## 7.16 ^PPPCFG–Set the PPP User Name and Password

### 7.16.1 Syntax

Command	Possible Response(s)
^PPPCFG=<userid>,<password>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^PPPCFG or ^PPPCFG?	<CR><LF>^PPPCFG:<userid>,<password><CR><LF> <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 7.16.2 Interface Description

This command sets the Point to Point Protocol (PPP) user name and password before data service dial-up. After the dial-up connection is successful, the client can use the user name and password to establish a PPP connection.

## 7.16.3 Parameter Description

<userid>: specifies the PPP authentication user name. It is a string with double quotation marks. The maximum length is 127 characters excluding the double quotation marks.

<password>: specifies the PPP authentication password. It is a string with double quotation marks. The maximum length is 127 characters excluding the double quotation marks.

## 7.16.4 Example

```
AT^PPPCFG="Huawei","Huawei"
```

```
OK
```

## 7.17 +CTA–Set the Time to Enter into Dormancy

### 7.17.1 Syntax

Command	Possible Response(s)
+CTA=<cta>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CTA?	<CR><LF>+CTA:<n><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CTA=?	<CR><LF>+CTA:(list of supported <n>s)<CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 7.17.2 Interface Description

The EXECUTION command is used to set the time to enter into dormancy.

The READ command is used to read the time to enter into dormancy.

The TEST command is used to return the range of time set to enter into dormancy.

### 7.17.3 Parameter Description

<cta>: the time to enter into dormancy. The default value is 30 seconds.

0: MS don't originate entering into dormancy. When the network originates entering into dormancy, the MS can enter into dormancy.

1–255: When the RLP data frame is not sent/received through the Um interface continuous <value>seconds, MT will release the service channel.

## 7.18 +CCWA–Set the Status of Call Waiting

### 7.18.1 Syntax

Command	Possible Response(s)
+CCWA[=<n>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CCWA?	<CR><LF>+CCWA:<n><CR><LF><CR><LF>OK<CR><LF>
+CCWA=?	<CR><LF>+CCWA:(list of supported <n>s)<CR><LF><CR><LF>OK<CR><LF>
	<CR><LF>+CCWA:<number>,<type>,<class><CR><LF>

### 7.18.2 Interface Description

The SET command sets whether reporting of the call waiting unsolicited result code (URC) is allowed. If the call waiting URC is allowed to be reported and the TE must has CLIP and CW active, when there is an incoming call and the TE is in a two-way conversation, the calling waiting indication is provided to the TE.

**Notes:**

- +CLCC supports only one way call state information query.
- If TE receives the call waiting URC, TE will only update the CLCC number field.
- If no new incoming call during a call, it will not change the CLCC number field.

### 7.18.3 Parameter Description

<n>:

0: Call Waiting URC reporting is not allowed (default value after startup).

1: Call Waiting URC reporting is allowed.

**Note:**

In case of using the command without <n>, <n> is set to 0.

<number>: specifies a calling number. It is a string with double quotation marks. Allowed characters include only 0–9, \*, #, +.



<type>: specifies the number type. "145" indicates an international number, and "129" indicates a national number. For details, see section 16.5 "Phone Number Type."

<classx>: a sum of integers each representing a class of information:

- 1: Voice (telephony)
- 2: Data (not supported)
- 4: Fax (not supported)
- 8: Short message service (not supported)
- 16: Data circuit sync (not supported)
- 32: Data circuit async (not supported)
- 64: Dedicated packet access (not supported)
- 128: Dedicated PAD access (not supported)

### 7.18.4 Example

+CCWA:"82882690",129,1

or

+CCWA:"",128,1

## 7.19 ^HFLASH/^FLASH-Send Flash/Flash with Information

### 7.19.1 Syntax

Command	Possible Response(s)
^HFLASH or ^FLASH	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^HFLASH=<dial_string> or ^FLASH=<dial_string>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 7.19.2 Interface Description

This command supplies operation for call related supplementary services.

When the TE signals a flash request without digits, it will place the active call (if any exist) on hold and accept the other (being held or waiting) call.

When the TE signals a flash request with digits, it will place the active call on hold and call the third party.

When the TE signals a flash and the TE is in the idle state, it will report "+CME ERROR: operation not allowed".

**Notes:**

- ^FLASH is only effective in the version for China Telecom.
- +CLCC supports only one way call state information query. ^HFLASH/^FLASH will not change the CLCC.
- Three-way calling and conference calls are distinguished, and the three-way calling only support three calling user.

### 7.19.3 Parameter Description

<dial\_string>: specifies the called number, consisting of ASCII characters. Allowed characters include only 0–9, \*, #, and +. The + symbol can only be placed at the beginning of a number. There are no quotation marks in the dial\_string. The maximum length of a number cannot exceed 32 (including "+").

### 7.19.4 Example

**e.g. one for Call Waiting**

AT+CDV<the second party number>

OK

+CCWA: "<the third party number >",129,1 // The call waiting URC

AT^HFLASH // Place the second party on hold. Connect  
the TE and the third party.

OK

AT^HFLASH // Place the third party on hold. Connect the  
TE and the second party.

OK

**e.g. two for Three-Way Calling**

AT+CDV<the second party number>

OK

AT^HFLASH // Place the active call on hold

OK

AT^HFLASH=<the third party number> // Call the third party

OK

AT^HFLASH //3-way calling active

OK



AT+CHV // Release the TE and the two other parties. Go  
to the idle state.

OK

**e.g. three for Three-Way Calling**

AT+CDV<the second party number>

OK

AT^HFLASH // Place the active call on hold

OK

AT^HFLASH=<the third party number> // Call the third party

OK

AT^HFLASH //3-way calling active

OK

AT^HFLASH // Release the third party. Connect the TE and the second  
party. Go to the 2-way state.

OK

**e.g. four for Three-Way Calling**

AT+CDV<the second party number>

OK

AT^HFLASH // Place the active call on hold

OK

AT^HFLASH=<the third party number> // Call the third party

OK

AT^HFLASH //3-way calling active

OK

// The third party send AT+CHV

// Release the third party. Connect the TE and the second party. Go to the 2-way  
state.

**e.g. five for Three-Way Calling**

AT+CDV<the second party number>

OK

AT^HFLASH // Place the active call on hold

OK

AT^HFLASH=<the third party number> // Call the third party

OK

AT^HFLASH //3-way calling active



OK

// The second party send AT+CHV

// Release the second party. Connect the TE and the third party. Go to the 2-way state.

**e.g. six for Three-Way Calling**

AT+CDV<the second party number>

OK

AT^HFLASH=<the third party number> // Put the second party on hold. Call the third party

OK

AT^HFLASH //3-way calling active

OK

# 8 SMS Interface Commands

## 8.1 +CPMS–Set the Short Message Storage Location

### 8.1.1 Syntax

Command	Possible Response(s)
+CPMS=<mem1>[,<mem2>[,<mem3>]]	<p>&lt;CR&gt;&lt;LF&gt;+CPMS:&lt;used1&gt;,&lt;total1&gt;,&lt;used2&gt;,&lt;total2&gt;,&lt;used3&gt;,&lt;total3&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</p> <p>In case of an MS-related error: &lt;CR&gt;&lt;LF&gt;+CMS ERROR:&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</p>
+CPMS?	<p>&lt;CR&gt;&lt;LF&gt;+CPMS:&lt;mem1&gt;,&lt;used1&gt;,&lt;total1&gt;,&lt;mem2&gt;,&lt;used2&gt;,&lt;total2&gt;,&lt;mem3&gt;,&lt;used3&gt;,&lt;total3&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</p> <p>In case of an MS-related error: &lt;CR&gt;&lt;LF&gt;+CMS ERROR:&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</p>
+CPMS=?	<p>&lt;CR&gt;&lt;LF&gt;+CPMS:(list of supported &lt;mem1&gt;s),(list of supported &lt;mem2&gt;s),(list of supported &lt;mem3&gt;s)&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</p>

### 8.1.2 Interface Description

The SET command sets the short message storage medium corresponding to the short message operations (such as read or write) and returns the current usage of the selected medium.

The name and usage of the currently selected storage medium are returned when the read command is executed.

All storage medium types supported by the MT can be returned when the test command is executed.

## 8.1.3 Parameter Description

<mem1>: specifies the medium for short message read and deletion. It is a string with double quotation marks. The optional values are as follows:

"SM": R-UIM card, this type of storage is allowed when R-UIM was available.

"ME": Nonvolatile memory on the module (default value after startup).

<mem2>: specifies the medium for short message write and sending. It is a string with double quotation marks. Its optional values and default value are the same as those of <mem1>.

<mem3>: specifies the medium for storing the received short message. It is a string with double quotation marks. Its optional values and default value are the same as those of <mem1>.

<total1>: an integer, specifying the total number of short messages that can be saved in <mem1>.

<total2>: an integer, specifying the total number of short messages that can be saved in <mem2>.

<total3>: an integer, specifying the total number of short messages that can be saved in <mem3>.

<used1>: an integer, specifying the number of short messages that are saved in <mem1>.

<used2>: an integer, specifying the number of short messages that are saved in <mem2>.

<used3>: an integer, specifying the number of short messages that are saved in <mem3>.

## 8.2 +CNMI-Set the Mode of New Short Message Notification

### 8.2.1 Syntax

Command	Possible Response(s)
+CNMI[=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	<CR><LF>OK<CR><LF> In case of an MS-related error: <CR><LF>+CMS ERROR:<err><CR><LF>
+CNMI?	<CR><LF>+CNMI:<mode>,<mt>,<bm>,<ds>,<bfr><CR><LF><CR><LF>OK<CR><LF>
+CNMI=?	<CR><LF>+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)<CR><LF><CR><LF>OK<CR><LF>

## 8.2.2 Interface Description

The SET command sets the mode of notifying the TE of a new short message.  
Where:

<mode> and <bfr> are used to set the mode of notifying the TE of a new short message.

<mt> sets the storage and notification rules for newly received short messages: a new short message is directly reported to the TE; or a new short message is stored in the MT and the storage position is reported to the TE.

<ds> sets whether a short message status report (+CDSI, ^HCDS) is sent.

The supported parameter value is returned when the test command is executed.

## 8.2.3 Parameter Description

<mode>: specifies the short message notification mode.

0: The short message notification is stored in the buffer of the MT. If the buffer of the MT is full, the new notification overwrites the oldest notification (not supported currently).

1: The short message notification is sent to the TE. If the short message notification fails to be sent (for example, in online data mode), the notification is discarded (default value after startup).

2: Send a message notification and message status report to the TE. If the sending fails (for example, in the online data mode), buffer the message notification in the MS and send it to the TE later (not supported currently).

In CDMA mode, <mode> always sets to 1.

<mt>: specifies the storage and notification rules for received short messages.

The storage and notification for a new short message has the two modes:

1. The short message is stored in the MT, and a storage position notification is sent to the TE (default value after startup).

The short message notification uses the +CMTI command, that is, a new short message is stored in <mem3> specified by the +CPMS command; the storage location and the index value are reported to the TE.

2. The short message is not stored in the MT but is directly sent to the TE.

The short message notification uses the ^HCMT command. A new short message is not stored on the board. It is reported to the TE. The TE needs to call the AT+CNMA command to acknowledge the reported short message. If the AT+CNMA command is not received within two seconds, the MT sends a receiving error to the network.

Figure 8-1 shows the interaction between the TE and the MT in the preceding two modes.

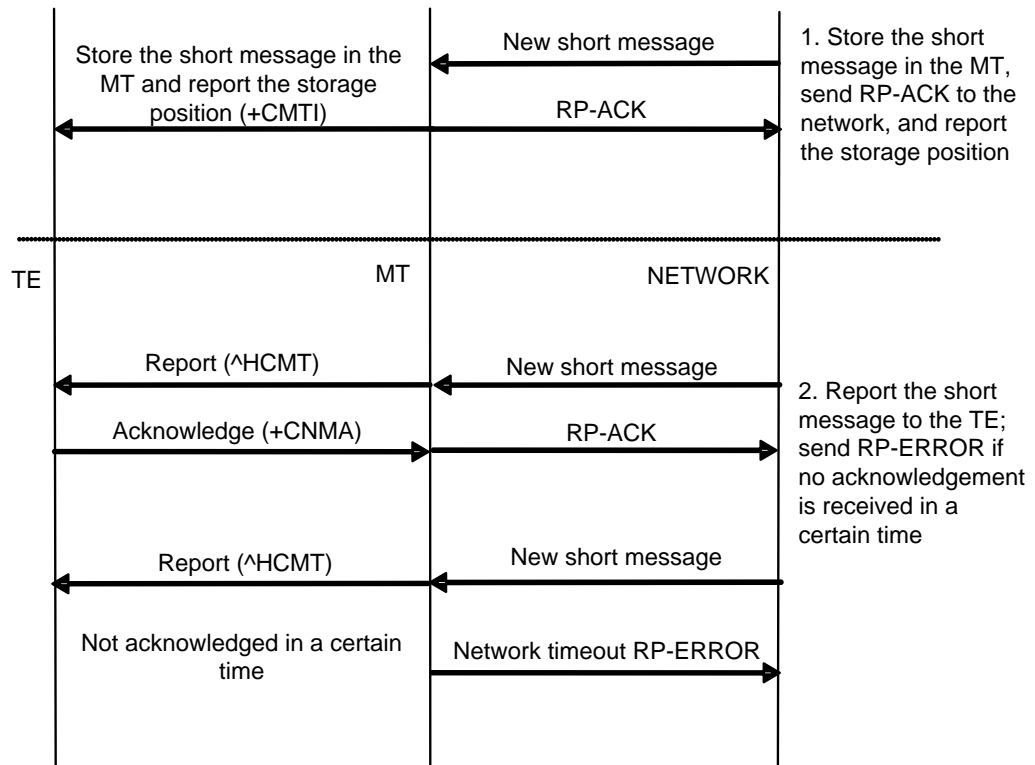
**Figure 8-1** Interaction between the TE and the MT


Table 8-1 describes the combinations of the preceding two parameters.

**Table 8-1** Combinations of the preceding two parameters

<mode>	<mt>	Saving a Short Message or Not	Reporting a Short Message or Not	Reporting Command
0	1	Yes	No	
1	1	Yes	Yes	+CMTI
0	2	No	No	
1	2	No	Yes	^HCMT

<bm>: not supported currently. The value is always 0.

