



AirPrime HL7588

AT Commands Interface Guide



SIERRA
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Version	Date	Updates
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>> 1. Introduction

This document presents the AT Command Set for the AirPrime HL7588 module. Note that the HL7588 has two variants – one for Verizon and one for AT&T. Differences, when applicable, between the two HL7588 variants are indicated in the command description.

1.1. Reference Configuration

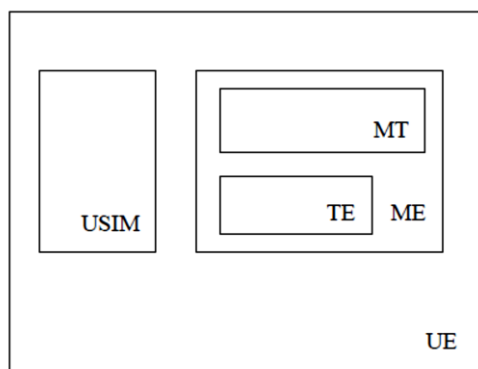


Figure 1. Reference Configuration

The User Equipment (UE) consists of the mobile equipment (ME) and the (U)SIM messages may be stored in either, but the present document does not distinguish between messages stored in the (U)SIM or in the ME. The management of message storage in the two parts of the UE is a matter for the UE implementation.

1.2. AT Command Principles

The "AT" or "at" prefix must be set at the beginning of each line. To terminate a command line, a <CR> character must be inserted.

Commands are usually followed by a response that includes '<CR><LF><response><CR><LF>'. Throughout this document, only the responses are indicated, the <CR> and <LF> characters are omitted intentionally.

Four kinds of extended AT commands are implemented:

Command Type	Syntax	Definition
Test Command	AT+CXXX=?	The equipment returns the list of parameters and values ranges set with the corresponding Write command or by internal processes
Read Command	AT+CXXX?	This command returns the currently set value of parameters
Write Command	AT+CXXX=<...>	This command sets user-related parameter values
Execution command	AT+CXXX	The execution command reads non-variable parameters affected by internal processes in the equipment

1.2.1. Parameters

In this document, the default parameters are underlined and the optional parameters are enclosed in square brackets.

Optional parameters or sub-parameters can be omitted unless they are followed by other parameters. A parameter in the middle of a string can be omitted by replacing it with a comma.

When the parameter is a character string, the string must be enclosed in quotation marks.

All space characters will be ignored when using strings without quotation marks.

1.2.2. Answers and Responses

There is always an answer sent by the TA to an AT Command line (except the very special case of a TA setup for no answer, see **ATQ**).

The answer is always terminated by an indication of success or failure. However, regarding the setup of the TA (by AT Commands), the message may be different.

Classical messages

OK or **ERROR**

Extended Error message (see **AT+CMEE**)

+CME ERROR: <n>

(See Appendix for the different values for <n>)

Numeric Mode (see **ATV**)

<n> with: <n> = 0 ⇔ OK or <n> is an error code

1.2.3. Multiple AT Commands on the Same Command Line

You may enter several AT commands on the same line. This eliminates the need to type the "AT" or "at" prefix before each command and to wait for the answer for each command. The main advantage is to avoid losing bandwidth on the link between DTE and the Module.

There is no separator between two basic commands but a semi-colon character is necessary between two extended commands (prefix +). The command line buffer accepts a maximum of 391 characters. If this number is exceeded none of the commands will be executed and TA returns ERROR.

If a command is not supported, then the treatment of the line is stopped (i.e. the following ones are not treated) and an error message is returned.

Example:

Command: **ATZ&K3+CBST=7,0,1;+CBST?**

Answer: **+CBST=7,0,1**

OK

1.2.4. AT Commands on Separate Lines

When you enter a series of AT commands on *separate* lines, it is strongly advised to leave a pause between the preceding and the following command until the final answer (OK or Error message) appears. This avoids sending too many AT commands at a time without waiting for a response for each.

1.3. Unsolicited Result Codes (URCs)

Unsolicited result codes (URCs) are sent simultaneously to all the channels (USB/UART) configured in AT commands mode.

URCs are not sent to channels configured in Data/NMEA/Traces modes.

In sleep mode URCs wake up the module and are sent to the AT commands channels.

1.4. PDP Context Usage

PDP context IDs (CIDs) are designed with the following purposes:

- CID=1 with APN=VZWIMS is reserved for IMS in Verizon (SMS over IMS)
- CID=2 with APN=VZWADMIN is reserved for Verizon Administration (SIM provision, OMADM, etc.)
- CID=3 with APN=VZWINTERNET is the default Internet APN in Verizon
- CID=4 with APN=VZWAPP is the default application APN in Verizon
- CID=5 is reserved for Sierra Wireless AirVantage (AVMS)

Note that:

- CID=1 to CID=4 are managed by Verizon OMADM administration. These APNs may be updated by the VZW OMADM server, e.g. after server's initialized DM session, or after a SIM card change.
- CID=3 to CID=10 are intended for customer use if other APN/PDP context is needed (e.g. APN for private network). Note that:
 - CID=3 or 4 may be updated by the VZW OMADM server
 - CID=5 is reserved for AVMS, but can be used by customer if AVMS feature is not used
 - It is recommended to use CID=6 to CID=10 in customer application if other APN/PDP context is needed
- CID=11 to CID=20 are disabled (related AT commands return error response) as maximum PDP context (APN parameter list) is 10 entries for Verizon data retry restriction. These CIDs can only be used properly provided that their IP-type and APN are the same as one configured in CID=1 to CID=10.
- CID=1 or 2 and CID=11-20 are locked by AT+HBHV=2 (related AT commands return error response).

Caution: *Two failed activation attempts (+CGACT, DUT, etc.) due to invalid/incorrect APN blocks the corresponding CID from further attempts until the module reboots, due to Verizon data retry restriction. If the CID is blocked, AT+CGACT returns +CME ERROR: 4 until the module reboots.*

1.5. SMS Commands

SMS is sent over IMS in the Verizon network using 3GPP2 SMS PDU format and protocol. Generally, 3GPP AT commands do not work with 3GPP2 SMS, but additional support is added in the HL7588 to convert input SMS from 3GPP format to 3GPP2 format. This allows the use of 3GPP AT commands like +CMGS, +CNMI and +CMGD to send, show or delete SMS messages as if the SMS is sent, received or stored in 3GPP SMS PDU format.

However, +XCMGS3GPP2 and +XCMT3GPP2 are still available for sending and receiving SMS messages in 3GPP2 SMS PDU format.

1.6. Document Modification

The commands described in this document are only to be used for usual AT commands use.

The information provided for the commands are subject to change without notice.

1.7. Abbreviations

Abbreviation	Definition
ACM	Accumulated Call Meter
ADC	Analog Digital Converter
ADN	Abbreviated Dialing Number (Phonebook)
AMR	Adaptive Multi-Rate
AMR-FR	AMR Full Rate (full rate speech version 3)
AMR-HR	AMR Half Rate (half rate speech version 3)
AOC	Advice Of Charge
APN	Access Point Name
ARN	Address Resolution Protocol
ARFCN	Absolute Radio Frequency Channel Number
ASCII	American Standard Code for Information Interchange
AT	ATtention; Hayes Standard AT command Set
BCCH	Broadcast Channel
BER	Bit Err Rate
BM	Broadcast Message Storage
CBM	Cell Broadcast Message
CB	Cell Broadcast
CCK	Corporate Control Key
CCM	Current Call Meter
CHV	Card Holder Verification
CHAP	Challenge handshake Authentication Protocol
CI	Cell Identifier
CLI	Client Line Identification
CNL	Cooperative Network List
CODEC	Coder Decoder
COLP	Connected Line Identification Presentation
CPHS	Common PCN Handset Specification
CPU	Central Processing Unit
CSD	Circuit Switched Data
CSP	Customer Service Profile
CTM	Cellular Text telephone Modem
CTS	Clear To Send signal

Abbreviation	Definition
CUG	Closed User Group
DAC	Digital to Analog Converter
DTR	Data Terminal Ready
DCS	Digital Cellular System
DCE	Data Circuit Equipment
DCD	Data Carrier Detect
DLC	Data Link Connection
DLCI	Data Link Connection Identifier
DM	Device Management
DNS	Domain Name System
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-Frequency
DTR	Data Terminal Ready
ECC	Emergency Call Codes
ECM	Error Correction Mode
ECT	Explicit Call Transfer
EDGE	Enhanced Data rates for GSM Evolution
EEPROM	Electrically Erasable Programming Only Memory
EF	Elementary Files
EFR	Enhanced Full Rate (full rate speech version 2)
EGPRS	Enhanced GPRS
ENS	Enhanced Network Selection
E-ONS	Enhanced Operator Name Service
ERMES	European Radio Messaging System
ETSI	European Telecommunications Standards Institute
FD	FIFO depth
FDN	Fixed Dialing Number (Phonebook)
FR	Full Rate (full rate speech version 1)
GERAN	GSM EDGE Radio Access Network
GPIO	General Purpose Input Output
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
HDLC	High-level Data Link Control
HFR	High Frequency Regeneration
HLR	Home Location Register
HR	Half Rate (half rate speech version 1)
ID	IDentifier
IETF	Internet Engineering Task Force
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IN/OUT/IN_OUT	In, out or In Out
I/O	Input/Output

Abbreviation	Definition
IP	Internet Protocol
LAC	Local Area Code
LED	Light Emitting Diode
LND	Last Number Dialed
LP	Language Preferred
LPI	Lines Per Inch
M	Mandatory
MCC	Mobile Country Code
ME	Mobile Equipment
MMI	Man Machine Interface
MNC	Mobile Network Code
MNP	Microcom Networking Protocol
MO	Mobile Originated
MOC	Mobile Originated Call (outgoing call)
MS	Mobile Station
MSB	Most Significant Bit
MSISDN	Mobile Station International ISDN Number
MT	Mobile Terminal
MTC	Mobile Terminated Call (incoming call)
N.A.	Not applicable
NCK	Network Control Key
NITZ	Network Information and Time Zone
NSCK	Network Subset Control Key
NTC	Negative Temperature Coefficient
N.U.	Not used
O	Optional
OA	Outgoing Access
OPL	Operator PLMN List
OS	Operating System
OTA	Over the Air
PAD	Portable Application Description
PAP	Password Authentication Protocol
PC	Personal Computer
PCCP	PC character set Code Page
PCK	Personalization Control Key
PCL	Power Control Level
PCM	Protection Circuit Module
PCN	Personal Communication Network
PCS 1900	Personal Communication Service
PDP	Packet Data Protocol
PDU	Protocol Description Unit
PIN	Personal Identification Number
PLMN	Public Land Mobile Networks

Abbreviation	Definition
PNN	PLMN Network Name
PPP	Point-to-Point Protocol/Peer to Peer
PSTN	Public Switched Telephone Network
PTS	Product Technical Specification
PUCT	Price per Unit and Currency Table
PUK	PIN Unlock Key
PWM	Pulse Width Modulation
QoS	Quality of Service
RAM	Random Access Memory
RDMS	Remote Device Management Services
RI	Ring Indicator
RIL	Radio Interface Layer
RLP	Radio Link Protocol
RSSI	Received Signal Strength Indication
RTS	Ready To Send signal
RX	Reception
SAP	Service Access Point
SC	Service Center
SDU	Service Data Unit
SIM	Subscriber Information Module
SMSR	Short Message Status Report
SMS	Short Message Service
SS	Supplementary Services
SPCK	Service Provider Control Key
SPN	Service Provider Name
STK	SIM ToolKit
SVN	Software Version Number
TA	Terminal Adaptor
TBF	Temporary Block Flow
TE	Terminal Equipment
TTY	TeleTYpe
TON/NPI	Type Of Number/Numbering Plan Identification
TX	Transmission
UART	Universal Asynchronous Receiver Transmitter
UCS2	Universal Character Set 2 Character table (2-byte coding)
UDUB	User Determined User Busy
UIH	Unnumbered Information with Header check
USB	Universal Serial Bus
USSD	Unstructured Supplementary Service Data

>> 2. V25ter AT Commands

2.1. +++ Command: Switch from Data Mode to Command Mode

HL7588	
Execute command	
<u>Syntax</u> +++	<u>Response</u> OK
<u>Reference</u> V.25Ter	<u>Notes</u> • This command is only available during data mode. The +++ character sequence suspends the data flow over the AT interface and switches to command mode. This allows entering AT commands while maintaining the data connection to the remote device. • To return to data mode, use the ATO[n] command. • Line needs one second silence before and one second after (do not end with terminating character). • The "+" character may be changed with the ATS2 command (see following chapters). • The +++ characters are not transmitted in the data flow.

2.2. A/ Command: Repeat Previous Command Line

HL7588	
Execute command	
<u>Syntax</u> A/	<u>Response</u> Depend on the previous command
<u>Reference</u> V.25Ter	<u>Notes</u> Line does not need to end with terminating character

2.3. O Command: Switch from Command Mode to Data Mode

HL7588	
Test command	
<u>Syntax</u> ATO[<n>]	<u>Response</u> TA returns to data mode from command mode: CONNECT <text>

HL7588	
	If connection is not successfully resumed: NO CARRIER <u>Parameter</u> <n> 0 Switch from command mode to data mode 1-200 Session ID; see section 12 Protocol Specific Commands
<u>Reference</u> V.25Ter	<u>Notes</u> ATO is the alternative command to the +++ escape sequence described in section 2.1. When a data call has been established and TA is in command mode, ATO causes the TA to resume the data connection and return to data mode.

2.4. E Command: Enable Echo Command

HL7588	
<i>Execute command</i>	
<u>Syntax</u> ATE[<value>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <value> 0 Echo OFF 1 Echo ON
<u>Notes</u>	- This setting determines whether the TA echoes characters received from TE during the command state. <value> is saved in non-volatile memory per AT port over module reboot.

2.5. Q Command: Set Result Code Presentation Mode

HL7588	
<i>Execute command</i>	
<u>Syntax</u> ATQ[<n>]	<u>Response</u> OK (if <n> = 0) Nothing (if <n> = 1) <u>Parameter</u> <n> 0 Result codes transmitted by TA 1 No result codes transmitted by TA
<u>Notes</u>	- Specifies whether the TA transmits any result code to the TE. Information text transmitted in response is not affected by this setting. <n> is saved in non-volatile memory per AT port over module reboot.

2.6. S0 Command: Set Number of Rings before Automatic Call Answering

HL7588	
<i>Read command</i>	
<u>Syntax</u> ATS0?	<u>Response</u> <n> OK
<i>Write command</i>	
<u>Syntax</u> ATS0=<n>	<u>Response</u> OK <u>Parameter</u> <n> 0 Automatic answering deactivated 1 – 255 Number of rings before automatically answering
<u>Notes</u>	In data mode (after any CONNECT) automatic call answering does not work that means that incoming calls are not automatically answered during data mode.

2.7. S4 Command: Set Response Formatting Character

HL7588	
<i>Read command</i>	
<u>Syntax</u> ATS4?	<u>Response</u> <n> OK
<i>Write command</i>	
<u>Syntax</u> ATS4=<n>	<u>Response</u> OK <u>Parameter</u> <n> 10 Response formatting character <LF>: line feed
<u>Notes</u>	This parameter determines the character recognized by TA to terminate answer line (10 = <LF> by default); it cannot be changed.

2.8. S7 Command: Set Delay for Connection Completion

HL7588	
<i>Read command</i>	
<u>Syntax</u> ATS7?	<u>Response</u> <n> OK
<i>Write command</i>	
<u>Syntax</u> ATS7=<n>	<u>Response</u> OK <u>Parameter</u> <n> 1 – 255 Number of second to wait for connection completion

2.9. V Command: TA Response Format

HL7588	
<i>Execute command</i>	
<u>Syntax</u> ATV[<u>value</u>]	<u>Response</u> In case of information response, the format is: for V0: <text><CR><LF> for V1: <CR><LF><text><CR><LF> In case of result codes, the format is: for V0: <numeric code><CR> for V1: <CR><LF><verbose code><CR><LF> or +CME ERROR: <err> <u>Parameter</u> <value> 0 Short result code format: <numeric code> 1 Long result code format: <verbose code>
<u>Notes</u>	<n> is saved in non-volatile memory per AT port over module reboot.

2.10. X Command: Result Code Selection and Call Progress Monitoring Control

HL7588																
Write command																
<u>Syntax</u> ATX[<value>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <table><tr><td><value></td><td>0</td><td>CONNECT result code only returned, dial tone and busy detection are both disabled</td></tr><tr><td></td><td>1</td><td>CONNECT<text> result code only returned, dial tone and busy detection are both disabled</td></tr><tr><td></td><td>2</td><td>CONNECT<text> result code returned, dial tone detection is enabled, busy detection is disabled</td></tr><tr><td></td><td>3</td><td>CONNECT<text> result code returned, dial tone detection is disabled, busy detection is enabled</td></tr><tr><td></td><td>4</td><td>CONNECT<text> result code returned, dial tone and busy detection are both enabled</td></tr></table>	<value>	0	CONNECT result code only returned, dial tone and busy detection are both disabled		1	CONNECT<text> result code only returned, dial tone and busy detection are both disabled		2	CONNECT<text> result code returned, dial tone detection is enabled, busy detection is disabled		3	CONNECT<text> result code returned, dial tone detection is disabled, busy detection is enabled		4	CONNECT<text> result code returned, dial tone and busy detection are both enabled
<value>	0	CONNECT result code only returned, dial tone and busy detection are both disabled														
	1	CONNECT<text> result code only returned, dial tone and busy detection are both disabled														
	2	CONNECT<text> result code returned, dial tone detection is enabled, busy detection is disabled														
	3	CONNECT<text> result code returned, dial tone detection is disabled, busy detection is enabled														
	4	CONNECT<text> result code returned, dial tone and busy detection are both enabled														
<u>Notes</u>	• This command defines the result code to be returned, as well as sets the dial tone or busy detection features. • <value> is saved in non-volatile memory per AT port over module reboot.															

2.11. &C Command: Set Data Carrier Detect (DCD) Function Mode

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588							
<i>Execute command</i>							
<u>Syntax</u> AT&C<value>	<u>Response</u> OK <u>Parameter</u> <table><tr><td><value></td><td>0</td><td>DCD line is always active</td></tr><tr><td></td><td><u>1</u></td><td>DCD line is active in the presence of data carrier only</td></tr></table>	<value>	0	DCD line is always active		<u>1</u>	DCD line is active in the presence of data carrier only
<value>	0	DCD line is always active					
	<u>1</u>	DCD line is active in the presence of data carrier only					
<u>Reference</u> V.25Ter	<u>Notes</u> • DCD/AT&C is only applicable to the USB AT port; it has no effect on UART1. • <value> is saved in non-volatile memory per AT port over module reboot.						

2.12. &D Command: Set Data Terminal Ready (DTR) Function Mode

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588		
<i>Execute command</i>		
<u>Syntax</u> AT&D<value>	<u>Response</u> OK	
	<u>Parameter</u> <value>	0 TA ignores status on DTR 1 DTR drops from active to inactive. Change to command mode while retaining the connected data call 2 DTR drops from active to inactive. Disconnect data call, change to command mode. Auto-answer is off during DTR inactive state
<u>Reference</u> V.25Ter	<u>Notes</u>	This command only applies to data calls. DTR/AT&D is only applicable to the USB AT port; it has no effect on UART1. <value> is saved in non-volatile memory per AT port over module reboot.

2.13. &F Command: Restore Factory Settings

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT&F[<value>]	<u>Response</u> OK <u>Parameter</u> <u><value></u> 0 or Omitted Restore STORED PROFILE 0 and 1 to factory settings
<u>Reference</u> V.25Ter	<u>Notes</u> This command also restores the factory settings to the active profile.
<u>Examples</u>	AT&F OK AT&F0 OK AT&F1 ERROR

2.14. IPR Command: Set Fixed Local/DTE Rate

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
Test command	
<u>Syntax</u> AT+IPR=?	<u>Response</u> +IPR: (list of supported auto detectable <rate> values)[,(list of fixed only <rate> values)] OK
Read command	
<u>Syntax</u> AT+IPR?	<u>Response</u> +IPR: <baud_rate> OK
Write command	
<u>Syntax</u> AT+IPR= <baud_rate>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <baud_rate> 115200 (default value) 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 230400, 460800, 500000, 750000, 921600, 1843200, 3000000, 3250000, 6000000
<u>Notes</u>	- Not all listed rates may be available as they depend on the target. - The full range of data rate values may be reduced depending on hardware or other criteria. <baud_rate> is saved in non-volatile memory per AT port over module reboot.

2.15. L Command: Monitor Speaker Loudness

HL7588	
Write command	
<u>Syntax</u> ATL [<volume>]	<u>Response</u> OK <u>Parameter</u> <volume> 0 – 9
<u>Notes</u>	The responses of this command are compliant with the recommendation but this command has no effect.

2.16. M Command: Monitor Speaker Mode

HL7588	
<i>Write command</i>	
<u>Syntax</u> ATM[<mode>]	<u>Response</u> OK <u>Parameter</u> <mode> 0 – 65535
<u>Notes</u>	The responses of this command are compliant with the recommendation but this command has no effect.

2.17. &W Command: Save Stored Profile

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT&W[<value>]	<u>Response</u> OK <u>Parameters</u> <value> 0 or Omitted Save in STORED PROFILE 0 1 Save in STORED PROFILE 1
<u>Reference</u> V.25Ter	<u>Notes</u> • This command saves the current configuration in a non-erasable place. • &R, S05, S06 and S08 have no effect and are not saved in non-volatile memory.
<u>Examples</u>	AT&W // Save current configuration to Profile 0 OK AT&W0 // Save current configuration to Profile 0 OK AT&W1 // Save current configuration to Profile 1 OK

2.18. &V Command: Display Current Configuration

HL7588	
<i>Execute command</i> <u>Syntax</u> AT&V[<value>]	<u>Response</u> ACTIVE PROFILE: <current configuration> STORED PROFILE 0: <user default configuration> STORED PROFILE 1: <manufacturer configuration> OK <u>Parameter</u> <value> 0 Profile number This command indicates the result of certain actions as shown below: <pre> graph TD AP[Active Profile] -- ATZ --> SP[Stored profile] SP -- AT&W --> AP DS[Default Settings] -- AT&F --> AP </pre>
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - At startup, the latest profile stored with AT&W is restored to the Active profile (no restoration if AT&W has not been used). - The configuration is a text string on multiple lines as shown in the example below. This string may vary depending on the manufacturer, the product and the user setup. - Some commands and registers have no effect and are only implemented for compliance with V.25ter: - Registers S05, S06 and S08 will always return 8, 2 and 2 respectively. &R will always return 1.
<u>Examples</u>	AT&V ACTIVE PROFILE: E1 Q0 V1 X0 &C1 &D1 &R:1 &S0 &K0 +IPR:115200 +FCLASS0 S00:0 S01:0 S04:10 S05:8 S06:2 S07:255 S08:2 STORED PROFILE 0: E1 Q0 V1 X0 &C1 &D1 &R:1 &S0 &K3 +IPR:115200 +FCLASS0 S00:0 S01:0 S04:10 S05:8 S06:2 S07:255 S08:2 STORED PROFILE 1: E1 Q0 V1 X0 &C1 &D1 &R:1 &S0 &K3 +IPR:115200 +FCLASS0 S00:0 S01:0 S04:10 S05:8 S06:2 S07:255 S08:2 OK

2.19. &K Command: Flow Control Option

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
Execute command	
<u>Syntax</u> AT&K<mode>	<u>Response</u> OK
	<u>Parameter</u> <mode> <u>0</u> Disable all flow control <u>3</u> Enable bi-directional hardware flow control
<u>Reference</u> V.25ter	<u>Notes</u> • Use AT&V0 to display the current flow control setting. • Sierra Wireless recommends the use of hardware flow control. • AT&K3 hardware flow control is only effective for UART1 and +KSLEEP=2 (UART always ON); it has no effect on the USB AT port. • <mode> is saved in non-volatile memory per AT port over module reboot.

2.20. &S Command: DSR Option

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
Write command	
<u>Syntax</u> AT&S [<override>]	<u>Response</u> OK
	<u>Parameter</u> <override> <u>0</u> , 1 or Omitted DSR signal is always ON (0 is the default value)
<u>Reference</u> V.25ter	<u>Notes</u> • This is a dummy command and has no effect on the DSR signal. • <override> is saved in non-volatile memory per AT port over module reboot.

>> 3. General AT Commands

3.1. I Command: Request Identification Information

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588

Execute command

Syntax

ATI[<value>]

Response

If <value> = 0 or omitted:

<model>

OK

If <value> = 1:

<short version name>

OK

If <value> = 3:

<version name>

OK

If <value> = 4:

<fuse state>

OK

If <value> = 9:

<version name>

<model>

<short version name>

<chipset>

<fuse state>

<build date & time>

<source rev>

OK

If <value> = 10:

Modem-Firmware:

<version name>

<model>

<short version name>

<chipset>

<fuse state>

<build date & time>

<source rev>

Primary-Boot:

<version name>

<build date & time>

<source rev>

HL7588	
	Secondary-Boot: <version name> <build date & time> <source rev> Update-Agent: <version name> <build date & time> <source rev> 4G-Firmware: <4G FW version name> 3G-Firmware: <4G FW version name> OK <u>Parameters</u> <model> Model identifier <version name> Firmware version string For example: AHL75xx_TEST.0.0.141506 <...> (test firmware) AHL75xx.1.0.141506.<...> (official firmware) <short version name> Firmware version string in short format (no date and time) For example: HL75xx_TEST.0.0 (test firmware) HL75xx.1.0 (official firmware) <4G FW version name> 4G Firmware version string <3G FW version name> 3G Firmware version string <chipset> Chipset name <build date & time> Souce code build time in format YYYY-MM-DD HH:MM:SS <source rev> Source code revision in version control <fuse state> Fuse state information FUSED Fused module NON-FUSED Non-fused module
<u>Reference</u> V.25ter	<u>Notes</u> • AT13 is identical to AT+GMR and AT+CGMR. • AT10 and AT1 are identical to AT+GMM and AT+CGMM.
<u>Examples</u>	AT1 HL7588 OK AT10 HL7588 OK

HL7588

For testing purpose firmware, TEST given in the version name

ATI3

AHL75xx_TEST.0.0.142102.201406222214.x7160_1

OK

Examples on official firmware

ATI1

HL75xx.1.0

OK

ATI3

AHL75xx.1.0.141506.201406241105.x7160_1

OK

For fused module

ATI4

FUSED

OK

ATI9

AHL75xx.1.0.141506.201406241105.x7160_1

HL7588

HL75xx.1.0

x7160I

FUSED

2014-06-24 11:15:12

r53

OK

For non-fused module

ATI4

NON-FUSED

OK

ATI9

AHL75xx.1.0.141506.201406241105.x7160_1

HL7588

HL75xx.1.0

x7160I

NON-FUSED

2014-06-24 11:15:12

r53

OK

ati10

Modem-Firmware:

AHL75xx.1.0.151600.201508191527.x7160_1

HL7588

HL75xx_TEST.A.0.0

x7160

FUSED

2015-08-19 15:27:48

r2046

HL7588	
	Primary-Boot: AHL75xx.1.0.0102150819.201508191441.x7160_1 2015-08-19 14:41:29 r2024 Secondary-Boot: AHL75xx.1.0.0102150819.201508191441.x7160_1 2015-08-19 14:41:29 r2024 Update-Agent: AHL75xx.1.0.0102150819.201508191441.x7160_1 2015-08-19 14:41:46 r2046 4G-Firmware: 7160.S3.561.10.3.516.00.0001 3G-Firmware: 202.413.386.43-54.35 OK

3.2. Z Command: Reset and Restore User Configuration

HL7588		
<i>Execute command</i>		
<u>Syntax</u>	<u>Response</u>	
ATZ[<value>]	OK	
	or	
	+CME ERROR: <err>	
	<u>Parameter</u>	
<u><value></u>	0	Reset and restore user configuration with profile 0
	1	Reset and restore user configuration with profile 1

3.3. +CGMI Command: Request Manufacturer Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGMI=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+CGMI	<u>Response</u> (manufacturer identification text) OK
<u>Reference</u> [27.007] § 5.1	<u>Note</u> This command is identical to AT+GMI.
<u>Example</u>	AT+CGMI Sierra Wireless OK

3.4. +CGMM Command: Request Model Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGMM=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+CGMM	<u>Response</u> <mode> OK <u>Parameter</u> <model> Model identifier
<u>Reference</u> [27.007] § 5.2	<u>Note</u> This command is identical to AT+GMM, ATI and ATIO.
<u>Example</u>	AT+CGMM HL7588 OK

3.5. +CGMR Command: Request Revision Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGMR=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+CGMR	<u>Response</u> (model revision identification text) OK
<u>Reference</u> [27.007] § 5.3	<u>Notes</u> This command is identical to AT+I3 and AT+GMR.
<u>Examples</u>	AT+CGMR AHL75xx_TEST.0.0.142102.201406222214.x7160_1 // test HL7588 firmware OK AT+CGMR AHL75xx.1.0.141506.201406241105.x7160_1 // official HL7588 firmware OK

3.6. +CGSN Command: Request Product Serial Number Identification (IMEI)

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGSN=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+CGSN	<u>Response</u> <IMEI> (identification text for determination of the individual ME) OK
<u>Reference</u> V.25ter	<u>Notes</u> • This command is identical to AT+GSN. • This command can work with or without a SIM card. • See also AT+KGSN.

3.7. +KGSN Command: Request Product Serial Number and Software Version

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KGSN=?	<u>Response</u> +KGSN: (list of supported <number type>s) OK
<i>Write command</i> <u>Syntax</u> AT+KGSN= <number type>	<u>Response</u> If <number type> = 0: +KGSN: <IMEI> OK If <number type> = 1: +KGSN: <IMEISV> OK If <number type> = 2: +KGSN: <IMEISV_STR> OK If <number type> = 3: +KGSN: <FSN> OK If <number type> = 4: +KGSN: <FSN-BB> OK <u>Parameters</u> <IMEI> 15 digits IMEI (8 digits for TAC + 6 digits for SNR + 1 check digit) <IMEISV> 16 digits IMEISV (8 digits for TAC + 6 digits for SNR + 2 SVN digits) <IMEISV_STR> Formatted string: <15 digits>-<Check digit> SV: <Software version> <FSN> 14 digits Serial Number <FSN-BB> 16 digits Serial Number + BB
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> This command has been developed to provide the IMEI SV and Serial Number through an AT command and it can work without SIM card.
<u>Examples</u>	AT+KGSN=0 +KGSN: 351578000023006 OK AT+KGSN=1 +KGSN: 3515780000230001 OK

HL7588	
	AT+KGSN=2 +KGSN: 35157800002300-6 SV:01 OK
	AT+KGSN=3 +KGSN: 0123456789ABCD OK
	AT+KGSN=4 +KGSN: 0123456789ABCD01 OK

3.8. +HWREV Command: Request Hardware Revision

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+HWREV=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+HWREV?	<u>Response</u> Hardware revision: X.Y OK
	<u>Parameter</u> X.Y These are the HH numbers in FSN (returned by TTYWWDNNNNPP HH -BB)
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> This command works with or without a SIM card.
<u>Example</u>	Assuming FSN=TTYWWDNNNNPP 01 -BB AT+HWREV? Hardware revision: 0.1 OK

3.9. +CSCS Command: Set TE Character Set

HL7588									
<i>Test command</i>									
<u>Syntax</u> AT+CSCS=?	<u>Response</u> +CSCS: (list of supported <vail>s) OK								
<i>Read command</i>									
<u>Syntax</u> AT+CSCS?	<u>Response</u> +CSCS: <vail> OK or +CME ERROR: <err>								
<i>Write command</i>									
<u>Syntax</u> AT+CSCS= [<vail>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <table> <tr> <td><vail> "GSM"</td><td>GSM default alphabet (3GPP TS 23.038)</td></tr> <tr> <td>"HEX"</td><td>Character strings only consist of hexadecimal numbers from 00 to FF. For example, "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230. No conversions to the original MT character set shall be done</td></tr> <tr> <td>"IRA"</td><td>International reference alphabet (ITU-T T.50)</td></tr> <tr> <td>"UCS2"</td><td>16-bit universal multiple-octet coded character set (ISO/IEC 10646)</td></tr> </table>	<vail> "GSM"	GSM default alphabet (3GPP TS 23.038)	"HEX"	Character strings only consist of hexadecimal numbers from 00 to FF. For example, "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230. No conversions to the original MT character set shall be done	"IRA"	International reference alphabet (ITU-T T.50)	"UCS2"	16-bit universal multiple-octet coded character set (ISO/IEC 10646)
<vail> "GSM"	GSM default alphabet (3GPP TS 23.038)								
"HEX"	Character strings only consist of hexadecimal numbers from 00 to FF. For example, "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230. No conversions to the original MT character set shall be done								
"IRA"	International reference alphabet (ITU-T T.50)								
"UCS2"	16-bit universal multiple-octet coded character set (ISO/IEC 10646)								
<u>Notes</u>	<vail> is saved in non-volatile memory per AT port over module reboot.								

3.10. +CIMI Command: Request International Mobile Subscriber Identity

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CIMI=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+CIMI	<u>Response</u> <IMSI> OK

HL7588	
	or +CME ERROR: <err> <u>Parameter</u> <IMSI> International Mobile Subscriber Identity

3.11. +GMI Command: Request Manufacturer Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+GMI=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+GMI	<u>Response</u> (manufacturer identification text) OK
<u>Reference</u> [27.007] § 5.1	<u>Note</u> This command is identical to AT+CGMI.
<u>Example</u>	AT+GMI Sierra Wireless OK

3.12. +GMM Command: Request Model Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+GMM=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+GMM	<u>Response</u> <model> OK <u>Parameter</u> <mode> Model identifier
<u>Reference</u> [27.007] § 5.2	<u>Note</u> This command is identical to AT+CGMM, ATI and ATIO.

HL7588	
<u>Example</u>	AT+GMM HL7588 OK

3.13. +GMR Command: Request Revision Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+GMR=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+GMR	<u>Response</u> (model revision identification text) OK
<u>Reference</u> [27.007] § 5.3	<u>Notes</u> This command is identical to ATi3 and AT+GMR.
<u>Examples</u>	AT+CGMR AHL75xx_TEST.0.0.142102.201406222214.x7160_1 // test HL7588 firmware OK AT+CGMR AHL75xx.1.0.141506.201406241105.x7160_1 // official HL7588 firmware OK

3.14. +GSN Command: Request Product Serial Number (IMEI)

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+GSN=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+GSN	<u>Response</u> <IMEI> (identification text for determination of the individual ME) OK
<u>Reference</u> V.25ter	<u>Notes</u> • This command is identical to AT+CGSN. • This command can work with or without a SIM card. • See also AT+KGSN.

3.15. +CMUX Command: Multiplexing Mode

HL7588	
<i>Test command</i> <u>Syntax</u> AT+CMUX=?	<u>Response</u> +CMUX: (list of supported <mode>s),(list of supported <subset>s),(list of supported <port_speed>s),(list of supported <N1>s),(list of supported <T1>s),(list of supported <N2>s),(list of supported <T2>s),(list of supported <T3>s),(list of supported <k>s) OK
<i>Read command</i> <u>Syntax</u> AT+CMUX?	<u>Response</u> +CMUX: <mode>,[<subset>],,<N1>,<T1>,<N2>,<T2>,<T3>[,<k>] OK or +CME ERROR: <err> OK
<i>Write command</i> <u>Syntax</u> AT+CMUX= <mode> [,<subset> [,<port_speed> [,<N1>[,<T1> [,<N2>[,<T2> [,<T3>[,<k>]]]]]]]]	<u>Response</u> OK or +CME ERROR: <err> OK <u>Parameters</u> <mode> Multiplexer transparency mechanism <u>0</u> Basic option <subset> <u>0</u> UIH frames used only <port_speed> Transmission rate 1 9 600 bit/s 2 19 200 bit/s 3 38 400 bit/s 4 57 600 bit/s 5 115 200 bit/s 6 230 400 bit/s <u>7</u> 1 Mbit/s <N1> 1 – 1509 Maximum frame size. Default value= <u>31</u> (64 if Advanced option is used) <T1> 1 – 255 Acknowledgement timer in units of ten milliseconds. Default value= <u>10</u> (100 ms) <N2> 0 – 5 Maximum number of re-transmissions. Default value= <u>3</u> <T2> 2 – 255 Response timer for the multiplexer control channel in units of ten milliseconds. Default value= <u>3</u> (300 ms). Note that <T2> must be longer than <T1>. <T3> 1 – 255 Wake up response timer in seconds. Default value= <u>10</u> . Currently not supported; in case of read command, 0 is returned.

HL7588	
	<k> 1 – 7 Window size for advanced operation with error recovery options. Default value=2. Currently not supported; in case of read command, 0 is returned.
<u>Notes</u>	- This command enables the multiplexing protocol control channel as defined in GSM07.10. - The AT command sets parameters for the Control Channel. If parameters are left out the default values are used. If no autobauding is supported, a customer related interface speed is pre-selected. The final response code OK or CME ERROR: <err> is returned using the old interface speed; parameters only become active after sending OK.

3.16. +GCAP Command: Request Complete TA Capability List

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT+GCAP	<u>Response</u> +GCAP: list of <name>s OK
<u>Example</u>	+GCAP:+FCLASS,+CGSM OK

3.17. +WIMEI Command: IMEI Write and Read

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WIMEI=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+WIMEI?	<u>Response</u> +WIMEI: <IMEI> OK
<i>Write command</i>	
<u>Syntax</u> AT+WIMEI= <IMEI>	<u>Response</u> +WIMEI: <IMEI> OK <u>Parameter</u> <IMEI> 14 or 15-digit IMEI as defined in GSM 23.003

HL7588	
<u>Notes</u>	- The default IMEI is 012345678901237. - The write command can only be used once for IMEI programming. - The IMEI to be written must be different from the default IMEI. - If a 14-digit IMEI is entered, the 15th checksum digit is automatically calculated. - The NV backup of the static calibrated NV partition which stores the IMEI is automatically updated after successfully executing the write command (i.e. backup is updated when OK is returned).
<u>Examples</u>	<pre> at+wimei? +WIMEI: 012345478901237 // Default IMEI OK at+wimei=354610060035829 // Enter 15-digit IMEI OK at+wimei? +WIMEI: 354610060035829 OK at+wimei=35461006003582 // Enter 14-digit IMEI OK at+wimei? +WIMEI: 354610060035829 OK </pre>

3.18. +KODIS Command: Access ODIS Information

Note: For HL7588 AT&T only.

HL7588 AT&T	
<i>Test command</i>	
<u>Syntax</u> AT+KODIS=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+KODIS?	<u>Response</u> +KODIS: <index>,"<hostMan>","<hostMod>","<hostSwV>","<hostID>" OK
<i>Write command</i>	
<u>Syntax</u> AT+KODIS= <index>, <hostMan>, <hostMod>, <hostSwV>, <hostID>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <index> Index number of the following parameters

HL7588 AT&T	
	<hostMan> Host manufacturer of ODIS node (ATT) <hostMod> Host model of ODIS node (ATT) <hostSwV> Host software version of ODIS node (ATT) <hostID> Host ID of ODIS node (ATT)
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This command is used for modifying host device details required by specific ODIS test cases in AT&T. - The maximum number of characters in the parameters listed above is 31. Characters beyond the maximum limit will be ignored.
<u>Examples</u>	at+kodis? +KODIS: 1,"HostMan","HostMod","HostSwV","HUID1" OK at+kodis=1,"HostMan","HostMode","01.00","HUID1" OK at+kodis? +KODIS: 1,"HostMan","HostMode","01.00","HUID1" OK

3.19. &R Command: RTS and CTS Option

HL7588	
<i>Write command</i> <u>Syntax</u> AT&R <option>	<u>Response</u> OK <u>Parameter</u> <option> <u>1</u> In sync mode, CTS is always ON (RTS transitions are ignored). In async mode, CTS will only drop if required by the flow control
<u>Notes</u>	This command has no effect and it is not defined in the V.25ter specification; it was only implemented for compatibility reasons. Parameters are ignored and are not saved in non-volatile memory.

3.20. +FMI Command: Request Manufacturer Identification

HL7588	
<i>Test command</i> <u>Syntax</u> AT+FMI=?	<u>Response</u> OK

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT+FMI	<u>Response</u> (manufacturer identification text) OK
<u>Reference</u> [27.007] § 5.1	<u>Example</u> AT+FMI Sierra Wireless OK

3.21. +FMM Command: Request Model Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+FMM=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+FMM	<u>Response</u> <model> OK <u>Parameter</u> <model> Model identifier
<u>Reference</u> [27.007] § 5.2	<u>Example</u> AT+FMM HL7588 OK

3.22. +FMR Command: Request Revision Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+FMR=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+FMR	<u>Response</u> (model revision identification text) OK

HL7588Reference

[27.007] § 5.3

Notes

An example of (model revision identification text) is:
 AHL75xx_TEST.0.0.142102.201406222214.x7160_1
 or
 RHL75xx.V.3.5.151600.201602082318.x7160_1

3.23. \N Command: Data Transmission Mode

HL7588*Execute command*Syntax

AT\N<x>

Response

OK

Parameter

<x> 0 Transparent mode
 4, 6 RLP mode (non-transparent)

Notes

This command has no effect and it is not defined in the V.25ter specification; it was only implemented for compatibility reasons. Parameters are ignored and are not saved in non-volatile memory.

3.24. N Command: Negotiate Handshake Option

HL7588*Execute command*Syntax

ATN[<option>]

Response

OK

Parameter

<option> 0 – 9

Notes

This command has no effect and it is not defined in the V.25ter specification; it was only implemented for compatibility reasons. Parameters are ignored and are not saved in non-volatile memory.

3.25. S5 Command: Write Command Line Editing Character

HL7588*Read command*Syntax

ATS5?

Response

OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> ATS5=<n>	<u>Response</u> OK <u>Parameters</u> <n> 1 – 255 Number of seconds to wait for connection completion
<u>Reference</u> V.25Ter	<u>Notes</u> This command has no effect and was only implemented to comply with V.25ter. Parameters are ignored and are not saved in non-volatile memory.

3.26. S6 Command: Pause before Blind Dialing

HL7588	
<i>Write command</i>	
<u>Syntax</u> ATS6=<time>	<u>Response</u> OK <u>Parameters</u> <time> 0 – 999
<u>Reference</u> V.25ter	<u>Notes</u> This command has no effect and was only implemented to comply with V.25ter. Parameters are ignored and are not saved in non-volatile memory.

3.27. S8 Command: Comma Dial Modifier Time

HL7588	
<i>Read command</i>	
<u>Syntax</u> ATS8?	<u>Response</u> <time> OK
<i>Write command</i>	
<u>Syntax</u> ATS8=<time>	<u>Response</u> OK <u>Parameters</u> <time> 0 – 255
<u>Reference</u> V.25ter	<u>Notes</u> This command has no effect and was only implemented to comply with V.25ter. Parameters are ignored and are not saved in non-volatile memory.

3.28. W Command: Extended Result Code

HL7588	
<i>Write command</i>	
<u>Syntax</u> ATW<mode>	<u>Response</u> OK
	<u>Parameter</u> <mode> 0 or Omitted Only CONNECT will be shown 1 CONNECT<connection speed> will be shown
<u>Notes</u>	This command has no effect and it is not defined in the V.25ter specification; it was only implemented for compatibility reasons. Parameters are ignored and are not saved in non-volatile memory.

>> 4. Call Control Commands

4.1. A Command: Answer a Call

HL7588	
Execute command	
<u>Syntax</u> ATA	<u>Response</u> ----- ----- -- ATA OK or +CME ERROR: <err>

4.2. H Command: Hook Control

HL7588	
Execute command	
<u>Syntax</u> ATH	<u>Response:</u> OK
or ATH0	or ERROR

4.3. D Command: Dial Number

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
Test command	
<u>Syntax</u> ATD=?	<u>Response</u> 1 2 3 4 5 6 7 8 9 0 * # + A B C OK
Read command	
<u>Syntax</u> ATD?	<u>Response</u> 1 2 3 4 5 6 7 8 9 0 * # + A B C OK

HL7588	
<i>Execute command</i>	
<u>Syntax</u> ATD[<n>]	<u>Response</u> OK If successfully connected CONNECT Connection has been established RING The DCE has detected an incoming call signal from the network NO CARRIER The connection cannot be established BUSY Engaged (busy) signal detected NO ANSWER If no hang up is detected after a fixed network timeout CONNECT <data rate> Same as CONNECT but includes the data rate RING CTM The MS has detected an incoming CTM call signal from the network; this code is proprietary CONNECT FAX Same as CONNECT but includes the indication related to a fax call <u>Parameter</u> <n> String of dialing digits and optionally V.25ter modifiers (dialing digits): 0-9, *, #, +, A, B, C (maximum length: 20 digits)

4.4. D> Command: Direct Dialing from Phonebook

HL7588	
<i>Execute command</i>	
<u>Syntax</u> ATD><str> ATD>[<mem>] <n>	<u>Response</u> See ATD <u>Parameters</u> <str> Alphanumeric field (if possible all available memories should be searched for correct entry) <mem> Memory storage ("ME", "SM", etc.) <n> Entry location
<u>Notes</u>	For memory storage locations, see AT+CPBS.

4.5. +CHUP Command: Hang up Call

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CHUP=?	<u>Response</u> OK

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT+CHUP	<u>Response</u> OK or +CME ERROR: <err>
<u>Notes</u>	This command hangs up waiting/active MT calls and MO calls.

4.6. +CR Command: Service Reporting Control

HL7588																						
<i>Test command</i>																						
<u>Syntax</u> AT+CR=?	<u>Response</u> +CR: (list of supported <mode> s) OK																					
<i>Read command</i>																						
<u>Syntax</u> AT+CR?	<u>Response</u> +CR: <mode> OK																					
<i>Write command</i>																						
<u>Syntax</u> AT+CR= [<mode>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <table><tr><td><mode></td><td><u>0</u></td><td>Disables reporting</td></tr><tr><td></td><td>1</td><td>Enables reporting</td></tr></table> <table><tr><td><serv></td><td>ASYNC</td><td>Asynchronous transparent</td></tr><tr><td></td><td>SYNC</td><td>Synchronous transparent</td></tr><tr><td></td><td>REL ASYNC</td><td>Asynchronous non-transparent</td></tr><tr><td></td><td>REL SYNC</td><td>Synchronous non-transparent</td></tr><tr><td></td><td>GPRS [<L2P>]</td><td>GPRS</td></tr></table>	<mode>	<u>0</u>	Disables reporting		1	Enables reporting	<serv>	ASYNC	Asynchronous transparent		SYNC	Synchronous transparent		REL ASYNC	Asynchronous non-transparent		REL SYNC	Synchronous non-transparent		GPRS [<L2P>]	GPRS
<mode>	<u>0</u>	Disables reporting																				
	1	Enables reporting																				
<serv>	ASYNC	Asynchronous transparent																				
	SYNC	Synchronous transparent																				
	REL ASYNC	Asynchronous non-transparent																				
	REL SYNC	Synchronous non-transparent																				
	GPRS [<L2P>]	GPRS																				
<u>Notes</u>	The optional <L2P> proposes a layer 2 protocol to use between the MT and the TE. It is defined in +CGDATA command.																					

4.7. +CRC Command: Set Cellular Result Codes for Incoming Call Indication

HL7588																											
Test command																											
<u>Syntax</u> AT+CRC=?	<u>Response</u> +CRC: (list of supported <mode>s) OK																										
Read command																											
<u>Syntax</u> AT+CRC?	<u>Response</u> +CRC:<mode> OK																										
Write command	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <table><tr><td><mode></td><td>0</td><td>Disable extended format</td></tr><tr><td></td><td>1</td><td>Enable extended format</td></tr></table>	<mode>	0	Disable extended format		1	Enable extended format																				
<mode>	0	Disable extended format																									
	1	Enable extended format																									
Unsolicited Notification	<u>Response</u> +CRING: <type> <u>Parameter</u> <table><tr><td><type></td><td></td></tr><tr><td>ASync [, <priority> [, <subaddr> , <satype>]]</td><td>Asynchronous transparent</td></tr><tr><td>SYnc [, <priority> [, <subaddr> , <satype>]]</td><td>Synchronous transparent</td></tr><tr><td>REL ASync [, <priority> [, <subaddr> , <satype>]]</td><td>Asynchronous non transparent</td></tr><tr><td>REL SYnc [, <priority> [, <subaddr> , <satype>]]</td><td>Synchronous non transparent</td></tr><tr><td>CTM [, <priority> [, <subaddr> , <satype>]]</td><td>Incoming CTM call</td></tr><tr><td>CTM2 [, <priority> [, <subaddr> , <satype>]]</td><td>Incoming CTM call at line 2</td></tr><tr><td>GPRS <PDP_type> , <PDP_addr> [, [<L2P>] [, <APN>]]</td><td>GPRS network request for PDP context activation</td></tr></table> <table><tr><td><priority></td><td>(Optional) EMLPP priority level of the incoming call by paging, notification or setup message.</td></tr><tr><td><subaddr></td><td>String type subaddress of format specified by <satype></td></tr><tr><td><satype></td><td>Type of subaddress octet in integer format</td></tr><tr><td><PDP_type> , <PDP_addr> , <APN></td><td>As defined in AT+CGDCONT command</td></tr><tr><td><L2P></td><td>(Optional) proposes a layer 2 protocol to use between the MT and the TE.</td></tr></table>	<type>		ASync [, <priority> [, <subaddr> , <satype>]]	Asynchronous transparent	SYnc [, <priority> [, <subaddr> , <satype>]]	Synchronous transparent	REL ASync [, <priority> [, <subaddr> , <satype>]]	Asynchronous non transparent	REL SYnc [, <priority> [, <subaddr> , <satype>]]	Synchronous non transparent	CTM [, <priority> [, <subaddr> , <satype>]]	Incoming CTM call	CTM2 [, <priority> [, <subaddr> , <satype>]]	Incoming CTM call at line 2	GPRS <PDP_type> , <PDP_addr> [, [<L2P>] [, <APN>]]	GPRS network request for PDP context activation	<priority>	(Optional) EMLPP priority level of the incoming call by paging, notification or setup message.	<subaddr>	String type subaddress of format specified by <satype>	<satype>	Type of subaddress octet in integer format	<PDP_type> , <PDP_addr> , <APN>	As defined in AT+CGDCONT command	<L2P>	(Optional) proposes a layer 2 protocol to use between the MT and the TE.
<type>																											
ASync [, <priority> [, <subaddr> , <satype>]]	Asynchronous transparent																										
SYnc [, <priority> [, <subaddr> , <satype>]]	Synchronous transparent																										
REL ASync [, <priority> [, <subaddr> , <satype>]]	Asynchronous non transparent																										
REL SYnc [, <priority> [, <subaddr> , <satype>]]	Synchronous non transparent																										
CTM [, <priority> [, <subaddr> , <satype>]]	Incoming CTM call																										
CTM2 [, <priority> [, <subaddr> , <satype>]]	Incoming CTM call at line 2																										
GPRS <PDP_type> , <PDP_addr> [, [<L2P>] [, <APN>]]	GPRS network request for PDP context activation																										
<priority>	(Optional) EMLPP priority level of the incoming call by paging, notification or setup message.																										
<subaddr>	String type subaddress of format specified by <satype>																										
<satype>	Type of subaddress octet in integer format																										
<PDP_type> , <PDP_addr> , <APN>	As defined in AT+CGDCONT command																										
<L2P>	(Optional) proposes a layer 2 protocol to use between the MT and the TE.																										

4.8. +CSTA Command: Select Type of Address

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CSTA=?	<u>Response</u> +CSTA: (list of supported <type>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CSTA?	<u>Response</u> +CSTA: <type> OK
<i>Write command</i>	
<u>Syntax</u> AT+CSTA= <type>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <type> <u>129</u> Dial string begins with a digit, or is a local number <u>145</u> Dial string includes international access code character "+"
<u>Notes</u>	<type> is saved in non-volatile memory over module reboot.

4.9. +CMOD Command: Call Mode

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CMOD=?	<u>Response</u> +CMOD: (list of supported <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CMOD?	<u>Response</u> +CMOD: <mode> OK
<i>Write command</i>	
<u>Syntax</u> AT+CMOD= [<mode>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <mode> <u>0</u> Single mode

4.10. +CEER Command: Extended Error Report

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CEER=?	<u>Response</u> OK
<i>Write command</i>	
<u>Syntax</u> AT+CEER	<u>Response</u> +CEER: <category>[,<cause>,<descriptions>] OK
	<u>Parameter</u> <category> "No report available" "CC setup error" "CC modification error" "CC release" "SM attach error" "SM detach" "SM activation error" "SM deactivation" "SS network error cause" "SS network reject cause" "SS network GSM cause" "EMM cause" "ESM attach error" "ESM detach"
	<cause> Digit representing the error cause sent internally or by the network. Refer to 18.2.2 CEER Error Codes for more information.
	<description> Verbose string containing the textual representation of <cause>. Refer to 18.2.2 CEER Error Codes for more information.

4.11. +CSNS Command: Single Numbering Scheme

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CSNS=?	<u>Response</u> +CSNS: (list of supported <mode>) OK
<i>Read command</i>	
<u>Syntax</u> AT+CSNS?	<u>Response</u> +CSNS:<mode> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CSNS= [<mode>]	<u>Response</u> OK <u>Parameter</u> <mode> 4 Data

4.12. +CBST Command: Select Bearer Service Type

HL7588																																																							
Test command																																																							
<u>Syntax</u> AT+CBST=?	<u>Response</u> +CBST: (list of supported <speed>s),(list of supported <name>s),(list of supported <ce>s) OK																																																						
Read command																																																							
<u>Syntax</u> AT+CBST?	<u>Response</u> +CBST: <speed>,<name>,<ce> OK																																																						
Write command																																																							
<u>Syntax</u> AT+CBST= [<speed> [,<name>[,<ce>]]]	<u>Response</u> OK or CME ERROR: <err> <u>Parameter</u> <table><tr><td><speed></td><td>0</td><td>Autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service)</td></tr><tr><td></td><td>4</td><td>2400 bps (V.22bis)</td></tr><tr><td></td><td>5</td><td>2400 bps (V.26ter)</td></tr><tr><td></td><td>6</td><td>4800 bps (V.32)</td></tr><tr><td></td><td>7</td><td>9600 bps (V.32)</td></tr><tr><td></td><td>12</td><td>9600 bps (V.34)</td></tr><tr><td></td><td>14</td><td>14400 bps (V.34)</td></tr><tr><td></td><td>15</td><td>19200 bps (V.34)</td></tr><tr><td></td><td>16</td><td>28800 bps (V.34)</td></tr><tr><td></td><td>17</td><td>33600 bps (V.34)</td></tr><tr><td></td><td>39</td><td>9600 bps (V.120)</td></tr><tr><td></td><td>43</td><td>14400 bps (V.120)</td></tr><tr><td></td><td>47</td><td>19200 bps (V.120)</td></tr><tr><td></td><td>48</td><td>28800 bps (V.120)</td></tr><tr><td></td><td>49</td><td>38400 bps (V.120)</td></tr><tr><td></td><td>50</td><td>48000 bps (V.120)</td></tr><tr><td></td><td>51</td><td>56000 bps (V.120)</td></tr><tr><td></td><td>68</td><td>2400 bps (V.110 or X.31 flag stuffing)</td></tr></table>	<speed>	0	Autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service)		4	2400 bps (V.22bis)		5	2400 bps (V.26ter)		6	4800 bps (V.32)		7	9600 bps (V.32)		12	9600 bps (V.34)		14	14400 bps (V.34)		15	19200 bps (V.34)		16	28800 bps (V.34)		17	33600 bps (V.34)		39	9600 bps (V.120)		43	14400 bps (V.120)		47	19200 bps (V.120)		48	28800 bps (V.120)		49	38400 bps (V.120)		50	48000 bps (V.120)		51	56000 bps (V.120)		68	2400 bps (V.110 or X.31 flag stuffing)
<speed>	0	Autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service)																																																					
	4	2400 bps (V.22bis)																																																					
	5	2400 bps (V.26ter)																																																					
	6	4800 bps (V.32)																																																					
	7	9600 bps (V.32)																																																					
	12	9600 bps (V.34)																																																					
	14	14400 bps (V.34)																																																					
	15	19200 bps (V.34)																																																					
	16	28800 bps (V.34)																																																					
	17	33600 bps (V.34)																																																					
	39	9600 bps (V.120)																																																					
	43	14400 bps (V.120)																																																					
	47	19200 bps (V.120)																																																					
	48	28800 bps (V.120)																																																					
	49	38400 bps (V.120)																																																					
	50	48000 bps (V.120)																																																					
	51	56000 bps (V.120)																																																					
	68	2400 bps (V.110 or X.31 flag stuffing)																																																					

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70	4800 bps (V.110 or X.31 flag stuffing)
71	9600 bps (V.110 or X.31 flag stuffing)
75	14400 bps (V.110 or X.31 flag stuffing)
79	19200 bps (V.110 or X.31 flag stuffing)
80	28800 bps (V.110 or X.31 flag stuffing)
81	38400 bps (V.110 or X.31 flag stuffing)
82	48000 bps (V.110 or X.31 flag stuffing)
83	56000 bps (V.110 or X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI or RDI service in order to get FTM)
84	64000 bps (X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI service in order to get FTM)
115	56000 bps (bit transparent)
116	64000 bps (bit transparent)
120	32000 bps (PIAFS32k)
121	64000 bps (PIAFS64k)
130	28800 bps (multimedia)
131	32000 bps (multimedia)
132	33600 bps (multimedia)
133	56000 bps (multimedia)
134	64000 bps (multimedia)
<name>	<u>0</u> Data circuit asynchronous (UDI or 3.1 kHz modem)
	1 Data circuit synchronous (UDI or 3.1 kHz modem)
	4 Data circuit asynchronous (RDI)
	5 Data circuit synchronous (RDI)
<ce>	<u>0</u> Transparent
	1 Non-transparent
	2 Both, transparent preferred
	3 Both, non-transparent preferred

>> 5. Mobile Equipment Control and Status Commands

5.1. +CACM Command: Accumulated Call Meter

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CACM=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+CACM?	<u>Response</u> +CACM: <acm> OK
<i>Write command</i>	
<u>Syntax</u> AT+CACM= [<passwd>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <passwd> SIM PIN2 as a string type <acm> Accumulated call meter value similarly coded as <ccm> in command +CAOC as string type

5.2. +CAMM Command: Accumulated Call Meter (Maximum)

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CAMM=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+CAMM?	<u>Response</u> +CAMM: <acmmax> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CMM= [<acmmax> [,<passwd>]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <acmmax> String type containing the accumulated call meter maximum value coded in hexadecimal format. Value 0 disables the ACMmax feature <passwd> SIM PIN2

5.3. +CCWE Command: Call Meter Maximum Event

HL7588							
<i>Test command</i>							
<u>Syntax</u> AT+CCWE=?	<u>Response</u> +CCWE: (list of supported <mode>s) OK						
<i>Read command</i>							
<u>Syntax</u> AT+CCWE?	<u>Response</u> +CCWE: <mode> OK						
<i>Write command</i>							
<u>Syntax</u> AT+CCWE= <mode>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <table><tr><td><mode></td><td><u>0</u></td><td>Disable the call meter warning event</td></tr><tr><td></td><td><u>1</u></td><td>Enable the call meter warning event</td></tr></table>	<mode>	<u>0</u>	Disable the call meter warning event		<u>1</u>	Enable the call meter warning event
<mode>	<u>0</u>	Disable the call meter warning event					
	<u>1</u>	Enable the call meter warning event					

5.4. +CCLK Command: Real Time Clock

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CCLK=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+CCLK?	<u>Response</u> +CCLK: <time> or +CME ERROR: <err>
<i>Write command</i>	
<u>Syntax</u> AT+CCLK= <time>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <time> String type value; format is "yy/MM/dd,hh:mm:ss+/-TZ", where characters indicate year (last two digits), month, day, hour, minutes, seconds and time zone (optional).
<u>Notes</u>	Year must be 2004 or later.

5.5. +CIND Command: Indicator Control

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CIND=?	<u>Response</u> +CIND: ("call",(0,1)), ("roam",(0,1)) OK
<i>Read command</i>	
<u>Syntax</u> AT+CIND?	<u>Response</u> +CIND: [<ind>[,<ind>[,...]]] OK
<i>Execute command</i>	
<u>Syntax</u> AT+CIND= [<ind> [,<ind>[,...]]]	<u>Response</u> OK or +CME ERROR: <err>

HL7588	
	<u>Parameters</u> <ind> 0 – 1 Integer type depending on the corresponding <descr> <descr> "call" Call in progress "roam" Roaming indicator
<u>Notes</u>	<ind> is saved in non-volatile memory per AT port over module reboot

5.6. +CLAC Command: List Available AT Commands

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT+CLAC	<u>Response</u> <AT command 1> [<CR><LF><AT command 2>[.]] OK or +CME ERROR: <err> <u>Parameter</u> <AT command> AT command (including the prefix "AT")
<u>Notes</u>	This command provides the AT Command list available for the user.

