Lierda NB Module V150

Hi2115 AT CommandSet

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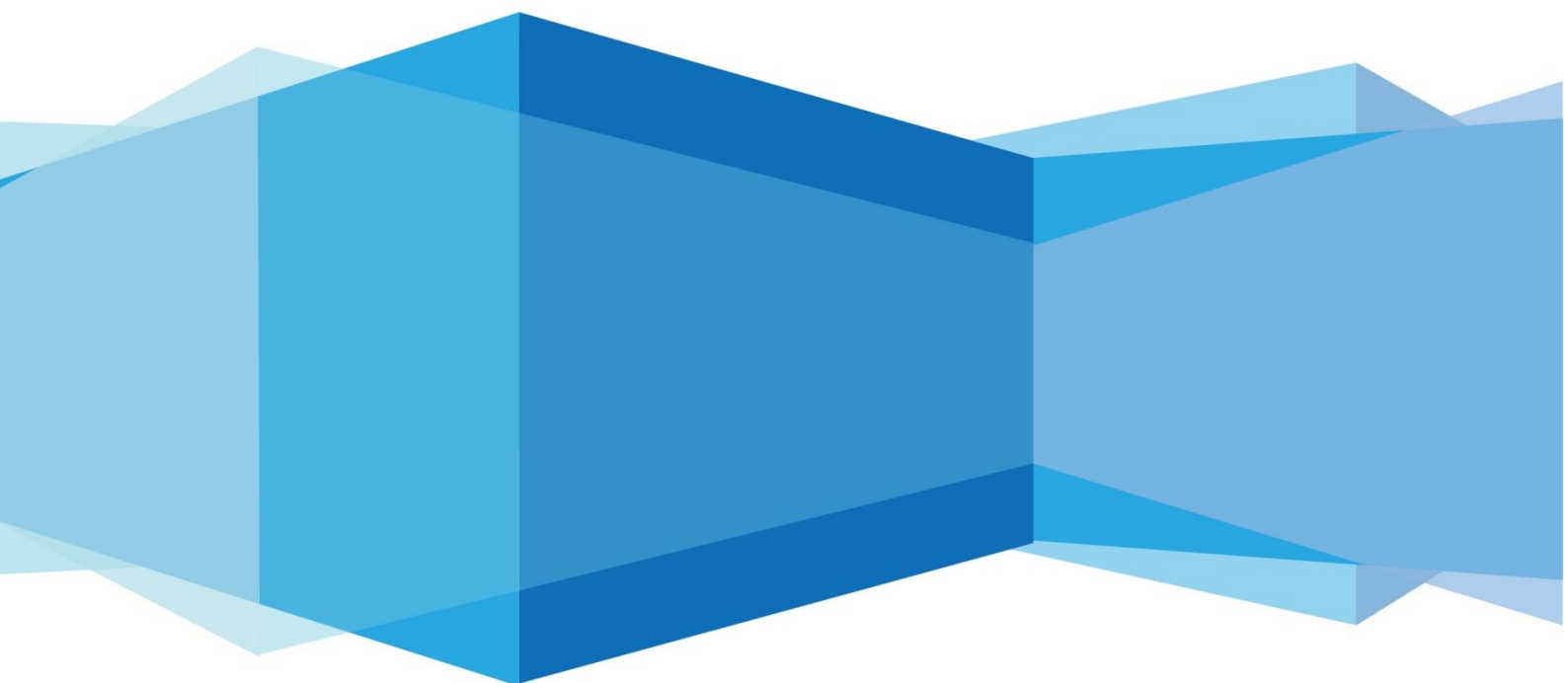
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文件修订历史

版本	修订日期	修订日志
1.0	2018-03-22	创建文档
1.1	2018-05-18	150B300新增指令集

适用模块型号

序号	模块型号	模块简介
1	NB86-G	适用多个频段，20×16×2.2（mm）

安全须知

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SOS	移动终端设备并不保障任何情况下都能进行有效连接，例如在移动终端设备没有花费或 SIM 无效。当您在紧急情况下遇见以上情况，请记住使用紧急呼叫，同时保证您的设备开机并且处于信号强度足够的区域。
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1.Introduction

This document gives details of the AT Command Set supported by the Hisi Hi2110 chip loaded with V100R100C20B657 and V150R100C10B120 firmware.

At boot the following string will be output:

<CR><LF>Neul<CR><LF>OK<CR><LF>

After this string has been received the AT Command processor is ready to accept AT commands.

If the Applications core was rebooted or restarted for any reason that wasn't a normalpower-on sequence, a message will be output before the <CR><LF>Neul<CR><LF>OK<CR><LF> string. See Chapter 6 for more details.

In case external MCU intervene the process of update, unsolicited information informs the external MCU update state. Please reference AT document [1] for more detail information.

<CR><LF>FIRMWARE DOWNLOADING<CR><LF>　　　　Indicates UE is downloading update package.

\<CR>\<LF>FIRMWARE DOWNLOAD FAILED\<CR>\<LF>	Indicates download failed.
\<CR>\<LF>FIRMWARE DOWNLOADED\<CR>\<LF>	Indicates download finished.
\<CR>\<LF>FIRMWARE UPDATING\<CR>\<LF>	Indicates UE is updating.
\<CR>\<LF>FIRMWARE UPDATE SUCCESS\<CR>\<LF>	Indicates update success, but not report update state to firmware package server yet.
\<CR>\<LF>FIRMWARE UPDATE FAILED\<CR>\<LF>	Indicates UE update fail.
\<CR>\<LF>FIRMWARE UPDATE OVER\<CR>\<LF>	Indicates reported update state to firmware package server.

During FOTA procedure, device shouldn't operate modem until " FIRMWARE UPDATE OVER" is reported.

E.g. AT+NRB, power off are not permitted, otherwise, indescribable error will be made.[1]

1.1 Definitions

➢ \<CR>carriage return character

➢ \<LF> line feed character

➢ \<..> parameter name. Angle brackets do not appear on command line

➢ [..] Option parameter. Square brackets do not appear on the command line.

1.2 AT Command Syntax

AT+\<cmd>	Execute Command	Execute Command
AT+\<cmd>=p1[,p2[,p3[.....]]]	Set Command	Set Command

AT+<cmd>?	Read Command	Check current sub-parameter values
AT+<cmd>=?	Test Command	Check possible sub-parameter values

Multiple commands can be placed on a single line using a semi-colon（ ';' ）between commands. Only the firstcommand should have AT prefix. Commands can be in upper or lower case.

When entering AT commands spaces are ignored except in the following cases:

•within quoted strings, where they are preserved

• within an unquoted string, numeric parameter

• within an IP address

• within the AT command name upto and including a '=' , '?' or '=?'

They can be used to make the input more human readable. On input, at least a carriage-return is required. Anew-line character is ignored so it is permissible to use carriage-return line-feed pairs on the input.

If no command is entered after the AT token, OK will be returned. If an invalid command is entered, ERRORwill be returned.

Optional parameters, unless explicitly stated, need to be provided up to the last parameter being entered.

1.3 AT Command Responses

When the AT Command processor has finished processing a line it will output either OK, ERROR or an error code indicating that it is ready to accept a new command. Solicited informational responses are sent before the final OK or ERROR. Unsolicited information

responses will never occur between a solicited informational response and the final OK or ERROR.

For AT Commands aligned to the 3GPP 27.007 specification error codes are enabled with the CMEE command, else the ERROR message will be returned. For AT Commands aligned to the 3GPP 27.005 specification, a CMS error will be returned where specified.

Response s will be of the format:

<CR><LF>+CMD1:<parameters><CR><LF>

<CR><LF>OK<CR><LF>

or

<CR><LF><parameters><CR><LF>

<CR><LF>OK<CR><LF>

1.4 3GPP Alignment

3GPP commands are aligned to 3GPP TS 27.007 v14.3.0 (2017-03). For clarification on 3GPP commands,please refer to this document.

1.5 Modification History

Document ID	Firmware Release	Modification
V100R100C00B350 Issue 2	B350SP13	Output now uses <CR><LF> before and after each line of output. Previously only the trailing <CR><LF> was generated
V100R100C00B350 Issue2	B350SP13	Error behaviour aligned to +CMEE=0 has beenimplemented. Only' OK' and" ERROR" are returned.
V100R100C00B600 Issue 1	B600	New commands added: +NBAND, +NLOGLEVEL, +CMEE have beenadded
V100R100C00B600 Issue	B600	3GPP numeric error codes have been implemented. Previous text errorshave been removed.

V100R100C00B650 Issue 1	B650	New command +NCONFIG added. Behaviour of +COPS and +CGDCONTwhen AUTOCONNECT is enabled has been added
V100R100C00B650 Issue 3	B650SP1	+NUESTATS extended to return coverage level Clarify syntax for some execute commands
V100R100C00B650 Issue 4	B650SP6	Minor changes to behaviour of some commands
V100R100C00B655 Issue 5	B655SP2	Minor changes to behaviour of some commands
V100R100C00B656 Issue 6	B656	Fix some description error and add FOTA status
V100R100C00B656 Issue 7	B656SP1	New command AT+NCCID added Add rsrq for AT+NUESTATS=RADIO
V100R100C00B656 Issue 8	B656SP2	New command AT+ NATSPEED added
V100R100C00B656 Issue 9	B656SP2	Add maximum value for parameter "timeout" of AT+ NATSPEED
V100R100C00B657 Issue 1	B657	Aligned to ETSI 27.005 v13.0.0 (2016-01) for +CSMS, +CNMA, +CSCA,+CMGS, +CMGC, +CSODCP +CRTDCP Commands added:+CGACT,+NCCID,CTZR,+CPSMS,+CEDRXS,+NRDCTRL,+NRDSET,+NRDEXEC,+NRDCTRL,+NRDSET,+NRDEXEC,+NFWUPD,+NMSTATUS,+NTPERMID Add +CEREG n=3,4,5 Add +NUESTATS=CELL Add +NCONFIG:CELL_RESELECTION, ENABLE_BIP Add +CGDCONT: NSLPI +CGMR will return information for each core
V100R100C00B657 Issue 2	B657SP1	Add +NPOWERCLASS,+NPSMR,+CGAPNRC,+NPTWEDR
V100R100C00B657 Issue 4	B657SP2	Add +CIPCA, +NXLOG Add parameter for +NATSPEED.
V100R100C00B657	B657SP3	Add+NPIN
V150R100C20B300 Issue 11	B300	Add XON/XOFF flow-control support +NATSPEED Add +CGAUTH, +CGCONTRDP,+NQPODCP,+NIPINFO, +NCPCDPR, +CNMPSD,+NCSEARFCN,+NSOCLI Add +NPOWERCLASS: <power class> support 6 Add +NCONFIG:RELEASE_VERSION +NCONFIG: SYNC_TIME_PERIOD +NCONFIG: RPM +NCONFIG: NB_CATEGORY +NCONFIG: IPV6_GET_PREFIX_TIME

		+NCONFIG:HEADD_COMPRESS +NCONFIG:RLF_UPDATE +NCONFIG:CONNECTION_REESTABLISHMENT Add error code:528,529,530

2. Commands (3GPP aligned to 27.007)

2.1 Request Manufacturer Identification (+CGMI)

Command	Response	Example
+CGMI	<manufacturer> +CME ERROR: <err>	AT+CGMI Neul OK
+CGMI=?		AT+CGMI=? OK

Description

This command returns the manufacturer information. By default this will return "Neul" on the standard platform.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<manufacturer>: the total number of characters, including line terminators, in theinformationtext shall not exceed 2048 characters.

Text shall not contain the sequence 0<CR> or OK<CR>

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2.2 Request Manufacturer Model (+CGMM)

Command	Response	Example
+CGMM	<model> +CME ERROR: <err>	AT+CGMM Hi211X OK
+CGMM=?		AT+CGMM=? OK

Description

This command returns the manufacturer model information. By default this will

return "Hi211X" on the standard platform.

Refer to <u>Chapter 7: Error Values for possible <err> values.</u>

Defined values

<model>:the total number of characters,including line terminators,in the information

text shall notexceed 2048 characters.

Text shall not contain the sequence0<CR>or OK<CR>

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2.3 Request Manufacturer Revision (+CGMR)

This command returns the manufacturer revision. The text is human readable and is

not intended for microcontroller parsing.

By default this will return the firmware revision – release and build.

Command	Response	Example
+CGMR	<revision> +CME ERROR:<err>	AT+CGMR SSB,UNKNOWN- SHA1000135005SECURITY_A,V150 R100C10B180PROTOCOL_A,V150 R100C10B180APPLICATION_A,V15 0R100C10B180 SECURITY_B,V150R100C10B180 OK
+CGMR=?		AT+CGMR=? OK

Description

Execution command returns one or more lines of information text<revision>. Refer to

<u>Chapter 7: Error Values for possible <err> values.</u>

Defined values

<revision>: the total number of characters, including line terminators, in the information

text shall not exceed 2048 characters.

Text shall not contain the sequence 0<CR> or OK<CR>

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•<revision>will change format over time. It should be treated as an opaque identifier.

2.4 Request Product Serial Number (+CGSN)

Command	Response	Example
+CGSN[=<snt>]	when <snt>=0 (or omitted) and command successful:<sn> when <snt>=1 and command successful: +CGSN: <imei> when <snt>=2 and command successful: +CGSN: <imeisv> when <snt>=3 and command successful: +CGSN: <svn> +CME ERROR: <err> when TE supports <snt> and command successful: +CGSN: (list of supported <snt>s)	AT+CGSN=0 123E4567-E89B-12D3-A456-426655440000 OK AT+CGSN=1 +CGSN:49015420323751 OK
+CGSN=?		AT+CGSN=? +CGSN:(0,1,2,3) OK

Description

Execution command returns the IMEI (International Mobile station Equipment Identity number) and related information

For a TA which does not support <snt>, only OK is returned.

Refer to Chapter 7: ErrorValues for possible <err> values.

Defined values

<snt>integer type indicating the serial number type that has been requested.

0 returns <sn>

1 returns the IMEI (International Mobile station Equipment Identity)

2 returns the IMEISV (International Mobile station Equipment Identity

and SoftwareVersion number)

3 returns the SVN (Software Version Number)

<sn>The 128-bit UUID of the UE. The total number of characters, including

line terminators, in the information text shall not exceed 2048

characters. Text shall not contain the sequence 0<CR> or OK<CR>

<imei> string type in decimal format indicating the IMEI

<imeisv>string type in decimal format indicating the IMEISV

<svn>string type in decimal format indicating the current SVN which is a

part of IMEISV;

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2.5 EPS network registration status (+CEREG)

Command	Response	Example
+CEREG=<n>	+CME ERROR: <err>	AT+CEREG=1 OK
+CEREG?	when <n>=0, 1, 2 or 3 and command successful: +CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>[,<cause_type>,<reject_cause>]]]	AT+CEREG? +CEREG:1,1 OK
+CEREG=?	When<n>=4 or 5 and command successful: +CEREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>],[<rac>][,[<causetype>],[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]	AT+CEREG=? +CEREG:(0,1,2,3,4,5) OK
	+CEREG: (list of supported <n>s)	

Description

The set command controls the presentation of an unsolicited result code +CEREG:

<stat>when <n>=1 and there is a change in the MT's EPS network registration status in E-

UTRAN, or unsolicited result code +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]] when <n>=2and

there is a change of the network cell in E-UTRAN. The parameters <AcT>, <tac> and <ci> are provided only if available. The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value of <stat> changes.

If the UE wants to apply PSM for reducing its power consumption the set command controls the presentation of an unsolicited result code +CEREG:<stat>[,[<tac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]. When<n>=4 the unsolicited result code will provide the UE with additional information for the Active Time value and the extended periodic TAU value if there is a change of the network cell in E-UTRAN. The value<n>=5 further enhances the unsolicited result code with <cause_type> and <reject_cause> when the value of <stat> changes.

The parameters <AcT>, <tac>, <ci>, <cause_type>, <reject_cause>, <Active-Time> and <Periodic-TAU> are provided only if available.

Refer to Chapter 7: ErrorValues for possible <err> values.

- **NOTE 1:**If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.

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

The parameters [,<cause_type>,<reject_cause>], if available, are returned when <n>=3.

Test command returns supported parameter values.

Defined values

<n>: integer type

0 disable network registration unsolicited result code

1 enable network registration unsolicited result code +CEREG: <stat>

2 enable network registration and location information unsolicited result

    code+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]]

3enable network registration, location information and EMM cause value

    Informationunsolicited result code

+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]

4 For a UE that wants to apply PSM, enable network registration and

    location informationunsolicited result code

+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,,[,[<Active-Time>],[<Periodic-TAU>]]]]

5 For a UE that wants to apply PSM, enable network registration, location

information and EMM cause value information unsolicited result code

+CEREG:<stat>[,[<tac>],[<ci>],[<AcT>]][,[<cause_type>],[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]

    <stat>: integer type; indicates the EPS registration status

0 not registered, MT is not currently searching for an operator to register to

1 registered, home network

2 not registered, but MT is currently trying to attach or searching for an

    operator to register to

3 registration denied

4 unknown (e.g. out of E-UTRAN coverage)

5 registered, roaming

6 registered for "SMS only", home network (not applicable)

7 registered for "SMS only", roaming (not applicable)

8 attached for emergency bearer services only

9 registered for "CSFB not preferred", home network (not applicable)

10 registered for "CSFB not preferred", roaming (not applicable)

•**NOTE2:** 3GPP TS 24.008 and 3GPP TS 24.301 specify the condition when the MS is

considered as attached for emergency bearer services.

　<tac>: string type; two byte tracking area code in hexadecimal format (e.g. "00C3"

　equals 195 in decimal)

<ci>: string type; four byte E-UTRAN cell ID in hexadecimal format

<AcT>: integer type; indicates the access technology of the serving cell

0 GSM (not applicable)

1 GSM Compact (not applicable)

2 UTRAN (not applicable)

3 GSM w/EGPRS (not applicable)

4 UTRAN w/HSDPA (not applicable)

5 UTRAN w/HSUPA (not applicable)

6 UTRAN w/HSDPA and HSUPA (not applicable)

7 E-UTRAN

　　8　　　　EC-GSM-IOT (A/Gb mode) (see NOTE5) (not applicable)

　　9　　　　E-UTRAN (NB-S1 mode) (see NOTE 6)

- **NOTE 3:** 3GPP TS 44.060 specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

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

- **NOTE 5:** 3GPP TS 44.018 [156] specifies the EC-SCH INFORMATION message which, if present, indicates that the serving cell supports EC-GSM-IoT.

- **NOTE 6:** 3GPP TS 36.331 [86] specifies the System Information blocks which give the information about whether the serving cell supports NB-IoT, which corresponds to E-UTRAN (NB-S1 mode).

<cause_type>: integer type; indicates the type of <reject_cause>.

0 Indicates that <reject_cause> contains an EMM cause value

1 Indicates that <reject_cause> contains a manufacturer-specific cause.

<reject_cause>: integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.

<Active-Time>: string type; one byte in an 8 bit format. Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 Table

10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401

<Periodic-TAU>: string type; one byte in an 8 bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is

coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401

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- •<stats> return values supported are 0-5

- • Unsolicited result code when <stat> changes

2.6 Signalling connection status (+CSCON)

This command gives details of the terminal's perceived radio connection status (i.e. to the base-station). It returns an indication of the current state. Note, however, that this state is only updated when radio events, such as send and receive, take place. This means that the current state may be out of date. The terminal may think it is "Connected" yet cannot currently use a basestation due to a change in the link quality.

The set command controls the presentation of an unsolicited result code +CSCON. If <n>=1, +CSCON: <mode> is sent from the MT when the connection mode of the MT is changed

Command	Response	Example
+CSCON=<n>	+CME ERROR: <err>	AT+CSCON=0 OK
+CSCON?	+CSCON:<n>,<mode>[,<state>] +CME ERROR: <err>	AT+CSCON? +CSCON:0,1 OK
+CSCON=?	+CSCON: (list of supported<n>s)	AT+CSCON=? +CSCON:(0,1)

		OK
	+CSCOM:<mode>,[state]	+CSCON:1

Description

The set command controls the presentation of an unsolicited result code +CSCON.