<ds>: used to set a short message return receipt.

0: A short message return receipt is not sent to the TE.

1: The short message return receipt is not stored in the MT but is sent to the TE.

If PDU mode enabled:

^HCDS: [<reserved>],<length><CR><LF> <layer3 packet><CR><LF>

If Text mode enabled:



^HCDS:

<callerID>,<year>,<month>,<day>,<hour>,<minute>,<second>,<lang>,<format>,<length>,<prt>,<prv>,<type>,<tag><CR><LF><msg><CTRL+Z><CR><LF>

2: The short message return receipt is stored in the MT, and a storage position notification is sent to the TE by using the +CDSI command. (default value after startup).

+CDSI: <mem>,<index><CR><LF>

<bfr>: set the buffer processing when <mode>=1, 2 is entered from <mode>=0.

0: In the <mode>1-2 mode, MS sends all URCs to TE in one time (default value after startup).

1: In the <mode>1-2 mode, clear all URCs.

## 8.2.4 Example

Set AT+CNMI=1,1,0,1,0.

A new short message is stored in the MT, and the storage position is reported by running the +CMTI:"ME",1 command. A status report short message is not stored but is reported by using the ^HCDS command.

If a message notification cannot be reported (for example, in the online-data mode), the message notification is discarded.

## 8.3 +CMTI-Indicate the Arrival of a Short Message

### 8.3.1 Syntax

Command	Possible Response(s)
	<CR><LF>+CMTI:<mem>,<index><CR><LF>

### 8.3.2 Interface Description

This command indicates that a new short message or a new status report short message has been received.

### 8.3.3 Parameter Description

<mem>: specifies the storage medium of a short message. Currently, only "SM" and "ME" are supported.

"ME": ME short message storage medium

"SM": R-UIM short message storage medium

<index>: an integer, indicating the position of a short message in the storage medium.

## 8.4 ^HCMT-Report a New Short Message

### 8.4.1 Syntax

Command	Possible Response(s)
	If PDU mode enabled: <CR><LF>^HCMT: [<reserved>],<length><CR><LF><layer3 packet><CR><LF> If text mode enabled: <CR><LF>^HCMT:<callerID>,<year>,<month>,<day>,<hour>,<minute>,<second>,<lang>,<format>,<length>,<pri>,<prv>,<type>,<tag><CR><LF><msg><CTRL+Z><CR><LF>

### 8.4.2 Interface Description

This command reports a new short message without storing it to the TE.

### 8.4.3 Parameter Description

<callerID>: specifies the number of the short message sender.

<year>,<month>,<day>,<hour>,<minute>,<second>: the year, month, day, hour, minute and second when a short message is received.

<lang>: specifies the language. The values are as follows:

0: Unspecified

1: English

6: Chinese

<format>: specifies the encoding format of a short message. The values are as follows:

0: GSM 7 bit (not supported currently)

1: ASCII encoding (when the encoding range is not greater than 7F)

2: IA5 (not supported currently)

3: Octet (not supported currently)

4: Latin (not supported currently)

5: Latin\_Hebrew (not supported currently)

6: UNICODE encoding (when the encoding range is greater than 7F)

<length>: specifies the length of a received short message.

<pri>: specifies the priority of a short message. The values are as follows:

0: Normal

1: Interactive

2: Urgent

3: Emergency

<prv>: specifies the confidentiality level.

0: Normal

1: Restricted

2: Confidential

3: Secret

<type>: specifies the type of a short message.

0: Normal

1: CPT (not supported currently)

2: Voice mail (not supported currently)

3: SMS report

4: Flash SMS

<tag>: an integer: 0–3

0: WMS\_TAG\_MT\_NOT\_READ

1: WMS\_TAG\_MT\_READ

2: WMS\_TAG\_MO\_NOT\_SENT

3: WMS\_TAG\_MO\_SENT

<msg>: the received short message.

<layer3 packet>: see ^HCMGS–Send a Short Message.

## 8.5 +CDSI–Indicate the Arrival of a Status Report Short Message

### 8.5.1 Syntax

Command	Possible Response(s)
	<CR><LF>+CDSI:<mem>,<index><CR><LF>

### 8.5.2 Interface Description

This command indicates that a new status report short message is received and provides the storage position.

## 8.5.3 Parameter Description

<mem>: specifies the storage location of a short message.

"SM": R-UIM short message storage medium

"ME": ROMSIM short message storage medium

<index>: an integer, identifying the position in the storage location.

## 8.6 ^HCDS–Report a New Status Report Short Message

### 8.6.1 Syntax

Command	Possible Response(s)
	If PDU mode enabled: <CR><LF>^HCDS: [<reserved>],<length><CR><LF><layer3 packet><CR><LF> If text mode enabled: <CR><LF>^HCDS: <callerID>,<year>,<month>,<day>,<hour>,<minute>,<second>, <lang>,<format>,<length>,<pri>,<prv>,<type>,<tag><CR><LF> <msg><CTRL+Z><CR><LF>

### 8.6.2 Interface Description

This command reports a received new short message report without storing it to the TE.

### 8.6.3 Parameter Description

<callerID>: specifies the number of the short message sender.

<format>: specifies the encoding format of a short message. The values are as follows:

0: GSM 7 bit (not supported currently)

1: ASCII encoding (when the encoding range is not greater than 7F)

2: IA5 (not supported currently)

3: Octet (not supported currently)

4: Latin (not supported currently)

5: Latin\_Hebrew (not supported currently)

6: UNICODE encoding (when the encoding range is greater than 7F)

<year>,<month>,<day>,<hour>,<minute>,<second>: the year, month, day, hour, minute and second when a short message is received.

<length>: specifies the length of a received short message.

<lang>: specifies the language. The values are as follows:

0: Unspecified

1: English

6: Chinese

<prt>: specifies the priority of a short message. The values are as follows:

0: Normal

1: Interactive

2: Urgent

3: Emergency

<prv>: specifies the confidentiality level.

0: Normal

1: Restricted

2: Confidential

3: Secret

<type>: specifies the type of a short message.

0: Normal

1: CPT (not supported currently)

2: Voice mail (not supported currently)

3: SMS report

4: Flash SMS

<tag>: an integer: 0–3

0: WMS\_TAG\_MT\_NOT\_READ

1: WMS\_TAG\_MT\_READ

2: WMS\_TAG\_MO\_NOT\_SENT

3: WMS\_TAG\_MO\_SENT

<msg>: the received short message.

<layer3 packet>: see ^HCMGS–Send a Short Message.

## 8.7 +CNMA–Acknowledge a New Short Message

### 8.7.1 Syntax

Command	Possible Response(s)
+CNMA	<CR><LF>OK<CR><LF> In case of an MS-related error: <CR><LF>+CMS ERROR:<err><CR><LF>
+CNMA=?	<CR><LF>OK<CR><LF>

### 8.7.2 Interface Description

This command replies to the ^HCMT or ^HCDS indication received by the TE from the MT.

The EXECUTION command acknowledges the reception of a new short message sent to the TE. For usage of the command, see the +CNMI–Set the Mode of New Short Message Notification.

Before the previous received short message is acknowledged, the MT does not send another ^HCMT or ^HCDS command to the TE.

If the MT does not obtain a short message acknowledgement in the specified time (about two seconds) (due to network timeout), it sends "RP-ERROR" to the network.

If this command is executed but no short message needs to be acknowledged, "+CMS ERROR:<err>" is returned.

## 8.8 ^HSMSSS–Set Short Message Parameters

### 8.8.1 Syntax

Command	Possible Response(s)
^HSMSSS=<ack>,<prt>,<fmt>,<prv>	<CR><LF>OK<CR><LF> In case of an MS-related error: <CR><LF>+CMS ERROR:<err><CR><LF>
^HSMSSS?	<CR><LF>^HSMSSS:<ack>,<prt>,<fmt>,<prv><CR><LF><CR><LF>OK<CR><LF>
^HSMSSS=?	<CR><LF>^HSMSSS:(list of supported <ack>s),(list of supported <prt>s),(list of supported <fmt>s),(list of supported <prv>s)<CR><LF><CR><LF>OK<CR><LF>

## 8.8.2 Interface Description

The SET command sets parameters for sending short messages, including whether to acknowledge, priority, encoding format, and confidentiality.

**Note:**

This AT command is only effective in text mode.

## 8.8.3 Parameter Description

<ack>: specifies whether a short message status report is required. The values are as follows:

0: The short message status report is not required (default value after startup).

1: The short message status report is required.

<prt>: specifies the priority of a short message. The values are as follows:

0: Normal (default value after startup)

1: Interactive

2: Urgent

3: Emergency

<format>: specifies the encoding format of a short message. The values are as follows:

0: GSM 7 bit (not supported currently)

1: ASCII encoding (when the encoding range is not greater than 7F)

2: IA5 (not supported currently)

3: Octet (not supported currently)

4: Latin (not supported currently)

5: Latin\_Hebrew (not supported currently)

6: UNICODE encoding (when the encoding range is greater than 7F)

<prv>: specifies the confidentiality level. The values are as follows:

0: Normal (default value after startup)

1: Restricted

2: Confidential

3: Secret

## 8.9 ^HCMGS-Send a Short Message

### 8.9.1 Syntax

Command	Possible Response(s)
If PDU mode (+CMGF=0): ^HCMGS=<length><CR><Layer3 packet><CTRL+Z/ESC> If text mode (+CMGF=1): ^HCMGS=<da>[,<toda>]<CR>text is entered<CTRL+Z/ESC>	If PDU mode (+CMGF=0): <CR><LF>^HCMGS: <mr><CR><LF><CR><LF>OK<CR><LF> If TEXT mode (+CMGF=1): <CR><LF>^HCMGSS: <mr><CR><LF><CR><LF>OK<CR><LF> In case of an MS-related error: <CR><LF>+CMS ERROR:<err><CR><LF>
^HCMGS=?	<CR><LF>OK<CR><LF>

### 8.9.2 Interface Description

This command sends a short message to the network. The short message is sent in two steps:

In PDU mode:

Firstly, ^HCMGS=<length> end with <CR>.

TE wait for <CR><LF><greater\_than><space>(IRA 13, 10, 62, 32) from the MT, and input the message content that end with<CTRL+Z> (IRA 26).

In TEXT mode:

The ^HCMGS=<da>[,<toda>] command is sent with the end of (CR).

The TE waits <CR><LF><greater\_than><space>(IRA 13, 10, 62, 32) returned by the MT, and then inputs the message content, when the <format> of ^HSMSSS is 1, then ending with <CTRL+Z>, otherwise, when the <format> of ^HSMSSS is 6, then ending with 0x001A. The UNICODE should be input as an integrity, not two bytes separately.(IRA 26).

In TEXT mode, it only supports 0~0x00FF with UCS2.

The maximum length of message is 160 characters with 7bit codec, and 70 characters with UCS2.

### 8.9.3 Parameter Description

<length>: the length is bytes of <layer3 packet>.

<da>: specifies the number of the recipient of a short message. It is a string with double quotation marks, consisting of a maximum of 20 characters. The value can be 0-9, \*, #, and +, that is, the + is a part of <da>. The "+" symbol can only be at the start of the number.



<tda>: specifies the address encoding format. It is a digit of one byte. It is not supported currently. The default value is 0.

<mr>: a decimal digit, specifying the identifier of a short message. The value ranges from 0 to 65535.

<CTRL+Z>: identifies the end of a short message. The character is '0x1A' ('0x001A' in the Unicode).

<ESC>: indicates that the sending of a short message is canceled. The character is '0x1B' ('0x001B' under the Unicode).

<Layer3 packet>: the character is 0–9, A–F, two characters form an Octet.

**Note:**

Sending of a short message adopts the asynchronous command processing mode in the AT command. Currently, the asynchronous command processing process cannot process other AT commands. During the process, if the MT receives a short message-related command, such as the +CPMS, ^HCMGR, +CMGD, ^HCMGL, +CNMA, +CNMI, or ^HCMGW command, it returns "+CMS ERROR:302". That is, the operation is not allowed. If the MT receives the ^HCMGS command, it returns "^HCMGSF: 0". If the MT receives another command unrelated to a short message, it returns "+CME ERROR:40". That is, the operation is not allowed.

## 8.10 ^HCMGSS–Report Successful Short Message Sending

### 8.10.1 Syntax

Command	Possible Response(s)
	<CR><LF>^HCMGSS:<mr><CR><LF>

### 8.10.2 Interface Description

This command notifies the TE of the successful sending of a short message.

**Note:**

This AT command is only effective in text mode.

### 8.10.3 Parameter Description

<mr>: a decimal digit, specifying the identifier of a short message. The value ranges from 0 to 65535.

## 8.11 ^HCMGSF-Report Short Message Sending Failure

### 8.11.1 Syntax

Command	Possible Response(s)
	<CR><LF>^HCMGSF:<err code><CR><LF>

### 8.11.2 Interface Description

This command notifies the TE of the failure in sending a short message.

**Note:**

This AT command is only effective in text mode.

### 8.11.3 Parameter Description

<err code>: specifies an error code of short message sending failure.