5.7. +CFUN Command: Set Phone Functionality

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CFUN=?	<u>Response</u> +CFUN: (list of supported <fun>s), (list of supported <rst>s) OK or +CME ERROR: <err>
<i>Read command</i>	
<u>Syntax</u> AT+CFUN?	<u>Response</u> +CFUN: <power_mode>,<STK_mode> or +CME ERROR: <err>

HL7588*Write command*Syntax**AT+CFUN=<fun>
[,<rst>]**Response**OK**

or

+CME ERROR: <err>Parameters

- <fun>**
- | | |
|----|--|
| 0 | Switch off MS |
| 1 | Full functionality |
| 4 | Disable both phone's transmit and receive RF circuits; airplane mode |
| 5 | Fast detach |
| 6 | Enable SIMTK and fetching of proactive commands |
| 7 | Disable SIMTK and enable fetching of proactive commands |
| 8 | Disable fetching of proactive commands |
| 15 | Perform hidden reset (reset MS without resetting SIM) |
| 16 | Simulate reset (reset MS including SIM) |
| 27 | Perform SIM reset and restore previous PIN validation state (reset SIM without resetting MS) |
| 31 | Disable single stack with an option to power off/power on single (U)SIM card |
| 32 | Disable all stacks with an option to power off/power on single (U)SIM card |
| 33 | Enable single stack with an option to reset (U)SIM card |
| 34 | Enable all stacks with an option to reset (U)SIM cards |
| 35 | Power off/power on single (U)SIM card |
| 36 | Power off/power on all (U)SIM cards |
| 37 | Reset single stack |
| 38 | Reset all stacks |

Note that when <fun> = 0, 15 or 16, the OK response may be missed due to race conditions, as MT may switch off by the time the OK response is triggered.

<rst> Reset value

If <fun> = 1 or 4:

- | | |
|---|--|
| 0 | Do not reset MT before resetting it to <fun> power level |
| 1 | Reset MT before setting it to <fun> power level |

If <fun> = 31, 32, 35 or 36:

- | | |
|---|---------------------|
| 0 | SIM is switched OFF |
| 1 | SIM is switched ON |

If <fun> = 33 or 34:

- | | |
|---|----------------------|
| 0 | SIM reset not needed |
| 1 | SIM reset needed |

If <fun> = 27

- | | |
|---|--|
| 0 | Hidden SIM reset (MS is not informed of SIM reset) |
| 1 | Normal SIM reset (MS is informed of SIM reset) |

- <power_mode>**
- | | |
|---|-------------------|
| 1 | MS is switched ON |
| 2 | Invalid mode |
| 4 | Airplane mode |

HL7588			
	<STK_mode>	<u>0</u>	Inactive state
		6	Enable the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM card
		7	Disable the SIM-toolkit interface and enable fetching of proactive commands by SIM-APPL from the SIM card
		8	Disable fetching of proactive commands by SIM-APPLU from the SIM card

5.8. +CMER Command: Mobile Equipment Event Reporting

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CMER=?	<u>Response</u> +CMER: (1,0,0,(0-1),0) OK
<i>Read command</i>	
<u>Syntax</u> AT+CMER?	<u>Response</u> +CMER: <mode>,<keyp>,<disp>,<ind>,<bfr> OK
<i>Write command</i>	
<u>Syntax</u> AT+CMER= [<mode>,<keyp> ,<disp>,<ind> ,<bfr>]]]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <mode> 1 Discard unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE <keyp> 0 No keypad event reporting <disp> 0 No display event reporting <ind> <u>0</u> No indicator event reporting 1 Indicator event reporting using result code +CIEV: <ind>,<value>. <ind> indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +CIND shall be indicated by the TA to the TE <bfr> 0 TA buffer of unsolicited result codes defined within this command is cleared when <mode> = 1 is entered
<u>Notes</u>	<mode> is saved in non-volatile memory per AT port over module reboot

5.9. +CMEE Command: Report Mobile Termination Error

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CMEE=?	<u>Response</u> +CMEE: (list of supported <n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CMEE?	<u>Response</u> +CMEE: <n> OK
<i>Write command</i>	
<u>Syntax</u> AT+CMEE=[<n>]	<u>Response</u> OK <u>Parameter</u> <n> 0 Disable +CME ERROR: <err> result code and use ERROR instead 1 +CME ERROR: <err> result code and use numeric <err> values 2 +CME ERROR: <err> result code and use verbose <err> values
<u>Notes</u>	<n> is saved in non-volatile memory per AT port over module reboot

5.10. +CCID Command: Request SIM Card Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CCID=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+CCID?	<u>Response</u> +CCID: <ICCID> OK or +CME ERROR: <err>

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT+CCID	<u>Response</u> +CCID: <ICCID> OK or +CME ERROR: <err>
	<u>Parameter</u> <ICCID> Integrated Circuit Card ID of the SIM card

5.11. +FMR Command: Request Revision Identification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+FMR=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+FMR	<u>Response</u> <revision>,<sv> OK or +CME ERROR: <err>
	<u>Parameters</u> <revision> Revised version from IMEISV of the mobile station <sv> Software version from IMEISV of the mobile station

5.12. +CPIN Command: Enter Pin

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CPIN=?	<u>Response</u> OK

HL7588	
<i>Read command</i>	
<u>Syntax</u> AT+CPIN?	<u>Response</u> +CPIN: <code> OK or +CME ERROR: <err>
<i>Write command</i>	
<u>Syntax</u> AT+CPIN=<pin> [,<newpin>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <code> Values when queried using the read command READY MT is not pending for any password SIM PIN MT is waiting for SIM PIN to be given SIM PUK MT is waiting for SIM PUK to be given SIM PIN2 MT is waiting SIM PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that MT does not block its operation) SIM PUK2 MT is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that ME does not block its operation). PH-NET PIN MT is waiting for the network personalization password to be given PH-NET PUK MT is waiting network personalization unblocking password to be given PH-NETSUB PIN MT is waiting network subset personalization password to be given PH-NETSUB PUK MT is waiting network subset personalization unblocking password to be given PH-SP PIN MT is waiting service provider personalization password to be given PH-SP PUK MT is waiting service provider personalization unblocking password to be given PH-CORP PIN MT is waiting corporate personalization password to be given PH-CORP PUK MT is waiting corporate personalization unblocking password to be given <pin>, <newpin> String type values

5.13. +CPIN2 Command: Enter Pin2

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CPIN2=?	<u>Response</u> OK

HL7588		
<i>Read command</i>		
<u>Syntax</u> AT+CPIN2?	<u>Response</u> +CPIN:code OK or +CME ERROR: <err>	
<i>Write command</i>		
<u>Syntax</u> AT+CPIN2= <puk2/oldpin2> [,<newpin2>] or AT+CPIN2= <oldpin2>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <puk2/oldpin2>, <newpin2> String type values <code> READY MT is not pending for any password SIM PIN2 MT is waiting for SIM PIN2 to be given (this "code" is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that MT does not block its operation) SIM PUK2 MT is waiting for SIM PUK2 to be given (this "code" is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that MT does not block its operation)	

5.14. +CPUC Command: Price per Unit and Currency

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CPUC=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+CPUC?	<u>Response</u> +CPUC: <currency>,<ppu> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CPUC= <currency>, <ppu> [,<passwd>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <currency> String type containing the three-character currency code (e.g. GBP, EUR) <ppu> String type containing the price per unit; dot is used as a decimal separator <passwd> String type containing SIM PIN2

5.15. *PSRDBS Command: Change Frequency Band

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT*PSRDBS=?	<u>Response</u> *PSRDBS: (list of supported<mode>s), (list of supported <band>s) OK
<i>Read command</i>	
<u>Syntax</u> AT*PSRDBS?	<u>Response</u> *PSRDBS: <band> OK
<i>Write command</i>	
<u>Syntax</u> AT*PSRDBS= <mode>,<band>	<u>Response</u> OK <u>Parameter</u> <Mode> 0 Set <band> at next switch on 1 Set <band> immediately <band> Bit field type parameter; to set several bands, sum up the values 64 BAND_UMTS_II 128 BAND_UMTS_V 4096 BAND_LTE_2 16384 BAND_LTE_4 32768 BAND_LTE_5 131072 BAND_LTE_13 262144 BAND_LTE_17
<u>Notes</u>	Selection can be one or more – up to two UMTS bands, and up to five LTE bands.

5.16. +CPAS Command: Phone Activity Status

HL7588																			
<i>Test command</i>																			
<u>Syntax</u> AT+CPAS=?	<u>Response</u> +CPAS: (list of supported <pas> es) OK or +CME ERROR: <err>																		
<i>Execute command</i>																			
<u>Syntax</u> AT+CPAS	<u>Response</u> +CPAS: <pas> OK or +CME ERROR: <err> <u>Parameter</u> <table><tr><td><pas></td><td>0</td><td>Ready (ME allows commands from TA/TE)</td></tr><tr><td></td><td>1</td><td>Unavailable (ME does not allow commands from TA/TE)</td></tr><tr><td></td><td>2</td><td>Unknown (ME is not guaranteed to respond to instructions)</td></tr><tr><td></td><td>3</td><td>Ringing (ME is ready for commands from TA/TE, but the ringer is active)</td></tr><tr><td></td><td>4</td><td>Call in progress (ME is ready for commands from TA/TE, but a call is in progress)</td></tr><tr><td></td><td>5</td><td>Asleep (ME is unable to process commands from TA/TE because it is in a low function-ality state)</td></tr></table>	<pas>	0	Ready (ME allows commands from TA/TE)		1	Unavailable (ME does not allow commands from TA/TE)		2	Unknown (ME is not guaranteed to respond to instructions)		3	Ringing (ME is ready for commands from TA/TE, but the ringer is active)		4	Call in progress (ME is ready for commands from TA/TE, but a call is in progress)		5	Asleep (ME is unable to process commands from TA/TE because it is in a low function-ality state)
<pas>	0	Ready (ME allows commands from TA/TE)																	
	1	Unavailable (ME does not allow commands from TA/TE)																	
	2	Unknown (ME is not guaranteed to respond to instructions)																	
	3	Ringing (ME is ready for commands from TA/TE, but the ringer is active)																	
	4	Call in progress (ME is ready for commands from TA/TE, but a call is in progress)																	
	5	Asleep (ME is unable to process commands from TA/TE because it is in a low function-ality state)																	

5.17. +CSQ Command: Signal Quality

HL7588	
<i>Test command</i> <u>Syntax</u> AT+CSQ=?	<u>Response</u> +CSQ: (list of supported <rssi>s),(list of supported <ber>s) OK
<i>Execute command</i> <u>Syntax</u> AT+CSQ	<u>Response</u> +CSQ: <rssi>,<ber> or +CME ERROR: <err>

HL7588	
	<u>Parameters</u> <rss> Received signal strength indication 0 -113 dBm or less 1 – 30 -111 to -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 in the table in 3GPP TS 45.008 [20] subclause 8.2.4 99 Not known or not detectable
<u>Notes</u>	- For LTE, <rss> is scaled from the current radio signal strength (RSRP) value of the serving cell. RSRP is defined according to 3GPP TS 36.133 section 9.1.4, from -140 dBm to -44 dBm with 1 dB resolution. - For LTE, <ber> is scaled to 0 – 7 from RSRQ signal quality 34 – 0. RSRQ is defined according to specification 3GPP 36.133 section 9.1.7, from -19.5 dBm to -3 dBm with 0.5 dB resolution.

5.18. +KCELL Command: Cell Environment Information

HL7588							
<i>Test command</i>							
<u>Syntax</u> AT+KCELL=?	<u>Response</u> +KCELL: (list of supported <revision>s) OK						
<i>Read command</i>							
<u>Syntax</u> AT+KCELL?	<u>Response</u> OK						
<i>Write command</i>							
<u>Syntax</u> AT+KCELL= <revision>	<u>Response</u> For UMTS cells: +KCELL: <nbUMTScells>[,<cell_type_k>,<dl_UARFCN_k>,<PLMN_k>,<LAC_k>,<UMTS_CI_k>,<scrambling_code_k>,<rscp_k>,<ecno_k>[,<pathloss_k>]][...] For LTE cells: +KCELL: <nbLTEcells>[,<cell_type>,<PLMN>,<LTE_CI>,<PhyCellInd>,<trackingAreaCode>,<RSRRResult>,<RSRQResult>,<TA>][<cell_type>,[<Earfcn>,<PhyCellID>,<RSRPResult>,<RSRQResult>]]][...] OK <u>Parameters</u> <revision> Reserved for future development (only 0 for the moment) <cell_type> <table> <tr> <td>2</td><td>UMTS serving cell</td></tr> <tr> <td>3</td><td>UMTS neighbor cell</td></tr> <tr> <td>4</td><td>UMTS detected cell</td></tr> </table>	2	UMTS serving cell	3	UMTS neighbor cell	4	UMTS detected cell
2	UMTS serving cell						
3	UMTS neighbor cell						
4	UMTS detected cell						

HL7588	
	5 LTE serving cell 6 LTE neighbor cell <nbUMTScells> Number of UMTS base stations available ($0 \leq k \leq 25$) <dl_UARFCN> DL UARFCN of serving cell in decimal format. The range can be found in 3GPP TS 25.101 <PLMN> PLMN identifiers (3 bytes) in hexadecimal format, made of MCC (Mobile Country Code), and MNC (Mobile Network Code) <LAC> Location Area in hexadecimal format, 4 digits <UMTS_CI> Cell ID, 8 hexadecimal digits, 32 bits <scrambling code> 0 – 511 The downlink scrambling code in decimal format <rscp> Received Signal Code Power. Power level in one chip. Range = 0 – 91, invalid/default value = <u>255</u> <ecno> Ratio of energy per modulating bit to the noise spectral density. This is the cell quality and is equal to RSCP/RSSI energy per chip/noise. Range = 0 – 24, invalid/default value = <u>255</u> <pathloss> Path loss in decimal format. Range = 46 dB to 158 dB; set to 255 if not available <nbLTEcells> Number of LTE base stations available ($0 \leq k \leq 33$) <LTE_CI> Cell Identity in 8 hexadecimal digits with length = 28 bits. (Ref: 3GPP TS 36.331, 6.3.4, CellIdentity IE) <Earfcn> The carrier frequency of the neighbor cell designated by the EUTRA Absolute Radio Frequency Channel Number (EARFCN), valid range: 0 – 0xFFFF. (Ref: 3GPP TS 36.101, 5.7.3) <PhyCellInd> Physical Cell ID (Ref: 3GPP TS 36.331, 6.3.4, PhysCellId IE) Integer type with range = 0 – 503 <TrackingAreacode> Tracking Area Code (Ref: 3GPP TS 36.331, 6.3.4, Tracking AreaCode IE) Integer type with length = 16 bits <RSRRResult> Reference Signal Received Power (Ref: 3GPP TS 36.331, 6.3.5, RSRP-Range IE) Integer type with range = 0 – 97 <RSRQResult> Reference Signal Received Quality (Ref: 3GPP TS 36.331, 6.3.5, RSRQ-Range IE) Integer type with range = 0 – 34 <TA> Timing Advance (as per [3GPP 36.321]). Integer type with range = 0 – 1282
Reference Sierra Wireless Proprietary	<u>Notes</u> • This command provides information related to the network environment and can be used, for example, for localization calculation. • SIM card must be inserted to support this command. The cell information can only be retrieved when the UE stays in an attached mode. • If no cell information is provided but the radio access technology is supported, +KCELL:0 is returned.

5.19. +KGPIO Command: Hardware IO Control

HL7588																			
Test command																			
<u>Syntax</u> AT+KGPIO=?	<u>Response</u> +KGPIO: (list of supported <IO>s),(list of supported <cde>s) OK																		
Read command																			
<u>Syntax</u> AT+KGPIO?	<u>Response</u> OK																		
Write command	<u>Response</u> If <cde> = 2: +KGPIO: <IO>, <current_value> OK Else OK <u>Parameters</u> <table><tr><td><IO></td><td>1 – 8, 10, 11, 13 – 15</td><td>Selected IO</td></tr></table> <table><tr><td><cde></td><td>0</td><td>Reset the selected IO</td></tr><tr><td></td><td>1</td><td>Set the selected IO</td></tr><tr><td></td><td>2</td><td>Request the current value of the IO</td></tr></table> <table><tr><td><current_value></td><td>0</td><td>GPIO is Low</td></tr><tr><td></td><td>1</td><td>GPIO is High</td></tr></table>	<IO>	1 – 8, 10, 11, 13 – 15	Selected IO	<cde>	0	Reset the selected IO		1	Set the selected IO		2	Request the current value of the IO	<current_value>	0	GPIO is Low		1	GPIO is High
<IO>	1 – 8, 10, 11, 13 – 15	Selected IO																	
<cde>	0	Reset the selected IO																	
	1	Set the selected IO																	
	2	Request the current value of the IO																	
<current_value>	0	GPIO is Low																	
	1	GPIO is High																	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The current configuration is saved in non-volatile memory over module reboot. - Check the configuration of +KGPIOCFG when +CME ERROR: 3 is issued. - By default, GPIO 3 is used by SIM detection and cannot be reconfigured unless the pin is released by SIM detection command +KSIMDET. - The test command AT+KGPIO=? returns a dynamic list of supported GPIOs; GPIOs assigned to a specific purpose are not listed. - This command can be used without SIM.																		
<u>Examples</u>	Make GPIO1 output high/low level AT+KGPIOCFG=1,0,2 // Configure GPIO1 as output mode; <pull mode> must // be "no pull" OK AT+KGPIO=1,1 // Set GPIO1 OK AT+KGPIO=1,0 // Reset GPIO1 OK Define input/output mode for GPIO1 AT+KGPIOCFG=1,1,0 // Configure GPIO1 as input mode;<pull mode> is "pull // down" OK																		

HL7588	
	AT+KGPIO=1,2 // Request the current value of GPIO1 +KGPIO: 1,1 // Value is HIGH for GPIO1 OK at+kgpio=? +KGPIO: (1,2,4,5,6,7,8,10,11,13,14,15),(0-2) // GPIO 3 is used for SIM detection OK at+kgpio=? +KGPIO: (1,2,3,4,5,6,7,8,10,11,13,14,15),(0-2) // GPIO 3 is not used for SIM detection OK at+kgpio=9,1 // Set GPIO9, and it should return ERROR +CME ERROR: 3

5.20. +KGPIOCFG Command: GPIO Configuration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KGPIOCFG=?	<u>Response</u> +KGPIOCFG: (list of supported <n>s),(list of supported <dir>s), (list of supported <pull mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KGPIOCFG?	<u>Response</u> +KGPIOCFG: <n>,<dir>,<pull mode>[<CR><LF> +KGPIOCFG: <n>,<dir>,<pull mode> [...] OK
<i>Write command</i>	
<u>Syntax</u> AT+KGPIOCFG=<n>,<dir>,<pull mode>	<u>Response</u> OK <u>Parameters</u> <n> 1 – 8, 10, 11, 13 – 15 GPIO number <dir> Direction 0 Output 1 Input <pull mode> 0 Pull down. Internal pull down resistor available. Only used in input mode 1 Pull up. Internal pull up resistor available. Only used in input mode 2 No pull. Internal pull up/down resistor NOT available. Only used in output mode

HL7588	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This command provides configuration for +KGPIO command. • The current configuration is saved in non-volatile memory before a reset. • By default, GPIO 3 is used by SIM detection and cannot be reconfigured unless the pin is released by SIM detection command +KSIMDET. • Pull down/up mode provides a stable input level. • Commands AT+KGPIOCFG=? and AT+KGPIOCFG? return a dynamic list of supported GPIOs. GPIOs assigned to a specific purpose are not listed. • This command can be used without SIM.
<u>Examples</u>	<pre> at+kgpiocfg=1,0,0 // When setting GPIO1 as Output, with incorrect <pull mode> ERROR at+kgpiocfg=1,0,1 // When setting GPIO1 as Output, with incorrect <pull mode> ERROR at+kgpiocfg=1,0,2 // When setting GPIO1 as Output, with correct <pull mode> OK at+kgpiocfg=1,1,0 // When setting GPIO1 as Input, with pull down OK at+kgpiocfg=1,1,1 // When setting GPIO1 as Input, with pull up OK at+kgpiocfg=1,1,2 // When setting GPIO1 as Input, with incorrect <pull mode> ERROR at+kgpiocfg=? +KGPIOCFG: (1,2,4,5,6,7,8,10,11,13,14,15),(0-1),(0-2) //GPIO 3 is used for SIM detection OK at+kgpiocfg=? +KGPIOCFG: (1,2,3,4,5,6,7,8,10,11,13,14,15),(0-1),(0-2) //GPIO 3 is not used for SIM //detection OK at+kgpiocfg? // GPIO 9 is not available for use +KGPIOCFG: 1,0,2 +KGPIOCFG: 2,0,2 +KGPIOCFG: 4,0,2 +KGPIOCFG: 5,0,2 +KGPIOCFG: 6,0,2 +KGPIOCFG: 7,0,2 +KGPIOCFG: 8,0,2 +KGPIOCFG: 10,0,2 +KGPIOCFG: 11,0,2 +KGPIOCFG: 13,0,2 +KGPIOCFG: 14,0,2 +KGPIOCFG: 15,0,2 OK at+kgpiocfg=9,1,0 // When setting GPIO9, it returns ERROR +CME ERROR: 3 </pre>

5.21. +KADC Command: Analog Digital Converter

HL7588											
<i>Test command</i> <u>Syntax</u> AT+KADC=?	<u>Response</u> +KADC: (list of supported <Meas id>s),(list of supported <Meas time>s) OK										
<i>Read command</i> <u>Syntax</u> AT+KADC= <Meas id>, <Meas time>	<u>Response</u> +KADC: <Meas result>,<Meas id>,<Meas time>[,<Temperature>] <u>Parameters</u> <Meas id> Measurement ID 0 VBATT – “VBATT” voltage 1 VCOIN – “BAT_RTC” backup battery voltage 2 THERM – Connected to RT400 (the thermistor on board which is located close to the 26MHz VCTCXO) 3 Reserved 4 Reserved 5 Reserved 6 Reserved 7 ADC1 <Meas time> Measurement time 1 During TX 2 Far from TX 3 No constraint <Meas result> Measurement result is in μV <Temperature> Temperature in degrees Celsius										
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • 10 bits converter • VBATT does not support no constraint measurement time • This AT command does not require a SIM card • Available range for voltage input are as follows: <table> <thead> <tr> <th><Meas id></th><th>Range (V)</th></tr> </thead> <tbody> <tr> <td>VBATT</td><td>3.2 - 4.5</td></tr> <tr> <td>VCOIN</td><td>0 - 1.8</td></tr> <tr> <td>THERM</td><td>0 - 1.2</td></tr> <tr> <td>ADC1</td><td>0 - 1.2</td></tr> </tbody> </table>	<Meas id>	Range (V)	VBATT	3.2 - 4.5	VCOIN	0 - 1.8	THERM	0 - 1.2	ADC1	0 - 1.2
<Meas id>	Range (V)										
VBATT	3.2 - 4.5										
VCOIN	0 - 1.8										
THERM	0 - 1.2										
ADC1	0 - 1.2										

5.22. +CSIM Command: Generic SIM Access

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CSIM=?	<u>Response</u> OK
<i>Write command</i>	
<u>Syntax</u> AT+CSIM= <length>, <command>	<u>Response</u> +CSIM: <length>,<response> OK or +CME ERROR: <err> <u>Parameters</u> <length> Integer type; length of the characters that are sent to TE in <command> or <response> <command> Command passed on by MT to the SIM in hexadecimal format <response> Response to the command passed on by the SIM to the MT in hexadecimal format

5.23. +KSIMDET Command: SIM Detection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KSIMDET=?	<u>Response</u> +KSIMDET: (list of supported <mod>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KSIMDET?	<u>Response</u> +KSIMDET: <mod> OK
<i>Write command</i>	
<u>Syntax</u> AT+KSIMDET= <mod>	<u>Response</u> OK <u>Parameters</u> <mod> 0 Disable SIM detection 1 Enable SIM detection
<u>Notes</u>	- If a change in the SIM status is detected, the module is notified by URC +SIM: <status>, where <status> = 0 means the SIM is extracted and <status> = 1 means the SIM is inserted. - This command can be used without a SIM card. <mod> setting is kept even after the module reboots.

HL7588Examples

```

<A SIM card is inserted>
AT+KSIMDET?           // read current setting
+KSIMDET: 1
OK

+SIM: 0               // Active SIM card is removed
+SIM: 1               // Active SIM card is inserted

AT+KSIMDET=?          // check supported setting
+KSIMDET: (0-1)
OK

AT+KSIMDET=0          // disable SIM detection
OK

<No URC indication when SIM card is removed or inserted>
AT+KSIMDET?           // read current setting
+KSIMDET: 0
OK

<Reboot module>
AT+KSIMDET?           // read current setting
+KSIMDET: 0
OK

```

5.24. +CLAN Command: Read Language

HL7588*Test command*Syntax**AT+CLAN=?**Response**OK***Read command*Syntax**AT+CLAN?**Response**+CLAN: <In>**Parameter

<In> Two letter abbreviation of the language. The language codes, as defined in ISO 639, consists of two characters, e.g. "sv", "en" etc.

5.25. +CCHO Command: Open Logical Channel

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CCHO=?	<u>Response</u> OK
<i>Write command</i>	
<u>Syntax</u> AT+CCHO= <dfname>	<u>Response</u> <session_id> OK or +CME ERROR: <err> <u>Parameters</u> <dfname> DF name coded on 1 to 16 bytes that references to all selectable application in the UICC <session_id> Session ID to be used in order to target a specific application on the smart card using logical channels mechanism (string without double quotes that represents a decimal value).
<u>Notes</u>	The +CCHO execute command gives the <session_id> when it receives SIM application response status words as shown below: • '90' '00' – normal ending of the command • '91' 'XX' – normal ending of the command with extra information from the proactive UICC containing a command for the terminal.length 'XX' of the response data • '92' 'XX' – normal ending of the command with extra information concerning an ongoing data transfer session

5.26. +CCHC Command: Close Logical Channel

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CCHC=?	<u>Response</u> OK
<i>Write command</i>	
<u>Syntax</u> AT+CCHC= <session_id>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <session_id> Session ID to be used in order to target a specific application on the smart card using logical channels mechanism (string without double quotes that represents a decimal value).

5.27. +CGLA Command: Generic UICC Logical Channel Access

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CGLA= <sessionid> , <length> , <command>	<u>Response</u> +CGLA: <length>,<response> OK or +CME ERROR: <err> <u>Parameters</u> <sessionid> Integer type; used as the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0"). <length> Integer type; length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response). <command> Command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 in hexadecimal format (refer to +CSCS). <response> Response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101 in hexadecimal format (refer to +CSCS).

5.28. +CRLA Command: Restricted UICC Logical Channel Access

HL7588							
<i>Write command</i>							
<u>Syntax</u> AT+CRLA= <sessionid> , <command> [,<file id>[,<P1> , <P2>,<P3> [,<data> [,<pathid>]]]]>	<u>Response</u> +CRLA: <sw1>,<sw2>[,<response>] OK or +CME ERROR: <err> <u>Parameters</u> <sessionid> Integer type which identifies the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0"). <command> <table> <tr> <td>176</td><td>READ BINARY</td></tr> <tr> <td>178</td><td>READ RECORD</td></tr> <tr> <td>192</td><td>GET RESPONSE</td></tr> </table>	176	READ BINARY	178	READ RECORD	192	GET RESPONSE
176	READ BINARY						
178	READ RECORD						
192	GET RESPONSE						

HL7588	
	214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS 219 SET DATA All other values are reserved <fileid> Integer type that identifies the elementary datafile on SIM. Mandatory for every <command> except STATUS. <P1>, <P2>, <P3> Integer type; parameters passed on by the MT to the UICC. These parameters are mandatory for every command, except GET RESPONSE and STATUS. <data> Information which shall be written to the SIM in hexadecimal format <pathid> String type containing the path of an elementary file on the UICC in hexadecimal format. <sw1>, <sw2> Integer type; information from the UICC about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command <response> Response of a successful completion of the command previously issued in hexadecimal format. STATUS and GET RESPONSE returns data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer to 3GPP TS 31.101). After READ BINARY, READ RECORD or RETRIEVE DATA command the requested data will be returned.
<u>Notes</u>	By using this command instead of generic UICC access command, +CGLA, the TE application has an easier but more limited access to the UICC database.

5.29. +CUAD Command: UICC Application Discovery

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CUAD=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+CUAD	<u>Response</u> <response> OK or +CME ERROR: <err> <u>Parameter</u> <response> Content of the EFDIR. String type in hexadecimal format.

5.30. +CRSM Command: Restricted SIM Access

HL7588	
Test command	
<u>Syntax</u> AT+CRSM=?	<u>Response</u> OK
Write command	
<u>Syntax</u> AT+CRSM= <command> [,<fileid>,<P1>, <P2>,<P3> [,<data> [,<pathid>]]]]	<u>Response</u> +CRSM: <sw1>,<sw2>[,<response>] OK or +CME ERROR: <err> <u>Parameters</u> <command> 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS <fileid> Integer type; this is the identifier of an elementary data file on the SIM. Mandatory for every command except STATUS. 28423 IMSI file (6F07) 28473 ACM file (6F39) 28481 PUKT file (6F41) 28482 SMS file (6F42) <P1>, <P2>, <P3> Integer type defining the request. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 51.011 <data> Information which shall be written to the SIM (hexadecimal character format; refer +CSCS) <sw1>, <sw2> Integer type containing SIM information 0x90 0x00 Normal entry of the command 0x9F 0xXX Length XX of the response data 0x92 0x0X Update successful but after using an internal retry routine X times 0x92 0x40 Memory problem 0x94 0x00 No EF selected 0x94 0x02 Out of range (invalid address) 0x94 0x04 File ID not found; pattern not found 0x94 0x08 File is inconsistent with the command 0x98 0x02 No CHV initialized 0x98 0x04 Access cond. Not fulfilled / unsuccessful CHV verify / authentication failed 0x98 0x08 In contradiction with CHV status 0x98 0x10 In contradiction with invalidation status 0x98 0x40 Unsucc. CHV-verif. Or UNBLOCK CHF / CHV blocked /UNBL.blocked 0x98 0x50 Increase can not be performed. Maximum value reached 0x61 0xXX SW2 indicates the number of response bytes still available. Use Get Response to access this data.

HL7588

0x62 0xXX	Warning - state unchanged
0x62 0x00	Warning - no information provided
0x62 0x81	Warning - part of returned data may be corrupt
0x62 0x82	Warning - end of file/record reached (bad cmd)
0x62 0x83	Warning - selected file invalidated
0x62 0x84	Warning - bad file control information format
0x63 0xXX	Warning - state unchanged
0x63 0x00	Warning - no information provided
0x63 0x81	Warning - file filled up with last write
0x63 0xCx	Warning - counter value is x
0x64 0xXX	Error - state unchanged
0x65 0xXX	Error - state changed
0x65 0x00	Error - no information provided
0x65 0x81	Error - memory failure 66 xx Security Error
0x66 0xXX	Security Error
0x67 0xXX	Incorrect parameter P3
0x68 0xXX	Check Error - CLA function not supported
0x68 0x00	Check Error - no information provided
0x68 0x81	Check Error - logical channel not supported
0x68 0x82	Check Error - secure messaging not supported
0x69 0xXX	Check Error - command not allowed
0x69 0x00	Check Error - no information provided
0x69 0x81	Check Error - command incompatible with file structure
0x69 0x82	Check Error - security status not satisfied
0x69 0x83	Check Error - authentication method blocked
0x69 0x84	Check Error - referenced data invalidated
0x69 0x85	Check Error - conditions of use not satisfied
0x69 0x86	Check Error - command not allowed (no current EF)
0x69 0x87	Check Error - expected SM data objects missing
0x69 0x88	Check Error - SM data objects incorrect
0x6A 0xXX	Check Error - wrong parameters
0x6A 0x00	Check Error - no information provided
0x6A 0x80	Check Error - incorrect parameters in data field
0x6A 0x81	Check Error - function not supported
0x6A 0x82	Check Error - file not found
0x6A 0x83	Check Error - record not found
0x6A 0x84	Check Error - not enough memory space in the file
0x6A 0x85	Check Error - Lc available on with TLV structure
0x6A 0x86	Check Error - available on parameters P1-P2
0x6A 0x87	Check Error - Lc available on with P1-P2
0x6A 0x88	Check Error - referenced data not found
0x6B 0xXX	Incorrect parameter P1 or P2
0x6C 0xXX	Check Error - wrong length - xx is the correct length
0x6D 0xXX	Unknown instruction code given in the command
0x6E 0xXX	Wrong instruction class given in the command
0x6F 0xXX	Technical problem with no diagnostic given

<response> Response of successful completion of the command previously issued in hexadecimal character format; refer to +CSCS, STATUS and GET RESPONSE returns data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer to GSM 51.011 [28]). After READ BINARY or READ RECORD commands, the requested data will be returned. <response> is not returned after a successful UPDATE BINARY or UPDATE RECORD command.

HL7588	
	<pathid> String type that contains the path of an elementary file on the SIM/USIM in hexadecimal format as defined in ETSI TS 102 221 (e.g. "7F205F70" in SIM and USIM case).
<u>Notes</u>	By using this command instead of generic SIM access command, +CSIM, the DTE application has an easier but more limited access to the SIM database.

5.31. +CEAP Command: EAP Authentication

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CEAP= <dfname> , <EAPMethod> , <EAP packet data>[,<DFeap>]	<u>Response</u> +CEAP: <EAPsessionid>,<EAP packet response> OK or +CME ERROR: <err> <u>Parameters</u> <dfname> String type in hexadecimal format. All selectable applications are represented in the UICC by an AID coded on 1 to 16 bytes. <EAPMethod> String type in hexadecimal format. The value range for 1 byte format and for 8 bytes expanded format is defined in RFC 3748. <EAP packet data> String type in hexadecimal format <DFeap> String type in hexadecimal format <EAPsessionid> 1 – 4294967295 Identifier of the EAP session to be used in order to retrieve the EAP parameters with +CERP command. <EAP packet response> String type in hexadecimal format

5.32. +CERP Command: EAP Retrieve Parameters

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT+CERP= <EAPsessionid> , <EAPparameter>	<u>Response</u> +CERP: <EAP parameter response> OK or +CME ERROR: <err>

HL7588	
	<u>Parameters</u> <EAPparameter> 1 Keys 2 Status 3 Identity 4 Pseudonym <EAPsessionid> 1 – 4294967295 Identifier of the EAP session to be used in order to retrieve the EAP parameters corresponding to an active EAP session. <EAP parameter response> String type in hexadecimal format

5.33. +KTEMPMON Command: Temperature Monitor

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KTEMPMON=?	<u>Response</u> +KTEMPMON: (list of supported <mod>s),(list of supported <temperature>s),(list of supported <urcMode>s),(list of supported <action>s),(list of supported <hystTime>s),(list of supported <repGPIO>s) OK
<i>Read command</i> <u>Syntax</u> AT+KTEMPMON?	<u>Response</u> +KTEMPMON: <mod>,<temperature>,<urcMode>,<action>,<hystTime>,<repGPIO> OK
<i>Write command</i> <u>Syntax</u> AT+KTEMPMON= <mod>, [<temperature> ,<urcMode> ,<action> ,<hystTime> ,<repGPIO>]]]]]	<u>Response</u> +KTEMPMON: <level>,<value> OK <u>Parameters</u> <mod> 0 Disable the module's internal temperature monitor 1 Enable the module's internal temperature monitor <temperature> Temperature limit before the module acts as defined by <action>. Default value: 0 <urcMode> 0 Disables the presentation of the temperature monitor URC 1 Enables the presentation of the temperature monitor URC <action> 0 No action 1 Automatic shut-down when the temperature is beyond <temperature> 2 The output pin <repGPIO> is tied HIGH when <temperature> is reached; when the temperature is normal the output pin <repGPIO> is tied LOW. Note that if this parameter is required, it is mandatory to set the <repGPIO> parameter.

HL7588	
	<hyst_time> 0 – 255 Hysteresis time in seconds. Action will only happen if <temperature> is maintained for at least as long as this period. This parameter is mandatory if <action> is not zero. Default value: 30. <repGPIO> 1 – 8, 10, 11, 13 – 15 Defines which GPIO is used as output pin. This parameter is mandatory only if <action>=2 is required. Default value: 6.
<u>Notes</u>	- When the module's internal temperature reaches either operating or extreme levels; the unsolicited message is in the format: +KTEMPMEAS: <level>,<value> where: <level> is the threshold level: -2 Extreme temperature lower bound (-40°C) -1 Operating temperature lower bound (-20°C) 0 Normal temperature 1 Operating temperature upper bound (+55°C) 2 Extreme temperature upper bound (+85°C) <value> is the actual temperature expressed in degrees Celsius - Due to temperature measurement uncertainty, there is a tolerance of $\pm 2^{\circ}\text{C}$. - Check available GPIOs with +KGPIOCFG when using this command.

5.34. +KBND Command: Current Networks Band Indicator

HL7588																			
<i>Test command</i>																			
<u>Syntax</u> AT+KBND=?	<u>Response</u> +KBND: (list of supported <bnd>s) OK																		
<i>Read command</i>																			
<u>Syntax</u> AT+KBND?	<u>Response</u> +KBND: <bnd> OK																		
	<u>Parameters</u> <table> <tr> <td><bnd></td><td>Band in hexadecimal format</td></tr> <tr> <td>0x0000</td><td>Not available</td></tr> <tr> <td>0x00000020</td><td>BAND_UMTS_II (1900 MHz)</td></tr> <tr> <td>0x00000040</td><td>BAND_UMTS_V (850 MHz)</td></tr> <tr> <td>0x00000800</td><td>BAND_LTE_2 (1900 MHz)</td></tr> <tr> <td>0x00002000</td><td>BAND_LTE_4 (1700 MHz)</td></tr> <tr> <td>0x00004000</td><td>BAND_LTE_5 (850 MHz)</td></tr> <tr> <td>0x00010000</td><td>BAND_LTE_13 (700 MHz)</td></tr> <tr> <td>0x00020000</td><td>BAND_LTE_17 (700MHz)</td></tr> </table>	<bnd>	Band in hexadecimal format	0x0000	Not available	0x00000020	BAND_UMTS_II (1900 MHz)	0x00000040	BAND_UMTS_V (850 MHz)	0x00000800	BAND_LTE_2 (1900 MHz)	0x00002000	BAND_LTE_4 (1700 MHz)	0x00004000	BAND_LTE_5 (850 MHz)	0x00010000	BAND_LTE_13 (700 MHz)	0x00020000	BAND_LTE_17 (700MHz)
<bnd>	Band in hexadecimal format																		
0x0000	Not available																		
0x00000020	BAND_UMTS_II (1900 MHz)																		
0x00000040	BAND_UMTS_V (850 MHz)																		
0x00000800	BAND_LTE_2 (1900 MHz)																		
0x00002000	BAND_LTE_4 (1700 MHz)																		
0x00004000	BAND_LTE_5 (850 MHz)																		
0x00010000	BAND_LTE_13 (700 MHz)																		
0x00020000	BAND_LTE_17 (700MHz)																		
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This command returns the UMTS or LTE band that the module currently uses. - A SIM card must be inserted to support this command.																		

5.35. +KSRAT Command: Set Radio Access Technology

HL7588													
<i>Test command</i>													
<u>Syntax</u> AT+KSRAT=?	<u>Response</u> +KSRAT: (list of supported <mode> s) OK												
<i>Read command</i>													
<u>Syntax</u> AT+KSRAT?	<u>Response</u> +KSRAT: <mode> OK												
<i>Write command</i>													
<u>Syntax</u> AT+KSRAT= <mode>	<u>Response</u> OK <u>Parameter</u> <table><tr><td><mode></td><td>2</td><td>UMTS only</td></tr><tr><td></td><td>5</td><td>LTE only</td></tr><tr><td></td><td>6</td><td>Search for UMTS first</td></tr><tr><td></td><td>7</td><td>Search for LTE first</td></tr></table>	<mode>	2	UMTS only		5	LTE only		6	Search for UMTS first		7	Search for LTE first
<mode>	2	UMTS only											
	5	LTE only											
	6	Search for UMTS first											
	7	Search for LTE first											
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This command works without a SIM. • <mode> is automatically stored in non-volatile memory. • Settings take effect immediately.												

5.36. +CTZU Command: Automatic Time Zone Update

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CTZU=?	<u>Response</u> +CTZU: (list of supported <onoff>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CTZU?	<u>Response</u> +CTZU: <onoff> OK

HL7588							
<i>Write command</i>							
<u>Syntax</u> AT+CTZU =<onoff>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <table><tr><td><onoff></td><td>0</td><td>Disable automatic time zone update via NITZ</td></tr><tr><td></td><td>1</td><td>Enable automatic time zone update via NITZ</td></tr></table>	<onoff>	0	Disable automatic time zone update via NITZ		1	Enable automatic time zone update via NITZ
<onoff>	0	Disable automatic time zone update via NITZ					
	1	Enable automatic time zone update via NITZ					
<u>Notes</u>	• <onoff> is saved in non-volatile memory over module reboot. • CTZU (onoff=1) is enabled by default for proper Verizon Administration (SIM provision, OMADM, etc.)						

5.37. +CTZR Command: Time Zone Reporting

HL7588							
Test command							
<u>Syntax</u> AT+CTZR=?	<u>Response</u> +CTZR: (list of supported <onoff>s) OK						
Read command							
<u>Syntax</u> AT+CTZR?	<u>Response</u> +CTZR: <onoff> OK						
Write command							
<u>Syntax</u> AT+CTZR =<onoff>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <table><tr><td><onoff></td><td>0</td><td>Disable time zone change event reporting</td></tr><tr><td></td><td>1</td><td>Enable time zone change event reporting</td></tr></table>	<onoff>	0	Disable time zone change event reporting		1	Enable time zone change event reporting
<onoff>	0	Disable time zone change event reporting					
	1	Enable time zone change event reporting					
Unsolicited Notification	<u>Response</u> +CTZV: <tz>,<time> XNITZINFO: <timezone_variance>,<time> +CTZDST: <dst> <u>Parameters</u> <tz> Integer value indicating the time zone <time> String type value in format “YY/MM/dd,hh:mm:ss” wherein the characters indicate year, month, date, hour, minutes and seconds.						

HL7588	
	<dst> Daylight savings time value 0 Disable time zone change event reporting and URC +XNITZINFO, +CTZDST 1 Enable time zone change event reporting and URC +XNITZINFO, +CTZDST <timezone_variance> String of format "GMT+HH:MM" or "GMT-HH:MM" (for example, GMT+5:30)
<u>Reference</u> [27.007] §8.41	<u>Notes</u> • The Time Zone reporting is not affected by the Automatic Time Zone setting command +CTZU. • If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed. • <onoff> is saved in non-volatile memory per AT port over module reboot.

5.38. +XDATACHANNEL Command: Configure Data Channel

HL7588																	
<i>Test command</i> <u>Syntax</u> AT+ XDATACHANNEL =?	<u>Response</u> +XDATACHANNEL: (list of <mode>s),(list of <csd_gprs_flag>s),(list of <connect_flag>s),(list of supported <cid>s) OK																
<i>Write command</i> <u>Syntax</u> AT+ XDATACHANNEL =<mode>, <csd_gprs_flag>, <ctrl_tid_path>, <tid_path> [,<connect_flag> [,<cid>]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <mode> <table> <tr> <td>0</td><td>Disable routing</td></tr> <tr> <td>1</td><td>Enable routing</td></tr> <tr> <td>2</td><td>Query current setting for the channel where the command is executed (other parameters will be ignored)</td></tr> </table> <csd_gprs_flag> <table> <tr> <td>0</td><td>Configure channel for a CSD connection</td></tr> <tr> <td>1</td><td>Configure channel for a GPRS connection</td></tr> </table> <ctrl_tid_path> Terminal for which the data routing mechanism shall be enabled in string format (e.g.: "/mux/5") <tid_path> Terminal to which a data call shall be routed in string format (e.g.: "/mux/5") <connect_flag> <table> <tr> <td>0</td><td>No reporting on the data channel (neither CONNECT nor NO CARRIER)</td></tr> <tr> <td>1</td><td>Reporting on the data channel enabled (CONNECT and NO CARRIER)</td></tr> <tr> <td>2</td><td>Reporting on the control channel enabled (CONNECT and NO CARRIER)</td></tr> </table>	0	Disable routing	1	Enable routing	2	Query current setting for the channel where the command is executed (other parameters will be ignored)	0	Configure channel for a CSD connection	1	Configure channel for a GPRS connection	0	No reporting on the data channel (neither CONNECT nor NO CARRIER)	1	Reporting on the data channel enabled (CONNECT and NO CARRIER)	2	Reporting on the control channel enabled (CONNECT and NO CARRIER)
0	Disable routing																
1	Enable routing																
2	Query current setting for the channel where the command is executed (other parameters will be ignored)																
0	Configure channel for a CSD connection																
1	Configure channel for a GPRS connection																
0	No reporting on the data channel (neither CONNECT nor NO CARRIER)																
1	Reporting on the data channel enabled (CONNECT and NO CARRIER)																
2	Reporting on the control channel enabled (CONNECT and NO CARRIER)																

HL7588	
	<cid> Numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands)
<u>Notes</u>	- The control channel must be in OPEN state when the +XDATACHANNEL command is sent. +XDATACHANNEL settings will only apply while control channel DLC is OPEN and will be reset as soon as DLC is closed. - When this command is sent with <cid> parameter, then the data channel (<tid_path>) must be in OPEN state and the given <cid> should already be defined. - If the <cid> is deleted or undefined, the XDATACHANNEL settings pertaining to the <cid> are not retained. - Connection must be established (start and stop) through <ctrl_tid_path> for data to be properly routed. +XDATACHANNEL query (mode=2) does not return the <cid> associated with the control channel, as the data routing of a control channel can be configured for multiple <cid>s.

5.39. +XCELLINFO Command: Provide Cell Information

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+XCELLINFO =?	<u>Response</u> +XCELLINFO: (range of <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+XCELLINFO?	<u>Response</u> +XCELLINFO: <mode>,<type>,<MCC>,<MNC>,<LAC>,<CI>,<RxLev> [,<t_advance>] OK or +XCELLINFO: <mode>,<type>,<MCC>,<MNC>,<LAC>,<CI>,<scrambling_code>,<dl_frequency>,<rscp>,<ecn0>,<pathloss> OK or +XCELLINFO: <mode>,<type>,[[<Earfcn>,[<PhyCellID>,[<RSRPResult>,[<RSRQResult>]]]]] OK or +XCELLINFO:<mode><type><MCC>,<MNC>,<CI>,<PhyCellInd>,<TrackingAreaCode>,<RSRRResult>,<RSRQResult>,<TA> OK

HL7588	
Write command	
<u>Syntax</u> AT+XCELLINFO= <mode>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <mode> 0 Disable periodic reporting 1 Enable reporting 2 Currently not used (for backward compatibility) <type> 2 UMTS serving cell 3 UMTS neighbor cell 4 UMTS detected cell 5 LTE serving cell 6 LTE neighbor cell <RxLev> See command +CGED <t_advance> Signal strength; only valid for the serving cell <MCC> 0 – 999 Mobile country code <MNC> 0 – 999 Mobile network code <CI> Cell identity. 28-bits integer type <PhysCellId> 0 – 503 Physical cell ID <TrackingAreaCode> Tracking area code, 16-bits integer type <RSRPResult> 0 – 97 Reference signal received power <RSRQResult> 0 – 34 Reference signal reference quality <TA> 0 – 1282 Timing advance <Earfcn> Carrier frequency of the neighbor cell designated by the EUTRA absolute radio frequency <PhyCellId> 0 – 503 Physical cell ID of the neighbor cell <RSRPResult> 1 – 97 Average RSRP of the neighbor cell <RSRQResult> 0 – 34 Average RSRQ of the neighbor cell
Unsolicited Notification	<u>Response for UMTS cells:</u> +XCELLINFO:<type>,<MCC>,<MNC>,<LAC>,<CI>,<scrambling_code>,<dl_frequency>,<rscp>,<ecno>,<pathloss> <u>Response for LTE serving cell:</u> +XCELLINFO:<type>,<MCC>,<MNC>,<CI>,<PhysCellId>,<TrackingAreaCode>,<RSRPResult>,<RSRQResult>,<TA> <u>Response for LTE neighbor cell:</u> +XCELLINFO: <type>,[<Earfcn>,<PhyCellId>,<RSRPResult>,<RSRQResult>]]]]]

5.40. +KCCINFO Command: Camped Cell Information

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
Test command	
<u>Syntax</u> AT+KCCINFO=?	<u>Response</u> +KCCINFO: (range of <mode>s) OK
Read command	
<u>Syntax</u> AT+KCCINFO?	<u>Response</u> +KCCINFO: <mode>,<LAC>,<RAC>,<TAC> OK
Write command	
<u>Syntax</u> AT+KCCINFO=<mode>	<u>Response</u> OK <u>Parameters</u> <mode> 0 Camped cell parameters change event notification is disabled 1 Camped cell parameters change event notification is enabled <LAC> 4-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) <RAC> 1-byte routing area code in hexadecimal format. FF will be displayed if routing area identity information is invalid. <TAC> 2-byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal). FFFF will be displayed if tracking area identity information is invalid.
Unsolicited Notification	<u>Response</u> +KCCINFOI: <LAC>,<RAC>,<TAC>
<u>Notes</u>	• This command used to enable/disable the unsolicited response which informs about any change in camped cell parameters. • This command works with a SIM card inserted in the modem. • <mode> is automatically stored in non-volatile memory. • The setting takes effect immediately.

5.41. +KSLEEP Command: Power Management Control for UART

HL7588										
<i>Test command</i>										
<u>Syntax</u> AT+KSLEEP=?	<u>Response</u> +KSLEEP: (list of supported <mngt>s) OK									
<i>Read command</i>										
<u>Syntax</u> AT+KSLEEP?	<u>Response</u> +KSLEEP: <mngt> OK									
<i>Write command</i>										
<u>Syntax</u> AT+KSLEEP= <mngt>	<u>Response</u> OK <u>Parameters</u> <table><tr><td><mngt></td><td>0</td><td>The UART doesn't go to sleep mode as long as the DTR is active (low level). The DTR has to be active to send AT commands.</td></tr><tr><td></td><td>1</td><td>The UART decides by itself (internal timing) when it will go to sleep mode, and it will be woken up with a character.</td></tr><tr><td></td><td>2</td><td>The UART never goes in sleep mode regardless of the DTR state.</td></tr></table>	<mngt>	0	The UART doesn't go to sleep mode as long as the DTR is active (low level). The DTR has to be active to send AT commands.		1	The UART decides by itself (internal timing) when it will go to sleep mode, and it will be woken up with a character.		2	The UART never goes in sleep mode regardless of the DTR state.
<mngt>	0	The UART doesn't go to sleep mode as long as the DTR is active (low level). The DTR has to be active to send AT commands.								
	1	The UART decides by itself (internal timing) when it will go to sleep mode, and it will be woken up with a character.								
	2	The UART never goes in sleep mode regardless of the DTR state.								
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • The current configuration is kept in non-volatile memory over module reboot. • This command only controls UART power management, and does not affect the USB AT command port. • This command can be used without a SIM. • When AT+KSLEEP=1 and the module is in sleep mode, the user needs to input a character to wake the module up. After which, AT commands can be input normally.									
<u>Example</u>	AT+KSLEEP=? +KSLEEP: (0-2) OK AT+KSLEEP? +KSLEEP: 2 OK AT+KSLEEP=0 // Change settings to mode 0 OK AT+KSLEEP? +KSLEEP: 0 OK AT+KSLEEP=2 // Change settings to mode 2 OK AT+KSLEEP? +KSLEEP: 2 OK									

5.42. +HBHV Command: Configure General System Behavior

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+HBHV=?	<u>Response</u> +HBHV: (0,2,3),(0,1) +HBHV: 1,(0-2) ... OK
<i>Read command</i>	
<u>Syntax</u> AT+HBHV?	<u>Response</u> +HBHV: 0,<ppp_dun_mode> +HBHV: 1,<omadm_reg_mode>,<omadm_reg_state> +HBHV: 2,<pdp_unlock_mode> +HBHV: 3,<show_orig_apn> OK
<i>Write command</i>	
<u>Syntax</u> AT+HBHV=0, <ppp_dun_mode> AT+HBHV=1, <omadm_reg_mode> AT+HBHV=2, <pdp_unlock_mode> AT+HBHV=3, <show_orig_apn>	<u>Response</u> OK <u>Parameters</u> <ppp_dun_mode> PPP dial-up networking behavior 0 PDP context is brought up after LCP negotiation 1 PDP context is brought up before LCP negotiation <omadm_reg_mode> OMADM client bootstrapping behavior 0 Disables bootstrapping initiated by the client. This is the default value for HL7588 AT&T modules. 1 Enables bootstrapping initiated by the client on the next successful registration if the module's IMEI is used for the first time and no server initiated session has happened before. This is the default value for HL7588 Verizon modules. 2 Enables bootstrapping initiates by the client on the next successful registration regardless of the above-mentioned criteria. This bootstrap mode will be automatically changed to "1" after the server initialized session has been successfully processed. <omadm_reg_state> Bootstrap registration state 0 The client hasn't been bootstrapped yet (no server initiated session has happened before) 1 The client has been bootstrapped before with a successful server initiated session <pdp_unlock_mode> PDP unlock mode 0 Protects the reserved PDP contexts (1, 2, 11-20) from being modified accidentally. This is the default value for HL7588 Verizon modules. 1 Unlocks the protection on the reserved PDP contexts. This is the default value for HL7588 AT&T modules.

HL7588	
	<show_orig_apn> Enables showing the original APN saved in non-volatile memory (updated by AT+CGDCONT); this is effective for PDP context 1 (LTE default bearer) with PDP context reading (AT+CGDCONT?) 0 Disabled. Shows APN given by the network (e.g. "Itemobile.apn.mnc720.mcc302.gprs", "vzwims.mnc480.mcc311.gprs") 1 Enabled. Shows the original APN saved in non-volatile memory
<u>Notes</u>	- The HL7588's OMADM client supports customized bootstrapping defined in the OMADM specification, i.e. with OMADM server connection configurations preloaded. However, the module still needs to be bootstrapped before the OMADM client can work with the OMADM server. There are two mechanisms to complete this bootstrapping: - Bootstrapping initiated by the server – the IMEI/IMSI are pre-registered to the OMADM database and bootstrapping is initiated automatically by the OMADM server through a DM session; or - Bootstrapping initiated by the client – the module initiates a DM session to the OMADM server that performs the bootstrapping. - For HL7588 Verizon modules: - the default option <omadm_reg_mode>=1 enables the module to perform bootstrapping automatically via mechanism 2. - CID 1, 2 and 11-20 must be locked; <pdp_unlock_mode> must not be set to 1. - For HL7588 AT&T modules, the default option <omadm_reg_mode>=0 disables the client bootstrapping because bootstrapping should be done via a WAP bootstrap SMS. - Parameters are saved in non-volatile memory and are persistent over device reboot.

5.43. +CIREP Command: IMS Network Reporting

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CIREP=?	<u>Response</u> +CIREP: (list of supported <reporting>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CIREP?	<u>Response</u> +CIREP: <reporting>,<nwimsvops> OK or +CME ERROR: <err>
<i>Write command</i>	
<u>Syntax</u> AT+CIREP= <reporting>	<u>Response</u> OK or +CME ERROR: <err>

HL7588	
	<u>Parameters</u> <reporting> <u>0</u> Disable reporting 1 Enable reporting <nwimsvops> Gives the last IMS Voice over PS session (IMSVOPS) supported indication received from network 0 IMSVOPS support indication is not received from network, or is negative 1 IMSVOPS support indication as received from network is possible <svcch> SRVCC handover information 0 PS to CS SRVCC handover has started in the CS domain ("Handover Command" indicating SRVCC received) 1 PS to CS SRVCC handover successful ("Handover Complete" sent) 2 PS to CS SRVCC handover cancelled ("Handover Failure" sent) 3 PS to CS SRVCC handover, general non-specific failure
<i>Unsolicited Notification</i>	<u>Response</u> +CIREPI: <nwimsvops> +CIREPH: <svcch>
<u>Notes</u>	• <reporting> is saved in non-volatile memory per AT port over module reboot. • <svcch>=3, general non-specific failure, may be used, for example in the case of handover cancellation as specified in 3GPP TS 24.301 subclause 6.6.2.

5.44. +CIREG Command: Registration Information

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CIREG=?	<u>Response</u> +CIREG: (list of supported <n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CIREG?	<u>Response</u> +CIREP: <n>,<reg_info>,<ext_info> OK
<i>Write command</i>	
<u>Syntax</u> AT+CIREG=<n>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <n> Enables or disables reporting of changes in the MT's IMS registration information <u>0</u> Disable reporting 1 Enable reporting (parameter <reg_info>) 2 Enable extended reporting (parameter <reg_info> and <ext_info>)

HL7588	
	<reg_info> Indicates IMS registration status 0 Not registered 1 Registered <ext_info> Numeric value in hexadecimal format. It is the sum of hexadecimal values, each representing a particular IMS capability of the MT. This parameter is not present if the IMS registration status is "not registered" 1 RTP-based transfer of voice 2 SMS using IMS functionality 5 Both RTP-based transfer of voice according to MMTEL and SMS using IMS functionality can be used
<i>Unsolicited Notification</i>	<u>Response</u> +CIREGU: <reg_info>[,<ext_info>]
<u>Notes</u>	<n> is saved in non-volatile memory per AT port over module reboot.

5.45. +GST Command: General System Status Information

HL7588										
Test command										
<u>Syntax</u> AT+GST=?	<u>Response</u> +GST: (list of supported <mode>s) OK									
Read command										
<u>Syntax</u> AT+GST?	<u>Response</u> ... (display all responses of <mode>s) OK									
Write command										
<u>Syntax</u> AT+GST=<mode>	<u>Response</u> For <mode>=0: ... (display all responses of <mode>s) OK For <mode>=1: +GST: <rtc_time>,<up_time> OK For <mode>=2: +GST: <port device string> OK <u>Parameters</u> <table><tr><td><mode></td><td>0</td><td>Display all status information</td></tr><tr><td></td><td>1</td><td>Display the RTC time in seconds since 1970 Jan 1, and system boot up time in seconds</td></tr><tr><td></td><td>2</td><td>Display module port device string (e.g. /USBCDC/0)</td></tr></table>	<mode>	0	Display all status information		1	Display the RTC time in seconds since 1970 Jan 1, and system boot up time in seconds		2	Display module port device string (e.g. /USBCDC/0)
<mode>	0	Display all status information								
	1	Display the RTC time in seconds since 1970 Jan 1, and system boot up time in seconds								
	2	Display module port device string (e.g. /USBCDC/0)								

HL7588

<rtc_time> RTC time in seconds since 1970 Jan 1

<up_time> System boot up time in seconds

<port device string> String type; unique AT port device string
e.g. "/USBCDC/0"
/USBCDC/0 → ACM0 AT port
/USBCDC/2 → ACM2 AT port

5.46. +CESQ Command: Extended Signal Quality

HL7588*Test command*Syntax**AT+CESQ=?**Response

+CESQ: (list of supported **<rxlev>s**),(list of supported **<ber>s**),(list of supported **<rscp>s**),
(list of supported **<ecno>s**),(list of supported **<rsrq>s**),(list of supported **<rsrp>s**)
OK

*Execute command*Syntax**AT+CESQ**Response

+CESQ: **<rxlev>**,**<ber>**,**<rscp>**,**<ecno>**,**<rsrq>**,**<rsrp>**
OK

Parameters

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

0	rssl < -110 dBm
1	-110 dBm ≤ rssi < -109 dBm
2	-109 dBm ≤ rssi < -108 dBm
...	
61	-50 dBm ≤ rssi < -49 dBm
62	-49 dBm ≤ rssi < -48 dBm
63	-48 dBm ≤ rssi
99	not known or not detectable

<ber> Integer type; channel bit error rate (in percent)
0 – 7 As RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4
99 Not known or not detectable

<rscp> Integer type; received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3)

0	rscp < -120 dBm
1	-120 dBm ≤ rscp < -119 dBm
2	-119 dBm ≤ rscp < -118 dBm
...	
94	-27 dBm ≤ rscp < -26 dBm
95	-26 dBm ≤ rscp < -25 dBm
96	-25 dBm ≤ rscp
255	Not known or not detectable

HL7588	
	<ecno> Integer type; ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause) 0 $E_c/I_o < -24$ dB 1 $-24 \text{ dB} \leq E_c/I_o < -23.5$ dB 2 $-23.5 \text{ dB} \leq E_c/I_o < -23$ dB ... 47 $-1 \text{ dB} \leq E_c/I_o < -0.5$ dB 48 $-0.5 \text{ dB} \leq E_c/I_o < 0$ dB 49 $0 \text{ dB} \leq E_c/I_o$ 255 Not known or not detectable <rsrq> Integer type; reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7) 0 $\text{rsrq} < -19.5$ dB 1 $-19.5 \text{ dB} \leq \text{rsrq} < -19$ dB 2 $-19 \text{ dB} \leq \text{rsrq} < -18.5$ dB ... 32 $-4 \text{ dB} \leq \text{rsrq} < -3.5$ dB 33 $-3.5 \text{ dB} \leq \text{rsrq} < -3$ dB 34 $-3 \text{ dB} \leq \text{rsrq}$ 255 Not known or not detectable <rsrp> Integer type; reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4) 0 $\text{rsrp} < -140$ dBm 1 $-140 \text{ dBm} \leq \text{rsrp} < -139$ dBm 2 $-139 \text{ dBm} \leq \text{rsrp} < -138$ dBm ... 95 $-46 \text{ dBm} \leq \text{rsrp} < -45$ dBm 96 $-45 \text{ dBm} \leq \text{rsrp} < -44$ dBm 97 $-44 \text{ dBm} \leq \text{rsrp}$ 255 Not known or not detectable
Notes	• If the current serving cell is not a GERAN cell, <rxlev> and <ber> are set to value 99. • If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rsrp> is set to 255. • If the current serving cell is not a UTRA FDD cell, <ecno> is set to 255. • If the current serving cell is not an E-UTRA cell, <rsrq> and <rsrp> are set to 255.