If <n>=1,+CSCON: <mode> is sent from the MT when the connection mode of the MT is changed. If <n>=2 and there is a state within the current mode, +CSCON: <mode>[,<state>] is sent from the MT. If <n>=3,+CSCON: <mode>[,<state>[,<access>]] is sent from the MT. If setting fails, an MT error,+CME ERROR: <err> is returned.

Refer to Chapter 7: Error Values for possible <err> values.

When the MT is in UTRAN or E-UTRAN, the mode of the MT refers to idle when no PS signalling connection and to connected mode when a PS signalling connection between UE and network is setup. When the UE is in GERAN, the mode refers to idle when the MT is in either the IDLE state or the STANDBY state and to connected mode when the MT is in READY state.

The <state> value indicates the state of the MT when the MT is in GERAN, UTRAN connected mode or EUTRAN.

The read command returns the status of result code presentation and an integer <mode> which shows whether the MT is currently in idle mode or connected mode. State information <state> is returned only when <n>=2. Radio access type information <access> is returned only when <n>=3.

Test command returns supported values as a compound value.

Defined values

<n>: integer type

0 disable unsolicited result code

1 enable unsolicited result code +CSCON: <mode>

2 enable unsolicited result code +CSCON: <mode>[,<state>]

3 enable unsolicited result code +CSCON: <mode>[,<state>[,<access>]]

　　<mode>: integer type; indicates the signalling connection status

　　0idle

　　1connected

　　2-255<reserved for future use>

<state>: integer type; indicates the CS or PS state while in GERAN and the RRC state

information if the MT is in connected Mode while in UTRAN and E-UTRAN.

0 UTRAN URA_PCH state

1 UTRAN Cell_PCH state

2 UTRAN Cell_FACH state

3 UTRAN Cell_DCH state

4 GERAN CS connected state

5 GERAN PS connected state

6 GERAN CS and PS connected state

7 E-UTRAN connected state

<access>: integer type; indicates the current radio access type.

0 Indicates usage of radio access of type GERAN

1 Indicates usage of radio access of type UTRAN TDD

2 Indicates usage of radio access of type UTRAN FDD

3 Indicates usage of radio access of type E-UTRAN TDD

4 Indicates usage of radio access of type E-UTRAN FDD

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- Unsolicited notifications are not currently supported. This functionality will be added in a future release.

- Only <n>=0 and <n>=1 are supported. <n>=0 is the default value.

2.7 List Available Commands (+CLAC)

This command lists the available AT commands.

Command	Response	Example
+CLAC	<AT Command> [<CR><LF><AT Command> [...]] +CME ERROR: <err>	AT+CLAC AT+GMEE AT+CGMI ... AT+CGSN AT+CLAC OK
+CLAC=?	+CME ERROR: <err>	AT+CLAC=? OK

Description

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

Refer to Chapter 7: Error Values for possible <err> values.

- **NOTE:** This command only returns the AT commands that are available for the user.

Defined values

<AT Command>: Defines the AT command including the prefix AT. Text shall not contain the sequence 0<CR> or OK<CR>

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2.8 Get signal strength indicator (+CSQ)

The terminal will provide a current signal strength indicator of 0 to 255 where larger is generally better. This information is based on a single measurement so can be expected to change greatly over short periods of time and may never use all possible (or even the majority) of the entire possible range or codes.

Command	Response	Example
+CSQ	+CSQ: <rssi>,<ber> +CME ERROR: <err>	AT+CSQ +CSQ:4,99 OK
+CSQ=?	+CSQ: (list of supported <rssi>s),(list of supported <ber>s)	AT+CSQ=? +CSQ:(0-31,99),(99) OK

Description

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

Refer to Chapter 7: Error Values for possible <err> values.

Test command returns values supported as compound values.

Defined values

<rssi>: integer type

0 -113 dBm or less

1 -111 dBm

2...30 -109... -53 dBm

31 -51 dBm or greater

99 not known or not detectable

<ber>: integer type; channel bit error rate (in percent)

0...7 as RXQUAL values (refer to 3GPP specification)

99 not known or not detectable

Hisi Hi2115 Implementation

●<ber> is currently not implemented, and will always be 99.

2.9 Show PDP Addresses (+CGPADDR)

This command returns the IP address of the device.

Command	Response	Example
+CGPADDR[=<cid>[,<cid>[,...]]]	[+CGPADDR:<cid>[,<PDP_addr_1>[,<PDP_addr_2>]]] [<CR><LF>+CGPADDR:<cid>,[<PDP_addr_1>[,<PDP_addr_2>]] [...]] IPv4: The string is given asdot-separated numeric (0-255) parameter of the form:a1.a2.a3.a4 IPv6: The string is given ascolon-separated hexadecimalparameter.	AT+CGPADDR +CGPADDR:1,101.43.5.1 +CGPADDR:2,2001:db8:85a3::8a2e:370 +CGPADDR:3 AT+CGPADDR=1 +CGPADDR:1,101.43.5.1 OK
+CGPADDR=?	+CGPADDr=(list of defined<cid>s)	AT+CGPADDR=? +CGPADDR:(0,1) OK

Description

The execution command returns a list of PDP addresses for the specified context identifiers.

If no <cid> is specified, the addresses for all defined contexts are returned.

Refer toChapter 7: Error Values for possible <err> values.

The test command returns a list of defined <cid>s. These are <cid>s that have been activated and may or may not have an IP address associated with them.

Defined values

<cid>: integer type; specifies a particular PDP context definition (see the +CGDCONT and+CGDSCONT commands).

<PDP_addr_1>and <PDP_addr_2>: each is a string type that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. Both <PDP_addr_1>and <PDP_addr_2>are omitted if none is available. Both <PDP_addr_1> and <PDP_addr_2>are included when both IPv4 and IPv6 addresses are assigned, with <PDP_addr_1> containing the IPv4 address and <PDP_addr_2> containing the IPv6 address. The string is given as dot-separated numeric (0-255) parameter of the form:

a1.a2.a3.a4 for IPv4 and

　a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6.

When +CGPIAF is supported, its settings can influence the format of the IPv6 address in parameter <PDP_addr_1> or <PDP_addr_2>returned with the execute form of +CGPADDR.

•**NOTE:** In dual-stack terminals (<PDP_type>IPV4V6), the IPv6 address will be provided in <PDP_addr_2>.For terminals with a single IPv6 stack (<PDP_type> IPv6) or due to

backwards compatibility, the IPv6 address can be provided in parameter

<PDP_addr_1>.

Hisi Hi2115 Implementation

•Only IPv4 is supported.

•<cid> values between 0 & 10 are supported.

•With autoconnect enabled, <cid>=0 will not be listed until an IP address is acquired.

2.10 PLMN selection (+COPS)

Command	Response	Example
+COPS=<mode>[,<format>[,<oper>[,<AcT>]]]	+CME ERROR: <err>	AT+COPS=1,2,"320160" OK
+COPS?	+COPS:<mode>[,<format>,<oper>][,<AcT>] +CME ERROR: <err>	AT+COPS? +COPS:1,2,"320160" OK
+COPS=?	+COPS: [list of supported (<stat>,longalphanumeric <oper>, shortalphanumeric <oper>, numeric<oper>[,<Act>])s][,,(list ofsupported <mode>s), (list of supported <format>s)] +CME ERROR: <err>	AT+COPS=? +COPS:(2,,,"24405"),(0,,,"24491"),,(0-2),(2) OK

Description

Set command forces an attempt to select and register the GSM/UMTS/EPS network

operator using the SIM/USIM card installed in the currently selected card slot. <mode> is

used to select whether the selection is done automatically by the MT or is forced by this

command to operator<oper> (it shall be given in format <format>) to a certain access

technology, indicated in<AcT>. If the selected operator is not available, no other operator

shall be selected (except <mode>=4). If the selected access technology is not available, then the same operator shall be selected in other access technology. The selected operator name format shall apply to further read commands (+COPS?) also. <mode>=2 forces an attempt to deregister from the network. The selected mode affects to all further network registration (e.g. after <mode>=2, MT shall be unregistered until <mode>=0or 1 is selected). This command should be abortable when registration/deregistration attempt is made.

Refer to Chapter 7: Error Values for possible <err> values.

Read command returns the current mode, the currently selected operator and the current Access Technology.

If no operator is selected, <format>, <oper> and <AcT> are omitted.

Test command returns a set of five parameters, each representing an operator present in the network. A set consists of an integer indicating the availability of the operator <stat>, long and short alphanumeric format of the name of the operator, numeric format representation of the operator and access technology. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM or active application in the UICC (GSM or USIM) in the following order:HPLMN selector, User controlled PLMN selector, Operator controlled PLMN selector and PLMN selector (in the SIM or GSM application), and other networks.

It is recommended (although optional) that after the operator list TA returns lists of supported <mode>s and <format>s. These lists shall be delimited from the operator list

by two commas.

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

Defined values

<mode>: integer type

0 automatic (<oper> field is ignored)

1 manual (<oper>field shall be present, and <AcT> optionally)

2 deregister from network

3 set only <format>(for read command +COPS?), do not attempt

　　registration/deregistration (<oper> and <AcT> fields are ignored);

　　this value isnotapplicable in read command response

4manual/automatic (<oper> field shall be present); if manual

　　selection fails,automatic mode (<mode>=0) is entered

<format>: integer type

0 long format alphanumeric <oper>

1 short format alphanumeric <oper>

2 numeric <oper>

<oper>: string type; <format>indicates if the format is alphanumeric or numeric; longalphanumeric format can be upto 16 characters long and short format up to 8 characters; numericformat is the GSM Location Area Identification number which consists

of a three BCD digit ITU-T country code coded, plus a two or three BCD digit network

code, which is administration specific.

<stat>: integer type

0 unknown

1 available

2 current

3 forbidden

<AcT>: integer type; access technology selected

0 GSM

1 GSM Compact

2 UTRAN

3 GSM w/EGPRS (see NOTE 1)

4 UTRAN w/HSDPA (see NOTE 2)

5 UTRAN w/HSUPA (see NOTE 2)

6 UTRAN w/HSDPA and HSUPA (see NOTE 2)

7 E-UTRAN

8　　　　EC-GSM-IoT (A/Gb mode) (see NOTE 3)

9　　　　E-UTRAN (NB-S1 mode) (see NOTE 4)

•**NOTE 1:** 3GPP TS 44.060 specifies the System Information messages which give the

information about whether the serving cell supports EGPRS.

•**NOTE 2:** 3GPP TS 25.331 specifies the System Information blocks which give the

information about whether the serving cell supports HSDPA or HSUPA.

- **NOTE 3:** 3GPP TS 44.018 [156] specifies the EC-SCH INFORMATION message which, if present, indicates that the serving cell supports EC-GSM-IoT.

- **NOTE 4:** 3GPP TS 36.331 [86] specifies the System Information blocks which give the information about whether the serving cell supports NB-IoT, which corresponds to E-UTRAN.(NB-S1 mode).

Hisi Hi2115 Implementation

- \<Act\>, if provided, must be set to 9

- Only \<format\>=2 is supported

- Only \<mode\>=0, \<mode\>=1&\<mode\>=2 are supported

- When \<mode\>=1 is used, the plmn setting will not persist after the UE is rebooted

- \<mode\>=1 is only for development use. \<mode\>=0 should be used in production, which the mode used when AUTOCONNECT is enabled.

- The test command currently returns the configured values rather than performing a plmn search.

- Not return \<ACT\> for AT+COPS?

- \<oper\> field couldn't be present when \<mode\>=0

+COPS=? Will start a back ground search when nas is in attached and idle state. And could be aborted by any characters when progressing. See Chapter 7 for more details.

2.11 PS attach or detach (+CGATT)

Command	Response	Example
+CGATT=\<state\>	+CME ERROR:\<err\>	AT+CGATT=1 OK

+CGATT?	+CGATT:<state> +CME ERROR:<err>	AT+CGATT? +CGATT:0 OK
+CGATT=?	+CGATT:(list of supported <state>s) +CME ERROR:<err>	AT+CGATT=? +CGATT:(0,1) OK

Description

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

Refer to Chapter 7: Error Values for possible <err> values.

•**NOTE 1:** If the initial PDP context is supported, the context with <cid>=0 is

automatically defined at startup.

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

The read command returns the current Packet Domain service state.

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

•**NOTE 2:** This command has the characteristics of both the V.250 action and parameter

commands.Hence it has the read form in addition to the execution/set and

test forms.

Defined Values

<state> integer type; indicates the state of PDP context activation. The default value

ismanufacturer specific.

0 detached

1 attached

<err> error value

Hisi Hi2115 Implementation

•When <state>=1 is selected, +COPS=0 is automatically selected.

•If a CGATT is in progress, further execution of the CGATT= command prior to the attach

or detach completing will return error.

2.12 PDP context activate or deactivate (+CGACT)

Command	Response	Example
+CGACT=[<state>[,<cid>[,<cid>[,...]]]]	+CME ERROR:<err>	AT+CGACT=0,1 OK
+CGACT?	[+CGACT:<cid>,<state>] [<CR><LF>+CGACT:<cid>,<state> [...]] +CME ERROR:<err>	AT+CGACT? +CGACT:1,0 OK
+CGACT=?	+CGACT:(list of supported <state>s) +CME ERROR:<err>	AT+CGACT=? +CGACT:(0,1) OK

Description

The execution command is used to activate or deactivate the specified PDP context

(s). After the command has completed, the MT remains in V.250 command state. If any

PDP context is already in the requested state, the state for that context remains

unchanged. If the requested state for any specified context cannot be achieved, an ERROR

or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE

command. If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and then attempts to activate the specified contexts. If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message. Refer subclause 9.2 for possible <err> values.

For EPS, if an attempt is made to disconnect the last PDN connection, then the MT responds with ERROR or, if extended error responses are enabled, a +CME ERROR.

•**NOTE :**If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0.

For EPS, the activation request for an EPS bearer resource will be answered by the network by either an EPS dedicated bearer activation or EPS bearer modification request. The request must be accepted by the MT before the PDP context can be set in to established state.

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

If no <cid>s are specified the deactivation form of the command deactivates all active contexts.

The read command returns the current activation states for all the defined PDP contexts.

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

•**NOTE :**This command has the characteristics of both the V.250 action and parameter

commands.Hence it has the read form in addition to the execution/set and test forms.

Defined values

\<state\>: integer type; indicates the state of PDP context activation. The default value is manufacturer specific.

> 0　deactivated
>
> 1　activated

\<cid\>:　integer type; specifies a particular PDP context definition (see the +CGDCONT command).

Hisi Hi2115 Implementation

- Could only activate or deactivate one cid one time..

2.13 Request international mobile subscriber identity (+CIMI)

Command	Response	Example
+CIMI	\<IMSI\> +CME ERROR:\<err\>	AT+CIMI 460001357924680 OK
+CIMI=?		AT+CIMI=? OK

Description

　　Execution command causes the TA to return \<IMSI\>, which is intended to permit the TE to identify the individual SIM card or active application in the UICC (GSM or USIM) which is attached to MT.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<IMSI>: International Mobile Subscriber Identity (string without double quotes)

Hisi Hi2115 Implementation

- IMSI may not be displayed for a few seconds after power-on.

2.14 Define PDP Context (+CGDCONT)

Command	Response	Example
+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>][,<Local_Addr_Ind>]]]]]]]]]]]]		AT+CGDCONT=1,"IP","HUAWEI.COM" OK
+CGDCONT?	[+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>]]]]]]]] [<CR><LF>+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>]]]]]]]] [...]]	AT+CGDCONT? +CGDCONT:1,"IP","HUAWEI.COM",,0,0,,,,,0 OK
+CGDCONT=?	+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of	

| | supported <d_comp>s),(list of supported <h_comp>s),(list of Supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s) ,(list of supported <NSLPI>s),(list of supported <securePCO>s),(list of supported <IPv4_MTU_discovery>s) [<CR><LF>+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s) ,(list of supported <NSLPI>s),(list of supported <securePCO>s,(list of supported <IPv4_MTU_discovery>s)) […]] | AT+CGDCONT=? +CGDCONT:(0-10),(\"IP\",\"NONIP\", \"IPV6\",\"IPV 4V6\"),,,(0),(0),,,,,(0,1) OK |

Description

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid> and also allows the TE to specify whether security protected transmission of ESM information is requested, because the PCO can include information that requires ciphering. There can be other reasons for the UE to use security protected transmission of ESM information, e.g. if the UE needs to transfer an APN. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.

Refer to Chapter 7: Error Values for possible <err> values.

For EPS the PDN connection and its associated EPS default bearer is identified

herewith.

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

If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see 3GPP TS 27.007 V13.5.0, subclause 10.1.0. As all other contexts, the parameters for <cid>=0 can be modified with +CGDCONT. If the initial PDP context is supported, +CGDCONT=0 resets context number 0 to its particular default settings.

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

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

Defined values

<cid>: integer type; specifies a particular PDP context definition. The parameter is local to the TEMT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1 or if the initial PDP context is supported, minimum value = 0) is returned by the test form of the command.

•**NOTE 1:** The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDCONT and +CGDSCONT.

<PDP_type>: string type; specifies the type of packet data protocol. The default value ismanufacturer specific.

X.25ITU-T/CCITT X.25 layer 3 (Obsolete)

IPInternet Protocol (IETF STD 5 [103])

IPV6 Internet Protocol, version 6

IPV4V6 Virtual <PDP_type> introduced to handle dual IP stack UE capability.

OSPIHInternet Hosted Octect Stream Protocol (Obsolete)

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

•NOTE 2: Only IP, IPV6 and IPV4V6 values are supported for EPS services.

　　NONIP　　　None Ip

<APN>: string type; a logical name that is used to select the GGSN or the external packet

data network.

　　If the value is null or omitted, then the subscription value will be requested. The APN

is a string of up to 82 characters.

<PDP_addr>: string type; identifies the MT in the address space applicable to the PDP. This

parameter can be left blank.

When +CGPIAF is supported, its settings can influence the format of this parameter

returned with the read form of +CGDCONT.

•NOTE 3: The value of this parameter isignored with the set command. The parameter is

included in the set command forbackwards compatibility reasons only.

<d_comp>: integer type; controls PDP data compression

0 off

1on (manufacturer preferred compression)

2 V.42bis

3 V.44

<h_comp>: integer type; controls PDP header compression

0 off

1 on (manufacturer preferred compression)

2 RFC 1144 [105] (applicable for SNDCP only)

3 RFC 2507 [107]

4 RFC 3095 [108] (applicable for PDCP only)

<IPv4AddrAlloc>: integer type; controls how the MT/TA requests to get the IPv4 addressinformation

0 IPv4 address allocation through NAS signalling

1 IPv4 address allocated through DHCP

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

•NOTE 4: If the PDP context for emergency bearer services is the only activatedcontext, only emergency calls are allowed, see 3GPP TS 23.401 subclause 4.3.12.9.

0PDP context is for new PDP context establishment or for handover

from a non-3GPP access network (how the MT decides whether

the PDP context is for new PDP contextestablishment or for

handover is implementation specific)

1 PDP context is for emergency bearer services

2 PDP context is for new PDP context establishment

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

<P-CSCF_discovery>: integer type; influences how the MT/TA requests to get the P-CSCF

address, see 3GPP TS 24.229 [89] annex B and annex L.

0 Preference of P-CSCF address discovery not influenced by +CGDCONT

1 Preference of P-CSCF address discovery through NAS signalling

2 Preference of P-CSCF address discovery through DHCP

<IM_CN_Signalling_Flag_Ind>: integer type; indicates to the network whether the

PDPcontext is for IM CN subsystem-related signalling only or not.

0 UE indicates that the PDP context is not for IM CN subsystem-related

　　signalling only

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

　　signalling only

<NSLPI>: integer type; indicates the NAS signalling priority requested for this PDP context:

0 indicates that this PDP context is to be activated with the value for

　　the low priority indicator configured in the MT.

1 indicates that this PDP context is is to be activated with the value for

　　the low priority indicator set to "MS is not configured for NAS

　　signalling low priority".

• **NOTE 5:** The MT utilises the provide NSLPI information as specified in3GPP TS 24.301

　　[83] and 3GPP TS 24.008 .

<securePCO>: integer type. Specifies if security protected transmission of PCO is requested or not (applicable for EPS only)

0 Security protected transmission of PCO is not requested

1 Security protected transmission of PCO is requested

<IPv4_MTU_discovery>: integer type; influences how the MT/TA requests to get the IPv4 MTU size, see 3GPP TS 24.008 subclause 10.5.6.3.