- 0: WMS\_ADDRESS\_VACANT\_S
- 1: WMS\_ADDRESS\_TRANSLATION\_FAILURE\_S
- 2: WMS\_NETWORK\_RESOURCE\_SHORTAGE\_S
- 3: WMS\_NETWORK\_FAILURE\_S
- 4: WMS\_INVALID\_TELESERVICE\_ID\_S
- 5: WMS\_OTHER\_NETWORK\_PROBLEM\_S
- 6: WMS\_OTHER\_NETWORK\_PROBLEM\_MORE\_FIRST\_S
- 31: WMS\_OTHER\_NETWORK\_PROBLEM\_MORE\_LAST\_S
- 32: WMS\_NO\_PAGE\_RESPONSE\_S
- 33: WMS\_DESTINATION\_BUSY\_S
- 34: WMS\_NO\_ACK\_S
- 35: WMS\_DESTINATION\_RESOURCE\_SHORTAGE\_S
- 36: WMS\_SMS\_DELIVERY\_POSTPONED\_S
- 37: WMS\_DESTINATION\_OUT\_OF\_SERVICE\_S
- 38: WMS\_DESTINATION\_NO\_LONGER\_AT\_THIS\_ADDRESS\_S
- 39: WMS\_OTHER\_TERMINAL\_PROBLEM\_S
- 40: WMS\_OTHER\_TERMINAL\_PROBLEM\_MORE\_FIRST\_S
- 47: WMS\_OTHER\_TERMINAL\_PROBLEM\_MORE\_LAST\_S
- 48: WMS\_SMS\_DELIVERY\_POSTPONED\_MORE\_FIRST\_S

49: WMS\_SMS\_DELIVERY\_POSTPONED\_MORE\_LAST\_S  
 64: WMS\_RADIO\_IF\_RESOURCE\_SHORTAGE\_S  
 65: WMS\_RADIO\_IF\_INCOMPATIBLE\_S  
 66: WMS\_OTHER\_RADIO\_IF\_PROBLEM\_S  
 67: WMS\_OTHER\_RADIO\_IF\_PROBLEM\_MORE\_FIRST\_S  
 95: WMS\_OTHER\_RADIO\_IF\_PROBLEM\_MORE\_LAST\_S  
 96: WMS\_UNEXPECTED\_PARM\_SIZE\_S  
 97: WMS\_SMS\_ORIGINATION\_DENIED\_S  
 98: WMS\_SMS\_TERMINATION\_DENIED\_S  
 99: WMS\_SUPPL\_SERVICE\_NOT\_SUPPORTED  
 100: WMS\_SMS\_NOT\_SUPPORTED\_S  
 101: WMS\_RESERVED\_101\_S  
 102: WMS\_MISSING\_EXPECTED\_PARM\_S  
 103: WMS\_MISSING\_MANDATORY\_PARM\_S  
 104: WMS\_UNRECOGNIZED\_PARM\_VALUE\_S  
 105: WMS\_UNEXPECTED\_PARM\_VALUE\_S  
 106: WMS\_USER\_DATA\_SIZE\_ERROR\_S  
 107: WMS\_OTHER\_GENERAL\_PROBLEMS\_S  
 108: WMS\_OTHER\_GENERAL\_PROBLEMS\_MORE\_FIRST\_S  
 109: WMS\_OTHER\_GENERAL\_PROBLEMS\_MORE\_LAST\_S

## 8.12 ^HCMGW-Store a Short Message

### 8.12.1 Syntax

Command	Possible Response(s)
If PDU mode enabled: ^HCMGW=<length>,<tag><CR><Layer3 packet><CTRL+Z/ESC> If TEXT mode enabled: ^HCMGW=<oa/da>[,<tooa/to da>],<stat>,<ptr>,<type>,<format>,<lang>[,<year>,<month>,<day>,<hour>,<minute>,<second>]<CR><text><CTRL+Z/ESC>	<CR><LF>^HCMGW:<index><CR><LF><CR><LF>>OK<CR><LF> In case of an MS-related error: <CR><LF>+CMS ERROR:<err><CR><LF>

Command	Possible Response(s)
^HCMGW=?	<CR><LF>OK<CR><LF>

## 8.12.2 Interface Description

This command stores a short message to the storage location specified by <mem2> in the +CPMS command. The short message can be saved to the "SM" or "ME".

In PDU mode:

Save a message to memory, there are two steps:

Firstly, ^HCMGW=<length>,<tag> end with(CR)

TE wait for <CR><LF>< greater\_than ><space>(IRA 13, 10, 62, 32) from the MT, and input the message content ,when the <format> is 1,then end with<CTRL+Z>, otherwise, when the <format> is 6, then end with 0x001A. The UNICODE should be input as an integrity, not two bytes separately (IRA 26).

In TEXT mode:

Save a message to memory, there are two steps:

Firstly,

^HCMGW=<oa/da>[,<tooa/toda>],<stat>,<ptr>,<type>,<format>,<lang>[,<year>,<month>,<day>,<hour>,<minute>,<second>] end with(CR)

TE wait for <CR><LF>< greater\_than ><space>(IRA 13, 10, 62, 32) from the MT, and input the text content that end with<CTRL+Z> (IRA 26)

## 8.12.3 Parameter Description

<oa/da>: specifies the number of the sender or recipient of a short message. It is a string with double quotation marks, consisting of a maximum of 20 characters. The value can be 0–9, \*, #, and +, that is, the + is a part of <oa/da>. The + symbol can only be placed at the beginning of a number.

<tooa/toda>: specifies the address encoding format. It is a digit of one byte. It is not supported currently. The default value is 0.

<stat>: specifies the storage status of a short message. The values are as follows:

0: Received unread short messages

1: Received read short messages

2: Stored unsent short messages

3: Stored sent short message

<lang>: specifies the language. The values are as follows:

0: Unspecified

1: English

6: Chinese

<ptr>: an integer, specifying the priority of a short message. The values are as follows:

- 0: Normal
- 1: Interactive
- 2: Urgent
- 3: Emergency

<year>,<month>,<day>,<hour>,<minute>,<second>: the year, month, day, hour, minute, and second of a short message.

<index>: a number consisting of decimal digits (0–9), specifying the position number in the storage medium. The value ranges from 0 to the value of the maximum memory capacity minus one.

<format>: specifies the encoding format of a short message. The values are as follows:

- 0: GSM 7 bit (not supported currently)
- 1: ASCII encoding (when the encoding range is not greater than 7F)
- 2: IA5 (not supported currently)
- 3: Octet (not supported currently)
- 4: Latin (not supported currently)
- 5: Latin\_Hebrew (not supported currently)
- 6: UNICODE encoding (when the encoding range is greater than 7F)

<type>: specifies the type of a short message. The values are as follows:

- 0: Normal
- 1: CPT (not supported currently)
- 2: Voice mail (not supported currently)
- 3: SMS report

<text>: specifies the content of a short message.

<CR>: command termination character, indicating the end of a command.

<CTRL+Z>: indicates the end of the content of a short message. The character is '0x1A' when the encoding format is not UNICODE encoding; the character is '0x001A' when the encoding format is UNICODE encoding.

<ESC>: indicates canceling sending of the short message. The character is '0x1B'.

<length>: the length of the bytes of layer3 packet

<Layer3 packet>: the character is 0–9, A–F, two characters form a Octet

<tag>: an integer: 0–3

- 0: WMS\_TAG\_MT\_NOT\_READ
- 1: WMS\_TAG\_MT\_READ

2: WMS\_TAG\_MO\_NOT\_SENT

3: WMS\_TAG\_MO\_SENT

## 8.12.4 Example

It saves a message but don't send out:

At ^HCMGW=44,2

>0000021002040702C4CC484898580601FC08190003200010010A104F88307C61  
F106 C4100306080731164709<CTRL+Z>

^HCMGW:1

OK

## 8.13 ^HCMGL-Short Message List Command

### 8.13.1 Syntax

Command	Possible Response(s)
^HCMGL[=<stat>]	<CR><LF>^HCMGL:<index1>,<tag1><CR><LF><CR><LF>^ HCMGL:<index2>,<tag2><CR><LF>[...]<CR><LF>OK<CR> <LF>  In case of an MS-related error: <CR><LF>+CMS ERROR:<err><CR><LF>
^HCMGL=?	<CR><LF>^HCMGL: (list of supported <stat>s)<CR><LF><CR><LF>OK<CR><LF>

### 8.13.2 Interface Description

The EXECUTION command returns all short message indexes with the status value of <stat> from the storage medium specified by <mem1>.

Status report short messages are considered as received common short messages.

When <stat> is omitted, AT^HCMGL is equivalent to AT^HCMGL=0.

All supported stat values are returned when the test command is executed.

### 8.13.3 Parameter Description

<stat>: specifies the type of a short message. The values are as follows:

0: Received unread short messages

1: Received read short messages

2: Stored unsent short messages

3: Stored sent short messages

4: All short messages

**Note:**

In case of using the command without <stat>, <stat> is set to 0.

<index>: an integer, identifying the position in the storage medium.

<tag>: an integer: 0–3

0: WMS\_TAG\_MT\_NOT\_READ

1: WMS\_TAG\_MT\_READ

2: WMS\_TAG\_MO\_NOT\_SENT

3: WMS\_TAG\_MO\_SENT

## 8.14 ^HCMGR–Read a Short Message

### 8.14.1 Syntax

Command	Possible Response(s)
^HCMGR=<index>[,<mode>]	<p>If PDU mode, command successful:</p> <pre>&lt;CR&gt;&lt;LF&gt;^HCMGR:&lt;stat&gt;[,&lt;reserved&gt;],&lt;length&gt;&lt;CR&gt; &lt;LF&gt;&lt;layer3 packet&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</pre> <p>If TEXT mode, command successful:</p> <pre>&lt;CR&gt;&lt;LF&gt;^HCMGR:&lt;callerID&gt;,&lt;year&gt;,&lt;month&gt;,&lt;day&gt;,&lt;hour&gt;,&lt;minute&gt;,&lt;second&gt;,&lt;lang&gt;,&lt;format&gt;,&lt;length&gt;,&lt;prt&gt;,&lt;prv&gt;,&lt;type&gt;,&lt;stat&gt;&lt;CR&gt;&lt;LF&gt;&lt;msg&gt;&lt;CTRL+Z&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</pre> <p>In case of an MS-related error:</p> <pre>&lt;CR&gt;&lt;LF&gt;+CMS ERROR:&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</pre>
^HCMGR=?	<CR><LF>OK<CR><LF>

### 8.14.2 Interface Description

The EXECUTION command returns short messages with the storage position of <index> from the storage medium specified by <mem1>. Whether to modify the short message status depends on the value of <mode>.

### 8.14.3 Parameter Description

<index>: an integer, identifying the position in the storage medium.

<mode>: specifies the change mode of the short message status. The values are as follows:

0: The short message status is changed to read (default value).

1: The short message status is not changed.

**Note:**

In case of using the command without <mode>, <mode> is set to 0.

<callerID>: specifies the number of the short message sender.

<format>: specifies the encoding format of a short message. The values are as follows:

0: GSM 7 bit (not supported currently)

1: ASCII encoding (when the encoding range is not greater than 7F)

2: IA5 (not supported currently)

3: Octet (not supported currently)

4: Latin (not supported currently)

5: Latin\_Hebrew (not supported currently)

6: UNICODE encoding (when the encoding range is greater than 7F)

<year, month, day, hour, minute, second>: the year, month, day, hour, minute, and second when a short message is received.

<length>: specifies the length of a received short message.

<lang>: specifies the language. The values are as follows:

0: Unspecified

1: English

6: Chinese

<prt>: specifies the priority of a short message. The values are as follows:

0: Normal

1: Interactive

2: Urgent

3: Emergency

<prv>: specifies the confidentiality level. The values are as follows:

0: Normal

1: Restricted

2: Confidential

3: Secret

<type>: specifies the type of a short message. The values are as follows:

0: Normal



1: CPT (not supported currently)

2: Voice mail (not supported currently)

3: SMS report

<stat>: specifies the type of a short message. The values are as follows:

0: Received unread short messages

1: Received read short messages

2: Stored unsent short messages

3: Stored sent short messages

4: All short messages(only useful in ^HCMGL command)

<msg>: the received short message.

<CTRL+Z>: indicates the end of the content of a short message. The character is '0x1A' when the encoding format is not UNICODE encoding; the character is '0x001A' when the encoding format is UNICODE encoding.

## 8.15 +CMGD-Delete a Short Message

### 8.15.1 Syntax

Command	Possible Response(s)
+CMGD=<index>[,<delflag>]	<CR><LF>OK<CR><LF> In case of an MS-related error: <CR><LF>+CMS ERROR:<err><CR><LF>
+CMGD=?	<CR><LF>+CMGD:(list of supported <index>s)[,(list of supported <delflag>s)]<CR><LF><CR><LF>OK<CR><LF>

### 8.15.2 Interface Description

The EXECUTION command deletes the short messages in the <index> position of the storage medium specified by <mem1>. For the setting and description of <mem1>, see the +CPMS command. If the second parameter <delflag> is provided, and the value is not 0, the MT ignores <index> and performs operations based on <delflag>.

The current storage position of short messages and the supported <delflag> values are returned when the test command is executed.

### 8.15.3 Parameter Description

<index>: identifies the storage position of a short message.

<delflag>: deletes the messages specified by <index>.

- 0: The short messages specified by <index> are deleted. The execution result corresponds to the execution result without the parameter.
- 1: All read short messages on the preferred storage medium are deleted; unread, sent, and unsent short messages are retained.
- 2: All read and sent short messages on the preferred storage medium are deleted; unread and unsent short messages are retained.
- 3: All read, sent, and unsent short messages on the preferred storage medium are deleted; unread short messages are retained.
- 4: All short messages (including unread short messages) on the preferred storage medium are deleted.

## 8.16 ^SMMEMFULL-Report Full of Short Messages on a Storage Medium

### 8.16.1 Syntax

Command	Possible Response(s)
	<CR><LF>^SMMEMFULL:<mem_type><CR><LF>

### 8.16.2 Interface Description

If the limit for the short messages stored on the specified storage medium has been reached, this event is automatically reported to the TE by using the ^SMMEMFULL command when a new message arrives. The user can use the +CPMS command to switch to another storage medium for storing the message.

### 8.16.3 Parameter Description

<mem\_type>: a string, specifying the type of the storage medium where short messages are full.

"SM": R-UIM card

"ME": Nonvolatile memory on the module

## 8.17 +CMGF-Set Message Format

### 8.17.1 Syntax

Command	Possible Response(s)
+CMGF[=<mode>]	<CR><LF>OK<CR><LF>

Command	Possible Response(s)
+CMGF?	<CR><LF>+CMGF:<mode><CR><LF><CR><LF>OK<CR><LF>
+CMGF=?	<CR><LF>+CMGF:(list of supported <mode>s)<CR><LF><CR><LF>OK<CR><LF>

## 8.17.2 Interface Description

The SET command is used to set the format of the short message. The format has two modes, and depends on the <mode> parameter. The two modes are: PDU mode and TEXT mode. The TEXT mode is unable to display Chinese. The format of message in PDU mode, refers to ^HCMGS—Send a Short Message.

The READ command is used to return the current mode selection.

The TEST command returns the applicable <mode> values.

## 8.17.3 Parameter Description

<mode>:

0: PDU mode

1: TEXT mode (default value)

If no <mode> is included, it is equivalent to the effect that the <mode> is 1.