5.47. +XCSQ Command: Radio Signal Strength and Quality with URC Support

HL7588	
Test command	
Syntax AT+XCSQ=?	Response +XCSQ: (list of supported <n>s) OK

HL7588	
<i>Read command</i>	
<u>Syntax</u> AT+XCSQ?	<u>Response</u> +XCSQ: <n>,<rssi>,<ber> OK
<i>Write command</i>	
<u>Syntax</u> AT+XCSQ=<n>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <n> 0 Disable radio signal strength and quality indication URC 1 Enable radio signal strength and quality indication URC <rssi> Radio signal strength indication 0 -113 dBm or less 1 – 30 -111 to -53 dBm 31 -51 dBm or greater 99 Not known or not detectable <ber> Received signal quality. Range of values = 0 – 34 according to specification 3GPP 36.133 section 9.1.7
<i>Unsolicited Notification</i>	<u>Response</u> +XCSQ: <rssi>,<ber>

5.48. +XCESQ Command: Extended Signal Quality with URC Support

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+XCESQ=?	<u>Response</u> +XCESQ: (list of supported <n>s),(list of supported <rxlev>s),(list of supported <ber>s),(list of supported <rscp>s),(list of supported <ecno>s),(list of supported <rsrq>s),(list of supported <rsrp>s),(list of supported <rssnr>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+XCESQ?	<u>Response</u> +XCESQ: <n>,<rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<rssnr> OK
<i>Write command</i>	
<u>Syntax</u> AT+XCESQ=[<n>]	<u>Response</u> OK

HL7588

or

+CME ERROR: <err>Parameters**<rxlev>** Integer type; received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4)

0	$\text{rssi} < -110 \text{ dBm}$
1	$-110 \text{ dBm} \leq \text{rssi} < -109 \text{ dBm}$
2	$-109 \text{ dBm} \leq \text{rssi} < -108 \text{ dBm}$
...	
61	$-50 \text{ dBm} \leq \text{rssi} < -49 \text{ dBm}$
62	$-49 \text{ dBm} \leq \text{rssi} < -48 \text{ dBm}$
63	$-48 \text{ dBm} \leq \text{rssi}$
99	Not known or not detectable

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

0 – 7	As RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4
99	Not known or not detectable

<rscp> Integer type; received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3)

0	$\text{rscp} < -120 \text{ dBm}$
1	$-120 \text{ dBm} \leq \text{rscp} < -119 \text{ dBm}$
2	$-119 \text{ dBm} \leq \text{rscp} < -118 \text{ dBm}$
...	
94	$-27 \text{ dBm} \leq \text{rscp} < -26 \text{ dBm}$
95	$-26 \text{ dBm} \leq \text{rscp} < -25 \text{ dBm}$
96	$-25 \text{ dBm} \leq \text{rscp}$
255	Not known or not detectable

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

0	$\text{Ec/lo} < -24 \text{ dB}$
1	$-24 \text{ dB} \leq \text{Ec/lo} < -23.5 \text{ dB}$
2	$-23.5 \text{ dB} \leq \text{Ec/lo} < -23 \text{ dB}$
...	
47	$-1 \text{ dB} \leq \text{Ec/lo} < -0.5 \text{ dB}$
48	$-0.5 \text{ dB} \leq \text{Ec/lo} < 0 \text{ dB}$
49	$0 \text{ dB} \leq \text{Ec/lo}$
255	Not known or not detectable

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

0	$\text{rsrq} < -19.5 \text{ dB}$
1	$-19.5 \text{ dB} \leq \text{rsrq} < -19 \text{ dB}$
2	$-19 \text{ dB} \leq \text{rsrq} < -18.5 \text{ dB}$
...	
32	$-4 \text{ dB} \leq \text{rsrq} < -3.5 \text{ dB}$
33	$-3.5 \text{ dB} \leq \text{rsrq} < -3 \text{ dB}$
34	$-3 \text{ dB} \leq \text{rsrq}$
255	Not known or not detectable

HL7588	
	<rsrp> Integer type; reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4) 0 $\text{rsrp} < -140 \text{ dBm}$ 1 $-140 \text{ dBm} \leq \text{rsrp} < -139 \text{ dBm}$ 2 $-139 \text{ dBm} \leq \text{rsrp} < -138 \text{ dBm}$... 95 $-46 \text{ dBm} \leq \text{rsrp} < -45 \text{ dBm}$ 96 $-45 \text{ dBm} \leq \text{rsrp} < -44 \text{ dBm}$ 97 $-44 \text{ dBm} \leq \text{rsrp}$ 255 Not known or not detectable <rssnr> Integer type; radio signal strength noise ration value -100 $\text{RSSNR} \leq -50 \text{ dB}$ -99 $-50 \text{ dB} < \text{RSSNR} \leq -49.5 \text{ dB}$ -98 $-49.5 \text{ dB} < \text{RSSNR} \leq -49 \text{ dB}$... -1 $-1 \text{ dB} < \text{RSSNR} \leq -0.5 \text{ dB}$ 0 $-0.5 \text{ dB} < \text{RSSNR} \leq 0 \text{ dB}$ 1 $0 \text{ dB} < \text{RSSNR} \leq 0.5 \text{ dB}$... 98 $49 \text{ dB} \leq \text{RSSNR} < 49.5 \text{ dB}$ 99 $49.5 \text{ dB} \leq \text{RSSNR} < 50 \text{ dB}$ 100 $50 \text{ dB} \leq \text{RSSNR}$ 255 Not known or not detectable
Unsolicited Notification	<u>Response</u> +XCESQI: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<rssnr>
Notes	• If the current serving cell is not a GERAN cell, <rxlev> and <ber> are set to value 99. • If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rscp> and <ecno> are set to 255. • If the current serving cell is not an E-UTRA cell, <rsrq>, <rsrp> and <rssnr> are set to 255.

5.49. +WEXTCLK Command: External Clocks Setting

HL7588	
Test command	
<u>Syntax</u> AT+WEXTCLK=?	<u>Response</u> +WEXTCLK: (list of supported <output>s),(list of supported <status>es) OK
Read command	
<u>Syntax</u> AT+WEXTCLK?	<u>Response</u> +WEXTCLK: <output>,<status> +WEXTCLK: <output>,<status> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+WEXTCLK= <output>, <status>	<u>Response</u> +WEXTCLK: <output>,<status> OK <u>Parameters</u> <output> 0 32kHz output (32K_CLKOUT) 1 26MHz output (26M_CLKOUT) <status> 0 Disabled 1 Enabled
<u>Notes</u>	• This command allows generating 32 kHz and 26 MHz on the output clock pins of the module. • Parameters are saved in non-volatile memory. • This command is available when the module has finished its initialization. • This command works without SIM card.

5.50. +KRIC Command: Ring Indicator Control

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KRIC=?	<u>Response</u> +KRIC: (list of supported <masks>es),(list of supported <shape>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KRIC?	<u>Response</u> +WEXTCLK: <masks>,<shape> OK
<i>Write command</i>	
<u>Syntax</u> AT+KRIC= <masks> [,<shape>]	<u>Response</u> OK <u>Parameters</u> <masks> Use of RI signal 0x00 RI is not used 0x01 RI is activated on incoming calls (+CRING, RING) 0x02 RI is activated on SMS (+CMT, +CMTI) 0x04 RI is activated on SMS-CB (+CBM, +CBMI) 0x08 RI is activated on USSD (+CUSD) 0x10 RI is activated on network state (+CIEV) <shape> Signal shape (only available for incoming calls) 0 Repeat pulses. The total length of the pulse is equivalent to the transfer of the RING or CRING notification 1 Always active. The signal is set to be active during the whole incoming call notification

HL7588	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The current configuration is kept in non-volatile memory after a reset. - For SMS and other unsolicited messages, only one pulse is set regardless of <shape>. - The width of the pulse is 1s. For repeated pulse on incoming calls, pulse width is 1s, and then rest for 4 seconds, and then repeated. - This command should not be used during an incoming call, SMS, SMSCB, USSD, etc. - This command can be used without a SIM. - If <shape> is omitted, the previously saved value will be used.
<u>Examples</u>	<pre> AT+KRIC=? +KRIC: (0-31),(0-1) OK AT+KRIC? +KRIC: 15,0 OK AT+KRIC=1,1 //RI is always activated on incoming calls OK AT+KRIC? +KRIC: 1,1 OK AT+KRIC=2 //RI is activated on SMS OK AT+KRIC? +KRIC: 2,1 OK </pre>

5.51. +CALM Command: Alert Sound Mode

HL7588	
<u>Test command</u>	
<u>Syntax</u> AT+CALM=?	<u>Response</u> +CALM: (list of supported <mode>s) OK
<u>Read command</u>	
<u>Syntax</u> AT+CALM?	<u>Response</u> +CALM: <mode> OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+CALM= <mode>	<u>Response</u> OK <u>Parameters</u> <mode> <u>0</u> Normal mode <u>1</u> Silent mode (all sounds from the MT are prevented)
<u>Reference</u> [27.007] § 8.20	<u>Examples</u> AT+CALM? +CALM: 0 OK AT+CALM=1 OK AT+CALM=? +CALM: (0-1) OK

5.52. +CRSL Command: Ringer Sound Level

HL7588	
<i>Test command</i> <u>Syntax</u> AT+CRSL=?	<u>Response</u> +CRSL: (list of supported <level>s) OK
<i>Read command</i> <u>Syntax</u> AT+CRSL?	<u>Response</u> +CRSL: <level> OK
<i>Write command</i> <u>Syntax</u> AT+CRSL= <level>	<u>Response</u> OK <u>Parameters</u> <level> Integer type value with manufacturer specific range (smallest value represents the lowest sound level). Possible values = <u>0</u> (default), 1, 2, 3.
<u>Reference</u> [27.007] § 8.21	<u>Examples</u> AT+CRSL? +CRSL: 0 OK AT+CRSL=1 OK AT+CRSL=? +CRSL: (0-3) OK

5.53. +CPWROFF Command: Switch MS Off

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CPWROFF=?	<u>Response</u> OK
<i>Execute/Write command</i>	
<u>Syntax</u> AT+CPWROFF [=<mode>]	<u>Response</u> OK or +CME ERROR: <error> <u>Parameter</u> <mode> Power down mode 1 Fast power down mode
<u>Notes</u>	- Not specifying a parameter value for the execute command will perform normal IMSI detach before powering down. <mode>=1 will perform fast power down (~1s faster than power down mode) without an IMSI detach request being sent to the network.

5.54. +KSIMSEL Command: SIM Selection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KSIMSEL=?	<u>Response</u> +KSIMSEL: (list of supported <mode>s),(list of supported <GPIO>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KSIMSEL?	<u>Response</u> +KSIMSEL: <mode>[,<GPIO>[,<sim_used>]] OK
<i>Write command</i>	
<u>Syntax</u> AT+KSIMSEL= <mode> [, <GPIO>]	<u>Response</u> OK If <mode> = 4: +KSIMSEL: <mode>,<sim1_pres>,<sim2_pres> OK <u>Parameters</u> <mode> SIM selection mode 0 SIM selection disable 1 Force to select the 1 st external SIM. The 2 nd external SIM presence will be ignored.

HL7588	
	2 Force to select the 2nd external SIM. The 1st external SIM presence will be ignored. 3 Select the 1st external SIM if present, else select the 2nd external SIM if present. 4 Read SIM cards presence status <GPIO> 1 – 8, 10, 11, 13 – 15 GPIO to be used for external SIM selection. Default value = 6. If the value is omitted, the previously configured GPIO will be used. <sim_used> 1 The 1st external SIM currently used 2 The 2nd external SIM currently used <sim1_pres> 0 The 1st external SIM is not present 1 The 1st external SIM is present <sim2_pres> 0 The 2nd external SIM is not present 1 The 2nd external SIM is present
<u>Notes</u>	- The firmware supports DSSS – Dual SIM Single Standby. This means that only one SIM can be set as active at a time. <GPIO> would be low leveled for enabling the 1st external SIM, whereas <GPIO> would be high leveled for enabling the 2nd external SIM. <sim_used> information is only available when <mode> = 3. - Response +KSIMSEL: 4,<sim1_pres>,<sim2_pres> is only available when <mode> = 4. - This command can be used without a SIM. - Parameters <mode> and <GPIO> are saved in non-volatile memory over module reboot. - When SIM select feature is disabled, only the 1st external SIM interface is available and the dedicated GPIO is free for customer use via +KGPI0. - When <mode>=3, SIM selection is performed immediately after the user enters the AT+KSIMSEL command. No SIM selection is performed for SIM insertion or SIM removal afterwards. - Module reboot is needed when the <mode> setting is changed from enabled (<mode> = 1, 2 or 3) to disabled (<mode> = 0) and vice versa.
<u>Examples</u>	<pre> AT+KSIMSEL=? // test command +KSIMSEL: (0-4),(1-8,10-11,13-15) OK AT+KSIMSEL? // check current setting +KSIMSEL: 1,6 // 1st SIM active and GPIO 6 is used for SIM selection OK AT+KSIMSEL=2,6 // force to select the 2nd external SIM OK AT+KSIMSEL? +KSIMSEL:2,6 // 2nd SIM active and GPIO 6 is used for SIM selection OK AT+KSIMSEL=1 // force to select the 1st external SIM OK AT+KSIMSEL? +KSIMSEL:1,6 // 1st SIM active and GPIO 6 is used for SIM selection OK </pre>

HL7588	
	AT+KSIMSEL=0 // Disable SIM select functionality OK
	AT+KSIMSEL=3,6 // Enable SIM select functionality. SIM selection will be // performed. SIM slot status = the 1 st SIM is present, the 2 nd // SIM is absent OK
	AT+KSIMSEL? +KSIMSEL: 3,6,1 // SIM selection performed. GPIO 6 is used as selection pin and // the 1 st external SIM is currently activated OK
	AT+KSIMSEL=0 // Disable SIM select functionality OK
	AT+KSIMSEL=3 // Re-enable SIM select functionality. SIM selection will be // performed. SIM slot status = the 1 st SIM is absent, the 2 nd // SIM is present OK
	AT+KSIMSEL? +KSIMSEL: 3,6,2 // SIM selection performed. GPIO 6 is used as selection pin and // the 2 nd external SIM is currently activated OK
	AT+KSIMSEL=4 +KSIMSEL: 4,0,1 // 1 st external SIM is absent and 2 nd external SIM is present OK

5.55. +KUSBCOMP Command: Set USB Composition

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KUSBCOMP= ?	<u>Response</u> +KUSBCOMP: (list of supported <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KUSBCOMP?	<u>Response</u> +KUSBCOMP: <mode> OK
<i>Write command</i>	
<u>Syntax</u> AT+KUSBCOMP= <mode>	<u>Response</u> OK

HL7588	
	<u>Parameter</u> <mode> 0 3 CDC-ACM and 4 NCM, (VID: 0x0807 PID: 0x0443) NCM0 – NCM Network interface NCM1 – NCM Network interface NCM2 – NCM Network interface NCM3 – NCM Network interface USB0 – AT / modem port USB1 – Traces port USB2 – AT / modem port 1 7 CDC-ACM, (VID: 0x1519 PID: 0x0020) USB0 – AT / modem port USB1 – Traces port USB2 – AT / modem port USB3 – AT / modem port USB4 – AT / modem port USB5 – reserved port USB6 – reserved port 2 1 MBIM and 1 CDC-ACM, (VID: 0x0807 PID: 0x0911) MBIM0 – MBIM Network interface USB2 – AT / modem port
<u>Notes</u>	• The current configuration is kept in non-volatile memory. • New configuration will only be activated after the module reboots. • The factory preset value of <mode> is 0. • This command can be used without a SIM.
<u>Examples</u>	AT+KUSBCOMP=0 OK AT+KUSBCOMP=3 ERROR AT+KUSBCOMP? +KUSBCOMP: 0 OK AT+KUSBCOMP=1 OK AT+CFUN=1,1 // Reboot the module to take effect. The new mode is effective // with the USB bus re-enumerated. OK <<<< module reboots >>>>

5.56. +WMUSBVCC Command: USB VCC Detection Setting

HL7588							
<i>Test command</i>							
<u>Syntax</u> AT+WMUSBVCC=?	<u>Response</u> +WMUSBVCC: (list of supported <mode> s) OK						
<i>Read command</i>							
<u>Syntax</u> AT+WMUSBVCC?	<u>Response</u> +WMUSBVCC: <mode> OK						
<i>Write command</i>							
<u>Syntax</u> AT+WMUSBVCC=<mode>	<u>Response</u> OK <u>Parameter</u> <table><tr><td><mode></td><td><u>0</u></td><td>USB detection if Vbus > 4.75V</td></tr><tr><td></td><td><u>1</u></td><td>USB detection if Vbus > 2.5V (e.g., for PC mini-card applications)</td></tr></table>	<mode>	<u>0</u>	USB detection if Vbus > 4.75V		<u>1</u>	USB detection if Vbus > 2.5V (e.g., for PC mini-card applications)
<mode>	<u>0</u>	USB detection if Vbus > 4.75V					
	<u>1</u>	USB detection if Vbus > 2.5V (e.g., for PC mini-card applications)					
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <mode> is saved to non-volatile memory over module reset. - This command can be used without a SIM.						
<u>Examples</u>	AT+WMUSBVCC=? +WMUSBVCC: (0-1) OK AT+WMUSBVCC? +WMUSBVCC: 0 OK AT+WMUSBVCC=0 // Change setting to mode 0 OK AT+WMUSBVCC? +WMUSBVCC: 0 OK AT+WMUSBVCC=1 // Change setting to mode 1 OK AT+WMUSBVCC? +WMUSBVCC: 1 OK						

5.57. +BOOTDWLCFG Command: Boot Configuration for Firmware Download

5.57.1. Description

This command configures the USB enumeration time out and USB link time out that are used in detecting a firmware download request.

The USB link time out refers to the time out for correct “AT” start frame to start the firmware download procedure.

The flow diagram below shows the sequence in detecting a firmware download request, which always happens when the module boots or reboots.

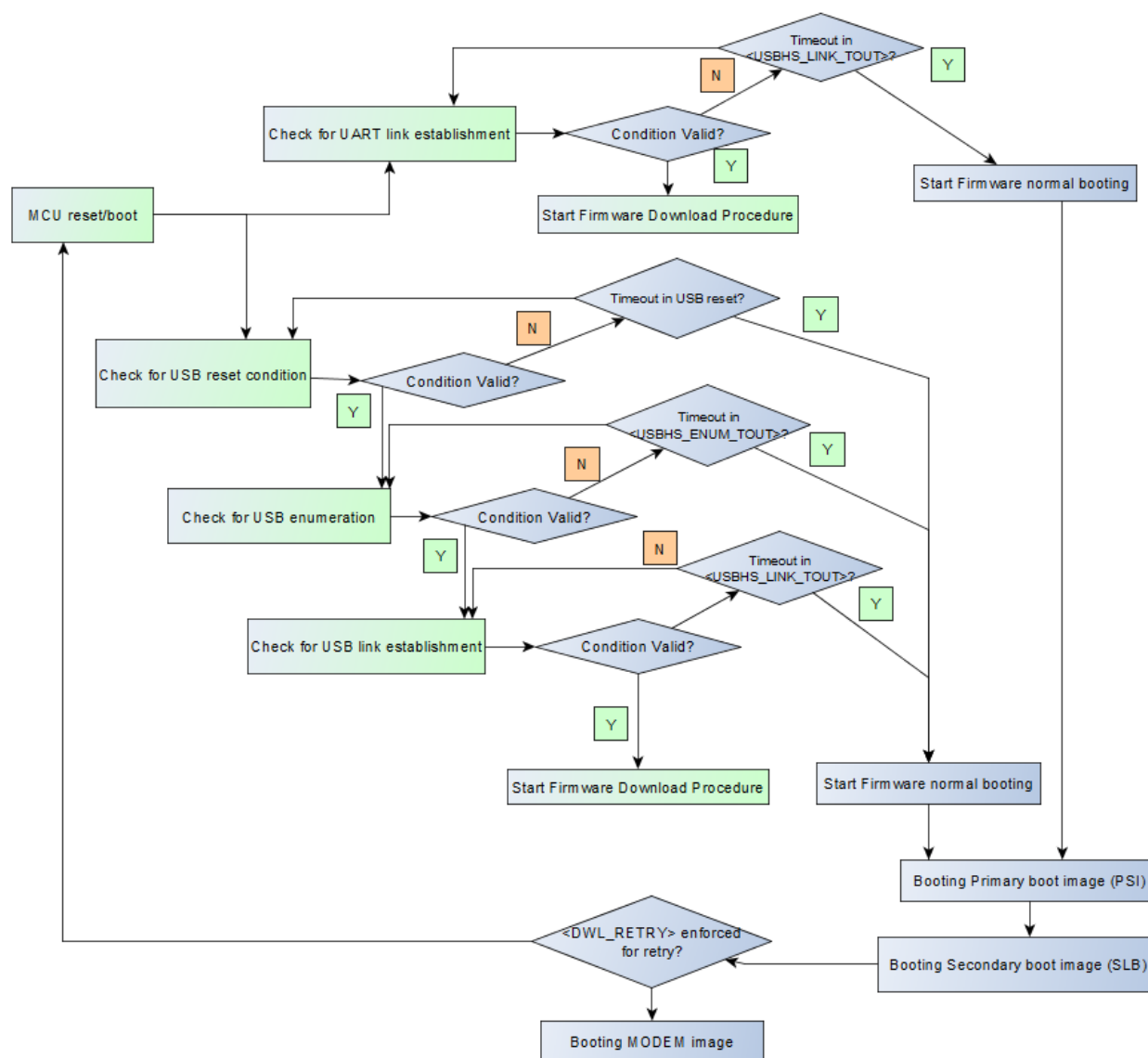


Figure 2. Firmware Download Request Detection Sequence

Basically, when the module boots, it polls the USB and UART channels in parallel for firmware download conditions.

For the USB channel, the module polls for the following conditions individually:

1. USB reset
2. USB enumeration
3. USB link establishment ("AT" start frame)

For the UART channel, the module polls for a USB link establishment ("AT" start frame) only.

If time out happens, the firmware download detection sequence breaks, and the module either boots normally or it reboots for another retry depending on the AT parameter <DWL_RETRY>.

Time out values are listed in the following table.

Table 1. Time Out Values

Time Out	Default Value	Configurable with +BOOTDWLCFG? (Possible Values)
UART link time out	150 milliseconds	No
USB reset time out	400 milliseconds	No
USB enumeration time out	3 seconds	Yes (3s, 30s, 60s, 90s)
USB link time out	1 second	Yes (1s, 30s, 60s, 90s)

If the primary boot image (PSI) is corrupted during firmware download, another set of time out values, extended timeout values, is used. The extended time out values are listed in the following table.

Table 2. Extended Time Out Values

Time Out	Value	Configurable
UART link time out	30 seconds	No
USB reset time out	3.5 seconds	No
USB enumeration time out	5 seconds	No
USB link time out	30 seconds	No

If the PSI is corrupted, the module will neither start normal booting nor reboot itself after time out. A successful firmware download is required to recover the module. Moreover, an external hardware reset will be required to start the firmware download again when the time out happens.

However, a PSI image is not usually corrupted because due to its small size (around 60kbytes in one flash block) and upgrade can be completed quickly in writing to the first NAND flash block.

5.57.2. Syntax

HL7588	
Test command	
<u>Syntax</u> AT+ BOOTDWLCFG= ?	<u>Response</u> +BOOTDWLCFG: (list of supported <USBHS_ENUM_TOUT>s),(list of supported <USBHS_LINK_TOUT>s),(list of supported <DWL_RETRY>s),(list of supported <SYS_REBOOT>s) OK
Read command	
<u>Syntax</u> AT+ BOOTDWLCFG?	<u>Response</u> +BOOTDWLCFG: <USBHS_ENUM_TOUT>,<USBHS_LINK_TOUT>,<DWL_RETRY> OK
Write command	
<u>Syntax</u> AT+ BOOTDWLCFG= [<USBHS_ENUM _TOUT> [,<USBHS_LINK TOUT>[,<DWL_ RETRY>[,<SYS_ REBOOT>]]]	<u>Response</u> OK <u>Parameters</u> <USBHS_ENUM_TOUT> USB enumeration time out value 0 3s 1 30s 2 60s 3 90s <USBHS_LINK_TOUT> USB link establishment time out value 0 1s 1 30s 2 60s 3 90s <DWL_RETRY> Desired firmware download retry count when firmware download conditions are not met (i.e. the download program didn't start) 0 No retry 1 – 10 Number of retries <SYS_REBOOT> System reboot options after executing this command 0 Do not reboot 1 Reboot immediately without network deregistration
<u>Notes</u>	• USB time out happens when the USB cable is connected (VBUS level > 0.8V) and USB RESET happens within a 400ms time out. • <USBHS_ENUM_TOUT> and <USBHS_LINK_TOUT> are automatically reset to their default values, 0, in the following conditions: ▪ Cold boot or hardware reset. ▪ Download program received the reset command from the host to reboot the module. ▪ Successfully booted in the module firmware, which means time out values are reset when time out happens in a previous boot. Basically, the conditions above are terminate conditions that time out values are effective only once.

HL7588	
	- If <DWL_RETRY> is enabled (non-zero value), and firmware download conditions are not met (i.e. download program didn't start), the module reboots itself with the input parameters <USBHS_ENUM_TOUT> and <USBHS_LINK_TOUT> for the next "TRY" of USB enumeration and USB link establishment. One of the following conditions stops this firmware download retry loop: - Cold boot or hardware reset. - Retry count exhausted (if not configured to be 255/continually). - Download program successfully started. - Any failures related to firmware download, that includes the following will have the module reboot itself with <USBHS_ENUM_TOUT>=3 and <USBHS_LINK_TOUT>=3, regardless of the setting <DWL_RETRY>: 10 seconds inactivity time out in download program. - Boot failures due to corrupted firmware images, either detected by the primary boot image (PSI) or secondary boot image (SLB). - Any exceptional failures in download program or boot-up images. Five (5) extra seconds of delay happens before the reboot for the second and third conditions. A successful firmware download is required to recover the module.
Examples	<pre> AT+BOOTDWLCFG=? +BOOTDWLCFG: (0-3),(0-3),(0-10),(0-1) OK //default values after boot-up AT+BOOTDWLCFG? +BOOTDWLCFG: 0,0,0 OK <USB enumeration time-out = 90s, USB link time-out = 90s> AT+BOOTDWLCFG=3,3,0,0 OK AT+BOOTDWLCFG? +BOOTDWLCFG: 3,3 OK AT+BOOTDWLCFG=3,3 or AT+CFUN=1,1 OK //module reboots for Firmware Download <USB enumeration time-out = 3s, USB link time-out = 30s, reboot automatically> AT+BOOTDWLCFG=0,1 OK //module reboots for Firmware Download </pre>

5.58. +KSREP Command: Mobile Start-Up Reporting

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KSREP=?	<u>Response</u> +KSREP: (list of supported <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KSREP?	<u>Response</u> +KSREP: <mode>,<stat>,<PB ready> OK
<i>Write command</i>	
<u>Syntax</u> AT+KSREP= <mode>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <mode> Unsolicited result code mode 0 Disable the start-up URC 1 Enable the start-up URC <stat> Module status 0 Module is ready to receive commands for the TE. No access code is required 1 The module is waiting for an access code (se AT+CPIN? command to determine access code) 2 The SIM card is not present 3 The module is in "SIM lock" state 4 unrecoverable error 5 unknown state <PB ready> Indicates the status of phone book 0 Phone book is not ready 1 Phone book is ready for read and write
<i>Unsolicited Notification</i>	<u>Response</u> +KSUP: <stat>
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • The URC message +KSUP: <stat> will only be displayed once after reboot if <mode> is equal to 1. • If <mode> is equal to 0, +PBREADY and +SIM URC notifications will not be sent at the start up process. However, they will still be sent afterwards during normal modem operation. • This command can be used without a SIM card. • <mode> is saved in non-volatile memory.

HL7588Example

```

// A SIM card is inserted
AT+KSREP? // The mode is 1. The module and phone book are ready
+KSREP: 1,0,1
OK

AT+KSREP=? // Test command
+KSREP: (0-1)
OK

AT+KSREP=0 // Set mode to 0
OK

AT+KSREP? // The mode is changed to 0 and saved to non-volatile memory
+KSREP: 0,0,1 // The mode is 0.
OK

// Reboot the module
AT+KSREP? // Mode is 0 which is restored from non-volatile memory.
+KSREP: 0,0,1
OK

// SIM card is not inserted.
// Reboot the module
+SIM: 0 // URC after reboot
+KSUP: 2 // Start-up report shows that the SIM is not present

AT+KSREP?
+KSREP: 1,2,0 // SIM not present and phone book not ready
OK

+SIM: 1 // Insert SIM card
+PBREADY // Phone Book is ready

AT+KSREP?
+KSREP: 1,0,1 // Start-up reporting is enabled. Module and phone are okay.
// Book is ready

```

5.59. +KSYNC Command: Application Synchronization Signal

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KSYNC=?	<u>Response</u> +KSYNC: (list of supported <mode> s),(list of supported <IO> s),(range of <Duty Cycle>), (range of <Pulse Duration>) OK
<i>Read command</i>	
<u>Syntax</u> AT+KSYNC?	<u>Response</u> +KSYNC: <mode> , <IO> , <Duty Cycle> , <Pulse Duration> OK
<i>Write command</i>	
<u>Syntax</u> AT+KSYNC= <mode> [<IO> [,<Duty Cycle> [,<Pulse Duration>]]]	<u>Response</u> OK <u>Parameters</u> <mode> Operation mode 0 Disable the generation of synchronization signal 1 Manage the generation of signal according to <Duty Cycle> and <Pulse Duration> . The waveform of the signal is controlled only by these two parameters; Network status would not affect the waveform 2 Manage the generation of signal according to CS network registration status; PERMANENTLY OFF Not register/Initialization/Register denied/no SIM card 600 ms ON / 600ms OFF Not registered but searching 75 ms ON / 3s OFF Right connected to the network <Duty Cycle> and <Pulse Duration> are not used in mode 2 When used in a GL7500: PERMANENTLY ON Not register/Initialization/Register denied/no SIM card/Not registered but searching 200 ms ON / 2s OFF Registered in the network 200 ms ON / 600ms OFF Registered in the network and communication is in progress 3 Manage the generation of signal according to PS network registration status; OFF Not registered/Initialization/Register denied/no SIM card ON Registered to the network <IO> 1 – 8, 10, 11, 15 GPIO used as output <Duty Cycle> 1 – 100 In percent; only used when <mode>=1 Default value = 50 <Pulse Duration> 5 – 65535 In milliseconds; only used when <mode>=1 Default value = 1000

HL7588	
<u>Notes</u>	- Parameter settings are automatically saved in non-volatile memory. - Refer to +KGPIOCFG for multiplexed functions of GPIOs. - GPIOs may be already used by SIM detection, temperature monitoring, etc. Check with other related commands such as +KSIMDET, +KTEMPMON, etc. prior to using this command. - This command can be used without a SIM. - This command will force the GPIO pins as output, regardless of AT+KGPIOCFG configuration. - Only 1 GPIO signal can be generated at any time. - The minimum LED ON/OFF cycle is 5ms due to the precision of timer. This feature can only be used if <Pulse Duration>*<Duty Cycle> is less than 5ms. <mode>=2 is kept for compatibility with other HL series LTE-only products which do not support CS. - When used in a GL7500, the LED is already connected to GPIO8. The firmware sets <mode> to 2 and <IO> to 8, and the module uses the LED to indicate network status by default.
<u>Examples</u>	<pre> AT+KSYNC=1,1,50,2000 // Generate signal with 50% duty cycle and 2000 ms pulse // duration on GPIO1 OK AT+KSYNC=1,2,50,2000 // Generate signal with 50% duty cycle and 2000 ms pulse // duration on GPIO2 OK // Previous signal on GPIO1 will be stopped AT+KSYNC=0,2 // Disable signal generation OK AT+KSYNC=2,1 // Generate signal on GPIO1 according to the CS network // registration status OK AT+KSYNC=3,1 // Generate signal on GPIO1 according to the PS network // registration status OK </pre>

6. Network Service Related Commands

6.1. +CAOC Command: Advice of Charge

HL7588										
Test command										
<u>Syntax</u> AT+CAOC=?	<u>Response</u> +CAOC: (list of supported <mode>s) OK									
Read command										
<u>Syntax</u> AT+CAOC?	<u>Response</u> +CAOC: <mode> OK									
Write command										
<u>Syntax</u> AT+CAOC= [<mode>]	<u>Response</u> +CAOC: <ccm> OK or +CME ERROR: <err> <u>Parameters</u> <table><tr><td><mode></td><td>0</td><td>Query CCM value</td></tr><tr><td></td><td>1</td><td>Deactivate unsolicited notification (+CCCM)</td></tr><tr><td></td><td>2</td><td>Activate unsolicited notification</td></tr></table> <ccm> String type; three bytes of the current call meter value in hexadecimal format	<mode>	0	Query CCM value		1	Deactivate unsolicited notification (+CCCM)		2	Activate unsolicited notification
<mode>	0	Query CCM value								
	1	Deactivate unsolicited notification (+CCCM)								
	2	Activate unsolicited notification								
Unsolicited Notification	<u>Response</u> +CCCM: <ccm>									

6.2. +CUSD: Unstructured Supplementary Service Data

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CUSD=?	<u>Response</u> +CUSD: (list of supported <n>s) OK

HL7588	
<i>Read command</i>	
<u>Syntax</u> AT+CUSD?	<u>Response</u> +CUSD: <n> OK
<i>Write command</i>	
<u>Syntax</u> AT+CUSD=[<n>[,<str>[,<dc>]]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <n> Enables or disables the presentation of an unsolicited result code <u>0</u> Disable the result code presentation to the TE (default value if no parameter) 1 Enable the result code presentation to the TE 2 Cancel session (not applicable to read command response) <str> String type USSD-string (when <str> parameter is not given, network is not interrogated): <dc> Cell Broadcast Data Coding Scheme in integer format (default value: <u>0</u>) <m> 0 No further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation) 1 Further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation) 2 USSD terminated by network 3 Other local client has responded 4 Operation not supported 5 Network time out
<i>Unsolicited Notification</i>	<u>Response</u> +CUSD: <m>[,<str>[,<dc>]]
<u>Notes</u>	<n> is saved in non-volatile memory per AT port over module reboot.

6.3. +CLCK Command: Facility Lock

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CLCK=?	<u>Response</u> +CLCK: (list of supported <fac>s) OK or +CME ERROR: <err>

HL7588*Write command*Syntax

**AT+CLCK=<fac>,
<mode>
[,<passwd>
[,<class>]]**

Response

If <mode> = 2 and command is successful

OK

+CLCK: <status>[,<class1>[<CR>,<LF>

+CLCK: <status>,class2...]]

or

+CME ERROR: <err>

Parameters

<fac> Values reserved by the present document:

"PS" PH-SIM (lock Phone to SIM/UICC card installed in the currently selected card slot) (MT asks for the password when other than current SIM/UICC card is inserted; MT may remember certain previously used cards thus not requiring password when they are inserted)

"SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued)

"AO" BAOB (Barr All Outgoing Calls)

"OI" BOIC (Barr Outgoing International Calls)

"OX" BOIC-exHC (Barr Outgoing International Calls except to Home Country)

"AI" BAIC (Barr All Incoming Calls)

"IR" BIC-Roam (Barr Incoming Calls when Roaming outside the home country)

"AB" All Barring services (applicable only for mode>=0)

"AG" All outgoing barring services (applicable only for <mode>=0)

"AC" All incoming barring services (applicable only for <mode>=0)

"FD" SIM card or active application in the UICC (GSM or USIM) fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)

"PN" Network Personalization

"PU" Network subset Personalization

"PP" Service Provider Personalization

"PC" Corporate Personalization

<mode>

0	Unlock
1	Lock
2	Query status

<status>

0	Not active
1	Active

<passwd> String type; shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD

<classx> Sum of integers each representing a class of information (default value = 7)

2 Data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)

4 Fax (facsimile services)

8 Short message service

16 Data circuit sync

32 Data circuit async

64 Dedicated packet access

128 Dedicated PAD access

6.4. +CNUM Command: Subscriber Number

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CNUM=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+CNUM	<u>Response</u> +CNUM: [<alpha1>,<number1>,<type1>[,<speed>,<service>[,<itc>]] [<CR><LF> +CNUM: [<alpha2>,<number2>,<type2>[,<speed>,<service>[,<itc>]] [...]] OK or +CME ERROR: <err> <u>Parameters</u> <alphax> Optional alphanumeric string associated with <numberx>; used character set should be the one selected with command +CSCS <numberx> String type phone number of format specified by <typex> <typex> Type of address octet in integer format <speed> As defined in 27.007 sub clause 6.7, corresponding to +CBST setting <service> Service related to the phone number 0 Asynchronous modem 1 Synchronous modem 2 PAD Access (asynchronous) 3 Packet Access (synchronous) 5 Fax <itc> Information transfer capability 0 3.1kHz 1 UDI

6.5. +COLP Command: Connected Line Identification Presentation

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+COLP=?	<u>Response</u> +COLP: (list of supported <n>s) OK

HL7588	
<i>Read command</i>	
<u>Syntax</u> AT+COLP?	<u>Response</u> +COLP: <n>,<m> OK
<i>Execute/Write command</i>	
<u>Syntax</u> AT+COLP=[<n>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <n> <u>0</u> Disable result code presentation status to the TE 1 Enable result code presentation status to the TE <m> 0 COLP not provisioned 1 COLP provisioned 2 Unknown (e.g. no network, etc.)
<u>Notes</u>	- If the connected line identity of the called party is enabled, (and called subscriber allows it), the intermediate result code +COLP: <number>, <type> [, <subaddr>, <satype> [, <alpha>]] is returned from TA to TE. <n> is saved in non-volatile memory per AT port over module reboot.

6.6. +COPN Command: Read Operator Name

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+COPN=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+COPN	<u>Response</u> +COPN: <numeric1>,<alpha1>[<CR><LF> +COPN: <numeric2>,<alpha2> [...] OK or +CME ERROR: <err> <u>Parameters</u> <numeric> String type; operator in numeric format (see +COPS) <alpha> String type; operator in long alphanumeric format (see +COPS)
<u>Notes</u>	If the matching PLMN name is not found then the numeric PLMN ID (MCCMNC) will be displayed.

6.7. +COPS Command: Operator Selection

HL7588	
<i>Test command</i> <u>Syntax</u> AT+COPS=?	<u>Response</u> +COPS: [[list of supported (<stat>, long alphanumeric <oper>, short alphanumeric <oper>, numeric <oper>[,< AcT>,<plmn_list>)s][,.(list of supported <mode>s),(list of supported <format>s)] OK or +CME ERROR: <err>
<i>Read command</i> <u>Syntax</u> AT+COPS?	<u>Response</u> +COPS: <mode>[,<format>,<oper>[,<AcT>]] OK or +CME ERROR: <err>
<i>Write command</i> <u>Syntax</u> AT+COPS= [<mode> [,<format> [,<oper> [,< AcT>]]]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <mode> 0 Automatic; in this case other fields are ignored and registration is done automatically by ME 1 Manual (other parameters like format and operator need to be passed) 2 Deregister from network 3 Sets <format> value. In this case <format> becomes a mandatory input 4 Manual/automatic; if manual selection fails then automatic mode is entered <format> 0 Long alphanumeric; if network name is not available it displays a combination of MCC and MNC in string format 1 Short alphanumeric 2 Numeric <oper> String type given in format <format>; this field may be up to 16-character long for long alphanumeric format, up to 8 characters for short alphanumeric format and 5 characters long for numeric format (MCC/MNC codes) <stat> 0 Unknown networks 1 Network available 2 Current (registered) 3 Forbidden network

HL7588	
	<AcT> 2 UMTS 7 LTE <plmn_list> 0 PLMN is present on the EHPLMN list 1 PLMN is present on the user-controlled PLMN list 2 PLMN is present on the operator-controlled PLMN list Note that this parameter only supports R7 Protocol Stack onwards.
<u>Notes</u>	• This command forces an attempt to select and register the GSM, UMTS network. • Set command sets automatic network selection or selects network and a certain access technology AcT. • Read command returns current network. • Test command returns available networks and lists of supported <mode>s and <format>s. • This command is abortable. The port shall be freed for issuing another command. No network abort shall be triggered. • <mode>=0,1,2,4 and <oper> are saved in non-volatile memory over module reboot. • <format> is saved in non-volatile memory per AT port over module reboot.

6.8. +CPOL Command: Preferred PLMN List

HL7588	
<i>Test command</i> <u>Syntax</u> AT+CPOL=?	<u>Response</u> +CPOL: (list of supported <index>es),(list of supported <format>s) OK or +CME ERROR: <err>
<i>Read command</i> <u>Syntax</u> AT+CPOL?	<u>Response</u> +CPOL: <index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>][<CR><LF> +CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>] [...]] OK or +CME ERROR: <err>

HL7588	
<i>Write command</i> <u>Syntax</u> AT+CPOL= [<index>] [,<format> [,<oper> [,<GSM_Act>, <GSM_Compact_Act>,<UTRAN_Act>,<EUTRAN_Act>]]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <index> Integer type; order number of operator in the SIM/USIM preferred operator list <format> 0 Long format alphanumeric <oper> 1 Short format alphanumeric <oper> 2 Numeric <oper> <opern> String type; <format> indicates if the format is alphanumeric or numeric <GSM_Act> 0 GSM access technology not selected 1 GSM access technology selected <GSM_Comp_Act> 0 GSM compact access technology not selected 1 GSM compact access technology selected <UTRA_Act> 0 UTRA access technology not selected 1 UTRA access technology selected <EUTRA_Act> 0 UTRA access technology not selected 1 UTRA access technology selected
<u>Notes</u>	• The read command can have “n” RAT values. • If matching PLMN name is not found, then numeric PLMN ID (MCCMNC) will be displayed. • <format> is saved in non-volatile memory over module reboot.

6.9. +CPWD Command: Change Password

HL7588	
<i>Test command</i> <u>Syntax</u> AT+CPWD=?	<u>Response</u> +CPWD: list of supported (<fac>,<pwdlength>)s OK
<i>Write command</i> <u>Syntax</u> AT+CPWD= <fac>,<oldpwd>,<newpwd>	<u>Response</u> OK or +CME ERROR: <err>

HL7588	
	<u>Parameters</u> <fac> "PS" PH-SIM (lock Phone to SIM/UICC card installed in the currently selected card slot) (MT asks for the password when other than current SIM/UICC card is inserted; MT may remember certain previously used cards thus not requiring password when they are inserted) "SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) "AO" BAO (Barr All Outgoing Calls) "OI" BOIC (Barr Outgoing International Calls) "OX" BOIC-exHC (Barr Outgoing International Calls except to Home Country) "AI" BAIC (Barr All Incoming Calls) "IR" BIC-Roam (Barr Incoming Calls when Roaming outside the home country) "FD" SIM card or active application in the UICC (GSM or USIM) fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>) "PN" Network Personalization "PU" Network subset Personalization "PP" Service Provider Personalization "PC" Corporate Personalization <oldpwd> String type containing the old password <newpwd> String type containing the new password <pwdlength> Length of password

6.10. +CREG Command: Network Registration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CREG=?	<u>Response</u> +CREG: (list of supported <n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CREG?	<u>Response</u> +CREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]] OK
<i>Write command</i>	
<u>Syntax</u> AT+CREG=[<n>]	<u>Response</u> OK or +CME ERROR: <err>

HL7588	
	<u>Parameters</u> <n> 0 Disable network registration unsolicited result code 1 Enable network registration unsolicited result code +CREG: <stat> 2 Enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>[,<Act>]] <stat> 0 Not registered, ME is not currently searching a new operator to register to 1 Registered, home network 2 Not registered, but ME is currently searching a new operator to register to 3 Registration denied 4 Unknown 5 Registered, roaming <lac> String type; two-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) <ci> String type; four-byte UTRAN/E-UTRAN cell ID in hexadecimal format <Act> 2 UTRAN 4 UTRAN with HSDPA 5 UTRAN with HSUPA 6 UTRAN with HSDPA and HSUPA 7 E-UTRAN
<i>Unsolicited Notification</i>	<u>Response</u> When <n>=1 and there is a change in the ME network registration status code: +CREG: <stat> When <n>=2 and there is a change in the network cell: +CREG: <stat>[,<lac>,<ci>[,<Act>]]
<u>Notes</u>	<n> is saved in non-volatile memory per AT port over module reboot.

6.11. +CSSN Command: Supplementary Service Notification

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CSSN=?	<u>Response</u> +CSSN: (list of supported <n>s), (list of supported <m>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CSSN?	<u>Response</u> +CSSN: <n>,<m> OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+CSSN=[<n>[,<m>]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <n> <u>0</u> Disable +CSSI result code presentation status to the TE 1 Enable +CSSI result code presentation status to the TE <m> <u>0</u> Disable +CSSU result code presentation status to the TE 1 Enable +CSSU result code presentation status to the TE
<i>Unsolicited Notification</i>	<u>Response</u> +CSSI : <code1>[,<index>] +CSSU: <code2>[<index> [,<number>,<type>]] <u>Parameters</u> <code1> 0 Unconditional call forwarding is active 1 Some of the conditional call forwarding are active 2 Call has been forwarded 3 Call is waiting 4 This is a CUG call (also <index> present) 5 Outgoing calls are barred 6 Incoming calls are barred 7 CLIR suppression rejected 8 Call has been deflected <index> <u>0</u> – 9 Index 10 No index (prefer to take from subscriber data) <code2> 0 This is a forwarded call (MT call setup) 1 This is a CUG call (<index> present) (MT call setup) 6 Forward check SS message received (can be received whenever) 8 Call has been connected with the other remote party in explicit call transfer operation (during an MT call setup) 9 This is a deflected call (MT call setup) 10 Additional incoming call forwarded <number> String type phone of format specified by <type> <type> Type of address octet in Integer format
<u>Notes</u>	<n> and <m> are saved in non-volatile memory per AT port over module reboot.

6.12. +CPLS Command: Select Preferred PLMN List

HL7588										
<i>Test command</i>										
<u>Syntax</u> AT+CPLS=?	<u>Response</u> +CPLS: (list of supported <cpls_list>s) OK									
<i>Read command</i>										
<u>Syntax</u> AT+CPLS?	<u>Response</u> +CPLS: <cpls_list> OK									
<i>Write command</i>										
<u>Syntax</u> AT+CPLS= [<cpls_list>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <table><tr><td><cpls_list></td><td>0</td><td>User controlled PLMN selector with access technology EFPLMNwAcT, but iff not found in the SIM/UICC, then the PLMN preferred list is EFPLMNsel</td></tr><tr><td></td><td>1</td><td>Operator controlled PLMN selector with access technology EFOPLMNwAcT</td></tr><tr><td></td><td>2</td><td>HPLMN selector with access technology EFHPLMNwAcT</td></tr></table>	<cpls_list>	0	User controlled PLMN selector with access technology EFPLMNwAcT, but iff not found in the SIM/UICC, then the PLMN preferred list is EFPLMNsel		1	Operator controlled PLMN selector with access technology EFOPLMNwAcT		2	HPLMN selector with access technology EFHPLMNwAcT
<cpls_list>	0	User controlled PLMN selector with access technology EFPLMNwAcT, but iff not found in the SIM/UICC, then the PLMN preferred list is EFPLMNsel								
	1	Operator controlled PLMN selector with access technology EFOPLMNwAcT								
	2	HPLMN selector with access technology EFHPLMNwAcT								

6.13. +CEREG Command: EPS Network Registration Status

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CEREG=?	<u>Response</u> +CEREG: (list of supported <n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CEREG?	<u>Response</u> +CEREG: <n>,<stat>[,<tac>,<ci>[,<AcT>]] OK
<i>Execute command</i>	
<u>Syntax</u> AT+CEREG= [<n>]	<u>Response</u> OK

HL7588	
	or +CME ERROR: <err> <u>Parameters</u> <n> <u>0</u> Disable network registration unsolicited result code 1 Enable network registration unsolicited result code +CEREG: <stat> 2 Enable network registration unsolicited result code +CEREG: <stat> [,<tac>,<ci>[,<AcT>]] <stat> 0 Not registered, MT is not currently searching an operator to register to 1 Registered on the 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 5 Registered, roaming 8 Attached for emergency bearer services only (note that this is only available when <AcT> = 2, 4, 5, 6) <tac> String type; two-byte tracking area code in hexadecimal format (e.g. "00C3" is equals to 195 in decimal) <ci> String type; four-byte UTRAN/E-UTRAN cell ID in hexadecimal format <AcT> 2 UTRAN 4 UTRAN with HSDPA 5 UTRAN with HSUPA 6 UTRAN with HSDPA and HSUPA 7 E-UTRAN
<u>Notes</u>	<n> is saved in non-volatile memory per AT port over module reboot.

6.14. +CEMODE Command: UE Modes of Operation for EPS

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CEMODE=?	<u>Response</u> +CEMODE: (list of supported <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CEMODE?	<u>Response</u> +CEMODE: <mode> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CEMODE= [<mode>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <mode> Indicates mode of operation 0 PS mode 2 of operation 1 CS/PS mode 1 of operation (default value for HL7588 AT&T) 2 CS/PS mode 2 of operation (default value for HL7588 Verizon) 3 PS mode 1 of operation
<u>Notes</u>	<mode> is saved in non-volatile memory over module reboot.



7. Phone Book Management

7.1. +CPBF Command: Find Phonebook Entries

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CPBF=?	<u>Response</u> +CPBF: [<nlength>],[<tlength>],[<glength>],[<slength>],[<elength>] OK or +CME ERROR: <err>
<i>Write command</i>	
<u>Syntax</u> AT+CPBF= <findtext>	<u>Response</u> [+CPBF:<index1>,<number>,<type>,<text>,<hidden>],[<group>],[<adnumber>] [,<adtype>],[<secondtext>],[<email>]] OK or +CME ERROR: <err> <u>Parameters</u> <index1>, <index2>, <index> Integer type values in the range of location numbers of phonebook memory <number> String type phone number of format <type> <type> Type of address octet in integer format <text> String type field of maximum length <tlength>; character set as specified by command +CSCS <group> String type field of maximum length <glength>; character set as specified by command +CSCS <adnumber> String type phone number of format <adtype> <adtype> Type of address octet in integer format <secondtext> String type field of maximum length <slength>; character set as specified by command +CSCS <email> String type field of maximum length <elength>; character set as specified by command +CSCS <nlength> Integer type value indicating the maximum length of field <number> <tlength> Integer type value indicating the maximum length of field <text>

HL7588	
	<glength> Integer type value indicating the maximum length of field <group> <slength> Integer type value indicating the maximum length of field <secondtext> <elength> Integer type value indicating the maximum length of field <email> <hidden> Indicates if the entry is hidden or not 0 Phonebook entry not hidden 1 Phonebook entry hidden
<u>Notes</u>	Execution command returns phonebook entries (from the current phonebook memory storage selected with +CPBS).

7.2. +CPBR Command: Read Current Phonebook Entries

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CPBR=?	<u>Response</u> +CPBR: (list of supported <index>es),[<nlength>],[<tlength>],[<glength>],[<alength>],[<slength>],[<elength>] OK
<i>Write command</i>	
<u>Syntax</u> AT+CPBR= <index1> [,<index2>]	<u>Response</u> [+CPBR: <index1>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]]][...] OK or +CME ERROR: <err> <u>Parameters</u> <index1>, <index2>, <index> Integer type values in the range of location numbers of phonebook memory <number> String type phone number of format <type> <type> Type of address octet in integer format <text> String type field of maximum length <tlength> <hidden> Indicates if the entry is hidden or not – only available if a UICC with an active USIM application is present 0 Phonebook entry not hidden 1 Phonebook entry hidden <group> String type field of maximum length <glength>

HL7588	
	<adnumber> String type phone number of format <adtype> <adtype> Type of address octet in integer format <secondtext> String type field of maximum length <slength> <email> String type field of maximum length <elength> <nlength> Integer type value indicating the maximum length of field <number> <tlength> Integer type value indicating the maximum length of field <text> <glength> Integer type value indicating the maximum length of field <group> <alength> Integer type value indicating the maximum length of field <adnumber> <slength> Integer type value indicating the maximum length of field <secondtext> <elength> Integer type value indicating the maximum length of field <email>
<u>Notes</u>	- Optional parameters <nlength>, <tlength>, <glength>, <alength>, <slength>, <elength> are only applicable for 3G UICC. - Execution command returns phonebook entries in location number range <index1>...<index2> from the current phonebook memory storage selected with +CPBS.

7.3. +CPBS Command: Select Phonebook Memory Storage

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CPBS=?	<u>Response</u> +CPBS: (list of supported <storage>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CPBS?	<u>Response</u> +CPBS: <storage>[,<used>,<total>] OK or +CME ERROR:<err>
<i>Write command</i>	
<u>Syntax</u> AT+CPBS= <storage> [,<password>]	<u>Response</u> OK or +CME ERROR:<err>

HL7588	
	<u>Parameters</u> <storage> "FD" SIM/USIM fixdialling phonebook "LD" SIM/UICC last dialling phonebook (LD phonebook can't be deleted) "ON" SIM (or MT) own numbers (MSISDNs) list (reading of this storage may be available through +CNUM also) "SM" SIM/UICC phonebook (default) "BL" Blacklist phonebook (delete only) "EN" SIM emergency-call-codes phonebook (read only) "AP" Selected application phonebook "BN" SIM barred-dialling-number (EF_BDN) phonebook (only valid with PIN2) "SN" SIM service-dialling-number (EF_SDN) phonebook (read only) <password> String type value representing the PIN2-code required when selecting PIN2 code locked <storage>s above <used> Integer type value indicating the number of used locations in the selected memory <total> Integer type value indicating the total number of locations in the selected memory
<u>Notes</u>	Set command selects phonebook memory storage <storage>, which is used by other phonebook commands.

7.4. +CPBW Command: Write Phonebook Entry

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CPBW=?	<u>Response</u> +CPBW: (list of supported <index>es),[<nlength>],(list of supported <type>s),[<tlength>], [<glength>],[<alength>],[<slength>],[<elength> OK
<i>Read command</i>	
<u>Syntax</u> AT+CPBW?	<u>Response</u> +CPBW: <written_index> OK or +CPBW:-1 OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+CPBW= [<index>] [,<number> [,<type>[,<text> [,<group> [,<adnumber> [,<adtype> [,<secondtext> [,<email> [,<hidden>]]]]]]]]]	<u>Response</u> +CPBW: <written_index> OK or +CME ERROR: <err> <u>Parameters</u> <index> Integer type values in the range of location numbers of phonebook memory <number> String type phone number of format <type> <type> Type of address octet in integer format; default value is 145 when dialing string includes international access code character "+"; otherwise, default value is 129 <text> String type field of maximum length <tlength> <hidden> Indicates if the entry is hidden or not – only available if a UICC with an active USIM application is present 0 Phonebook entry not hidden 1 Phonebook entry hidden <group> String type field of maximum length <glength> <adnumber> String type phone number of format <adtype> <adtype> Type of address octet in integer format <secondtext> String type field of maximum length <slength> <email> String type field of maximum length <elength> <nlength> Integer type value indicating the maximum length of field <number> <tlength> Integer type value indicating the maximum length of field <text> <glength> Integer type value indicating the maximum length of field <group> <alength> Integer type value indicating the maximum length of field <adnumber> <slength> Integer type value indicating the maximum length of field <secondtext> <elength> Integer type value indicating the maximum length of field <email>
<u>Notes</u>	- Optional parameters <nlength>, <tlength>, <glength>, <alength>, <slength>, <elength> are only applicable for 3G UICC. - Execution command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS.

7.5. +PBREADY URC: Phonebook Ready

+PBREADY URC will be displayed when the phone book is ready for read and write operation on boot-up or upon insertion of a valid SIM card.

>> 8. SMS Commands

For other information regarding HL7588 SMS commands, refer to section 1.5 SMS Commands.

8.1. Parameters Definition

The following parameters are used in the subsequent clauses which describe all commands. The formats of integer and string types referenced here are defined in V.25ter.

The default values are for command parameters, not for result code parameters.