0 Preference of IPv4 MTU size discovery not influenced by +CGDCONT

1 Preference of IPv4 MTU size discovery through NAS signalling

Hisi Hi2115 Implementation

- Only <PDP_type>= "IP" is supported. <PDP_type>= "IPV6" will be supported in a future release.

- Hisi supports +CGDCONT=<cid>,<PDP_type>,<APN>,,,,,,<NSLPI> only.

- <cid> values of 0-10 are supported

- Only <hcomp> and <dcomp> values of 0 are supported.

- No default <PDP_type> value specific.

- <cid> value of 7 can't be set when bip is enabled.

- Maximum <APN>string size is 63.

2.15 Change device functionality (+CFUN)

Command	Response	Example
+CFUN=<fun>[,<rst>]	+CME ERROR: <err>	AT+CFUN=1 OK
+CFUN?	+CFUN:<fun>	AT+CFUN? +CFUN:1 OK

+CFUN=?	+CFUN:(list of supported <fun>s), (list of supported <rst>s)	AT+CFUN=? +CFUN:(0,1),(0,1) OK

Description

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

Refer toChapter 7: Error Values for possible <err> values.

•NOTE1: It is manufacturer specific if this command affects network registration.

Command Operator Selection+COPS is used to force

registration/deregistration.

Read command returns the current setting of <fun>.

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

Defined values

<fun>: integer type

0 minimum functionality

1 full functionality. Enable (turn on) the transmit and receive RF circuits

for all supported radio access technologies. For MTs supporting

+CSRA, this equals the RATs indicated by the response of +CSRA=?.

Current +CSRA setting is ignored. It is not required that the MT

transmit and receive RF circuits are in a disabled state for this setting

to have effect.

2 disable (turn off) MT transmit RF circuits only

3 disable (turn off) MT receive RF circuits only

4 disable (turn off) both MT transmit and receive RF circuits

5…127 reserved for manufacturers as intermediate states between full and

minimumFunctionality

128 Full functionality with radio access support according to the setting of

+CSRA.Enables (turns on) the transmit and receive RF circuits if not

already enabled. This<fun> setting is applicable for MTs supporting

+CSRA.

129 Prepare for shutdown. This setting has its prime use when some of the

MT's resources (e.g. file system) are located on a tightly integrated

TE (host). The MT will execute pending actions resulting in

"permanent" changes, e.g. execute pending file system operations.

The MT will also make an orderly network detach. After this action

and +CFUN has returned OK, the MT can be shut down with <fun>=0,

or by other means. After setting <fun>=129, only <fun>=0 is valid. All

other values will make +CFUN return ERROR.

<rst>: integer type

0 do not reset the MT before setting it to <fun> power level

•NOTE 2: This shall be always default when <rst> is not given.

1reset the MT before setting it to <fun> power level

Hisi Hi2115 Implementation

•Only <fun> = 0& 1 are supported.

•<rst> is not supported and will be ignored.

•DeepSleep will be entered when the system is quiescent, but only if it has been

enabled by the network.

2.16 Report mobile termination error (+CMEE)

Command	Response	Example
+CMEE=<n>		AT+CMEE=1 OK
+CMEE?	+CMEE=<n>	AT+CMEE? +CMEE：1 OK
+CMEE=?	+CMEE：(list of supported <n>s)	AT+CMEE? +CMEE：(0,1) OK

Description

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

Read command returns the current setting of <n>.

Test command returns values supported as a compound value.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<n>: integer type

0   disable +CME ERROR:<err> result code and use ERROR instead

1　　enable +CME ERROR:<err> result code and use numeric <err> values

(Refer to Chapter 7: Error Values for possible <err>values)

2　　enable +CME ERROR:<err> result code and use verbose <err> values

Hisi Hi2115 Implementation

- Only n=0 & n=1 are supported.

2.17 Return current date & time (+CCLK)

Command	Response	Example
+CCLK?	+CCLK:[<yy/MM/dd,hh:mm:ss>[<±zz>]] +CME ERROR:<err>	AT+CCLK? +CCLK:17/01/09,14:53:12+01 OK
+CCLK=?		AT+CCLK=? OK

Description

The clock will be set automatically once the UE has connected to the network.

Read command returns the current setting of the clock.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<time>: string type value; format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -96…+96). E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"

•**NOTE :**If MT does not support time zone information then the three last characters of

<time> are not returned by +CCLK?

Hisi Hi2115 Implementation

•No value will be returned before core network sent EMM INFORMATION.

2.18 Power saving mode setting (+CPSMS)

Command	Response	Example
+CPSMS=[<mode>[,<Requested_Periodic-RAU>[,<Requested_GPRSREADYtimer>[,<Requested_PeriodicTAU>[,<Requested_ActiveTime>]]]]]	+CME ERROR:<err>	AT+CPSMS=1,,,01000011,01000011 OK
+CPSMS?	+CPSMS:<mode>,[<Requested_PeriodicRAU>],[<Requested_GPRS-READYtimer>],[<Requested_PeriodicTAU>],[<Requested_Active-Time>]	AT+CPSMS? +CPSMS:1,,,01000011,01000011 OK
+CPSMS=?	+CPSMS:(list of supported <mode>s),(list of supported <Requested_Periodic-RAU>s),(list of supported <Requested_GPRS-READYtimer>s),(list of supported <Requested_Periodic-TAU>s),(list of supported <Requested_Active-Time>s)	AT+CPSMS=? +CPSMS:(0,1,2),,,(00000000-11111111), (00000000-11111111) OK

Description

The set command controls the setting of the UEs power saving mode (PSM) parameters. The command controls whether the UE wants to apply PSM or not, as well

as the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN/UTRAN, the requested extended periodic TAU value in EUTRAN and the requested Active Time value. See the unsolicited result codes provided by command +CEREG for the Active Time value and the extended periodic TAU value that are allocated to the UE by the network in E-UTRAN.

A special form of the command can be given as +CPSMS=2. In this form, the use of PSM will be disabled and data for all parameters in the command +CPSMS will be removed or, if available, set to the manufacturer specific default values.

The read command returns the current parameter values.

The test command returns the supported <mode>s and the value ranges for the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN/UTRAN, the requested extended periodic TAU value in E-UTRAN and the requested Active Time value as compound values.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<mode>: integer type. Indication to disable or enable the use of PSM in the UE.

0   Disable the use of PSM

1   Enable the use of PSM

2   Disable the use of PSM and discard all parameters for PSM or, if available, reset to the manufacturer specific default values.

<Requested_Periodic-RAU>: string type; one byte in an 8 bit format. Requested extended periodic RAU value (T3312) to be allocated to the UE in GERAN/UTRAN. The

requested extended periodic RAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.060 [47]. The default value, if available, is manufacturer specific.

<Requested_GPRS-READY-timer>: string type; one byte in an 8 bit format. Requested GPRS READY timer value (T3314) to be allocated to the UE in GERAN/UTRAN. The requested GPRS READY timer value is coded as one byte (octet 2) of the GPRS Timer information element coded as bit format (e.g. "01000011" equals 3 decihours or 18 minutes). For the coding and the value range, see the GPRS Timer IE in 3GPP TS 24.008 [8] Table 10.5.172/3GPP TS 24.008. See also 3GPP TS 23.060 [47]. The default value, if available, is manufacturer specific.

<Requested_Periodic-TAU>: string type; one byte in an 8 bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. The requested extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82]. The default value, if available, is manufacturer specific.

<Requested_Active-Time>: string type; one byte in an 8 bit format. Requested Active Time value (T3324) to be allocated to the UE. The requested Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g.

"00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer

2 IE in 3GPP TS 24.008 [8] Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 [149],

3GPP TS 23.060 [47] and 3GPP TS 23.401 [82]. The default value, if available, is

manufacturer specific.

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- RAU is not supported by NB-IOT. No value will be output, and any input will be

  ignored.

●<Requested_Periodic-TAU> **and** <Requested_Active-Time> **could be quoted.**

2.19 eDRX setting (+CEDRXS)

Command	Response	Example
+CEDRXS=[<mode>,[,<AcTtype>[,<Requested_eDRX_value>]]]	+CME ERROR:<err>	AT+CEDRXS=1,5,0101 OK
+CEDRXS?	[+CEDRXS:<AcT-type>,<Requested_eDRX_value>[<CR><LF>+CEDRXS:<AcT-type>,<Requested_eDRX_value>[...]]]	AT+CEDRXS? +CEDRXS:5,"0101" OK
+CEDRXS=?	+CEDRXS:(list of supported <mode>s),(list of supported <AcT-type>s),(list of supported<Requested_eDRX_value>s)	AT+CEDRXS=? +CEDRXS:(0,1,2,3),(5),("0000"-"1111") OK

Description

     The set command controls the setting of the UEs eDRX parameters. The command

controls whether the UE wants to apply eDRX or not, as well as the requested eDRX value

for each specified type of access technology.

The set command also controls the presentation of an unsolicited result code +CEDRXP:<AcTtype>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]]when <n>=2 and there is a change in the eDRX parameters provided by the network.

A special form of the command can be given as +CEDRXS=3. In this form, eDRX will be disabled and data for all parameters in the command +CEDRXS will be removed or, if available, set to the manufacturer specific default values.

The read command returns the current settings for each defined value of <AcT-type>.

The test command returns the supported <mode>s and the value ranges for the access technology and the requested eDRX value as compound values.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<mode>: integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>.

    0   Disable the use of eDRX

    1   Enable the use of eDRX

    2   Enable the use of eDRX and enable the unsolicited result code

        +CEDRXP:<AcT-type>[,<Requested_eDRX_value>[,<NWprovided_eDRX_value>[,<Paging_time_window>]]]

    3   Disable the use of eDRX and discard all parameters for eDRX or, if

        available, reset to the manufacturer specific default values.

<AcT-type>: integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the

requested eDRX value.

0   Access technology is not using eDRX. This parameter value is only used in

the unsolicited result code.

1   EC-GSM-IoT (A/Gb mode)

2   GSM (A/Gb mode)

3   UTRAN (Iu mode)

4   E-UTRAN (WB-S1 mode)

5   E-UTRAN (NB-S1 mode)

<Requested_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.

<NW-provided_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

<Paging_time_window>: string type; half a byte in a 4 bit format. The paging time window referes to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table

10.5.5.32/3GPP TS 24.008.

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- <AcT-type>value 5 is supported.

2.20 Extended Error Reporting (+CEER)

Command	Response	Example
AT+CEER	+CEER:<report>	AT+CEER +CEER:ILLEGAL_ME OK
AT+CEER=?		AT+CEER=? OK

Description

Execution command causes the TA to return one or more lines of information text

<report>, determined bythe MT manufacturer, which should offer the user of the TA an

extended report of the reason for

- the failure in the last unsuccessful call setup (originating or answering) or

    in-call modification;

- the last call release;

- the last unsuccessful PDP context activation;

- the last PDP context deactivation.

Typically, the text will consist of a single line containing the cause information given

by GSM/UMTS network intextual format.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<report>:the total number of characters, including line terminators, in the information text shall notexceed 2041 characters.

Text shall not contain the sequence 0<CR> or OK<CR>.

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2.21 eDRX read dynamic parameters (+CEDRXRDP)

Command	Response	Example
AT+CEDRXRDP	+CEDRXRDP:<AcT-type>[,<Requested eDRX value>[,<NW - provided_eDRX_value>[,<Paging _time_window>]]]	AT+CEDRXRDP +CEDRXRDP:5,0010"," 1110 "," 0101" OK
AT+CEDRXRDP=?		AT+CEDRXRDP=? OK

Description

The execution command returns <AcT-type> and <Requested_eDRX_value>, <NW-provided_eDRX_value> and <Paging_time_window> if eDRX is used for the cell that the MS is currently registered to.

If the cell that the MS is currently registered to is not using eDRX, AcT-type=0 is returned.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<AcT-type>: integer type, indicates the type of access technology. This AT-command is used to specifythe relationship between the type of access technology and the requested eDRX value.

0 Access technology is not using eDRX

1 EC-GSM-IoT (A/Gb mode)

2 GSM (A/Gb mode)

3 UTRAN (Iu mode)

4 E-UTRAN (WB-S1 mode)

5 E-UTRAN (NB-S1 mode)

<Requested_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters informationelement in 3GPP TS 24.008 [8] Table10.5.5.32/3GPP TS 24.008.

<NW-provided_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters informationelement in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

<Paging_time_window>: string type; half a byte in a 4 bit format. The paging time window referes tobit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters informationelement in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

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●<AcT-type>value 5 is supported.

2.22 Time Zone Reporting (+CTZR)

Command	Response	Example
+CTZR[=<reporting>]	+CME ERROR:<err>	AT+CTZR=1 OK
+CTZR?	+CTZR:<reporting> +CME ERROR:<err>	AT+CTZR? +CTZR:1 OK
+CTZR=?	+CZTR:(list of supported <reporting>s) +CME ERROR:<err>	AT+CTZR=? +CTZR:(0,1,2,3) OK

Description

This set command controls the time zone change event reporting. If reporting is enabled the MT returns theunsolicited result code +CTZV: <tz>, +CTZE: <tz>,<dst>,[<time>], or +CTZEU: <tz>,<dst>,[<utime>] whenever thetime zone is changed. The MT also provides the time zone upon network registration if provided by thenetwork. If setting fails in an MT error, +CME ERROR: <err> is returned. Refer to Chapter 7: Error Values forpossible <err> values.

Read command returns the current reporting settings in the MT.

Test command returns supported <reporting>-values as a compound value.

•**NOTE :**The Time Zone reporting is not affected by the Automatic Time Zone setting command, +CTZU ifimplemented.

Command	Response	Example
+CTZV:	<tz>	+CTZV:4
+CTZE:	<tz>,<dst>,[<time>]	+CTZE:4,0
+CTZEU:	<tz>,<dst>,[<utime>]	+CTZEU:4,0

Defined values

<reporting>: integer type value indicating:

    0 disable time zone change event reporting.

    1Enable time zone change event reporting by unsolicited result code

        +CTZV: <tz>.

    2 Enable extended time zone and local time reporting by unsolicited result

        code+CTZE: <tz>,<dst>,[<time>].

    3Enable extended time zone and universal time reporting by unsolicited

        result code+CTZEU: <tz>,<dst>,[<utime>].

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

<dst>: integer type value indicating whether <tz> includes daylight savings adjustment;

    0 <tz> includes no adjustment for Daylight Saving Time

    1 <tz>includes +1 hour (equals 4 quarters in <tz>) adjustment for daylight

        saving time

    2 <tz> includes +2 hours (equals 8 quarters in <tz>) adjustment for

        daylight saving time

<time>: string type value representing the local time. The format is "YYYY/MM/DD,hh:mm:ss",expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) andsecond (ss). The local time can be derived by the

MT from information provided by the network at thetime of delivering time zone information and will be present in the unsolicited result code for extendedtime zone and local time reporting if the universal time is provided by the network.

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

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2.23 Initial PDP context activation (+CIPCA)

Command	Response	Example
+CIPCA=[<n>[,<AttachWithoutPDN>]]	+CME ERROR: <err>	AT+CIPCA=3,1 OK
+CIPCA?	+CIPCA:<n>[,<AttachWithoutPDN>]	AT+CIPCA? +CIPCA:3,1 OK
+CIPCA=?	+CIPCA:(list of supported <n>s),(list of supported <AttachWithoutPDN>s)	AT+CIPCA =? +CIPCA:(3),(0,1) OK

Description

The set command controls whether an initial PDP context (see subclause 10.1.0) shall be established automatically following an attach procedure when the UE is attached to GERAN or UTRAN RATs and whether the UE is attached to E-UTRAN with or without a PDN connection.

For <n>≠0, deactivating the last (active) PDP context can lead to a (re)establishment of the initial PDP context. Changing setting of <n> from 0 to 1 will cause an immediate attempt to (re)establish the initial PDP context if no PDP context is active. Changing <n>from 0 to 2 will if not roaming cause an immediate attempt to (re)establish the initial PDP context if no other PDP context is active. The value of <n>=3 applies to E-UTRAN RATs and does not change the setting of PDP context activation in GERAN or UTRAN RATs. Changing <n> will never cause a PDP context deactivation.

For <AttachWithoutPDN>=1, the EPS Attach is performed without a PDN connection.

•**NOTE :**For this command, the term roaming corresponds to being registered to a

VPLMN which is not equivalent to HPLMN or EHPLMN.

The read command returns the current setting of the command.

The test command returns values supported as a compound value.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<n>: integer type. Activation of PDP context upon attach.

0 Do not activate

1 Always activate

2 Activate when not roaming

3 No change in current setting

<AttachWithoutPDN>: integer type. EPS Attach with or without PDN connection.

0 EPS Attach with PDN connection

1 1 EPS Attach without PDN connection

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•Only<n>=3is supported.

• If <AtttachWithoutPDN> is omitted, will use the default value 0.

2.24 APN rate control (+CGAPNRC)

Command	Response	Example
+CGAPNRC[=<cid>]	[+CGAPNRC:<cid>[,<Additional _exception _reports>[,<Uplink time unit>[,<Maximum_uplink_rate>]]] [<CR><LF>+CGAPNRC: <cid>[,<Additional_exception_r eports>[,<Uplink time unit>[, <Maximum_uplink_rate>]]] [...]]] +CME ERROR:<err>	AT+CGAPNRC +CGAPNRC=1,0,2,2 +CGAPNRC=2,1,2,3 OK
+CGAPNRC=?	+CGAPNRC: (list of <cid>s associated with active contexts) +CME ERROR:<err>	+CGAPNRC=? +CGAPNRC: (1,2) OK

Description

This execution command returns the APN rate control parameters (see 3GPP TS 24.008 [8]) associated to the provided context identifier <cid>.

If the parameter <cid> is omitted, the APN rate control parameters for all active PDP contexts are returned.

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

Refer to <u>Chapter 7: Error Values for possible <err> values.</u>

Defined values

<cid>: integer type; specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONTcommands).

<Additional_exception_reports>: integer type; indicates whether or not additional exceptionreports are allowed to be sent when the maximum uplink rate is reached. This refers to bit 4 of octet 1 ofthe APN rate control parameters IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.3.2.

0 Additional_exception_reports at maximum rate reached are not allowed to be sent.

1 Additional_exception_reports at maximum rate reached are allowed to be sent.

<Uplink_time_unit>: integer typ; specifies the time unit to be used for the maximum uplink rate. Thisrefers to bits 1 to 3 of octet 1 of the APN rate control parameters IE as specified in 3GPP TS 24.008 [8]subclause 10.5.6.3.2.

0 unrestricted

1 minute

2 hour

3 day

4 week

<Maximum_uplink_rate>: integer type; specifies the maximum number of messages the UE isrestricted to send per uplink time unit. This refers to octet 2 to 4 of the APN rate control parameters IE asspecified in 3GPP TS 24.008 [8] subclause 10.5.6.3.2.

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2.25 Sending of originating data via the control plane (+CSODCP)

Command	Response	Example
+CSODCP=<cid>,<cpdata_length>,<cpdata>[,<RAI>[,<type_of_user_data>]]	+CME ERROR:<err>	AT+CSODCP=1 , 3,112233 OK
+CSODCP=?	+CSODCP:(rane of supported <cid>s),(maximum number of bytes of the <cpdata_length>),(list of supported <RAI>s),(list of supported <type_of_user_data>s)	AT+CSODCP=? +CSODCP:(0-10),(1358),(0,1,2),(0,1) OK

Description

The set command is used by the TE to transmit data over control plane to network via MT. Context identifier <cid> is used to link the data to particular context.

This command optionally indicates that the application on the MT expects that the exchange of data:

- will be completed with this uplink data transfer; or

- will be completed with the next received downlink data.

This command also optionally indicates whether or not the data to be transmitted is an exception data.

This command causes transmission of an ESM DATA TRANSPORT message, as defined in 3GPP TS 24.301 [83].

Test command returns the maximum number of bytes of the user data container supported by the MT, supported <RAI>s and supported <type_of_user_data>s as a

compound value.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<cid>: integer type. A numeric parameter which specifies a particular PDP context or EPS bearer context definition. The<cid>parameter is local to the TE-MT interface and identifies the PDP or EPS bearer contexts which have been setup via AT command (see the +CGDCONT and +CGDSCONT commands).