# 9 Phonebook Interface Commands

## 9.1 +CPBS–Select a Phonebook Memory

### 9.1.1 Syntax

Command	Possible Response(s)
+CPBS=<storage>[, <reserved>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CPBS?	<CR><LF>+CPBS:<storage>,<used>,<total><CR><LF><C R><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CPBS=?	<CR><LF>+CPBS:(list of supported <storage>s)<CR><LF><CR><LF>OK<CR><LF>

### 9.1.2 Interface Description

The SET command selects a phonebook memory. The initial setting is "SM" after the MT is restarted. Other phonebook-related commands are executed on the phonebook memory selected by this command.

The currently selected phonebook memory, number of used entries, and maximum number of entries are returned when the read command is executed.

The supported phonebook memory type is returned when the test command is executed.

### 9.1.3 Parameter Description

<storage>: specifies the type of the phonebook memory.

"SM": R-UIM/UICC phonebook (default value after startup)

"ME": Nonvolatile memory on the module

<reserved>: reserved.

<used>: an integer, specifying the number of used entries in the currently selected memory.

<total>: an integer, specifying the maximum number of entries in the currently selected memory. When the memory is "SM", the maximum value depends on the R-UIM card. When the memory is "ME", the maximum value is 300.

## 9.2 ^CPBR-Read the Phonebook

### 9.2.1 Syntax

Command	Possible Response(s)
^CPBR=<index1> [,<index2>]	[<CR><LF>^CPBR:<index1>,<number>,<type>,<text>,<coding>[...]<CR><LF>^CPBR:<index2>,<number>,<type>,<text>,<coding>]<CR><LF>]<CR><LF>OK<CR><LF>  In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^CPBR=?	<CR><LF>^CPBR:(list of supported <index>s),<nlength>,<tlength><CR><LF><CR><LF>OK<CR><LF>  In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 9.2.2 Interface Description

This command returns the phonebook entries between index1 and index2 in the currently selected phonebook memory. If no phonebook entry is available in all positions between index1 and index2, "+CME ERROR: not found" is returned.

If only <index1> is specified, only the phonebook records of index1 are returned.

The position range of the currently selected phonebook memory and the maximum lengths of <number> and <text> are returned when the test command is executed.

### 9.2.3 Parameter Description

<index1>, <index2>, <index>: integers, specifies the position in the phonebook.

<number>: a string with double quotation marks, specifying a phone number.

<type>: specifies the number type. The value ranges from 128 to 255. 145 indicates an international number, and 129 indicates a national number. For details, see section 16.5 "Phone Number Type." When the first character in the read phone number is +, <type> is set to 145 automatically.

<text>: a string with double quotation marks, specifying a name. When <coding> is set to 1, it indicates that <text> is the hex text of original data.

<coding>: specifies the encoding format, indicating the character code of the <text> field, and the language. The values are as follows:

1: RAW mode (<text> is uploaded in the original data format.)

2: ASCII (<text> is uploaded in the original keyboard value.)

<nlength>: an integer, specifies the maximum length of a phone number. When the memory is "SM", the maximum value depends on the R-UIM card. When the memory is "ME", the maximum value is 40.

<tlength>: an integer, specifies the maximum length of a name. When the memory is "SM", the maximum value depends on the R-UIM card. When the memory is "ME", the maximum value is 90.

## 9.3 ^CPBW-Write Entries to the Phonebook

### 9.3.1 Syntax

Command	Possible Response(s)
^CPBW[=<index>][,<number>[,<type>[,<text>,<coding>]]]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^CPBW=?	<CR><LF>^CPBW:(list of supported <index>s),<nlength>,(list of supported <type>s),<tlength><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 9.3.2 Interface Description

This command stores phonebook entries in the position specified by the currently selected phonebook memory <index>. If <index> is omitted, but <number> is contained in the parameter, the phonebook entry is stored in the first blank position of the phonebook. If there is no blank position, "+CME ERROR: memory full" is reported.

The position range of the currently selected phonebook memory, maximum length of the <number> field, all values of the <type> field, and maximum length of the <text> field are returned when the test command is executed.

When the phonebook is stored, all entered lengths should be within the maximum length range.

### 9.3.3 Parameter Description

<index>: an integer, specifies the position in the phonebook.

<number>: a string with double quotation marks, specifying a phone number. (Allowed characters are 0–9, '#', '\*', '+', '(', ')', and '-'). The three characters '(', ')', and

'\_' are ignored by the processing program regardless of their positions. The + symbol can only be in the at the start of the number.

<type>: specifies the number type. The value ranges from 128 to 255. 145 indicates an international number, and 129 indicates a national number. For details, see section 16.5 "Phone Number Type." If this parameter is omitted, and the first symbol in a phone number is +, the default value is 145. Otherwise, the default value is 129.

<text>: a string with double quotation marks, specifying a name (its content does not support Enter and quotation marks).

<coding>: specifies the encoding format, which indicates the character code of the <text> field, and the language. The values are as follows:

1: RAW mode (<text> is uploaded in the original data format.)

2: ASCII (<text> is uploaded in the original keyboard value.) In case of using the command without this parameter, this parameter is set to 2.

<nlength>: an integer, specifying the maximum length of a phone number. When the memory is "SM", the maximum value depends on the R-UIM card. When the memory is "ME", the maximum value is 40.

<length>: an integer, specifying the maximum length of a name. When the memory is "SM", the maximum value depends on the R-UIM card. When the memory is "ME", the maximum value is 90.

### 9.3.4 Example

```
AT^CPBW=1,"28780808",129,"80534E4E3A",1
OK
```

#### Notes:

In the above command string the parameter values mean the following:

- 1 (position of the record in the memory)
- "28780808" (phone number)
- 129 (number type)
- " 80534E4E3A" (name Huawei)
- 1 (name encoding format UCS2)

# 10

## Internet Service Interface Commands

### 10.1 ^IPINIT-Initialize a TCP/UDP Connection

#### 10.1.1 Syntax

Command	Possible Response(s)
^IPINIT=<APN>[,<user_name>[,<password>[,<ip_addr>[,<auth_type>]]]]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^IPINIT?	If initialization is performed: <CR><LF>^IPINIT: <state>,<ip_address>,<APN>,<pri_dns_address>,<sec_dns_address><CR><LF><CR><LF>OK<CR><LF> If initialization is not performed: <CR><LF>^IPINIT: 0<CR><LF><CR><LF>OK<CR><LF>
^IPINIT=?	<CR><LF>^IPINIT: (list of supported <state>s)<CR><LF><CR><LF>OK<CR><LF>

#### 10.1.2 Interface Description

This command initializes a TCP/UDP connection. After initialization is complete, a local IP address is obtained, enabling the next step to be performed, for example, enabling a TCP connection and transmitting UDP data.

In case of using the command without <user\_name> and/or <password>, the user name and password that have been set by running the PPPCFG command are used.

During the execution command running, the command can be interrupted.



### 10.1.3 Parameter Description

<APN>: a string with double quotation marks, consisting of a maximum of 100 characters. Not used by the product. It does not need to be specified. For details, see "Example".

<user\_name>: a string with double quotation marks, consisting of a maximum of 31 characters. It can be omitted.

<password>: a string with double quotation marks, consisting of a maximum of 31 characters. It can be omitted.

<ip\_addr>: a string with double quotation marks, consisting of a maximum of 40 characters, specifying the local IP address in the read command.

<auth\_type>: an integer, specifying the authentication mode determined by the module and network consultation.

0: Non authentication

1: PAP authentication

2: CHAP authentication (default value)

<state>: an integer, specifying the initialization completion flag.

0: Non-initialized

1: Initialized

<pri\_dns\_address>: a string with double quotation marks, specifying the IP address of the primary DNS server.

<sec\_dns\_address>: a string with double quotation marks, specifying the IP address of the secondary DNS server.

### 10.1.4 Example

```
AT+IPINIT="card","card"
```

```
OK
```

```
AT+IPINIT?
```

```
+IPINIT: 1,"10.0.10.87","", "129.11.18.8", "0.0.0.0"
```

```
OK
```

## 10.2 ^IOPEN-Establish a TCP/UDP Connection

### 10.2.1 Syntax

Command	Possible Response(s)
^IOPEN=<link_id>,<type>,<remote_addr>,<remote_port>[,<local_port>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^IOPEN?	If a connection is established: <CR><LF>^IOPEN: <link_id>,<type>,<local_port>,<remote_ip>,<remote_port>,<SIO_port>,<MSS>[<CR><LF>^IOPEN: <link_id>,<type>,<local_port>,<remote_ip>,<remote_port>,<SIO_port>,<remote_MSS>][...]]<CR><LF><CR><LF>OK<CR><LF> If no connection is established: <CR><LF>OK<CR><LF>
^IOPEN=?	<CR><LF>^IOPEN: (list of supported <link_id>s),(list of supported <local_port>s),(list of supported <remote_port>s)<CR><LF><CR><LF>OK<CR><LF>

### 10.2.2 Interface Description

This command establishes a wireless connection with one or more remote servers to complete data exchange. TCP and UDP are supported.

During the execution command running, the command can be interrupted.

### 10.2.3 Parameter Description

<link\_id>: an integer, specifying the ID of a connection. The value ranges from 1 to 5.

<type>: a string with double quotation marks, specifying the connection type.

"TCP": A TCP connection is established.

"UDP": A UDP connection is established.

<remote\_addr>: a string enclosed in double quotation marks, specifying the target IP address to be connected to, or the domain name to be resolved. The maximum value length is 255 characters.

<remote\_ip>: a string with double quotation marks, specifying the target IP address to be connected to.

<remote\_port>: an integer, specifying the port of the peer server to be connected to. The value ranges from 1 to 65535.

<local\_port>: an integer, specifying the local sending and receiving port. The value ranges from 1 to 65535. This parameter of the execution command parameter is

optional, if the user does not enter the parameters, TE will be randomly assigned to the local port number.

<SIO\_port>: an integer, specifying the link binding the physical port number. The value ranges from 0 to 10.

0: Reserved

1: UART

2: MODEM

3: PCUI

4-10: Reserved

<remote\_MSS>: an integer, specifying maximum segment size in TCP protocol.

## 10.2.4 Example

```
AT+IPOPEN=1,"TCP","129.11.18.8",10000,9000
```

```
OK
```

```
AT+IPOPEN=2,"TCP","129.11.18.8",10000,8000
```

```
OK
```

```
AT+IPOPEN=3,"UDP","129.11.18.8",7000,6000
```

```
OK
```

```
AT+IPOPEN?
```

```
+IPOPEN: 1,"TCP",9000,"129.11.18.8",10000,1,1460
```

```
+IPOPEN: 2,"TCP",8000,"129.11.18.8",10000,1,1460
```

```
+IPOPEN: 3,"UDP",6000,"129.11.18.8",7000,1,0
```

```
OK
```

```
AT+IPOPEN=1,"TCP","www.baidu.com",80,3081
```

```
OK
```

```
AT+IPOPEN?
```

```
+IPOPEN: 1,"TCP",3081,"220.181.111.147",80,1,1440
```

```
OK
```

## 10.3 ^IPLISTEN-Enable Server Listening

### 10.3.1 Syntax

Command	Possible Response(s)
^IPLISTEN=<type>,<listen_port>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^IPLISTEN?	<CR><LF>^IPLISTEN: <type>,<listen_port>,<idle_num><CR><LF><CR><LF>OK<CR><LF>
^IPLISTEN=?	<CR><LF>^IPLISTEN: (list of supported <type>s),(list of supported <listen_port>s),(list of supported <idle_num>s)<CR><LF><CR><LF>OK<CR><LF>

### 10.3.2 Interface Description

This command enables the server listening function. After a server is started, the server can be connected to a maximum of five clients.

### 10.3.3 Parameter Description

<type>: a string with double quotation marks, specifying the connection type.

"TCP": A TCP connection is established.

"UDP": A UDP connection is established.

"": No connection is established. The value is returned only when the read command is executed. The value cannot be returned when the test command is executed. The value cannot be used in the execution command.

<listen\_port>: an integer, specifying the local listening port. The value ranges from 1 to 65535.

**Note:**

If server listening is not enabled, 0 is returned when the query command is executed.

<idle\_num>: an integer, specifying the number of currently idle connections. The value ranges from 0 to 5.

### 10.3.4 Example

AT^IPLISTEN?

^IPLISTEN: "",0,2

```
OK
AT^IPLISTEN=?
^IPLISTEN: ("TCP","UDP"),(1-65535),(0-5)
```

```
OK
AT^IPLISTEN="TCP",12000
OK
AT^IPLISTEN?
^IPLISTEN: "TCP",12000,2
```

```
OK
```

## 10.4 ^IPSEND-Transmit TCP/UDP Data

### 10.4.1 Syntax

Command	Possible Response(s)
^IPSEND=<link_id>,<data>	<pre>&lt;CR&gt;&lt;LF&gt;^IPSEND: &lt;link_id&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</pre> <p>In case of an MT-related error:</p> <pre>&lt;CR&gt;&lt;LF&gt;+CME ERROR:&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</pre>
^IPSEND=?	<pre>&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</pre>

### 10.4.2 Interface Description

This command is used to transmit subscriber data through an established connection.  
During the execution command running, the command can be interrupted.

### 10.4.3 Parameter Description

<link\_id>: an integer, specifying the ID of an established connection. The value ranges from 1 to 5.

<data>: specifies subscriber data, enclosed in double quotation marks, with a maximum length of 1500 bytes.

**Note:**

Only the subscriber data in the form of visible characters can be transmitted. To transmit invisible characters, they must first be converted into visible ones. In addition, subscriber data cannot contain quotation marks.

## 10.4.4 Example

```
AT^IPSEND=3,"ASDF"
```

```
^IPSEND: 3
```

```
OK
```

## 10.5 ^IPSENDEX–Send TCP/UDP Data Extension Command

### 10.5.1 Syntax

Command	Possible Response(s)
<mode>=0,1: ^IPSENDEX=<link_id>,<mode>,<data>  <mode>=2: ^IPSENDEX=<link_id>,<mode>,<len><CR>entered data	<CR><LF>^IPSENDEX: <link_id><CR><LF><CR><LF>OK<CR><LF>  In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^IPSENDEX=?	<CR><LF>^IPSENDEX: (list of supported <link_id>s),(list of supported <mode>s)<CR><LF><CR><LF>OK<CR><LF>

### 10.5.2 Interface Description

This command is used to transmit user data through an established connection, supporting three data transmission modes.