8.1.1. Message Storage Parameters

<index>	Integer type; value in the range of location numbers supported by the associated memory	
<mem1>	String type; memory from which messages are read and/or deleted (by commands +CMGL, +CMGR and +CMGD); defined values are as follows:	
	"BM"	Broadcast message storage
	"ME"	ME message storage
	"MT"	Any of the storages associated with ME
	"SM"	(U)SIM message storage; default value
	"TA"	TA message storage
	"SR"	Status report storage
<mem2>	String type; memory to which writing and sending operations are made (commands Send Message from Storage +CMSS and Write Message to Memory +CMGW); refer <mem1> for defined values. Default value is "SM".	
<mem3>	String type; preferred memory to which received SMs are to be stored (unless forwarded directly to TE; refer command New Message Indications +CNMI); refer <mem1> for defined values; received CBMs are always stored in "BM" (or some manufacturer specific storage) unless directly forwarded to TE; received status reports are always stored in "SR" (or some manufacturer specific storage) unless directly forwarded to TE. Default value is "SM".	
<stat>	Status of message in memory. Integer type in PDU mode, or string type in text mode. Available values are as follows:	
	0	"REC UNREAD" Received unread message (i.e. new message)
	1	"REC READ" Received read message
	2	"STO UNSENT" Stored unsent message (only applicable to SMs)
	3	"STO SENT" Stored sent message (only applicable to SMs)
	4	"ALL" All messages (only applicable to +CMGL command)
<total1>	Integer type; total number of message locations in <mem1>	
<total2>	Integer type; total number of message locations in <mem2>	
<total3>	Integer type; total number of message locations in <mem3>	
<used1>	Integer type; number of messages currently in <mem1>	
<used2>	Integer type; number of messages currently in <mem2>	
<used3>	Integer type; number of messages currently in <mem3>	

8.1.2. Message Data Parameters

<ackpdu>	RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without SC address field and parameter shall be bounded by double quote characters like a normal string type parameter.
<alpha>	String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command +CSCS.
<cdata>	Command data in text mode responses; ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).
<ct>	Command type in integer format (default value = 0).
<da>	Address value in string format. BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to command +CSCS). Type of address is given by <toa>.
<data>	In the case of user data in text mode responses; format: - if <dcs> indicates that GSM 7-bit default alphabet is used and <fo> indicates that user data header indication is not set - if TE character set other than "HEX" (refer to command +CSCS): ME/TA converts GSM alphabet into current TE character set - if TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7-bit default alphabet into two IRA character long hexadecimal number (e.g. character II (GSM 7-bit default alphabet 23) is presented as 17 (IRA 49 and 55)) - if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that user data header indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) In the case of CBS: CBM Content of Message in text mode responses; format: - if <dcs> indicates that GSM 7-bit default alphabet is used - if TE character set other than "HEX" (refer to command +CSCS); ME/TA converts GSM alphabet into current TE character set - if TE character set is "HEX"; ME/TA converts each 7-bit character of the GSM 7-bit default alphabet into two IRA character long hexadecimal number - if <dcs> indicates that 8-bit or UCS2 data coding scheme is used; ME/TA converts each 8-bit octet into two IRA character long hexadecimal number
<length>	Integer type vlayue indicating the length of the actual TP data unit in octets in PDU mode. This is 140 characters long according to 8-bit GSM coding scheme. In text mode, the maximum length of an SMS depends on the used coding scheme (160 characters if 7-bit).
<mid>	CBM Message Identifier in integer format
<mn>	TP-Message-Number in integer format
<mr>	Message reference in integer format
<oa>	Origination address address value field in string format; BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to command +CSCS); type of address given by <tooa>
<page>	CBM Page Parameter bits 4-7 in integer format
<pages>	CBM Page Parameter bits 0-3 in integer format

<pdu>	GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format In the case of CBS, TPDU in hexadecimal format
<pid>	Protocol identifier in integer format. Default value is 0
<ra>	Recipient address address value in string format; BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to command +CSCS); type of address is given by <tora>
<sca>	String value enclosed in quotes indicating the service center address. Note that BCD numbers are converted to characters; type of address is given by <tosca>
<scts>	Service centre time stamp in time-string format (refer to <dt>)
<sn>	CBM Serial Number in integer format
<st>	Status in integer format
<toda>	Type of address octet in integer format. Default value is <u>145</u> if the first character of <da> is "+"; otherwise, default value is 129
<toa>	Originating address type of address octet in integer format (refer to <toda> for the default value)
<tora>	Recipient address type of address octet in integer format (refer to <toda> for the default value)
<tosca>	SC address type of address octet in integer format (refer to <toda> for the default value)
<vp>	Depending on SMS-SUBMIT <fo> setting: TP-Validity-Period either in integer format (default value = <u>167</u>) or in time-string format (refer to <dt>)
<vp>	Validity period in either integer format (default value = 167) or in time-string format depending on <fo> settings
<dc>	SMS Data Coding Scheme (default value = <u>0</u>), or Cell Broadcast Data Coding Scheme in integer format
<dt>	Discharge time in time-string format "yy/MM/dd,hh:mm:ss+zz" where the characters indicate year, month, day, hour, minutes, seconds and time zone. For example, May 6, 1994, 10:10 pm GMT+2 hours is equals to "94/05/06,22:10:00+08"
<fo>	First octet of SMS-DELIVER, SMS-SUBMIT (default value = 17), SMS-STATUS-REPORT, or SMS-COMMAND (default value = 2) in integer format depending on command or result code

8.2. +CMGD Command: Delete Message

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CMGD=?	<u>Response</u> +CMGD: (list of supported <index>es)[,(list of supported <delflag>s)] OK
<i>Execute command</i>	
<u>Syntax</u> AT+CMGD= <index> [,<delflag>]	<u>Response</u> OK or +CMS ERROR: <err>

HL7588	
	<u>Parameter</u> <delflag> Integer indicating multiple message deletion request 0 (or omitted) Delete the message specified in <index> 1 Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched 2 Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched 3 Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched 4 Delete all messages from preferred message storage including unread messages
<u>Notes</u>	Execution command deletes message from preferred message storage <mem1>, location <index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag> shown above.

8.3. +CMGF Command: Set Message Format

HL7588							
<i>Test command</i>							
<u>Syntax</u> AT+CMGF=?	<u>Response</u> +CMGF: (list of supported <mode>s) OK						
<i>Read command</i>							
<u>Syntax</u> AT+CMGF?	<u>Response</u> +CMGF: <mode> OK						
<i>Execute command</i>							
<u>Syntax</u> AT+CMGF= [<mode>]	<u>Response</u> OK or +CMS ERROR: err> <u>Parameters</u> <table><tr><td><mode></td><td><u>0</u></td><td>PDU mode (default when implemented)</td></tr><tr><td></td><td><u>1</u></td><td>Text mode</td></tr></table>	<mode>	<u>0</u>	PDU mode (default when implemented)		<u>1</u>	Text mode
<mode>	<u>0</u>	PDU mode (default when implemented)					
	<u>1</u>	Text mode					
<u>Notes</u>	<mode> is saved in non-volatile memory per AT port over module reboot.						

8.4. +CMGL Command: List Messages

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CMGL=?	<u>Response</u> +CMGL: (list of supported <stat>s) OK
<i>Execute command</i>	
<u>Syntax</u> AT+CMGL [=<stat>]	<u>Response</u> If in text mode, command is successful and SMS-SUBMITs and/or SMS-DELIVERs: +CMGL: <index>,<stat>,<oa/da>,<[alpha]>,<[scts]>,<[tooa/toda>,<length>] <CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>,<[alpha]>,<[scts]>,<[tooa/toda>,<length>] <CR><LF><data> [...] If in text mode, command is successful and SMS-STATUS-REPORTs: +CMGL: <index>,<stat>,<fo>,<mr>,<[ra>,<[tora>,<[scts>,<[d-t>,<[st>[<CR><LF> +CMGL: <index>,<stat>,<fo>,<mr>,<[ra>,<[tora>,<[scts>,<[d_t>,<[st>[...] If in text mode, command is successful and SMS-COMMANDs: +CMGL: <index>,<stat>,<fo>,<ct> [<CR><LF> +CMGL: <index>,<stat>,<fo>,<ct>[...] If in text mode, command is successful and CBM storage: +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages> <CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[...] If in PDU mode and command is successful: +CMGR: <stat>,<[alpha]>,<length><CR><LF><pdu> or +CMS ERROR: <err> <u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.

8.5. +CMGR Command: Read Message

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CMGR=?	<u>Response</u> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CMGR= <index>	<u>Response</u> If text mode (+CMGF=1), command is successful, and SMS-DELIVER: +CMGR: <stat>,<oa>,<[alpha]>,<scts>,<tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>,<length>]<CR><LF><data> if text mode (+CMGF=1), command is successful, and SMS-SUBMIT: +CMGR: <stat>,<da>,<[alpha]>,<[toda>,<fo>,<pid>,<dc>,<[vp>,<sca>,<tosca>,<length>]<CR><LF><data> if text mode (+CMGF=1), command is successful, and SMS-STATUS-REPORT: +CMGR: <stat>,<fo>,<mr>,<[ra>,<[tora>,<scts>,<d_t>,<st> if text mode (+CMGF=1), command is successful, and SMS-COMMAND: +CMGR: <stat>,<fo>,<ct>,<[pid>,<[mn>,<[da>,<[toda>,<length><CR><LF><cdata>] if text mode (+CMGF=1), command is successful, and CBM storage: +CMGR: <stat>,<sn>,<mid>,<dc>,<page>,<pages><CR><LF><data> if PDU mode (+CMGF=0) and command is successful: +CMGR: <stat>,<[alpha>,<length><CR><LF><pdu> or +CMS ERROR: <err> <u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.

8.6. +CMGS Command: Send Message

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CMGS=?	<u>Response</u> OK
<i>Write command</i>	
<u>Syntax</u> If text mode (+CMGF=1): AT+CMGS=<da> [,<toda>]<CR> text is entered <ctrl-Z/ESC> If PDU mode (+CMGF=0): AT+CMGS= <length><CR> PDU is given <ctrl-Z/ESC>	<u>Response</u> If text mode (+CMGF=1) and sending is successful: [+CMGS: <mr>,<[scts>]] OK if PDU mode (+CMGF=0) and sending is successful: [+CMGS: <mr>] OK or +CMS ERROR: <err>

HL7588	
	<u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.
<u>Notes</u>	- 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 PDU shall be hexadecimal format (similarly as specified for <pdu>) and given in one line; ME/TA converts this coding into the actual octets of PDU. - When the length octet of the SMSC address (given in the PDU) equals zero, the SMSC address set with command Service Centre Address +CSCA is used; in this case the SMSC Type-of-Address octet shall not be present in the PDU, i.e. TPDU starts right after SMSC length octet. - Sending can be cancelled by giving <ESC> character. <ctrl-Z> must be used to indicate the ending of PDU. +CMGS: <mr>[,<scts>] is not available in +CMGS intermediate response as SMS is sent over IMS using 3GPP2 SMS PDU format and protocol.

8.7. +CMGW Command: Write Message to Memory

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CMGW=?	<u>Response</u> OK
<i>Write command</i> <u>Syntax</u> If text mode (+CMGF=1): AT+CMGW=[<oa/da>[,<tooa/toda>[,<stat>]]]<CR> text is entered <ctrl-Z/ESC> If PDU mode (+CMGF=0): AT+CMGW=<length>[,<stat>]<CR> PDU is given <ctrl-Z/ESC>	<u>Response</u> +CMGW: <index> OK or +CMS ERROR: <err> <u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.
<u>Notes</u>	- Execution command stores a message to memory storage <mem2>, and memory location <index> of the stored message is returned. - By default, message status will be set to 'stored unsent', but parameter <stat> also allows other status values to be given. (ME/TA manufacturer may choose to use different default <stat> values for different message types.) - Entering of PDU is done similarly as specified in command +CMGS.

8.8. +CMSS Command: Send Message from Storage

HL7588	
Test command	
<u>Syntax</u> AT+CMSS=?	<u>Response</u> OK
Write command <u>Syntax</u> AT+CMSS= <index>[,<da> [,<tda>]]	<u>Response</u> If text mode (+CMGF=1) and sending is successful: +CMSS: <mr>[,<scts>] If PDU mode (+CMGF=0) and sending is successful: +CMSS: <mr> OK or +CMS ERROR: <err> <u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.
<u>Notes</u>	- Execution command sends message with location value <index> from message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. - Reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports the feature), <scts> is returned in text mode.

8.9. +CNMI Command: New Message Indication

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
Test command	
<u>Syntax</u> AT+CNMI=?	<u>Response</u> +CNMI: (list of supported <mode>s), (list of supported <mt>s), (list of supported <bm>s), (list of supported <ds>es), (list of supported <bfr>s) OK
Read command	
<u>Syntax</u> AT+CNMI?	<u>Response</u> +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK

HL7588	
Write command	
<u>Syntax</u> +CNMI=[<mode> [,<mt>[,<bm> [,<ds>[,<bfr>]]]]]	<u>Response</u> OK or +CMS ERROR: <err> <u>Parameters</u> <mode> <u>0</u> Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE. 2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. <mt> <u>0</u> No indications are routed to the TE 1 Result code is sent when ME does not have any other display device other than the AT interface 2 Acknowledgement command must be sent when +CSMS <service> = 1 and ME does not have any other display device other than the AT interface 3 Acknowledgement command must be sent when +CSMS <service> = 1 <bm> <u>0</u> No CBM indications are routed to the TE 1 If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI: <mem>,<index> 2 New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled); or +CBM: <sn>,<mid>,<dc>,<page>,<pages><CR><LF><data> (text mode enabled) 3 Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1 <ds> <u>0</u> No SMS-STATUS-REPORTs are routed to the TE 1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: +CDS: <length><CR><LF><pdu> (PDU mode enabled) or +CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st> (text mode enabled) 4 If SMS-STATUS-REPORT is stored in ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CDSI: <mem>,<index> <bfr> <u>0</u> TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> = 1 – 3 is entered 1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> = 1 – 3 is entered
<u>Notes</u>	<mode>, <mt>, <bm> and <ds> are saved in non-volatile memory over module reboot; URC is available on the port that executes the command.

8.10. +CSCB Command: Select Cell Broadcast Message Type

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CSCB=?	<u>Response</u> +CSCB: (list of supported <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CSCB?	<u>Response</u> +CSCB: <mode>,<mids>,<dcss> OK
<i>Write command</i>	
<u>Syntax</u> AT+CSCB= [<mode> [,<mids>]]	<u>Response</u> OK or +CMS ERROR: <err> <u>Parameters</u> <mode> <u>0</u> Accepts messages that are defined in <mids> and <dcss> <u>1</u> Does not accept messages that are defined in <mids> and <dcss> <mids> String type; combinations of CBM message IDs (e.g. "0,1,5,320-478,922"). Default value is an empty string. The number of ranges in <mids> parameter string is limited to 6. Note that intervals are not allowed. <dcss> String type; all different possible combinations of CBM data coding schemes. Default value is an empty string.

8.11. +CSCA Command: Service Center Address

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CSCA=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+CSCA?	<u>Response</u> +CSCA: <sca>,<tosca> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CSCA=<sca> [,<tosca>]	<u>Response</u> OK or +CMS ERROR: <err> <u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.

8.12. +CSMP Command: Set Text Mode Parameters

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CSMP=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+CSMP?	<u>Response</u> +CSMP: <fo>,<vp>,<pid>,<dc> OK
<i>Write command</i>	
<u>Syntax</u> AT+CSMP=[<fo> [,<vp>[,<pid> [,<dc>]]]	<u>Response</u> OK <u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.

8.13. +CSMS Command: Select Message Service

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CSMS=?	<u>Response</u> +CSMS: (list of supported <service>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CSMS?	<u>Response</u> +CSMS: <service>,<mt>,<mo>,<bm> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CSMS= <service>	<u>Response</u> +CSMS: <mt>,<mo>,<bm> OK or +CMS ERROR: <err> <u>Parameters</u> <service> <u>0</u> 3GPP TS 23.040 and 3GPP TS 23.041 1 3GPP TS 23.040 and 3GPP TS 23.041 (the requirement of setting <service> =1 is mentioned in the corresponding command description) <mt> Message terminated messages 0 Type not supported 1 Type supported <mo> Message originated messages 0 Type not supported 1 Type supported <bm> Broadcast type messages 0 Type not supported 1 Type supported

8.14. +CPMS Command: Preferred Message Storage

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CPMS=?	<u>Response</u> +CPMS: (list of supported <mem1>s), (list of supported <mem2>s), (list of supported <mem3>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CPMS?	<u>Response</u> +CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> OK or +CMS ERROR: <err>

HL7588	
Write command	
<u>Syntax</u> AT+CPMS= <mem1> [,<mem2> [,<mem3>]]	<u>Response</u> +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK or +CMS ERROR: <err> <u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.
<u>Notes</u>	<mem1>, <mem2> and <mem3> are saved in non-volatile memory over module reboot.

8.15. +CSDH Command: Show Text Mode Parameters

HL7588							
Test command							
<u>Syntax</u> AT+CSDH=?	<u>Response</u> +CSDH: (list of supported <show>s) OK						
Read command							
<u>Syntax</u> AT+CSDH?	<u>Response</u> +CSDH: <show> OK						
Write command							
<u>Syntax</u> AT+CSDH= [<show>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <table><tr><td><show></td><td>0</td><td>Do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dc>) nor <length>, <toda> or <tooa> in +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata></td></tr><tr><td></td><td>1</td><td>Show values in result codes</td></tr></table>	<show>	0	Do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dc>) nor <length>, <toda> or <tooa> in +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>		1	Show values in result codes
<show>	0	Do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dc>) nor <length>, <toda> or <tooa> in +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>					
	1	Show values in result codes					

8.16. +XCMGS3GPP2 Command: Send 3GPP2 SMS Message

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+ XCMGS3GPP2=?	<u>Response</u> OK
<i>Write command</i> <u>Syntax</u> AT+ XCMGS3GPP2= <length> <message_type> <CR> PDU is given <ctrl-Z/ESC>	<u>Response</u> If sending is successful: OK If sending fails: +CMS ERROR: <err> <u>Parameter</u> <length> Indicates the number of total octets coded in the PDU to be given <message_type> 0 Invalid 1 Point to Point 2 Acknowledge 3 Broadcast
<u>Notes</u>	- Entered text should be formatted as follows: - PDU should be in hexadecimal format and given in one continuous line; the ME/TA converts this coding into the actual octets of PDU. - Sending can be called by giving the <ESC> character during input. <ctrl-Z> must be used to indicate the ending of PDU. - AT+CMGF has no impact on this command. - This command returns error when SMS over IP network option is not set.

8.17. +XCMT3GPP2 Command: Enable or Disable the 3GPP2 MT SMS URC

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+XCMT3GPP2 =?	<u>Response</u> +XCMT3GPP2: (list of supported <n>s) OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+XCMT3GPP2 =<n>	<u>Response</u> OK or +CMS ERROR: <err> <u>Parameter</u> <length> Indicates the number of total octets coded in the PDU to be given <n> Type of 3GPP2 message 0 Disable URC 1 Enable URC
<i>Unsolicited Notification</i>	<u>Response</u> +XCMT3GPP2: <length><CR><LF><PDU data> <u>Parameters</u> <length> Indicates the number of total octets coded in the PDU to be given <PDU data> PDU data in 3GPP2 format
<u>Notes</u>	If XCMT3GPP2 URC is enabled, then unsolicited result codes are buffered in the TA when the TA-TE link is reserved (e.g. in online data mode) and flushed to the TE after reservation. Otherwise, they are forwarded directly to the TE.

9. Audio Commands

9.1. +CLVL Command: Loudspeaker Volume Level

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CLVL=?	<u>Response</u> +CLVL: (list of supported <level>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CLVL?	<u>Response</u> +CLVL: <level> OK
<i>Write command</i>	
<u>Syntax</u> AT+CLVL= <level>	<u>Response</u> OK <u>Parameter</u> <level> 1 – 10 Loudspeaker level (smallest value represents the lowest sound level)
<u>Reference</u> [27.007] § 8.23	<u>Notes</u> The value of <level> is not saved; it will return to its nominal value after the module is reset.
<u>Examples</u>	AT+CLVL=? +CLVL: (1-10) OK AT+CLVL? +CLVL: 8 OK AT+CLVL=1 //Turn to the lowest volume level OK AT+CLVL=10 //Turn to the loudest volume level OK

9.2. +KECHO Command: Echo Cancellation

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KECHO=?	<u>Response</u> +KECHO: (list of supported <mode>s),(list of supported <param>s) OK

HL7588																																	
Read command																																	
<u>Syntax</u> AT+KECHO?	<u>Response</u> +KECHO: <status>,<param_1>,...,<param_n> OK																																
Write command	<u>Response</u> OK <u>Parameter</u> <mode> 0 Deactivate echo cancellation 1 Activate echo cancellation <status> Echo cancellation status 0 Deactivated 1 Activated <param_n> NLMSTaps_band_x stands for number of LMS (Least Mean Squares) filter taps in frequency band x <table><tr><th>#</th><th>Name</th><th>Range</th><th>Default Handset Profile</th></tr><tr><td>1</td><td><NLMSTaps_band_0></td><td>2-1096</td><td>100</td></tr><tr><td>2</td><td><NLMSTaps_band_1></td><td>1-548</td><td>100</td></tr><tr><td>3</td><td><NLMSTaps_band_2></td><td>1-548</td><td>100</td></tr><tr><td>4</td><td><NLMSTaps_band_3></td><td>1-995</td><td>2</td></tr><tr><td>5</td><td><NLMSTaps_band_4></td><td>1-995</td><td>2</td></tr><tr><td>6</td><td><NLMSTaps_band_5></td><td>1-995</td><td>2</td></tr><tr><td>7</td><td><NLMS_Block_Length></td><td>1, 2, 4, 5, 8</td><td>1</td></tr></table>	#	Name	Range	Default Handset Profile	1	<NLMSTaps_band_0>	2-1096	100	2	<NLMSTaps_band_1>	1-548	100	3	<NLMSTaps_band_2>	1-548	100	4	<NLMSTaps_band_3>	1-995	2	5	<NLMSTaps_band_4>	1-995	2	6	<NLMSTaps_band_5>	1-995	2	7	<NLMS_Block_Length>	1, 2, 4, 5, 8	1
#	Name	Range	Default Handset Profile																														
1	<NLMSTaps_band_0>	2-1096	100																														
2	<NLMSTaps_band_1>	1-548	100																														
3	<NLMSTaps_band_2>	1-548	100																														
4	<NLMSTaps_band_3>	1-995	2																														
5	<NLMSTaps_band_4>	1-995	2																														
6	<NLMSTaps_band_5>	1-995	2																														
7	<NLMS_Block_Length>	1, 2, 4, 5, 8	1																														
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - Settings will take effect immediately. - Parameters are saved and kept after reset. - This command can be used without a SIM card.																																
<u>Examples</u>	AT+KECHO? //Shows the current configuration +KECHO: 1,100,100,100,2,2,2,1 OK AT+KECHO=0 //Turn off the echo cancellation OK AT+KECHO? +KECHO: 0,100,100,100,1,1,1,2 //Echo cancellation is deactivated OK AT+KECHO=1,150,100,100,2,2,2,1 //Activate echo cancellation again and modify //param_0 to 150 +KECHO: 1,150,100,100,2,2,2,1 //The algorithm is activated again with new //parameters OK																																

HL7588	
	AT+CFUN=1,1 OK AT+KECHO? +KECHO: 1,150,100,100,2,2,1 //Parameters are retained after reset OK

9.3. +KNOISE Command: Echo Suppression

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KNOISE=?	<u>Response</u> +KNOISE: (list of supported <rx_mode>s), (list of supported <tx_mode>s), (list of supported <rx_param_1>s),..., (list of supported <rx_param_5>s), (list of supported <tx_param_1>s),..., (list of supported <tx_param_5>s) OK
<i>Read command</i> <u>Syntax</u> AT+KNOISE?	<u>Response</u> +KNOISE: <rx_status>,<tx_status>,<rx_param_1>,...,<rx_param_5>,<tx_param_1>,...,<tx_param_5> OK
<i>Write command</i> <u>Syntax</u> AT+KNOISE= <rx_mode>,<tx_mode> [,<rx_param_1>,<rx_param_5>,<tx_param_1>,...,<tx_param_5>]	<u>Response</u> OK <u>Parameters</u> <rx_mode> Receive mode 0 Deactivate downlink noise suppression 1 Activate downlink noise suppression <tx_mode> Transmit mode 0 Deactivate uplink noise suppression 1 Activate uplink noise suppression <rx_status> Receive noise suppression status 0 Deactivated 1 Activated <tx_status> Transmit noise suppression status 0 Deactivated 1 Activated <rx_param_1> 0-65535 Minimum attenuation Default handset profile value = <u>6000</u> <rx_param_2> 0-65535 Over-estimation factor for band 0 Default handset profile value = <u>8000</u>

HL7588	
	<rx_param_3> 0-65535 Over-estimation factor for all other bands Default handset profile value = <u>8000</u> <rx_param_4> 0-65535 Exponent factor of the NR Default handset profile value = <u>1000</u> <rx_param_5> 0-65535 Over-estimation factor for all other bands Default handset profile value = <u>19660</u> <tx_param_1> 0-65535 Minimum attenuation Default handset profile value = <u>6000</u> <tx_param_2> 0-65535 Over-estimation factor for band 0 Default handset profile value = <u>8000</u> <tx_param_3> 0-65535 Over-estimation factor for all other bands Default handset profile value = <u>8000</u> <tx_param_4> 0-65535 Exponent factor of the NR Default handset profile value = <u>1000</u> <tx_param_5> 0-65535 Over-estimation factor for all other bands Default handset profile value = <u>19660</u>
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • Settings will take effect immediately • Parameters are saved and kept after reset • This command can be used without a SIM card
<u>Examples</u>	AT+KNOISE=? +KNOISE: (0-1),(0-1),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535), (0-65535),(0-65535),(0-65535),(0-65535) OK AT+KNOISE? //Shows the current configuration +KNOISE: 1,1,6000,8000,8000,1000,19660, 6000,8000,8000,1000,19660 OK AT+KNOISE=0,0 //Disable uplink and downlink noise suppression OK AT+KNOISE=1,1,6500,8000,8000,1000,19660, 6800,8000,8000,1000,19660 //Enable uplink and downlink noise suppression with new parameters OK AT+CFUN=1,1 OK AT+KNOISE? +KNOISE: 1,1,6500,8000,8000,1000,19660, 6800,8000,8000,1000,19660 //Parameters are retained after reset OK

9.4. +KPC Command: Peak Compressor

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KPC=?	<u>Response</u> +KPC: (list of supported <rx_mode>s), (list of supported <tx_mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KPC?	<u>Response</u> +KPC: <rx_mode>,<tx_mode> OK
<i>Write command</i>	
<u>Syntax</u> AT+KPC= <rx_mode>, <tx_mode>	<u>Response</u> OK <u>Parameters</u> <rx_mode> <u>0</u> Disable 1 Enable <tx_mode> <u>0</u> Disable 1 Enable
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - Settings will take effect immediately. - Parameters are saved and kept after reset. - This command can be used without a SIM card.
<u>Examples</u>	AT+VIP? //Check the current audio profile +VIP: 0 OK AT+KPC=? +KPC: (0-1),(0-1) OK AT+KPC? //Shows the current value +KPC: 0,0 OK AT+KPC=1,0 //Activate the rx peak compressor OK AT+KPC? +KPC: 1,0 OK AT+VIP=1 //Switch to headset profile OK AT+KPC? +KPC: 0,0 //Peak compressor status is different in different audio profiles OK

9.5. +KPCMCFG Command: Configure PCM Digital Audio

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
Test command <u>Syntax</u> AT+KPCMCFG=?	<u>Response</u> +KPCMCFG: (list of supported <Mode>s), (list of supported <SamplingCtrl>s), (list of <BitClk>s) OK
Read command <u>Syntax</u> AT+KPCMCFG?	<u>Response</u> +KPCMCFG: <Mode>,<SamplingCtrl>,<BitClk> OK
Write command <u>Syntax</u> AT+KPCMCFG =<Mode> [,<SamplingCtrl> [,<BitClk>]]	<u>Response</u> OK <u>Parameters</u> <Mode> PCM mode 0 Master 1 Slave <SamplingCtrl> Sampling clock edge control 0 Falling edge 1 Rising edge <BitClk> PCM bit clock 0 256 kHz 1 384 kHz 2 512 kHz
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • Settings will take effect immediately; no reset is required. • Parameters are saved and kept after reset. • This command can be used without a SIM card. • The sampling rate is fixed at 8 kS/s. • Only 16-bit linear PCM mode is supported. A-law and μ-law compression modes are not supported. • Only long frame sync is supported. • In slave mode, the acceptable PCM clock is also determined by <BitClk>.
<u>Examples</u>	AT+KPCMCFG? //Shows the current configuration +KPCMCFG: 0,1,2 //Master mode, rising edge and PCM clock is 512 kHz OK AT+KPCMCFG=1,0 //Switch to slave mode with falling edge latched. As parameter <BitClk> is omitted, the old //<BitClk> value will be used in the new configuration. OK

HL7588	
	AT+KPCMCFG? +KPCMCFG: 1,0,2 //Slave mode, falling edge and PCM clock is 512 kHz OK
	AT+KPCMCFG=0,1 //Turn back to master mode and rising edge latched OK
	AT+KPCMCFG? +KPCMCFG: 0,1,2 OK

9.6. +KST Command: Side Tone

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KST=?	<u>Response</u> +KST: (list of supported <level>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KST?	<u>Response</u> +KST: <level> OK
<i>Write command</i>	
<u>Syntax</u> AT+KST=<level>	<u>Response</u> OK
	<u>Parameters</u> <level> 0 – 16 Side tone value (side tone gain from -14 dB to +18 dB in steps of 2) 20 Disable sidetone
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • Settings will take effect immediately. • Parameters are saved and kept after reset. • This command can be used without a SIM card.
<u>Examples</u>	AT+KST=? +KST: (0-16, 20) OK
	AT+KST? //Shows the current value +KST: 8 OK
	AT+KST=0 //Set side tone gain to -14dB OK
	AT+KST=20 //Disable side tone OK

HL7588	
	AT+CFUN=1,1 OK AT+KST? +KST: 20 //Parameters are retained after reset OK

9.7. +KVGR Command: Receive Gain Selection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KVGR=?	<u>Response</u> +KVGR: (list of supported <n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KVGR?	<u>Response</u> +KVGR: <n> OK
<i>Write command</i>	
<u>Syntax</u> AT+KVGR=<n>	<u>Response</u> OK <u>Parameter</u> <n> -21 to 6 Digital gain of the downlink path in dB. Default value = <u>0</u>
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • The value of <n> is not saved; it will return to its nominal value after the module is reset. • <n> can be specified with or without quotes. • Gain can be changed either during a connection or outside of a connection.
<u>Examples</u>	AT+KVGR="-21" //Receive gain is set to 21dB less than the nominal gain OK AT+KVGR="-22" //Input is out of range ERROR AT+KVGR="6" //Receive gain is set to 6dB more than the nominal gain OK AT+KVGR="7" //Input is out of range ERROR AT+VGR=87 //Receive gain is set to -20.5dB less than the nominal gain by +VGR OK AT+KVGR? //+KVGR response truncates the decimal part of the actual gain +KVGR: -20 OK

9.8. +KVG T Command: Transmit Gain Selection

HL7588	
Test command	
<u>Syntax</u> AT+KVG T=?	<u>Response</u> +KVG T: (list of supported <n>s) OK
Read command	
<u>Syntax</u> AT+KVG T?	<u>Response</u> +KVG T: <n> OK
Write command	
<u>Syntax</u> AT+KVG T=<n>	<u>Response</u> OK <u>Parameter</u> <n> -21 to 6 Digital gain of the uplink path in dB. Default value = <u>0</u>
Reference Sierra Wireless Proprietary	<u>Notes</u> • The value of <n> is not saved; it will return to its nominal value after the module is reset. • <n> can be specified with or without quotes. • Gain can be changed either during a connection or outside of a connection.
<u>Examples</u>	AT+KVG T="-21" //Transmit gain is set to 21dB less than the nominal gain OK AT+KVG T="-22" //Input is out of range ERROR AT+KVG T="6" //Transmit gain is set to 6dB more than the nominal gain OK AT+KVG T="7" //Input is out of range ERROR AT+VGT=87 //Transmit gain is set to -20.5dB less than the nominal gain by +VGT OK AT+KVG T? //+KVG T response truncates the decimal part of the actual gain +KVG T: -20 OK

9.9. +VGR Command: Receive Gain Selection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+VGR=?	<u>Response</u> +VGR: (list of supported <n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+VGR?	<u>Response</u> +VGR: <n> OK
<i>Write command</i>	
<u>Syntax</u> AT+VGR=<n>	<u>Response</u> OK <u>Parameter</u> <n> $86 \leq n \leq 140$ < 128 (128 – n)/2 dB less than the normal gain (up to -21 dB) <u>128</u> Nominal gain > 128 (n – 128)/2 dB more than the nominal gain (up to 6 dB)
<u>Reference</u> [27.007] § C.2.5	<u>Notes</u> • The value of <n> is not saved; it will return to its nominal value after the module is reset. • Gain can be changed either during a connection or outside of a connection. • This command returns an error when the requested value is out of range (-21 dB to 6 dB).
<u>Examples</u>	AT+VGR=86 //Receive gain is set to 21 dB less than the nominal gain OK AT+VGR=85 //Input is out of range ERROR AT+VGR=140 //Receive gain is set to 6 dB more than the nominal gain OK AT+VGR=141 //Input is out of range ERROR

9.10. +VGT Command: Transmit Gain Selection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+VGT=?	<u>Response</u> +VGT: (list of supported <n>s) OK

HL7588	
<i>Read command</i>	
<u>Syntax</u> AT+VGT?	<u>Response</u> +VGT: <n> OK
<i>Write command</i>	
<u>Syntax</u> AT+VGT=<n>	<u>Response</u> OK <u>Parameters</u> <n> $86 \leq n \leq 140$ < 128 (128 – n)/2 dB less than the normal gain (up to -21 dB) 128 Nominal gain > 128 (n – 128)/2 dB more than the nominal gain (up to 6 dB)
<u>Reference</u> [27.007] § C.2.5	<u>Notes</u> • The value of <n> is not saved; it will return to its nominal value after the module is reset. • Gain can be changed either during a connection or outside of a connection. • This command returns an error when the requested value is out of range (-21 dB to 6 dB).
<u>Examples</u>	AT+VGT=86 //Transmit gain is set to 21 dB less than the nominal gain OK AT+VGT=85 //Input is out of range ERROR AT+VGT=140 //Transmit gain is set to 6 dB more than the nominal gain OK AT+VGT=141 //Input is out of range ERROR

9.11. +VIP Command: Initialize Voice Parameters

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+VIP=?	<u>Response</u> +VIP: (list of supported <profile>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+VIP?	<u>Response</u> +VIP: <profile> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+VIP=<profile>	<u>Response</u> OK <u>Parameters</u> <profile> Audio profile 0 Handset 1 Headset 2 Handsfree + back speaker 5 TTY 23 Basic (no specific transducer defined)
<u>Reference</u> [27.007] § C.2.6	<u>Notes</u> - Settings will take effect in the next call, and is automatically reset after a call - This command can be used without a SIM card
<u>Examples</u>	AT+VIP? //Shows the current configuration +VIP: 0 OK AT+VIP=1 //Turn to headset profile OK AT+VGT=140 //Transmit gain of headset profile is changed to 140 OK AT+VIP=0 //Turn to handset profile OK AT+VGT? //Transmit gain of handset profile is still 128 +VGT: 128 OK

9.12. +WMAUDIOLOOP Command: Audio Test

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WMAUDIOLOOP=?	<u>Response</u> +WMAUDIOLOOP: (list of supported <ENABLE>s),(list of supported <TXORGAN>s), (list of supported <RXORGAN>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+WMAUDIOLOOP?	<u>Response</u> +WMAUDIOLOOP: <ENABLE>[,<TXORGAN>,<RXORGAN>] OK Note that parameters <TXORGAN> and <RXORGAN> are only available if <ENABLE>=1.

HL7588	
<i>Write command</i> <u>Syntax</u> AT+WMAUDIOLOOP= <ENABLE>, <TXORGAN>, <RXORGAN>	<u>Response</u> OK <u>Error Case</u> +CME ERROR: 4 (when a non-supported <TXORGAN> or <RXORGAN> is used) <u>Parameters</u> <ENABLE> 0 Stop the audio loop test 1 Execute the audio loop <TXORGAN> Audio input used as reference for the audio loop 0 PCM in 1 Reserved <RXORGAN> Audio output used to loop the audio input 0 PCM out 1 Reserved
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> Audio loop activation involves some restructions on the use of other AT commands: • It must not be enabled when: ▪ Communications is active ▪ A tone is under generation • It must be disabled (if active) before opening up communications. • Tone generation and sidetone modifications is not possible when the audio loop is active.
<u>Examples</u>	<pre> AT+WMAUDIOLOOP=? +WMAUDIOLOOP: (0-1),(0-1),(0-1) OK AT+WMAUDIOLOOP? +WMAUDIOLOOP: 0 OK AT+WMAUDIOLOOP=1,0,0 OK //Started audio loop AT+WMAUDIOLOOP? +WMAUDIOLOOP: 1,0,0 OK AT+WMAUDIOLOOP=0,0,0 OK //Stopped audio loop </pre>

9.13. +CODECINFO Command: Display Audio Codec Information

HL7588																					
Test command																					
<u>Syntax</u> AT+CODECINFO=?	<u>Response</u> +CODECINFO: (list of supported <MODE>s) OK																				
Read command																					
<u>Syntax</u> AT+CODECINFO? ?	<u>Response</u> +CODECINFO: <MODE> OK																				
Write command																					
<u>Syntax</u> AT+CODECINFO= =<MODE>	<u>Response</u> OK <u>Parameter</u> <table><tr><td><MODE></td><td>0</td><td>Disable codec info unsolicited message</td></tr><tr><td></td><td>1</td><td>Enable codec info unsolicited message</td></tr></table>	<MODE>	0	Disable codec info unsolicited message		1	Enable codec info unsolicited message														
<MODE>	0	Disable codec info unsolicited message																			
	1	Enable codec info unsolicited message																			
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <MODE> is stored in non-volatile memory immediately when a valid write command is entered, and retained after reset. <MODE> is effective without a reset. - This command can be used without a SIM card. - If <MODE> = 1, +CODECINFO: x unsolicited message will be displayed in the format below: <table><tr><td>+CODECINFO: 6</td><td>UMTS_AMR2</td></tr><tr><td>+CODECINFO: 10</td><td>UMTS_AMR_WB</td></tr></table>	+CODECINFO: 6	UMTS_AMR2	+CODECINFO: 10	UMTS_AMR_WB																
+CODECINFO: 6	UMTS_AMR2																				
+CODECINFO: 10	UMTS_AMR_WB																				
<u>Examples</u>	<table><tr><td>AT+CODECINFO=?</td><td>// Read available options</td></tr><tr><td>+CODECINFO: (0-1)</td><td></td></tr><tr><td>OK</td><td></td></tr><tr><td>AT+CODECINFO=1</td><td></td></tr><tr><td>OK</td><td></td></tr><tr><td>AT+CODECINFO?</td><td>// Read current setting</td></tr><tr><td>+CODECINFO: 1</td><td></td></tr><tr><td>OK</td><td></td></tr><tr><td>RING</td><td>// An incoming call</td></tr><tr><td>+CODECINFO: 10</td><td>// UMTS_AMR_WB is chosen</td></tr></table>	AT+CODECINFO=?	// Read available options	+CODECINFO: (0-1)		OK		AT+CODECINFO=1		OK		AT+CODECINFO?	// Read current setting	+CODECINFO: 1		OK		RING	// An incoming call	+CODECINFO: 10	// UMTS_AMR_WB is chosen
AT+CODECINFO=?	// Read available options																				
+CODECINFO: (0-1)																					
OK																					
AT+CODECINFO=1																					
OK																					
AT+CODECINFO?	// Read current setting																				
+CODECINFO: 1																					
OK																					
RING	// An incoming call																				
+CODECINFO: 10	// UMTS_AMR_WB is chosen																				

9.14. +KSRAP Command: Save or Restore Audio Parameters

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KSRAP=?	<u>Response</u> +KSRAP: (list of supported <level>s) OK
<i>Write command</i> <u>Syntax</u> AT+KSRAP=<level>	<u>Response</u> OK <u>Parameter</u> <level> 2 Restore audio parameters in non-volatile memory to their default values
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> This command changes the values in the non-volatile memory immediately; settings take effect in the next speech call.
<u>Example</u>	<pre> at+ksrap ERROR at+ksrap? ERROR at+ksrap=? +KSRAP: (2) OK at+kecho? // Current +kecho NVM parameters +KECHO: 0,100,100,100,2,2,2,1 OK at+kecho=1,103,102,101,4,3,2,1 // Change +kecho NVM parameters by at+kecho +KECHO: 1,103,102,101,4,3,2,1 OK at+cfun=1,1 OK at+kecho? // +kecho NVM parameters are modified +KECHO: 1,103,102,101,4,3,2,1 OK at+ksrap=2 // By +ksrap=2, default kecho parameters in NVM // are restored OK at+kecho? +KECHO: 0,100,100,100,2,2,2,1 OK </pre>

9.15. +WVR Command: Voice Codec Selection

HL7588	
<i>Test command</i> <u>Syntax</u> AT+WVR=?	<u>Response</u> +WVR: (list of supported <aud_coding_type_2G>s),(list of supported <aud_coding_type_3G>s) OK
<i>Read command</i> <u>Syntax</u> AT+WVR?	<u>Response</u> +WVR: <aud_coding_type_2G>,<aud_coding_type_3G> OK
<i>Write command</i> <u>Syntax</u> AT+WVR= [<aud_coding_type_2G>] [,<aud_coding_type_3G>]	<u>Response</u> OK <u>Parameters</u> <aud_coding_type_2G> Supported 2G types (not supported) 5 FR, EFR, HR, AMR-FR, AMR-HR <aud_coding_type_3G> Supported 3G types 3 UMTS AMR v2 4 UMTS AMR v2, UMTS, AMR-WB
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This command allows the configuration of supported 3G voice codecs of the device; although the final codec decision is made by the network. No call would be established and no sound would be heard if the list of supported codecs set in the device does not match the network's. (Note that 2G voice codecs are not supported in the HL7588.) <aud_coding_type_2G> has no effect in the HL7588 as it is not supported. - Parameters are stored in non-volatile memory immediately when a valid write command is entered. - This command can be used without a SIM card.
<u>Example</u>	AT+WVR=? // Read the available options +WVR: (5),(3-4) OK AT+WVR=,3 // Set 3G codec as UMTS AMR v2, 2G codec is skipped as only 3G // codecs available OK AT+WVR? // Read the current setting +WVR: 5,3 OK

9.16. +VTD Command: Tone Duration

Note: For HL7588 AT&T only.

HL7588 AT&T	
<i>Test command</i>	
<u>Syntax</u> AT+VTD=?	<u>Response</u> +VTD: (list of supported <n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+VTD?	<u>Response</u> +VTD: <n> OK
<i>Write command</i>	
<u>Syntax</u> AT+VTD=<n>	<u>Response</u> OK <u>Parameter</u> <n> 0 Default setting (default duration of the tone is 7/10 second) 1 – 100 Duration of the tone in 1/10 seconds
<u>Reference</u> [27.007] § C.2.12	<u>Notes</u> The network shall ensure that the minimum length of tone and the minimum gap between two subsequent tones (according to ETR 206) is achieved. (In ETR 206 the minimum duration of a DTMF tone is 70ms ± 5ms, the minimum gap between DTMF tones is 65ms). There is no defined maximum length to the tone; however, the operator may choose to put a pre-defined time limit on the duration of tones sent to line (refer to [23.014]). That means that with n<6, DTMF will be generated with a duration given by the network.

9.17. +VTS Command: DTMF and Tone Generation

Note: For HL7588 AT&T only.

For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588 AT&T	
<i>Test command</i>	
<u>Syntax</u> AT+VTS=?	<u>Response</u> +VTS: (list of supported <DTMF>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+VTS= "<DTMF>₁, <DTMF>₂ ..., <DTMF>_n"	<u>Response</u> OK

HL7588 AT&T	
or AT+VTS= "{<DTMF>₁, <DURATION>₁, {<DTMF>₂, <DURATION>₂, ... {<DTMF>_n, <DURATION>_n}"	<u>Parameters</u> <DTMF> A single ASCII character in the set 0 – 9, #, *, A – D. This is interpreted as a single ASCII character whose duration is set by the +VTD command. DTMF tones can only be issued during a voice call. <DURATION> This is interpreted as a DTMF tone of different duration from that mandated by the +VTD command. In GSM, this only operates in voice mode. Values are in 1/10 second multiples.
<u>Reference</u> [27.007] § C.2.11	<u>Notes</u> The network shall ensure that the minimum length of tone and the minimum gap between two subsequent tones (according to ETR 206) is achieved. (In ETR 206 the minimum duration of a DTMF tone is 70ms ± 5ms, the minimum gap between DTMF tones is 65ms). There is no defined maximum length to the tone, however, the operator may choose to put a pre-defined time limit on the duration of tones sent to line (refer to [23.014]). That means that with n<6, DTMF will be generated with a duration given by the network

>> 10. Packet Domain Commands

For details about PDP context use, refer to section 1.4 PDP Context Usage.

10.1. +CGATT Command: PS Attach or Detach

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGATT=?	<u>Response</u> +CGATT: (list of supported <state>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CGATT?	<u>Response</u> +CGATT: <state> OK
<i>Write command</i>	
<u>Syntax</u> AT+CGATT= [<state>]	<u>Response</u> OK or ERROR <u>Parameters</u> <state> State of PS attachment <u>0</u> Detached <u>1</u> Attached

10.2. +CGACT Command: Activate or Deactivate PDP Context

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGACT=?	<u>Response</u> +CGACT: (list of supported <state>s) OK

HL7588	
<i>Read command</i>	
<u>Syntax</u> AT+CGACT?	<u>Response</u> +CGACT: <cid>, <state> OK
<i>Write command</i>	
<u>Syntax</u> AT+CGACT= [<state> [,<cid> [,<cid> [...]]]	<u>Response</u> OK or ERROR <u>Parameters</u> <state> State of PDP context activation 0 Deactivated 1 Activated <cid> Numeric parameter which specifies a particular PDP context definition.
<u>Notes</u>	Up to three (3) PDP contexts can be active at once.

10.3. +CGANS Command: PDP Context Activation Manual Response

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGANS=?	<u>Response</u> +CGANS: (list of supported <response>s), (list of supported <L2P>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+CGANS= [<response>, [<L2P> ,<cid>]]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <response> 0 Reject the request (default value if omitted) 1 Accept and request that the PDP context be activated <L2P> String parameter indicating the layer 2 protocol to be used (see +CGDATA) <cid> Numeric parameter that specifies a particular PDP context definition (see +CGDCONT and +CGDSCT). Parameter <response> allows the TE to accept or reject the request.

HL7588Notes

- Commands following the +CGANS command in the AT command line shall not be processed by the MT.
- If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.250 online data state. If no <cid> is given or if there is no matching context definition, the MT will attempt to activate the context using the values for PDP type and PDP address provided by the network, together with any other relevant information known to the MT. The other context parameters will be set to their default values.
- If the activation is successful, data transfer may proceed. Note that this is not the same as if the MT issues a +CGDATA (or +CGACT) command after receiving a +CRING unsolicited result code. +CGDATA (or +CGACT) does not command the MT to acknowledge the network request but rather to make a new request for context activation. The network request would be ignored.

10.4. +CGCMOD Command: Modify PDP Context

HL7588*Test command*Syntax

AT+CGCMOD=?

Response

+CGCMOD: (list of <cid>s associated with active contexts)
OK

*Write command*Syntax

AT+CGCMOD=
[<cid>[,<cid>
[,...]]]

Response

OK

or
+CME ERROR: <err>

Parameter

<cid> Numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCT)

10.5. +CGTFT Command: Traffic Flow Template

HL7588*Test command*Syntax

AT+CGTFT=?

Response

+CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s), (list of supported <direction>s)

HL7588	
	[<CR><LF>+CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s), (list of supported <direction>s)[...]]
<i>Read command</i> <u>Syntax</u> AT+CGTFT?	<u>Response</u> +CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction> [<CR><LF>+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction> [...]]
<i>Write command</i> <u>Syntax</u> AT+CGTFT= [<cid>],[<packet filter identifier>, <evaluation precedence index> [,<source address and subnet mask> [,<protocol number (ipv4) / next header (ipv6)> [,<destination port range> [,<source port range> [,<ipsec security parameter index (spi)> [,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> [,<flow label (ipv6)>, <direction>]]]]]]]]	<u>Response</u> OK or ERROR <u>Parameter</u> <cid> Numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCT) <packet filter identifier> Numeric parameter with value range from 1 to 16 <evaluation precedence index> Numeric parameter with value range from 0 to 255 <source address and subnet mask> String type given as a dot-separated numeric (0 – 255) parameter of the form "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13. a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6 <protocol number (ipv4) / next header (ipv6)> Numeric parameter with value range from 0 to 255 <destination port range> String type given as a dot-separated numeric (0 – 65535) parameter on the form 'f.t.' <source port range> String type given as a dot-separated numeric (0 – 65535) parameter on the form 'f.t.' <ipsec security parameter index (spi)> Numeric value in hexadecimal format with value range from 00000000 to FFFFFFFF <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> String type given as a dot-separated numeric (0 – 255) parameter on the form 't.m.'

HL7588	
	<flow label (ipv6)> Numeric value in hexadecimal format with value range from 00000 to FFFFF. Valid for IPv6 only <direction> Specifies the transmission direction in which the packet filter shall be applied 1 Uplink 2 Downlink 3 Birectional (up and downlink ; default if omitted)
<u>Notes</u>	Some of the listed attributes above may coexist in a Packet Filter while others mutually exclude each other. For the list of possible combinations, refer to 3GPP TS 23.060.

10.6. +CGCLASS Command: GPRS Mobile Station Class

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGCLASS=?	<u>Response</u> +CGCLASS: (list of supported <class> es) OK
<i>Read command</i>	
<u>Syntax</u> AT+CGCLASS?	<u>Response</u> +CGCLASS: <class> OK
<i>Write command</i>	
<u>Syntax</u> AT+CGCLASS= [<class>]	<u>Response</u> OK or ERROR <u>Parameters</u> <class> Mode of operation "A" Class A "B" Class B "CG" Class C in GPRS mode "CC" Class C in circuit switched mode
<u>Notes</u>	<class> is saved in non-volatile memory over module reboot.

10.7. +CGDCONT Command: Define PDP Context

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGDCONT=?	<u>Response</u> +CGDCONT: (range of supported <cid>s), <PDP_type>,...,(list of supported <d_comp>s), (list of supported <h_comp>s), (list of supported <IPv4Addr Alloc>s), (list of supported <emergency_indication>s), (list of supported <PCSCF_discovery>s), (list of supported <IM_CN_Signalling_Flag_Ind>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 <IPv4Addr Alloc>s), (list of supported <emergency_indication>s), (list of supported <PCSCF_discovery>s), (list of supported <IM_CN_Signalling_Flag_Ind>s) [...] OK
<i>Read command</i>	
<u>Syntax</u> AT+CGDCONT?	<u>Response</u> [+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp> [<IPv4AddrAlloc>,<emergency_indication>,<PCSCF_discovery> [<IM_CN_Signalling_Flag_Ind>]]] [<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp>,<IPv4AddrAlloc>,<emergency_indication>,<PCSCF_discovery> [<IM_CN_Signalling_Flag_Ind>]]] [...] OK
<i>Write command</i>	
<u>Syntax</u> AT+CGDCONT= [<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp> [,<IPv4AddrAlloc> >,<emergency_indication> [,<PCSCF_discovery> [,<IM_CN_Signalling_Flag_Ind>]]]]]]]]	<u>Response</u> OK or ERROR <u>Parameters</u> <cid> PDP Context Identifier. A numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of the permitted values (minimum value = 1) is returned by the test command. <PDP_type> Packet Data Protocol type "IP" Internet Protocol "IPv6" Internet Protocol, version 6 "IPv4V6" Virtual <PDP_type>introduced to handle dual IP stack UE capability <APN> Access Point Name String parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. <PDP_address> String parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the command +CGPADDR command.

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	Note that IPv6 address obtained on LTE will be prefixed with a constant 8 byte address "FE.80.00.00.00.00.00" if the network has not provided any. <d_comp> PDP data compression (applicable for SDCP only) 0 Off (default if value if omitted) 1 On (manufacturer preferred compression) 2 V.42 bis <h_comp> PDP header compression 0 Off (default if value if omitted) 1 On (manufacturer preferred compression) 2 RFC1144 (applicable for SDCP only) 3 RFC2507 4 RFC3095 (applicable for PDCP only) <IPv4AddrAlloc> Numeric parameter that controls how MT/TA requests to get IPv4 address information 0 IPv4 address allocated through NAS signalling 1 IPv4 address allocated through DHCP <emergency_indication> Indicates whether the PDP context is for emergency bearer services or not 0 PDP context is not for emergency bearer services 1 PDP context is for emergency bearer services <P-CSCF_discovery> Numeric parameter that influences how the MT/TA requests get the P-CSCF address 0 Preference of P-CSCF address discovery not influences by +CGDCONT 1 Preference of P-CSCF address discovery through NAS signalling <IM_CN_Signalling_Flag_Ind> Numeric parameter used to indicate whether the PDP context is for IM CN subsystem related signaling only or not 0 UE indicates that the PDP context is not for IM CN subsystem-related signaling only 1 UE indicates that the PDP context is for IM CN subsystem-related signaling only
Notes	- If the command is used only with the one parameter <cid>, it means that the corresponding PDP context becomes undefined. - The APN Control List (ACL) will only be checked if a USIM is inserted. Before performing context definition, it will check if the ACL-service is enabled and activated. If yes, all APNs from ACL of EF-ACL of the USIM will be read out and compared with the requested APN. - If the requested APN is listed in the ACL, the context definition will be performed. - If the requested APN is empty ("") and ACL contains "network provided APN", the context definition will also be requested. - If the APN is not listed in the ACL the command returns error. - If the ACL-service is not enabled or not activated in the USIM or a GSM-SIM is inserted the context definition will be performed without any checks. - Parameters are saved in non-volatile memory over module reboot

10.8. +CGDSCONT Command: Define Secondary PDP Context

HL7588	
<i>Test command</i> <u>Syntax</u> AT+CGDSCONT=?	<u>Response</u> +CGDSCONT: (range of <cid>s),(list of <cid>s for defined primary contexts),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IM_CN_Signalling_Flag_Ind>s) [<CR><LF>]+CGDSCONT: (range of <cid>s),(list of <cid>s for defined primary contexts),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IM_CN_Signalling_Flag_Ind>s) [...] OK
<i>Read command</i> <u>Syntax</u> AT+CGDSCONT?	<u>Response</u> [+CGDSCONT: <cid>, <p_cid>, <d_comp>, <h_comp> [,<IM_CN_Signalling_Flag_Ind>]] [<CR><LF>]+CGDSCONT: <cid>, <p_cid>, <d_comp>,<h_comp> [,<IM_CN_Signalling_Flag_Ind>]] [...] OK
<i>Write command</i> <u>Syntax</u> AT+CGDSCONT=[<cid>,<p_cid>[,<d_comp>[,<h_comp>[,<IM_CN_Signalling_Flag_Ind>]]]]	<u>Response</u> OK or ERROR <u>Parameters</u> <cid> PDP Context Identifier. A numeric parameter that specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of the permitted values (minimum value = 1) is returned by the test command. <p_cid> Primary PDP Context Identifier. Numeric parameter that specifies a particular PDP context definition which has been specified by +CGDSCONT. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test command. <d_comp> PDP data compression (applicable for SNDSCP only) 0 Off (default value if omitted) 1 On (manufacturer preferred compression) 2 V.42 bis <h_comp> PDP header compression 0 Off (default value if omitted) 1 On (manufacturer preferred compression) 2 RFC1144 (applicable for SNDSCP only) 3 RFC2507 4 RFC3095 (applicable for PDCP only)

HL7588	
	<IM_CN_Signalling_Flag_Ind> Numeric parameter used to indicate whether the PDP context is for IM CN subsystem related signaling only or not 0 UE indicates that the PDP context is not for IM CN subsystem-related signaling only 1 UE indicates that the PDP context is for IM CN subsystem-related signaling only

10.9. +CGDATA Command: Enter Data State

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGDATA=?	<u>Response</u> +CGDATA: (list of supported <L2P>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+CGDATA = [<L2P> [<cid> [,<cid> [...]]]	<u>Response</u> CONNECT (followed by data transfer) or CME ERROR: <err> <u>Parameter</u> <L2P> String parameter that indicates the layer 2 protocol to be used between the TE and MT PPP Point-to-point protocol for a PDP such as IP M-OPT-PPP MS supports manufacturing specific protocol M-HEX MS supports manufacturing specific protocol M-RAW_IP MS supports manufacturing specific protocol <cid> Numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT)

10.10. +CGED Command: GPRS Cell Environment

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGED=?	<u>Response</u> +CGED: (list of supported <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CGED?	<u>Response</u> +CGED: <mode> OK

HL7588*Write command*Syntax

AT+CGED=
[<mode>]

Response

If UMTS is not supported:

+CGED:

Service-Cell:

<MCC>,<MNC>,<LAC>,<CI>,<BSIC>,<AcT>

Equivalent PLMNs:

<MCC>,<MNC>

<MCC>,<MNC>

<arfcn>,<RxLevServ>,<RfChannels>,<Arfcn_ded>,<RxLevFull>,<RxLevSub>,<RxQualFull>,<RxQualSub>,<GSM-<ciphering>,<GPRS Ciphering Algorithm: GEA<gprs_ciphering>,<ms_txpwr>,<rx_acc_min>,<cbq>,<cba>,<c2_valid>,<cr_offset>,<tmp_offset>,<penalty_t>,<c1>,<c2>,<ch_type>,<ch_mode>,<txpwr>,<dtx_used>,<dtr_used>,<t3212>,<acc>,<t_adv>,<bs_pa_mfrms>,<dsc>,<rll>,<amr_acs>,<amr_cod_ul>,<amr_cod_dl>,<amr_c_i>,<BEP GMSK: <mean_bep_gmsk>,<cv_bep_gmsk>,<BEP 8PSK: <mean_bep_8psk>,<cv_bep_8psk>,<Neighbour Cell <n>:<MCC>,<MNC>,<LAC>,<CI>,<BSIC>,<arfcn>,<RxLev><C1_nc>,<C2_nc>

Note: Neighbour cell content may be repeated up to 6 times.