<cpdata_length>: integer type. Indicates the number of bytes of the <cpdata>information element. When there is no data to transmit, the value shall be set to zero.

<cpdata>: string of octets. Contains the user data container contents (refer 3GPP TS 24.301 [83] subclause 9.9.4.24). When there is no data to transmit, the <cpdata> shall be an empty string (""). This parameter shall not be subject to conventional character conversion as per +CSCS. The coding format of the user data container and the maximum length of <cpdata>are implementation specific.

<RAI>: integer type. Indicates the value of the release assistance indication, refer 3GPP TS 24.301 [83] subclause 9.9.4.25.

0   No information available.

1   The MT expects that exchange of data will be completed with the transmission of the ESM DATA TRANSPORT message.

2   The MT expects that exchange of data will be completed with the receipt of an ESM DATA TRANSPORT message.

<type_of_user_data>: integer type. Indicates whether the user data that is transmitted is regular or exceptional.

       0   Regular data.

       1   Exception data.

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●Maximum data length will be 1358 bytes when non-ip is used, otherwise will be 0.

●   Only one message will be buffered at any one time.

2.26 Reporting of terminating data via the control plane (+CRTDCP)

Receive a message from the CDP server.

Command	Response	Example
+CRTDCP=<reporting>	+CME ERROR:<err>	AT+CRTDCP=1 OK
+CRTDCP?	+CRTDCP:<reporting>	AT+CRTDCP? +CRTDCP:1 OK
+CRTDCP=?	+CRTDCP:(list of supported <reporting>s),(range of supported<cid>s),(maximum number of octets of user data indicated by <cpdata_length>)	AT+CRTDCP=? +CRTDCP:(0-1),(0-10),(1358) OK

Description

    The set command is used to enable and disable reporting of data from the network to the MT that is transmitted via the control plane in downlink direction. If reporting is enabled, the MT returns the unsolicited result code

+CRTDCP:<cid>,<cpdata_length>,<cpdata>when data is received from the network.

Read command returns the current settings.

Test command returns supported values as compound values.

Refer to Chapter 7: Error Values for possible <err> values.

Command	Response	Example
+CRTDCP:	<cid>,<cpdata_length>,<cpdata>	+CRTDCP:0,2," ab"

Defined values

<reporting>: integer type, controlling reporting of mobile terminated control plane data events

    0   Disable reporting of MT control plane data.

    1   Enable reporting of MT control plane data by the unsolicited result code +CRTDCP.

<cid>: integer type. A numeric parameter which specifies a particular PDP context or EPS bearer context definition. The <cid>parameter is local to the TE-MT interface and identifies the PDP or EPS bearer contexts which have been setup via AT command (see the +CGDCONT and +CGDSCONT commands).

<cpdata_length>: integer type. Indicates the number of bytes of the <cpdata> information element. When there is no data to transmit, the value shall be set to zero.

<cpdata>: string of octets. Contains the user data container contents (refer 3GPP TS 24.301 [83] subclause 9.9.4.24). When there is no data to transmit, the <cpdata> shall be an empty string (""). This parameter shall not be subject to conventional character conversion as per +CSCS. The coding format of the user data container and the maximum

length of <cpdata> are implementation specific.

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●Maximum data length will be 1358 bytes when non-ip is used, otherwise will be 0

Only one message will be buffered at any one time.

2.27 PDP context read dynamic parameters +CGCONTRDP

Command	Response	Example
+CGCONTRDP[=<cid>]	[+CGCONTRDP:<cid>,<bearer_id>,<apn>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>[,<IPv4_MTU>[,<WLAN_Offload>[,<Local_Addr_Ind>[,<Non-IP_MTU>[,<Serving_PLMN_rate_control_value>[,<Reliable_Data_Service]]]]]]]]]]]]]]][<CR><LF>+CGCONTRDP:<cid>,<bearer_id>,<apn>[,<local_addr and	AT+CGCONTRDP +CGCONTRDP:0,,,,,10.121.34.223 +CGCONTRDP:1,,,,,10.121.34.224 OK AT+CGCONTRDP=1 +CGCONTRDP:1,,,,,10.121.34.223 OK

	subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>[,<IPv4_MTU>[,<WLAN_Offload>[,<Local_Addr_Ind>[,<Non-IP_MTU>[,<Serving_PLMN_rate_control_value>[,<Reliable_Data_Service]]]]]]]]]]]]]][...]]	
+CGCONTRDP=?	+CGCONTRDP: (list of <cid>s associated with active contexts)	AT+CGCONTRDP=? +CGCONTRDP:(0,1) OK

Description

The execution command returns the relevant information <bearer_id>, <apn>, <local_addr and subnet_mask>,<gw_addr>,<DNS_prim_addr>,<DNS_sec_addr>,<P-CSCF_prim_addr>,<P-CSCF_sec_addr>, <IM_CN_Signalling_Flag>, <LIPA_indication>, <IPv4_MTU>,<WLAN_Offload>, <Non-IP_MTU>, <Serving_PLMN_rate_control_value> and <Reliable_Data_Service> for an active non secondary PDP context with the context identifier <cid>. If the MT indicates more than two IP addresses of P-CSCF servers or more than two IP addresses of DNS servers, multiple lines of information per <cid> will be returned.

If the MT has dual stack capabilities, at least one pair of lines with information is returned per <cid>. First one line with the IPv4 parameters followed by one line with the IPv6 parameters. If this MT with dual stack capabilities indicates more than two IP addresses of P-CSCF servers or more than two IP addresses of DNS servers, multiple of such pairs of lines are returned.

NOTE: If the MT doesn't have all the IP addresses to be included in a line, e.g. in case the UE received four IP addresses of DNS servers and two IP addresses of P-CSCF servers, the parameter value

representing an IP address that can not be populated is set to an empty string or an absent string.

If the parameter <cid> is omitted, the relevant information for all active non secondary PDP contexts is returned.

Defined values

<cid>: integer type; specifies a particular non secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).

<bearer_id>: integer type; identifies the bearer, i.e. the EPS bearer in EPS and the NSAPI in UMTS/GPRS.

<apn>: string type; a logical name that was used to select the GGSN or the external packet data network.

<local_addr and subnet_mask>: string type; shows the IP address and subnet mask of the MT.

The string is given as dot-separated numeric (0-255) parameters on the form:

"a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or
"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m1

2.m13.m14.m15.m16" for IPv6.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<gw_addr>: string type; shows the Gateway Address of the MT. The string is given as dot-separated numeric (0-255) parameters.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<DNS_prim_addr>: string type; shows the IP address of the primary DNS server.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<DNS_sec_addr>: string type; shows the IP address of the secondary DNS server.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<P_CSCF_prim_addr>: string type; shows the IP address of the primary P-CSCF server.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<P_CSCF_sec_addr>: string type; shows the IP address of the secondary P-CSCF server.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<IM_CN_Signalling_Flag>: integer type; shows whether the PDP context is for IM CN subsystem-related signalling only or not.

0   PDP context is not for IM CN subsystem-related signalling only

1   PDP context is for IM CN subsystem-related signalling only

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

0   indication not received that the PDP context provides connectivity using a LIPA PDN connection

1   indication received that the PDP context provides connectivity using a LIPA PDN connection

<IPv4_MTU>: integer type; shows the IPv4 MTU size in octets.

<WLAN_Offload>: integer type; indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bits 1 and 2 of the WLAN offload acceptability IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.20.

0   offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is not acceptable.
1   offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in Iu mode.

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

3   offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is acceptable.

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

0   indicates that the MS or the network or both do not support local IP address in TFTs

1　　indicates that the MS and the network support local IP address in TFTs

<Non-IP_MTU>: integer type; shows the Non-IP MTU size in octets.

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

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

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

1　　Reliable Data Service is being used for the PDN connection

Hisi Hi2115 Implementation

- Only support <cid>, <DNS_prim_addr>,<DNS_sec_addr> now.
- <DNS_prim_addr>,<DNS_sec_addr> could display only when <PDP_type> is "IP" or "IPV6".
- Could configure PDP context dynamic parameter items to read by +NCPCDPR.

2.28 Define PDP context authentication parameters (+CGAUTH)

Command	Response	Example
+CGAUTH=<cid>[,<auth_prot>[,<userid>[,<password>]]]	+CME ERROR:<err>	AT+CGAUTH=1,2,"1234","1234" OK
+CGAUTH?	[+CGAUTH: <cid>,<auth_prot>,<userid>,<password>] [<CR><LF>+CGAUTH: <cid>,<auth_prot>,<userid>,<password>[…]]	AT+CGAUTH? +CGAUTH:1，1，"1234"，"1234" +CGAUTH:2，1，"1234"，"1234" OK
+CGAUTH=?	+CGAUTH: (range of supported<cid>s),(list of	AT+CGAUTH=? +CGAUTH:(0-10),(0,1,2),(0-

	supported<auth_prot>s),(r angeofsupported<userid>s),(rangeofsupported<passw ord>s)	60), (0-60) OK

Description

Set command allows the TE to specify authentication parameters for a PDP context identified by the (local) context identification parameter <cid> used during the PDP context activation and the PDP context modification procedures. Since the <cid> is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, +CGAUTH is effectively as an extension to these commands. Refer subclause 9.2 for possible <err> values.

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

The test command returns values supported as compound values.

Defined values

<cid>: integer type. Specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

<auth_prot>: integer type. Authentication protocol used for this PDP context.

0　　None. Used to indicate that no authentication protocol is used for this PDP context. Username and password are removed if previously specified.

1　　PAP

2　　CHAP

<userid>: String type. User name for access to the IP network.

<password>: String type. Password for access to the IP network.

Hisi Hi2115 Implementation

- <userid> is needed when <auth_prot> is 1 or 2.
- Maximum <userid> string and <password> string length is 60.

2.29 No more PS data (+CNMPSD)

Command	Response	Example
+CNMPSD	+CME ERROR:<err>	AT+CNMPSD OK
+CNMPSD=?	OK	AT+CNMPSD=? OK

Description

This command indicates that no application on the MT is expected to exchange data.'

When in UTRAN, if further conditions defined in 3GPP TS 25.331 [74] are met, this can cause transmission of a SIGNALLING CONNECTION RELEASE INDICATION message with the cause "UE Requested PS Data session end". When in E-UTRAN, if further conditions defined in 3GPP TS 36.331 [86] are met, this can cause transmission of a UEAssistanceInformation message with powerPrefIndication set to "lowPowerConsumption" to the network.

NOTE: See subclause 10.1.38 for a command applicable to an MT using E-UTRAN, where the MT has a preference for a configuration that is not optimized for power saving.

This command may be used in both normal and modem compatibility modes.

Defined values

Hisi Hi2115 Implementation

3.Commands (3GPP aligned to 27.005)

3.1 Select Message Service (+CSMS)

Command	Response	Example
+CSMS=<service>	+CSMS:<mt>,<mo>,<bm> +CMS ERROR:<err>	AT+CSMS=1 +CSMS:1,1,1 OK
+CSMS?	+CSMS:<service>,<mt>,<mo>,<bm>	AT+CSMS? +CSMS:1,1,0,1 OK
+CSMS=?	+CSMS:(list of supported <service>s)	AT+CSMS=? +CSMS:(0,1) OK

Description

Set command selects messaging service <service>. It returns the types of messages supported by the ME:<mt> for mobile terminated messages, <mo> for mobile originated messages and <bm>for broadcast typemessages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS

ERROR: <err> shall be returned.

Also read command returns supported message types along the current service setting.

Test command returns a list of all services supported by the TA.

Refer to Chapter 7: Error Values for possible <err> values

Defined values

<service>: integer type

0 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4]

1 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] the requirement of <service>

setting 1 is mentioned under corresponding command descriptions)

2...127 reserved

128... manufacturer specific

<mt>, <mo>, <bm>: integer type

0 type not supported

1 type supported

Hisi Hi2115 Implementation

•MT will report to user if received SMS messages:

+CMT:[<alpha>],<length><CR>,<LF><pdu>(PDU mode enabled);

3.2 New Message Acknowledgement to ME/TA (+CNMA)

Command	Response	Example
+CNMA=[<n>[,<length>[<CR> PDU is given<ctrl-Z/ESC>]]]	+CMS ERROR:<err>	AT+CNMA=1 OK
+CNMA=?	+CNMA:(list of supported<n>s)	AT+CNMA=? +CNMA:(1,2) OK

Description

Execution command confirms reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT)which is routed directly to the TE (refer command +CNMI table 3.4.1-3

and table 3.4.1-5). Thisacknowledgement command shall be used when +CSMS parameter <service> equals 1. In PDU mode, it ispossible to send either positive (RPACK) or negative (RP-ERROR) acknowledgement to the network.

Parameter <n> defines which one will be sent. Optionally (when <length> is greater than zero) anacknowledgement TPDU (SMS-DELIVER-REPORT for RPACK or RP-ERROR) may be sent to the network.

The entering of PDU is done similarly as specified in command Send Message +CMGS, except that the format of<ackpdu> is used instead of <pdu> (i.e. SMSC address field is not present). PDU shall not be bounded bydouble quotes. TA shall not send another +CMT or +CDS result code to TE before previous one isacknowledged.

If ME does not get acknowledgement within required time (network timeout), ME should respond as specifiedin 3GPP TS 24.011 [6] to the network. ME/TA shall automatically disable routing to TE by setting both <mt>and <ds> values of +CNMI to zero.

If command is executed, but no acknowledgement is expected, or some other ME related error occurs, finalresult code +CMS ERROR: <err> is returned

• **NOTE :** In case that a directly routed message must be buffered in ME/TA (possible when +CNMIparameter <mode> equals 0 or 2) or AT interpreter remains too long in a state where result codescannot be sent to TE (e.g. user is entering a message using +CMGS), acknowledgement (RP-ACK) mustbe sent to the network without waiting +CNMA command from TE. Later, when buffered result codesare flushed to TE, TE must send +CNMA[=0] acknowledgement for each

result code. In this way,ME/TA can determine if message should be placed in

non-volatile memory and routing to TE disabled(+CNMA[=0] not received).

Refer command +CNMI for more details how to use <mode>parameter reliably.

Test command returns a list of supported <n> values. If the only value supported is

0, the device does notsupport sending of TPDU.

Refer to Chapter 7: Error Values for possible <err> values

Defined Values

<n>: integer type

 0 command operates similarly as defined for the text mode

    (UE don't support text mode for SMS currently)

 1 send RP-ACK (or buffered result code received correctly)

 2 send RP-ERROR (if PDU is not given, ME/TA shall send

    SMS-DELIVER-REPORTwith 3GPP TS 23.040 [3] TP-FCS value

    set to 'FF' (unspecified error cause))

<length>integer type value indicating in the text mode (+CMGF=1) the

    length of the messagebody <data>> (or <cdata>) in

    characters; or in PDU mode (+CMGF=0), thelength of the

    actual TP data unit in octets (i.e. the RP layer SMSC address

    octets arenot counted in the length)

Hisi Hi2115 Implementation

• Only <n>=1 and <n>=2 are supported.

• +CNMI is not supported now.

- Length range 0 – 232.

3.3 Service Centre Address (+CSCA)

Command	Response	Example
+CSCA=<sca>[,<tosca>]	+CMS ERROR:<err>	AT+CSCA=358501234567,145 OK
+CSCA?	+CSCA:<sca>[,<tosca>]	AT+CSCA? +CSCA:" 358501234567",145 OK
+CSCA=?		AT+CSCA=? OK

Description

Set command updates the SMSC address, through which mobile originated SMs are transmitted. In text mode,setting is used by send and write commands. In PDU mode, setting is used by the same commands, but onlywhen the length of the SMSC address coded into <pdu> parameter equals zero.

Refer to Chapter 7: Error Values for possible <err> values

Defined values

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

BCDnumbers (or GSM 7 bit default alphabet characters) are converted

to characters of thecurrently selected TE character set (refer command

+CSCSin 3GPP TS 27.007[9]); type of address given by <tosca>

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

format (whenfirst character of <da>is + (IRA 43) default is 145,

otherwise default is 129)

Hisi Hi2115 Implementation

3.4 Send SMS Message (+CMGS)

Command	Response	Example
+CMGS=<length><CR> PDU is given<ctrl-Z/ESC>	if sucessful +CMGS:<mr>[,<ackpdu>]] if fails +CMS ERROR:<err>	AT+CMGS=8 1A1B1C +CMGS:1 OK
+CMGS=?		AT+CMGS=? OK

Description`

Execution command sends message from a TE to the network (SMS-SUBMIT).

Message reference value <mr>is returned to the TE on successful message delivery.

Optionally (when +CSMS<service> value is 1 andnetwork supports) <ackpdu> is returned.

Values can be used to identify message upon unsolicited deliverystatus report result

code. If sending fails in a network or an ME error, final result code +CMS ERROR:<err>is

returned. This command should be abortable.

- <length> must indicate the number of octets coded in the TP layer data

unit to be given (i.e. SMSCaddress octets are excluded).

- the TA shall send a four character sequence <CR><LF><greater_than>

<space> (IRA 13, 10,62, 32) after command line is terminated with <CR>;

after that PDU can be given from TE to ME/TA.

- the DCD signal shall be in ON state while PDU is given.

- the echoing of given characters back from the TA is controlled by

V.25ter echo command E.

- the PDU shall be hexadecimal format (similarly as specified for <pdu>)

and given in one line; ME/TAconverts this coding into the actual octets

of PDU.

- when the length octet of the SMSC address (given in the PDU) equals

zero, the SMSC address set withcommand Service Centre Address

+CSCA is used; in this case the SMSC Type-of-Address octet shallnot be

present in the PDU, i.e. TPDU starts right after SMSC length octet.

- sending can be cancelled by giving <ESC> character (IRA 27).

- <ctrl-Z> (IRA 26) must be used to indicate the ending of PDU.

Refer to Chapter 7: Error Values for possible <err> values

Defined values

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

<length>integer type value indicating in the text mode (+CMGF=1) the length of

the messagebody <data>> (or <cdata>) in characters; or in PDU mode

(+CMGF=0), thelength of the actual TP data unit in octets (i.e. the RP

layer SMSC address octets arenot counted in the length)

<ackpdu>3GPP TS 23.040 [3] RP-User-Data element of RP-ACK PDU; format is same

as for<pdu>in case of SMS, but without 3GPP TS 24.011 [6] SC address

field andparameter shall be bounded by double quote characters like a

normal tring typeparameter

Hisi Hi2115 Implementation

• <length> range 7-220.

• Don't return ackpdu now

• For address field in PDU(3GPP TS 24.011), should put the country code at the start of it(eg,

China:86).:

3.5 Send SMS Command (+CMGC)

Command	Response	Example
+CMGC=<length><CR> PDU is given<ctrl-Z/ESC>	if successful +CMGC:<mr>[,<ackpdu>] if fails +CMS ERROR:<err>	AT+CMGC=8 1A1B1C1D1F1G1C1D +CMGC:1 OK
+CMGC=?		AT+CMGC=? OK

Description

Execution command sends a command message from a TE to the network (SMS-COMMAND). The entering oftext (3GPP TS 23.040 [3] TP-Command-Data) is done similarly as specified in command Send Message +CMGS,but the format is fixed to be a sequence of two IRA character long hexadecimal numbers which ME/TAconverts into 8-bit octets (refer +CMGS). Message reference value <mr> is returned to the TE on successfulmessage delivery. Optionally (when +CSMS <service> value is 1 and network supports) <scts> isreturned. Values can be used to identify message upon unsolicited delivery status report result code. If sendingfails in a network or an ME error, final result code +CMS ERROR: <err> is returned.. This command shouldbe abortable.

Refer to Chapter 7: Error Values for possible <err> values

Defined values

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

<length>integer type value indicating in the text mode (+CMGF=1) the length of

the messagebody <data>> (or <cdata>) in characters; or in PDU

mode (+CMGF=0), thelength of the actual TP data unit in octets (i.e.

the RP layer SMSC address octets arenot counted in the length)

<ackpdu> 3GPP TS 23.040 [3] RP-User-Data element of RP-ACK PDU; format is

same as for<pdu> in case of SMS, but without 3GPP TS 24.011 [6] SC

address field andparameter shall be bounded by double quote

characters like a normal string typeparameter

Hisi Hi2115 Implementation

•<length> range 8-220.