The first mode is the ^IPSEND compatible mode, in which ^IPSENDEX functions as the old command ^IPSEND.

The second mode is the forced conversion mode. In this mode, a user must convert the original data from hexadecimal data to character strings before entering them to the MT. Then the MT converts the data back to hexadecimal data before sending the data to the receiving end. The receiving end can obtain the original data without additional processing. For example, if a user wants to send four bytes of data (0x00, 0x08, 0x1B, and 0x2C), the user enters the command ^IPSENDEX=1,1,"00081B2C". Then the receiving end receives 0x00, 0x08, 0x1B, and 0x2C.

The third mode is the length-limited transparent transmission mode. In this mode, a user runs the command to send the data length to the MT. After the MT returns OK, the user enters the data to be sent until it reaches the length limit. For example, if a user wants to send four bytes of data, 0x00, 0x08, 0x1B, and 0x2C, the user runs the



command ^IPSENDEX=1,2,4. After OK is returned, the user enters 0x00, 0x08, 0x1B, and 0x2C.

**Note:**

If the length of the entered data is shorter than the requested length, the MT will wait until the remaining data is entered. If the length of the entered data is longer than the requested length, it will return "+CME ERROR: Too many data to be sent".

During the execution command running, the command can be interrupted.

### 10.5.3 Parameter Description

<link\_id>: an integer, specifying the ID of an established connection. The value ranges from 1 to 5.

<mode>:

0: ^IPSEND compatible

1: Forced conversion mode.

2: Length-limited transparent transmission mode

<data>: user data, only STRING type data supported. The maximum length of the user data is 1500 bytes.

<len>: data length user request to transfer, the maximum value is the 1500 bytes.

### 10.5.4 Example

```
AT^IPSENDEX=1,1,"393830"
```

```
^IPSENDEX: 1
```

```
OK
```

```
AT^IPSENDEX=1,2,3
```

```
OK
```

```
Input user data
```

```
^IPSENDEX: 1
```

```
OK
```

## 10.6 ^IPDATA–Indicate the Arrival of TCP/UDP Data

### 10.6.1 Syntax

Command	Possible Response(s)
	<CR><LF>^IPDATA: <link_id>,<data_len>,<data><CR><LF>

### 10.6.2 Interface Description

This command automatically reports the received data.

### 10.6.3 Parameter Description

<link\_id>: an integer, specifying the ID of an established connection. The value ranges from 1 to 5.

<data\_len>: an integer, specifying the data length. The value ranges from 1 to 1500.

<data>: a string without double quotation marks, specifying the newly received data.

### 10.6.4 Example

^IPDATA: 3,4,asdf

## 10.7 ^IPCLOSE–Disable a TCP/UDP Connection

### 10.7.1 Syntax

Command	Possible Response(s)
^IPCLOSE=<link_id>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^IPCLOSE?	<CR><LF>^IPCLOSE: <link1_state>,<link2_state>,<link3_state>,<link4_state>,<link5_state><CR><LF><CR><LF>OK<CR><LF>
^IPCLOSE=?	<CR><LF>^IPCLOSE: (list of supported <link_id>s)<CR><LF><CR><LF>OK<CR><LF>

### 10.7.2 Interface Description

This command disables a TCP/UDP connection or disables the TCP/UDP function.



If <link\_id> is set to 1–5, it indicates that the corresponding established connection is disconnected. To disconnect a TCP connection, four handshaking operations are needed for both party. UDP connection can be disconnected directly.

**Note:**

This command will close the TCP link as soon as the AT command returns OK. In some rare contention case, when the server doesn't receive FIN ACK from the client, the server will remain in CLOSE\_WAIT state. In that rare case, the server can't finish TCP release on time. But the server will close the link after some time. The waiting time depends on the server's implementation.

If <link\_id> is set to 6, it indicates that the server listening function is disabled for the module.

If <link\_id> is set to 7, it indicates that the module deregisters from the network, which is similar to dial-up disconnection.

During the execution command running, the command can be interrupted.

### 10.7.3 Parameter Description

<link\_id>: specifies the ID of a connection. The value ranges from 1 to 7.

1–5: Actual connection ID

6: Established connection and the local server

7: Disable all connections and PPP

<linkx\_state>: specifies the state of connection x.

0: Connection x is disabled and can be used.

1: Connection x is enabled and is being used.

### 10.7.4 Example

```
AT^IPCLOSE?
```

```
^IPCLOSE: 1,1,0,0,0
```

```
OK
```

```
AT^IPCLOSE=1
```

```
OK
```

```
AT^IPCLOSE?
```

```
^IPCLOSE: 0,1,0,0,0
```

```
OK
```

## 10.8 ^IPENTRANS–Enable the Transparent Transmission Mode

### 10.8.1 Syntax

Command	Possible Response(s)
^IPENTRANS=<link_id>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^IPENTRANS?	<CR><LF>^IPENTRANS: <link_id><CR><LF><CR><LF>OK<CR><LF> If there is no link in the transparent transmission mode: <CR><LF>OK<CR><LF>

### 10.8.2 Interface Description

This command enables the TCP/UDP transparent transmission mode.

After "OK" is returned, a subscriber can continuously enter data and transmit the data to the remote TE.

If a subscriber continuously enters +++, the transparent transmission mode is disabled.

Detection +++ rules:

- The interval between the user data and +++ must be greater than 900 ms.
- The interval between two '+' can't exceed 900ms. And there are no other data input between two '+'.

Before link enters transparent transmission mode, the other links on the same physical port should be closed. Otherwise the command ^IPENTRANS will return +CME ERROR.

For UDP connections, the transmission mode is specified by the number 12 parameter set by the AT^IPCFL command.

If the value of the number 12 parameter is set to 0 (time- and length-based transmission mode)

Any data from the master machine is treated as user data and sent to SOCKET. The delay time for the transparent transmission timer and the length trigger during transparent data transmission are determined by the values of the number 5 and number 10 parameters respectively.

The process of sending data is as follows:

- Step 1 When the length of data sent from the master machine reaches the specified threshold, the module sends the data as a packet to SOCKET. Then the module continues to process data sent from the master machine.

- Step 2 If the length of data sent from the master machine does not reach the specified threshold, the transmission timer is started or reset.
- Step 3 When the timer counts down to zero, the data will be sent to SOCKET.
- Step 4 If the module receives data from the master machine when the transmission timer is counting down, the module repeats steps i to iii.
- Step 5 The value of the number 12 parameter is set to 1 (0x7E ending character mode)

In this mode, the master machine must add a packet ending character (0x7E) to a packet. When the module detects the 0x7E character, it recognizes that it is the end of a packet and sends the received data as a packet to SOCKET. Because ending characters are added to user data, conversion of user data is required, that is, before sending user data, the master machine checks all the user data and converts characters according to the user data conversion rules. After receiving the data from the master machine, the module converts the characters back to the original user data before send the user data to SOCKET.

The user data conversion rules are as follows:

- For user data sent from the master machine to the module, character 0x7E is converted to 0x7D 0x5E, and character 0x7D is converted to 0x7D 0x5D.
- For data sent from the module to the master machine, 0x7D 0x5E is converted to 0x7E, and 0x7D 0x5D is converted to 0x7D. After conversion, 0x7E indicates the end of a UDP packet and is not user data.

**Notes:**

- This command is only supported in UART port. If the user uses this command to enter into the transparency transmission mode in other ports, it may cause some uncertain issues.
- When the module in server listen state, this command only supports the link that created by the remote client to enter the transparency transmission mode. And the link which created by the module can't enter the transparency transmission mode.
- When the module is in transparency transmission mode, a TCP connection request is coming. The module will close the TCP link after accept it. And if there are some UDP data packets received and this UDP link is not the trans link, the module will discard those packets, and close the UDP link.

## 10.8.3 Parameter Description

<link\_id>: specifies the ID of an established connection. The value ranges from 1 to 5.

## 10.8.4 Example

```
AT+IPENTRANS=1
```

OK

Now, the remote end will receive any characters (excluding consecutive three +) entered by a subscriber.



## 10.9 ^IPSTATE-Report TCP/UDP Connection State

### 10.9.1 Syntax

Command	Possible Response(s)
	<CR><LF>^IPSTATE: <link_id>,<state>,<errcode><CR><LF>

### 10.9.2 Interface Description

When a TCP/UDP link was closed by AT command IPCLOSE (linked is 1–5), the MT will not send this unsolicited report to TE. Otherwise, the MT will send this unsolicited report to TE.

When a TCP/UDP link was created by AT command IPOPEN, the MT will not send this unsolicited report to TE. Otherwise, the MT will send this unsolicited report to TE.

### 10.9.3 Parameter Description

<link\_id>: specifies the ID of an established connection. The value ranges from 0 to 7.

0: Illegal ID

1–5: The ID of an established connection

6: Local server

7: Network

<state>: link state

0: The link is closed

1: The remote TCP link is accepted.

Others reserved

<errcode>: error information

0: Link has been closed by remote or ME

1: Remote link has been accepted by MT

2: Network error

3: No idle link

4: Reject the remote request link in the transparent transmission mode

Others reserved

### 10.9.4 Example

There has been a link 1 for TCP connection as client. After the TCP server close the connection, the ME will report:

^IPSTATE: 1,0,0

## 10.10 ^IPCFL-Set IPSTACK Static Parameters

### 10.10.1 Syntax

Command	Possible Response(s)
^IPCFL=<parameter_id>,<value>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
^IPCFL?	<CR><LF>^IPCFL: <parameter_id>,<value>[<CR><LF>^IPCFL: <parameter_id>,<value>[...]]<CR><LF><CR><LF>OK<CR><LF>
^IPCFL=?	<CR><LF>^IPCFL: <parameter_id>,(list of supported <value>s),<CR><LF>^IPCFL: <parameter_id>,(list of supported <value>s),[...]<CR><LF><CR><LF>OK<CR><LF>

### 10.10.2 Interface Description

This command is used to set some parameters of the IPSTACK. It only support set the value items 5, 10 and 12 now. The other parameters are not supported in currently.

**Note:**

When used the READ command. The response will not contain the unsupported items.

### 10.10.3 Parameter Description

<parameter\_id>: the item which the command will to set.

<value>: the value the command will set the item to.

parameter_id	Value range(Unit)	Description
5	1–100 (unit: 0.1s, default value: 10)	Sets the delay time for the transparent transmission timer.
10	1–1472 (unit: 1 Byte, default value: 1024)	Sets the length trigger during transparent data transmission.
12	0–1 (default value: 0)	Sets the UDP transparent transmission mode: 0: specifies time- and length-based transmission mode. 1: specifies 0x7E ending character mode. see section "^IPENTRANS"

## 10.10.4 Example

The value of the transparent transmission timer is set to 0.2 seconds.

AT+IPCFL=5,2

OK

## 10.11 ^IPFLOWQ-Query TCP/UDP Flow

### 10.11.1 Syntax

Command	Possible Response(s)
^IPFLOWQ[=<link_id>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^IPFLOWQ?	<CR><LF>^IPFLOWQ: <link1>,<TX_FROM_USER>,<TX_TO_SOCKET>,<TX_ ACK_SUM>,<RX_FROM_SOCKET>,<RX_TO_USER>< CR><LF>^IPFLOWQ: <link2>,<TX_FROM_USER>,<TX_TO_SOCKET>,<TX_ ACK_SUM>,<RX_FROM_SOCKET>,<RX_TO_USER>< CR><LF>[...]<CR><LF>OK<CR><LF>
^IPFLOWQ=?	<CR><LF>^IPFLOWQ: (list of supported <link_id>s)<CR><LF><CR><LF>OK<CR><LF>

### 10.11.2 Interface Description

The EXECUTION command is used to clear the specified TCP/UDP link packet statistics.

The READ command is used to query the current TCP/UDP link packet statistics.

### 10.11.3 Parameter Description

<link\_id>: specifies the ID of the link. The value ranges from 0 to 5.

0: It is used to clear the statistics for all links in the execution command.

1–5: It specifies the link need to clear the statistical data.

<TX\_FROM\_USER>: an integer, specifying the amount of data received from user. The maximum value is the  $(2^{32}-1)$  bytes.

<TX\_TO\_SOCKET>: an integer, specifying the amount of data sent to socket. The maximum value is the  $(2^{32}-1)$  bytes.

<TX\_ACK\_SUM>: an integer, specifying the amount of ACK received. The maximum value is the  $(2^{32}-1)$  bytes.

<RX\_FROM\_SOCKET>: an integer, specifying the amount of data received from socket. The maximum value is the  $(2^{32}-1)$  bytes.

<RX\_TO\_USER>: an integer, specifying the amount of data sent to user. The maximum value is the  $(2^{32}-1)$  bytes.

## 10.12 ^DVCFG-Set Priority of Voice Call and Data Service

### 10.12.1 Syntax

Command	Possible Response(s)
^DVCFG=<mode>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
^DVCFG?	<CR><LF>^DVCFG: <mode><CR><LF><CR><LF>OK<CR><LF>
^DVCFG=?	<CR><LF>^DVCFG:(list of supported <mode>s)<CR><LF><CR><LF>OK<CR><LF>

### 10.12.2 Interface Description

This command sets and queries the priority of voice call and data service.

### 10.12.3 Parameter Description

<mode>:

0: Voice call prefer (default value)

In this state, an incoming voice call will suspend the data transmission. If data service is not in transparent transmission mode, all ports (PCUI port, MODEM port, and UART port) will report RING message. If data service is in transparent transmission mode, all ports will report RING message except the port which is processing data service, and the RING pin is dredged. The data transmission will keep on going after stopping the voice call. But there is one risk that the transmitted data maybe loss during the process of voice call, only the last packet(less than 1600 byte) can be sent successfully

1: Data service prefer

In this state, When the TE performing IP Stack asynchronous command or in the transparent transmission mode, an incoming voice call will be hung up by the module automatically.

In this state, the TE can originate a voice call. And a new incoming voice call during the call will not be hung up automatically.

To change the priority of voice call and data service by using AT^DVCFG=0 command, or using command AT^IPCLOSE=7 to close IPSTACK, which can return back to answer the voice call when it coming.