GPRS Parameters:

<GPRS_sup>,<RAC>,<Split_Pg_Cycle>,<NCO>,<NOM>,<T3192>,<Acc_Burst_type>,<DRX_Timer_Max>,<PBCCH>,<Ext_Measure_Order>

<PSI1_r_per>,<si13_location>,<packet_psi_status>,<packet_si_status>,<ext_upl_tbf_supported>,<ccn_active>,<pfc_feat_supported>

Coding Scheme:

dl_sc: <dl_sc>,ul_sc: <ul_sc>

<Count_LR>,<Count_HR>,<C_R_Hyst>,<C31>,<C32>,<Prior_Acc_Thr>

OK

If UMTS is supported:

+CGED: RAT:<rat>,<URR>:<rrc_state>,<DC>:<urrcdc_state>,<BP>:<urrcbp_state>,<M>:<urrcm_state>,<ERR>:<as_error_code>,<RC>:<release_cause>,<OOS>:<out_of_service>,<BLER>:<meas_bler>,<TSIR>:<target_sir>,<MSIR>:<meas_sir>,<DPUC>:<dlpc_power_up_commands_count>,<DPDC>:<dlpc_power_down_commands_count>,<UPUC>:<ulpc_power_up_commands_count>,<UPDC>:<ulpc_power_down_commands_count>,<CMOD>:<compressed_mode>,<TPCA>:<tx_ul_pwr_ctrl_alg>,<DCL>:<drx_cycle_length>,<UPCS>:<ul_pwr_ctrl_step_size>,<BTRG>:<bler_target>,<NHSC>:<num_hsscch_codes>,<HSC>:<hierarchical_cell_structure>,<HMD>:<high_mobility_detected>,<LM>:<limited_mode>,<RJZC>:<urrc_con_rej_cause>

CMAx:<UMAC data CQI max value>,<CMEAN>:<UMAC data CQI mean value>,<CMIN>:<UMAC data CQI min value>,<AFTI>:<AMR frame type id>,<ATYP>:<AMR type>

CellId:<cell_identity>,<DLF>:<dl_frequency>,<ULF>:<ul_frequency>,<C>:<ciphering>,<D>:<ps_data_transferred>,<PSM>:<power_saving_mode>,<Cell>:<celltype=AS>,<SC>:<scrambling_code>,<RSCP>:<rscp>,<ECN0>:<ecn0>

Cell:<celltype=VAS>,<SC>:<scrambling_code>,<RSCP>:<rscp>,<ECN0>:<ecn0>,<DLF>:<dl_frequency>

Cell:<celltype=M>,<SC>:<scrambling_code>,<RSCP>:<rscp>,<ECN0>:<ecn0>

Cell:<celltype=D>,<SC>:<scrambling_code>,<RSCP>:<rscp>,<ECN0>:<ecn0>

Cell:<celltype=G>,:<gsm_band>,<Arfcn>:<arfcn>,<RxLev>:<rxLev>,<Bsic>:<bsic>,<RV>:<ranking_value>

Cell:<celltype=U>,<SC>:<scrambling_code>,<RSCP>:<rscp>,<ECN0>:<ecn0>,<DLF>:<dl_frequency>,<RV>:<ranking_value>

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Cell:<celltype=NU>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>, DLF:<dl_frequency>, RS:<ranking_status>
 Cell:<celltype=NG>, B:<gsm band>, Arfcn:<arfcn>, RxLev:<rxLev>, Bsic:<bsic>, RS:<ranking_status>
 RR measurement evaluation:
 MeasId :<meas_id>, EventId :<event_id>, <par 3>,<par 4>, <par 5>, <par 6>,...,<par N>,<par N>,<par N>, MeasId :<meas_id>, EventId :<event_id>, <par 3>,<par 4>,<par 5>,<par 6>,...,<par M>,<par M>,<par M>,...etc...
 MM:
 Process:CO, MMs:<mm_state>,MMSs:<mm_service_state>,MSC:<ms_class>, T:<active_timer_bitmap>
 Process:CS, MMs:<mm_state>,MMSs:<mm_service_state>,LUS:<location_update_status>, T:<active_timer_bitmap>,L:<limited_service>
 Process:PS, MMs:<mm_state>,MMSs:<mm_service_state>, LUS:<location_update_status>,T:<active_timer_bitmap>,L:<limited_service>, GS:<gprs_supported>,R:<ready_state>
 Cell change counters:
 CRT:<cell_reselecetion_total>,IRCR:<ir_cell_reselecetion>,AIRCR:<attempted_ir_cell_reselecetion>,IRHO:<ir_handover>, AIRHO:<attempted_ir_handover>
 Equivalent PLMNs:
 MCC:<mobile_country_code>, MNC:<mobile_network_code>
 Serving PLMN:
 MCC:<mobile_country_code>,MNC:<mobile_network_code>, LAC:<location_area_code>,RAC:<routing_area_code>

Note: The maximum total number of cells is 24.

or

CME ERROR: <err>

Parameters

<mode>	0	One shot dump
	1	Periodic refreshed dump
	2	Stop periodic dump
<MCC>	0 – 999	3-digit mobile country code
<MNC>	0 – 99	2-digit mobile network code
<LAC>	0h – FFFFh	2-octet location area code
<CI>	0h – FFFFh	2-octet cell identity
<BSIC>	0h – 3Fh	6-bit base station identify code
<AcT>	0	GSM
	1	GPRS
	2	EGPRS
	3	EGPRS_PCR
	4	EGPRS_EPCR
	5	UMTS (unused)
	6	DTM
	7	EGPRS_DTM
	8	Undefined

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<arfcn>	0 – 1023	Absolute radio frequency channel number
<RfChannels>	Number of frequencies in MA	
	0	N.A.
	0x01	Single RF
<Arfcn_ded>	Single ARFCN of dedicated channel of first ARFCN of MA	
<RxLevFull>	0h – 3Fh	Received signal strength on serving cell, measured on all slots
<RxLevSub>	0h – 3Fh	Received signal strength on serving cell, measured on a subset of slots
<RxQualFull>	0 – 7	Received signal quality on serving cell, measured on all slots
<RxQualSub>	0 – 7	Received signal quality on serving cell, measured on a subset of slots
<ms_txpwr>	0 – 31	Maximum TX power level an MS may use when accessing the system until otherwise commanded
<rx_acc_min>	0 – 63	RXLEV-ACCESS-MIN
<cbq>	0 – 1	CELL_BAR_QUALIFY
<cba>	0 – 1	CELL_BAR_ACCESS
<cs_valid>	True if all parameter for calculation of c2 are available	
<cr_offset>	0 – 63	6-bit CELL_RESELECT_OFFSET
<tmp_offset>	0 – 7 (mapped to 0 – 70)	TEMPORARY_OFFSET
<penalty_t>	0 – 31	Penalty time
<c1>	Value of c1	
<c2>	Value of c2	
<ch_type>	Channel type of the current connection	
	0	INVALID_CHN_TYPE
	1	TCH_F
	2	TCH_F
	3	SDCCH_4
	4	SDCCH_8
	5	TCH_H_H
	6	TCH_F_M
<ch_mode>	Channel mode of the current connection. Value = 0 – 255 (mapped to an internal value as detailed below)	
	0	MODE_SIG_ONLY
	1	MODE_SPEECH_F
	2	MODE_SPEECH_H
	3	MODE_DATA_96_F

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4	MODE_DATA_48_F
5	MODE_DATA_48_H
6	MODE_DATA_24_F
7	MODE_DATA_24_H
8	MODE_SPEECH_F_V2
9	MODE_SPEECH_F_V3
10	MODE_SPEECH_H_V2
11	MODE_SPEECH_H_V3
12	MODE_DATA_144_F
<txpwr>	0 – 31 5-bit transmit power level of the current connection
<dtx_used>	0 – 1 DTX used
<dtr_used>	0 – 1 DTX used
<t3212>	0 – 255 8-bit T3212 timeout value field coded as the binary representation of the timeout value for periodic updating in decihours
<acc>	0 – 65535 Access control class (RACH Control Parameters)
<t_adv>	FFh Timing Advance (not used)
<bs_pa_mfrms>	0 – 7 (mapped to 2 – 9) BS_PA_MFRMS (multiframes period for transmission of PAGING REQUEST)
<amr_acs>	AMR active codec
<amr_cod_dl>	AMR codec used in DL
<amr_cod_ul>	AMR codec used in UL
<amr_ci_i>	AMR C/I in dB/2
<mean_bep_8psk>	0 – 31 MEAN_BEP_8PSK
<cv_bep_8psk>	0 – 7 CV_BEP_8PSK
<mean_bep_gmsk>	0 – 31 MEAN_BEP_GMSK
<cv_bep_gmsk>	0 – 7 CV_BEP_GMSK
GPRS Parameters:	
<GPRS_sup>	0 – 255 GPRS supported (in serving cell)
<RAC>	0 – 1 Routing Area Code
<Split_Pg_Cycle>	0 – 1 SPGC_CCH_SUP split pg_cycle on cch by network
<NCO>	0 – 3 NETWORK_CONTROL_ORDER (GPRS_Cell_Options)
<NOM>	0 – 3 NETWORK OPERATION MODE (GPRS_Cell_Options)

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<T3192> 0 – 7 (mapped to 0 – 1500msec) Wait for release time of the TBF after reception of the final block

0 500 msec
 1 1000 msec
 2 1500 msec
 3 0 msec
 4 80 msec
 5 120 msec
 7 200 msec

<Acc_Burst_type> 0 8-bit access burst
 1 11-bit access burst

<DRX_Timer_Max> 0 – 7 DRX_TIMER_MAX

<PBCCH> PBCCH present

<Ext_Measure_Order> 0 – 3 EXT_MEASUREMENT_ORDER

<PSI1_r_per> 0 – 15 (mapped to 1 – 16) PSI1_REPEAT_PERIOD

<si14_location> "BCCH_NORM"
 "BCCH_EXT"
 "NO_BCCH_TYPE"

<packet_psi_status> 0 – 1

<packet_si_status> 0 – 1

<ext_upl_tbf_supported> 0 – 1

<ccn_active> 0 – 1

<pfc_feat_supported> 0 – 1

<dl_sc>, <ul_sc> Current modulation and coding scheme of downlink <dl_sc> or uplink <ul_sc>

NB_CS_1
 NB_CS_2
 NB_CS_3
 NB_CS_4
 NB_MCS_1
 NB_MCS_2
 NB_MCS_3
 NB_MCS_4
 NB_MCS_5
 NB_MCS_6
 NB_MCS_7
 NB_MCS_8
 NB_MCS_9
 NB_MCS_5_7
 NB_MCS_6_9

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AB_8
AB_11
AB_11_E

<Count_LR> 0 – 63 PSI_COUNT_LR

<Count_HR> 0 – 15 (mapped to 1 – 16) PSI_COUNT_HR

<C_R_Hyst> 0 – 7 CELL-RESELECT-HYSTERESIS

<C1> Integer value of c1

<C2> Integer value of c2

<C31> Integer value of c31

<C32> Integer value of c32

<Prior_Acc_Thr> 0 – 7 Priority_ACCESS_THR

<rrc_state> "CD" CELL_DCH
"CF" CELL_FACH
"CP" CELL_PCH
"UP" URA_PCH
"ID" IDLE
"ST" START

<urrcdc_state> Indicated by three hex digits (octet1, 2:event, 3:state)

<urrcbp_state> Indicated by four hex digits (1, 2:event, 3, 4:state)

<urrcm_state> Indicated by three hex digits (1:event, 2:state, 3:number of sent measurements)

<as_error_code> Indication about error in UAS; integer value with range from 0 – 99

<release_cause> Integer value with range from 0 – 99

<out_of_service> 0 – 1

<meas_bler> Block error rate. Range of values = 1.0×10^{-6} to 9.9×10^{-1}
The value '-' is indicated if the parameter is not available, or for all cells except DCH. The internal received value is divided by 2^{23} before displayed.

<target_sir> Target SIR. Range of value = -10 to 20 (3 digits are always displayed); the value '-' is displayed if the parameter is not available, or for all cells except DCH. The internal received value is divided by 2^{24} before displayed.

<meas_sir> Integer displayed in hexadecimal format with range from -10 to 20; the value '-' is displayed if the parameter is not available, or for all cells except DCH. The internal received value is divided by 2^{24} before displayed.

<hierarchical_cell_structure> 0 – 1

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<high_mobility_detected>	0 – 1
<limited_mode>	0 – 1
<dlpc_power_up_commands_count>	L1 related data counter
<dlpc_power_down_commands_count>	L1 related data counter
<ulpc_power_up_commands_count>	L1 related data counter
<ulpc_power_down_commands_count>	L1 related data counter
<compressed_mode>	Flag indicating if Compressed Mode is Active or not
<tx_ul_pwr_ctrl_alg>	Tx Uplink Power Control Algorithm
<drx_cycle_length>	DRX Cycle Length value 2^k
<ciphering>	Indicates whether GSM Ciphering may be ON or OFF
<ps_data_transferred>	0 – 1
<power_saving_mode>	0 – 1
<cell_type>	"AS" Active set "VAS" Virtual active set "M" Monitored cells "D" Detected cells "G" GSM cells "<< U >>" UMTS cells "<< NU >>" Non-ranked UMTS cells "NG" Non-ranked GSM cells
<scrambling_code>	Integer value with range from 0 – 511
<rscp> value	Received Signal Code Power with range from 0 – 91; <u>255</u> for invalid/default value
<ecno>	Energy per chip/noise with range from 0 – 24; <u>255</u> for invalid/default value
<gsm_band>	"D" 1800 MHz "P" 1900 MHz "G" 900 MHz
<arfcn>	Absolute radio frequency channel number with range from 0 – 1023
<ranking_value>	Integer value with range from 0 – 999
<ranking_status>	Integer value with range from 0 – 9
Measurement Parameters:	
<meas_id>	One hex digit with range from 0 – FH

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	<event_id> Two hex digits with range from 1AH – 3DH <par 3,4,5,...,M,...,N> Integer value with range from 0 – 99 <mm_state> Integer value with range from 0 – 99 <mm_service_state> Integer value with range from 0 – 99 <ms_class> MS GPRS-class (previously stored in ATC either at reception of message MN_GCLASS_IND or sending the message MN_GCLASS_REQ). Possible values are: class A class B class CG: class C in GPRS only mode classCC: class C in circuit switched only mode (lowest class) <active_timer_bitmap> Four hex coded digits <location_update_status> Integer value with range from 0 – 9 <limited_service> 0 – 1 <gprs_supported> 0 – 1 <ready_state> 0 – 1 <cell_reselecetion_total> Integer value with range from 0 – 999 <ir_cell_reselecetion_counter> Integer value with range from 0 – 999 <attempted_ir_cell_reselecetion> Integer value with range from 0 – 999 <ir_handover> Integer value with range from 0 – 999 <attempted_ir_handover> Integer value with range from 0 – 999 <routing_area_code> Integer value with range from 0 – 255
<u>Notes</u>	This command returns a dump of the cell environment, either as a one-shot dump or as a periodic refreshed dump (5 seconds each), dependent on the command parameter <mode>.

10.11. +CGEREP Command: Packet Domain Event Reporting

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGEREP=?	<u>Response</u> +CGEREP: (list of supported <mode>s),(list of supported <bfr>s) OK

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<i>Read command</i> <u>Syntax</u> AT+CGEREP?	<u>Response</u> +CGEREP: <mode>, <bfr> OK or ERROR
<i>Write command</i> <u>Syntax</u> AT+CGEREP= [<mode>[,<bfr>]]	<u>Response</u> OK or ERROR <u>Parameters</u> <mode> <u>0</u> Buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1 Discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE 2 Buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE <bfr> <u>0</u> MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered 1 MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes)
<i>Unsolicited Notification</i>	<u>Response</u> +CGEV: NW DETACH The network has forces a PS detach +CGEV: NW CLASS <class> The network has forced a change of MT class +CGEV: ME CLASS <class> The mobile termination has forced a change of MT class +CGEV: ME PDN ACT <cid>[,<reason>] The mobile termination has activated a context +CGEV: NW ACT <p_cid>, <cid>, <event_type> The network has activated a context +CGEV: ME ACT <p_cid>, <cid>, <event_type> The network has responded to an ME initiated context activation +CGEV: NW PDN DEACT <cid> The network has deactivated a context +CGEV: ME PDN DEACT <cid> The mobile termination has deactivated a context +CGEV: NW DEACT <p_cid>, <cid>, <event_type> The network has deactivated a context +CGEV: ME DEACT <p_cid>, <cid>, <event_type> The network has responded to an ME initiated context deactivation request +CGEV: NW MODIFY <cid>, <change_reason>, <event_type> The network has modified a context +CGEV: ME MODIFY <cid>, <change_reason>, <event_type> The mobile termination has modified a context

HL7588																			
	<u>Parameters</u> <reason> <table> <tr><td>0</td><td>IPv4 only allowed</td></tr> <tr><td>1</td><td>IPv6 only allowed</td></tr> <tr><td>2</td><td>Single address bearers only allowed</td></tr> <tr><td>3</td><td>Single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful</td></tr> </table> <event_type> <table> <tr><td>0</td><td>Informational event</td></tr> <tr><td>1</td><td>Information request, acknowledgement required</td></tr> </table> <change_reason> <table> <tr><td>0</td><td>TFT only changed</td></tr> <tr><td>1</td><td>QoS only changed</td></tr> <tr><td>2</td><td>Both TFT and QoS changed</td></tr> </table>	0	IPv4 only allowed	1	IPv6 only allowed	2	Single address bearers only allowed	3	Single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful	0	Informational event	1	Information request, acknowledgement required	0	TFT only changed	1	QoS only changed	2	Both TFT and QoS changed
0	IPv4 only allowed																		
1	IPv6 only allowed																		
2	Single address bearers only allowed																		
3	Single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful																		
0	Informational event																		
1	Information request, acknowledgement required																		
0	TFT only changed																		
1	QoS only changed																		
2	Both TFT and QoS changed																		
<u>Notes</u>	<mode> is saved in non-volatile memory over module reboot; URC is available on the port that executes the command.																		

10.12. +CGAUTO Command: Automatic Response

HL7588																
<i>Test command</i>																
<u>Syntax</u> AT+CGAUTO=?	<u>Response</u> +CGAUTO: (list of supported <n>s) OK															
<i>Read command</i>																
<u>Syntax</u> AT+CGAUTO?	<u>Response</u> +CGAUTO: <n> OK															
<i>Read command</i>																
<u>Syntax</u> AT+CGAUTO= [<n>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <table><tr><td><n></td><td>0</td><td>Turn off automatic response for packet domain only</td></tr><tr><td></td><td>1</td><td>Turn on automatic response for packet domain only</td></tr><tr><td></td><td>2</td><td>Modem compatibility mode, packet domain only</td></tr><tr><td></td><td>3</td><td>Modem compatibility mode, packet domain and circuit switched calls</td></tr><tr><td></td><td>4</td><td>Turn on automatic negative response for packet domain only</td></tr></table>	<n>	0	Turn off automatic response for packet domain only		1	Turn on automatic response for packet domain only		2	Modem compatibility mode, packet domain only		3	Modem compatibility mode, packet domain and circuit switched calls		4	Turn on automatic negative response for packet domain only
<n>	0	Turn off automatic response for packet domain only														
	1	Turn on automatic response for packet domain only														
	2	Modem compatibility mode, packet domain only														
	3	Modem compatibility mode, packet domain and circuit switched calls														
	4	Turn on automatic negative response for packet domain only														
<u>Notes</u>	- When the +CGAUTO=1 command is received, the MT shall attempt to perform a PS attach if it is not already attached. <n> is saved in non-volatile memory over module reboot.															

10.13. +CGPADDR Command: Show PDP Address

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGPADDR=?	<u>Response</u> +CGPADDR: (list of supported <cid>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+CGPADDR= [<cid> ,<cid> [,...]]]	<u>Response</u> +CGPADDR: <cid>[,<PDP_addr_1>,<PDP_addr_2>]] [<CR><LF> +CGPADDR: <cid>[,<PDP_addr_1>,<PDP_addr_2>]]][...]] OK <u>Parameters</u> <cid> a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). If no <cid> is specified, the addresses for all defined contexts are returned. <PDP_addr_1>, <PDP_addr_2> String that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address, it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. Both <PDP_addr_1> and <PDP_addr_2> are omitted if none are 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.

10.14. +CGQMIN Command: Quality of Service Profile (Minimum)

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGQMIN=?	<u>Response</u> +CGQMIN: <PDP_type>, (list of supported <precedence>s),(list of supported <delay>s), (list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) [<CR><LF> +CGQMIN: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) [...]] OK

HL7588	
<i>Read command</i>	
<u>Syntax</u> AT+CGQMIN?	<u>Response</u> +CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> [<CR><LF>+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> [...]] OK
<i>Write command</i>	
<u>Syntax</u> AT+CGQMIN= [<cid> [,<precedence> [,<delay> [,<reliability>. [,<peak> [,<mean>]]]]]	<u>Response</u> OK or ERROR <u>Parameters</u> <cid> Numeric parameter that specifies a particular PDP context definition. Refer to the defined values under the +CGDCONT command. <precedence> Numeric parameter for the precedence class <delay> Numeric parameter for the delay class <reliability> Numeric parameter for the reliability class <peak> Numeric parameter for the peak throughput class <mean> Numeric parameter for the mean throughput class
<u>Notes</u>	If a value is omitted for a particular class then the value is considered to be unspecified.
<u>Examples</u>	AT+CGQMIN=? +CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: "IPV4V6",(0-3),(0-4),(0-5),(0-9),(0-18,31) OK AT+CGQMIN? +CGQMIN: 1,0,0,0,0,0 +CGQMIN: 2,0,0,0,0,0 +CGQMIN: 3,0,0,0,0,0 +CGQMIN: 4,0,0,0,0,0 +CGQMIN: 5,0,0,0,0,0 OK AT+CGQMIN=5 OK

10.15. +CGEQMIN Command: 3G Quality of Service Profile (Minimum)

HL7588	
Test command	
<u>Syntax</u> AT+CGEQMIN=?	<u>Response</u> +CGEQMIN: <PDP_type>, (list of supported <Traffic_class>es) ,(list of supported <Maximum_bitrate_UL>s) , (list of supported <Maximum_bitrate_DL>s) ,(list of supported <Guaranteed_bitrate_UL>s) ,(list of supported <Guaranteed_bitrate_DL>s) ,(list of supported <Delivery_order>s) ,(list of supported <Maximum_SDU_size>s) ,(list of supported <SDU_error_ratio>s) ,(list of supported <Residual_bit_error_ratio>s) ,(list of supported <Delivery_of_erroneous_SDUs>s) ,(list of supported <Transfer_delay>s) ,(list of supported <Traffic_handling_priority>s) [(list of supported <Source_statistics_descriptor>s) ,(list of supported <Signalling_indication>s)] [<CR><LF> +CGEQMIN: <PDP_type>, (list of supported <Traffic_class>es) ,(list of supported <Maximum_bitrate_UL>s) ,(list of supported <Maximum_bitrate_DL>s) ,(list of supported <Guaranteed_bitrate_UL>s) ,(list of supported <Guaranteed_bitrate_DL>s) ,(list of supported <Delivery_order>s) ,(list of supported <Maximum_SDU_size>s) ,(list of supported <SDU_error_ratio>s) ,(list of supported <Residual_bit_error_ratio>s) ,(list of supported <Delivery_of_erroneous_SDUs>s) ,(list of supported <Transfer_delay>s) ,(list of supported <Traffic_handling_priority>s) [(list of supported <Source_statistics_descriptor>s) ,(list of supported <Signalling_indication>s)] [...]] ERROR
Read command	
<u>Syntax</u> AT+CGEQMIN?	<u>Response</u> +CGEQMIN: <cid>, <Traffic_class> ,<Maximum_bitrate_UL>, <Maximum_bitrate_DL> , <Guaranteed_bitrate_UL> ,<Guaranteed_bitrate_DL>,<Delivery_order> , <Maximum_SDU_size>,<SDU_error_ratio> ,<Residual_bit_error_ratio> ,<Delivery_of_erroneous_SDUs>,<Transfer_delay> ,<Traffic_handling_priority> [,<Source_statistics_descriptor> ,<Signalling_indication>] [<CR><LF> +CGEQMIN: <cid>,<Traffic_class> ,<Maximum_bitrate_UL>, <Maximum_bitrate_DL> ,<Guaranteed_bitrate_UL>,<Guaranteed_bitrate_DL> ,<Delivery_order>,<Maximum_SDU_size>,<SDU_error_ratio> ,<Residual_bit_error_ratio>,<Delivery_of_erroneous_SDUs>,<Transfer_delay> ,<Traffic_handling_priority>[,<Source_statistics_descriptor> ,<Signalling_indication>] [...]] Error

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HL7588	
	<Traffic_handling_priority> Numeric parameter that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers <Source_Statistics_Descriptor> Supported in R7 P S a numeric parameter that specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as conversational or streaming 0 Characteristics of SDUs is unknown 1 Charactersitics of SDUs correspond to a speech source <Signalling_Indication> Supported in R7 P S a numeric parameter used to indicate content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive 0 PDP context is not optimized 1 PDP context is optimized <PDP_type> Refer to +CGDCONT and +CGDSCONT commands.
<u>Notes</u>	If a value is omitted for a particular class then the value is considered to be unspecified.

10.16. +CGQREQ Command: Request Quality of Service Profile

HL7588	
<i>Test command</i> <u>Syntax</u> AT+CGQREQ=?	<u>Response</u> +CGQREQ: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) [<CR><LF>+CGQREQ: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) [...]] OK
<i>Read command</i> <u>Syntax</u> AT+CGQREQ?	<u>Response</u> +CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> [<CR><LF>+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> [...]] OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+CGQREQ = [<cid> [,<precedence> [,<delay> [,<reliability> [,<peak> [,<mean>]]]]]	<u>Response</u> OK or ERROR <u>Parameters</u> <cid> Numeric parameter that specifies a particular PDP context definition <precedence> Numeric parameter that specifies the precedence class <delay> Numeric parameter that specifies the delay class <reliability> Numeric parameter that specifies the reliability class <peak> Numeric parameter that specifies the peak throughput class <mean> Numeric parameter that specifies the mean throughput class
<u>Notes</u>	• This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network. • If a value is omitted for a particular class then the value is considered to be unspecified.
<u>Examples</u>	AT+CGQREQ=? +CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "IPv6",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "IPv4V6",(0-3),(0-4),(0-5),(0-9),(0-18,31) OK AT+CGQREQ? +CGQREQ: 1,0,0,0,0,0 +CGQREQ: 2,0,0,0,0,0 +CGQREQ: 3,0,0,0,0,0 +CGQREQ: 4,0,0,0,0,0 OK AT+CGQREQ=1 OK

10.17. +CGEQREQ Command: 3G Request Quality of Service Profile

HL7588									
<i>Test command</i> <u>Syntax</u> AT+CGEQREQ=?	<u>Response</u> +CGEQREQ: <PDP_type>, (list of supported <Traffic_class>es) ,(list of supported <Maximum_bitrate_UL>s) ,(list of supported <Maximum_bitrate_DL>s) ,(list of supported <Guaranteed_bitrate_UL>s) ,(list of supported <Guaranteed_bitrate_DL>s) ,(list of supported <Delivery_order>s) ,(list of supported <Maximum_SDU_size>s) ,(list of supported <SDU_error_ratio>s) ,(list of supported <Residual_bit_error_ratio>s) ,(list of supported <Delivery_of_erroneous_SDUs>s) ,(list of supported <Transfer_delay>s) ,(list of supported <Traffic_handling_priority>s) [(list of supported <Source_statistics_descriptor>s) ,(list of supported <Signalling_indication>s)] [<CR><LF>+CGEQREQ: <PDP_type>, (list of supported <Traffic_class>es) ,(list of supported <Maximum_bitrate_UL>s) ,(list of supported <Maximum_bitrate_DL>s) ,(list of supported <Guaranteed_bitrate_UL>s) ,(list of supported <Guaranteed_bitrate_DL>s) ,(list of supported <Delivery_order>s) ,(list of supported <Maximum_SDU_size>s) ,(list of supported <SDU_error_ratio>s) ,(list of supported <Residual_bit_error_ratio>s) ,(list of supported <Delivery_of_erroneous_SDUs>s) ,(list of supported <Transfer_delay>s) ,(list of supported <Traffic_handling_priority>s) [(list of supported <Source_statistics_descriptor>s) ,(list of supported <Signalling_indication>s)] [...]]								
<i>Read command</i> <u>Syntax</u> AT+CGEQREQ?	<u>Response</u> +CGEQREQ: <cid>,<Traffic_class>,<Maximum_bitrate_UL>,<Maximum_bitrate_DL>,<Guaranteed_bitrate_UL>,<Guaranteed_bitrate_DL>,<Delivery_order>,<Maximum_SDU_size>,<SDU_error_ratio>,<Residual_bit_error_ratio>,<Delivery_of_erroneous_SDUs>,<Transfer_delay>,<Traffic_handling_priority> [(,<Source_statistics_descriptor>,<Signalling_indication>)] [<CR><LF>+CGEQREQ: <cid>,<Traffic_class>,<Maximum_bitrate_UL>,<Maximum_bitrate_DL>,<Guaranteed_bitrate_UL>,<Guaranteed_bitrate_DL>,<Delivery_order>,<Maximum_SDU_size>,<SDU_error_ratio>,<Residual_bit_error_ratio>,<Delivery_of_erroneous_SDUs>,<Transfer_delay>,<Traffic_handling_priority>[(,<Source_statistics_descriptor>,<Signalling_indication>)] [...]]								
<i>Write command</i> <u>Syntax</u> AT+CGEQREQ=[<cid>[,<Traffic_class>[,<Maximum_bitrate_UL>[,<Maximum_bitrate_DL>[,<Guaranteed_bitrate_UL>[,<Guaranteed_bitrate_DL>[,<Delivery_order>[,<Maximum_SDU_size>[,<SDU_error_ratio>[,<Residual_bit_error_ratio>[,<Delivery_of_	<u>Response</u> OK or ERROR <u>Parameters</u> <cid> Numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands) <Traffic_class> UMTS bearer service application type <table> <tr> <td>0</td><td>Conversational</td></tr> <tr> <td>1</td><td>Streaming</td></tr> <tr> <td>2</td><td>Interactive</td></tr> <tr> <td>3</td><td>Background</td></tr> </table>	0	Conversational	1	Streaming	2	Interactive	3	Background
0	Conversational								
1	Streaming								
2	Interactive								
3	Background								

10.18. +CGEQNEG Command: 3G Negotiated Quality of Service Profile

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588													
Test command													
Syntax AT+CGEQNEG=?	Response +CGEQNEG: (list of <cid>s associated with active contexts)												
Write command													
Syntax AT+CGEQNEG= [<cid>[,<cid> [,...]]]	Response +CGEQNEG: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority> [<CR><LF>+CGEQNEG: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>[....]] Parameters <cid> numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands) <Traffic_class> UMTS bearer service application type <table> <tr><td>0</td><td>Conversational</td></tr> <tr><td>1</td><td>Streaming</td></tr> <tr><td>2</td><td>Interactive</td></tr> <tr><td>3</td><td>Background</td></tr> </table> <Maximum_bitrate_UL> Numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. <Maximum_bitrate_DL> Numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. <Guaranteed_bitrate_UL> Numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). <Guaranteed_bitrate_DL> Numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). <Delivery_order> Numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not <table> <tr><td>0</td><td>No</td></tr> <tr><td>1</td><td>Yes</td></tr> </table> <Maximum_SDU_size> Numeric parameter that indicates the maximum allowed SDU size in octets <SDU_error_ratio> String parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'.	0	Conversational	1	Streaming	2	Interactive	3	Background	0	No	1	Yes
0	Conversational												
1	Streaming												
2	Interactive												
3	Background												
0	No												
1	Yes												

HL7588	
	<Residual_bit_error_ratio> String parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. <Delivery_of_erroneous_SDUs> Numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not 0 No 1 Yes 2 No detect <Transfer_delay> Numeric parameter that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds <Traffic_handling_priority> Numeric parameter that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers
Notes	If a value is omitted for a particular class then the value is considered to be unspecified.

10.19. +CGREG Command: GPRS Network Registration Status

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
Test command	
<u>Syntax</u> AT+CGREG=?	<u>Response</u> +CGREG: (list of supported <n>s) OK
Read command	
<u>Syntax</u> AT+CGREG?	<u>Response</u> +CGREG: <n>,<stat>[,<lac>,<ci>[,<AcT>,<rac>]] OK
Write command	
<u>Syntax</u> AT+CGREG= [<n>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <n> 0 Disable network registration unsolicited result code 1 Enable network registration unsolicited result code +CGREG: <stat> 2 Enable network registration and location information unsolicited result code +CGREG: <stat>[,<lac>,<ci>[,<AcT>,<rac>]]

HL7588	
	<stat> 0 Not registered, home network 1 Registered, home network 2 Not registered, but ME is currently searching for a new operator to register to 3 Registration denied 4 Unknown 5 Registered, roaming 8 Attached for emergency bearer services only (only applicable when <AcT>=2, 4, 5, 6) <lac> String type; two-byte location area code in hexadecimal format <ci> String type; four-byte UTRAN/E-UTRAN cell ID in hexadecimal format <Act> 2 UTRAN 4 UTRAN with HSDPA 5 UTRAN with HSUPA 6 UTRAN with HSDPA and HSUPA 7 E-UTRAN <rac> String type; one-byte routing area code in hexadecimal format
<i>Unsolicited Notification</i>	<u>Response</u> +CGREG: <stat> +CGREG: <stat>[,<lac>,<ci>[,<AcT>,<rac>]]
<u>Notes</u>	<n> is saved in non-volatile memory per AT port over module reboot.

10.20. +CGSMS Command: Select Service for MO SMS Messages

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGSMS=?	<u>Response</u> +CGSMS: (list of currently available <service>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CGSMS?	<u>Response</u> +CGSMS: <service> OK
<i>Write command</i>	
<u>Syntax</u> AT+CGSMS= [<service>]	<u>Response</u> OK or ERROR

HL7588	
	<u>Parameter</u> <service> Indicates the service or service preference to be used 0 Packet Domain 1 Circuit switched 2 Packet Domain preferred (use circuit switched if GPRS is not available) 3 Circuit switched preferred (use packet domain if circuit switched is not available)
<u>Note</u>	+CGSMS is ignored for sending SMS over IMS as used in the Verizon network.

10.21. +CRLP Command: Select Radio Link Protocol

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CRLP=?	<u>Response</u> +CRLP: (list of supported <iws>es),(list of supported <mws>es),(list of supported <T1>s), (list of supported <N2>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CRLP?	<u>Response</u> +CRLP: <iws>,<mws>,<T1>,<N2> OK
<i>Write command</i>	
<u>Syntax</u> AT+CRLP=[<iws> [,<mws>[,<T1> [,<N2>]]]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <iws> IWF to MS window size <mws> MS to IWF window size <T1> Acknowledgement timer (in units of 10 ms) <N2> Retransmission attempts

10.22. +XDNS Command: Dynamic DNS Request

HL7588									
<i>Test command</i>									
<u>Syntax</u> AT+XDNS=?	<u>Response</u> +XDNS: (list of supported <cid>s),(list of supported <mode>s) OK								
<i>Read command</i>									
<u>Syntax</u> AT+XDNS?	<u>Response</u> +XDNS: <cid>, <primary DNS>, <secondary DNS> [+XDNS: <cid>, <primary DNS>, <secondary DNS> [...]] OK								
<i>Write command</i>									
<u>Syntax</u> AT+XDNS=<cid>, <mode>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <cid> Context ID <mode> <table> <tr> <td><u>0</u></td><td>Disable dynamic DNS request</td></tr> <tr> <td>1</td><td>Enable dynamic DNS request (IPv4)</td></tr> <tr> <td>2</td><td>Enable dynamic DNS request (IPv6)</td></tr> <tr> <td>3</td><td>Enable dynamic DNS request (IPv4v6)</td></tr> </table> <primary DNS>, <secondary DNS> Strings representing the DNS addresses and given as dot-separated numeric (0 – 255) parameters in the form of: a1.a2.a3.a4 for IPv4, a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6 and a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.a17.a18.a19.a20 for IPv4v6. (a1 to a4 here represents IPV4 and a5 to a20 represents IPv6) The DNS address is by default " <u>0.0.0.0</u> " which is not a valid address. Note that IPv6 address obtained on LTE will be prefixed with a constant 8-byte address "FE.80.00.00.00.00.00" if the network has not provided any.	<u>0</u>	Disable dynamic DNS request	1	Enable dynamic DNS request (IPv4)	2	Enable dynamic DNS request (IPv6)	3	Enable dynamic DNS request (IPv4v6)
<u>0</u>	Disable dynamic DNS request								
1	Enable dynamic DNS request (IPv4)								
2	Enable dynamic DNS request (IPv6)								
3	Enable dynamic DNS request (IPv4v6)								

10.23. +CGPIAF Command: Printing IP Address Format

HL7588																	
<i>Test command</i>																	
<u>Syntax</u> AT+CGPIAF=?	<u>Response</u> +CGPIAF: (list of supported <IPv6_AddressFormat>s),(list of supported <IPv6_SubnetNotation>s),(list of supported <IPv6_LeadingZeros>s),(list of supported <IPv6_CompressZeros>s)																
<i>Read command</i>																	
<u>Syntax</u> AT+CGPIAF?	<u>Response</u> +CGPIAF: <IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros> OK																
<i>Write command</i>																	
<u>Syntax</u> AT+CGPIAF= [<IPv6_AddressFormat>,<IPv6_SubnetNotation> [,<IPv6_LeadingZeros>,<IPv6_CompressZeros>]]]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <IPv6_AddressFormat> <table> <tr> <td>0</td> <td>Use IPv4-like dot notation. IP address and subnetwork mask (if applicable) are dot-separated</td> </tr> <tr> <td>1</td> <td>Use IPv6-like colon notation. IP address and subnetwork mask (if applicable and when given explicitly) are separated by a space</td> </tr> </table> <IPv6_SubnetNotation> Specifies the subnet notation for remote address and subnet mask. This parameter setting does not apply if <IPv6_AddressFormat> = 0. <table> <tr> <td>0</td> <td>Both IP address and subnet mask are stated explicitly, and separated by a space</td> </tr> <tr> <td>1</td> <td>The printout format uses a slash (/) subnet-prefix Classless Inter-Domain Routing (CIDR) notation</td> </tr> </table> <IPv6_LeadingZeros> Specifies whether leading zeros are omitted or not. This parameter setting does not apply if <IPv6_AddressFormat> = 0. <table> <tr> <td>0</td> <td>Leading zeros are omitted</td> </tr> <tr> <td>1</td> <td>Leading zeros are included</td> </tr> </table> <IPv6_CompressZeros> Specifies whether 1-n instances of 16-bit zero values are replaced by "::". This parameter setting does not apply if <IPv6_AddressFormat> = 0. <table> <tr> <td>0</td> <td>No zero compression</td> </tr> <tr> <td>1</td> <td>Use zero compression</td> </tr> </table> If the address is unspecified (all bytes are zeros), "::" will be displayed.	0	Use IPv4-like dot notation. IP address and subnetwork mask (if applicable) are dot-separated	1	Use IPv6-like colon notation. IP address and subnetwork mask (if applicable and when given explicitly) are separated by a space	0	Both IP address and subnet mask are stated explicitly, and separated by a space	1	The printout format uses a slash (/) subnet-prefix Classless Inter-Domain Routing (CIDR) notation	0	Leading zeros are omitted	1	Leading zeros are included	0	No zero compression	1	Use zero compression
0	Use IPv4-like dot notation. IP address and subnetwork mask (if applicable) are dot-separated																
1	Use IPv6-like colon notation. IP address and subnetwork mask (if applicable and when given explicitly) are separated by a space																
0	Both IP address and subnet mask are stated explicitly, and separated by a space																
1	The printout format uses a slash (/) subnet-prefix Classless Inter-Domain Routing (CIDR) notation																
0	Leading zeros are omitted																
1	Leading zeros are included																
0	No zero compression																
1	Use zero compression																
<u>Notes</u>	Parameters are saved in non-volatile memory per AT port over module reboot.																

10.24. +WPPP Command: PDP Context Authentication Configuration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WPPP=?	<u>Response</u> +WPPP: (list of supported <Auth>s),[(list of supported <cid>s)] OK
<i>Read command</i>	
<u>Syntax</u> AT+WPPP?	<u>Response</u> +WPPP: <Auth>,<cid>,<username>,<password> OK
<i>Write command</i>	
<u>Syntax</u> AT+WPPP= <Auth>,<cid>,<username>,<password>	<u>Response</u> OK or +CME ERROR <err> <u>Parameters</u> <Auth> Type of authentication supported 0 None 1 PAP 2 CHAP <cid> 1 – 20 PDP context identifier used in +CGDCONT. If omitted, the configuration is set for all PDP contexts. <username> Login for the APN. String type, up to 30 characters <password> Password for the APN. String type, up to 30 characters
<u>Notes</u>	+WPPP is available when SIM has been inserted and the pin code is entered. - Parameters are saved in non-volatile memory.
<u>Examples</u>	AT+WPPP=? +WPPP: (0-2),(1-20) OK AT+WPPP=1,1,"myusername","mypassword" OK AT+WPPP? +WPPP: 1,1,"myusername","mypassword" OK

>> 11. SIM Application Toolkit AT Commands

11.1. +STKPRO Command: Display List of Supported Proactive Commands

HL7588	
Test command	
Syntax AT+STKPRO=?	Response +STKPRO: (01,05,16,17,18,19,20,21,32,33,34,35,36,37,38,40,52,53,64) OK
Unsolicited Notification	Response +STKPRO: <proactive_cmd>... Details of which are as follows: • +STKPRO: 01, <type> • +STKPRO: 05, <event_list> • +STKPRO: 16, <number>, <subaddr>, <type>, <alpha_1>, <icon_id1>, <alpha_2>, <icon_id2> • +STKPRO: 17, <ss_data>, <alpha>, <icon_id>, <ref_number> • +STKPRO: 18, <dc>, <hex_string>, <alpha>, <icon_id>, <ref_number> • +STKPRO: 19, <alpha>, <icon_id>, <ref_number> • +STKPRO: 20, <alpha>, <icon_id>, <dtmf_string> • +STKPRO: 21, <URL>, <alpha>, <icon_id> • +STKPRO: 32, <tone>, <unit>, <interval>, <alpha>, <icon_id> • +STKPRO: 33, <type>, <dc>, <hex_string>, <icon_id> • +STKPRO: 34, <type>, <dc>, <hex_string>, <icon_id> • +STKPRO: 35, <type>, <dc>, <hex_string>, <max_rsp_len>, <min_rsp_len>, <defaulttext>, <icon_id> • +STKPRO: 36, <type>, <alpha>, <item_id>, <total_items>, <item_text>, <next_action>, <default_item>, <icon_id>, <icon_id_list_element> • +STKPRO: 37, <type>, <alpha>, <item_id>, <total_items>, <item_text>, <next_action>, <icon_id>, <icon_id_list_element> • +STKPRO: 38, <type> • +STKPRO: 40, <dc>, <hex_string>, <icon_id> • +STKPRO: 52, <type>, <alpha>, <icon_id> • +STKPRO: 53, <language> • +STKPRO: 64, <cmd_qualifier>, <alpha_id>, <icon_reference>, <dialing_number>, <reconnect_interval>, <reconnect_unit>, <idle_interval>, <idle_unit>, <bearer_type>, <bearer_parameter>, <buffer_size>, <login_dc>, <login_text>, <password_dc>, <password_text>, <transport_level>, <transport_port>, <sub_address>, <destination_address_type>, <destination_address> Parameters <alpha>, <alpha_1>, <alpha_2>, <item_text>, <default text> Text string

HL7588

<dsc> Data coding scheme

<default_item> Default items (s. item_id)

<event_list> 04 User activity event
 05 Idle screen available event
 07 Language selection
 08 Browser termination event

<hex_string> String containing data in hexadecimal format

<icon_id>, <icon_id1>, <icon_id2>, <icon_id_list_element> List containing icon IDs. For example, <icon_id1>, <icon_id2>

<interval> Time duration in number of units

<item_id> Item identifier (identifier of item chosen, refer to GSM 11.14)

<language> 2-byte string indicating the language

<max rsp len> Maximum response length

<min rsp len> Minimum response length

<next_action> Next action

<number> Called party number

<proactive_cmd> 01 Refresh
 05 Set up event list
 16 Set up call
 17 Send SS
 18 Send USSD
 19 Send SMS
 20 Send DTMF
 21 Launch browser
 32 Play tone
 33 Display text
 34 Get inkey
 35 Get input
 36 Select item
 37 Set up menu
 38 Language setting
 40 Set up idle mode text
 52 Run AT command info
 53 Language notification
 64 Open channel
 129 End of the proactive session

<ref_number> Reference number

<subaddr> Called party subaddress

HL7588

<ss_data>	Data string
<type>	Integer as command qualifier; possible value "4" means language
<tone>	01 Dial tone 02 Call subscriber busy 03 Congestion 04 Radio path acknowledge 05 Radio path not available 06 Error/special information 07 Call waiting tone 08 Ringing tone 10 General beep 11 Positive acknowledgement tone 12 Negative acknowledgement or error tone
<total_items>	Total items
<unit>	0 Minutes 1 Seconds 2 Tenth of a second
<URL>	URL to be loaded
<reconnect_interval>	1 – 255 Duration for reconnect tries. The interval specifies the time interval of the duration in multiples of the time unit used. The value "0" indicated a non-existing duration object.
<reconnect_unit>	Used with <reconnect_interval> 0 Minutes 1 Seconds 2 Tenth of a second
<idle_interval>	1 – 255 Defines the duration when an idle connection is released automatically. If not present, the terminal will never release a connection automatically. A value of "0" indicates a non-existing duration object.
<idle_unit>	Used with <idle_interval> 0 Minutes 1 Seconds 2 Tenth of a second
<bearer_type>	1 Circuit switched 2 Packet switched 3 Default 255 Invalid
<bearer_parameter>	Hex string that gave detailed information about the bearer type
<buffer_size>	Buffer the terminal shall allocate for channel data. The terminal may allocate less or more than this.

HL7588

<login_dcs>	Data coding scheme of the text string. Text strings may be coded in 7-bit, 8-bit or UCS2 (16-bit) for user authentication data if requested by the bearer connection.
<login_text>	Specifies user authentication data is requested by the bearer connection. Coding based on <login_dcs>.
<password_dcs>	Data coding scheme of the text string. Text strings may be coded in 7-bit, 8-bit or UCS2 (16-bit) for user authentication data if requested by the bearer connection.
<password_text>	Specifies user authentication data if requested by the bearer connection. Coding based on <password_dcs>.
<transport_level>	Transport layer protocol of the UICC/terminal connection 1 UDP 2 TCP 255 Invalid; no transport protocol specified
<transport_port>	Integer that specifies the transport port
<sub_address>	Called party subaddress (for CS bearers only)
<dsc>	Data coding scheme
<destination_address_type>	33 IPv4 IP address 87 IPv6 IP address 255 Invalid; unknown address type
<destination_address>	Hex string that specifies the destination point of the connection

11.2. +STKTR Command: Enter Response

HL7588	
<i>Test command</i> <u>Syntax</u> AT+STKTR=?	<u>Response</u> +STKTR: (01,05,16,17,18,19,20,21,32,33,34,35,36,37,38,40,52,53,64) OK
<i>Write command</i> <u>Syntax</u> AT+STKTR=1,0	<u>Response</u> OK or +CME ERROR: <err>

HL7588*Execute command*Syntax

AT+STKTR=
<proactive_cmd>
 [,<result>,
 <add_result>
 [,<last_cmd>]
 [,<dcsc>]
 [,<hexstring>]]

Response

Response depends on the proactive command

- +STKTR: 01, <result>, [<add_result>]
- +STKTR: 05, <result>
- +STKTR: 16, <result>, [<add_result>]
- +STKTR: 17, <result>, <add_result>
- +STKTR: 18, <result>, <add_result>
- +STKTR: 19, <result>, <add_result>
- +STKTR: 20, <result>,<add_result>]
- +STKTR: 21, <result>
- +STKTR: 32, <result>, <add_result>
- +STKTR: 33, <result>, <add_result>
- +STKTR: 34, <result>, <add_result>,0,<dcsc>,<hex_string>
- +STKTR: 35, <result>, <add_result>,0,<dcsc>,<hex_string>
- +STKTR: 36, <result>, <add_result>,0,<dcsc>,<hex_string>

Note: The "0" stands for the parameter <last_cmd> which is obsolete but not yet removed.

- +STKTR: 37, <result>, <add_result>
- +STKTR: 38, <language as integer, e.g.28261>
- +STKTR: 40, <result>, <add_result>
- +STKTR: 52, <result>, <add_result>
- +STKTR: 53, <result>, <add_result>

Note: For general results (<result>) 32, 33, 38, 52, 53, 55, 56, 57 and 58, it is mandatory for the ME to provide a specific cause value as additional information. For others, additional information will be ignored.

- +STKTR: 64, <result>,<add_result>,<last_cmd>,<buffer_size>,<open_channel_id>,<link_status>,<channel_status_state>,<bearer_description_type>,<bearer_description_params>,<address_type>,<address>]

Parameters

<add_result> Additional result

<dcsc> Data coding scheme

<hex_string> String in hexadecimal format

<last_cmd> Last command

<proactive_cmd> Decimal code that indicates the proactive command (refer to +STKPRO)

<result>	0	Command performed successfully
	1	Command performed with partial comprehension
	2	Command performed with missing information
	3	Refresh performed with additional EFS read
	4	Command performed successfully, but requested icon could not be displayed

HL7588

- 5 Command performed but modified by call control by SIM
- 6 Command performed successfully, limited service
- 7 Command performed with modification
- 16 Proactive SIM session terminated by the user
- 17 Backward move in the proactive SIM session requested by the user
- 18 No response from user
- 19 Help information required by the user
- 20 USSD or SS transaction terminated by the user
- 32 ME currently unable to process command
- 33 Network currently unable to process the command
- 34 User did not accept call set-up request
- 35 User cleared down call before connection or network release
- 36 Action in contradiction with the current timer state
- 37 Interaction with call control by SIM, temporary problem
- 38 Launch browser generic error code
- 48 Command beyond ME's capabilities
- 49 Command type not understood by ME
- 50 Command data not understood by ME
- 51 Command number not known by ME
- 52 SS return error
- 53 SMS RP ERROR
- 54 Error, required values are missing
- 55 USSD return error
- 56 Multiple card command error (if class "a" is supported)
- 57 Interaction with call control by SIM or MO, short message control by SIM
- 58 Bearer independent protocol error (if class "e" is supported)

<buffer size> Size of the allocated buffer

<open_channel_id> 1 – 7 Channel ID
0 Invalid

<link_status> Specifies whether link is established or packet data service is activated
1 Enabled
0 Disabled

<channel_status_state> Link state
00 No further information can be given

<bearer_description_type> Bearer type which can be used to decode the bearer description value
01 Circuit switched UTA_SIM_TK_BEARER
02 Packet switched UTA_SIM_TK_BEARER (GPRS)
03 Terminal default UTA_SIM_TK_BEARER
255 Invalid bearer value; indicates an unknown bearer type which is not supported by the interface version

<bearer_description_params> Hexadecimal string; gives detailed information dependent on the bearer type

<address_type> Type of address
33 IPv4 IP address
87 IPv6 IP address

HL7588

<address> Address data dependent on bearer type. IPv4 address representation shall follow the format x.x.x.x where 0<x≤255. IPv6 address representation shall follow the format x.x.x.x.x.x.x.x.x.x.x.x.x.x.x.x where 0<x≤255

11.3. +STKENV Command: Send a SIM APPL TK Envelope Command

HL7588*Test command*Syntax**AT+STKENV=?**Response**+STKENV:
OK***Write command*Syntax**AT+STKENV=
<envelope_cmd>,
<optional_ENV_
data>**Response**OK**

or

+CME ERROR: <err>Parameters

<cause> 00 User termination
 01 Error termination

<envelope_cmd> Code 211 (hex: D3) Menu selection (needs)
 Code 214 (hex: D6) Event download (note that only one event can be
 included in the <event_list>)

<item_id> Item identification

<help_requested> 1 Help is requested
 0 Help is not requested

<language> Currently used language in the DTE (refer to +STKPROF)

<call_id> Call ID

<call_direction> 0 MT call
 1 MO call

<optional_ENV_data> D3 <item_identifier> (for code 211)
 D6 <event_list> (for code 214)

11.4. +STKPROF Command: Terminal Profile Data

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+STKPROF=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+STKPROF?	<u>Response</u> +STKPROF: <length>,<data> OK
<i>Write command</i>	
<u>Syntax</u> AT+STKPROF= <length>,<data>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <length> Integer type; length of characters sent to TE in <data>. When set to "0", forces a reset to the default terminal profile stored in the ME <data> Terminal profile data in hexadecimal format

11.5. +STKCC Notification: SIM – APPL – TK Call Control

HL7588									
<i>Unsolicited Notification</i>	<u>Response</u> +STKCC: <cc_command>... Details of which are as follows: • +STKCC: 1,<res_val>,<alpha>,<number> • +STKCC: 2,<res_val>,<alpha>,<ss_code> • +STKCC: 3,<res_val>,<alpha>,<ussd_code> • +STKCC: 4,<res_val>,<alpha>,<ton_npi>,<sc_addr>,<ton_npi>,<dest_addr> <u>Parameters</u> <cc_command> <table> <tr><td>1</td><td>Set up call</td></tr> <tr><td>2</td><td>Send SS</td></tr> <tr><td>3</td><td>Send USSD</td></tr> <tr><td>4</td><td>Send SM</td></tr> </table> <res_val> Call control result value <alpha> Text string	1	Set up call	2	Send SS	3	Send USSD	4	Send SM
1	Set up call								
2	Send SS								
3	Send USSD								
4	Send SM								

HL7588	
	<number> Called party number <ton_npi> Type of number and numbering plan <sc_addr> Service centre address <dest_addr> Destination address

11.6. +STKCNF Notification: SIM – APPL – TK Proactive Session Status

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +STKCNF: <proactive_cmd>,<result>,<add_result>,<sw1> <u>Parameters</u> <proactive_cmd> Decimal code that indicates the command that was finished (refer to +STKPRO) <result> General result code <add_result> Additional result code <sw1> 0 Command to SIM was suppressed because of multiple terminal response or wrong client. For other responses, refer to GSM 11.11

11.7. *PSSTKI Command: SIM Toolkit Configuration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT*PSSTKI=?	<u>Response</u> *PSSTKI: (list of supported <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT*PSSTKI?	<u>Response</u> *PSSTKI: <mode> OK
<i>Write command</i>	
<u>Syntax</u> AT*PSSTKI=<mode>	<u>Response</u> OK

HL7588	
	Parameter <mode> 0 No unsolicited result code will be sent to the TE; the TE will not send proactive commands to the module 1 Manual mode. Any unsolicited result codes will be sent to the TE. The TE had to acknowledge with a +STKPRO notification 2 Auto acknowledge mode. The module answers to STK without the TE. Any unsolicited result codes will be sent to the TE 3 Auto acknowledge mode without sending unsolicited result codes to the TE
Reference Sierra Wireless Proprietary	Notes This command is only supported when a SIM card is available. <mode> is saved even after the module reboots. If <mode>=0, the module will automatically restart before the new mode takes effect. <mode>=2 and <mode>=3 are only possible for a subset of STK proactive commands with user interaction: Where basic Yes/No responses are expected: SEND SMS SEND SS SEND USSD SET UP CALL Where MMI action is need and Yes/No responses are expected when done (for the display part): SET UP IDLE MODE TEXT DISPLAY TEXT PLAY TONE REFRESH
Examples	<SIM card with STK application is inserted> AT*PSSTKI? // read current setting *PSSTKI: 0 OK AT*PSSTKI=? // check supported setting *PSSTKI: (0-3) OK At*psstki=1 // set STK manual mode OK +STKPRO: 33,0,4,"4D6F62696C65204F4B",0 at+stktr=33,0 OK At*psstki=0 // deactivate STK OK +SIM: 1 // module resets +KSUP: 0 +PBREADY <Example: Manual Mode - proactive command SET UP MENU> At*psstki=1 // activate STK manual mode OK

HL7588

```

// SET UP MENU
+STKPRO: 37,0,"GemXplore CASE",1,5,"User interaction",33,0,0
+STKPRO: 37,0,"GemXplore CASE",2,5,"Mobile interaction",33,0,0
+STKPRO: 37,0,"GemXplore CASE",3,5,"Network interaction",33,0,0
+STKPRO: 37,0,"GemXplore CASE",4,5,"Card interaction",33,0,0
+STKPRO: 37,0,"GemXplore CASE",128,5,"Common STK features",33,0,0

at+stktr=37,0           // Terminal Response for SET UP MENU successful
OK

+STKCNF: 37,0,255,145   // [ACK] SET UP MENU successful, session on-going

at+stkenv=211,2,0       // Select menu item #2

+STKCNF: 129, 0, 255, 144 // [ACK] session end
OK

<Example: Manual Mode - proactive command SELECT ITEM>
+STKPRO: 36,0,"Choose an item :",1,5,"Play tone",0,0,0,0
+STKPRO: 36,0,"Choose an item :",2,5,"Provide local info",0,0,0,0
+STKPRO: 36,0,"Choose an item :",3,5,"Refresh",0,0,0,0
+STKPRO: 36,0,"Choose an item :",4,5,"Timer management",0,0,0,0
+STKPRO: 36,0,"Choose an item :",5,5,"Launch browser",0,0,0,0

at+stktr=36,0,0,0,0,"03" // Terminal Response SELECT ITEM #3
OK

+STKCNF: 36,0,255,145   // [ACK] SELECT ITEM successful
+STKPRO: 36,0,"Choose an item:",1,2,"Init and file change",0,0,0,0
+STKPRO: 36,0,"Choose an item:",2,2,"Reset",0,0,0,0

at+stktr=36,0,0,0,0,"02" // Terminal Response SELECT ITEM #2
OK

+STKCNF: 36,0,255,145   // [ACK] SELECT ITEM successful

<Example: Manual Mode - proactive command REFRESH>
+STKPRO: 01,4,,0,,0     // proactive command: REFRESH - SIM reset

at+stktr=01,0           // Terminal Response for REFRESH
OK
+SIM: 0                 // SIM reset

+STKCNF: 144, 0         // [ACK] Reset completed
+SIM: 1

+STKPRO: 33,0,4,"4D6F62696C65204F4B",0
+PBREADY

<Example: Automatic Mode - proactive command REFRESH>
At*psstki=2             // set STK automatic mode
OK

```

HL7588

```

//Proactive command REFRESH is received
+STKPRO: 01,4,,0,, 0      // proactive command: REFRESH - SIM reset
+SIM: 0                  // SIM reset

+STKCNF: 144, 0          // [ACK] Reset completed
+SIM: 1

+STKPRO: 33,0,4,"4D6F62696C65204F4B",0
+PBREADY

<Example: Silent Mode - proactive command REFRESH>
At*psstki=3              // set STK silent mode
OK
+SIM: 0                  // SIM reset
+SIM: 1
+PBREADY

<SIM card is not inserted>
at+cpin?
+CME ERROR: 10

AT*PSSTKI?              // read current setting
+CME ERROR: 10

AT*PSSTKI=?             // check supported setting
+CME ERROR: 10

AT*PSSTKI=1             // deactivate STK
+CME ERROR: 10

```



12. Protocol Specific Commands

12.1. Preliminary Comments

Sierra Wireless has developed a set of proprietary AT Commands to simplify data exchanges with different protocols:

- TCP
- UDP
- FTP
- HTTP
- HTTPS

12.2. IP Address Format in AT Commands

Unless specified elsewhere, the following format is used for IP address field in AT commands described in this chapter when using the HL7588:

- IPv4 address: Consists of dot-separated decimal (0 – 255) parameters of the form a1.a2.a3.a4
- IPv6 address: Consists of colon-separated hexadecimal (0 – ffff) parameters of the form a1:a2:a3:a4:a5:a6:a7:a8 with abbreviations

12.3. Session ID

Protocol specific AT commands share the same range of session IDs. A session ID <session_id> is a unique number and ranges from 1 to 32.

12.4. Connection of PDP Contexts

A PDP connection will be started when a session becomes active (e.g. +KTCPCNX) and will only be stopped if all sessions are closed or all sessions request to stop the connection. In case of session errors, the PDP connection deactivation behavior can be configured by +KIPOPT with <option_id>=3. The default setting after the module boot-up is that a PDP connection is requested to stop only when a session is closed by an Internet AT command (e.g. +KTCPCLOSE).

12.5. Buffer Length of AT Commands

In AT command mode, the maximum length of an AT command is 1023 characters; any AT command input longer than this limit will produce an error response. If the maximum length of a parameter is not specified in this manual, it may vary but still bound by this limit.

In AT data mode, the terminal receive buffer size is limited to 32000 bytes; the terminal driver will stop the receive flow at 16000 bytes if hardware handshaking is used.

12.6. Parameter Format of AT Commands

Double quotation marks are optional in the parameter input of protocol specific AT commands.

If the AT command does not meet the following conditions, the AT parser will regard it as an error and will not go to the corresponding AT command handler. It will immediately return +CME ERROR: 3.

This means that it will not process any action further or return any specific error code.

- If double quotation marks are used to enclose parameters, double quotation marks must appear at both the head and tail of the parameter.
- The total number of parameter input (including empty parameters) in the AT commands must be within the minimum and maximum required number of parameters.

12.7. Connection Configuration

12.7.1. +KCNXCFG Command: GPRS Connection Configuration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KCNXCFG=?	<u>Response</u> +KCNXCFG: (list of possible <cnx conf>s),"GPRS",(range of possible length of <apn>),(range of possible length of <login>),(range of possible length of <password>),<af>,<ip>,<dns1>,<dns2>,<ipv6>,<dns1v6>,<dns2v6> OK
<i>Read command</i>	
<u>Syntax</u> AT+KCNXCFG?	<u>Response</u> +KCNXCFG: <cnx conf>, "GPRS", <apn>,<login>,<password>,<af>,<ip>,<dns1>,<dns2>,<ip_v6>,<dns1_v6>,<dns2_v6>,<state> [...] OK
<i>Write command</i>	
<u>Syntax</u> AT+KCNXCFG= <cnx conf>, "GPRS",<apn> [,<login>] [,<password>] [,<af> [,<ip>] [,<dns1>] [,<dns2>]]] [,<ip_v6>] [,<dns1_v6>] [,<dns2_v6>]]]]	<u>Response</u> OK <u>Parameters</u> <cnx conf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration <apn> (Access Point Name) a string parameter (max size 63 bytes), logical name used to select the GGSN or the external packet data network. <login> String type (max size 24 bytes), indicates the user name of the cnx <password> String type (max size 24 bytes), indicates the password of the cnx

HL7588	
	<af> Address family used for the connection IPV4 IPv4 only IPV6 IPv6 only IPV4V6 IPv4 and IPv6 <ip> String type. If the mobile is supposed to work with a dynamic address, the value should be "0.0.0.0" or an empty string. <dns1>, <dns2> String type. If the mobile is supposed to work with dynamic DNS addresses, the value should be "0.0.0.0" or an empty string. <ip_v6> IPV6 String type. If the mobile is supposed to work with a dynamic address, the value should be "::" or an empty string. <dns1_v6>, <dns2_v6> IPV6 String type. If the mobile is supposed to work with dynamic DNS addresses, the value should be "::" or an empty string. <state> Connection state 0 Disconnected 1 Connecting 2 Connected 3 Idle, down counting for disconnection 4 Disconnecting
Reference Sierra Wireless Proprietary	<u>Notes</u> • This AT command is used to configure the bearer to be used for the future IP services. • By default, the IP and DNS address are dynamic (those values would be affected by the network during the PDP connection). • This connection will be used by the module to access to the IP services described on the following chapters. The AT+KCNXCFG command is only defined to set the current parameters. The defined connection will be automatically opened when needed by the IP services. (e.g. UDP service). • The use of IPV4 and/or IPV6 addresses is configured by PDP context configuration • <cnx cfg> values 1 to 5 corresponds to PDP context ID 1 to 5 respectively, e.g. <cnx cfg>=3 corresponds to CID=3 in +CGDCONT/+CGACT. • When the connection is up, the read command returns the actual values used by the connection interface. • If reusing of activated PDP context is required, <apn> can be set as an empty string or as the existing APN string returned by +CGDCONT.