•Don't return ackpdu now.

•For address field in PDU (3GPP TS 24.011), should put the country code at the start of it

(eg, China:86).

4.Commands (Hisi – General)

4.1Neul Reboot (+NRB)

Command	Response	Example
+NRB	REBOOTING<CR><LF>	AT+NRB REBOOTING

Description

This command reboots the terminal. There is a short delay after issuing this command

before the terminal reboots. No further AT commands will be processed.

Refer to Chapter 7: Error Values for possible <err> values.

Note that there is no final OK to signal that the command line has finished processing as

AT command processing terminates with this command. No confirmation messages are

expected until the reboot.

Defined values

Hisi Hi2115 Implementation

+nrb has the highest priority, can be used at any time except when executing a

blocking and abortableAT command or AT command being interrupted.

4.2 Query UE Statistics (+NUESTATS)

Command	Response	Example

+NUESTATS = RADIO	Signal power:<signal power in centibels> Total power:<total power in centibels> TX power:<current Tx power level in centibels > TX time:<total Tx time since last reboot in millisecond> RX time:<total Rx time since last reboot in millisecond> Cell ID:<last cell ID> ECL:<last ECL value> SNR:< last snr value> EARFCN:< last earfcn value> PCI:< last pci value> RSRQ:<rsrq in centibels> OPERATOR MODE:<operator mode> +CME ERROR:<err>	AT+NUESTATS=RADIO NUESTATS:RADIO,Signal power,50 NUESTATS:RADIO,Total power,500 NUESTATS:RADIO,TX power,30 NUESTATS:RADIO,TX time,1234567 NUESTATS:RADIO,RX time,12345 NUESTATS:RADIO,Cell ID,70 NUESTATS:RADIO,ECL,1 NUESTATS:RADIO,ECL,SNR:20 NUESTATS:RADIO,EARFCN:30 NUESTATS:RADIO,PCI:11 NUESTATS:RADIO,RSRQ:0 NUESTATS:RADIO,OPERATOR MODE:1 OK
+NUESTATS =CELL	NUESTATS:CELL,<earfcn>,<physical cell id>,<primary cell>,<rsrp>,<rsrq>,<rssi>,<snr> [… NUESTATS:CELL,<earfcn>,<physical cell id>,<primary cell>,<rsrp>,<rsrq>,<rssi>,<snr>] +CME ERROR:<err>	AT+NUESTATS=CELL NUESTATS:CELL,3569,69,1,23,-1073,-1145,5 OK
+NUESTATS =THP	NUESTATS:THP,<throughput_type>,<throughput> [… NUESTATS:THP,<throughput_type>,<throughput>] +CME ERROR: <err>	AT+NUESTATS=THP NUESTATS:THP,RLC UL,100 NUESTATS:THP,RLC DL,98 NUESTATS:THP,MAC UL,103 NUESTATS:THP,MAC DL,100 OK

AT+NUESTATS=APPSMEM	APPSMEM:Current Allocated,<allocated> APPSMEM:Total Free,<free> APPSMEM:Max Free,<max free> APPSMEM:Num Allocs,<num allocs> APPSMEM:Num Frees,<num frees>	AT+NUESTATS=APPSMEM APPSMEM:Current Allocated,8240 APPSMEM:Total Free,198 APPSMEM:Max Free,8496 APPSMEM:Num Allocs, 300 APPSMEM:Num Frees, 240 OK
+NUESTATS=<type>	NUESTATS:<type>,<name/value>,<value>[,<value[,<value>[...]]] [... NUESTATS:<type>,<name/value>,<value>[,<value[,<value>[...]]] +CME ERROR: <err>	AT+NUESTATS=BLER NUESTATS:BLER,RLC UL BLER,10 NUESTATS:BLER,RLC DL BLER,5 NUESTATS:BLER,MAC UL BLER,8 NUESTATS:BLER,MAC DL BLER,3 NUESTATS:BLER,Total TX bytes,1080 NUESTATS:BLER,Total RX bytes,900 NUESTATS:BLER,Total TX blocks,80 NUESTATS:BLER,Total RX blocks,80 NUESTATS:BLER,Total RTX blocks,100 NUESTATS:BLER,Total ACK/NACK RX,100 OK
+NUESTATS=?		AT+NUESTATS=? NUESTATS: (RADIO,CELL,BLER,THP,APPSMEM,ALL) OK

Description

This command fetches the most recent operational statistics.

Refer to Chapter 7: Error Values for possible <err> values.

It can take an optional parameter that allows different sets of statistics to be displayed. The <type>RADIO provides the default set of values. <type>=ALL will print all data.

Defined values

<type> Type of data to be displayed as an unquoted string.

Supported values of <type> are:

RADIO radio specific information

CELL per-cell information for the top 8 cells

BLER block error rate information

THP throughput

ALL all information. The value of <type> output is the correct one for

each data type.

<type> = RADIO

<signal power in centibels>

<total power in centibels>

<current TX power level in centibels >

<total TX time since last reboot in millisecond>

<total RX time since last reboot in millisecond>

<last SIB1 cell ID>

<last ECL value>

< last snr value>

< last earfcn value>

< last pci value>

<rsrq in centibels>

<operator mode>   operator mode for SIB1.

0	Unknown mode.
1	Inband different pci mode.
2	Inband same pci mode.
3	Guardband mode.
4	Standalone mode.

<type> = CELL

per-cell information for the top 5 cells.

Returned entries are of the form: <earfcn>,<physical cell id>,

<primary cell>,<rsrp>,<rsrq>,<rssi>

<earfcn>　　absolute radio-frequency channel number

<physical cell id>　　physical id of the cell

<primary cell>1　indicates the current serving cell

<rsrp>　reference signal received power

<rsrq>　reference signal received quality

<rssi>received signal strength indicator

　　　　　<snr>　　　　　　　　　　　　　　signal to noise ratio

<type> = BLER

block error rate

<rlc_ul_bler> RLC layer block error rate (uplink). Integer %RLC

　　<rlc_dl_bler> layer block error rate (downlink). Integer % physical

<mac_ul_bler> layer block error rate (uplink). Integer %physicallayer

<mac_dl_bler> block error rate (downlink). Integer %

<total bytes transmitted>

<total bytes received>

<transport blocks sent>

<transport blocks received>

<transport blocks retransmitted>

<total ack/nack messages received>

<type> = THP

throughput

<rlc_ul>RLC layer throughput (uplink). Integer bps

<rlc_dl>RLC layer throughput (downlink). Integer bps

<mac_ul>physical layer throughput (uplink). Integer bps

<mac_dl>physical layer throughput (downlink). Integer bps

<type> = APPSMEM

Application Core dynamic memory usage

<allocated>

<free>

<max free >

<num allocs >

<num frees>

Hisi Hi2115 Implementation

•The variant of NUESTATS without an argument prints out the RADIO arguments without

the command and vartiant prefixes.This will be deprecated in a future release

- • +NUSTATS and +NUESTATS=RADIO,CELL,BLER,THP will be reset to invalid value when power off or out of service.
- • +NUSTATS and +NUESTATS=RADIO have default invalid values,they are
    Signal power:-32768
    Total power:-32768
    TX power:-32768
    TX time:0
    RX time:0
    Cell ID:4294967295
    ECL:255

SNR:-32768
EARFCN:4294967295
PCI:65535
RSRQ:-32768
OPERATOR MODE:0

4.3 Specify search frequencies (+NEARFCN)

Command	Response	Example
+NEARFCN=<search_mode>,[,<paraml1>[,<paraml2>[,...]]]	+CME ERROR: <err>	AT+NEARFCN=0,10,10A OK
+NEARFCN=?		+NEARFCN=? OK

Description

The set command provides a mechanism to lock to a specific E-ULTRA Absolute Radio

Frequency Channel Number (EARFCN). All actions will be locked to this carrier until either

the lock is removed or the UE is rebooted.

If the specified EARFCN is not present, the UE will enter out of service mode. If the

specified PCI is not present, the UE will enter out of service mode.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<search_mode>Specifies the type of search and defines the supplied parameters.

0 <earfcn>,<pci>

Lock to a specific earfcn

<earfcn>A number in the range 0-65535 representing the earfcn to search.

An<earfcn> value of 0 will remove the restriction and any associated Physical Cell ID

lock.

<pci>string type; E-UTRAN physical cell ID in hexadecimal format. Valid range 0 -1F7.

Hisi Hi2115 Implementation

4.4 Create Socket (+NSOCR)

Create a socket and associate with specified protocol.

Command	Response	Example
+NSOCR=<type>,<protocol>,<listenport>[,<receive control>[,<af_type>]]	<socket> +CME ERROR: <err>	AT+NSOCR=DGRAM,17,56,1,AF_INET 1 OK

Description

This command creates a socket on the UE. If the port is set, receiving is enabled and

unsolicited +NSONMI messages will appear for any message that is received on that port.

Refer to Chapter 7: Error Values for possible <err> values.

If a socket has already been created for a protocol, port combination, +NSOCR will fail if

requested a second time.

Defined values

<type>Socket Type. DGRAM for UDP, STREAM for TCP.

<protocol>Standard internet protocol definition. For example, UDP is 17.

<listen port>A number in the range 0-65535. This is the local port that will

be includedin sent messages and on which messages will be

received.

<socket>This is a reference to the created socket. It is an integer greater

than orequal to 0

<receive control>Set to 1 if incoming messages should be received, 0 if incoming

messages should be ignored. Defaults to 1 (messages will be

received)

<af_type>String type, "AF_INET" for IPv4 and "AF_INET6" for IPv6. Default value

"AF_INET".

Hisi Hi2115 Implementation
•A maximum of 7 sockets are supported, but other services may reduce this number.

• Only UDP(protocol 17), TCP(protocol 6) supported.

<listen port> value of 20000 can't be set when bip is enabled.

4.5 Send To Command (UDP only) (+NSOST)

Send a UDP datagram containing length bytes of data to remote_port on

remote_addr.

Command	Response	Example
+NSOST=<socket>,<remote_addr>, <remote_port>,<length>,< data>[,< sequence>]	<socket>, <length> +CME ERROR: <err>	AT+NSOST=1,192.158.5.1,1024,2,AB30 1,2 OK

Description

This command sends a UDP datagram to the specified host:port. It will return with the

socket that it was sent on, and the number of bytes of data sent. If the amount of data is

larger than the largest datagram that can be sent, the +NSOST return value will indicate

how much of the data was successfully sent.

Refer to <u>Chapter 7: Error Values for possible <err> values.</u>

Defined values

<socket>Socket number returned by +NSOCR

<remote addr> IP address

<remote port>A number in the range 0-65535. This is the remote port that

   messages will be received on

<length>Decimal length of data to be sent.

<data>Data to be transmitted in hexstring format, or quoted string format.

<sequence>Sequence of data, range 1-255.If omit, will not report data sent status.

   <status>The status of datagram

      0 ERROR

      1 SENT

Hisi Hi2115 Implementation.

- Maximum data size is 1358 bytes
- <data> Only hexstring format is supported
- IP addresses can be specified in decimal, octal or hexadecimal notation
- Data can't be transferred if MT don't have address (could use +cgpaddr to get)

4.6 Send To Command with Flags (UDP only)(+NSOSTF)

Send a UDP datagram containing length bytes of data to remote_port on remote_addr and allowsmeta-data flags to be set.

Command	Response	Example
+NSOSTF=<socket>,<remot	<socket>,<length>	AT+NSOSTF=1,192.158.5.1,1

e_addr>,<remote_port>,<flag>,<length>,<data>[,<sequence>]	+CME ERROR:<err>	024,0x100,2,AB30 1,2 OK

Description

This command sends a UDP datagram to the specified host:port. It will return with the socket that it was senton, and the number of bytes of data sent. If the amount of data is larger than the largest datagram that can besent, the +NSOSTF return value will indicate how much of the data was successfully sent.

If <sequence>is not omitted, when datagram is sent by rf or discard, will report the result

Command	Response	Example
	+NSOSTR:<socket>,<sequence>,<status>	+NSOSTR:1,2,1

Refer to Chapter 7:Error Values for possible <err> values.

Defined values

<socket>   Socket number returned by +NSOCR

<remote addr> IP address

<remote port> A number in the range 0-65535. This is the remote port that

                messages will bereceived on

<flag>Specifies the type of message transmission. Values of this

                argument are in hexformat and are formed by logically OR'ing

                zero or more of the following flags:

                0x100 Exception Message: Send message with high priority

0x200 Release Indicator: indicate release after next message

0x400 Release Indicator: indicate release after next message

has been replied to

If no flags are set, a value of 0 should be provided.

<length>   Decimal length of data to be sent.

<data> Data to be transmitted in hexstring format, or quoted string

format=

<sequence>Sequence of data, range 1-255.If omit, will not report data sent status

<status>The status of datagram

0 Error

1 Sent

- **Hisi Hi2115 Implementation**
- Maximum data size is 1358 bytes.
- <data> Only hexstring format is supported
- IP addresses can be specified in decimal, octal or hexadecimal notation.
- Data can't be transferred if MT don't have address (could use +cgpaddr to get).

4.7 Query Socket Messages Sent Pending Data List (+NQSOS)

Command	Response	Example
+NQSOS=<socket>[,<socket>[,<socket>[...]]]	[+NQSOS:<socket>,<sequence><CR><LF>[+NQSOS:<socket>,<sequence>][...]]	AT+NQSOS=1,2 +NQSOS:1,2 +NQSOS:2,3 OK

+NQSOS?	[+NQSOS:<socket>,< sequence><CR><LF>[+ NQSOS:<socket>,< sequence>][...]] +CME ERROR:<err>	AT+NQSOS? +NQSOS:1,2 +NQSOS:2,3 OK

Description

This command queries the list of the pending upstream message by MT.

Refer to Chapter 7: *Error Values* for possible <err> values.

Defined values

<socket>Socket number.

<sequence>The sequence of pending up steam message. Range 1-255.

Hisi Hi2115 Implementation

4.8 Receive Command(+NSORF)

Command	Response	Example
+NSORF=<socket>, <req_length>	<socket>,<ip_addr>,<port>,<leng th>,<data>,<remaining_length> +CME ERROR: <err>	AT+NSORF=1,10 1,192.168.5.1,1024,2,ABAB,0 OK

Description

Reads up to <req length> characters of data from <socket>.

Returned length is the actual number of characters returned.

Receive data on a socket. When data arrives a +NSONMI response will be generated

that indicates the socket the message was received on and the amount of data. The

+NSORF command takes a length, which is the maximum amount of data that will be

returned.

If the requested length is larger than the actual size of the returned data, only the length

of returned data is provided, and the remaining length is returned as 0. If the requested

length is less than the amount of data returned, only the requested amount of data will be returned, plus an indication of the number of bytes remaining.. Once a message has been fully read, a new +NSONMI notification will be sent if there is another message to process.

Refer to Chapter 7: Error Values for possible <err> values.

If messages arrive faster than they are read, and the internal message buffer is full, the most recent message will be discarded.

Defined values

<socket>Socket number returned by +NSOCR

<req_length>Maximum amount of data to be returned as a decimal byte length.

<remote addr>Address of system sending the message

<remote port>A number in the range 0-65535. This is the remote port that messages was sentfrom

<length>Amount of data returned as a decimal byte length

<remaining_length>Amount of data left to read for this message as a decimal byte length

<data>Data received in hexstring format

Hisi Hi2115 Implementation

•Maximum data size is 1358 bytes.

•Remaining length is always 0. The remaining data is readable.

4.9　Connect Command (TCP only) (+NSOCO)

Command	Response	Example
+NSOCO=<socket>,<remote_addr>, <remote_port>	+CME ERROR: <err>	AT+NSOCO=0,192.158.5.1,1024 OK

Description

This command Connect to a TCP sever to the specified host:port.

Refer to Chapter 7: *Error Values* for possible <err> values.

Defined values

<socket> Socket number returned by +NSOCR

<remote_addr>　　　Address of system sending the message

<remote_port> A number in the range 0-65535. This is the remote port that connect to.

Neul Hi21XX Implementation

- IP addresses can be specified in decimal, octal or hexadecimal notation.

4.10　Send Command (TCP only) (+NSOSD)

Send a TCP datagram containing length bytes of data to TCP server.

Command	Response	Example
+NSOSD=<socket>,<length>,<data>[,<flag>[,sequence]]	socket, length +CME ERROR: <err>	AT+NSOSD=0,2,AB30 0,2 OK AT+NSOSD=0,2,AB30,0x100 0,2 OK AT+NSOSD=0,2,AB30,0x100,255 0,2 OK

Description

This command sends a TCP datagram to the TCP server. It will return with the socket

that it was sent on, and the number of bytes of data sent. If the amount of data is larger

than the largest datagram that can be sent, the +NSOSD return value will indicate how

much of the data was successfully sent.

If <sequence>is not omitted, when datagram is acked by server or discard by UE, will report the result.

Command	Response	Example
	+NSOSTR: <socket>,<sequence>,<status>	+NSOSTR:1,2,1

Refer to Chapter 7: *Error Values*for possible <err> values.

Defined values

<socket> Socket number returned by +NSOCR.

<length> Decimal length of data to be sent.

<data> Data to be transmitted in hexstring format, or quoted string format.

<flag> Specifies the type of message transmission. Values of this argument are in hex format andare formed by logically OR'ing zero or more of the following flags:

0x100 Exception Message: Send message with high priority

0x200 Release Indicator: indicate release after next message

0x400 Release Indicator: indicate release after next message has been replied toIf no flags are set, a value of 0 should be provided.

<sequence> Sequence of data, range 1-255.If omit, will not report data sent status.

<status> The status of datagram.

0 Error

1 Sent

Neul Hi21XX Implementation

• Maximum data size is 1358 bytes.

• <data> Only hexstring format is supported

• IP addresses can be specified in decimal, octal or hexadecimal notation.

• <flag> couldn't work now.

4.11 Close Socket (+NSOCL)

Command	Response	Example
+NSOCL=<socket>	+CME ERROR: <err>	AT+NSOCL=1 OK

Description

Close the specified socket. If there are pending messages to be read, they will be dropped.

No further unsolicited +NSONMI notifications will be generated. If the socket has already

been closed, or was never created, an error will be returned.

Defined values

<socket>Socket number returned by +NSOCR

Hisi Hi2115 Implementation

4.12 Socket message arrived indicator (+NSONMI) (Response Only)

Command	Response	Example
+NSONMI:	<socket>, <length>	+NSONMI:1,10

Description

Unsolicited message to notify that data has been received on a socket and is ready to be

read. Returns socket number and number of bytes of data available to read for the first

message that is queued. If another message is received on the same socket, it will only

be notified when the preceding message has been completely read.

Refer to Chapter 7：Error Values for possible <err> values.

Defined values

\<socket\>Socket on which data is received. Decimal number returned by +NSOCR

\<length\>Number of bytes of data in the first message.

Hisi Hi2115 Implementation

•This message can occur at any point if it is indicating a new message with no

messages buffered. If there are buffered messages it will occur in the AT+NSORF

command before the data is returned.

4.13 Socket close indicator (+NSOCLI) (Response Only)

Command	Response	Example
+NSOCLI:	\<socket\>	+NSOCLI:1

Description

Unsolicited message to notify that socket has been closed by LWIP internally. Returns socket number.

Refer to Chapter 7: Error Values for possible \<err\> values.

Defined values

\<socket\>
Socket on which is closed. Decimal number returned by +NSOCR.

Hisi Hi2115 Implementation

•   Only TCP could report +NSOCLI.

4.14 Test IP network connectivity to a remote host (+NPING)

Command	Response	Example
+NPING=\<remote_address\>[,\<p_size\>[,\<timeout\>]]	+CME ERROR: \<err\>	AT+PING=192.168.1.1 OK
+NPING	+NPING:\<,\<remote_address\>,\<ttl\>,\<rtt\>	+NPING:192.168.1.1,20,50
+NPINGERR	+NPINGERR:\<err\>	+NPINGERR: 1

Description

This command sends an ICMP packet to the specified host address.

Refer to Chapter 7: Error Values for possible <err> values.

AT+NPING initiates the sending of a PING packet to the specified address. This will either cause a packet to be returned if the remote system is connected and responding to PING packets, or no response will be received. .