# 11 Audio Commands

## 11.1 ^SWSPATH-Switch Sound Path

### 11.1.1 Syntax

Command	Possible Response(s)
^SWSPATH=<n>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^SWSPATH?	<CR><LF>^SWSPATH:<n><CR><LF><CR><LF>OK<CR><LF>
^SWSPATH=?	<CR><LF>^SWSPATH:(list of supported <n>s)<CR><LF><CR><LF>OK<CR><LF>

### 11.1.2 Interface Description

This command is used to switch sound path in voice call. Resetting the module will not affect the value. Module updating will reset the value to default value.

The SET command is used to switch the sound path. The set command can be used regardless of whether there is an active call. After the MT restarts, the sound path is reset to the first sound path.

The READ command is used to query the current sound path.

The TEST command is used to return the supported sound paths.

### 11.1.3 Parameter Description

<n>:

0: Handset (default value)

1: Speaker

2: PCM



## 11.2 ^CPCM-Configure PCM Audio

### 11.2.1 Syntax

Command	Possible Response(s)
^CPCM=<mode>,<format>,<clock>,<frame>,<offset>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^CPCM?	<CR><LF>^CPCM:<mode>,<format>,<clock>,<frame>,<offset><CR><LF><CR><LF>OK<CR><LF>
^CPCM=?	<CR><LF>^CPCM:(list of supported <mode>s),(list of supported <format>s),(list of supported <clock>s),(list of supported <frame>s),(list of supported <offset>s)<CR><LF><CR><LF>OK<CR><LF>

### 11.2.2 Interface Description

This command is used to configure the PCM audio before a voice call. Resetting the module will not affect the value. Module updating will reset the value to default value.

### 11.2.3 Parameter Description

<mode>:

- 0: MASTER\_PRIM (default value)
- 1: MASTER\_AUX (reserved, not supported currently)
- 2: SLAVE (reserved, not supported currently)

<format>:

- 0: linear (default value)
- 1: u-law
- 2: a-law (reserved, not supported currently)

<clock>:

- 0: 2.048 MHz (default value)
- 1: 128 kHz (reserved, not supported currently)

<frame>:

- 0: Short frame (default value)
- 1: Long frame (reserved, not supported currently)

<offset>:

0: Offset cleared: the sync launched is aligned to the rising edge of the PCM CLK (default value).

1: Short sync offset set: the short sync sent to the external world in Primary PCM master mode is launched 1/4 cycle after the rising edge of the PCM CLK.

2: Long sync offset set: the long sync sent to the external world in Aux PCM master mode is launched 1/4 cycle ahead of the rising edge of PCM CLK (Reserved, not supported currently).

## 11.3 +CMIC-Tune Microphone Gain Level

### 11.3.1 Syntax

Command	Possible Response(s)
+CMIC=<level>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CMIC?	<CR><LF>+CMIC: <level><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CMIC=?	<CR><LF>+CMIC: (list of supported <level>s)<CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 11.3.2 Interface Description

This command is used to adjust the microphone gain of the MT.

The TEST command returns supported values as compound value.

### 11.3.3 Parameter Description

<level>:

1–12: Integer type value with manufacturer specific range (smallest value represents the lowest gain). Default value is 5. Resetting the module will not affect the value. Firmware updating will reset the value to default value.

## 11.4 +CLVL-Tune Loudspeaker Volume Level

### 11.4.1 Syntax

Command	Possible Response(s)
+CLVL=<level>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CLVL?	<CR><LF>+CLVL:<level><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CLVL=?	<CR><LF>+CLVL:(list of supported <level>s)<CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 11.4.2 Interface Description

This command is used to select the volume of the internal loudspeaker of the MT.

The TEST command returns supported values as compound value.

### 11.4.3 Parameter Description

<level>:

0–7: Integer type value with manufacturer specific range (smallest value represents the lowest sound level). 0 means mute. Default value is 2. Resetting the module will not affect the value. Module updating will reset the value to default value.

## 11.5 +CMUT-Switch Mute Status

### 11.5.1 Syntax

Command	Possible Response(s)
+CMUT=<n>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
+CMUT?	<CR><LF>+CMUT:<n><CR><LF><CR><LF>OK<CR><LF>

Command	Possible Response(s)
+CMUT=?	<CR><LF>+CMUT:(list of supported <n>s)<CR><LF><CR><LF>OK<CR><LF>

## 11.5.2 Interface Description

The SETcommand is used to mute or un-mute the microphone. The SET command can be used only when a call is activated. The volume value is valid only in one call. The value of <n> changes to 0 after a call is complete or the MT is restarted.

The READ command is used to query the current status of the microphone.

The TEST command is used to query the parameter value supported by AT+CMUT.

## 11.5.3 Parameter Description

<n>:

0: Mute off (default value)

1: Mute on

This value restored to 0 when voice call is ended.

## 11.6 ^SMUT–Switch Speaker Mute Status

### 11.6.1 Syntax

Command	Possible Response(s)
^SMUT=<n>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^SMUT?	<CR><LF>^SMUT:<n><CR><LF><CR><LF>OK<CR><LF>
^SMUT=?	<CR><LF>^SMUT:(list of supported <n>s)<CR><LF><CR><LF>OK<CR><LF>

## 11.6.2 Interface Description

This command is used to enable and disable the downlink voice muting.

The TEST command returns supported values as compound value.

## 11.6.3 Parameter Description

<n>:

0: Mute off (default value)

1: Mute on

Resetting the module will not affect the value. Module updating will reset the value to default value.

## 11.7 ^STN-Switch Sidetone Status

### 11.7.1 Syntax

Command	Possible Response(s)
^STN=<vol>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^STN?	<CR><LF>^STN:<vol><CR><LF><CR><LF>OK<CR><LF>
^STN=?	<CR><LF>^STN:(list of supported <vol>s)<CR><LF><CR><LF>OK<CR><LF>

### 11.7.2 Interface Description

This command is used to enable and disable the sidetone before a voice call.

The TEST command returns supported values as compound value.

### 11.7.3 Parameter Description

<vol>:

0: Sidetone off

1: Sidetone on (default value)

Resetting the module will not affect the value. Module updating will reset the value to default value.

## 11.8 ^ECHO-Switch Echo Canceller Mode

### 11.8.1 Syntax

Command	Possible Response(s)
^ECHO=<n>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

Command	Possible Response(s)
^ECHO?	<CR><LF>^ECHO: <n><CR><LF><CR><LF>OK<CR><LF>
^ECHO=?	<CR><LF>^ECHO: (list of supported <n>s)<CR><LF><CR><LF>OK<CR><LF>

## 11.8.2 Interface Description

This command is used to switch the echo canceller mode before a voice call.

The TEST command returns supported values as compound value.

## 11.8.3 Parameter Description

<n>:

0: Close the echo canceller

1: Handset mode, mild echo, short delay (less than 16 ms dispersion)

2: Headset mode, moderate echo, short delay(less than 16 ms dispersion)

3: Carkit mode, loud echo, long delay (up to 64ms dispersion)

4: Speakerphone mode, loud echo, long delay (default value)

5: Bluetooth headset mode, there is a lot of delay in the Bluetooth air interface, definitely can't be used for non-Bluetooth modes.

6: Pad mode, louder echo,long delay.The sensitivity of the microphone is high.

Resetting and updating the module will not affect the value.

## 11.9 ^AUDIOCFG-Configure Tone Parameter

### 11.9.1 Syntax

Command	Possible Response(s)
^AUDIOCFG=<tone_type>,<tone_volume>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^AUDIOCFG?	<CR><LF>^AUDIOCFG: <tone_type1>,<tone_volume1><CR><LF>^AUDIOCFG: <tone_tyoe2>,<tone_volume2><CR><LF><CR><LF>OK <CR><LF>

Command	Possible Response(s)
^AUDIOCFG=?	<CR><LF>^AUDIOCFG:(list of supported <tone_type>s),(list of supported <tone_volume>s)<CR><LF><CR><LF>OK<CR><LF>

## 11.9.2 Interface Description

The SET command is used to set the volume of an incoming call's ring.

The READ command is used to query the volume of an incoming call's ring.

The TEST command is used to return tone type supported by AT^AUDIOCFG.

This command is not restricted by PIN. Parameters support sudden power loss protection (NV storage). The values that NV saved are not influenced by factory default recovery or one-click update.

## 11.9.3 Parameter Description

<tone\_type>: integer type value with range from 0 to 1

0: Tone type of an incoming call's ring.

1: DTMF tone

<tone\_volume>: integer type value with range from 0 to 7

0: Mute

1: The first level volume

2: The second level volume

3: The third level volume

.....

The volume progressively increases.

### Notes:

- When <tone\_type>=0, an incoming call rings. When the corresponding <tone\_volume>=0, the ring is disabled. When <tone\_volume> is 1 to 7, the ring is enabled. And the default value is 0.
- When <tone\_type>=1, send AT^KEYTONE to execute DTMF tone local playback. When the corresponding <tone\_volume>=0, DTMF tone local playback is disabled. corresponding <tone\_volume>=1 to 7, DTMF tone local playback is enabled. And the default value is 2.

## 11.10 ^KEYTONE-DTMF Tone Local Playback

### 11.10.1 Syntax

Command	Possible Response(s)
^KEYTONE=<key>[,<duration>]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^KEYTONE=?	<CR><LF>^KEYTONE: (list of supported <key>s)<CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>

### 11.10.2 Interface Description

This command is used to play the DTMF tone, supporting 16 characters (0–9, A–D, \* and #).

### 11.10.3 Parameter Description

<key>: indicates keytone; character type with range 0–9, A–D, \* and #.

<duration>: the duration of keytone with range from 0 ms to 1000 ms.

## 11.11 ^ECHOPARA-Set Echo Canceller Parameters

### 11.11.1 Syntax

Command	Possible Response(s)
^ECHOPARA=<para>,<value>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^ECHOPARA?	<CR><LF>^ECHOPARA: <para>,<value>[<CR><LF>^ECHOPARA: <para1>,<value1>[<CR><LF>^ECHOPARA: <para2>,<value2>[...]]]<CR><LF><CR><LF>OK<CR><LF> >
^ECHOPARA=?	<CR><LF>^ECHOPARA: (list of supported <para>s)<CR><LF><CR><LF>OK<CR><LF>



## 11.11.2 Interface Description

This command is used to set the values of parameters which is related to echo before a voice call.

The TEST command returns supported values as compound value.

## 11.11.3 Parameter Description

<para>: integer type value with manufacturer specific range.

1: Codectxgain, the gain of codec in transmission path

<value>: integer type value with manufacturer specific range.

If <para> is set to 1, the available values for <value> are an integer ranging from 1 to 12. The gain decreases with the value. The default value is 6. Resetting and updating the module will not affect the value.

## 11.11.4 Example

- Test command:  
AT^ECHOPARA=?  
^ECHOPARA: (1)  
  
OK
- Read command:  
AT^ECHOPARA?  
^ECHOPARA: 1,6  
  
OK
- Set command:  
AT^ECHOPARA=1,12  
OK  
AT^ECHOPARA?  
^ECHOPARA: 1,12  
  
OK

# 12 Wakeup Commands

## 12.1 ^WAKEUPCFG-Configure Wakeup Function

### 12.1.1 Syntax

Command	Possible Response(s)
^WAKEUPCFG=<n>[, <channel>[,<source>]]	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
^WAKEUPCFG?	<CR><LF>^WAKEUPCFG: <n>,<channel>,<source><CR><LF><CR><LF>OK<CR><LF>
^WAKEUPCFG=?	<CR><LF>^WAKEUPCFG: (list of supported <n>s),(list of <channel>s),(list of supported <source>s)<CR><LF><CR><LF>OK<CR><LF>

### 12.1.2 Interface Description

This command is used to configure module's wakeup function by host, including the hardware interfaces supported, and the supported remote-wakeup sources.

### 12.1.3 Parameter Description

<n>: the status of wakeup function

0: Turn off the wakeup function

1: Turn on the wakeup function (default value)

<channel>: option of hardware interfaces that support wakeup with length of 1 byte.

The supported hardware interfaces are defined with 8-bit mask. Every single bit represents the status of one kind of hardware interface. '1' represents TURN ON and '0' represents TURN OFF. Details are defined as following table:

Bit [3-7]	Bit[2]	Bit[1]	Bit[0]
Reserved	UART (Not Supported)	USB	WAKUP_OUT Pin
Default Value	2 (Support USB)		

1: Support WAKUP\_OUT Pin only

2: Support USB only

3: Support WAKUP\_OUT pin and USB

<source>: parameter to configure remote wakeup source with length of 2 bytes.

This parameter is defined with 16-bit mask. Every single bit represents a remote wakeup source supported by Module. '1' represents TURN ON and '0' represents TURN OFF. Details are defined as following table:

Bit [4-15]	Bit[3]	Bit[2]	Bit[1]	Bit[0]
Reserved	UR	DATA	SMS	Voice
Default Value	15 (Support Voice+SMS+DATA+UR)			

UR can control the following unsolicited reports: ^IPDATA, ^DSDORMANT, ^RFSWITCH, ^CEND, ^CONN, ^ORIG, +CLIP, ^HCMGSS, ^HCMGSF, and ^SMEMFULL. These unsolicited reports cannot report to TE when UR is 0 and USB is suspended.

## 12.1.4 Example

Query the current configuration parameters:

AT^WAKEUPCFG?

The wakeup function status is TURN ON. The hardware interface to wakeup is WAKUP\_OUT PIN. The supported remote-wakeup sources are Voice, SMS and DATA.

^WAKEUPCFG: 1,1,7

OK

Set the wakeup function status TURN ON. The hardware interface to wakeup is set to USB. Supported remote-wakeup sources are Voice, SMS, DATA and UR.

AT^WAKEUPCFG=1,2,15

Configuration Succeed:

OK

## 12.2 ^CURC-Unsolicited Report Control Command

### 12.2.1 Syntax

Command	Possible Response(s)
^CURC=<mode>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
^CURC?	<CR><LF>^CURC:<mode><CR><LF><CR><LF>OK<CR><LF>
^CURC=?	<CR><LF>^CURC:(list of supported <mode>s)<CR><LF><CR><LF>OK<CR><LF>

### 12.2.2 Interface Description

The SET command is used to set mode value to open or close unsolicited reports. The unsolicited reports controlled by ^CURC are listed in Appendix 16.7.