12.7.2. +KCNXTIMER Command: Connection Timer Configuration

HL7588	
Test command	
<u>Syntax</u> AT+KCNXTIMER=?	<u>Response</u> +KCNXTIMER: (list of supported <cnx cnf>s),(list of supported <tim1>s),(list of supported <nbtrial>s),(list of supported <tim2>s) ,(list of supported <idletime>s) OK

HL7588	
<i>Read command</i> <u>Syntax</u> AT+KCNXTIMER ?	<u>Response</u> +KCNXTIMER: <cnx cnf>,<tim1>,<nbtrial>,<tim2>,<idletime> [...] OK
<i>Write command</i> <u>Syntax</u> AT+KCNXTIMER =<cnx cnf>[, <tim1>][, <nbtrial>] [,<tim2>] [,<idletime>]]]	<u>Response</u> OK <u>Parameters</u> <cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration <tim1> 1 – 120s (30s by default) If module fails to activate the PDP context, a timer of <tim1> will be started. When this timer expires, it will try to activate the PDP context again. <nbtrial> Attempt times from 1-4 (2 by default) Module will try to activate the PDP context with max <nbtrial> <tim2> 0 – 300s (60s by default) 0 Deactivated (connection will not close by itself) For client sockets, module will try to connect to the server within <tim2>s; if <tim2> expires, it will give up the connection. <idletime> 0 – 1800s (30s by default) When all sessions are closed, the idle timer starts with the idle time. When this timer expires, it will try to deactivate the PDP context. Before the timer expires, connecting any session will stop this timer and the PDP context is reused.
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> This command will only have impact on TCP, UDP, FTP, HTTP and HTTPS specific commands.

12.7.3. +KCNXPROFILE Command: Current Profile Connection Configuration

HL7588	
<i>Test command</i> <u>Syntax</u> AT+ KCNXPROFILE =?	<u>Response</u> +KCNXPROFILE: (list of possible <cnx cnf>s) OK
<i>Read command</i> <u>Syntax</u> AT+ KCNXPROFILE?	<u>Response</u> +KCNXPROFILE: <cnx cnf> OK

HL7588	
<i>Write command</i>	
<u>Syntax</u> AT+KCNXPROFILE= <cnx cnf>	<u>Response</u> OK <u>Parameters</u> <cnx cnf> 1 – 5 PDP context configuration – a numeric parameter which specifies a particular PDP context configuration
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> This command sets the default PDP context configuration ID for +KTCPCFG, +KUDPCFG and +KFTPCFG, if <cnx cnf> parameter is not given in these commands.

12.7.4. +KCGPADDR Command: Display PDP Address

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KCGPADDR =?	<u>Response</u> +KCGPADDR: (list of possible <cnx_cnf>s) OK
<i>Write command</i>	
<u>Syntax</u> For all <cnx_cnf>s: AT+KCGPADDR For specific <cnx_cnf>s: AT+KCGPADDR= <cnx_cnf>	<u>Response</u> +KCGPADDR: <cnx_cnf>, <PDP_addr_1> [[+KCGPADDR: <cnx_cnf>, <PDP_addr_2>] ...] OK <u>Parameters</u> <cnx_cnf> 1 – 5 PDP context configuration – a numeric parameter which specifies a particular PDP context configuration <PDP_addr> A string that identifies the MT in the address space applicable to the PDP
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This AT command can be used after +KTCPCNX, +KUDPCFG, etc. to display the local IP address of the module. - For IPv6, more than one PDP addresses corresponding to the interface may be displayed.

12.7.5. +KCNX_IND Notification: Connection Status Notification

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KCNX_IND: <cnx cnf>,<status>,<af> (for <status> = 0, 1) +KCNX_IND: <cnx cnf>,<status>,<attempt>,<nbtrial>,<tim1> (for <status> = 2) +KCNX_IND: <cnx cnf>,<status> (for <status> = 3,6) +KCNX_IND: <cnx cnf>,<status>,<attempt> (for <status> = 4) +KCNX_IND: <cnx cnf>,<status>,<idletime> (for <status> = 5) <u>Parameters</u> <cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration <status> PDP connection status 0 Disconnected due to network 1 Connected 2 Failed to connect, <tim1> timer is started if <attempt> is less than <nbtrial> 3 Closed 4 Connecting 5 Idle time down counting started for disconnection 6 Idle time down counting canceled <af> 0 IPV4 1 IPV6 <tim1> Refer to +KCNXTIMER <attempt> Current attempt of bringing up of PDP connection <nbtrial> Refer to +KCNXTIMER <idletime> Refer to +KCNXTIMER
<u>Reference</u> Sierra Wireless Proprietary	

12.7.6. +KCNXUP Command: Bring the PDP Connection Up

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KCNXUP=?	<u>Response</u> +KCNXUP: (list of possible <cnx_cnf>s) OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KCNXUP= <cnx_cnf>	<u>Response</u> OK <u>Parameter</u> <cnx_cnf> 1 – 5 PDP context configuration – a numeric parameter which specifies a particular PDP context configuration
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This command activates the PDP context and reserves the activated PDP connection (i.e. keeps the PDP connection up even after the last session is closed). • If this command is not used, the PDP context will be brought down after the last session is closed unless +KCNXDOWN is used.

12.7.7. +KCNXDOWN Command: Bring the PDP Connection Down

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KCNXDOWN =?	<u>Response</u> +KCNXDOWN: (list of possible <cnx_cnf>s),(list of possible <mode>s) OK
<i>Write command</i> <u>Syntax</u> AT+KCNXDOWN =<cnx_cnf> [,<mode>]	<u>Response</u> OK <u>Parameters</u> <cnx_cnf> 1 – 5 PDP context configuration – a numeric parameter which specifies a particular PDP context configuration <mode> 0 Cancels the reservation of the activated PDP connection previously configured by +KCNXUP 1 Similar to 0, but deactivates the PDP connection even if the active session exists
<u>Reference</u> Sierra Wireless Proprietary	

12.8. Common Configuration

12.8.1. +KPATTERN Command: Custom End of Data Pattern

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KPATTERN =?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+KPATTERN?	<u>Response</u> +KPATTERN: <EOF pattern> OK
<i>Write command</i>	
<u>Syntax</u> AT+KPATTERN = <EOF pattern>	<u>Response</u> OK +CME ERROR <err> <u>Parameter</u> <EOF pattern> String type (max size 128 bytes). This is a pattern used to notify the end of data (or file) during data or file transfer. This string doesn't have to be human-readable (Not printable characters are allowed)
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The default value of the pattern is: "--EOF--Pattern--". - It is the responsibility of the user to select an appropriate pattern according to the data transferred (i.e. numeric pattern for text files and Readable string for binary files). - The <EOF pattern> pattern is detected within 100ms or higher timeout and without following data. The timeout value is equal to <wait_time> of +KIPOPT. - The received data is stored with buffer size <send size v4> or <send size v6> so that the <EOF pattern> with size larger than it is not detected. The user application should ensure that the value of <send size v4> or <send size v6> is larger than the size of <EOF pattern>.

12.8.2. +KURCCFG Command: Enable or Disable the URC from Protocol Commands

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KURCCFG=?	<u>Response</u> +KURCCFG: (list of supported <protoopt>s),(list of supported <noti_act>s),(list of supported <indi_act>s) OK

HL7588	
Read command	
<u>Syntax</u> AT+KURCCFG?	<u>Response</u> +KURCCFG: list of supported (<protoopt>,<noti_act>,<indi_act>) OK
Write command	
<u>Syntax</u> AT+KURCCFG= <protoopt>, <noti_act> [,<indi_act>]	<u>Response</u> OK <u>Parameters</u> <protoopt> Protocol option to enable/disable URC "TCPC" TCP client session "TCPS" TCP server session "UDPC" UDP client session "UDPS" UDP server session "FTP" FTP client session "HTTP" HTTP client session (not supported) "HTTPS" HTTPS client session (not supported) "TCP" Both TCP client and TCP server sessions "UDP" Both UDP client and UDP server sessions <noti_act> <u>1</u> Enable URC (like +KTCP_NOTIF, +KFTP_ERROR, etc.) 0 Disable URC <indi_act> <u>1</u> Enable URC (like +KTCP_SRVREQ, +KTCP_IND, +KTCP_DATA, +KUDP_DATA, +KUDP_RCV, +KFTP_IND, etc.) 0 Disable URC
<u>Examples</u>	To disable URC: AT+KURCCFG="TCP",0 OK Test and read command: AT+KURCCFG=? +KURCCFG: ("TCPC","TCPS","UDPC","UDPS","FTP","HTTP","HTTPS","TCP","UDP"), (0,-1),(0-1) OK AT+KURCCFG? +KURCCFG: "TCPC",1,1 +KURCCFG: "TCPS",1,1 +KURCCFG: "UDPC",1,1 +KURCCFG: "UDPS",1,1 +KURCCFG: "FTP",1,1 +KURCCFG: "HTTP",1,1 +KURCCFG: "HTTPS",1,1 OK
Reference Sierra Wireless Proprietary	<u>Notes</u> • Enable/disable +KTCP_NOTIF unsolicited messages, this is useful to use only in polling mode with +KTCPSTAT. • If set to "disable", URCs are discarded and not stored. • Can be used in 07.10 multiplexer.

12.8.3. +KIOPT Command: General Options Configuration

HL7588																													
<i>Test command</i> <u>Syntax</u> AT+KIOPT=?	<u>Response</u> +KIOPT: 0,<UDP>,(1-100),(8-1472),(8-1452) +KIOPT: 0,<TCP-based>,(0-100),(0,8-1460),(0,8-1440) +KIOPT: 1,(0-1) +KIOPT: 2,(0-255) +KIOPT: 3,(0-1),(0-1) +KIOPT: 4,(0-2) OK																												
<i>Read command</i> <u>Syntax</u> AT+KIOPT?	<u>Response</u> +KIOPT: 0,<proto>,<wait time>,<send size v4>,<send size v6>] [...] +KIOPT: 1,<http_chunked> +KIOPT: 2,<http_max_redirect> +KIOPT: 3,<stop_on_error>,<stop_on_peer> +KIOPT: 4,<ssl_ver> OK																												
<i>Write command</i> <u>Syntax</u> If <option_id>=0 AT+KIOPT= <option_id>,<proto>,<wait time> [,<send size v4> [,<send size v6>]] If <option_id>=3 AT+KIOPT= <option_id>,<stop_on_error>,<stop_on_peer>	<u>Response</u> OK +CME ERROR<err> <u>Parameters</u> <option_id> Option ID <table> <tr> <td>0</td><td>Wait time, send size threshold configuration</td></tr> <tr> <td>1</td><td>HTTP chunked transfer encoding (not supported)</td></tr> <tr> <td>2</td><td>HTTP maximum redirection (not supported)</td></tr> <tr> <td>3</td><td>PDP connection deactivated behavior</td></tr> <tr> <td>4</td><td>SSL version for use in +KHTTPS (not supported)</td></tr> </table> <proto> Protocol, string type <table> <tr> <td>"TCPC"</td><td>TCP client session</td></tr> <tr> <td>"TCPS"</td><td>TCP server session</td></tr> <tr> <td>"UDPC"</td><td>UDP client session</td></tr> <tr> <td>"UDPS"</td><td>UDP server session</td></tr> <tr> <td>"FTP"</td><td>FTP client session</td></tr> <tr> <td>"HTTP"</td><td>HTTP client session (not supported)</td></tr> <tr> <td>"HTTPS"</td><td>HTTP server session (not supported)</td></tr> <tr> <td>"TCP"</td><td>Both client and server TCP sessions</td></tr> <tr> <td>"UDP"</td><td>Both client and server UDP sessions</td></tr> </table>	0	Wait time, send size threshold configuration	1	HTTP chunked transfer encoding (not supported)	2	HTTP maximum redirection (not supported)	3	PDP connection deactivated behavior	4	SSL version for use in +KHTTPS (not supported)	"TCPC"	TCP client session	"TCPS"	TCP server session	"UDPC"	UDP client session	"UDPS"	UDP server session	"FTP"	FTP client session	"HTTP"	HTTP client session (not supported)	"HTTPS"	HTTP server session (not supported)	"TCP"	Both client and server TCP sessions	"UDP"	Both client and server UDP sessions
0	Wait time, send size threshold configuration																												
1	HTTP chunked transfer encoding (not supported)																												
2	HTTP maximum redirection (not supported)																												
3	PDP connection deactivated behavior																												
4	SSL version for use in +KHTTPS (not supported)																												
"TCPC"	TCP client session																												
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"UDPS"	UDP server session																												
"FTP"	FTP client session																												
"HTTP"	HTTP client session (not supported)																												
"HTTPS"	HTTP server session (not supported)																												
"TCP"	Both client and server TCP sessions																												
"UDP"	Both client and server UDP sessions																												

HL7588	
	<wait time> Timeout for configuring the packet segmentation on the IP network side; it specifies the timeout after which the buffered data will be sent to the peer irrespective of data packet size. Value is in 100 ms units. Range: For UDP: 1 – 100, default value = 2 For TCP: 0 – 100, default value = 1. Note that value = 0 has the same effect as having value = 1 due to the limitation from +KPATTERN detection timing <send size v4> Data packet size for IPv4 sessions. This parameter specifies the data packet size that needs to be sent to the peer. Range: For UDP: 8 – 1472, default value = 1020 For TCP: 0, 8 – 1460, default value = 0 (disabled) <send size v6> Data packet size for IPv6 sessions. This parameter specifies the data packet size that needs to be sent to the peer. Range: For UDP: 8 – 1452, default value = 1020 For TCP: 0, 8 – 1440, default value = 0 (disabled). Note that value = 0 uses a wait time of 100 ms. <stop_on_error> PDP connection deactivation behavior when a session is closed due to any error 0 Do not request to stop the connection 1 Request to stop the connection <stop_on_peer> PDP connection deactivation behavior when a session is closed by a peer/server 0 Do not request to stop the connection 1 Request to stop the connection 2 TLS version 1.2
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The default setting of <option_id>=3 is (<stop_on_error>=0, <stop_on_peer>=0) after module boot-up; this means that a PDP connection is requested to stop only when a session is closed by an Internet AT command (e.g. +KTCPCLOSE). - Thresholds <send size v4> and <send size v6> control the maximum size of data received from the AT terminal to be buffered within timeout <wait time>. When the threshold is reached or after timeout, the buffered data are sent to the socket layer for transmission. For UDP: data are sent as a UDP packet For TCP based protocol: data are copied to socket first-in-first-out buffer for transmission but packet segmentation is not guaranteed to be <send size> - For TCP based protocol, when <send size v4> and <send size v6> are disabled (=0), threshold = 4000 is used internally. - The maximum transmission unit (MTU) is 1500 bytes. <send size v4> and <send size v6> impacts the detection of <EOF pattern>. Refer to the notes of +KPATTERN for more information.

12.9. TCP Specific Commands

12.9.1. +KTCPCFG Command: TCP Connection Configuration

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
Test command	
<u>Syntax</u> AT+KTCPCFG=?	<u>Response</u> +KTCPCFG: (list of possible <cnx_cnf>s),(list of possible <mode>s),<remote-name/ip>,(list of possible <tcp_port >s),(list of possible <source_port>s),(list of possible <data_mode>s),(list of possible <URC-ENDTCP-enable>s),(list of possible <af>s) OK
Read command	
<u>Syntax</u> AT+KTCPCFG?	<u>Response</u> +KTCPCFG: <session_id>,<status>,<cnx_cnf>,<mode>[,<serverID>],<tcp remote address>,<tcp_port>[,<source_port>],<data_mode>,<URC-ENDTCP-enable>,<af> [...]
Write command	
<u>Syntax</u> AT+KTCPCFG= [<cnx_cnf>], <mode>, [<tcp remote address>], <tcp_port>[, [<source_port>] [, [<data_mode>], [<URC-ENDTCP-enable>]],<af>]	<u>Response</u> +KTCPCFG: <session_id> OK <u>Parameters</u> <cnx_cnf> Index of a set of parameters for configuring one TCP session (see +KCNXCFG) <session_id> TCP session index <mode> 0 Client 1 Server 2 Child (generated by server sockets) <tcp remote address> IP address string or explicit name of the remote server. For server configuration, this parameter is left blank <tcp_port> TCP port number; numeric parameter with range 1 – 65535. This parameter is the listening port for a server configuration. <status> Connection state of the selected socket 0 Disconnected 1 Connected <serverID> Server session ID index. Only for sockets in CHILD mode <source_port> Numeric parameter (0-65535). Specifies the local TCP port number. This parameter is left blank for a server configuration.

HL7588													
	<data_mode> <table> <tr> <td>0</td><td>Do not display <data> in URC (default setting)</td></tr> <tr> <td>1</td><td>Display <data> in URC</td></tr> </table> <URC-ENDTCP-enable> <table> <tr> <td>0</td><td>Do not display URC "+KTCP_ACK" (default setting)</td></tr> <tr> <td>1</td><td>Display URC "+KTCP_ACK"</td></tr> </table> <af> Address family used for the connection. <table> <tr> <td>0</td><td>IPV4</td></tr> <tr> <td>1</td><td>IPV6</td></tr> </table>	0	Do not display <data> in URC (default setting)	1	Display <data> in URC	0	Do not display URC "+KTCP_ACK" (default setting)	1	Display URC "+KTCP_ACK"	0	IPV4	1	IPV6
0	Do not display <data> in URC (default setting)												
1	Display <data> in URC												
0	Do not display URC "+KTCP_ACK" (default setting)												
1	Display URC "+KTCP_ACK"												
0	IPV4												
1	IPV6												
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • If the socket is defined as a <CLIENT> socket, <tcp_port> and <tcp remote address> define the port and the IP address of the remote server we want to connect. • Maximum <session_id> is 32. • For child session, the property <data_mode> will be kept the same as the server socket's setting. • See section 18.5.6 Use Cases for AT+KTCPCNXPINFO and <URC-ENDTCP-enable> Option. • This command can be used before setting up +KCNXCFG configuration. Note however that the latter is required to start the connection properly. • The connection timeout for TCP socket is about 9 seconds with 3 retransmissions with 3 seconds delay.												

12.9.2. +KTCPCNX Command: Start TCP Connection

HL7588															
<i>Test command</i>															
<u>Syntax</u> AT+KTCPCNX=?	<u>Response</u> +KTCPCNX: (list of possible <session_id>s) OK														
<i>Write command</i>															
<u>Syntax</u> AT+KTCPCNX= <session_id>	<u>Response</u> OK +CME ERROR: <err> +KTCP_NOTIF: <session_id>, <tcp_notif> <u>Parameters</u> <session_id> TCP session index <tcp_notif> Integer type. Indicates the cause of the TCP connection failure <table> <tr> <td>0</td><td>Network error</td></tr> <tr> <td>1</td><td>No more sockets available; max. number already reached</td></tr> <tr> <td>2</td><td>Memory problem</td></tr> <tr> <td>3</td><td>DNS error</td></tr> <tr> <td>4</td><td>TCP disconnection by the server or remote client</td></tr> <tr> <td>5</td><td>TCP connection error</td></tr> <tr> <td>6</td><td>Generic error</td></tr> </table>	0	Network error	1	No more sockets available; max. number already reached	2	Memory problem	3	DNS error	4	TCP disconnection by the server or remote client	5	TCP connection error	6	Generic error
0	Network error														
1	No more sockets available; max. number already reached														
2	Memory problem														
3	DNS error														
4	TCP disconnection by the server or remote client														
5	TCP connection error														
6	Generic error														

HL7588	
	7 Fail to accept client request's 8 Data sending is OK but KTCPSND was waiting more or less characters 9 Bad session ID 10 Session is already running 11 All sessions are used 12 Socket connection timer timeout 13 SSL connection error 14 SSL initialization error
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> This command is used for connecting to a remote server or listening to a bound port, depending on the selected mode of <session_id>.

12.9.3. +KTCPRCV Command: Receive Data through a TCP Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KTCPRCV=?	<u>Response</u> +KTCPRCV: (list of possible <session_id>s),(list of possible <ndata>s) OK
<i>Write command</i> <u>Syntax</u> AT+KTCPRCV= <session_id>, <ndata>	<u>Response</u> CONNECT ...<EOF pattern> OK +KTCP_NOTIF: <session_id>,<tcp_notif> <u>Parameters</u> <session_id> TCP session index <ndata> Number of bytes the device wants to receive (max value 4294967295) <tcp_notif> See command AT+KTCPCNX
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This function is used to receive <ndata> data bytes through a previously opened TCP socket. <ndata> indicates the max data number that the terminal wishes to receive. If the TCP socket contains more data than <ndata> bytes then only <ndata> bytes will be received. If the TCP socket contains less data than <ndata> bytes then only TCP socket's data will be received. <EOF pattern> would be added at the end of data automatically. - When <ndata> (max value) bytes or only available data in the TCP socket have been received, the module returns to command state and returns OK. - It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. - Refer to AT&D for the behavior of DTR drop.

12.9.4. +KTCPSND Command: Send Data through a TCP Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KTCPSND=?	<u>Response</u> +KTCPSND: (list of possible <session_id>s),(list of possible <ndata>s) OK
<i>Write command</i> <u>Syntax</u> AT+KTCPSND= <session_id>, <ndata>	<u>Response</u> CONNECT OK <u>Error case</u> NO CARRIER +CME ERROR: <err> +KTCP_NOTIF: <session_id>,<tcp_notif> <u>Parameters</u> <session_id> TCP session index <ndata> Number of bytes (max value 4294967295) <tcp_notif> See command AT+KTCPCNX
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • All data will be sent out ignoring <ndata>. If data sent is not equal to <ndata> then KTCP_NOTIF would appear. • <ndata> is the data size without <EOF pattern>. • It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. • Refer to AT&D for the behavior of DTR drop. • The data session is automatically ended when <ndata> data bytes are sent/received, and the module returns to command state and returns OK. • The data session can also be ended by <EOF pattern>, +++ or DTR. Refer to section 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table for the behavior of +++, DTR or ATO.

12.9.5. +KTCPCLOSE Command: Close Current TCP Operation

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KTCPCLOSE =?	<u>Response</u> +KTCPCLOSE: (list of possible <session_id>s), (list of possible <closing_type>s) OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KTCPCLOSE =<session_id> [,<closing_type>]	<u>Response</u> OK +CME ERROR: <err> NO CARRIER +KTCP_NOTIF: <session_id>, <tcp_notif> <u>Parameters</u> <session_id> TCP session index. <closing_type> 0 Abort. Fast closing of the TCP connection (not supported). 1 The TCP connection is properly closed, which means that data sent to the module by AT+KTCPSEND will be sent to the TCP server and acknowledged before the socket is closed. <tcp_notif> See command AT+KTCPCNX
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This function first closes the TCP socket and if there is no other session running then the PDP context is released. • AT+KTCPDEL=<session_id> can be used to delete the socket configuration after close.

12.9.6. +KTCPDEL Command: Delete a Configured TCP Session

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KTCPDEL=?	<u>Response</u> +KTCPDEL: (list of possible <session_id>s) OK
<i>Write command</i> <u>Syntax</u> AT+KTCPDEL= <session_id>	<u>Response</u> OK +CME ERROR: <err> <u>Parameters</u> <session_id> TCP session index
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> The session must be closed (using +KTCPCLOSE) before using this command.

12.9.7. +KTCP_SRVREQ Notification: Incoming Client Connection Request

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KTCP_SRVREQ: <session_id>,<subsession_id>,<client_ip>,<client_port> <u>Parameters</u> <session_id> TCP session index <subsession_id> Newly created TCP session index <client_ip> IP address string of the incoming socket <client_port> 0 – 65535 Port of the incoming client
<u>Examples</u>	Configure the module to TCP servers AT+KCNXCFG=0,"GPRS","szsjmc.gd"; +KTCPCFG=0,1,,179 +KTCPCFG: 1 OK AT+KCNXCFG=0,"GPRS","szsjmc.gd"; +KTCPCFG=0,1,,180 +KTCPCFG: 2 OK Start the TCP servers AT+KTCPCNX=1 //listen on port 179 OK AT+KTCPCNX=2 //listen on port 180 OK Show the TCP servers' IP address AT+KCGPADDR +KCGPADDR: 0,"192.168.1.49" OK Incoming connection request from remote client, shows ip address and port of remote client +KTCP_SRVREQ: 1,3,"192.168.0.32",4614 //incoming a connection request from "192.168.0.32" via //listening port 179, the remote port //is 4614 +KTCP_SRVREQ: 2,4,"10.10.10.110",4665 //incoming a connection request from "10.10.10.110" via //listening port 180, the remote port //is 4665 +KTCP_SRVREQ: 2,5,"10.10.10.110",4668 //incoming a connection request from the same ip via the same //listening port, the remote //port is 4668 +KTCP_SRVREQ: 1,6,"192.168.1.117",1739 //incoming a connection request from "192.168.1.117" via //listening port 179, the remote //port is 1739

HL7588	
	+KTCP_NOTIF: 4,4 //the connection of sub session id 4 (on listening port 180) is //closed. +KTCP_SRVREQ: 2,4,"10.10.10.8",4672 //incoming a connection request from "10.10.10.8" via listening //port 180, the remote port is //4672
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This notification is sent when a client requests a connection to the server. The connection is automatically accepted. • The created session is driven as any other TCP session with its own session ID. Use +KTCPSEND, +KTCPRCV, +KTCPCLOSE, etc. to provide the service associated to this TCP server. • The TCP server corresponding to the session ID is still able to receive connection requests from other clients. These requests are notified with +KTCP_SRVREQ. • The client IP address and port can also be checked using AT+KTCPCFG? after the client is connected to the TCP server.

12.9.8. +KTCP_DATA Notification: Incoming Data through a TCP Connection

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KTCP_DATA: <session_id>,<ndata available>[,<data>] <u>Parameters</u> <session_id> TCP session index <ndata available> for <data_mode> = 0, maximum number of bytes to be read in the TCP receive buffer for <data_mode> = 1, maximum number of bytes to be read in <data> <data> Data in octet. The length of data is specified by <ndata_available>
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • As soon as the connection is established, the module can receive data through the TCP socket. This notification is sent when data are available in the receive buffer. • This notification is sent for each TCP packet received. • When <data_mode> is set to 1, <ndata_available> will range from 1 to 1500 in the URC. If the user application sends over 1500 bytes of data to the module, the module will display those data with several URCs. • See section 18.6.3 Use Cases for KTCP_DATA and KUDP_DATA for sample use cases.

12.9.9. +KTCP_IND Notification: TCP Status

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KTCP_IND: <session_id>,<status> <u>Parameters</u> <session_id> TCP session index <status> TCP session status 1 Session is set up and ready for operation
<u>Reference</u> Sierra Wireless Proprietary	

12.9.10. +KTCPSTAT Command: Get TCP Socket Status

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KTCPSTAT= ?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+KTCPSTAT?	<u>Response</u> OK
<i>Write command</i>	
<u>Syntax</u> For all TCP session IDs: AT+KTCPSTAT or AT+KTCPSTAT= <session_id>	<u>Response</u> +KTCPSTAT: <session_id>,<status>,<tcp_notif>,<rem_data>,<rcv_data> [...] OK or +KTCPSTAT: <status>,<tcp_notif>,<rem_data>,<rcv_data> OK <u>Parameters</u> <session_id> TCP session index <status> TCP socket state 0 Socket not defined, use KTCPCFG to create a TCP socket 1 Socket is only defined but not used 2 Socket is opening and connecting to the server, cannot be used 3 Connection is up, socket can be used to send/receive data 4 Connection is closing, it cannot be used, wait for status 5 5 Socket is closed <tcp_notif> -1 if socket/connection is OK, <tcp_notif> if an error has happened

HL7588	
	<rem_data> Remaining bytes in the socket buffer, waiting to be sent <rcv_data> Received bytes, can be read with +KTCPCRV command
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The socket buffer's size for sending is 17520 bytes. - This command returns +CME ERROR: 910 (Bad Session ID) for undefined <session_id>s.

12.9.11. +KTCPSTART Command: Start a TCP Connection in Direct Data Flow

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KTCPSTART =?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+KTCPSTART ?	<u>Response</u> OK
<i>Write command</i>	
<u>Syntax</u> AT+KTCPSTART =<session_id>	<u>Response</u> CONNECT OK +CME ERROR: an error occurs, syntax error +KTCP_NOTIF: <session_id>,<tcp_notif> : an error occurs <u>Parameters</u> <session_id> TCP session index <tcp_notif> See command AT+KTCPCNX
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This function is used to send and receive data bytes through a TCP socket. - It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. - Refer to AT&D for the behavior of DTR drop. - Only 1 +KTCPSTART session can be used. - Can be used in 07.10 multiplexer. - If the session is successfully connected by +KTCPCNX, this command does not restart the connection and the module directly enters direct data flow. - The data session can also be ended by <EOF pattern>, +++ or DTR. Refer to section 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table for the behavior of +++, DTR or ATO.

12.9.12. +KTCP_ACK Notification: Status Report for Latest TCP Data

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KTCP_ACK: <session_id>,<result> <CR><LF> <u>Parameters</u> <session_id> TCP session index <result> 0 Data sent failure: not all data has been received by remote side 1 Data sent success: all the data has already been received by the remote side
Reference Sierra Wireless Proprietary	<u>Notes</u> - This URC is enabled or disabled by parameter <URC-ENDTCP-enable> of command +KTCPCFG. The URC is disabled by default. - See section 18.5.6 Use Cases for AT+KTCPPACKINFO and <URC-ENDTCP-enable> Option.

12.9.13. +KTCPPACKINFO Command: Poll ACK Status for the Latest Data

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KTCPPACKINFO=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+KTCPPACKINFO?	<u>Response</u> OK
<i>Write command</i>	
<u>Syntax</u> For all TCP session IDs with <URC-ENDTCP-enable>=1: AT+KTCPPACKINFO or AT+KTCPPACKINFO=<session_id>	<u>Response</u> +KTCPPACKINFO: <session_id>,<result> [...] OK or +KTCPPACKINFO: <session_id>,<result> OK +CME ERROR: <err> <u>Parameters</u> <session_id> TCP session index

HL7588							
	<result> <table> <tr> <td>0</td><td>Data sent failure: not all data has been received by remote side.</td></tr> <tr> <td>1</td><td>Data sent success: all the data has already been received by the remote side; or no data transfer has happened yet</td></tr> <tr> <td>2</td><td>The status is unknown yet</td></tr> </table>	0	Data sent failure: not all data has been received by remote side.	1	Data sent success: all the data has already been received by the remote side; or no data transfer has happened yet	2	The status is unknown yet
0	Data sent failure: not all data has been received by remote side.						
1	Data sent success: all the data has already been received by the remote side; or no data transfer has happened yet						
2	The status is unknown yet						
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The command will return ERROR if <URC-ENDTCP-enable> of command +KTCPCFG is 0. - After the TCP session is connected and before any data transfer, AT+KTCPCFG returns 1.						

12.10. UDP Specific Commands

12.10.1. +KUDPCFG Command: UDP Connection Configuration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KUDPCFG=?	<u>Response</u> +KUDPCFG: (list of possible <cnx cnf>s),(list of possible <mode>s),(list of possible <port>s),(list of possible <data_mode>s),<remote-name/ip>,(list of possible <udp_port>s),(list of possible <af>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KUDPCFG?	<u>Response</u> +KUDPCFG: <session_id>,<cnx cnf>,<mode>,<port>,<data_mode>,<udp remote address>,<udp_port>,<af> [...] OK
<i>Write command</i>	
<u>Syntax</u> AT+KUDPCFG=[<cnx cnf>],<mode>[,<port>],<data_mode>,<udp remote address>,<udp_port>,<af>	<u>Response</u> +KUDPCFG: <session_id> OK <u>Error case</u> +CME ERROR: <err> +KUDP_NOTIF: <session_id>,<udp_notif> <u>Parameter</u> <session_id> UDP session index. <mode> 0 Client 1 Server <port> 0 – 65535 Port; 0 = random <cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see section 12.7.1 +KCNXCFG Command: GPRS Connection Configuration).

HL7588	
	<udp_notif> Integer type. Indicates the cause of the UDP connection failure. 0 Network error 1 No more sockets available; max number already reached 2 Memory problem 3 DNS error 5 UDP connection error (Host unreachable) 6 Generic error 8 Data sending is OK but KUDPSND was waiting more or less characters 9 Bad session ID 10 Session is already running 11 All sessions are used <data_mode> <u>0</u> Do not display <data> in URC (Default setting) 1 Display <data> in URC <udp remote address> IP address string or explicit name of the remote host, default is empty (given by +KUDPSND) <udp_port> UDP peer port. Numeric parameter with range 0-65535. Default value is <u>0</u> (given by +KUDPSND) <af> Address family used for the connection. <u>0</u> IPV4 1 IPV6
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - For UDP socket in server mode, it is bound to a defined port number, incoming connection are notified by +KUDP_DATA. If remote address and port are given, they are saved for use in +KUDPSND. - Maximum <session_id> is 32. +KCNXCFG configuration should be set up in order to start the connection properly.

12.10.2. +KUDPRCV Command: Receive Data through a UDP Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KUDPRCV=?	<u>Response</u> +KUDPRCV: (list of possible <session_id>s),(list of possible <ndata>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KUDPRCV= <session_id>,<ndata>	<u>Response</u> CONNECT ...<EOF pattern> OK +KUDP_RCV: <udp remote address>,<udp remote port>,<ndata available>

HL7588	
	<u>Error case</u> NO CARRIER +CME ERROR: <err> +KUDP_NOTIF: <session_id>, <udp_notif> +KUDP_DATA_MISSED: <session_id>, <ndata missed> <u>Parameters</u> <session_id> UDP session index <ndata> Number of bytes the device wants to receive (max value 4294967295) <udp remote address> IP address string of the remote host <udp remote port> 0 – 65535 Remote UDP port <ndata available> Number of bytes to be read in first received packet <udp_notif> See command AT+KUDPCFG <ndata missed> Number of bytes left in the UDP socket
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This function is used to receive <ndata> data bytes through a previously opened UDP socket. • <ndata> indicates the max data number that the terminal wishes to receive. If the UDP socket contains more data than <ndata> bytes, then only <ndata> bytes will be received and more data can be read by running this command again. • <EOF pattern> would be added at the end of data automatically. • When <ndata> (max value) bytes or only available data in the UDP socket have been received, the module returns to command mode. • It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. • Refer to AT&D for the behavior of DTR drop.

12.10.3. +KUDPSND Command: Send Data through a UDP Connection

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KUDPSND=?	<u>Response</u> +KUDPSND: (list of possible <session_id>s),<remote-name/ip>,(list of possible <udp_port>s),(list of possible <ndata>s) OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KUDPSND= <session_id>, <udp remote address>, <udp_port>, <ndata>	<u>Response</u> CONNECT OK <u>Error case</u> NO CARRIER +CME ERROR: <err> +KUDP_NOTIF: <session_id>,<udp_notif> <u>Parameters</u> <session_id> UDP session index <udp remote address> IP address string or explicit name of the remote host <udp_port> 1 – 65535 UDP peer port <ndata> Number of bytes (max value 4294967295) <udp_notif> See command AT+KUDPCFG
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • All the data will be sent out ignoring <ndata>. If data sent is not equal to <ndata> then +KUDP_NOTIF would appear. • <ndata> is the data size without <EOF pattern>. • It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. • Refer to AT&D for the behavior of DTR drop. • The maximum transmission unit (MTU) is 1500 Bytes. • The <udp remote address> and <udp_port> are saved internally such that they can be omitted in subsequent calls of +KUDPSND. • The packet segmentation is controlled by +KIPOPT with <option_id>=0, and the maximum UDP packet size is limited by <send size v4> (1472 bytes) or <send size v6> (1452 bytes). Default values are 1020 bytes. • The data session is automatically ended when <ndata> data bytes are sent/received, and the module returns to command state and returns OK. • The data session can also be ended by <EOF pattern>, +++ or DTR. Refer to section 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table for the behavior of +++, DTR or ATO.

12.10.4. +KUDPCLOSE Command: Close Current UDP Operation

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KUDPCLOSE =?	<u>Response</u> +KUDPCLOSE: (list of possible <session_id>s),(list of possible <keep_cfg>s) OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KUDPCLOSE =<session_id> [,<keep_cfg>]	<u>Response</u> OK +KUDP_NOTIF: <session_id>, <udp_notif> <u>Parameters</u> <session_id> UDP session index <udp_notif> See command AT+KUDPCFG <keep_cfg> Specifies whether to delete the session configuration after closing it 0 Delete the session configuration 1 Keep the session configuration
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This function closes the UDP session. If there is no other session running, the PDP context would be released. • This function will delete the session configuration if <keep_cfg> = 0.

12.10.5. +KUDPDEL Command: Delete a Configured UDP Session

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KUDPDEL=?	<u>Response</u> +KUDPDEL: (list of possible <session_id>s) OK
<i>Write command</i> <u>Syntax</u> AT+KUDPDEL= <session_id>	<u>Response</u> OK +CME ERROR: <err> <u>Parameters</u> <session_id> UDP session index
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> The session must be closed (using +KUDPCLOSE) before using this command.

12.10.6. +KUDP_IND Notification: UDP Status

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KUDP_IND: <session_id>,<status> <u>Parameters</u> <session_id> UDP session index <status> UDP session status 1 Session is set up and ready for operation
<u>Reference</u> Sierra Wireless Proprietary	

12.10.7. +KUDP_DATA Notification: Incoming Data through a UDP Connection

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KUDP_DATA: <session_id>,<ndata available>[,<udp remote address>,<udp remote port>,<data>] <u>Parameters</u> <session_id> UDP session index <ndata available> Number of bytes to be read <udp remote address> IP address string of the remote host <udp remote port> 0 – 65535 Remote UDP port <data> Data in octet. The length of data is specified by <ndata_available>
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - As soon as the UDP socket is created, the module can receive data through this socket. This notification is sent when data are available in the receive buffer. - This notification will be sent one time. When <data_mode> was set to 0 (Do not display data in URC), the controlling software must read the buffer with KUDPRCV in order to activate the notification again. - When <data_mode> was set to 1, <ndata_available> will range from 1 – 1500 in the URC. If the user application sends over 1500 bytes of data to the module, the module will display those data with several URCs. It is possible for other applications (e.g. from Windows) to send more than 1472 bytes UDP packets to the module but the packet will be segmented and reassembled by the network stack. - When <data_mode> is set to 1, URC "+KUDP_RCV" will not be displayed after +KUDP_DATA. - When <data_mode> was set to 1, the fields <udp remote address> and <udp remote port> will be displayed in URC +KUDP_DATA. When <data_mode> was set to 0, they will be displayed in URC +KUDP_RCV. - See section 18.6.3 Use Cases for KTCP_DATA and KUDP_DATA.

12.11. FTP Client Specific Commands

12.11.1. +KFTPCFG Command: FTP Configuration

HL7588	
Test command	
<u>Syntax</u> AT+KFTPCFG=?	<u>Response</u> +KFTPCFG: (list of possible <cnx cnf>s),<server-name/ip>,(range of possible length of <login>),(range of possible length of <password>),(list of possible <port_number>s),(list of possible <mode>s),(list of possible <start>s),(list of possible <af>s) OK
Read command	
<u>Syntax</u> AT+KFTPCFG?	<u>Response</u> +KFTPCFG: <session_id>,<cnx cnf>,<server_name>,<login>,<password>,<port_number>,<mode>,<started>,<af>
Write command	
<u>Syntax</u> AT+KFTPCFG= [<cnx cnf>], <server_name> [,<login> [,<password> [,<port_number> [,<mode>] [,<start>] [,<af>]]]]	<u>Response</u> +KFTPCFG:<session_id> OK <u>Error case</u> +KFTP_ERROR: <session_id>,<ftp cause> <u>Parameters</u> <cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration <session_id> FTP session index <server_name> IP address string of the ftp server or domain name of the server <login> String type, indicates the user name to be used during the FTP connection <password> String type, indicates the password to be used during the FTP connection <port_number> 1 – 65535 Numeric parameter that indicates the remote command port (21 by default) <mode> Numeric number. Indicates the initiator of the FTP connection 0 Active. The server is initiator of the FTP data connection 1 Passive. The client is initiator of the FTP data connection in order to avoid the proxy filtrate. The passive data transfer process “listens” on the data port for a connection from the active transfer process in order to open the data connection <start> Specifies whether to start the FTP connection immediately 0 Start the FTP connection later by +KFTPCNX 1 Start the FTP connection immediately

HL7588	
	<started> Specifies whether the FTP connection is started 0 FTP connection is not started yet 1 FTP connection is started <af> Address family used for the connection. 0 IPV4 1 IPV6 <ftp_cause> Integer type that indicates the cause of the FTP connection failure. 0 Sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to download a file due to connection troubles 3 Download was impossible due to connection timeout 4 No network available 5 Flash access trouble 6 Flash memory full 7 Network error XXX Three-digit reply codes from the FTP server. See section 18.2.5 FTP Reply Codes
<u>Example</u>	AT+KFTPCFG=1,"ftp.connect.com","username","password",21,0
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - Execution command sets the server name, the login, the password, the port number and the mode for ftp operations. - This command (with <start> = 0) can be used before setting up +KCNXCFG configuration. Note however that the latter is required to start the connection properly. - The result of the FTP connection is notified using unsolicited response.

12.11.2. +KFTPCNX Command: Start FTP Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KFTPCNX=?	<u>Response</u> +KFTPCNX: (list of possible <session_id>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KFTPCNX= <session_id>	<u>Response</u> OK <u>Error case</u> NO CARRIER +CME ERROR: <err> +KFTP_ERROR: <session_id>,<ftp_cause> <u>Parameters</u> <session_id> FTP session index

HL7588	
	<ftp_cause> Integer type that indicates the cause of the FTP connection failure. 0 Sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to download a file due to connection troubles 3 Download was impossible due to connection timeout 4 No network available 5 Flash access trouble 6 Flash memory full 7 Network error XXX Three-digit reply codes from the FTP server. See section 18.2.5 FTP Reply Codes
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This command is used to start the FTP connection created by +KFTPCFG with <start>=0. • +KFTPRCV, +KFTPSND, +KFTPDEL automatically starts the connection if it has not been started using AT+KFTPCNX. • The result of the FTP connection is notified using unsolicited response.

12.11.3. +KFTPRCV Command: Receive FTP Files

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KFTPRCV=?	<u>Response</u> +KFTPRCV: (list of possible <session_id>s),<local_uri>,<server_path>,<file_name>, (list of possible <type_of_file>s),(list of possible <offset>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KFTPRCV= <session_id>, [<local_uri>], [<server_path>], <file_name> [,<type_of_file> [,<offset>]]	<u>Response</u> CONNECT <EOF_pattern> OK <u>Error case</u> +CME ERROR<err> NO CARRIER +KFTP_ERROR: <session_id>,<ftp cause> <u>Parameters</u> <session_id> FTP session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax. <server_path> String type. Indicates the path of the file to be downloaded. An empty string or no string indicates the downloading is done from the path given by the FTP server <file_name> string type. Indicates the name of the file to download

HL7588	
	<type_of_file> Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 Binary (default value) 1 ASCII <offset> 0 – 4294967295 Integer type indicating the offset to “resume transfer”. See 18.7.2 “FTP Resume” Use Case. When downloading file and transmitting to serial link, module will use the <offset> value and “resume transfer” from this position. <EOF_pattern> End of file notification. See +KPATTERN for value <ftp_cause> Integer type. Indicates the cause of the FTP connection failure 0 Sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to download a file due to connection troubles. 3 Download was impossible due to connection timeout 4 No network available 5 Flash access trouble 6 Flash memory full 7 Network error XXX Three-digit reply codes from the FTP server. See section 18.2.5 FTP Reply Codes
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • Before using this command, an FTP connection must have been achieved using AT+KFTPCFG. • After sending the +KFTPCV command, the user will receive the entire data stream. • The user can abort the download by sending the “End of Data pattern” from the host. In this case, the module will end the transfer by transmitting the EOF followed by NO CARRIER. • Download can also be aborted (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. • If AT&C1 is set, DCD will be ON after CONNECT and DCD will be OFF after download is done. • “Resume transfer” feature shall be supported by the FTP server to be used. • See section 18.7.2 “FTP Resume” Use Case. • If the FTP server does not support the resume feature, module will output +KFTP_ERROR. The <ftp_cause> will be in the sets {500, 501, 502, 421, 530}. See section 18.2.5 FTP Reply Codes for error codes.

12.11.4. +KFTPSND Command: Send FTP Files

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KFTPSND=?	<u>Response</u> +KFTPSND: (list of possible <session_id>s),<local_uri>,<server_path>,<file_name>,(list of possible <type of file>s),(list of possible <append>s) OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KFTPSND= <session_id>, [<local_uri>], [<server_path>], <file_name> [,<type of file>] [,<append>]	<u>Response</u> CONNECT OK <u>Error case</u> +CME ERROR <err> NO CARRIER +KFTP_ERROR: <session_id>,<ftp cause> <u>Parameters</u> <session_id> FTP session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax. <server_path> String type. Indicates the path of the file to be uploaded. An empty string or no string indicates the uploading is done from the path given by the FTP server <file_name> String type. Indicates the name of the file to upload <type of file> Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 Binary 1 ASCII <append> Numeric type. Indicates using "append" or not when uploading. 0 Do not use "append". (default value) If the file already exists then the file will be overridden 1 Use "append". If the file already exists then the data will be appended at the end of the file; otherwise the file will be created <EOF pattern> End of file notification. See +KPATTERN for values <ftp_cause> Integer type that indicates the cause of the FTP connection failure. 0 Sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to download a file due to connection troubles. 3 Download was impossible due to connection timeout 4 No network available 5 Flash access trouble 6 Flash memory full 7 Network error XXX Three-digit reply codes from the FTP server. See section 18.2.5 FTP Reply Codes
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • Before using this command, an FTP connection must have been achieved using AT+KFTPCFG. • After sending the +KFTPSND command, the host must send the entire data stream of the file. • Upload can also be ended (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. • ATO is not available for this command. • If AT&C1 is set, DCD will be ON after CONNECT, and it will be OFF after the upload done.

12.11.5. +KFTPDEL Command: Delete FTP Files

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KFTPDEL=?	<u>Response</u> +KFTPDEL: (list of possible <session_id>s),<server_path>,<file_name>,(list of possible <type>s) OK
<i>Write command</i> <u>Syntax</u> AT+KFTPDEL= <session_id>, [<server_path>, <file_name> [,<type>]	<u>Response</u> OK <u>Error case</u> +CME ERROR <err> NO CARRIER +KFTP_ERROR: <session_id>,<ftp cause> <u>Parameters</u> <session_id> FTP session index <server_path> String type. Indicates the path of the file to be deleted. An empty string or no string indicates the deleting is done from the path given by the <server_name> parameter <file_name> String type. Indicates the name of the file to delete <type> Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 Binary 1 ASCII <ftp_cause> Integer type that indicates the cause of the FTP connection failure 0 Sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to delete a file due to connection troubles 3 Deleting was impossible due to connection timeout 4 No network available XXX Three-digit reply codes from the FTP server. See section 18.2.5 FTP Reply Codes
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - Before using this command, an FTP connection must have been achieved using AT+KFTPCFG. - The result of the delete operation is notified using unsolicited response.

12.11.6. +KFTP_IND Notification: FTP Status

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KFTP_IND: <session_id>,<status>[,<data_len>] <u>Parameters</u> <session_id> FTP session index <status> FTP session status 1 Session is set up and ready for operation 2 The last FTP command is executed successfully <data_len> Byte length of data downloaded/uploaded to/from the terminal (+KFTPRCV/+KFTPSND)
<u>Reference</u> Sierra Wireless Proprietary	

12.11.7. +KFTPCLOSE Command: Close Current FTP Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KFTPCLOSE =?	<u>Response</u> +KFTPCLOSE: (list of possible <session_id>s),(list of possible <keep_cfg>s) OK
<i>Write command</i> <u>Syntax</u> AT+KFTPCLOSE =<session_id> [,<keep_cfg>]	<u>Response</u> OK <u>Parameters</u> <session_id> FTP session index <keep_cfg> Specifies whether to delete the session configuration after closing it 0 Delete the session configuration 1 Keep the session configuration
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> This command will close the connection to the FTP server.

12.11.8. +KFTPCFGDEL Command: Delete a Configured FTP Session

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KFTPCFGDEL=?	<u>Response</u> +KFTPCFGDEL: (list of possible <session_id>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KFTPCFGDEL= <session_id>	<u>Response</u> OK +CME ERROR: <err> <u>Parameters</u> <session_id> FTP session index
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> The session must be closed (using +KFTPCLOSE) before using this command.

12.12. HTTP Client Specific Commands

12.12.1. +KHTTPCFG Command: HTTP Connection Configuration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPCFG=?	<u>Response</u> +KHTTPCFG: (list of possible <cnx_cnf>s),<server-name/ip>,(list of possible <http_port>s),(list of possible <http_version>s),(range of possible length of <login>),(range of possible length of <password>),(list of possible <started>s),(list of possible <af>s),<cipher_index> OK
<i>Read command</i>	
<u>Syntax</u> AT+KHTTPCFG?	<u>Response</u> +KHTTPCFG: <session_id>,<cnx_cnf>,<http_server>,<http_port>,<http_version>,<login>,<password>,<started>,<af>,<cipher_index> OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KHTTPCFG= [<cnx cnf>], <http_server> [,<http_port> [,<http_version> [,<login> [,<password>] [,<start>] [,<af>]]] [,<cipher_index>]]	<u>Response</u> +KHTTPCFG: <session_id> OK or +CME ERROR: <err> <u>Parameters</u> <cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see KCNXCFCG) <session_id> HTTP session index <http_server> IP address string or explicit name of the remote server <http_port> 1 – 65535 Default value = <u>80</u> <http_version> <u>0</u> HTTP 1.1(by default) 1 HTTP 1.0 2 HTTP 1.1 over TLS (HTTPS) 3 HTTP 1.0 over TLS (HTTPS) <login> String type, indicates the user name to be used during the HTTP connection <password> String type, indicates the password to be used during the HTTP connection <start> Specifies whether to start the HTTP connection immediately or not 0 Start the HTTP connection later using +KTTPCNX 1 Start the HTTP connection immediately <started> Specifies whether the HTTP connection has been started 0 The HTTP connection has not been started yet 1 The HTTP connection has already been started <af> Address family used for the connection. Default is IPV4. <u>0</u> IPV4 1 IPV6 <cipher_index> Cipher suite profile index to use for a secured socket; defined by +KSSLCRYPTO
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • <http_port> and <http_server> define the port and the IP address of the remote server one wants to connect. • The connection timeout for TCP socket is about 9 seconds with 3 retransmissions with 3 seconds delay. • This command can be used before setting up +KCNXCFCG configuration. Note however that the latter is required to start the connection properly. • For <af>=1 (IPV6), server address (<http_server>) in IP address string format can be optionally quoted with square brackets "[]", e.g. [FEDC:BA98:7654:3210:FEDC:BA98:7654:3210]

12.12.2. +KHTTPCNX Command: Start the HTTP Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPCNX= ?	<u>Response</u> +KHTTPCNX: (list of possible <session_id>s) OK
<i>Write command</i> <u>Syntax</u> AT+KHTTPCNX= <session_id>	<u>Response</u> OK or +CME ERROR: <err> +KHTTP_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTP session index <http_notif> Integer type. Indicates the cause of the HTTP connection failure 4 DNS error 5 HTTP connection error due to internal trouble 6 HTTP connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP has partial data
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This command is used to start the HTTP connection created by +KHTTPCFG with <start>=0. +KHTTPGET, +KHTTPHEAD, +KHTTPPOST automatically starts the connection if it has not been started before using AT+KHTTPCNX.

12.12.3. +KHTTPHEADER Command: Set the HTTP Request Header

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+ KHTTPHEADER =?	<u>Response</u> +KHTTPHEADER: (list of possible <session_id>s),<local_uri> OK
<i>Read command</i>	
<u>Syntax</u> AT+ KHTTPHEADER?	<u>Response</u> +KHTTPHEADER: <session_id>,<count> [...]

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KHTTPHEADER= <session_id> [,<local_uri>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <session_id> HTTP session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax. <count> Count of HTTP headers
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • The data session is automatically ended when <ndata> data bytes are sent/received, and the module returns to command state and returns OK. • The data session can also be ended by <EOF pattern>, +++ or DTR. Refer to section 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table for the behavior of +++, DTR or ATO.

12.12.4. +KHTTPGET Command: Get HTTP Server Information

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KHTTPGET =?	<u>Response</u> +KHTTPGET: (list of possible <session_id>s),<request_uri>,(list of possible <show_resp>s) OK
<i>Write command</i> <u>Syntax</u> AT+KHTTPGET= <session_id>,<request_uri> [,<show_resp>]	<u>Response</u> CONNECT ...<EOF pattern> OK or NO CARRIER +CME ERROR: <err> +KHTTP_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTP session index <request_uri> string type, indicates the information url to get during the HTTP connection

HL7588	
	<http_notif> Integer type. Indicates the cause of the HTTP connection failure 4 DNS error 5 HTTP connection error due to internal trouble 6 HTTP connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP has partial data <show_resp> Whether to show HTTP response and HTTP headers 0 Do not show response and headers 1 Show response and headers (default)
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The user can abort the download by sending the "End of Data pattern" from the host. In this case, the module will end the transfer by transmitting the EOF followed by NO CARRIER. - Download can also be aborted (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table.

12.12.5. +KHTTPHEAD Command: Get HTTP Headers

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPHEAD =?	<u>Response</u> +KHTTPHEAD: (list of possible <session_id>s),<request_uri> OK
<i>Write command</i> <u>Syntax</u> AT+KHTTPHEAD =<session_id>,<request_uri>	<u>Response</u> CONNECT ...<EOF pattern> OK or NO CARRIER +CME ERROR: <err> +KHTTP_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTP session index <request_uri> String type, indicates the information URL to get during HTTP connection <http_notif> Integer type. Indicates the cause of the HTTP connection failure 4 DNS error 5 HTTP connection error due to internal trouble 6 HTTP connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP has partial data

HL7588	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • HTTP does not support DTR1 • This method is identical to GET except that the server MUST NOT return a message-body in the response. The meta-information contained in the HTTP headers in response to a HEAD request SHOULD be identical to the information sent in response to a GET request

12.12.6. +KHTTPPOST Command: Perform HTTP Post

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPPOST =?	<u>Response</u> +KHTTPPOST: (list of possible <session_id>s),<local_uri>,<request_uri>,(list of possible <show_resp>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPPOST =<session_id>,<local_uri>,<request_uri>[,<show_resp>]	<u>Response</u> CONNECT ...<EOF pattern> OK or NO CARRIER +CME ERROR: <err> +KHTTP_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTP session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax. <request_uri> String type, the request data of the HTTP connection <http_notif> Refer to +KHTTPGET <show_resp> Whether to show HTTP response and HTTP headers 0 Do not show HTTP response and headers 1 Show HTTP response and headers (default)
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. • Upload can also be ended (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. • ATO is not available for this command.

12.12.7. +KHTTPCLOSE Command: Close an HTTP Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPCLOSE=?	<u>Response</u> +KHTTPCLOSE: (list of possible <session_id>s), (list of possible <keep_cfg>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPCLOSE= <session_id> [,<keep_cfg>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <session_id> HTTP session index <keep_cfg> Specifies whether to delete the session configuration after closing it 0 Delete the session configuration 1 Keep the session configuration
<u>Reference</u> Sierra Wireless Proprietary	

12.12.8. +KHTTPDEL Command: Delete a Configured HTTP Session

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPDEL=?	<u>Response</u> +KHTTPDEL: (list of possible <session_id>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPDEL= <session_id>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <session_id> HTTP session index
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> The HTTP session must be closed (using +KHTTPCLOSE) before using this command.

12.12.9. +KHTTP_IND Notification: HTTP Status

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KHTTP_IND: <session_id>,<status>[,<data_len>,<st_code>,<st_reason>] <u>Parameters</u> <session_id> HTTP session index <status> HTTP session status 1 Session is set up and ready for operation 3 The last HTTP command is executed successfully <data_len> Byte length of data downloaded/uploaded to/from the terminal (using +KHTTPHEAD, +KHTTPGET, or +KHTTPPOST) <st_code> HTTP response status code <st_reason> HTTP response status reason string
<u>Reference</u> Sierra Wireless Proprietary	

12.13. HTTPS Client Specific Commands

12.13.1. +KHTTPSCFG Command: HTTPS Connection Configuration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPSCFG =?	<u>Response</u> +KHTTPSCFG: (list of possible <cnx_cnf>s),<server-name/ip>,(list of possible <https_port>s),(list of possible <http_version>s),(list of possible <cipher_suite>s),(list of possible <sec_level>s),(range of possible length of <login>),(range of possible length of <password>),(list of possible <started>s), (list of possible <af>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+KHTTPSCFG ?	<u>Response</u> +KHTTPSCFG: <session_id>,<cnx_cnf>,<http_server>,<https_port>,<http_version>,<cipher suite>,<sec_level>,<login>,<password>,<started>,<af> OK

HL7588*Write command*Syntax

AT+KHTTPSCFG
 =[<cnx cnf>],
 <http_server>
 [,<https_port>
 [,<http_version>
 [,<cipher_suite>
 [,<sec_level>
 [,<login>
 [,<password>]
 [,<start>]
 [,<af>]]]]]]

Response

+KHTTPSCFG: <session_id>

OK

or

+CME ERROR: <err>

Parameters

<cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see +KCNXCFG).

<session_id> HTTPS session index

<http_server> IP address string or explicit name of the remote server

<https_port> 1 – 65535 Default value = 443

<http_version> 0 HTTP 1.1
 1 HTTP 1.0

<cipher_suite>

0 TLS_RSA_CHOOSE_BY_SERVER
 1 TLS_RSA_WITH_RC4_128_MD5
 2 TLS_RSA_WITH_RC4_128_SHA
 3 TLS_RSA_WITH_DES_CBC_SHA (not supported)
 4 TLS_RSA_WITH_3DES_EDE_CBC_SHA (not supported)
 5 TLS_RSA_EXPORT1024_WITH_DES_CBC_SHA (not supported)
 6 TLS_RSA_WITH_AES_128_CBC_SHA
 7 TLS_RSA_WITH_AES_256_CBC_SHA
 8 TLS_RSA_WITH_AES_128_GCM_SHA256

<sec_level> 1 No authentication
 2 Manage server authentication (renegotiation of client certificate is not supported)
 3 Manage server and client authentication if requested by remote server (renegotiation of client certificate is not supported)

<login> String type, indicates the user name to be used during the HTTPS connection.

<password> String type, indicates the password to be used during the HTTPS connection.

<start> Specifies whether to start the HTTPS connection immediately or not
0 Start the HTTPS connection later using +KHTPSCNX
1 Start the HTTPS connection immediately

<started> Specifies whether the HTTPS connection has been started
0 The HTTPS connection has not been started yet
1 The HTTPS connection has already been started

<af> Address family used for the connection
0 IPV4
1 IPV6

HL7588	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • <https_port> and <http_server> define the port and the IP address of the remote server one wants to connect. • The connection timeout for TCP socket is about 9 seconds with 3 retransmissions with 3 seconds delay. • For <sec_level>:2 and 3, certificates or private key must be loaded from internal storage. See SSL Certificate Management for more information. • Any certificates referenced in HTTPS feature should be DER encoded. • Any private key referenced in HTTPS feature should be DER- PKCS#8 encoded. • This command can be used before setting up +KCNXCFG configuration. Note however that the latter is required to start the connection properly. • For <af>=1 (IPV6), server address (<http_server>) in IP address string format can be optionally quoted with square brackets "[]", e.g. [FEDC:BA98:7654:3210:FEDC:BA98:7654:3210] • SSL version is TLS 1.1 by default; refer to <ssl_ver> of +KIPOPT for configuration.

12.13.2. +KHTTPSCNX Command: Start HTTPS Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPSCNX =?	<u>Response</u> +KHTTPSCNX: (list of possible <session_id>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPSCNX =<session_id>	<u>Response</u> OK or +CME ERROR: <err> +KHTTPS_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTPS session index <http_notif> Integer type. Indicates the cause of the HTTPS connection failure 4 DNS error 5 HTTPS connection error due to internal trouble 6 HTTPS connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTPS has no data 11 HTTPS has partial data 12 SSL connection error 13 SSL initialization error
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This command is used to start the HTTPS connection created by +KHTTPSCFG with <start>=0. • +KHTTPSGET, +KHTTPSHEAD, +KHTTPSPOST automatically starts the connection if it has not been started using AT+KHTTPSCNX.

12.13.3. +KHTTPSHEADER Command: Set the HTTPS Request Header

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPSHEADER=?	<u>Response</u> +KHTTPSHEADER: (list of possible <session_id>s), <local_uri> OK
<i>Read command</i>	
<u>Syntax</u> AT+KHTTPSHEADER?	<u>Response</u> +KHTTPSHEADER: <session_id>,<count> [...]
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPSHEADER=<session_id>[,<local_uri>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <session_id> HTTPS session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax. <count> HTTPS header count
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The data session is automatically ended when <ndata> data bytes are sent/received, and the module returns to command state and returns OK. - The data session can also be ended by <EOF pattern>, +++ or DTR. Refer to section 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table for the behavior of +++, DTR or ATO.