A maximum of 1 ping attempts will be tried. If none of the packets receive a response within the timeout period, an error will be raised.

If a response is received, the unsolicited +NPING message will be returned. If no response is received the +NPINGERR unsolicited response will be returned with an error value.

Defined values

<remote addr> Address of system sending the message

<p_size>   size in bytes of echo packet payload.

                        Range of 12-1480

                        Default 12

<timeout>   maximum time in ms to wait for an echo reply response.

                        Range 10-600000.

                        Default 10000

<ttl>   ttl received in the response packet

<rtt>   elapsed time in msec from packet sent to response received.

<err>   An integer value to provide some information on why the ping

            request failed.

            1 No response from remote host within timeout period

2 Failed to send ping request

Hisi Hi2115 Implementation

•IP addresses can be specified in decimal, octal or hexadecimal notation.

•Data can't be transferred if MT don't have address (could use +cgpaddr to get)

4.15 Set Debug Logging Level (+NLOGLEVEL)

Command	Response	Example
+NLOGLEVEL= <core>,<level>	+CME ERROR:<err>	AT+NLOGLEVEL=PROTOCOL,ERROR OK
+NLOGLEVEL?	+NLOGLEVEL:<core>,<leve>	AT+NLOGLEVEL? +NLOGLEVEL:PROTOCOL,ERROR +NLOGLEVEL:SECURITY,NONE +NLOGLEVEL:APPLICATION,WARNING OK
+NLOGLEVEL=?	+NLOGLEVEL:(<core>,...),(<level>,<level>,...)	AT+NLOGLEVEL=? +NLOGLEVEL:(PROTOCOL,APPLICATION,SECURITY),(VERBOSE,NORMAL,WARNING,ERROR,NONE) OK

Description

This command sets the logging level. It can take one of the following values: The default

logging level is NONE.

This value is persistent across reboots.

Defined values

<core>Core required

PROTOCOL

SECURITY

APPLICATION

<level>Logging level required

VERBOSE

NORMAL

WARNING

ERROR

NONE

Hisi Hi2115 Implementation

- Default logging level is NORMAL

4.16 Configure UE Behaviour (+NCONFIG)

Command	Response	Example
+NCONFIG=<function>,<value>	+CME ERROR:<err>	AT+NCONFIG=AUTOCONNECT,TRUE OK
+NCONFIG?	+NCONFIG:<function>,<value> [+NCONFIG:<function>,<valu> [..]]	AT+NCONFIG? +NCONFIG:AUTOCONNECT,FALSE +NCONFIG:CR_0354_0338_SCRAMBL ING,TRUE +NCONFIG:CR_0859_SI_AVOID,TRUE +NCONFIG:COMBINE_ATTACH,FALSE +NCONFIG:CELL_RESELECTION,TRUE +NCONFIG:ENABLE_BIP,FALSE +NCONFIG:MULTITONE,TRUE +NCONFIG:NAS_SIM_POWER_SAVIN G_ENABLE,TR UE +NCONFIG:BARRING_RELEASE_DELA Y,64 OK
+NCONFIG=?	+NCONFIG:(<function>,(<value1>,<value2>[,<value3>[,...]]) [+NCONFIG:(<function>,(<value1>,<value2>[,<value3>[,...]]) [,...]]	AT+NCONFIG=? +NCONFIG:(AUTOCONNECT,(FALSE,T RUE)) +NCONFIG:(CR_0354_0338_SCRAMB LING,(FALS E,TRUE)) +NCONFIG:(CR_0859_SI_AVOID,(FALS E,TRUE))

		+NCONFIG:(COMBINE_ATTACH,(FALSE,TRUE))
		+NCONFIG:(CELL_RESELECTION,(FALSE,TRUE))
		+NCONFIG:(ENABLE_BIP,(FALSE,TRUE))
		+NCONFIG:(MULTITONE,(FALSE,TRUE))
		+NCONFIG:(NAS_SIM_POWER_SAVING_ENABLE,(FALSE,TRUE))
		+NCONFIG:(BARRING_RELEASE_DELAY,(0-1800))
		OK

Description

This command allows the configuration of certain aspects of UE behaviour. It takes a function and a value thatcontrols operation of that function.

Defined values

<function>UE function to configure

AUTOCONNECT

Control if the platform will automatically attempt to connect to the network afterpower-on or reboot. When enabled, will set+ CFUN=1 and read the plmn from theSIM. It will use the APN provided by the network.

COMBINE_ATTACH

Enable/disable combine attach.

CELL_RESELECTION

Enable support for RRC cell reselection

ENABLE_BIP

　Enable/disable bip

MULTITONE

　Enable/disablemultitone. Need rf support multitone too if enable

multitone.

NAS_SIM_POWER_SAVING_ENABLE.

　Enable/disable sim card power saving mode. Could set only when power off

BARRING_RELEASE_DELAY

　Time (in seconds) to delay release from barring. Value from 0-1800

　Should only be set when bar release timer not running

Hisi Hi2115 Implementation

•CR_ functions are temporary and will be retired when no longer required.

•+NCONFIG=MULTITONE,<value> will take effect when rebooted. Could get the real value when power on

4.17 Set ID (+NTPERMID)

Migrate system identities into permanent storage. This is a temporary command that

will be replaced with a production tool

Command	Response	Example
+NTPERMID=<snt>,<dest>	+CME ERROR:<err>	AT+NTPERMID=1,1 OK
+NTPERMID=?	+NTPERMID:(list of supported<snt>s),(list of supported <dest>s)	AT+NTPERMID? <snt>s),(list of supported +NTPERMID:(0,1),(1,2) <dest>s) OK

Description

Move serial number or IMEI into non-modifiable storage. This is either flash that

can't be written or one-time-programmable storage that can never be erased.

Defined values

<snt> integer type indicating the serial number type that has been requested.

0 sets <sn>

1 sets the IMEI (International Mobile station Equipment Identity)

<dest>

1 permanent flash

2 one-time programmable storage

Hisi Hi2115 Implementation

•This command must be executed when the radio is inactive (AT+CFUN=0 will force

this state).

4.18 Set ID (+NTSETID)

Set system identities. This is a temporary command that will be replaced with a

production tool

Command	Response	Example
+NTSETID=<snt>,<data>	+CME ERROR:<err>	AT+NTSETID=1,123456789012345 OK

Description

Set uuid or IMEI value.

Defined values

<snt>　　　integer type indicating the serial number type that has been requested.

0　　sets <sn>

1　　sets the IMEI (International Mobile station Equipment Identity)

2   returns the SVN (Software Version Number)

<data>

   0   <sn>

   1   <imei>

   2   <svn>

<sn>

   The 128-bit UUID of the UE as a hexstring.

<imei>

   15-character string type in decimal format

<svn>

   2 digit SVN

Hisi Hi2115 Implementation

• The Serial Number and IMEI values assigned is persistent across reboots.

   •SVN is not persistent and will default to 0x00.

•   Need to send AT+NCDP to configure CDP Server again after set new IMEI. Otherwise, UE

   will use the old IMEI to connect with CDP Server.

4.19 Card Identification (+NCCID)

Command	Response	Example
+NCCID	+NCCID:<ICCID> +CME ERROR:<err>	AT+NCCID +NCCID:4412345678901234567 OK
+NCCID?	+NCCID:<ICCID> +CME ERROR:<err>	AT+NCCID? +NCCID:4412345678901234567 OK
+NCCID=?		AT+NCCID=? OK

Description

Both the execute and read commands read the ICCID off the SIM card. If no SIM card is

present, or the SIMcard is unreadable, no data is returned.

Refer to Chapter 7: Error Values for possible <err> values

Defined values

<ICCID>SIM Card Identification Number

Hisi Hi2115 Implementation

4.20 Set Supported Bands (+NBAND)

Command	Response	Example
+NBAND=n[,n[,n[...]]]	+CME ERROR: <err>	AT+NBAND=5,8 OK
+NBAND?	+NBAND: n[,n[,n[...]]]	AT+NBAND? +NBAND:5,8,28,3 OK
+NBAND=?	+NBAND:(n[,n[,n[...]]])	AT+NBAND=? +NBAND: (1,2,3,5,8,12,13,14,17,18,19,20,25 ,26,28,66) OK

Description

This command restricts the set of bands to be used.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<n>Band as a decimal number.

Hisi Hi2115 Implementation

•AT+NBAND=? returns the list of bands supported by the hardware

4.21 Set the mapping for band and power class

(+NPOWERCLASS)

Command	Response	Example
+NPOWERCLASS =<band>,<power class>	+CME ERROR:<err>	AT+NPOWERCLASS=5,3 OK
+NPOWERCLASS?	[+NPOWERCLASS:<band>,<powerclass><CR><LF>[+NPOWERCLASS:<band>,<powerclass>][...]] +CME ERROR:<err>	AT+NPOWERCLASS? +NPOWERCLASS:5,3 OK
+NPOWERCLASS=?	+NPOWERCLASS:((list of supportedbands),(list of supported power class)	AT+NPOWERCLASS=? +NPOWERCLASS:(5,8,20),(3,5) OK

Description

Set the mapping for band and power class.

The read command list all mapping of bands and power class.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<band>　　　　　Configured band by +NBAND set.

<power class>　　　Power class value for band.

Hisi Hi2115 Implementation

•<power class>only support 3, 5 now.

•Could set only when MT is power off

4.22 Power saving mode status report(+NPSMR)

Command	Response	Example
+NPSMR=<n>	+CME ERROR:<err>	AT+NPSMR=0 OK
+NPSMR?	+NPSMR:<n>[,<mode>] +CME ERROR:<err>	AT+NPSMR? +NPSMR:1,1 OK
	+NPSMR:(list of supported	AT+NPSMR=?

+NPSMR=?	<n>s)	+NPSMR:(0,1) OK
	+NPSMR:<mode>	+NPSMR:1

Description

The set command controls the presentation of an unsolicited result code +NPSMR.

If <n>=1, +NPSMR: <mode> is sent from the MT when the power mode of the MT

is changed.

Refer to Chapter 7: Error Values for possible <err> values.

The read command returns the status of result code presentation and an integer

<mode> which showswhether the MT is currently in power saving mode or normal

mode.

Test command returns supported values as a compound value.

Defined values

<n>: integer type

　　0 disable unsolicited result code

　　1 enable unsolicited result code +NPSMR: <mode>

<mode>: integer type; indicates the power mode of MT.

　　0 normal mode

　　1 power saving mode

Hisi Hi2115 Implementation

4.23 Paging time window value and eDRX setting (+NPTWEDRXS)

Command	Response	Example

+NPTWEDRXS=[<mode>,[<AcT-type>[,<Requested_Paging_time_window>[,<Requested_eDRX_value>]]]]	+CME ERROR: <err>	AT+NPTWEDRXS=1,5,1110,0101 OK
+NPTWEDRXS?	[+NPTWEDRXS: <AcT-type>,<Requested_Paging_time_window>,<Requested_eDRX_value>[<CR><LF>+NPTWEDRXS: <AcT-type>,<Requested_Paging_time_window>,<Requested_eDRX_value>[...]]]	AT+NPTWEDRXS? +NPTWEDRXS:" 5","1110"," 0101" OK
+NPTWEDRXS=?	+NPTWEDRXS: (list of supported<mode>s),(list of supported<AcT-type>s) ,(list of supported<Requested_Paging_time_window>s),(list ofsupported<Requested_eDRX_value>s)	AT+NPTWEDRXS=? +NPTWEDRXS:(0,1,2,3),(5),(" 0000" - "1111"),(" 0000" - "1111") OK

Description

The set command controls the setting of the UEs paging time window value and

eDRX parameters. Thecommand controls whether the UE wants to apply paging time

window and eDRX or not, as well as therequested paging time window and eDRX value

for each specified type of access technology.

The set command also controls the presentation of an unsolicited result code

+NPTWEDRXP:<AcT-type>[,<Requested_Paging_time_window>[,<Requested_eDRX_value>[,<NWprovided_eDRX_value>[,<Paging_time_window>]]]] when <n>=2 and there is a change in the pagingtime window

and eDRX parameters provided by the network.

A special form of the command can be given as +NPTWEDRXS=3. In this form,

paging time window and eDRXwill be disabled and data for all parameters in the

command +NPTWEDRXS will be removed or, if available, setto the manufacturer specific default values.

The read command returns the current settings for each defined value of <AcT-type>.

The test command returns the supported <mode>s and the value ranges for the access technology and therequested paging time window and requested eDRX value as compound values.

Refer to Chapter 7: Error Values for possible <err> values

Defined values

<mode>: integer type, indicates to disable or enable the use of requested paging time window and eDRX inthe UE. This parameter is applicable to all specified types of access technology, i.e. the most recentsetting of <mode> will take effect for all specified values of <AcT>.

0 Disable the use of requested paging time window and eDRX

1 Enable the use of requested paging time window and eDRX

2 Enable the use of requested paging time window and eDRX and enable the

unsolicited result code

+NPTWEDRXP:<AcT-type>[,<Requested_Paging_time_window>][,<Requested_eDRX_value>[,<NWprovided_eDRX_value>[,<Paging_time_window>]]]

3 Disable the use of eDRX and discard all parameters for eDRX or, if available,

reset to themanufacturer specific default values.

<AcT-type>: integer type, indicates the type of access technology. This AT-command is used to specifythe relationship between the type of access technology and the requested eDRX value.

　　0 Access technology is not using eDRX. This parameter value is only used in the unsolicited resultcode.

　　1 EC-GSM-IoT (A/Gb mode)

　　2 GSM (A/Gb mode)

　　3 UTRAN (Iu mode)

　　4 E-UTRAN (WB-S1 mode)

　　5 E-UTRAN (NB-S1 mode)

<Requested_Paging_time_window>: string type; half a byte in a 4 bit format. The paging timewindow referes to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (seesubclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRXparameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

<Requested_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, ismanufacturer specific.

<NW-provided_eDRX_value>: string type; half a byte in a 4 bit format. The eDRX value refers to bit 4to 1 of octet 3 of the Extended DRX parameters information element (see

subclause 10.5.5.32 of3GPP TS 24.008 [8]). For the coding and the value range, see

Extended DRX parameters informationelement in 3GPP TS 24.008 [8] Table

10.5.5.32/3GPP TS 24.008.

    \<Paging_time_window>: string type; half a byte in a 4 bit format. The paging time

window referes tobit 8 to 5 of octet 3 of the Extended DRX parameters information

element (see subclause 10.5.5.32 of3GPP TS 24.008 [8]). For the coding and the value

range, see the Extended DRX parameters informationelement in 3GPP TS 24.008 [8]

Table 10.5.5.32/3GPP TS 24.008.

Hisi Hi2115 Implementation

•\<AcT-type> value 5 is supported.

4.24 Firmware Update (+NFWUPD)

Command	Response	Example
+NFWUPD=\<cmd>[,\<sn>,\<l en>,\<data>,\<crc>]	\<result> +CME ERROR:\<err>	AT+NFWUPD=0 OK
+NFWUPD=?	+NFWUPD:(list of supported \<cmd>s)	AT+NFWUPD=? +NFWUPD:(0-5) OK

Description

    This command supports Firmware Updating. It allows package download, package

validation, packagenameand version querying and firmware upgrading. Before

upgrading firmware, it need package downloadfirst. After download finish, it send

package validity cmd. If package is legal return ok, otherwise return errorand print

reason. When validity is running, it refuse to exec other command with error return,

After validityfinish, it send firmware upgrade command. It refuse to exec firmware

upgrade command without packagevalidity.

Defined values

<cmd>　　　　　Package process command

　　0　　　　　**Erase package zone in internal flash**

　　1　　　　　sn>,<len>,<data>,<crc>

　　　　　　Download a package segment. Download a FOTA package.

　　　Package segments are continuous segments of the FOTA package.

　　　　　Segments can be of any length, but must be provided in order.

　　2　　Validitate package

　　3　　Get package name

　　4　　Get package version

　　5　　Upgrade firmware

<sn>Sequence number. It start with 0, and increments by one for each

　　　　　ackage segment.

<len>　　　　Data length in bytes of data

<data>　Data to be transmitted in hexstring format,

<crc>　CRC of the package segment binary data. CRC is sent as a HexString

　　　　The <crc> is an xor8 of each byte in the package segment.,

Hisi Hi2115 Implementation

4.25 Configure AT Uart Baud Rate (+NATSPEED)

Command	Response	Example

+NATSPEED=<baud rate>,<timeout>,<store>,<sync mode>[,<stop bits>[,<parity>]]	+CME ERROR:<err>	AT+NATSPEED=9600,30,1,3,1,0 OK
+NATSPEED?	+NATSPEED:<baud rate>,<sync mode>,<stop bits>,<parity>	AT+NATSPEED? +NATSPEED:9600,3,1,0 OK
+NATSPEED=?	+NATSPEED:(<baud rate>),(<timeout>),(<store>),(<sync mode>),(<stop bits>),(parity)	+NATSPEED:(4800,9600,57600,115200,230400,460800),(0-30),(0,1),(0-3),(1,2),(0-2) OK

Description

Configure AT uart baud rate.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<baud rate>   Integer type indicating the at uart baud rate that has been requested.

<timeout>   Integer type indicating the time to wait for communication before

switching back to the original speed, unit second. Default value is 3

second.Max value is 30.

<store>   Integer type indicating parameter baud_rate and sync_mode store to

nv ornot. Default value is 0.

0   Do not store to nv, need configure again after reboot.

1   Will store to nv, while there is interaction before timeout.

<sync mode> The LP UART synchronises to each start bit that it detects and uses

this to configure its optimum sampling point for each subsequent

bit

in a dataword. The Sync Mode field allows this sampling point to be

modified ifrequired.

0	Default value for most operations
1	Sample later
2	Sample earlier
3	Sample even earlier

<stopbits>　　The AT UART stop bits, default value is 1

1	1 stop bit
2	2 stop bits

<parity>　　The AT UART parity, default value is 0.

0	No parity enabled
1	Odd parity
2	Even parity

Hisi Hi2115 Implementation

- <baud_rate> baud rate higher than the fastest speed supported by the Low Power

  UART willdisable Deep Sleep Low Power Operation.

- <sync mode> parameter may be removed in a future release

- <sync mode>don't support 3when <baud rate> is 4800and 57600.

4.26 PIN operator (+NPIN)

Command	Response	Example
+NPIN=<command>,<parameter1>[,< parameter2>]	+CME ERROR:<err>	AT+NPIN=0,29102394 OK
	+NPIN:<npin result>	+NPIN: OK

Description

Set command is used to verify, change, enable, disable, or unblock pin. Will receive an unsolicited result when execute pin command is completed.

- **NOTE 1:** SIM PIN, SIM PUK refer to the PIN of the selected application on the UICC. For example, in an UTRAN context, the selected application on the currently selected UICC should be a USIM and the SIM PIN then represents the PIN of the selected USIM. See 3GPP TS 31.101 [65] for further details on application selection on the UICC.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<command>

 0   <pin>

       Verify pin.

 1   <old pin>,<new pin>

       Change pin.

 2   <pin>

       Enable pin

 3   <pin>

       Disable pin.

  4 <puk>,<pin>

       Unblock pin.

<pin>,<old pin>,<new pin>   Decimal string format; <old pin> shall be the same as password specified for the facility from the MT user interface or with command AT+NPIN=1, <old pin>， <new

	pin>and<new pin> is the new password; minimum length is 4, maximum length is 8.
<puk>	Decimal string format, string size is 8.
<npin result>	"OK" "ERROR PIN disabled" "ERROR PIN blocked" "ERROR wrong PIN <pin retries remaining>" "ERROR wrong format" "ERROR"
<pin retries remaining>	Decimal type, remaining PIN retries. If no retries left then PIN is blocked. Need to enter +npin=4<puk>,<pin> before can use again

Hisi Hi2115 Implementation

• Need send AT+CFUN=1 to power on MT first.