The unsolicited reports are closed if the mode value is set to 0 or if the USB is suspended. And the unsolicited reports are open if the mode value is set to 1.

The default value of mode is set to 1. So, "^CURC=0" should be executed if all the unsolicited reports need to be closed.

The READ command returns the current mode value.

The TEST command returns the value range it supports.

### 12.2.3 Parameter Description

<mode>:

0: The unsolicited reports closed

1: The unsolicited reports open (default value)

2: (not supported currently)

# 13 SAR Commands

## 13.1 ^BODYSARON-Disable or Enable BodySAR

### 13.1.1 Syntax

Command	Possible Response(s)
^BODYSARON=<on>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
^BODYSARON?	<CR><LF>^BODYSARON:<on><CR><LF><CR><LF>OK<CR><LF>
^BODYSARON=?	<CR><LF>^BODYSARON:(0,1)<CR><LF><CR><LF>OK<CR><LF>

### 13.1.2 Interface Description

This command is used to enable or disable the BodySAR function. The READ command can query current state for BodySAR function. The TEST command returns supported value of set command.

### 13.1.3 Parameter Description

<on>: state of BodySAR function

0: Disable Body SAR (default value).

1: Enable Body SAR.

## 13.2 ^BODYSARCDMA–Set the Max tx Power Limit of CDMA

### 13.2.1 Syntax

Command	Possible Response(s)
^BODYSARCDMA=<power>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
^BODYSARCDMA?	<CR><LF>^BODYSARCDMA:<power><CR><LF><CR><LF>OK<CR><LF>
^BODYSARCDMA=?	<CR><LF>^BODYSARCDMA:(19,24)<CR><LF><CR><LF>OK<CR><LF>

### 13.2.2 Interface Description

This command is used to set the max transmit power limit of CDMA. The READ command queries current value of the max transmit power limit. The TEST command returns supported value of the max transmit power limit.

### 13.2.3 Parameter Description

<power>: the max transmit power limit of CDMA

Integer from 19 to 24; default value is 24.

## 13.3 ^THERM–Thermal Protection Activated Unsolicited Report

### 13.3.1 Syntax

Command	Possible Response(s)
	<CR><LF>^THERM:<Status><CR><LF>

### 13.3.2 Interface Description

This command is used to send an unsolicited report to host when entering/exiting thermal protecting state according to temperature. This command is affected by AT command ^CURC (if exists).



### 13.3.3 Parameter Description

<Status>: value that indicates whether thermal protection takes effect. The possible values are defined as below:

- 1: Indicates that the modem has entered thermal protecting state.
- 0: Indicates that the modem has exit thermal protecting state.

# 14 GPS Commands

## 14.1 ^WPDOM-Set Operation Mode

### 14.1.1 Syntax

Command	Possible Response(s)
^WPDOM=<mode>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^WPDOM?	<CR><LF>^WPDOM: <mode><CR><LF><CR><LF>OK<CR><LF>
^WPDOM=?	<CR><LF>^WPDOM: (list of supported <mode>s)<CR><LF><CR><LF>OK<CR><LF>

### 14.1.2 Interface Description

This command is used to set the position operation mode. The READ command queries current operation mode. The TEST command returns supported operation mode. The SET command can only be used before position session beginning or after end, and cannot be used during positioning, or will be error.

### 14.1.3 Parameter Description

<mode>: operation mode, default value is 0, no storing at power down

0: Standalone only mode, no network assistance is required, and the MT can be in or out of network coverage.

1: Network only mode, MT operates in MT-assisted position calculation mode only, MT communications with AGPS server for every position fix, and every fix is calculated by AGPS server. Both PDE/PDM access and network coverage are required for this mode of operation. If this mode failed, it'll switch to Cell-ID mode. (reserved and not supported currently)



2: Speed optimal, mobile tries to obtain position fixes in such a way that TTF is minimal, depending upon the fix rate and initial uncertainties, MT decides whether to attempt MT-based fix or MT-assisted fix. In CDMA, MT-based and download ephemeris from AGPS server is preferred, if failed then MT-assisted. In UMTS, it's just MT-based. (reserved and not supported currently)

3: Accuracy optimal, mobiles tries to obtain position fixes with best accuracy. In CDMA, MT-Assisted mode and download ephemeris from AGPS server is preferred, MT-based mode uses only if MT-assisted fix fails. In UMTS, it's just MT-assisted. (reserved and not supported currently)

4: Data optimal, MT will try to minimize the amount of data exchanged over the network. In CDMA, MT-based and download ephemeris from AGPS server is a preferred mode over MT-assisted mode, and minimum AGPS server/network access is allowed. In UMTS, it's just standalone. (reserved and not supported currently)

5: MT-based only, all position fixes provided to PD client are calculated by MT. If communication with network fails, the session will fallback to standalone. (reserved and not supported currently)

6: GpsOneXTRA, provide enhanced standalone performance. It eliminates the need to demodulate the GPS signal for ephemeris, almanac, iono, UTC, or health. (reserved and not supported currently)

7: Cell-ID, the user position will be fixed by the cell which the MT in. (reserved and not supported currently)

<err>: error description or error code

Error code	Error Description
4	Operation not supported
276	GPS function disabled
277	Standalone disabled
278	AGPS disabled
279	gpsOneXTRA disabled
280	Cell-ID disabled
281	Invalid parameter
283	PD session is ongoing
285	Too many parameters

## 14.2 ^WPDST-Set Session Type

### 14.2.1 Syntax

Command	Possible Response(s)
^WPDST=<type>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^WPDST?	<CR><LF>^WPDST:<type><CR><LF><CR><LF>OK<CR><LF>
^WPDST=?	<CR><LF>^WPDST:(list of supported <type>s)<CR><LF><CR><LF>OK<CR><LF>

### 14.2.2 Interface Description

This command is used to set the position session type. The READ command queries current session type.

The TEST command returns supported session type.

The SET command can only be used before position session beginning or after end, and can't be used during positioning, or will be error.

### 14.2.3 Parameter Description

<type>: session type, default value is 0, no storing at power down

0: Single-shot fix, this provides the ability to obtain a one-shot position location according to user-specified QoS. The QoS is set by command ^WPQOS.

1: Tracking fix, this provides the ability to request continuous position fixes and obtain fixes at the user-specified rate. The rate is set by command ^WPDFR.

2: Last result, this provides the last position information available at the time of request, no fix action.

3: Data download, this allow the MT to download ephemeris/almanac data and coarse position a-priori. The data can be used by the PD module to obtain future fixes with a minimal TTF. (reserved and not supported currently)

<err>: error description or error code

Error code	Error description
4	Operation not supported
281	Invalid parameter
283	PD session is ongoing
285	Too many parameters

## 14.3 ^WPDFR–Set Fix Rate

### 14.3.1 Syntax

Command	Possible Response(s)
^WPDFR=<num>,<time>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^WPDFR?	<CR><LF>^WPDFR:<num>,<time><CR><LF><CR><LF>OK<CR><LF>
^WPDFR=?	<CR><LF>^WPDFR:(list of supported <num>s),(list of supported <time>s)<CR><LF><CR><LF>OK<CR><LF>

### 14.3.2 Interface Description

This command is used to set the fix rate of position session. The READ command queries the current fix rate. The TEST command returns supported fix rates. The SET command can only be used before position session beginning or after end, and can't be used during positioning, or will be error.

**Note:**

This command can be only used when the session type is tracking fix.

### 14.3.3 Parameter Description

<num>: the number of position fixes an application will trigger. The range is 1 to 65535; default value is 65535, no storing at power down

<time>: the valid time between fixes. User can set the parameter value only when <num> is larger than 1. The range is 1 to 1800(s); default value is 1, no storing at power down

<err>: error code or error description

Error code	Error description
4	Operation not supported
281	Invalid parameter
283	PD session is ongoing
285	Too many parameters

## 14.4 ^WPQOS-Set Fix QoS

### 14.4.1 Syntax

Command	Possible Response(s)
^WPQOS=<performance>,<accuracy>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^WPQOS?	<CR><LF>^WPQOS:<performance>,<accuracy><CR><LF><CR><LF>OK<CR><LF>
^WPQOS=?	<CR><LF>^WPQOS:(list of supported <performance>s),(list of supported <accuracy>s)<CR><LF><CR><LF>OK<CR><LF>

### 14.4.2 Interface Description

This command is used to set the QoS of fix request, include the performance and the accuracy threshold. The READ command queries current QoS. The TEST command returns supported QoS range. The SET command can only be used before position session beginning or after end, can't be used during positioning, or will be error.

**Note:**

The command is not supported when operation mode is Cell-ID.

### 14.4.3 Parameter Description

<performance>: the level of desired performance in the scale of 0 to 255, this value encodes the preferred response quality(in seconds) to be used for the GPS pseudorange measurements. No storing at power down.

0: This indicates that no time is to be spent making GPS measurements

1–255: This indicates the upper bound for GPS search. Note that this does not correspond to overall session time, but only the amount of time spent searching in GPS mode.

<accuracy>: this allows applications to specify(in meters) the accuracy threshold for a GPS fix. The range is 25 to 1000 meters; default value is 50 meters, no storing at power down.

<err>: error code or error description

Error code	Error description
4	Operation not supported
281	Invalid parameter

Error code	Error description
283	PD session is ongoing
285	Too many parameters

## 14.5 ^WPDGP-Start GPS Position

### 14.5.1 Syntax

Command	Possible Response(s)
^WPDGP	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 14.5.2 Interface Description

This command is used to start a GPS position. Each time only support one position, if it has have a GPS session, then this command will returns error.

### 14.5.3 Parameter Description

<err>: error code or error description

Error code	Error description
4	Operation not supported
276	GPS function disabled
283	PD session is ongoing

## 14.6 ^WPEND-End GPS Position

### 14.6.1 Syntax

Command	Possible Response(s)
^WPEND	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

## 14.6.2 Interface Description

This command is used to end GPS position session. If there is no active session, this command will return error.

## 14.6.3 Parameter Description

<err>: error code or error description

Error code	Error description
4	Operation not supported
276	GPS function disabled
284	PD session is in off status

## 14.7 ^POSITION-Report Position Result

### 14.7.1 Syntax

Command	Possible Response(s)
	<CR><LF>^POSITION: <long>,<lat>,<alt><CR><LF>

### 14.7.2 Interface Description

This command reports the position result to user. The report interval is related to fix rate. If the time between fix  $\geq 3$ s, it won't limited the report interval, or it will report the first fix result, then report once after three fixes.

### 14.7.3 Parameter Description

All the default parameters below are 0.

<long>: longitude, in the range from  $-180$  degrees to  $+180$  degrees, referenced to the WGS-84 reference ellipsoid, counting positive angles east of the Greenwich meridian and negative angles west of the Greenwich meridian.

<lat>: latitude, in the range from  $-90$  degrees to  $+90$  degrees, referenced to the WGS-84 reference ellipsoid, counting positive angles north of the equator and negative angles south of the equator.

<alt>: altitude, height of MT above the WGS 84 reference ellipsoid in units of 1 meter, ranging from  $-500$  m to  $15883$  m, where the field value conveys the height plus  $500$  m, positive is above the horizontal and negative is under the horizontal.(Because of the bug of GPS system, the altitude is not accurate)

## 14.7.4 Example

When position success,

^POSITION: 113.94026d,22.53206d, 270m

## 14.8 ^POSEND-Report Position End

### 14.8.1 Syntax

Command	Possible Response(s)
	<CR><LF>^POSEND: <reason><CR><LF>

### 14.8.2 Interface Description

When position ends, it will report this command and tell the user the end reason.

### 14.8.3 Parameter Description

<reason>: position end reason

0: Session ended due to phone going offline

1: Session ended due to no service

2: Session ended due to no connection with PDE

7: Session ended due to connection failure with PDE

9: User ended the session

12: Session ended due to timeout (i.e., for GPS search)

15: Session ended due to an error in fix

16: Session rejected from PDE

18: Ending session due to E911 call

20: Ending because BS information is stale

21: Session ended due to VX LCS agent authorization failure

22: Session ended due to unknown system error

23: Session ended due to unsupported service

24: Subscription violation

25: The desired fix method failed

28: Network indicated a normal ending of the session

29: No error specified by the network

- 31: Session ended due to position server not available
- 32: Network reported an unsupported version of protocol
- 33: Mapped to corresponding SS-MOLR-error error code
- 34: MO-LR unexpected error
- 35: MO-LR Data missing
- 36: MO-LR facility not supported
- 37: MO-LR subscription violation
- 38: MO-LR position method failure
- 39: MO-LR undefined error
- 43: Position response Nongood (NG) reception (LIS side system anomaly)
- 44: Position response NG reception (beyond the LSU maximum session count)
- 45: Position response NG reception (MT side setting information failure)
- 46: Session interruption NG reception (LIS side system anomaly)
- 47: Session interruption NG reception (MT side setting information failure)
- 48: Abnormal response reception
- 49: T04 timer timed out
- 50: T03 timer timed out
- 51: T02 timer timed out
- 52: IS-801 timer timed out
- 53: LR reject reception
- 54: AA reject reception
- 55: EPH reject reception
- 56: ALM reject reception
- 57: Seed reject reception
- 58: IS-801 sequence error
- 59: PPP establish trial failure
- 60: Network link disconnection after PPP established (MT-initiated)
- 61: Network link disconnection after PPP established (server-initiated)
- 62: GPS data request response NG reception (LIS side system anomaly)
- 63: GPS data request response NG reception (beyond LSU maximum session count)
- 64: GPS data request response NG reception (MT side setting information)
- 65: GPS data request interruption NG reception (LIS side system)
- 66: GPS data request interruption NG reception (MT side setting information)



- 67: T20 timer timed out
- 68: T21 timer timed out
- 901: No fix with download the data
- 911: MSA (MSB auto) – No fix with download the data

## 14.9 ^WPDIM-Delete Assisted Data

### 14.9.1 Syntax

Command	Possible Response(s)
^WPDIM=<mode>	<CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>
^WPDIM=?	<CR><LF>^WPDIM: (list of supported <mode>s)<CR><LF><CR><LF>OK<CR><LF>

### 14.9.2 Interface Description

This command is used to delete the assisted data. The TEST command returns supported delete types. This command can only be used before position begin or after position end, and does not support deleting during position.

### 14.9.3 Parameter Description

<mode>: delete type, default value is 2, no storing at power down.