12.13.4. +KHTTPSGET Command: Get Information from HTTPS Server

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPSGET=?	<u>Response</u> +KHTTPSGET: (list of possible <session_id>s),<request_uri>,(list of possible <show_resp>s) OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KHTTPSGET =<session_id>,<request_uri> [,<show_resp>]	<u>Response</u> CONNECT ...<EOF pattern> OK or NO CARRIER +CME ERROR: <err> +KHTTPS_ERROR: <session_id>,<http_notif> <u>Parameters</u> <session_id> HTTPS session index <request_uri> String type, indicates the information URL to get during HTTPS connection <http_notif> Integer type. Indicates the cause of the HTTPS connection failure 4 DNS error 5 HTTPS connection error due to internal trouble 6 HTTPS connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTPS has no data 11 HTTPS has partial data 12 SSL connection error 13 SSL initialization error <show_resp> Defines whether HTTPS response and HTTPS headers are shown 0 Do not show HTTPS response and headers 1 Show HTTPS response and headers
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The user can abort the download by sending the “End of Data pattern” from the host. In this case, the module will end the transfer by transmitting the EOF followed by NO CARRIER. - Download can also be aborted (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table.

12.13.5. +KHTTPSHEAD Command: Retrieve HTTP Headers

HL7588	
<i>Test command</i> <u>Syntax</u> AT+ KHTTPSHEAD=?	<u>Response</u> +KHTTPSHEAD: (list of possible <session_id>s),<request_uri> OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+ KHTTPSHEAD= <session_id>, <request_uri>	<u>Response</u> CONNECT ...<EOF pattern> OK or NO CARRIER +CME ERROR: <err> +KHTTPS_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTPS session index <request_uri> String type, indicates the information URL to get during HTTPS connection
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • HTTPS does not support DTR1. • This method is identical to GET except that the server MUST NOT return a message-body in the response. The meta-information contained in the HTTP headers in response to a HEAD request SHOULD be identical to the information sent in response to a GET request.

12.13.6. +KHTTPSPOST Command: Send Data to HTTPS Server

HL7588	
<i>Test command</i> <u>Syntax</u> AT+ KHTTPSPOST=?	<u>Response</u> +KHTTPSPOST: (list of possible <session_id>s),<local_uri>,<request_uri>,(list of possible <show_resp>s) OK
<i>Write command</i> <u>Syntax</u> AT+ KHTTPSPOST= <session_id>, <local_uri>, <request_uri> [,<show_resp>]	<u>Response</u> CONNECT ...<EOF pattern> OK or NO CARRIER +CME ERROR: <err> +KHTTPS_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTPS session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax.

HL7588	
	<request_uri> String type, indicates the request data of the HTTPS connection <http_notif> Integer type. Indicates the cause of the HTTPS connection failure 4 DNS error 5 HTTPS connection error due to internal trouble 6 HTTPS connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTPS has no data 11 HTTPS has partial data 12 SSL connection error 13 SSL initialization error <show_resp> Defines whether HTTPS response and HTTPS headers are shown 0 Do not show HTTPS response and headers 1 Show HTTPS response and headers
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. - Upload can also be ended (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. - ATO is not available for this command.

12.13.7. +KHTTPSCLOSE Command: Close an HTTPS Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPSCLOSE=?	<u>Response</u> +KHTTPSCLOSE: (list of possible <session_id>s), (list of possible <keep_cfg>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPSCLOSE=<session_id>[,<keep_cfg>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <session_id> HTTPS session index <keep_cfg> Specified whether to delete the session configuration after closing it 0 Delete the session configuration 1 Keep the session configuration
<u>Reference</u> Sierra Wireless Proprietary	

12.13.8. +KHTTPSDEL Command: Close an HTTPS Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPSDEL =?	<u>Response</u> +KHTTPSDEL: (list of possible <session_id>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPSDEL =<session_id>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <session_id> HTTPS session index
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> The session must be closed (using +KHTTPSCLOSE) before using this command.

12.13.9. +KHTTPS_IND Notification: HTTPS Status

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KHTTPS_IND: <session_id>,<status>[,<data_len>] <u>Parameters</u> <session_id> HTTPS session index <status> HTTPS session status 1 Session is set up and ready for operation 2 The last HTTPS command is executed successfully <data_len> Byte length of data downloaded/uploaded to/from the terminal (using +KHTTPSHEAD, +KHTTPSGET, or +KHTTPSPOST)
<u>Reference</u> Sierra Wireless Proprietary	

12.14. SSL Certificate Manager

12.14.1. +KCERTSTORE Command: Store Root CA and Local Certificates to Internal Storage

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KCERTSTORE=?	<u>Response</u> +KCERTSTORE: (list of possible <data_type>s),(range of possible lengths of <NbData>),(list of possible <index>es) OK
<i>Read command</i> <u>Syntax</u> AT+KCERTSTORE?	<u>Response</u> +KCERTSTORE [root_cert,<index>,<NbData><CR><LF> <File_data><CR><LF>] [local_cert,<index>,<NbData><CR><LF> <File_data> <CR><LF>] [...] OK or +CME ERROR: <err>
<i>Write command</i> <u>Syntax</u> AT+KCERTSTORE= <data_type> [,<NbData> [,<index>]]	<u>Response</u> CONNECT OK or +CME ERROR: <err> <u>Parameters</u> <data_type> 0 Root certificate 1 Local certificate <NbData> 1 – 3000 Number of bytes to read/write <index> Stored root/local certificate index. If a root/local certificate is already stored at the index, it will be overloaded. <u>0</u> by default. Value range: 0 If <data_type> = 0 0 – 2 If <data_type> = 1 <File_data> File data in bytes

HL7588	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The <index> parameter is the link between a local certificate and a private key (refer to +KPRIVKSTORE and +KCERTDELETE for more information). - The data session is automatically ended when <ndata> data bytes are sent/received, and the module returns to command state and returns OK. - The data session can also be ended by <EOF pattern>, +++ or DTR. Refer to section 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table for the behavior of +++ or DTR. - ATO is not available for this command.

12.14.2. +KPRIVKSTORE Command: Store Private Key Associated to a Local Certificate

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KPRIVKSTORE=?	<u>Response</u> +KPRIVKSTORE: (list of possible <index>es),(range of possible lengths of <NbData>) OK
<i>Read command</i>	
<u>Syntax</u> AT+KPRIVKSTORE?	<u>Response</u> +KPRIVKSTORE private_key,<index>,<NbData><CR><LF> <File_data> <CR><LF> OK or +CME ERROR: <err>
<i>Write command</i>	
<u>Syntax</u> AT+KPRIVKSTORE= <index> [,<NbData>]	<u>Response</u> CONNECT OK or +CME ERROR: <err> <u>Parameters</u> <index> 0 – 2 Index of the stored local certificate associated to this private key. <NbData> 1 – 3000 Number of bytes to read/write (mandatory for both reading and writing) <File_data> File data in bytes

HL7588	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The data session is automatically ended when <ndata> data bytes are sent/received, and the module returns to command state and returns OK. - The data session can also be ended by <EOF pattern>, +++ or DTR. Refer to section 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table for the behavior of +++ or DTR. - ATO is not available for this command.

12.14.3. +KCERTDELETE Command: Delete Local Certificate from the Index

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KCERTDELETE=?	<u>Response</u> +KCERTDELETE: (list of possible <data_type>s),(list of possible <index>es) OK
<i>Read command</i>	
<u>Syntax</u> AT+KCERTDELETE?	<u>Response</u> +KCERTDELETE: OK or +CME ERROR: <err>
<i>Write command</i>	
<u>Syntax</u> AT+KCERTDELETE=<data_type>[,<index>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <data_type> 0 Root certificate 1 Local certificate <index> Stored local certificate index. Default value = 0. Value range: 0 If <data_type> = 0 0 – 2 If <data_type> = 1
<u>Reference</u> Sierra Wireless Proprietary	

12.14.4. +KPRIVKDELETE Command: Delete Private Key from the Index

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KPRIVKDELETE=?	<u>Response</u> +KPRIVKDELETE: (list of possible <index>es) OK
<i>Write command</i>	
<u>Syntax</u> AT+KPRIVKDELETE=<index>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <index> 0 – 2 Stored private key index
<u>Reference</u> Sierra Wireless Proprietary	

>> 13. AVMS Commands

13.1. +WDSA Command: Change Account for DM Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WDSA=?	<u>Response</u> +WDSA: (list of supported <ServerId>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+WDSA?	<u>Response</u> +WDSA: <ServerId> OK
<i>Write command</i>	
<u>Syntax</u> AT+WDSA= <serverId>	<u>Response</u> OK or +CME ERROR <err> <u>Parameter</u> <ServerId> String type – Server ID associated with the account.
<u>Notes</u>	This command is available when the embedded module has finished the Device Services initialization (see +WDSI) and when AVMS services is activated (see +WDSG).
<u>Examples</u>	AT+WDSA=? +WDSA: (“Cingular”, “Cingularlab”, “WAVECOM-RDMS-SERVER”) OK AT+WDSA=“WAVECOM-RDMS-SERVER” OK AT+WDSA? +WDSA: “WAVECOM-RDMS-SERVER” OK

13.2. +WDSC Command: Device Services Configuration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WDSC=?	<u>Response</u> +WDSC: (0-2), (list of supported <State>s) +WDSC: 3, (list of supported <State>s) +WDSC: 4, (list of supported <Timer_n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+WDSC?	<u>Response</u> +WDSC: 0,<State> +WDSC: 1,<State> +WDSC: 2,<State> +WDSC: 3,<State> +WDSC: 4,<Timer_1>[,<Timer_2>]...[,<Timer_n>] OK
<i>Write command</i>	
<u>Syntax</u> For <Mode>= 0, 1, 2 or 3 AT+WDSC=<Mode>,<State> For <Mode>= 4 AT+WDSC=<Mode>,<timer_1>[,<Timer_2>]...[,<Timer_n>]	<u>Response</u> OK or +CME ERROR <err> <u>Parameters</u> <Mode> Integer type 0 User agreement for connection When this mode is activated and when a notification SMS is received by the embedded module, an indication (see +WDSI indication for more information) is returned by the embedded module to request for an agreement before connecting to the AirVantage Management Services server 1 User agreement for package download When this mode is activated, an indication (see +WDSI indication for more information) is returned by the embedded module to request for an agreement before downloading any package 2 User agreement for package install When this mode is activated, an indication (see +WDSI indication for more information) is returned by the embedded module to request for an agreement before installing any package 3 Polling mode The embedded module will initiate a connection to the Device Services server according to the defined timer 4 Retry mode If an error occurs during a connection to the Device Services server (GPRS establishment failed, etc.), the embedded module will initiate a new connection according to the defined timers. This mechanism is persistent to the reset.

HL7588	
	<State> Mode status For <Mode> = 0, 1 or 2 <u>0</u> Disabled (default value) 1 Enabled For <Mode> = 3 Value in range 0 – 525600 (units = min) 0 The polling mode is deactivated <Timer_1> Timer between the first failed connection and the next attempt. Value in range 0 – 20160 (units = min). 0 The retry mode is deactivated <u>15</u> Default value <Timer_n> Timer between the nth failed attempt connection and the (n+1)th connection (n<=8). Value in range 1 – 20160 (units = min) Default values: <Timer_2> = 60 <Timer_3> = 240 <Timer_4> = 960 <Timer_5> = 2880 <Timer_6> = 10080 <Timer_7> = 10080
<u>Notes</u>	• This command is available when the embedded module has finished the Device Services initialization (see +WDSI) and when the AVMS services are in prohibited state (see +WDSG). • Parameters <State> and <Timer_1> to <Timer_n> are stored in non-volatile memory. The &F command has no impact on these values. • The network registration is considered as “failed” when all connections configured by the retry mode have failed. This registration is forbidden while the APN is not set by the +WDSS command.
<u>Examples</u>	AT+WDSC=? +WDSC:(0-2),(0-1) +WDSC:3,(0-525600) +WDSC:4,(0-20160),(1-20160),(1-20160),(1-20160),(1-20160),(1-20160),(1-20160) OK AT+WDSC? <i>// All modes are deactivated except retry mode which is used with default timers</i> +WDSC: 0,0 +WDSC: 1,0 +WDSC: 2,0 +WDSC: 3,0 +WDSC: 4,15,60,240,960,2880,10080,10080 OK AT+WDSC=0,1 OK AT+WDSC? +WDSC: 0,1 +WDSC: 1,0 +WDSC: 2,0 +WDSC: 3,0 +WDSC: 4,15,60,240,960,2880,10080,10080 OK

13.3. +WSDS Command: Device Services Local Download

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WSDS=?	<u>Response</u> +WSDS: (list of supported <Size>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+WSDS= <Size>	<u>Response</u> <NACK> <i>// User sends data</i> OK or +CME ERROR <err> <u>Parameters</u> <Size> 1 – 24643584 Package size in bytes
<u>Examples</u>	AT+WSDS=? +WSDS: (1-24643584) OK AT+WSDS=1024 <i>//download a 1kBytes package</i> <NACK> <i>//the device is ready to receive data</i> <i>//send data</i> OK <i>//All data are well received by the module</i> +WDSI: 3 <i>//A package is ready to install (see +WDSI and +WDSR commands)</i>
<u>Reference</u> Sierra Wireless Proprietary Command	<u>Notes</u> • This command is available when the embedded module has finished its initialization. • The response to the AT+WSDS=<Size> command is the <NACK> character when the device is ready to receive data using the 1K-Xmodem protocol • The flow control of the TE has to be set to 'Hardware' • This command will automatically activate the user agreement for install (see +WDSI command description). • No reset is made during the package download. • A timeout will happen (and a +CME ERROR: 3 is returned) if no data is sent to the device in 5 minutes.

13.4. +WDSE Command: Device Services Error

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT+WDSE	<u>Response</u> [+WDSE:<HTTP_Status>] OK

HL7588

or

+CME ERROR <err>Parameters**<HTTP_Status>** Integer type – Last HTTP response received by the module

- 100 Continue
- 101 Switching Protocols
- 200 OK
- 201 Created
- 202 Accepted
- 203 Non-Authoritative Information
- 204 No Content
- 205 Reset Content
- 206 Partial content
- 300 Multiple Choices
- 301 Moved Permanently
- 302 Found
- 303 See Other
- 304 Not Modified
- 305 Use Proxy
- 307 Temporary Redirect
- 400 Bad Request
- 401 Unauthorized
- 402 Payment Required
- 403 Forbidden
- 404 Not Found
- 405 Method Not Allowed
- 406 Not Acceptable
- 407 Proxy Authentication Required
- 408 Request timeout
- 409 Conflict
- 410 Gone
- 411 Length Required
- 412 Precondition Failed
- 413 Request Entity too large
- 414 Request URI too large
- 415 Unsupported Media type
- 416 Request range unsatisfiable
- 417 Expectation failed
- 500 Internal server error
- 501 Not implemented
- 502 Bad Gateway
- 503 Service unavailable
- 504 Gateway time out
- 505 HTTP version not supported

If no session was made with the server, AT+WDSE only returns **OK**, without **+WDSE:**
<HTTP_Status> intermediary response.

Notes

This command is available when the embedded module has finished the Device Services initialization (see +WDSI) and when AVMS services is activated (see +WDSG).

HL7588	
<u>Examples</u>	AT+WDSS=1,1 //A session was made with the server OK AT+WDSE +WDSE: 200 //The last HTTP response received is "OK" OK

13.5. +WDSF Command: Device Services Fallback

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WDSF=?	<u>Response</u> +WDSF: (list of supported <Mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+WDSF?	<u>Response</u> +WDSF: 1,<FallbackInfo> +WDSF: 2,<EraseInfo> OK
<i>Write command</i>	
<u>Syntax</u> AT+WDSF= <Mode>	<u>Response</u> OK or +CME ERROR <err> <u>Parameters</u> <Mode> Integer type 1 Downgrade to a previous installation 2 Delete the downloaded package which contains the reverse patch <FallbackInfo> Integer type – Indicates the presence of the previous package 0 Previous package is not present 1 Previous package is present <EraseInfo> Integer type – Indicate if a package can be deleted. Be careful, erasing the package will disable the possibility to make any recovery or manual fallback 0 The package cannot be deleted 1 The package can be deleted
<u>Notes</u>	This command is available when the embedded module has finished the Device Services initialization (see +WDSI).
<u>Examples</u>	AT+WDSF? //a reverse package is present, deletion impossible +WDSF: 1,1 +WDSF: 2,0 OK

HL7588	
	AT+WDSF=1 <i>//downgrade to the previous installation</i> OK +WDSI: 17,1 <i>//downgrade the package successfully done, displayed only if +WDSI</i> <i>//indication is activated</i>

13.6. +WDSG Command: Device Services General Status

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WDSG=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+WDSG	<u>Response</u> +WDSG: <Indication>,<State> [+WDSG: <Indication>,<State>[...]] OK or +CME ERROR <err> <u>Parameters</u> <Indication> Integer type 0 Device services activation state 1 Session and package indication <State> Indication status For <Indication>=0 0 Device services are prohibited. Devices services will never be activated. 1 Device services are deactivated. Connection parameters to a device services have to be provisioned. 2 Device services have to be provisioned. NAP parameters have to be provisioned. 3 Device services are activated. If a device has never been activated (first use of device services on this device), <State> is set to 1. The connection parameters are automatically provisioned, no action is needed from the user. For <Indication>=1 0 No session or package 1 A session is under treatment 2 A package is available on the server. 3 A package was downloaded and ready to install When a package was installed or a recovery was made, <State> is set to 0.
<u>Notes</u>	This command is available when the embedded module has finished the Device Services initialization (see +WDSI).

HL7588	
<u>Examples</u>	AT+WDSG=? OK AT+WDSG +WDSG: 0,3 <i>//Device services are activated,</i> +WDSG: 1,0 <i>//No session to the server, no patch to download or to install</i> OK

13.7. +WDSI Command: Device Services Indication

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WDSI=?	<u>Response</u> +WDSI: (list of supported <Level>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+WDSI?	<u>Response</u> [+WDSI: <Level>] OK
<i>Write command</i>	
<u>Syntax</u> AT+WDSI= <Level>	<u>Response</u> OK or +CME ERROR <err> <u>Parameters</u> <Level> Indication level, bit field (default value = 0) Bit set to 0 Indication deactivated Bit set to 1 Indication activated 0 No indication 1 Activate the initialization end indication (<Event> = 0) 2 Activate the server request for a user agreement indication (<Event> = 1, 2 and 3) 4 Activate the authentication indications (<Event> = 4 and 5) 8 Activate the session start indication (<Event> = 6, 7 and 8) 16 Activate the package download indications (<Event> = 9, 10 and 11) 32 Activate the certified downloaded package indication (<Event> = 12 and 13) 64 Activate the update indications (<Event> = 14, 15 and 16) 128 Activate the fallback indication (<Event> = 17) 256 Activate download progress indication (<Event> = 18) 512 Reserved 1024 Reserved 2048 Activate provisioning indication (<Event> = 21) 4096 Reserved

HL7588

<Event>	0	Device services are initialized and can be used. Devices services are initialized when the SIM PIN code is entered and a dedicated NAP is configured (see +WDSS command)
	1	The Device Services server requests the device to make a connection. The device requests a user agreement to allow the embedded module to make the connection. The response can be sent using +WDSR command and this indication can be returned by the device if the user has activated the user agreement for connection (see +WDSC command for more information)
	2	The Device Services server requests the device to make a package download. The device requests a user agreement to allow the embedded module to make the download. The response can be sent using +WDSR command and this indication can be returned by the device if the user has activated the user agreement for download (see +WDSC command for more information).
	3	The device has downloaded a package. The device requests a user agreement to install the downloaded package. The response can be sent using +WDSR command and this indication can be returned by the device if the user has activated the user agreement for install (see +WDSC command for more information).
	4	The embedded module starts sending data to the server
	5	Authentication with the server failed
	6	Authentication has succeeded, a session with the server started
	7	Session with the server failed
	8	Session with the server is finished
	9	A package is available on the server and can be downloaded by the embedded module. A <Data> parameter is returned indicating the package size in kB
	10	A package was successfully downloaded and stored in flash
	11	An issue happens during the package download. If the download has not started (+WDSI: 9 indication was not returned), this indication indicates that there is not enough space in the device to download the update package. If the download has started (+WDSI: 9 indication was returned), a flash problem implies that the package has not been saved in the device
	12	Downloaded package is certified to be sent by the AirVantage Management Services server
	13	Downloaded package is not certified to be sent by the AirVantage Management Services server
	14	Update will be launched
	15	OTA update client has finished unsuccessfully
	16	OTA update client has finished successfully
	17	A fallback mechanism was launched
	18	Download progress. This event is returned without <Data> parameter to indicate that a download starts. During the download, a percentage progress is indicated in <Data> parameter
	19	Reserved
	20	Reserved
	21	A provision was made by the AirVantage Management Services server
	22	Reserved

<Data> Specific data for some <Event>

For<Event>=9, <Data> indicates the package size in bytes, which will be downloaded

For<Event>=17, <Data> indicates if the fallback was asked by the user or applied because a recovery was necessary

0 Automatic recovery (a recovery mechanism was made)

1 Fallback asked by the user (see +WDSF for more information)

HL7588	
	For<Event>=18, <Data> indicates the download progress in percentage For<Event>=21, <Data> indicates the provisioned parameters 0 Reserved 1 Reserved 2 Reserved 3 Reserved 4 Reserved 5 Reserved 6 Reserved 7 Reserved 8 Reserved 9 Device Service polling mode (see +WDSC command for more information) 10 Reserved 11 Reserved 12 Reserved 13 Reserved
Unsolicited Notification	<u>Response</u> +WDSI: <Event>[,<Data>]
<u>Notes</u>	• This command is available when the embedded module has finished its initialization. • To receive +WDSI indications, Device Services should be activated (see +WDSG for more information). • The <Level> parameter is stored in non-volatile memory. The default value can be restored using AT&F. • When the AVMS status is updated, +WDSI unsolicited response will be displayed according to the AVMS status change at the same time. If there is power loss when the AVMS status is updating and is updated successfully, the +WDSI unsolicited response may be lost.
<u>Examples</u>	AT+WDSI=? +WDSI: (0-2047) OK AT+WDSI? +WDSI: 0 <i>// All indications are deactivated</i> OK AT+WDSI=207 OK +WDSI: 1 <i>// The devices services server requests a connection to the embedded module</i> AT+WDSR=1 <i>// Accept the connection</i> OK +WDSI: 4 <i>// The embedded module will send the first data to the AirVantage Management Services server</i> +WDSI: 6 <i>// The authentication succeeded</i> +WDSI: 8 <i>// The session with the server is over</i> +WDSI: 9,1000 <i>// A package will be downloaded, the size is 1kbytes</i> +WDSI: 18,"1%" <i>// 1% was downloaded</i> +WDSI: 18,"100%" <i>// The whole package was downloaded</i> +WDSI: 10 <i>// The whole package was stored in flash</i>

13.8. +WDSR Command: Device Services Reply

HL7588	
Test command	
<u>Syntax</u> AT+WDSR=?	<u>Response</u> +WDSR: (list of supported <Reply> s),(list of supported <Timer> s) OK
Write command	
<u>Syntax</u> AT+WDSR= <Reply> [,<Timer>]	<u>Response</u> OK or +CME ERROR <err> <u>Parameters</u> <Reply> Reply to user agreement request 0 Delay or refuse the connection to the server 1 Accept the connection to the server 2 Delay or refuse the download 3 Accept the download 4 Accept the install 5 Delay the install <timer> 0 – 1440 Timer (in minutes) until a new user agreement request is returned by the module. This parameter is only available for <Reply>=0, 2 or 5 . Default value = <u>30</u> . Value 0 indicates that the application refuses the user agreement (impossible when <Reply>=5).
<u>Notes</u>	• This command is available when the embedded module has finished the Device Services initialization (see +WDSI) and when AVMS services are activated (see +WDSG). • It is impossible to refuse an install request (AT+WDSR=5,0); this will return +CME ERROR: 3. • After an install delay if the embedded module is powered down until after the delay, it is not powered on and the new user agreement request should be returned at the new start up.
<u>Examples</u>	AT+WDSR=? +WDSR: (0-5),(0-1440) OK +WDSI: 1 //The device Services server requests the device to make a connection // to the server. The user is requested to allow the connection. AT+WDSR=1 OK +WDSI: 3 //A user agreement is requested to install a package AT+WDSR=5,10 //A delay of 10 minutes is requested OK +WDSI: 3 //10 minutes later, a new user agreement is requested to install a //package AT+WDSR=4 //The install is requested OK

13.9. +WDSS Command: Device Services Session

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WDSS=?	<u>Response</u> +WDSS: 0 , (Max length for <Apn>), (Max length for <User>), (Max length for <Pwd>), (list of supported <Cid>s) [+WDSS: 1 , (list of supported <Action>s for this <Mode>)] OK
<i>Read command</i>	
<u>Syntax</u> AT+WDSS?	<u>Response</u> [+WDSS: 0 , <Apn>[, <User>], <Cid>] [+WDSS: 1 , <Action>] OK
<i>Write command</i>	
<u>Syntax</u> For <Mode>=0: AT+WDSS= <Mode> , [<Apn> [, <User>[, <Pwd> [, <Cid>]]]] For <Mode>=1 AT+WDSS= <Mode> , <Action>	<u>Response</u> OK +CME ERROR <err> <u>Parameters</u> <Mode> Integer type 0 PDP context configuration for Device Services 1 User initiated connection to the Device services server <Apn> Access Point Name for Devices Services. String type up to 50 characters. See <Cid> for empty strings. <User> Login for the APN. String type, up to 30 characters <Pwd> Password for the APN. String type, up to 30 characters <Cid> Context ID used for AVMS PDP activation. This parameter must be set to 1 when using 4G, but can have a value of 1 – 5 when using 3G (default value = 5). When connecting to the server, if the PDP of <Cid> has already been activated: • AVMS connection will directly reuse the PDP of that <Cid> when <Apn> is set as an empty string; • <Apn> will be checked if it matches with +CGDCONT settings to reuse the connection when <Apn> is set as a non-empty string. Otherwise, APN <Apn> will be activated. <Action> For <Mode>=1 only 0 Release the current connection to the Device Services Server 1 Establish a connection to the Device Services Server
<u>Notes</u>	• This command is available when the embedded module has finished the Device Services initialization (see +WDSI). • <Apn>, <User>, <Pwd> and <Cid> parameters are automatically stored in non-volatile memory. AT&F has no effect on these parameters. • AT+WDSS? command only returns OK if no APN is defined. • When a request is sent to the embedded module to resume a non-existent or unsuspended session, +CME ERROR: 3 is returned.

HL7588	
	• When a request is sent to the embedded module to release a non-existent session, +CME ERROR: 3 is returned. • Depending on +WDSM configuration, when no dedicated NAP is defined using +WDSS command and a session is asked (by AT command or notify by SMS), the embedded module will use a NAP defined by +CGDCONT command to activate the dedicated PDP context. This NAP will be recorded to configure the NAP Device Services and it will be used to activate the dedicated PDP context for the next sessions. • When the PDP context cannot be activated because of bad AirVantage Management Services NAP configuration, the embedded module will use a NAP defined by +CGDCONT command to activate the dedicated PDP context (but the initial NAP configuration is not erased). • Activation is done if the embedded module is registered on the network. If the embedded module is not registered when the command is performed, activation will be done at the next network registration (even if the embedded module resets). • No GPRS connection to the AirVantage Management Services server is possible when a registration is not completed. • The default value of <Cid> is 5; if reuse of existing activated PDP context is required for all internet connection, set <Cid> accordingly. For example, in LTE, if the internet connection uses PDP of cid1, then <Cid> should be set to 1. • AT+WDSS=0 will remove all stored information <Apn>, <User>, <Pwd> and <Cid>. <Apn> will become unprovisioned, but not an empty string.
<u>Examples</u>	<pre>// Example for HL7588 Verizon and 3G HL7588 AT&T modules AT+WDSS? OK //No APN defined AT+WDSS=? +WDSS: 0, 50,30,30,(1-5) +WDSS: 1,(0-1) OK AT+WDSS=0,"Sierra Wireless",,,5 //Define the APN for the Device Services; context //ID = 5 OK AT+WDSS? +WDSS: 0,"Sierra Wireless",,,5 +WDSS: 1,0 OK AT+WDSS=1,1 //Initiation of a connection to the Device Services server OK AT+WDSS=1,0 //Release connection to the Device Services server OK // Example for HL7588 AT&T modules using 4G with only 1 PDP context allowed, and // where <Cid> must be 1 at+cgdcont? +CGDCONT: 1,"IP","broadband","10.191.8.184",0,0,0,0,0 OK at+wdss=0,"broadband",,,1 OK</pre>

HL7588	
	<pre> at+wdss? +WDSS: 0,"broadband",,1 +WDSS: 1,0 at+cgact? +CGACT: 1,1 OK at+wdss=1,1 OK +WDSI: 4 +WDSI: 8 at+cgdcont? +CGDCONT: 1,"IP","broadband","10.191.8.184",0,0,0,0,0 OK // Example of when an activated PDP is reused at+cgdcont? +CGDCONT: 1,"IP","broadband","10.191.8.184",0,0,0,0,0 OK at+wdss=0 //Clear all setting OK at+wdss? OK at+wdss=0,,,1 //Define empty string APN OK at+wdss? +WDSS: 0,"",,1 +WDSS: 1,0 OK at+wdss=1,1 //Reuse activated PDP of cid 1 for connection OK +WDSI: 4 +WDSI: 8 </pre>

13.10. +WDSM Command: Manage Device Services

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WDSM=?	<u>Response</u> +WDSM: (list of supported <Mode>s),(list of supported <State>s) OK

HL7588	
<i>Read command</i> <u>Syntax</u> AT+WDSM?	<u>Response</u> +WDSM: 0,<State> +WDSM: 1,<State> OK
<i>Write command</i> <u>Syntax</u> AT+WDSM= <Mode>,<State>	<u>Response</u> OK or +CME ERROR <err> <u>Parameters</u> <Mode> APN backup 0 If AVMS APN (filled with +WDSS command) is incorrect, the module will use the APN defined by +CGDCONT command. 1 If AVMS APN has not been filled with +WDSS command, the module will use the APN defined by +CGDCONT command. Each APN will be used until successful session activation. If an AVMS session succeeds, the corresponding APN is copied in the +WDSS command and remains after the AVMS session ends. <State> Mode status 0 Disable (default value) 1 Enable (not supported)
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <State> is automatically stored in non-volatile memory. AT&F command has no impact on these values.
<u>Examples</u>	AT+WDSM=? +WDSM: (0-1),(0) OK AT+WDSM? +WDSM: 0,0 +WDSM: 1,0 OK // all modes are activated AT+WDSM=0,0 OK AT+WDSM? +WDSM: 0,0 +WDSM: 1,0 OK

>> 14. Test Commands

The following commands are used for testing purposes.

14.1. +WMTXPOWER Command: Test RF Tx

HL7588	
Test command	
<u>Syntax</u> AT+WMTXPOWER=?	<u>Response</u> +WMTXPOWER: (list of supported <ENABLE>s),(list of supported 3G <BAND>s),(list of supported 3G <CHANNEL>s),(list of supported 3G <POWER_LEVEL>s) +WMTXPOWER: (list of supported <ENABLE>s),(list of supported 4G <BAND>s), (list of supported 4G <CHANNEL>s), (list of supported 4G <POWER_LEVEL>s),(list of supported <BANDWIDTH>s) OK
Read command	
<u>Syntax</u> AT+WMTXPOWER?	<u>Response</u> For UMTS: +WMTXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>] OK For LTE: +WMTXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>,<BANDWIDTH>] OK Note that parameters <BAND>, <CHANNEL>, <POWER_LEVEL> and <BANDWIDTH> are only available if <ENABLE>=1.
Write command	
<u>Syntax</u> AT+WMTXPOWER=<ENABLE>,[,<BAND>,<CHANNEL>,<POWER_LEVEL>,<BANDWIDTH>]	<u>Response</u> OK <u>Parameters</u> <ENABLE> 0 Stop the burst emission 1 Start the burst emission <BAND> Tx burst band emission. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. For UMTS: 2 Band II (1900 band) 5 Band V (850 band) For LTE: 2 PCS 4 AWS 5 CLR 13 Upper SMH block C 17 Lower SMH blocks B/C

HL7588	
	<CHANNEL> Tx burst channel emission. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. For UMTS: If <BAND>=2 9262 – 9538, 12, 37, 62, 87, 112, 137, 162, 187, 212, 237, 262, 287 If <BAND>=5 4132 – 4233, 782, 787, 807, 812, 837, 862 For LTE: If <BAND>=2 18600 – 19199 If <BAND>=4 19950 – 20399 If <BAND>=5 20400 – 20649 If <BAND>=13 23180 – 23279 If <BAND>=17 23730 – 23849 <POWER_LEVEL> Tx burst power. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. Range: 0 (0 dBm) to 384 (24 dBm) for all UMTS bands; 0 (0 dBm) to 368 (23 dBm) for all LTE bands <BANDWIDTH> Defines the bandwidth of Tx burst emissions. This parameter is not allowed if <ENABLE>=0 and is only applicable with LTE bands. 0 1.4MHz 1 3 MHz 2 5 MHz 3 10 MHz 4 15 MHz 5 20 MHz
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • Only one burst can be emitted at a time. • This AT command is not available if AT+WMRXPOWER is enabled. • The module must be restarted after using this command.
<u>Example</u>	<pre>at+wmtxpower=? +WMTXPOWER: (0,1),(2,5),(9262,9538,12,37,62,87,112,137,162,187,212,237,262,287, 4132-4233,782,787,807,812,837,862),(0-384) +WMTXPOWER: (0-1),(2,4,5,13,17),(18600-19199,19950-20399,20400-20649, 23180-23279,23730-23849),(0-368),(0-5) OK at+wmtxpower=1,2,9262,0 // A Tx burst is emitted at Uarfcn 9262 OK at+wmtxpower=0 OK at+wmtxpower=1,2,18600,0,0 // A Tx burst is emitted at Earfcn 18600 OK at+wmtxpower=0 OK</pre>

14.2. +WMRXPOWER Command: Test RF Rx

HL7588	
<i>Test command</i> <u>Syntax</u> AT+WMRXPOWER=?	<u>Response</u> +WMRXPOWER: (list of supported <ENABLE>s),(list of supported 3G <BAND>s), (list of supported 3G <CHANNEL>s) +WMRXPOWER: (list of supported <ENABLE>s),(list of supported 4G <BAND>s), (list of supported 4G <CHANNEL>s) OK
<i>Read command</i> <u>Syntax</u> AT+WMRXPOWER?	<u>Response</u> +WMRXPOWER: <ENABLE>[,<BAND>,<CHANNEL>] OK Note that parameters <BAND> and <CHANNEL> are only available if <ENABLE>=1.
<i>Write command</i> <u>Syntax</u> AT+WMRXPOWER= <ENABLE> [,<BAND>, <CHANNEL>]	<u>Response</u> +WMRXPOWER: <POWER1>,<POWER2> OK <u>Parameters</u> <ENABLE> 0 Stop the Rx measurement 1 Start the Rx measurement <BAND> Rx band to read. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. For UMTS: 2 Band II (1900 band) 5 Band V (850 band) For LTE: 2 PCS 4 AWS 5 CLR 13 Upper SMH block C 17 Lower SMH blocks B/C <CHANNEL> Rx channel to read. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. For UMTS: If <BAND>=2 9662 – 9938 If <BAND>=5 4357 – 4458 For LTE: If <BAND>=2 600 – 1199 If <BAND>=4 1950 – 2399 If <BAND>=5 2400 – 2649 If <BAND>=13 5180 – 5279 If <BAND>=17 5730 – 5849

HL7588	
	<POWER1> Received power at primary antenna in dBm <POWER2> Received power at secondary antenna in dBm
Reference Sierra Wireless Proprietary	<u>Examples</u> at+wmrxpower=? +WMRXPOWER: (0,1),(2,5),(9662-9938,4357-4458) +WMRXPOWER: (0-1),(2,4,5,13,17),(600-1199,1950-2399,2400-2649,5180-5279,5730-5849) OK at+wmrxpower=1,2,9662 // read Uarfcn 9662 +WMRXPOWER: -97.9,-103.8 // Rx power -97.9 dBm at primary antenna // Rx power -103.8 dBm at secondary antenna OK at+wmrxpower=1,2,600 // read Earfcn 600 +WMRXPOWER: -95.0,-108.8 // Rx power -95.0 dBm at primary antenna // Rx power -108.8 dBm at secondary antenna OK

14.3. +WMANTSEL Command: Select Main and/or Diversity Antenna for UMTS or LTE

Note: For command information when using a VoLTE-capable software, refer to section 17 Command Support for VoLTE-capable Software.

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WMANTSEL=?	<u>Response</u> +WMANTSEL: (list of supported <MODE>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+WMANTSEL?	<u>Response</u> +WMANTSEL: <MODE> OK
<i>Write Command</i>	
<u>Syntax</u> AT+WMANTSEL=<MODE>	<u>Response</u> OK <u>Parameter</u> <MODE> Mode of operation for main and diversity antennas. This parameter is coded as a single decimal number, <digit-L>, for LTE-only variants; and coded as a 2-digit BCD number, [<digit-U>]<digit-L>, for variants that use both LTE and UMTS.

HL7588	
	<digit-L> LTE options 0 Use primary antenna for Tx and Rx, and use diversity antenna for Rx 1 Only use primary antenna for Tx and Rx 2 Use primary antenna for Tx only, and diversity antenna for Rx only <digit-U> UMTS options 0 Use primary antenna for Tx and Rx, and use diversity antenna for Rx 1 Only use primary antenna for Tx and Rx 2 Use primary antenna for Tx only, and diversity antenna for Rx only
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This command works with or without a SIM card. • <MODE> will not be saved in non-volatile memory; after reset, it will again have its default value. • This command should be issued when network registration is disabled; it will be effective when network registration is re-enabled. • Choices on LTE antenna selection do not affect UMTS in any aspect and vice versa. • The diversity antenna is an Rx only antenna; no power will be transmitted from the diversity antenna.
<u>Examples</u>	<pre>// Example for LTE-only variants at+wmantSEL? +WMANTSEL: 0 OK at+cops=2 // disable network registration OK at+wmantSEL=1 // to select primary antenna only for Tx and Rx on LTE OK at+cops=0 // re-enable network registration OK // Example for variants that support both LTE and UMTS at+wmantSEL? +WMANTSEL: 00 OK at+cops=2 // disable network registration OK at+wmantSEL=1 // to select primary antenna only for Tx and Rx on LTE OK at+cops=0 // re-enable network registration OK at+cops=2 // disable network registration OK at+wmantSEL=21 // to select primary antenna for Tx only and diversity // antenna for Rx only on UMTS OK at+cops=0 // re-enable network registration OK</pre>



15. NV Related Commands

15.1. Auto Generation of NV Backup Files

There are 3 NV partitions in flash used by the firmware:

- Static Calibrated NV partition
- Static Fixed NV partition
- Dynamic NV partition

NV backup is per partition based, with one NV backup file per partition. These are labelled with <file id>=0, 1, 2 in the NV log and by firmware design.

The firmware automatically generates NV backup files from existing NV data at ~8 seconds after boot if one of the following conditions are met:

- NV backup of a partition does not exist, or it has been corrupted unexpectedly
- NV backup files exist, but the firmware version has changed while IMEI has not changed, in comparison to the records in the backup file
- NV backup files exist, but the firmware version has changed and a valid IMEI has been updated, in comparison to the records in the backup file

An automatic backup file generation is notified with +NVBU_IND with <status>=0 on all AT ports.

15.2. Auto Recovery from Backup NV Files

NV recovery is automatically done if an NV corruption is detected during NV initialization at boot.

The firmware automatically recovers NV data from available NV backups when one or more NV items are corrupted. This is notified with +NVBU_IND with <status>=3 on all AT ports.

Manual NV data restores all data from backup file to the original NV partition.

The firmware will try to recover corrupted or missing NV data items instead of all NV data items (partial restore) if possible; otherwise, the firmware restores all NV data items (full restore).

If the firmware crashes with 10 consecutive loops and a full restore has not been performed before, the firmware performs a full restore of all NV data items. Only consecutive crashes that happened within 8 seconds after the module boots is counted for this reset loop detection.

15.3. +NVBU Command: NV Backup Status and Control

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+NVBU=?	<u>Response</u> +NVBU: (0-2) OK
<i>Read command</i> <u>Syntax</u> AT+NVBU?	Returns list of NV backup with the format: +NVBU: <file id>,<backup date>,<backup firmware version> <u>Response</u> [+NVBU: 0,<backup date>,<backup firmware version>] [+NVBU: 1,<backup date>,<backup firmware version>] [+NVBU: 2,<backup date>,<backup firmware version>] OK <u>Parameters</u> <file id> Backup file ID corresponding to an NV partition in flash <backup date> NV backup generation date <backup firmware version> Firmware version used to generate the NV backup
<i>Write command</i> <u>Syntax</u> For <mode>=0 or 1 AT+NVBU= <mode> [,<parti_id>] For <mode>=2 AT+NVBU= <mode>[,<clear>]	<u>Response</u> For <mode>=0 or 1 OK For <mode>=2 and <clear>=0 <log data 0> [<log data 1>] ... [<log data n>] OK For <mode>=2 and <clear>=1 OK <u>Parameters</u> <mode> 0 Generate backup of all NV data to NV backup partition 1 Restore all NV data from the NVM backup partition 2 List logs of NV backup operations <log data> NV backup operations log data <parti_id> 0 Static Calibrated NV 1 Static Fixed NV partition 2 Dynamic NV partition 3 All NV partitions <clear log> 0 Read log 1 Clear log

HL7588	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • Status of operations for <mode>=0 and <mode>=1 is notified by +NVBU_IND unsolicited notifications with <status>=0 and <status>=1 respectively on the AT port that executed the write command. • Execution of the write command with <mode>=1 is followed by a modem reboot automatically; NVs are restored to their default values on booting. • The number of lines of <log data> ranges from 1 to 2142 lines. • No SIM card is required for this command. • <mode>=2 is for retrieving log for R&D analysis and not fully documented, generally: ○ USER=0 for operations triggered by the firmware ○ USER=1 for manual operations
<u>Example</u>	<pre># automatic backup files generation after FW upgrade, notified by +NVBU_IND +NVBU_IND: 0,0,"2015/07/22 04:23:33","RHL75xx.2.15.142600.201507220405.x7160_2" +NVBU_IND: 0,1,"2015/07/22 04:23:33","RHL75xx.2.15.142600.201507220405.x7160_2" +NVBU_IND: 0,2,"2015/07/22 04:23:33","RHL75xx.2.15.142600.201507220405.x7160_2" # manual generation of backup files from existing NV partitions AT+NVBU=0,3 OK +NVBU_IND: 0,0,"2015/07/22 04:23:39","RHL75xx.2.15.142600.201507220405.x7160_2" +NVBU_IND: 0,1,"2015/07/22 04:23:39","RHL75xx.2.15.142600.201507220405.x7160_2" +NVBU_IND: 0,2,"2015/07/22 04:23:39","RHL75xx.2.15.142600.201507220405.x7160_2" # manual restore of backup files to original NV partitions AT+NVBU=1,3 OK +NVBU_IND: 1,0,"2015/07/22 04:23:39","RHL75xx.2.15.142600.201507220405.x7160_2" +NVBU_IND: 1,1,"2015/07/22 04:23:39","RHL75xx.2.15.142600.201507220405.x7160_2" +NVBU_IND: 1,2,"2015/07/22 04:23:39","RHL75xx.2.15.142600.201507220405.x7160_2" <module reboots automatically> # to retrieve the list of NV related operations done by the Firmware at+nvbu=2 [2015/07/22 04:02:49] BULO: MDM-RHL75xx.2.15.142600.201507220405.x7160_2 [2015/07/22 04:02:49] BUFL: GENERATE USER=0 FILE=3 LAS=0,0,0 [2015/07/22 04:02:49] BUFL: ENCODE F=0 REF=0 CNT=15/15 41 [2015/07/22 04:02:49] BUFL: ENCODE F=1 REF=0 CNT=16/16 31 [2015/07/22 04:02:49] BUFL: ENCODE F=2 REF=42 CNT=41/41 57 [2015/07/22 04:23:39] BUFL: GENERATE USER=1 FILE=3 LAS=0,0,0 [2015/07/22 04:23:39] BUFL: ENCODE F=0 REF=0 CNT=15/15 41 [2015/07/22 04:23:39] BUFL: ENCODE F=1 REF=0 CNT=16/16 31 [2015/07/22 04:23:39] BUFL: ENCODE F=2 REF=42 CNT=41/41 57 [2015/07/22 04:23:43] BUFL: RESTORE USER=1 FILE=3 LAS=0,0,0 [2015/07/22 04:23:43] BUFL: DECODE-2 F=0 REF=1 CNT=15/15 15,41 [2015/07/22 04:23:43] BUFL: DECODE-2 F=1 REF=1 CNT=16/16 16,31 [2015/07/22 04:23:43] BUFL: DECODE-2 F=2 REF=43 CNT=41/41 41,57 OK</pre>

15.4. +NVBU_IND Notification: NV Backup Status Notification

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +NVBU_IND: <status>,<file id>,... For <status>=0 +NVBU_IND: <status>,<file id>,<backup date>,<backup firmware version> For <status>=1 +NVBU_IND: <status>,<file id>,<backup date used for restore>,<backup firmware version used for restore> For <status>=2 +NVBU_IND: <status>,<file id>,<backup date used for restore>,<backup firmware version used for restore>,<num NV> <NV ID 1>[<NV ID 2>...[<NV ID 16><CR><LF>]] ... <u>Parameters</u> <status> NV backup status 0 Indicates completion of NV backup generation 1 Indicates completion of NV backup restore 2 Indicates that backup data were restored when the NV corruption was detected during NV initialization <backup date> NV backup generation date <backup firmware version> Firmware version used to generate the NV backup <backup date used for restore> Generation date of the NV backup that was used for the NV restore <backup firmware version used for restore> Firmware version used to generate the NV backup that was used for the NV restore <num NV> Total number of NV items restored <NV ID> List of NV item IDs with data restored, expressed in hexadecimal number delimited by spaces, and delimited by <CR><LF> every 16 numbers.
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> The list of <NV ID> is expressed in 16 hexadecimal numbers per line.
<u>Examples</u>	# recovery in calibrated NV partition after Firmware boot # note that the data is also logged by NV log (i.e. AT+NVBU=2) +NVBU_IND: 2,0,"2015/07/22 04:23:39","RHL75xx.2.15.142600.201507220405.x7160_2",15 10034900 10034901 10034401 10034402 10034902 10035400 10035401 10035402 10035403 10035500 10035501 10035502 10050000 10310000 10370000

>> 16. Board Support Commands

16.1. +WCARRIER Command: Show Carrier Name

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WCARRIER=?	<u>Response</u> OK
<i>Action command</i>	
<u>Syntax</u> AT+WCARRIER	<u>Response</u> +WCARRIER: <Carrier Name> OK <u>Parameters</u> <Carrier Name> Carrier string (maximum of 8 characters, without quotes)
<u>Notes</u>	The carrier name is written in non-volatile memory during the factory customization process.
<u>Example</u>	at+wcarrier +WCARRIER: AT&T OK

>> 17. Command Support for VoLTE-capable Software

This section lists command information when using a VoLTE-capable software.

17.1. V25ter AT Commands

17.1.1. IPR Command: Set Fixed Local/DTE Rate

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+IPR=?	<u>Response</u> With Autobaud: +IPR: (list of supported auto detectable <rate> values)[,(list of fixed only <rate> values)] OK Without Autobaud: +IPR: ()[(list of fixed only <baud_rate> values)] OK
<i>Read command</i>	
<u>Syntax</u> AT+IPR?	<u>Response</u> +IPR: <baud_rate> OK
<i>Write command</i>	
<u>Syntax</u> AT+IPR= <baud_rate>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <baud_rate> <u>115200</u> (default value) 0 Autobaud 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 230400, 460800, 500000, 750000, 921600, 1843200, 3000000, 3250000, 6000000
<u>Notes</u>	• Not all listed rates may be available as they depend on the target. • The full range of data rate values may be reduced depending on hardware or other criteria. • <baud_rate> is saved in non-volatile memory per AT port over module reboot. • After autobaud is activated on a UART port, the next AT command can be entered at a different speed. +IPR is then set to the speed of this command. Autobaud is then automatically deactivated. • When autobaud is activated on a USB COM port, any speed provided by the USB driver is accepted. AT+IPR? responds with +IPR: 0 regardless of USB speed used.

17.1.2. &K Command: Flow Control Option

HL7588	
Execute command	
Syntax AT&K[<mode>]	Response OK Parameter <mode> <u>0</u> or Omitted Disable all flow control <u>3</u> Enable bi-directional hardware flow control
Reference V.25ter	Notes • Use AT&V0 to display the current flow control setting. • Sierra Wireless recommends the use of hardware flow control. • AT&K3 hardware flow control is only effective for UART1 and +KSLEEP=2 (UART always ON); it has no effect on the USB AT port.

17.1.3. &C Command: Set Data Carrier Detect (DCD) Function Mode

HL7588	
Execute command	
Syntax AT&C<value>	Response OK Parameter <value> <u>0</u> DCD line is always active <u>1</u> DCD line is active in the presence of data carrier only
Reference V.25Ter	Notes DCD/AT&C is only applicable to the USB AT port; it has no effect on UART1.

17.1.4. &D Command: Set Data Terminal Ready (DTR) Function Mode

HL7588	
Execute command	
Syntax AT&D<value>	Response OK Parameter <value> <u>0</u> TA ignores status on DTR <u>1</u> DTR drops from active to inactive. Change to command mode while retaining the connected data call <u>2</u> DTR drops from active to inactive. Disconnect data call, change to command mode. Auto-answer is off during DTR inactive state

HL7588

HL7588

Write command

HI 7588

Read command

17.1.7. S10 Command: Automatic Disconnect Delay

HL7588	
<i>Read command</i>	
<u>Syntax</u> ATS10?	<u>Response</u> <time> OK
<i>Write command</i> <u>Syntax</u> ATS10=<time>	<u>Response</u> OK <u>Parameter</u> <time> 1 – 254 Number of tenths of a second of delay
<u>Reference</u> V.25Ter	<u>Notes</u> • This command has no effect and was only implemented to comply with V.25ter. • Parameters are ignored and are not saved in non-volatile memory.

17.1.8. S11 Command: DTMF Dialing Speed

HL7588	
<i>Write command</i>	
<u>Syntax</u> ATS11=<time>	<u>Response</u> OK <u>Parameter</u> <time> 0 – 999
<u>Reference</u> V.25Ter	<u>Notes</u> • This command has no effect and was only implemented to comply with V.25ter. • Parameters are ignored and are not saved in non-volatile memory.

17.2. General AT Commands

17.2.1. I Command: Request Identification Information

HL7588	
<i>Execute command</i>	
<u>Syntax</u> ATI[<value>]	<u>Response</u> If <value> = 0 or omitted: <model> OK

HL7588

```

If <value> = 1:
<short version name>
OK

If <value> = 3:
<version name>
OK

If <value> = 4:
<fuse state>
OK

If <value> = 9:
<version name>
<model>
<short version name>
<chipset>
<fuse state>
<build date & time>
<source rev>
OK

If <value> = 10:
Modem-Firmware:
<version name>
<model>
<short version name>
<chipset>
<fuse state>
<build date & time>
<source rev>

Primary-Boot:
<version name>
<build date & time>
<source rev>

Secondary-Boot:
<version name>
<build date & time>
<source rev>

Update-Agent:
<version name>
<build date & time>
<source rev>

4G-Firmware:
<4G FW version name>

3G-Firmware:
<4G FW version name>
OK

```

HL7588	
	<u>Parameters</u> <model> Model identifier <version name> Firmware version string; follows the format: <prefix>.<major no.>.<minor no.>.<baseline no.>.<date-time>.<integration> of size: <variable, up to 32 characters>.<2digits>.<2digits>.<6digits>.<12digits>.<2digits> Note that test firmware will have <major no.>.<minor no.> = 00.00. For example: SWIMCB71XX-G.00.00.163500.201609231719.01 (test firmware) SWIMCB71XX-G.01.00.163500.201609231719.01 (official firmware) <short version name> Firmware version string in short format (no date and time) For example: HL75xx_TEST.0.0 (test firmware) HL75xx.1.0 (official firmware) <4G FW version name> 4G Firmware version string <3G FW version name> 3G Firmware version string <chipset> Chipset name <build date & time> Souce code build time in format YYYY-MM-DD HH:MM:SS <source rev> Source code revision in version control <fuse state> Fuse state information FUSED Fused module NON-FUSED Non-fused module
<u>Reference</u> V.25ter	<u>Notes</u> • AT13 is identical to AT+GMR and AT+CGMR. • AT10 and AT1 are identical to AT+GMM and AT+CGMM.
<u>Examples</u>	ATI HL7588 OK ATI0 HL7588 OK # For fused module ATI4 FUSED OK # For non-fused module ATI4 NON-FUSED OK

HL7588	
	# Example using a test firmware ATI1 SWIMCB71XX-G.00.00.163500 OK ATI3 SWIMCB71XX-G.00.00.163500.201609261356.01 OK

17.3. Call Control Commands

17.3.1. D Command: Dial Number

HL7588	
<i>Test command</i>	
<u>Syntax</u> ATD=?	<u>Response</u> 1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ ! OK
<i>Read command</i>	
<u>Syntax</u> ATD?	<u>Response</u> 1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ ! OK
<i>Execute command</i>	
<u>Syntax</u> ATD[<n>]	<u>Response</u> OK If successfully connected CONNECT Connection has been established RING The DCE has detected an incoming call signal from the network NO CARRIER The connection cannot be established BUSY Engaged (busy) signal detected NO ANSWER If no hang up is detected after a fixed network timeout CONNECT <data rate> Same as CONNECT but includes the data rate RING CTM The MS has detected an incoming CTM call signal from the network; this code is proprietary CONNECT FAX Same as CONNECT but includes the indication related to a fax call <u>Parameter</u> <n> String of dialing digits and optionally V.25ter modifiers (dialing digits): 0-9, *, #, +, A, B, C, D, P, T, W, ,, @, ! (maximum length: 20 digits)

17.4. Mobile Equipment Control and Status Commands

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CIND=?	<u>Response</u> +CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0-1)),("message",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-1)) OK
<i>Read command</i>	
<u>Syntax</u> AT+CIND?	<u>Response</u> +CIND: <battchg>,<signal>,<service>,<call>,<smsfull> OK
	<u>Parameters</u> <battchg> 0 – 5 Battery level 0 Lowest level 4 Highest level 5 Battery is charging (not supported)

HL7588	
	<signal> 0 – 5 Signal quality level 0 Lowest signal level 5 Highest signal level <service> Network service availability 0 Network service is not available 1 Network service is available <message> Message reception 0 No message is received 1 Message is received <call> Calling in progress 0 Service is not available 1 Service is available <roam> Roaming indicator 0 Home network 1 Roaming <smsfull> SMS memory storage 0 Memory available 1 Memory full
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes:</u> • This command can be used without a SIM. • <message> and <smsfull> are only supported for memory 3 with “SM” and “ME” storage type. If a different storage type is used with memory 3, <message> and <smsfull> parameters are always 0.
<u>Example</u>	<pre>// Test command AT+CIND=? +CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0-1)),("message",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-1)) OK // Read command AT+CIND? +CIND: 0,1,1,0,0,0,0 // Indicate signal level = 1 and service is available. OK</pre>

17.4.2. +CMER Command: Mobile Equipment Event Reporting

HL7588	
<u>Test command</u> <u>Syntax</u> AT+CMER=?	<u>Response</u> +CMER: (list of supported <mode>s),(list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s),(list of supported <bfr>s) OK

HL7588	
Read command	
<u>Syntax</u> AT+CMER?	<u>Response</u> +CMER: <mode>,<keyp>,<disp>,<ind>,<bfr> OK
Write command	
<u>Syntax</u> AT+CMER= [<mode>,<keyp> [,<disp>,<ind> [,<bfr>]]]]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <mode> <u>0</u> Buffer unsolicited result codes in the TA; if TA result code buffer is full, codes can be buffered in some other place or the oldest ones can be discarded. 1 Discard unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE. 2 Buffer unsolicited result codes in the TA when TA TE link is reserved (e.g. in on line data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE. <keyp> <u>0</u> No keypad event reporting <disp> <u>0</u> No display event reporting <ind> <u>0</u> No indicator event reporting 1 Indicator event reporting using result code +CIEV: <ind>,<value>. Where <ind> indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +CIND shall be indicated by the TA to the TE. <bfr> <u>0</u> TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1 or 2 is entered. 1 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1 or 2 is entered (OK response shall be given before flushing the codes)
Unsolicited Notification	<u>Response</u> • +CIEV: 1,(0-5) indicates the battery charging level • +CIEV: 2,(0-5) indicates the received signal level • +CIEV: 3,(0-1) indicates the network service status • +CIEV: 4,(0-1) indicates the message status • +CIEV: 5,(0-1) indicates the active call status • +CIEV: 6,(0-1) indicates the roaming status • +CIEV: 7,(0-1) indicates the sms full status
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> This command can be used without a SIM.

HL7588Example

```

at+cmer=?
+CMER: (1-2),0,0,(0-1),(0-1)
OK

at+cmer=2,,,1
OK

# mode =2: enable indication if AT link is available
# ind = 1: enable indicator event report (+CIND)
at+cmer?
+CMER: 2,0,0,1,0
OK

# +CMER setting can be preserved after boot
at+cfun=1,1
OK

at+cmer?
+CMER: 2,0,0,1,0
OK

# roaming status = 0 update on registration status change
+CIEV: 6,0
+PBREADY

# enable +CMER <mode> = 0 buffering
at+cmer=0
OK

at+cfun=4
OK

at+cfun=1
OK

# wait for registration, one +CIEV: 6 should be buffered, some +CGEV buffered
at+creg?
+CREG: 0,1
OK

# buffered +CIEV is flushed with <bfr>=1 and <mode>=2
at+cmer=2,,,1
OK
+CIEV: 6,0

at+cmer=0
OK

at+cfun=4
OK

at+cfun=1
OK

```

HL7588

```
# wait for registration, one +CIEV: 6 should be buffered, some +CGEV buffered
at+creg?
+CREG: 0,1
OK

# buffered +CIEV is cleared with <bfr>=1 and <mode>=2
at+cmer=2,,,0
OK
```

17.4.3. +CALA Command: Set Alarm**HL7588***Test command*Syntax**AT+CALA=?**Response

```
+CALA: ("yy/MM/dd,hh:mm:ss"),(list of supported <n>s)
OK
```

*Read command*Syntax**AT+CALA?**Response

```
[+CALA: <time>,<n>]
OK
```

*Write command*Syntax

```
AT+CALA=
<time>[,<n>]
```

Response

OK

or

+CME ERROR: <err>

Parameters

<time> String type value with format "yy/MM/dd,hh:mm:ss", where characters indicate year (last two digits), month, day, hour, minutes and seconds

<n> Alarm index

*Unsolicited Notification*Response

+CALV: <value>

Parameter

<value> Alarm state

1 Alarm is enabled

HL7588	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - When an alarm is timed out, the unsolicited result code is returned. - Only one alarm can be set at a time; <n> must always be 1. - The alarm will wake the module up even if it is already in the off state (e.g., turned off by AT+CPOF or AT+CFUN=0). The module will then boot up normally, and no unsolicited result code +CALV: 1 is returned. - This command can be used without a SIM. - The year “yy” of <time> must be set to 2004 or later. <time> can only be set to later than the current time on the internal clock.
<u>Examples</u>	<pre> AT+CCLK="16/08/26,15:00:00+0" // Set the date and time OK AT+CALA=? // Test command +CALA: ("yy/mm/dd, hh:mm:ss"),(1) OK AT+CALA? // Read command OK AT+CALA="16/08/26,15:00:35" // Set an alarm for the date and time OK +CALV: 1 // An URC is indicated when the alarm is expired. </pre>

17.4.4. +CALD Command: Delete Alarm

HL7588	
<u>Test command</u>	
<u>Syntax</u> AT+CALD=?	<u>Response</u> OK
<u>Write command</u>	
<u>Syntax</u> AT+CALD=<n>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <n> Alarm index
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This command can be used without SIM. - This write command takes effect only when the alarm is already set by AT+CALA.
<u>Examples</u>	<pre> AT+CALD=? // Test command OK AT+CALD=1 // Delete the alarm OK </pre>

17.4.5. +CMEC Command: Mobile Equipment Control Mode

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CMEC=?	<u>Response</u> +CMEC: (list of supported <key>s),(list of supported <disp>s),(list of supported <ind>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CMEC?	<u>Response</u> +CMEC: <key>,<disp>,<ind> OK
<i>Write command</i>	
<u>Syntax</u> AT+CMEC= [<key>[,<disp> [,<ind>]]]	<u>Response</u> OK <u>Parameters</u> <key> 0 Keypad management, not significant (no keypad) <disp> 0 Display management, not significant (no display) <ind> 0 Only ME can set the status of its indicators (command +CIND can only be used to read the indicators)
<u>Notes</u>	• This command has no effect and was only implemented for compatibility. • Parameters are ignored and are not saved in non-volatile memory.