4.27 Neul Debug and Exception Log (+NXLOG)

Command	Response	Example
AT+NXLOG=<Command>[,parameter]	[<report>] +CME ERROR:<err>	AT+NXLOG=DUMP OK
AT+NXLOG?	+NXLOG:<log mode> +CME ERROR:<err>	AT+NXLOG=? AT+NXLOG: 1 OK
AT+NXLOG=?	NXLOG:(<list of supported commands>) +CME ERROR:<err>	AT+NXLOG=? NXLOG:(DUMP,DELETE,ENABLE,DISABLE) OK

Description

NXLOG provides an interface to the exception log. The exception log stores all debug error message ofverbosity ERROR. It also allows the exception log to be enabled, disabled or cleared.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<command>

DUMP	dump out the exception log
DELETE	delete all exception log data
ENABLE	enable logging of exception data
DISABLE	disable logging of exception data

<report>　　　　　　　　　hexstring encoded debug and exception log when <dump mode> is 0.

　　　　　　　　　　　　　binary encoded debug and exception log when <dump mode> is 1.

<dump mode>　　　　　　　0: dump over at port

　　　　　　　　　　　　　1: dump over debug serial port

<log mode>　　　　　　　　0: disable logging of debug data

　　　　　　　　　　　　　1: enable logging of debug data

Hisi Hi2115 Implementation

　<command>= DELETE / ENABLE/DISABLE and +NXLOG? could work only when using external flash.

4.28 Clear Stored Earfcn (+NCSEARFCN)

Command	Response	Example

| +NCSEARFCN | +CME ERROR:<err> | AT+NCSEARFCN
OK |

Description

This command clear Stored Earfcn.

Refer to Chapter 7: Error Values for possible <err> values.

Hisi Hi2115 Implementation

• Could exclude only when MT is power off.

4.29 IP address info Report(+NIPINFO)

Command	Response	Example
+NIPINFO=<n>	+CME ERROR:<err>	AT+NIPINFO=1 OK
+NIPINFO?	+NIPINFO:<n>	AT+NIPINFO? AT+NIPINFO:1 OK
+NIPINFO=?	+NIPINFO:(list of supported <n>s)	AT+NIPINFO=? +NIPINFO:(0,1) OK

Description

This command is used to report IP address information

The set command controls the presentation of an unsolicited result code .

If the IP address is obtained successfully, <failure_cause> will be omitted.

The format: +NIPINFO:<cid>,<IP_type>,<IP_addr>.

If it fails to obtain an IP address, <IP_addr> will be omitted.

The format: +NIPINFO:<cid>,<IP_type>,,<failure_cause>.

The read command returns the status of the current setting <n>.

Test command returns supported parameter values.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<n>: integer type;

0   disable unsolicited result code (default value)

1   enable unsolicited result code +NIPINFO:<cid>,<IP_type>,[<IP_addr>] [,<failure_cause>]

<cid>: integer type; specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

<IP_type>: string type; specifies the type of IP address.

IP   Internet Protocol (IETF STD 5 [103])

IPV6   Internet Protocol, version 6

IPV4V6　　Virtual <PDP_type> introduced to handle dual IP stack UE capability.

<IP_addr>: string type; IP address. The IPV4 address is expressed in decimal numbers and dots, such as 100.1.0.26. IPV6 addresses are expressed in hexadecimal numbers and colon, such as 108F: 0: 0: 0: 8: 800:

200C: 417A. This parameter is not displayed when the address acquisition failed

<failure_cause>: integer type; Cause values for failed to get IP address

1　　PDN type IPv4 only allowed

2　　PDN type IPv6 only allowed

3　　Single address bearers only allowed

4　　IPV6 RA timeout

5　　Unspecified

Hisi Hi2115 Implementation

4.30 Configure PDP context dynamic parameter items to read(+NCPCDPR)

Command	Response	Example
+NCPCDPR=<parameter>,<state>	+CME ERROR:<err>	AT+NCPCDPR=1,1 OK
+NCPCDPR	+NCPCDPR:<parameter>,<state> [+NCPCDPR:<parameter>,<state> [..]]	AT+NCPCDPR +NCPCDPR:0,1 +NCPCDPR:1,1 OK
+NCPCDPR=?	+NCPCDPR:(list of<parameter>s),(0,1)	AT+NCPCDPR=? +NCPCDPR:(0,1) OK

Description

This command allows the configuration of PDP context dynamic parameters request item.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

Unsigned char formate. Dynamic parameter to read

0　　Get DNS Server IPv4 Address request.

1Get DNS Server IPv6 Address request.

<state>　　PDP context dynamic parameter items read state.

0　　Disable to get

1　　Enable to get

Hisi Hi2115 Implementation

- Could set only when power off.

4.31　Query pending originating data list via the control plane (+NQPODCP)

Command	Response	Example
+NQPODCP	[+NQPODCP:[<sequence>[<sequence>...]]] +CME ERROR:<err>	AT+NQPODCP +QPODCP:1,2,3 OK
+NQPODCP=?	OK	AT+NQPODCP=? OK

Description

This command queries the pending originating data list via the control plane by MT.

Refer to Chapter 7: Error Values for possible <err> values.

Defined values

<sequence> The sequence of pending sending originating message. Range 1-255.

Hisi Hi2115 Implementation

6 HuaweiRDK

6. 1. AT+NSECSWT 命令

6. 1.1 命令语法

命令	返回结果	示例
+NSECSWT=\<type>[,\<renegotiation time>]	OK +CME ERROR:\<err>	DTLS 关闭时： AT+NSECSWT=0 OK 使用标准 DTLS 时： AT+NSECSWT=1,100 OK 使用 DTLS+时： AT+NSECSWT=2 OK
+NSECSWT?	+NSECSWT:\<type>[,\<renegotiation time>] OK +CME ERROR:\<err>	AT+NSECSWT? +NSECSWT:0 OK

6.1.2 命令描述

该命令用来设置数据的加密方式和标准 DTLS 会话超时重协商时间。

6.1.3 参数描述

参数	描述
\<type>	加密方式类型： 0：数据不加密； 1：采用标准 DTLS 进行数据加密； 2：采用 DTLS+进行数据加密； 默认为 0，数据不加密。
\<renegotiation time>	标准 DTLS 会话超时重协商时间：单位为分钟，取值范围是 1~525600，只对标准 DTLS 有效。

6.1.4 实现说明

当\<type>=2 时，固定重协商时间为 1 个月。

参数\<renegotiation time>只在\<type>=1 时才能配置，该参数配置值需要小于网络的 NAT 变化

时间。

6.2 AT+NSETPSK 命令

6.2.1 命令语法

命令	返回结果	示例
+NSETPSK=<pskid>,<psk>	OK +CME ERROR:<err>	AT+NSETPSK=201703230000024,0123456789ABCDEF0123456789ABCDEF OK
+NSETPSK?	+NSETPSK:<pskid>,<psk> OK +CME ERROR:<err>	AT+NSETPSK? +NSETPSK:201703230000024,*** OK

6.2.2 命令描述

该命令用来配置 PSK ID 和 PSK。

6.2.3 参数描述

参数	描述
<pskid>	密钥索引：用于索引 psk，固定长度为 15 位的十进制数字，取值 需要和设备的 IMEI 相同，需要和 IoT 平台保持一致。
<psk>	预置密钥：固定长度为 16 字节的十六进制的数字，需要和 IoT 平 台保持一致。

6.2.4 实现说明

当<pskid>=0 时，将 IMEI 号作为<pskid>。

配置 pskid 需要在 CFUN=0 时执行。

6.3. AT+NCDP 命令

6.3.1 命令语法

命令	返回结果	示例
+NCDP=<ip_addr>[,<port>]	OK +CME ERROR:<err>	AT+NCDP=192.168.5.1,5683 OK
+NCDP?	+NCDP:<ip_addr>,<port> OK +CME ERROR:<err>	AT+NCDP? +NCDP:192.168.5.1,5683 OK

6.3.2 命令描述

该命令用来配置 NB-IoT 平台的 IP 地址和端口。

6.3.3 参数描述

参数	描述
<ip_addr>	点分十进制格式的 IPv4 地址：a1.a2.a3.a4。a1,a2,a3,a4 取值范围为 0~255.
<port>	0~65535

6.3.4 实现说明

该命令仅支持配置 IPv4 类型 IP 地址。

配置 IP 和 port 之前必须先设置 IMEI，否则会返回失败。

如果 AT 命令中没有<port>，且之前没有设置过<port>，则使用默认端口（5683）。

如果 AT 命令中没有<port>，且之前已经设置过<port>，则使用之前设置的<port>。

如果<port>为 0，则使用默认端口（5683）。

配置 IP 和 port 之后，需要重启模组。

6.4. AT+NNMI 命令

6.4.1 命令语法

命令	返回结果	示例
+NNMI=<status>	OK +CME ERROR:<err>	AT+NNMI=1 OK
+NNMI?	+NNMI:<status> OK	AT+NNMI? +NNMI:1 OK

6.4.2 命令描述

该命令用来设置模组接收数据后，通知终端的模式

当 NNMI=0 时，不通知终端。

当 NNMI=1 时，通知和数据一起发送给终端。即模组接收到 NB-IoT 发来的数据时，直接发送给终端。

返回结果	示例
+NNMI:<length>,<data>	+NNMI:5,48656C6C6F

当 NNMI=2 时，仅发送通知消息给终端。模组接收 NB-IoT 发的数据后，仅通知终端。终端可以通过 AT+NMGR 来获取接收数据

返回结果	示例
+NNMI	+NNMI

6.4.3 参数描述

返回结果	示例
<status>	0：不通知终端 1： 通知消息和数据一起发送给终端（默认 2： 仅发送通知消息给终端

6.4.4 实现说明

NNMI 默认设为 1

模组重启之后，NNMI 会恢复为默认值（默认值为 1）

6.5. AT+NSMI 命令

6.5.1 命令语法

命令	返回结果	示例
+NSMI=<indications>	OK +CME ERROR:<err>	AT+NSMI=1 OK
+NSMI?	+NSMI:<indications> OK	AT+NSMI? +NSMI:1 OK

6.5.2 命令描述

终端经模组发送数据给 NB-IoT 平台时，通过该命令可设置发送结果是否通知终端。
当+NSMI=0 时，发送结果不通知终端。
当+NSMI=1 时，终端发送数据后，模组将发送结果主动通知终端。

返回结果	示例
+NSMI:<status>[,<seq_num>]	+NSMI:SENT

NSMI 默认设置为 0

6.5.3 参数描述

参数	描述
<indications>	0：发送结果不通知终端 1：发送结果通知给终端
<status>	SENT：成功发送给 C 核。 SENT_TO_AIR_INTERFACE：成功发送给基站空口 DISCARDED：数据被丢弃。
<seq_num>	1~255，发送数据时携带的非 0 seq_num。

6.5.4 实现说明

只有当发送数据时携带 seq_num，数据发送完成后，模组发送给终端的通知消息中才会携

带 seq_num，且与数据发送时携带的 seq_num 保持一致。

当发送数据时携带 seq_num 且 seq_num 非 0，数据发送成功，模组通知终端时，<status>

为 SENT_TO_AIR_INTERFACE；当发送数据时，没有携带 seq_num 或者携带 seq_num 为 0，

数据发送成功，模组通知终端时，<status>为 SENT。

对于 CON 类型数据，SENT 以及 SENT_TO_AIR_INTERFACE 均表示数据发送到 NB-IoT 平

台的结果。

对于 NON 类型数据，SENT 表示数据发送到 C 核；SENT_TO_AIR_INTERFACE 表示数据发

送到基站空口。

模组重启之后，NSMI 会恢复为默认值（默认值为 0）。

6.6. AT+NMGS 命令

6.6.1 命令语法

命令	返回结果	示例
+NMGS=<length>,<data>[,<seq_num>]	OK +CME ERROR:<err>	AT+NMGS=3,AA11BB OK

6.6.2 命令描述

终端通过该命令发送数据到 NB 模组，然后模组按照 LWM2M 协议封装数据并发送到 NB-IoT 平台。如果数据发送失败，会返回错误。

6.6.3 参数描述

参数	描述
<length>	发送数据的长度
<data>	16 进制形式的字符串
<seq_num>	0~255

6.6.4 实现说明

1.该命令同 AT+MLWULDATA，最多发送 512 字节数据。

2.如果未注册或未收到 19/0/1 资源的订阅，则只会触发模组注册，并将发送的数据丢弃。

3.如果使用该命令发送 CoAP 数据时携带了非 0 的 seq_num，且当前有携带相同 seq_num 的 NON 或者 CON 类型 CoAP 数据未发送完成，那么，会将数据丢弃并返回错误。

6.7. AT+NMGR 命令

6.7.1 命令语法

命令	返回结果	示例
+NMGR	<length>,<data> OK +CME ERROR:<err>	AT+NMGR 5,48656C6C6F OK

6.7.2 命令描述

通过该命令获取 NB-IoT 平台发送到模组的数据。如果模组接收到多条数据，该指令返回最先接收到的数据，并将接收完的数据从缓存队列中删除。如果 NB 模组接收缓存队列为空，该指令不会返回数据。

当 NNMI 模式设置为 1 时，模组接收到 NB-IoT 平台发来的下行数据，会直接发送给终端，不需要终端再调用该 AT 命令获取下行数据。

6.7.3 参数描述

参数	描述
<length>	接收数据的长度

参数	描述
<data>	16 进制形式的字符串

6.7.4 实现说明

该命令最多接收 512 字节数据

6.8. AT+NQMGR 命令

6.8.1 命令语法

命令	返回结果	示例
+NQMGR	BUFFERED=<buffered>, RECEIVED=<received>, DROPPED=<dropped> OK +CME ERROR:<err>	AT+NQMGR BUFFERED=0,RECEIVED=34, DR OPPED=2 OK

6.8.2 命令描述

该命令用来查询 NB-IoT 平台发送给终端的下行数据统计值。

6.8.3 参数描述

参数	描述
<buffered>	模组中缓存接收数据的数量
<received>	模组启动之后，接收下行数据的总数量
<dropped>	模组启动之后，丢弃下行数据的总数量

6.8.4 实现说明

6.9. AT+NQMGS 命令

6.9.1 命令语法

命令	返回结果	示例
+NQMGS	PENDING=<pending>,SENT =<sent>,ERROR=<error>	AT+NQMGS

命令	返回结果	示例
	OK +CME ERROR:<err>	PENDING=1,SENT=34, ERROR=0 OK

6.9.2 命令描述

该命令用来查询终端发送给 NB-IoT 平台上行数据的统计值。

6.9.3 参数描述

参数	描述
<pending>	模组中缓存发送数据的数量
<sent>	模组启动之后，发送给 NB-IoT 平台数据的总数
<error>	模组启动之后，发送给 NB-IoT 过程中被丢弃数据的总数

6.9.4 实现说明

对于 CON 类型 CoAP 数据，只有当 timeout、RST、sent_fail 或者 sent_success 之后，才会相应修改统计值。

对于 NON 类型 CoAP 数据，如果发送数据时携带了非 0 的 seq_num，在数据发送到空口时，才会相应修改统计值；如果发送数据时没有携带 seq_num 或者携带 seq_num 为 0，在数据发送到 C 核时就会相应修改统计值。

6.10. AT+NMSTATUS 命令

6.10.1 命令语法

命令	返回结果	示例
AT+NMSTATUS?	+NMSTATUS: <registration_status> OK +CME ERROR:<err>	AT+NMSTATUS? +NMSTATUS:REGISTERED
AT+NMSTATUS=?	<list of	AT+NMSTATUS=? UNINITIALISED MISSING_CONFIG INIITIALISING INIITIALISED INIT_FAILED REGISTERING REGISTERED DEREGISTERED MO_DATA_ENABLED NO_UE_IP REJECTED_BY_SERVER TIMEOUT_AND_RETRYING REG_FAILED DEREG_FAILED OK

	supported<registration_status>s>	

6.10.2 命令描述

该命令用来查询当前 LWM2M 注册状态.

6.10.3 参数描述

参数	描述
<registration_status>	UNINITIALISED MISSING_CONFIG INIITIALISING INIITIALISED INIT_FAILED REGISTERING REGISTERED DEREGISTERED MO_DATA_ENABLED NO_UE_IP REJECTED_BY_SERVER TIMEOUT_AND_RETRYING REG_FAILED DEREG_FAILED

6.10.4 实现说明

LWM2M 处于 MO_DATA_ENABLED 状态下，终端才可以发送数据

6.11. AT+MLWSREGIND 命令

6.11.1 命令语法

Command	Response	Example
+MLWSREGIND =<type>	+CME ERROR: <err>	AT+MLWSREGIND=0 OK

6.11.2 命令描述

终端通过该命令控制模组向 NB-IoT 平台发起注册和注销。

6.11.3　参数描述

参数	描述
<type>	0: 注册 1: 注销

6.11.4　实现说明

6.12. AT+MLWULDATA 命令

6.12.1 命令语法

Command	Response	Example
+MLWULDATA =<length>,<data>[,<seq_num>]	+CME ERROR: <err>	AT+MLWULDATA =3,AA34BB OK

6.12.2 命令描述

终端通过该命令将发送的数据发送到模组，然后模组通过 LWM2M 协议将数据发送到 NB-IoT 平台

6.12.3 参数描述

Parameter	Description
< length >	发送数据的长度
<data>	16 进制形式的字符串
<seq_num>	0~255

6.12.4 实现说明

　　该命令同 AT+NMGS，最多发送 512 字节数据。

　　如果未注册或未收到 19/0/1 资源的订阅，则只会触发模组注册，并将发送的数据丢弃。

　　如果使用该命令发送 CoAP 数据时携带了非 0 的 seq_num，且当前有携带相同 seq_num 的 NON 或者 CON 类型 CoAP 数据未发送完成，那么，会将数据丢弃并返回错误。

6.13. AT+MLWULDATAEX 命令

6.13.1 命令语法

Command	Response	Example
+MLWULDATAEX =<length>,<data>,<mode>[,<seq _num>]	OK +CME ERROR: <err>	AT+MLWULDATAEX =3,AA34BB,0x0001 OK

6.13.2 命令描述

终端设备通过该命令将数据发送给 NB 模组，模组在向 NB-IoT 平台发送 CON 或 NON 消息时携带释放辅助指示（RAI）

6.13.3 参数描述

Parameter	Description
< length >	发送数据的长度
<data>	16 进制形式的字符串
<mode>	0x0000: 发送 NON 消息 0x0001: 发送 NON 消息，且携带 RELEASE 释放辅助指示 0x0100: 发送 CON 消息 0x0101: 发送 CON 消息，且携带 RELEASE_AFTER_REPLY 释放辅助指示
<seq_num>	0~255

6.13.4 实现说明

该命令发送最多 512 字节数据。

如果未注册或未收到 19/0/1 资源的订阅，则只会触发模组注册，并将发送的数据丢弃。

如果使用该命令发送 CoAP 数据时携带了非 0 的 seq_num，且当前有携带相同 seq_num 的 NON 或者 CON 类型 CoAP 数据未发送完成，那么，会将数据丢弃并返回错误。

6.14. AT+MLWULDATASTATUS 命令

6.14.1 命令语法

Command	Response	Example
+MLWULDATASTATUS?	+MLWULDATASTATUS:<indications>[,<seq_num>]	AT+MLWULDATASTATUS? +MLWULDATASTATUS:4 OK

6.14.2 命令描述

通过该命令可获取发送 CON 数据的状态。

6.14.3 参数描述

Parameter	Description
0	未发送
1	等待响应
2	发送失败
3	发送超时
4	发送成功
5	收到 RST 响应

6.14.4 实现说明

该命令只能获取发送 CON 数据的状态。

当发送 CON 类型 CoAP 数据时携带了非 0 的 seq_num，该命令响应字符串为 +MLWULDATASTATUS:<indications>,<seq_num>；当发送 CON 类型 CoAP 数据时没有携带 seq_num 或者携带 seq_num 为 0，该命令响应字符串为 +MLWULDATASTATUS:<indications>。

6.15. AT+MLWFOTAIND 命令

6.15.1 命令语法

Command	Response	Example
+MLWFOTAIND=\<type\>	+CME ERROR: \<err\>	AT+MLWFOTAIND=1 OK

6.15.2 命令描述

　　该命令用于设置 FOTA 下载和升级的模式：自动模式，受控模式。当处于受控模式时，该命令也可用来控制 FOTA 下载和升级流程。

　　自动模式：自动完成 FOTA 下载和升级。

　　受控模式：FOTA 下载和升级受终端设备控制。

6.15.3 参数描述

Parameter	Description
\<type\>	0: 设置自动模式 1: 设置受控模式 2: 终端通知模组开始下载 3: 终端通知模组取消下载 4: 终端通知模组开始升级 5: 终端通知模组取消升级