0: Delete operation related to cold start.

1: Delete operation related to warm start.

2: Delete operation related to hot start.

3: Delete gpsOneXTRA data, if the module is not support XTRA, then not support this parameter.

<err>: error code or error description

Error code	Error description
4	Operation not supported
279	gpsOneXTRA disabled
281	Invalid parameter
282	Unable to delete data
283	PD session is ongoing

Error code	Error description
285	Too many parameters

## 14.10 ^GPSTYPE-Query GPS Type

### 14.10.1 Syntax

Command	Possible Response(s)
^GPSTYPE?	<CR><LF>^GPSTYPE:<type><CR><LF><CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR:<err><CR><LF>

### 14.10.2 Interface Description

This command queries current GPS type.

### 14.10.3 Parameter Description

<type>: indicates GPS type, integer in bits, 1 indicates supporting; 0 indicates not supporting.

Bits	Bit3	Bit2	Bit1	Bit0
GPS Type	gpsOneXTRA	User plane	Control plane	Standalones

- bit0: indicates supporting standalone or not
- bit1: indicates supporting control plane or not
- bit2: indicates supporting user plane or not
- bit3: indicates supporting gpsOneXTRA or not

<err>: Error code or error description

Error code	Error description
4	Operation not supported

### 14.10.4 Example

If the module supports all GPS types:

AT^GPSTYPE?



^GPSTYPE:15

OK

# 15 Update Commands

## 15.1 ^FWLOAD-Perform a Local Upgrade

### 15.1.1 Syntax

Command	Possible Response(s)
^FWLOAD=<update_type>	<CR><LF>><CR><LF>C<CR><LF> In case of an MT-related error: <CR><LF>+CME ERROR: <err><CR><LF>

### 15.1.2 Interface Description

This command is used to specify the upgrade type, transmit the upgrade file into the module using 1K-Xmodem, and start the upgrade. The following table lists the ports supported by the full upgrades.

Upgrade type	UART port	MODEM port	PCUI port	Application port
AT Command	√	√	√	×
Update data	√	×	×	√

You can run AT+IPR? to query the baud rates supported by the current module. To set the baud rates for a module, run the IPR SET command. When you do so, refer to the following baud rates supported by the full upgrades.

Full upgrades support the baud rate of 115200 bps.

**Note:**

During a local update, if module restarts, the Host needs re-open the port to receive the data sent by the module. Meanwhile, in order to avoid some adverse impact, other ports cannot perform other operations, and the Host can transmit data through Application port or UART port in the full updates.

During the upgrade process, please ensure that the module is powered on and the host's USB is not in the sleep state.

### 15.1.3 Parameter Description

<update\_type>: an integer, specifying the upgrade type.

0: Full upgrade

The 1K-XMODEM protocol is used to transmit update files.

### 15.1.4 Example

Local full upgrade:

```
AT^FWLOAD=0
```

The board restarts.

>

C

The board restarts, and the upgrade starts.

```
^FWLSTATE: 90
```

**Note:**

After the data transmit is normally end in during full updates, OK will not be reported.

## 15.2 ^FWLSTATE-Report the Upgrade Status

### 15.2.1 Syntax

Command	Possible Response(s)
	<CR><LF>^FWLSTATE: <state>[,<error_code>]<CR><LF>

### 15.2.2 Interface Description

During an update, the board reports the current update status after ^FWLSTATE is executed.

## 15.2.3 Parameter Description

<state>: an integer, specifying the current upgrade status.

80: Update failed

90: Update succeeded

<error\_code>: an integer, specifying the cause of the upgrade failure. See the error list in appendix 15.3 .

## 15.2.4 Example

Local full upgrade

AT+FWLOAD=0

The board restarts.

>

C

OK

The board restarts, and the upgrade starts.

^FWLSTATE: 90

## 15.3 Appendix

### 15.3.1 ERROR CODE Values and Descriptions for the Update Feature

<err> code	Description
01	Operation failed due to unknown error
02	Previous command is not complete
03	Error command parameters
04	Operation not supported
05	Operation failed due to system error
11	The network has not been opened yet
12	The network has been opened already
13	Fail to open network
14	The link has not been established yet
15	The link has been established already

<err> code	Description
16	Fail to establish link
17	Fail to bind the specified port
18	Fail to connect to the specified address
19	Invalid domain name
20	Fail to resolve DNS
21	Http server error
22	File type is not correct
23	File source is not correct
51	Fail to get filelist file
52	MD5 check failed
54	FOTA is in collision state
101	Fail to send data because TE cancel
102	Fail to send data because retry times are bigger than 10
103	Fail to send data because input file tag is error
104	Fail to send data because packet number is error
105	Fail to send data because the protocol is not 1K-Xmodem
106	Invalid port for fwload mode
107	Fail to send data because file crc or subfile crc is error
108	Fail to send data because update type is error
109	Fail to send data because model product is error
110	Fail to send data because source version is error
111	Fail to send data because some tag length is error
112	Fail to send data because file num error
113	Fail to send data because open subfile failed
114	Fail to send data because write subfile to flash error
151	Fail to write flag
152	Fail to read flag
153	Fail to erase region
154	Fail to copy osbl
155	Fail to replace image
156	Fail to copy xnv



<err> code	Description
157	Fail to write xnv
158	Fail to backup nv
159	Fail to restore nv



# 16 Appendix

## 16.1 CME ERROR List

**Note:**

For all AT commands, if the default value of the CMEE is 2, "ERROR" can be reported, or "CME ERROR" can be reported. "CME ERROR" includes certain common errors and certain specific errors of the AT commands.

Table 16-1 describes the mapping between the <err> value of CME ERROR and the string.

**Table 16-1** Mapping between the <err> value of CME ERROR and the string

<err> Code	String Text
0	phone failure
1	no connection to phone
2	phone adaptor link reserved
3	operation not allowed
4	operation not supported
9	invalid pin/puk param
10	R-UIM not inserted
11	R-UIM PIN required
12	R-UIM PUK required
13	R-UIM failure
14	R-UIM busy
15	R-UIM wrong
16	incorrect password

<err> Code	String Text
17	R-UIM PIN2 required
18	R-UIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network timeout
32	network not allowed emergency calls only
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
100	unknown
103	illegal MESSAGE
106	illegal ME
132	service option not supported
133	requested service option not subscribed
134	service option temporarily out of order
257	network rejected request
258	retry operation
259	invalid deflected to number
260	deflected to own number

<err> Code	String Text
261	unknown subscriber
262	service not available
263	unknown class specified
264	unknown network message
65280	call index error
65284	SPN file wrong
65285	SPN file access denied
65286	SPN file not exist
65287	another SPN query operation still not finished

## 16.2 CMS ERROR List

The following lists the <err> value of CMS ERROR that may be returned by all AT commands of CDMA product short messages.

<err> Values	3	300	301	302	303	304	305	313	314	320	321	322	340	500
+CNMI				4										
+CMGD		2		4				10		12	13			19
+CNMA				4									18	19
+CPMS				4										
^HCMGS	3			4		6	6							19
^HCMGW		2		4		6	6	10		12		14		

Table 16-2 describes the mapping between the <err> value of CMS ERROR and the string.

**Table 16-2** Mapping between the <err> value of CMS ERROR and the string

<err> Code	String Text
3	Network Failure
300	ME Failure
301	reserved
302	operation not allowed

<err> Code	String Text
303	operation not supported
304	INVALID PDU Param
305	INVALID TXT Param
313	R-UIM Failure
314	R-UIM Busy
320	MEM Failure
321	invalid index
322	MEM Full
340	CNMA Not Exp
341	length of SMS text too long
350	unknown err

The causes are as follows:

- 2: NV error
- 3: Network failure
- 4: Operation not allowed
- 6: Incorrect parameter
- 10: R-UIM wrong
- 11: R-UIM busy
- 12: Memory failure
- 13: Invalid index
- 14: Memory full
- 18: No short message to be acknowledged
- 19: Unknown

## 16.3 Final Result Codes

Final result code	No.	Description
OK	0	A command is executed, and there is no error.
CONNECT	1	A connection is established.
RING	2	An incoming call is originated.

Final result code	No.	Description
NO CARRIER	3	A connection is terminated.
ERROR	4	There is a common error.
NO DIALTONE	6	There is no dialing tone.
BUSY	7	The peer is busy.
NO ANSWER	8	Timeout occurs when the connection is complete, and there is no reply.
+CME ERROR:<err>		The error type is specified by <err>.
+CMS ERROR: <err>		It is a short message-related error.

**Note:**

The final result code is the termination flag of an AT command.

## 16.4 Initial Values of Command Parameters After MT Restart

Table 16-3 lists the initial values of the interface parameters mentioned in this document during MT startup.

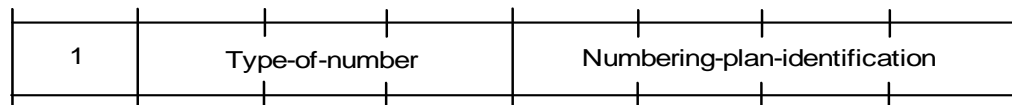
**Table 16-3** Initial parameter values after startup

	Initial Value
E	<value>=1
V	<value>=1
S0	<value>=0
S3	<value>=013
S4	<value>=010
S5	<value>=008
Q	<value>=0
+CMEE	<value>=2
+CPMS	<mem1>="ME", <mem2>="ME", and <mem3>="ME"
+CNMI	<mode>=1, <mt>=1, <bm>=0, <ds>=2, and <bfr>=0
^HSMSSS	<ack>=0,<prr>=0,<fmt>=1,<prv>=0

	Initial Value
&C	<value>=1
&D	<value>=2
&S	<value>=0
+ICF	<format>=3 and <parity>=3
+IFC	<DCE_by_DTE>=0 and <DTE_by_DCE>=0
+IPR	<rate>=115200
+CMUT	<n>=0
^RSSIREP	<value>=1
+CLIP	<n>=0
+CCWA	<n>=0

## 16.5 Phone Number Type

The phone number type consists of one byte. Its structure is as follows:



Type-of-Number(bit6...bit4): The values are as follows:

0 0 0: This value is selected when the subscriber does not know the check information of the target address number. The address number is organized by the network side.

0 0 1: This value is selected when the subscriber can identity that the number is an international number or the user considers that the number is in the national number range.

0 1 0: The number is a national number without a prefix or a suffix. This value is selected when the subscriber originates a national call.

0 1 1: The number is a specific number on the network and is used for management or service. This value cannot be used by the user.

1 0 1: The number is in the default 7-bit encoding format of the GSM and is not supported currently.

1 1 0: The number is short and is not supported currently.

1 1 1: The number is reserved for extension and is not supported currently.

Numbering-plan-identification(bit3...bit0): The values are as follows:

(Note: bit3...bit0 is valid only when the value of bit6...bit4 is 000,001,010.

0 0 0 0: The number depends on the number scheme on the network side.

0 0 0 1: ISDN/telephone numbering plan

0 0 1 1: Data numbering plan, not supported currently.

0 1 0 0: Telex numbering plan, not supported currently.

1 0 0 0: National numbering plan, not supported currently.

1 0 0 1: Private numbering plan, not supported currently.

1 0 1 0: ERMES numbering plan, not supported currently.

The common phone number types are as follows:

145: International number

129: National number

161: National number without a prefix or a suffix

## 16.6 AT Commands That Are Allowed to Be Executed in PIN Code Limit Mode

Command		
E	+CMEE	^RESET
S0	+CFUN	^MSO
S3	+CGMM/+GMM	^CPIN
S4	+CGMI/+GMI	^HWVER
S5	+CGMR/+GMR	^PPPCFG
V	+CGSN/+GSN	^HS
Q	^ICCID	^SYSINFO
&F	+ICF	^RSSIREP
&V	+IPR	^TIME
I	+IFC	^MEID
&C	+CPMS	^OTAACED
&D	+CPIN	^SWSPATH
&S	+CLVL	^SMUT
A/		^STN
	+CHV	^DTMF
	+CLCC	^ECHO

## 16.7 List of Unsolicited Report Command Controlled by ^CURC

COMMAND	ENABLE/DISABLE	COMMENT
^SIMST	AT+CURC=1/0	
^MODE		
^CRSSI		
^HDRSSI		
^RSSILVL		
^HRSSILVL		
^THERM		
^ANTDTCT		

## 16.8 Acronyms and Abbreviations

Abbreviation	Full Spelling
3GPP	Third Generation Partnership Project
ADC	Analog to Digital Converter
APN	Access Point Name
AT	ATtention
BER	Bit Error Rate
CDMA	Code Division Multiple Access
CLI	Calling Line Identity
CLIP	Call Line Identification Presentation
CS	Circuit-switched
CTS	Clear To Send
DCD	Data Carrier Detection
DCE	Data Circuit Equipment
DCS	Data Coding Scheme
DSR	Data Set Ready
DTE	Data Terminal Equipment



Abbreviation	Full Spelling
DTMF	Dual Tone Multiple Frequency
DTR	Data Terminal Ready
ESN	Electronic Serial Number
GPIO	General Programmable Input Output Pin
HDR	High Data Rate
ICCID	Integrated Circuit Card Identity
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
ITU-T	International Telecommunication Union-Telecommunication Standardization Sector
IWF	Interworking Function
MCC	Mobile Country Code
MDN	Mobile Directory Number
MEID	Mobile Equipment Identifier
MIN	Mobile Identification Number
MNC	Mobile Network Code
MSIN	Mobile Subscriber Identification Number
MT	Mobile Terminal
NV	Nonvolatile
OTAPA	Over-the-air Parameter Administration
OTASP	Over-the-air Service Provisioning
PCM	Pulse Code Modulation
PIN	Personal Identity Number
PLMN	Public land mobile network
PPP	Point to Point Protocol
PRI	Product Release Instruction
PRL	Preferred Roaming List
PS	Packet-switched
PUK	PIN Unblocking Key
R-UIM	Removable User Identify Module
RF	Radio Frequency



Abbreviation	Full Spelling
RSSI	Receive Signal Strength Indicator
RTS	Request To Send
SCA	Service Center Address
SIM	GSM Subscriber Identity Module
SM	Short Message
SMS	Short Message Service
TA	Terminal Adapter
TE	Terminal Equipment
UIM	User Identity Module
URC	Unsolicited Result Code