6.15.4 实现说明

　　终端收到 AT+MLWEVTIND=6（有新的升级包）或 AT+MLWEVTIND=7（下载完成后，通过 AT+MLWFOTAIND=\<type\>控制模组是否下载或者升级。

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6.16. AT+MLWEVTIND 命令

6.16.1 命令语法

Command	Response	Example
	AT+MLWEV TIND=\<type\>	AT+MLWEVTIND=4

6.16.2 命令描述

模组通过该命令发送通知给终端。

6.16.3 参数描述

Parameter	Description
\<type\>	0：注册成功 1：注销成功 2：更新注册成功 3：19/0/0 订阅成功 4：Bootstrap 完成 5：5/0/3 订阅成功 6：有新的升级包 7：下载完成 9：19/0/0 取消订阅成功

6.16.4 实现说明

NB 模组在以下场景：1）注册、更新注册或者注销成功；2）成功订阅或者取消订阅 19/0/0；3） Bootstrap 完成；4）成功订阅 5\0\3，通过 AT+MLWEVTIND=\<type\>通知终端。

NB 模组收到 5/0/1 升级包 URL 或者 5/0/2 请求升级的消息后，通过 AT+MLWEVTIND=\<type\>通知终端，终端根据当前自身的情况决定是否下载或升级。

6.17. AT+MREGSWT 命令

6.17.1 命令语法

Command	Command Output	Example
+MREGSWT=\<type>	+CME ERROR: \<err>	AT+MREGSWT=1 OK
+MREGSWT?	+MREGSWT:\<indications>	AT+MREGSWT? +MREGSWT:1 OK

6.17.2 命令描述

该命令用于设置模组重启后注册模式。如果设置为 1，模组重启并入网后会触发自动注册；如果设置为 0，模组重启并入网后向终端发送"REGISTERNOTIFY"消息，终端收到该消息后，需要通过 AT+ MLWSREGIND 命令触发注册。

6.17.3 参数描述

Parameter	Description
\<type>	0：非自动注册模式 1：自动注册模式(default value)

6.17.4 实现说明

如果没有设置注册模式，默认为自动注册模式。

6.18. AT+MRESETDTLS 命令

6.18.1 命令语法

Command	Response	Example
+MRESETDTLS	OK	AT+MRESETDTLS OK

6.18.2 命令描述

如果 DTLS 已经完成握手或重协商，通过该 AT 命令将 DTLS 状态置为 INIT 态，在下次发送数据时会重新走握手流程。

6.18.3 实现说明

如果当前 DTLS 正在握手或重协商，命令直接返回成功。下次发送数据不会触发重握手。

6.19. AT+MDTLSSTAT 命令

6.19.1 命令语法

Command	Response	Example
+MDTLSSTAT?	OK +MDTLSSTAT:0/1/2/3	AT+MDTLSSTAT? OK +MDTLSSTAT:0

6.19.2 命令描述

该命令用于查询 DTLS 当前的建链状态。
0：DTLS 协商或握手完成
1：未开始协商或握手
2：正在协商或握手
3：协商或握手失败

6.19.3 实现说明

在每次发送上行数据 8 秒内如果 DTLS 没有协商完成，DTLS 状态也无法查询，要等 8 秒之

后才能查询。如果 8 秒内 DTLS 可以协商完成，在协商完成之后可以查询 DTLS 状态。

如果是刚上电模组发起注册，或者通过 AT 命令手动发起注册，由于注册流程是通过

LwM2M 触发，不阻塞 AT 命令。

在 DTLS 每次协商或握手完成后，NB 模组主动向终端发送+MDTLSSTAT:0/3 消息。

6.20.AT+ MBOOTSTRAPHOLDOFF 命令

6.20.1 命令语法

Command	Command Output	Example
+ MBOOTSTRAPHOLDOFF = \<ClientHoldOffTime \>	OK +*CME ERROR: \<err>*	AT+ MBOOTSTRAPHOLDOFF=6 0 OK
+ MBOOTSTRAPHOLDOFF?	+MBOOTSTRAPHOLDOFF:\<Clie ntHoldOffTime>] OK +CME ERROR: \<err>	AT+ MBOOTSTRAPHOLD OFF? + MBOOTSTRAPHOLD OFF: 600 OK

6.20.2 命令描述

设置和查询 ClientHoldOffTime，默认 600s。

推荐 600s=\<ClientHoldOffTime <3000s;如果配置过大(>3000s)，会延时终端 Bootstrap Sequence 尝试时间，进而影响终端接入功耗；

如果配置过小（<600s），会导致 Factory Bootstrap 和 Server Initiated Bootstrap 时间过短，进而影响 Factory Bootstrap 和 Server Initiated bootstrap 成功率，因此，如果模组入网后需要执行 Server Initiated.

bootstrap 过程(没有配置 BootStrap Server 和 LWM2M server 地址)，或已配置了 LWM2M server 地址，不建议 ClientHoldOffTimer 值小于 600s。

6.20.3 实现说明

必须在配置了 BootStrap Server 地址的情况下，ClientHoldOffTime 才可以为 0，模组会直接进入 Client Initiated Bootstrap，缩短模组进入 Client Initiated Bootstrap 时间。

（如果模组没有配置 BootStrap Server 地址，AT+MBOOTSTRAPHOLDOFF=0 返回 ERROR）。

如果 BS Server 不存在，ClientHoldOffTimer 定时器时间不能设置为 0。如果 ClientHoldOffTimer 定时器时间为 0，则不能擦除 BS Server IP。

6.21.AT+ MBOOTSTRAPSERVERIP 命令

6.21.1 命令语法

Command	Response	Example
+MBOOTSTRAPSERVERIP =<type>,<ip_addr>[,<port>]	+CME ERROR: <err> OK	AT+ MBOOTSTRAPSERVERIP =BS，192.168.5.1 OK AT+ MBOOTSTRAPSERVERIP =LWM2M，192.168.5.2 OK AT+ MBOOTSTRAPSERVERIP =DEL，192.168.5.2 OK AT+ MBOOTSTRAPSERVERIP =BS,www.baidu.com OK AT+ MBOOTSTRAPSERVERIP =LWM2M,www.baidu.com OK AT+ MBOOTSTRAPSERVERIP =DEL,www.baidu.com OK

6.21.2 命令描述

Parameter	Description
<type>	BOOTSTRAP Server IP type: **LWM2M**: IoT Server IP **BS**: Bootstrap Server IP **DEL**：删除设置的 IP 信息
<addr>	域名或者 IP 地址。 IP 地址格式：点分十进制格式的 IPv4 地址：a1.a2.a3.a4。a1,a2,a3,a4 取值范围为 0~255.
<port>	0~65535

6.21.3 实现说明

支持设置和删除 BOOTSTRAP 和 IOT 平台服务器的 IP 地址。

AT+MBOOTSTRAPSERVERIP 和 AT+NCDP 使用的是同一个 kv 项。

AT+MBOOTSTRAPSERVERIP=DEL,IP,PORT 时进行 IP 和 PORT 完全配比擦除。

AT+MBOOTSTRAPSERVERIP=DEL,IP 时进行 IP 配比擦除。

6.22.AT+ MSETBSPSK 命令

6.22.1 命令语法

Command	Command Output	Example
+MSETBSPSK=<pskid>,<psk>	OK +CME ERROR: <err>	AT+ MSETBSPSK =201703230000024,0123456789AB CDEF0123456789ABCDEF OK
+MSETBSPSK?	+ MSETBSPSK:<pskid>,<psk> OK +CME ERROR:<err>	AT+ MSETBSPSK? +MSETBSPSK:20170323 0000024,*** OK

6.22.2 命令描述

该命令用来配置 BS Server 对接 DTLS 连接的 PSK ID 和 PSK。

6.22.3 参数描述

Parameter	Description
<pskid>	密钥索引：用于索引 psk，固定长度为 15 位的十进制数字，取值 需要和设备的 IMEI 相同，需要和 IoT 平台保持一致。
<psk>	预置密钥：固定长度为 16 字节的十六进制的数字，需要和 IoT 平台保持一致。

6.22.4 实现说明

当<pskid>=0 时，将 IMEI 号作为<pskid>。
配置 pskid 需要在 CFUN=0 时执行。

6.23.AT+ MBSSECSWT 命令

6.23.1 命令语法

Command	Command Output	Example
+ MBSSECSWT =<type>[,<NAT type >]	OK +CME ERROR: <err>	DTLS 关闭时： AT+NSECSWT=0 OK 使用标准 DTLS 时： AT+NSECSWT=1,1 OK
MBSSECSWT?	+ MBSSECSWT:<type>[,< NAT type >] OK +CME ERROR:<err>	AT+ MBSSECSWT? + MBSSECSWT:0 OK AT+ MBSSECSWT? + MBSSECSWT:1,1 OK

6.23.2 命令描述

该命令用来配置与 BS Server 对接的 DTLS 连接的开关和标准 DTLS 会话超时重协商时间。在启动 DTLS 首次协商时启动定时器，每收到一次 BS Server 的 DTLS 报文重启定时器。发送上行报文时，如果该定时器已经超时，需要触发重协商。

6.23.3 参数描述

Parameter	Description
<type>	加密方式类型： 0：数据不加密； 1：采用标准 DTLS 进行数据加密；
<NAT type>	标准 DTLS 是否存在 NAT 组网： 0：每次数据上传时都会自动重建 DTLS 链路 1：只有初次上电或模组 IP 地址发生变化之后才能重建 DTLS 链路

26.4.AT+ MDNS 命令

6.24.1 命令语法

Command	Command Output	Example
+MDNS=<mode>[,hostname]	+CME ERROR: <err>	AT+MDNS=0,www.baidu.com OK
域名解析回显	+MREGSWT:<indications>	+MDNS:10.10.10.1 +MDNS:2000::1:2345:6789:abcd +MDNS:FAIL

6.24.2 命令描述

该命令用来 AT 命令触发 DNS 域名解析。

6.24.3 参数描述

Parameter	Description
<mode>	0: 解析域名，hostname 不能为空 1: 如果 hostname 不为空，则清除内存和 KV 中 hostname 解析数据；如果 hostname 为空，则清除所有的解析数据。
[hostname]	待解析的域名

7.Error Values

The error codes listed below are enabled when CMEE is set to mode 1..

7.1 Overview

Error codes are aligned to the 3GPP spec. Refer to 3GPP TS 27.007 V13.5.0, sub-clause 9.2 for all possible <err> values. The error codes listed are those returned for the Hi2115 implementation.

Error codes 0-255 are reserved and defined in 3GPP TS 27.007 and may be used by Hisi in future releases

7.2 General Errors(27.007)

Error Code	Error Text	Error Code	Error Text	Error Code	Error Text
3	Operation not allowed	4	Operation not supported	5	Need to enter PIN
23	Memory failure	30	No Network Service	50	Incorrect parameters
51	Command implemented but currently disabled	52	Command aborted by user	100	Unknown
159	Uplink Busy/Flow Control				

7.3 General Errors(27.007)

Unused error codes will be removed.

Error Code	Error Text	Error Code	Error Text	Error Code	Error Text

300	ME failure	312	PH-(U)SIM PIN required	321	invalid memory index
301	SMS service of ME reserved	313	(U)SIM failure	322	memory full
302	operation not allowed	314	(U)SIM busy	330	SMSC address unknown
303	operation not supported	315	(U)SIM wrong	331	no network service
304	invalid PDU mode parameter	316	(U)SIM PUK required	332	network timeout
305	invalid text mode parameter	317	(U)SIM PIN2 required	340	no +CNMA acknowledgement expected
310	(U)SIM not inserted	318	(U)SIM PUK2 required	311	(U)SIM PIN required
320	memory failure	500	unknown error		

7.4 HISI specific error codes

Nisi specific error codes are in the range 512 onwards.

Error code 512 was previously error code 256.Error code 513 was previously error code 257.

Error Code	Error Text	Error Code	Error Text	Error Code	Error Text
512	Required parameter not configured	513	TUP not registered	514	AT Internal Error
515	CID is active	516	Incorrect State for Command	517	Cid is invalid
518	CID is not active	520	Deactive last active cid	521	Cid is not defined
522	Uart parity error	523	Uart frame error	524	Mt not power on
525	sent data sequence repeat error	526	at command abort error	527	command interrupted
528	Configuration conflicts	529	FOTA is updating	530	Not the at allocated socket

7.5 Possible Error Causes

Error Code	Error Text	Possible Causes
513	TUP not registered	IMEI needs to be set. AT+NTSETID=1 can be used to set IMEI. The CDP IP address has not been set. AT+NCDP=<ip addr> to set. AT+NMSTATUS to query TUP status
512	Required parameter not configured	For AT+NCDP, if the IMEI is not set, the command will fail. AT+NTSETID=1 can be used to set IMEI.
515	CID is active	Disable CID prior to changing CID configuration.
516	Incorrect State for Command	Some commands have to be executed in a specific order. Refer to the documentation for the specific command.
517	Cid is invalid	Beyond the accepted range of cid values for +CSODCP set
520	deactivate last active cid	For +CGACT, the protocol say: if an attempt is made todisconnect the last PDN connection, then the MT respondswith error. Return this error code when deactivate last active cid,
521	Cid is not defined	Activate or deactivate cid which is not defined.
518	CID is not active	Deactivate the pdp context which is not active.
522	Uart parity error	The mismatch between setting and using for uart parity.
523	Uart frame error	Uart frame error.
524	MT not power on	Some command could only exclude only when power on like +CIMI, otherwise will return ERROR:524
525	at command abort in processing	Send uart characters when MT is aborting at command.
526	at command abort error	Abort blocking command error.
527	command interrupted	When start back ground search by +COPS=?, will start a protect timer. It will abort when timer timeout if back ground search not finished, then return this error code.
528	configuration conflicts	When send +NPOWERCLASS=<band>,6 to set powerclass 6 and the "RELEASE_VERSION" in +NCONFIG is 13 will return this error code because release 13 don't support powerclass 6.
529	FOTA is updating	Send UDP/TCP data when FOTA is updating.

| 530 | not the at allocated socket | Send AT+NSOCL to close a socket which is not created. |

8Reset Reasons

If the Applications core rebooted for any reason apart from either being power cycled or being externally reset, it will return a message before the <CR><LF>Hisi<CR><LF>OK<CR><LF> message that indicates the reason for the reboot.

The list of possible reboot reasons are :

Reboot Message Displayed
REBOOT_CAUSE_SECURITY_RESET_UNKNOWN
REBOOT_CAUSE_SECURITY_SYSRESETREQ
REBOOT_CAUSE_SECURITY_WATCHDOG
REBOOT_CAUSE_SECURITY_SELF
REBOOT_CAUSE_SECURITY_ALTBOOT
REBOOT_CAUSE_SECURITY_REG_0
REBOOT_CAUSE_SECURITY_REG_3
REBOOT_CAUSE_SECURITY_STANDARD_CHIP_WATCHDOG
REBOOT_CAUSE_SECURITY_UPDATER_CHIP_WATCHDOG
REBOOT_CAUSE_SEUCRITY_SCAN_ENTER_EXIT
REBOOT_CAUSE_SECURITY_PMU_POWER_ON_RESET
REBOOT_CAUSE_SECURITY_RESET_PIN
REBOOT_CAUSE_SECURITY_REGIONS_UPDATED
REBOOT_CAUSE_SECURITY_FOTA_UPGRADE
REBOOT_CAUSE_PROTOCOL_SYSRESETREQ
REBOOT_CAUSE_PROTOCOL_WATCHDOG
REBOOT_CAUSE_PROTOCOL_MONITOR_REBOOT_REQ
REBOOT_CAUSE_PROTOCOL_RPC_TIMEOUT
REBOOT_CAUSE_APPLICATION_SYSRESETREQ
REBOOT_CAUSE_APPLICATION_WATCHDOG
REBOOT_CAUSE_APPLICATION_AT
REBOOT_CAUSE_APPLICATION_RPC_TIMEOUT
REBOOT_CAUSE_PROTOCOL_IMSI_UPDATE
REBOOT_CAUSE_UNKNOWN

9. Abort process

Some action commands that require time to execute may be aborted while in progress; these are explicitly noted in the description of the command. Aborting of commands is accomplished by the transmission from the DTE to the DCE of any character. A single character shall be sufficient to abort the command in progress; however, characters transmitted during the first 125 milliseconds after transmission of the termination character shall be ignored (to allow for the DTE to append additional control characters such as line feed after the command line termination character). To insure that the aborting character is recognized by the DCE, it should be sent at the same rate as the preceding command line; the DCE may ignore characters sent at other rates. When such an aborting event is recognized by the DCE, it shall terminate the command in progress and return an appropriate result code to the DTE, as specified for the particular command.

Hisi Hi2115 Implementation

1. If command is blocking and abort is allowed.

Current command state	In 125 ms	Over 125ms	Over 125ms, current progressing command is abortable but protocol core current state is unabortable. (almost impossible)	aborting
React for sending any characters	ignore	Start aborting process, return nothing	+CME ERROR:526	ignore

2. If command is blocking but abort is not allowed.

	In 125 ms	Over 125ms
Send any characters	ignore	+CME ERROR:51

3. Abort Return Vlaue

Abort result	abort success	abort fail	abort when command complete
Return value	+CME ERROR: 52	+CME ERROR:526	Return origin command result

NOTE:

1. Only +COPS=? is abortable now.

2. If sent more than 1 character for abort over 125ms, only the first character is the

   abort character. Other character may treat as an at command string. So advice

   just send 1 character for abort character.

10.Examples

10.1 UDP Sockets

10.1.1 Sending a message

A simple example sending a UDP datagram. Once the socket is closed, no replies will be received.

AT+NSOCR=DGRAM,17,56,1

1

OK

AT+NSOST=1,192.158.5.1,8080,20,"http://www.Hisi.com"

1,19

OK

AT+NSOCL=1

OK

10.1.2 Receiving messages from multiple remote systems

An example receiving messages from multiple hosts and consuming different amounts of the received data.

AT+NSOCR=DGRAM,17,1024,1

1

OK

+NSONMI:1,11

AT+NSORF=1,5

1,192.168.5.1,1024,5,68656C6C6F,6

OK

AT+NSORF=1,999

1,192.168.5.1,1024,6,20776F726C64,0

OK

+NSONMI:1,8

AT+NSORF=1,8

1,10.11.12.13,32701,8,616172647661726B,0

OK

10.1.3 Server

Example of a server-style implementation, where multiple remote systems can request to communicate withthe UE.

Messages:

63616E204920636F6E6E656374 "can I connect"

73757265 "sure"

Example

AT+NSOCR=DGRAM,17,56,1

1

OK

+NSONMI:1,13

AT+NSORF=1,13

1,192.168.5.1,1234,13,63616E204920636F6E6E656374 ,0

OK

AT+NSOCR=DGRAM,17,45678,1

2

OK

AT+NSOST=2,192.158.5.1,1234,4,73757265

2,4

OK

+NSONMI:1,13

AT+NSORF=1,13

1,10.11.12.13,2345,13,63616E204920636F6E6E656374,0

OK

AT+NSOCR=DGRAM,17,45679,1

3

OK

AT+NSOST=3,210.11.12.13,2345,4,73757265

3,4

OK

11.相关文档及术语缩写

11.1 相关文档

以下相关文档提供了文档的名称，版本请以最新发布的为准。

表 0-1 相关文档

序号	文档名称	注释
[1]	NB-IoT 模块生产指导手册 NBXX-01 型	涉及 PCB 设计、包装、生产等参考指导。
[2]	NB-IoT 模块硬件应用手册 NBXX-01 型	
[3]	Lierda NB Module V120_FOTA_用户使用指导	
[4]	Lierda NBXX-01 V120_B656 版本升级操作说明	
[5]	Lierda NBXX-01 V120_B657 版本升级操作说明	
[6]	Lierda NBXX-01 V120_固件版本更新说明	
[7]	Lierda NB Module V120_AT CommandSet_B657SP3	
[8]	Lierda NB Module V120_GUI_APPDemo 用户使用指导	
[9]	Lierda NB Module V120_IoT 平台对接流程指引说明	
[10]	Lierda NB Module V120_使用常见 Q&A 说明	
[11]	Lierda NB Module V120_应用笔记	
[12]	Lierda NB-IoT USB Dongle 使用详情	