17.4.6. +CPOF Command: Power Off

HL7588	
<i>Execute command</i>	
<u>Syntax</u> AT+CPOF	<u>Response</u> OK
<u>Notes</u>	• This command powers off the mobile. It is equivalent to AT+CFUN=0. • "OK" is immediately returned after the power off sequence is started.

17.4.7. +KCCINFO Command: Camped Cell Information

HL7588																							
Test command																							
<u>Syntax</u> AT+KCCINFO=?	<u>Response</u> +KCCINFO: (list of supported <mode>s) OK																						
Read command																							
<u>Syntax</u> AT+KCCINFO?	<u>Response</u> +KCCINFO: <mode>,<CI>,<RAC>,<TAC> OK																						
Write command	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <table><tr><td><mode></td><td>0</td><td>Camped cell parameters change event notification is disabled</td></tr><tr><td></td><td>1</td><td>Camped cell parameters change event notification is enabled</td></tr></table> <CI> Four-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) <RAC> One-byte routing area code in hexadecimal format. FF will be displayed if routing area identity information is invalid. <TAC> Two-byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal). FFFF will be displayed if tracking area identity information is invalid.	<mode>	0	Camped cell parameters change event notification is disabled		1	Camped cell parameters change event notification is enabled																
<mode>	0	Camped cell parameters change event notification is disabled																					
	1	Camped cell parameters change event notification is enabled																					
Unsolicited Notification	<u>Response</u> +KCCINFOI: <CI>,<RAC>,<TAC>																						
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This command used to enable/disable unsolicited response reagarding changes in camped cell parameters. - This command works with a SIM card. <mode> is automatically stored in non-volatile memory. - Settings take effect immediately.																						
<u>Examples</u>	<table><tr><td>AT+KCCINFO=1</td><td>// Set mode to 1</td></tr><tr><td>OK</td><td></td></tr><tr><td>AT+KCCINFO=?</td><td>// Test command</td></tr><tr><td>+KCCINFO: (0-1)</td><td></td></tr><tr><td>OK</td><td></td></tr><tr><td>AT+COPS=0</td><td>// Attach to network</td></tr><tr><td>OK</td><td></td></tr><tr><td>+KCCINFOI: "00006773","01","FFFF"</td><td>// URC displayed after attachment</td></tr><tr><td>AT+KCCINFO?</td><td>// Read command</td></tr><tr><td>+KCCINFO: 1,"00006773","01","FFFF"</td><td></td></tr><tr><td>OK</td><td></td></tr></table>	AT+KCCINFO=1	// Set mode to 1	OK		AT+KCCINFO=?	// Test command	+KCCINFO: (0-1)		OK		AT+COPS=0	// Attach to network	OK		+KCCINFOI: "00006773","01","FFFF"	// URC displayed after attachment	AT+KCCINFO?	// Read command	+KCCINFO: 1,"00006773","01","FFFF"		OK	
AT+KCCINFO=1	// Set mode to 1																						
OK																							
AT+KCCINFO=?	// Test command																						
+KCCINFO: (0-1)																							
OK																							
AT+COPS=0	// Attach to network																						
OK																							
+KCCINFOI: "00006773","01","FFFF"	// URC displayed after attachment																						
AT+KCCINFO?	// Read command																						
+KCCINFO: 1,"00006773","01","FFFF"																							
OK																							

17.5. Network Service Commands

17.5.1. +KAAT Command: GPRS Automatic Attach

HL7588							
<i>Test command</i>							
<u>Syntax</u> AT+KAAT=?	<u>Response</u> +KAAT: (list of supported <attach mode>s) OK						
<i>Read command</i>	Get current mode						
<u>Syntax</u> AT+KAAT?	<u>Response</u> +KAAT: <attach mode> OK						
<i>Write command</i>	Set attach mode						
<u>Syntax</u> AT+KAAT= <attach mode>	<u>Response</u> OK <u>Parameter</u> <table><tr><td><attach mode></td><td>0</td><td>No GPRS automatic attach at switch on</td></tr><tr><td></td><td>1</td><td>GPRS automatic attach at switch on</td></tr></table>	<attach mode>	0	No GPRS automatic attach at switch on		1	GPRS automatic attach at switch on
<attach mode>	0	No GPRS automatic attach at switch on					
	1	GPRS automatic attach at switch on					
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - The write command is used to select the GPRS attach mode at ME switch on. - This AT command works with a SIM card. <attach mode> is automatically stored in non-volatile memory.						
<u>Example</u>	<start up with no SIM card> AT+KAAT? +CME ERROR: 10 <Insert SIM card and reset> <default mode is GPRS automatic attach at switch on> AT+KAAT? +KAAT: 1 OK AT+CGATT? +CGATT: 1 OK <set no GPRS automatic attach at switch on> AT+KAAT=0 OK AT+CGATT? +CGATT: 1 OK						

HL7588	
	<pre> <reset> AT+CGATT? +CGATT: 0 OK AT+KAAT? AT+KAAT: 0 OK AT+CGATT=1 OK AT+CGATT? +CGATT: 1 OK <reset> AT+KAAT? +KAAT: 0 OK AT+CGATT? +CGATT: 0 OK </pre>

17.6. SMS Commands

17.6.1. +CNMI Command: New Message Indication

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CNMI=?	<u>Response</u> +CNMI: (list of supported <mode>s), (list of supported <mt>s), (list of supported <bm>s), (list of supported <ds>es), (list of supported <bfr>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CNMI?	<u>Response</u> +CNMI: <mode> , <mt> , <bm> , <ds> , <bfr> OK
<i>Write command</i>	
<u>Syntax</u> +CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	<u>Response</u> OK or +CMS ERROR: <err>

HL7588	
	<u>Parameters</u> <mode> 0 Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE. 2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. <mt> 0 No indications are routed to the TE 1 Result code is sent when ME does not have any other display device other than the AT interface 2 Acknowledgement command must be sent when +CSMS <service> = 1 and ME does not have any other display device other than the AT interface 3 Acknowledgement command must be sent when +CSMS <service> = 1 <bm> 0 No CBM indications are routed to the TE 1 If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI: <mem>,<index> 2 New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled); or +CBM: <sn>,<mid>,<dc>,<page>,<pages><CR><LF><data> (text mode enabled) 3 Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1 <ds> 0 No SMS-STATUS-REPORTs are routed to the TE 1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: +CDS: <length><CR><LF><pdu> (PDU mode enabled) or +CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st> (text mode enabled) 2 If SMS-STATUS-REPORT is stored in ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CDSI: <mem>,<index> <bfr> 0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> = 1 – 3 is entered 1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> = 1 – 3 is entered
<u>Notes</u>	<mode>, <mt>, <bm> and <ds> are saved in non-volatile memory over module reboot; URC is available on the port that executes the command.
<u>Examples</u>	AT+CNMI=1 // Write command OK AT+CNMI=? // Test command +CNMI: (0-2),(0-3),(0-3),(0-2),(0-1) OK AT+CNMI? // Read command +CNMI: 1,0,0,0,0 OK

17.7. Audio Commands

17.7.1. +KPCMCFG Command: Configure PCM Digital Audio

HL7588	
Test command	
<u>Syntax</u> AT+KPCMCFG=?	<u>Response</u> +KPCMCFG: (list of <Mode>s),(list of <SamplingCtrl>s),(list of <BitClk>s), (list of <SampleRate>s) OK
Read command	
<u>Syntax</u> AT+KPCMCFG?	<u>Response</u> +KPCMCFG: <Mode>,<SamplingCtrl>,<BitClk>,<SampleRate> OK
Write command	
<u>Syntax</u> AT+KPCMCFG= <Mode> [,<SamplingCtrl> [,<BitClk> [,<SampleRate>]]]	<u>Response</u> OK <u>Parameters</u> <Mode> PCM mode 0 Master 1 Slave <SamplingCtrl> Sampling clock edge control 0 Falling edge 1 Rising edge <BitClk> PCM bit clock 0 256 kHz 1 384 kHz 2 512 kHz <SampleRate> PCM sample rate 0 8kS/s 1 16kS/s
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • Settings will take effect immediately; no reset is required. • Parameters are saved and kept after reset. • This command can be used without a SIM. • Only 16-bit linear PCM mode is supported. A-law and μ-law compression modes are not supported. • Only long frame sync is supported. • In slave mode, the acceptable PCM clock is also determined by <BitClk>.
<u>Examples</u>	AT+KPCMCFG? //Shows the current configuration +KPCMCFG: 0,1,2,0 //Master mode, rising edge, PCM clock is 512 kHz and PCM //sample rate is 8kS/s OK

HL7588	
	AT+KPCMCFG=1,0 //Turn to slave mode and falling edge latched. As //parameter <BitClk> and <SampleRate> are omitted, old //<BitClk> and <SampleRate> values will be used in the new //configuration. OK AT+KPCMCFG? +KPCMCFG: 1,0,2,0 //Slave mode, falling edge, PCM clock is 512 kHz and PCM //sample rate is 8kS/s OK AT+KPCMCFG=0,1 //Turn back to master mode and rising edge latched. OK AT+KPCMCFG? +KPCMCFG: 0,1,2,0 OK

17.7.2. +VTS Command: DTMF and Tone Generation

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+VTS=?	<u>Response</u> +VTS: (list of supported <DTMF>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+VTS= "<DTMF>₁, <DTMF>₂, ..., <DTMF>_n" or AT+VTS= "{<DTMF>₁, <DURATION>₁}, {<DTMF>₂, <DURATION>₂}, ... {<DTMF>_n, <DURATION>_n}"	<u>Response</u> OK <u>Parameters</u> <DTMF> A single ASCII character in the set 0 – 9, #, *, A – D. This is interpreted as a single ASCII character whose duration is set by the +VTD command. DTMF tones can only be issued during a voice call. <DURATION> This is interpreted as a DTMF tone of different duration from that mandated by the +VTD command. In GSM, this only operates in voice mode. Values are in 1/10 second multiples.

HL7588	
<u>Reference</u> [27.007] § C.2.11	<u>Notes</u> - The network shall ensure that the minimum length of tone and the minimum gap between two subsequent tones (according to ETR 206) is achieved. (In ETR 206 the minimum duration of a DTMF tone is 70ms ± 5ms, the minimum gap between DTMF tones is 65ms). There is no defined maximum length to the tone, however, the operator may choose to put a pre-defined time limit on the duration of tones sent to line (refer to [23.014]). That means if the tone duration is set to less than 60 ms, DTMF will be generated with a duration given by the network. - Entering a character string without quotes in the write command is supported for compatibility reasons.

17.8. Packet Domain Commands

17.8.1. +CGACT Command: Activate or Deactivate PDP Context

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGACT=?	<u>Response</u> +CGACT: (list of supported <state>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CGACT?	<u>Response</u> +CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>,<state> [...]] OK
<i>Write command</i>	
<u>Syntax</u> AT+CGACT= [<state> [,<cid> [,<cid> [...]]]	<u>Response</u> OK or ERROR <u>Parameters</u> <state> State of PDP context activation 0 Deactivated 1 Activated <cid> Numeric parameter which specifies a particular PDP context definition.
<u>Notes</u>	Up to three (3) PDP contexts can be active at once.

17.8.2. +CGEQNEG Command: 3G Negotiated Quality of Service Profile

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGEQNEG=?	<u>Response</u> +CGEQNEG: (list of <cid>s associated with active contexts)
<i>Write command</i>	
<u>Syntax</u> AT+CGEQNEG= [<cid>[,<cid> [,...]]]	<u>Response</u> +CGEQNEG: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority> [<CR><LF>+CGEQNEG: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication> [...]]
	<u>Parameters</u> <cid> numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands) <Traffic_class> UMTS bearer service application type 0 Conversational 1 Streaming 2 Interactive 3 Background <Maximum_bitrate_UL> Numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. <Maximum_bitrate_DL> Numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. <Guaranteed_bitrate_UL> Numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). <Guaranteed_bitrate_DL> Numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). <Delivery_order> Numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not 0 No 1 Yes <Maximum_SDU_size> Numeric parameter that indicates the maximum allowed SDU size in octets <SDU_error_ratio> String parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'.

HL7588	
	<Residual_bit_error_ratio> String parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. <Delivery_of_erroneous_SDUs> Numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not 0 No 1 Yes 2 No detect <Transfer_delay> Numeric parameter that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds <Traffic_handling_priority> Numeric parameter that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers <Source_statistics_descriptor> Numeric parameter that specifies the characteristics of the source of submitted SDUs <Signal indication> Numeric parameter that indicates the signalling nature of the submitted SDUs. This parameter is in addition to the other QoS attributes and does not override them; it is only defined for the interactive traffic class. If signalling indication is set to 'Yes', the UE should set the traffic handling priority to '1'.
<u>Notes</u>	If a value is omitted for a particular class then the value is considered to be unspecified.
<u>Examples</u>	AT+CGDCONT? +CGDCONT: 1,"IP","smartone","10.149.7.167",0,0,0,0,0 +CGDCONT: 3,"IP","internet","121.203.230.208",0,0,0,0,0 OK AT+CGEQNEG=? // Test command +CGEQNEG: (1,3) OK AT+CGEQNEG=3 // Write command for cid = 3 +CGEQNEG: 3,4,0,0,0,0,0,0,"0E0","0E0",3,0,0,0,0 OK

17.8.3. +CGREG Command: GPRS Network Registration Status

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+CGREG=?	<u>Response</u> +CGREG: (list of supported <n>s) OK

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HL7588	
	<pre>AT+CGREG=2 // Set mode to 2 OK AT+COPS=0 OK +CGREG: 1,"008C","6771",0,"01" // URC displayed after attaching to network</pre>

17.9. Protocol Specific Commands

Additionally, for VoLTE-capable firmware, the HL7588 also supports the following protocols:

- HTTP
- HTTPS

17.9.1. SSL Configuration

17.9.1.1. +KSSLCRYPTO Command: Cipher Suite Configuration

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+ KSSLCRYPTO=?	<u>Response</u> +KSSLCRYPTO: <profile_id>,<mkey_Algo>,<auth_algo>,<enc_algo>,<mac_algo>,<tls_ver>,<auth>,<tls_ver>,<auth> OK
<i>Read command</i>	
<u>Syntax</u> AT+ KSSLCRYPTO?	<u>Response</u> + KSSLCRYPTO: <profile_id>,<mkey_algo>,<auth_algo>,<enc_algo>,<mac_algo>,<tls_ver>,<auth> [...]
<i>Write command</i>	
<u>Syntax</u> AT+ KSSLCRYPTO= <profile_id>,<mkey_Algo>,<auth_algo>,<enc_algo>,<mac_algo>,<tls_ver>,<auth>	<u>Response</u> OK <u>Parameters</u> <profile_id> Index of a set of parameters for configuring one SSL profile <mkey_algo> Key exchange algorithm selection 1 RSA key exchange <auth_algo> Authentication algorithm selection 1 RSA authentication

HL7588	
	<enc_algo> Encryption algorithm selection 4 RC4 64 AES 128 128 AES 256 8192 AES128GCM <mac_algo> Message authentication code algorithm selection 1 MD5 2 SHA1 64 AEAD <tls_ver> Cipher suite version selection. 1 TLS 1.0 4 TLS 1.2 <auth> Authentication 0 No authentication 1 Authenticate server 2 Provide client certificate to server 3 Authenticate server and provide client certificate to server
Reference	
Sierra Wireless Proprietary	

17.9.1.2. +KSSLCFG Command: SSL Configuration

HL7588	
Test command	
<u>Syntax</u> AT+KSSLCFG=?	<u>Response</u> +KSSLCFG:<option id>,<option> OK
Read command	
<u>Syntax</u> AT+KSSLCFG?	<u>Response</u> +KSSLCFG:0,<TLS Version> +KSSLCFG:2,<Session Mode> OK
Write command	
<u>Syntax</u> AT+KSSLCFG =<option id>,<option>	<u>Response</u> If <option_id> = 0: AT+KSSLCFG=<option_id>,<TLS Version> OK If <option_id> = 1: AT+KSSLCFG=<option_id>,<Random Seed> OK

HL7588

If <option_id> = 2:

AT+KSSLCFG=<option_id>,<Session Mode>**OK**Parameters

<option id> 0 Specify a TLS version to be used for hand shake
 1 Setup random seed
 2 Specify session mode

<TLS Version> 0 Highest possible
 1 TLS 1.0
 3 TLS 1.2

<Random Seed> String to be added into the entropy of the random number generator

<Session Mode> 0 Automatic
 1 Always start a new session (not supported)

17.9.2. TCP Specific Commands

17.9.2.1. +KTCPCFG Command: TCP Connection Configuration

HL7588*Test command*Syntax**AT+KTCPCFG=?**Response

+KTCPCFG: (list of possible <cnx_cnf>s),(list of possible <mode>s),
 <remote-name/ip>,(list of possible <tcp_port >s),(list of possible <source_port>s),(list of
 possible <data_mode>s),(list of possible <URC-ENDTCP-enable>s),(list of possible
 <af>s),(list of possible <cipher_index>es)
OK

*Read command*Syntax**AT+KTCPCFG?**Response

+KTCPCFG: <session_id>,<status>,<cnx cnf>,<mode>[,<serverID>],
 <tcp remote address>,<tcp_port>[,<source_port>],<data_mode>,
 <URC-ENDTCP-enable>,<af>,<cipher_index>
 [...]]

HL7588*Write command*Syntax

AT+KTCPCFG=
[<cnx cnf>],
<mode>,
[<tcp remote
address>],
<tcp_port>[[,
[<source_port>
],[<data_mode>],
[<URC-ENDTCP-
enable>]]],<af>
[,<cipher_index>]

Response

+KTCPCFG: <session_id>
OK

Parameters

<cnx cnf> Index of a set of parameters for configuring one TCP session (see +KCNXCFG)

<session_id> TCP session index

<mode>

0	Client
1	Server
2	Child (generated by server sockets)
3	Secure client

<tcp remote address> IP address string or explicit name of the remote server. For server configuration, this parameter is left blank

<tcp_port> TCP port number; numeric parameter with range 1 – 65535. This parameter is the listening port for a server configuration.

<status> Connection state of the selected socket

0	Disconnected
1	Connected

<serverID> Server session ID index. Only for sockets in CHILD mode

<source_port> Numeric parameter (0 – 65535). Specifies the local TCP port number. This parameter is left blank for a server configuration.

<data_mode>

0	Do not display <data> in URC (default setting)
1	Display <data> in URC

<URC-ENDTCP-enable>

0	Do not display URC "+KTCP_ACK" (default setting)
1	Display URC "+KTCP_ACK"

<af> Address family used for the connection.

0	IPV4
1	IPV6

<cipher_index> Cipher suite profile index to use for a secured socket; defined by +KSSLCRYPTO

HL7588	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • If the socket is defined as a <CLIENT> socket, <tcp_port> and <tcp remote address> define the port and the IP address of the remote server to connect to. • Maximum <session_id> is 32. • For child session, the property <data_mode> will be kept the same as the server socket's setting. • See section 18.5.6 Use Cases for AT+KTCPPACKINFO and <URC-ENDTCP-enable> Option. • This command can be used before setting up +KCNXCFG configuration. Note however that the latter is required to start the connection properly. • The connection timeout for TCP socket is about 9 seconds with 3 retransmissions with 3 seconds delay.

17.9.3. HTTP Client Specific Commands

17.9.3.1. +KHTTPCFG Command: HTTP Connection Configuration

HL7588	
<u>Test command</u>	
<u>Syntax</u> AT+KHTTPCFG=?	<u>Response</u> +KHTTPCFG: (list of possible <cnx_cnf>s),<server-name/ip>,(list of possible <http_port>s),(list of possible <http_version>s),(range of possible length of <login>),(range of possible length of <password>),(list of possible <started>s),(list of possible <af>s),(list of possible <cipher_index>es) OK
<u>Read command</u>	
<u>Syntax</u> AT+KHTTPCFG?	<u>Response</u> +KHTTPCFG: <session_id>,<cnx_cnf>,<http_server>,<http_port>,<http_version>,<login>,<password>,<started>,<af>,<cipher_index>
<u>Write command</u>	
<u>Syntax</u> AT+KHTTPCFG= [<cnx_cnf>], <http_server> [,<http_port> [,<http_version> [,<login> [,<password> [,<af>]]] [,<cipher_index>]]	<u>Response</u> +KHTTPCFG: <session_id> OK <u>Error case</u> +CME ERROR: <err> <u>Parameters</u> <cnx_cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see KCNXCFCG) <session_id> HTTP session index <http_server> IP address string or explicit name of the remote server <http_port> 1 – 65535 Default value = <u>80</u>

HL7588																					
	<http_version> <table> <tr><td>0</td><td>HTTP 1.1 (by default)</td></tr> <tr><td>1</td><td>HTTP 1.0</td></tr> <tr><td>2</td><td>HTTP 1.1 over TLS (HTTPS)</td></tr> <tr><td>3</td><td>HTTP 1.0 over TLS (HTTPS)</td></tr> </table> <login> String type, indicates the user name to be used during the HTTP connection <password> String type, indicates the password to be used during the HTTP connection <start> Specifies whether to start the HTTP connection immediately or not <table> <tr><td>0</td><td>Start the HTTP connection later using +KHTTPCNX</td></tr> <tr><td>1</td><td>Start the HTTP connection immediately</td></tr> </table> <started> Specifies whether the HTTP connection has been started <table> <tr><td>0</td><td>The HTTP connection has not been started yet</td></tr> <tr><td>1</td><td>The HTTP connection has already been started</td></tr> </table> <af> Address family used for the connection. Default is IPV4. <table> <tr><td>0</td><td>IPV4</td></tr> <tr><td>1</td><td>IPV6</td></tr> </table> <cipher_index> Cipher suite profile index to use for a secured socket; defined by +KSSLCRYPTO	0	HTTP 1.1 (by default)	1	HTTP 1.0	2	HTTP 1.1 over TLS (HTTPS)	3	HTTP 1.0 over TLS (HTTPS)	0	Start the HTTP connection later using +KHTTPCNX	1	Start the HTTP connection immediately	0	The HTTP connection has not been started yet	1	The HTTP connection has already been started	0	IPV4	1	IPV6
0	HTTP 1.1 (by default)																				
1	HTTP 1.0																				
2	HTTP 1.1 over TLS (HTTPS)																				
3	HTTP 1.0 over TLS (HTTPS)																				
0	Start the HTTP connection later using +KHTTPCNX																				
1	Start the HTTP connection immediately																				
0	The HTTP connection has not been started yet																				
1	The HTTP connection has already been started																				
0	IPV4																				
1	IPV6																				
Reference Sierra Wireless Proprietary	<u>Notes</u> • <http_port> and <http_server> define the port and the IP address of the remote server one wants to connect. • The connection timeout for TCP socket is about 9 seconds with 3 retransmissions with 3 seconds delay. • This command can be used before setting up +KCNXCFG configuration. Note however that the latter is required to start the connection properly. • For <af>=1 (IPV6), server address (<http_server>) in IP address string format can be optionally quoted with square brackets "[]", e.g. [FEDC:BA98:7654:3210:FEDC:BA98:7654:3210]																				

17.9.3.2. +KHTTPCNX Command: Start the HTTP Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPCNX=?	<u>Response</u> +KHTTPCNX: (list of possible <session_id>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPCNX= <session_id>	<u>Response</u> OK <u>Error case</u> +CME ERROR: <err> +KHTTP_ERROR: <session_id>, <http_notif>

HL7588	
	<u>Parameters</u> <session_id> HTTP session index <http_notif> Integer type. Indicates the cause of the HTTP connection failure 4 DNS error 5 HTTP connection error due to internal trouble 6 HTTP connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP has partial data
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This command is used to start the HTTP connection created by +KHTTPCFG with <start>=0. +KHTTPGET, +KHTTPHEAD, +KHTTPPOST automatically starts the connection if it has not been started before using AT+KHTTPCNX.

17.9.3.3. +KHTTPHEADER Command: Set the HTTP Request Header

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPHEADER=?	<u>Response</u> +KHTTPHEADER: (list of possible <session_id>s),<local_uri> OK
<i>Read command</i>	
<u>Syntax</u> AT+KHTTPHEADER?	<u>Response</u> +KHTTPHEADER: <session_id>,<count> [...]
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPHEADER= <session_id> [,<local_uri>]	<u>Response</u> OK <u>Error case</u> +CME ERROR: <err> <u>Parameters</u> <session_id> HTTP session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax. <count> Count of HTTP headers

HL7588ReferenceSierra Wireless
ProprietaryNotes

- <session_id> is always 0.
- File (local_uri) should be put into the directory "/ftp".
- User must use <EOF pattern> to finish sending; then the module will return to command mode.

17.9.3.4. +KHTTPGET Command: Get HTTP Server Information**HL7588***Test command*Syntax**AT+KHTTPGET
=?**Response**+KHTTPGET:** (list of possible <session_id>s),<request_uri >,
(list of possible <show_resp>s)
OK*Write command*Syntax**AT+KHTTPGET=
<session_id>,
<request_uri>
[,<show_resp>]**Response**CONNECT**
...<EOF pattern>
OKError case**NO CARRIER**
+CME ERROR: <err>
+KHTTP_ERROR: <session_id>, <http_notif>Parameters**<session_id>** HTTP session index**<request_uri>** string type, indicates the information url to get during the HTTP connection**<http_notif>** Integer type. Indicates the cause of the HTTP connection failure

- 4 DNS error
- 5 HTTP connection error due to internal trouble
- 6 HTTP connection timeout
- 9 Triple plus (+++) error (switch to command mode)
- 10 HTTP has no data
- 11 HTTP has partial data

<show_resp> Whether to show HTTP response and HTTP headers

- 0 Do not show response and headers
- 1 Show response and headers (default)

HL7588Reference

Sierra Wireless
Proprietary

Notes

- <session_id> is always 0.
- The user can abort the download by sending the “End of Data pattern” from the host. In this case, the module will end the transfer by transmitting the EOF followed by NO CARRIER.
- Download can also be aborted (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table.
- HTTP does not support DTR1.

17.9.3.5. +KHTTPHEAD Command: Get HTTP Headers**HL7588**Test commandSyntax

**AT+KHTTPHEAD
=?**

Response

**+KHTTPHEAD: (list of possible <session_id>s),<request_uri>
OK**

Write commandSyntax

**AT+KHTTPHEAD
=<session_id>,
<request_uri>**

Response

**CONNECT
...<EOF pattern>
OK**

Error case

**NO CARRIER
+CME ERROR: <err>
+KHTTP_ERROR: <session_id>, <http_notif>**

Parameters

<session_id> HTTP session index

<request_uri> String type, indicates the information URL to get during HTTP connection

<http_notif> Integer type. Indicates the cause of the HTTP connection failure

- 4 DNS error
- 5 HTTP connection error due to internal trouble
- 6 HTTP connection timeout
- 9 Triple plus (+++) error (switch to command mode)
- 10 HTTP has no data
- 11 HTTP has partial data

Reference

Sierra Wireless
Proprietary

Notes

- HTTP does not support DTR1
- This method is identical to GET except that the server MUST NOT return a message-body in the response. The meta-information contained in the HTTP headers in response to a HEAD request SHOULD be identical to the information sent in response to a GET request

17.9.3.6. +KHTTPPOST Command: Perform HTTP Post

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPPOST =?	<u>Response</u> +KHTTPPOST: (list of possible <session_id>s),<local_uri>,<request_uri>,(list of possible <show_resp>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPPOST = <session_id>,<local_uri>,<request_uri>[,<show_resp>]	<u>Response</u> CONNECT ...<EOF pattern> OK <u>Error case</u> NO CARRIER +CME ERROR: <err> +KHTTP_ERROR: <session_id>,<http_notif> <u>Parameters</u> <session_id> HTTP session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax. <request_uri> string type, the request data of the HTTP connection <http_notif> Refer to +KHTTPGET <show_resp> Whether to show HTTP response and HTTP headers 0 Do not show HTTP response and headers 1 Show HTTP response and headers (default)
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. - Upload can also be ended (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. - ATO is not available for this command.

17.9.3.7. +KHTTPCLOSE Command: Close an HTTP Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPCLOSE =?	<u>Response</u> +KHTTPCLOSE: (list of possible <session_id>s), (list of possible <keep_cfg>s) OK

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KHTTPCLOSE= <session_id> [,<keep_cfg>]	<u>Response</u> OK <u>Error case</u> +CME ERROR: <err> <u>Parameters</u> <session_id> HTTP session index <keep_cfg> Specifies whether to delete the session configuration after closing it 0 Delete the session configuration 1 Keep the session configuration
<u>Reference</u> Sierra Wireless Proprietary	

17.9.3.8. +KHTTPDEL Command: Delete a Configured HTTP Session

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KHTTPDEL =?	<u>Response</u> +KHTTPDEL: (list of possible <session_id>s) OK
<i>Write command</i> <u>Syntax</u> AT+KHTTPDEL= <session_id>	<u>Response</u> OK +CME ERROR: <err> <u>Parameter</u> <session_id> HTTP session index
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> The HTTP session must be closed (using +KHTTPCLOSE) before using this command.

17.9.3.9. +KHTTP_IND Notification: HTTP Status

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KHTTP_IND: <session_id>,<status>[,<data_len>,<st_code>,<st_reason>] <u>Parameters</u> <session_id> HTTP session index

HL7588	
	<status> HTTP session status 1 Session is set up and ready for operation 3 The last HTTP command is executed successfully <data_len> Byte length of data downloaded/uploaded to/from the terminal (using +KHTTPHEAD, +KHTTPGET, or +KHTTPPOST) <st_code> HTTP response status code <st_reason> HTTP response status reason string
Reference Sierra Wireless Proprietary	

17.9.4. HTTPS Client Specific Commands

17.9.4.1. +KHTTPSCFG Command: HTTPS Connection Configuration

HL7588	
Test command	
<u>Syntax</u> AT+KHTTPSCFG =?	<u>Response</u> +KHTTPSCFG: (list of possible <cnx_cnf>s),<server-name/ip>,(list of possible <http_port>s),(list of possible <http_version>s),(list of possible <cipher_suite>s) ,(list of possible <sec_level>s),(range of possible length of <login>),(range of possible length of <password>),(list of possible <started>s),(list of possible <af>s) OK
Read command	
<u>Syntax</u> AT+KHTTPSCFG ?	<u>Response</u> +KHTTPSCFG: <session_id>,<cnx_cnf>,<http_server>,<https_port>,<http_version>,<cipher suite>,<sec_level>,<login>,<password>,<started>,<af> OK
Write command	
<u>Syntax</u> AT+KHTTPSCFG = [<cnx_cnf>], <http_server> [,<https_port> [,<http_version> [,<cipher_suite> [,<sec_level> [,<login> [,<password>] [,<start>] [,<af>]]]]]]	<u>Response</u> +KHTTPSCFG: <session_id> OK <u>Error case</u> +CME ERROR: <err> <u>Parameters</u> <cnx_cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see +KCNXCFG). <session_id> HTTPS session index

HL7588	
	<http_server> IP address string or explicit name of the remote server <https_port> 1 – 65535 Default value = <u>443</u> <http_version> <u>0</u> HTTP 1.1 1 HTTP 1.0 <cipher_suite> <u>0</u> TLS_RSA_CHOOSE_BY_SERVER 1 TLS_RSA_WITH_RC4_128_MD5 2 TLS_RSA_WITH_RC4_128_SHA 3 TLS_RSA_WITH_DES_CBC_SHA (not supported) 4 TLS_RSA_WITH_3DES_EDE_CBC_SHA (not supported) 5 TLS_RSA_EXPORT1024_WITH_DES_CBC_SHA (not supported) 6 TLS_RSA_WITH_AES_128_CBC_SHA 7 TLS_RSA_WITH_AES_256_CBC_SHA <sec_level> <u>1</u> No authentication 2 Manage server authentication (renegotiation of client certificate is not supported) 3 Manage server and client authentication if requested by remote server (renegotiation of client certificate is not supported) <login> String type, indicates the user name to be used during the HTTPS connection. <password> String type, indicates the password to be used during the HTTPS connection. <start> Specifies whether to start the HTTPS connection immediately or not 0 Start the HTTPS connection later using +KTPSCNX <u>1</u> Start the HTTPS connection immediately <started> Specifies whether the HTTPS connection has been started 0 The HTTPS connection has not been started yet 1 The HTTPS connection has already been started <af> Address family used for the connection <u>0</u> IPV4 1 IPV6
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • <https_port> and <http_server> define the port and the IP address of the remote server one wants to connect. • The connection timeout for TCP socket is about 9 seconds with 3 retransmissions with 3 seconds delay. • For <sec_level>:2 and 3, certificates or private key must be loaded from internal storage. See SSL Certificate Management for more information. • Any certificates referenced in HTTPS feature should be DER encoded. • Any private key referenced in HTTPS feature should be DER- PKCS#8 encoded. • This command can be used before setting up +KCNXCFG configuration. Note however that the latter is required to start the connection properly. • For <af>=1 (IPV6), server address (<http_server>) in IP address string format can be optionally quoted with square brackets "[]", e.g. [FEDC:BA98:7654:3210:FEDC:BA98:7654:3210] • SSL version is TLS 1.1 by default; refer to <ssl_ver> of +KIPOPT for configuration.

17.9.4.2. +KHTTPSCNX Command: Start HTTPS Connection

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KHTTPSCNX =?	<u>Response</u> +KHTTPSCNX: (list of possible <session_id>s) OK
<i>Write command</i>	
<u>Syntax</u> AT+KHTTPSCNX =<session_id>	<u>Response</u> OK +CME ERROR: <err> +KHTTPS_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTPS session index <http_notif> Integer type. Indicates the cause of the HTTPS connection failure 4 DNS error 5 HTTPS connection error due to internal trouble 6 HTTPS connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTPS got no data 11 HTTPS got partial data 12 SSL connection error 13 SSL initialization error
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - This command is used to start the HTTPS connection created by +KHTTPSCFG with <start>=0. +KHTTPSGET, +KHTTPSHEAD, +KHTTPSPOST automatically starts the connection if it has not been started using AT+KHTTPSCNX.

17.9.4.3. +KHTTPSHEADER Command: Set the HTTPS Request Header

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+ KHTTPSHEADER =?	<u>Response</u> +KHTTPSHEADER: (list of possible <session_id>s), <local_uri> OK
<i>Read command</i>	
<u>Syntax</u> AT+ KHTTPSHEADER ?	<u>Response</u> +KHTTPSHEADER: <session_id>,<count> [...]

HL7588	
<i>Write command</i> <u>Syntax</u> AT+KHTTPSHEADER =<session_id> [,<local_uri>]	<u>Response</u> OK <u>Error case</u> +CME ERROR: <err> <u>Parameters</u> <session_id> HTTPS session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax. <count> HTTPS header count
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> User must use <EOF pattern> to finish sending, then module returns to command mode.

17.9.4.4. +KHTTPSGET Command: Get Information from HTTPS Server

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KHTTPSGET =?	<u>Response</u> +KHTTPSGET: (list of possible <session_id>s),<request_uri >,(list of possible <show_resp>s) OK
<i>Write command</i> <u>Syntax</u> AT+KHTTPSGET =<session_id>,<request_uri> [,<show_resp>]	<u>Response</u> CONNECT ...<EOF pattern> OK <u>Error case</u> NO CARRIER +CME ERROR: <err> +KHTTPS_ERROR: <session_id>,<http_notif> <u>Parameters</u> <session_id> HTTPS session index <request_uri> String type, indicates the information URL to get during HTTPS connection <http_notif> Integer type. Indicates the cause of the HTTPS connection failure 4 DNS error 5 HTTPS connection error due to internal trouble

HL7588	
	6 HTTPS connection timeout 7 Flash access trouble 8 Flash memory full 9 Triple plus (+++) error (switch to command mode) 10 HTTPS has no data 11 HTTPS has partial data 12 SSL connection error 13 SSL initialization error <u><show_resp></u> Defines whether HTTPS response and HTTPS headers are shown 0 Do not show HTTPS response and headers 1 Show HTTPS response and headers
Reference Sierra Wireless Proprietary	<u>Notes</u> - The user can abort the download by sending the “End of Data pattern” from the host. In this case, the module will end the transfer by transmitting the EOF followed by NO CARRIER. - Download can also be aborted (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table.

17.9.4.5. +KHTTPSHEAD Command: Retrieve HTTP Headers

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+ KHTTPSHEAD=?	<u>Response</u> +KHTTPSHEAD: (list of possible <session_id>s),<request_uri> OK
<i>Write command</i>	
<u>Syntax</u> AT+ KHTTPSHEAD= <session_id>, <request_uri>	<u>Response</u> CONNECT ...<EOF pattern> OK <u>Error case</u> NO CARRIER +CME ERROR: <err> +KHTTPS_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTPS session index <request_uri> String type, indicates the information URL to get during HTTPS connection
Reference Sierra Wireless Proprietary	<u>Notes</u> - HTTPS does not support DTR1 - This method is identical to GET except that the server MUST NOT return a message-body in the response. The meta-information contained in the HTTP headers in response to a HEAD request SHOULD be identical to the information sent in response to a GET request.

17.9.4.6. +KHTTSPPOST Command: Send Data to HTTPS Server

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KHTTSPPOST=?	<u>Response</u> +KHTTSPPOST: (list of possible <session_id>s),<local_uri>,<request_uri>,(list of possible <show_resp>s) OK
<i>Write command</i> <u>Syntax</u> AT+KHTTSPPOST= <session_id>, <local_uri>, <request_uri> [,<show_resp>]	<u>Response</u> CONNECT ...<EOF pattern> OK <u>Error case</u> NO CARRIER +CME ERROR: <err> +KHTTSP_ERROR: <session_id>, <http_notif> <u>Parameters</u> <session_id> HTTPS session index <local_uri> This argument must be empty. It is reserved for compatibility of command syntax. <request_uri> String type, indicates the request data of the HTTPS connection <http_notif> Integer type. Indicates the cause of the HTTPS connection failure 4 DNS error 5 HTTPS connection error due to internal trouble 6 HTTPS connection timeout 7 Flash access trouble 8 Flash memory full 9 Triple plus (+++) error (switch to command mode) 10 HTTPS has no data 11 HTTPS has partial data 12 SSL connection error 13 SSL initialization error <show_resp> Defines whether HTTPS response and HTTPS headers are shown 0 Do not show HTTPS response and headers 1 Show HTTPS response and headers
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> - It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. - Upload can also be ended (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. - ATO is not available for this command.

17.9.4.7. +KHTTSCLOSE Command: Close an HTTPS Connection

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KHTTSCLOSE=?	<u>Response</u> +KHTTSCLOSE: (list of possible <session_id>s), (list of possible <keep_cfg>s) OK
<i>Write command</i> <u>Syntax</u> AT+KHTTSCLOSE=<session_id>[,<keep_cfg>]	<u>Response</u> OK <u>Error case</u> +CME ERROR: <err> <u>Parameters</u> <session_id> HTTPS session index <keep_cfg> Specified whether to delete the session configuration after closing it 0 Delete the session configuration 1 Keep the session configuration
<u>Reference</u> Sierra Wireless Proprietary	

17.9.4.8. +KHTTSDDEL Command: Close an HTTPS Connection

HL7588	
<i>Test command</i> <u>Syntax</u> AT+KHTTSDDEL=?	<u>Response</u> +KHTTSDDEL: (list of possible <session_id>s) OK
<i>Write command</i> <u>Syntax</u> AT+KHTTSDDEL=<session_id>	<u>Response</u> OK +CME ERROR: <err> <u>Parameter</u> <session_id> HTTPS session index
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> The session must be closed (using +KHTTSCLOSE) before using this command.

17.9.4.9. +KHTTPS_IND Notification: HTTPS Status

HL7588	
<i>Unsolicited Notification</i>	<u>Response</u> +KHTTPS_IND: <session_id>,<status>[,<data_len>] <u>Parameters</u> <session_id> HTTPS session index <status> HTTPS session status 1 Session is set up and ready for operation 2 The last HTTPS command is executed successfully <data_len> Byte length of data downloaded/uploaded to/from the terminal (using +KHTTPSHEAD, +KHTTPSGET, or +KHTTPSPOST)
<u>Reference</u> Sierra Wireless Proprietary	

17.9.5. SSL Certificate Manager

17.9.5.1. +KCERTSTORE Command: Store Root CA and Local Certificates to Internal Storage

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+ KCERTSTORE=?	<u>Response</u> +KCERTSTORE: (list of possible <data_type>s),(range of possible lengths of <NbData>), (list of possible <index>es) OK
<i>Read command</i>	
<u>Syntax</u> AT+ KCERTSTORE?	<u>Response</u> +KCERTSTORE [root_cert,<index>,<NbData><CR><LF> <File_data><CR><LF>] [local_cert,<index>,<NbData><CR><LF> <File_data> <CR><LF>] [...] OK <u>Error case</u> +CME ERROR: <err>

HL7588	
<i>Write command</i> <u>Syntax</u> AT+ KCERTSTORE= <data_type> [,<NbData> [,<index>]]	<u>Response</u> CONNECT OK <u>Error case</u> +CME ERROR: <err> <u>Parameters</u> <data_type> 0 Root certificate 1 Local certificate <NbData> Number of bytes to read/write. Value range: 1 – 3000. <index> Stored root/local certificate index. If a root/local certificate is already stored at the index, it will be overloaded. <u>0</u> by default. Value range: 0 If <data_type> = 0 0 – 2 If <data_type> = 1 <File_data> File data in bytes
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • The <index> parameter is the link between a local certificate and a private key (refer to +KPRIVKSTORE and +KCERTDELETE for more information). • If <NbData> is not given, the input should be terminated by +++ or DTR signal

17.9.5.2. +KPRIVKSTORE Command: Store Private Key Associated to a Local Certificate

HL7588	
<i>Test command</i> <u>Syntax</u> AT+ KPRIVKSTORE =?	<u>Response</u> +KPRIVKSTORE: (list of possible <index>s),(range of possible lengths of <NbData>) OK
<i>Read command</i> <u>Syntax</u> AT+ KPRIVKSTORE?	<u>Response</u> +KPRIVKSTORE private_key,<index>,<NbData><CR><LF> <File_data> <CR><LF> OK <u>Error case</u> +CME ERROR: <err>

HL7588	
<i>Write command</i> <u>Syntax</u> AT+ KPRIVKSTORE= <index> [,<NbData>]	<u>Response</u> CONNECT OK <u>Error case</u> +CME ERROR: <err> <u>Parameters</u> <index> Index of the stored local certificate associated to this private key. Value range: 0 – 2 <NbData> Number of bytes to read/write (mandatory for both reading and writing). Value range: 1-3000. <File_data> File data in bytes
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> If <NbData> is not given, the input should be terminated by +++ or DTR signal.

17.9.5.3. +KCERTDELETE Command: Delete Local Certificate from the Index

HL7588	
<i>Test command</i> <u>Syntax</u> AT+ KCERTDELETE =?	<u>Response</u> +KCERTDELETE: (list of possible <data_type>s),(list of possible <index>s) OK
<i>Read command</i> <u>Syntax</u> AT+ KCERTDELETE?	<u>Response</u> +KCERTDELETE: OK <u>Error case</u> +CME ERROR: <err>
<i>Write command</i> <u>Syntax</u> AT+ KCERTDELETE= <data_type> [,<index>]	<u>Response</u> OK <u>Error case</u> +CME ERROR: <err> <u>Parameters</u> <data_type> 0 Root certificate 1 Local certificate

HL7588	
	<index> Stored local certificate index. Default value = <u>0</u>. Value range: 0 If <data_type> = 0 0 – 2 If <data_type> = 1
<u>Reference</u> Sierra Wireless Proprietary	

17.9.5.4. +KPRIVKDELETE Command: Delete Private Key from the Index

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+KPRIVKDELETE=?	<u>Response</u> +KPRIVKDELETE: (list of possible <index>es) OK
<i>Write command</i>	
<u>Syntax</u> AT+KPRIVKDELETE=<index>	<u>Response</u> OK <u>Error case</u> +CME ERROR: <err> <u>Parameter</u> <index> Stored private key index. Value range: 0 – 2
<u>Reference</u> Sierra Wireless Proprietary	

17.10. Test Commands

17.10.1. +WMANTSEL Command: Select Main and/or Diversity Antenna for LTE

HL7588	
<i>Test command</i>	
<u>Syntax</u> AT+WMANTSEL=?	<u>Response</u> +WMANTSEL: (list of supported <MODE>s) OK

HL7588	
<i>Read command</i>	
<u>Syntax</u> AT+WMANTSEL?	<u>Response</u> +WMANTSEL: <MODE> OK
<i>Write Command</i>	
<u>Syntax</u> AT+WMANTSEL= <MODE>	<u>Response</u> OK <u>Parameter</u> <MODE> <u>0</u> Use main and diversity antenna on LTE <u>1</u> Only use main antenna on LTE <u>2</u> Only use diversity antenna on LTE
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> • This command works with or without a SIM. • <MODE> is stored in non-volatile memory using the AT&W command. • This command should be issued when the device is deregistered from the network; settings will be effective the next time the module registers to the network.
<u>Examples</u>	at+wmantSEL? +WMANTSEL: 0 OK at+cops=2 // deregister from the network OK at+wmantSEL=1 // select main antenna only OK at+cops=0 // re-register to the network OK at+cops=2 // deregister from the network OK at+wmantSEL=2 // select diversity antenna only OK at+cops=0 // re-register to the network OK

>> 18. Appendix

18.1. Result Codes and Unsolicited Messages

Verbose Result Code	Numeric	Type	Description
+CCCM: <ccm>	like verbose	Unsolicited	
+CME ERROR: <err>	like verbose	Final	
+CMS ERROR: <err>	like verbose	Final or unsolicited	
+CMTI	like verbose	Unsolicited	
+CBM	like verbose	Unsolicited	
+CDS	like verbose	Unsolicited	
+COLP: <number>,<type>[,<subaddr> ,<satype>[,<alpha>]]	like verbose	Intermediate	
+CR: <type>	like verbose	Intermediate	
+CREG: <stat>[,<lac>,<ci>]	like verbose	Unsolicited	
+CRING: <type>	like verbose	Unsolicited	
+CSSI: <code1>[,<index>]	like verbose	Intermediate	
+CSSU: <code2>[,<index>[,<number>,<type>[,<subaddr>,<satype>]]]	like verbose	Unsolicited	
+CUSD: <m>[,<str>,<dc>]	like verbose	Unsolicited	
BUSY	6	Final	
CONNECT	1	Intermediate	connection has been established
CONNECT <text>	manufacturer specific	Intermediate	like CONNECT but manufacturer specific <text> gives additional information (e.g. connection data rate)
ERROR	4	Final	command not accepted
NO ANSWER	7	Final	connection completion timeout
NO CARRIER	3	Final	connection terminated
NO DIAL TONE	5	Final	no dial tone detected
OK	0	Final	acknowledges execution of a command line
RING	2	Unsolicited	incoming call signal from network

18.2. Error Codes

18.2.1. CME Error Codes

<err> Code	Meaning
0	Phone failure
1	No connection to phone
2	Phone-adapter link reserved
3	Operation not allowed
4	Operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full
21	Invalid index
22	Not found
23	Memory failure
24	Text string too long
25	Invalid characters in text string
26	Dial string too long
27	Invalid characters in dial string
30	No network service
31	Network timeout
32	Network not allowed - emergency call only
40	Network personalization PIN required
41	Network personalization PUK required
42	Network subset personalization PIN required
43	Network subset personalization PUK required
44	Service provider personalization PIN required
45	Service provider personalization PUK required
46	Corporate personalization PIN required
47	Corporate personalization PUK required
48	Hidden key required
49	EAP method not supported

<err> Code	Meaning
50	Incorrect parameters
99	Resource limitation
100	Synchronization error
103	Illegal MS
106	Illega IME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
132	Service option not supported
133	Requested service option not subscribed
134	Service option temporarily out of order
148	Unspecified GPRS error
149	PDP authentication failure
150	Invalid mobile class
201	Alternate SIM conflict
500	CTS Handover on Progress
501	Cellular Protocol Stack Out of service state
502	CTS Unspecified Error
650	General AVMS error
651	Communication error
652	Session in progress
654	RDMS services are in "deactivated" state
655	RDMS services are in "prohibited" stae (see +WDSG command)
656	RDMS services are in "to be provisioned" state; no available NAP
800	SIM Security unspecified error
902	No more sockets available; the maximum number has been reached
903	Memory problem
904	DNS error
905	TCP disconnection by the server
906	TCP/UDP connection error
907	Generic error
908	Fail to accept client request's
909	Data send by KTCPSND/KUDPSND are incoherent
910	Bad session ID
911	Session is already running
912	No more sessions can be used (maximum session is 32)
913	Socket connection timer timeout
914	Control socket connection timer timeout
915	A parameter is not expected
916	A parameter has an invalid range of values
917	A parameter is missing
918	Feature is not supported

<err> Code	Meaning
919	Feature is not available
920	Protocol is not supported
921	Error due to invalid state of bearer connection
922	Error due to invalid state of session
923	Error due to invalid state of terminate port data mode
924	Error due to session busy, retry later
929	Format of input data is invalid
930	Content of input data is invalid or not supported
931	The length of a parameter is invalid
932	The format of a parameter is invalid

18.2.2. CEER Error Codes

<cause>	<description>
0	No cause information available
1	Unassigned (unallocated) number
3	No route destination
6	Channel unacceptable
8	Operator determined barring
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Call rejected
22	Number changed
26	Non selected user clearing
27	Destination out of order
28	Invalid number format (incomplete number)
29	Facility rejected
30	Response to STATUS ENQUIRY
31	Normal, unspecified
34	No circuit / channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit / channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred with in the CUG
57	Bearer capability not authorized

<cause>	<description>
58	Bearer capability not presently available
63	Service or option not available, unspecified
65	Bearer service not implemented
68	ACM equal to or greater than AC Mmax
69	Requested facility not implemented
70	Only restricted digital information bearer capability is available
79	Service or option not implemented, unspecified
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with protocol state
99	Information element non-existent or not implemented
100	Conditional IE error
101	Message not compatible with protocol state
102	Recovery on timer expiry
103	Illegal MS
106	Illegal ME
107	GPRS service not allowed
111	Protocol error, unspecified
112	Location area not allowed
113	Roaming not allowed in this location area
124	MBMS bearer capabilities insufficient for the service
125	LLC or SNDSCP failure
126	Insufficient resources
127	Missing or unknown APN
128	Unknown PDP address or PDP type
129	User authentication failed
130	Activation rejected by GGSN
131	Activation reject, unspecified
132	Service not supported
133	Requested service option not subscribed
134	Service option temporarily out of order
135	NSAPI already used
136	Regular PDP context deactivation
137	QoS not accepted
138	Network failure
139	Reactivation requested
140	Feature not supported
141	Semantic error in the TFT operation

<cause>	<description>
142	Syntactical error in the TFT operation
143	Unknown PDP context
144	Semantic errors in packet filter(s)
145	Syntactical errors in packet filter(s)
146	PDP context without TFT already activated
148	Unspecified GPRS error
149	PDP authentication error
212	APN restriction
256	Internal unspecified
257	Out of memory
258	Invalid parameters
259	Data call active
260	Speech call active
262	Missing ACM information
263	Temporary forbidden
264	Called party is blacklisted
265	Blacklist is full
266	No service
267	Limited service
268	Client conflict
269	Dual Service call active
271	Unknown SIM error
274	Active client is gone
277	SIM status failure
278	Rejected by call control
279	FDN failed
280	BDN failed
283	CCBS possible
284	Invalid alternate service line
285	LND overview
287	MM network failure unspecified
288	MM no service
289	MM access class barred
290	MM RR no resource
291	MM ME busy
292	MM unspecified
301	MMI not registered
303	Rejected by user
304	Rejected due to time out
306	Disconnected due to SIM TK call setup
307	Pending SIM TK call setup
310	SIM reset
340	MM sapi3 release

<cause>	<description>
341	MM lower layer failure
342	MM authentication failure
343	MM PS reject
344	MM service rejected
345	MM abort by network
346	MM timeout
347	MM detach
348	MM RR connection release
349	MM not registered
350	MM reestablishment failure
351	Failure due to handover
352	Link establishment failure
353	Random access failure
354	Radio link aborted
355	Lower layer failure in Layer 1
356	Immediate assignment reject
357	Failure due to paging
358	Abnormal release unspecified
359	Abnormal release channel unacceptable
360	Abnormal release timer expired
361	Abnormal release no act on radio path
362	Preemptive release
363	UTRAN configuration unknown
364	Handover impossible
365	Channel mode unacceptable
366	Frequency not implemented
367	Originator leaving call group area
368	Lower layer failure from network
369	Call already cleared
370	Semantically incorrect message
371	Invalid mandatory info
372	Message type non-existing
373	Message type incompatible in state
374	Conditional information element error
375	No cell allocation available
376	Protocol error unspecified
377	Normal event
378	Unspecified
379	Preemptive release
380	Congestion
381	RE establishment reject
382	Directed sig conn establishment
383	User inactivity

<cause>	<description>
384	Lower layer failure downlink
385	Lower layer failure uplink
386	Cell barred due to authentication failure
387	Signalling connection release
388	CS connection release triggered by MM
389	RRC connection establishment failure
390	RRC connection establishment re-ject with redirection
391	Resource conflict
392	Layer 2 sequence error
393	Layer 2 T200 exp N200 plus 1 times
394	Layer 2 unsolicited DM resp MFES
395	Layer 2 contention resolution
396	Layer 2 normal cause
397	RR connection release due to BAND change (2G)
400	MM RR connection error while release
500	User disconnected
510	Remote user / NW disconnected for call status rather than call proceeding
511	Remote user / NW disconnected for call status is call proceeding
512	Request rejected, BCM violation

18.2.3. CMS Error Codes

<err> Code	Meaning
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state

<err> Code	Meaning
99	Information element non-existent or not implemented
111	Protocol error, unspecified
127	Interworking, unspecified
128	Telematic interworking not supported
129	Short message Type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be executed
161	Command unsupported
175	Unspecified TP-Command error
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	D0 SIM SMS storage full
209	No SMS storage capability in SIM
210	Error in MS
211	Memory Capacity Exceeded
212	SIM Application Toolkit Busy
213	SIM data download error
255	Unspecified error cause
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required

<err> Code	Meaning
318	SIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	no network service
332	Network timeout
340	NO +CNMA ACK EXPECTED
500	Unknown error

18.2.4. GPRS Error Codes

<err> Code	Meaning
Errors related to a failure to Perform an Attach	
103	Illegal MS
106	Illegal ME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
Errors related to a failure to Activate a Context	
132	Service option not supported
133	Requested service option not subscribed
134	Service option temporarily out of order
149	PDP authentication failure
Other GPRS Errors	
148	Unspecified GPRS error
150	Invalid mobile class

Other values in the range 101 - 150 are reserved for use by GPRS.

18.2.5. FTP Reply Codes

FTP Reply Code	Meaning
110	Restart marker reply
120	Service ready in nnn minutes
125	Data connection already open: transfer starting
150	File status okay; about to open data connection
200	Command okay
202	Command not implemented, superfluous at this site

FTP Reply Code	Meaning
211	System status or system help reply
212	Directory status
213	File status
214	Help message
215	NAME system type
220	Service ready for new user
221	Service closing control connection. Logged out if appropriate. Unassigned (unallocated) number
225	Data connection open; no transfer in progress
226	Closing data connection. Requested file action successful (for example, file transfer or file abort)
227	Entering Passive Mode (h1, h2, h3, h4, p1, p2)
22	User logged in, proceed
250	Requested file action okay, completed
257	"PATHNAME" created
331	User name okay, need password
332	Need account for login
350	Requested file action pending further information
421	Service not available, closing control connection. This may be a reply to any command if the service knows it must shut down
425	Can't open data connection
426	Connection closed; transfer aborted
450	Requested file action not taken. File unavailable (e.g., file busy)
451	Requested action aborted: local error in processing
452	Requested action not taken. Insufficient storage space in system
500	Syntax error, command unrecognized. This may include errors such as command line too long
501	Syntax error in parameters or arguments
502	Command not implemented
503	Bad sequence of commands
504	Command not implemented for that parameter
530	Not logged in
532	Need account for storing files
550	Requested action not taken. File unavailable (e.g., file not found, no access)
551	Requested action aborted: page type unknown
552	Requested file action aborted. Exceeded storage allocation (for current directory or dataset)
553	Requested action not taken. File name not allowed

18.2.6. AVMS Error Codes

<err> Code	Meaning
3	Parameter is out of range; Device Services is not in a good state
24	Parameters <APN>, <User> or <Pwd> are too long
650	General error
651	Communication error
652	Session in progress
654	AVMS services are in DEACTIVATED state (see +WDSG)
655	AVMS services are in PROHIBITED state (see +WDSG)
656	AVMS services are in TO BE PROVISIONED state (see +WDSG)

18.2.7. Error Case Examples

AT commands return specific error codes if parameter verification fails. The following tables enumerate some examples to demonstrate specific error cases.

Table 3. Generic Error Case Examples

Error Codes	Corresponding Examples
+CME ERROR: 3 when execute command is not supported	AT+SWITRC AT+COREDUMP AT+LOGLV AT+NVBUS AT+KGSN AT+HWREV AT+KBND AT*PSRDBS AT+KSRAT AT+KSREP AT+WMANTSEL AT+KGPIOCFG AT+KGPIO AT+WMIOTEST AT+KTEMPMON AT+WPPP AT+KADC AT+KCELL AT+KCCINFO AT+KSLEEP AT+KRIC AT&C AT+OMADMST AT+GST AT+HBHV AT+KSIMDET AT+KSIMSEL AT*PSSTKI AT+KPCMCFG

Error Codes	Corresponding Examples
+CME ERROR: 3 when action command is not supported	AT+WMAUDIOLOOP AT+VIP AT+VGT AT+KVG AT+VGR AT+KVGR AT+CLVL AT+KECHO AT+KNOISE AT+KST AT+KPC AT+CALM AT+CRSL AT+KSRAP AT+CODECINFO AT+WIMEI AT+WMUSBVCC AT+KUSBCOMP AT+BOOTDWLCFG AT+KSYNC AT+KAAT AT+CMEC AT+CALA AT+CALD

Table 4. Internet Error Case Examples

Error Codes	Corresponding Examples
+CME ERROR: 907 Generic error/Unsupported read command	AT+KFTPCNX? AT+KFTPCLOSE? AT+KFTPCFGDEL? AT+KFTPRCV? AT+KFTPSND? AT+KFTPDEL? AT+KUDPDEL? AT+KUDPCLOSE? AT+KUDPRCV? AT+KUDPSND? AT+KTCPSND? AT+KTCPRCV? AT+KTCPCNX? AT+KTCPCLOSE? AT+KTCPDEL?
+CME ERROR: 912 No more sessions can be used	Create a UDP client session repeatedly until 32 sessions are created: AT+KUDPCFG=1,0,1033,,"10.10.10.10" Then try to create a TCP server session (33rd session) AT+KTCPCFG=1,1,,80
+CME ERROR: 915 A parameter is not expected	AT+KFTPRCV=1,0,,"/sample.txt" AT+KFTPRCV=1,1,,"/sample.txt" AT+KFTPRCV=1,"file",,"/sample.txt"

Error Codes	Corresponding Examples
+CME ERROR: 916 A parameter has an invalid range of values	AT+KFTPCFG=0,"ftp.kernel.org" AT+KFTPCFG=1,"ftp.kernel.org",,,65536 AT+KFTPCFG=1,"ftp.kernel.org",,-1 AT+KFTPCFG=1,"ftp.kernel.org",,,,2 AT+KFTPCFG=1,"ftp.kernel.org",,,,,-1 AT+KFTPCFG=1,"ftp.kernel.org",,,,2 AT+KFTPCFG=1,"ftp.kernel.org",,,,,10 AT+KFTPCFG=1,"ftp.kernel.org",,,,,,-1 AT+KFTPCFG=1,"ftp.kernel.org",,,,,,?
	AT+KFTPCNX=0 AT+KFTPCNX=99 AT+KFTPCNX=-1
	AT+KFTPCLOSE=0 AT+KFTPCLOSE=1,2 AT+KFTPCLOSE=1,-1
	AT+KFTPCFGDEL=0 AT+KFTPCFGDEL=-1
	AT+KFTPCRCV=0,,,"/sample.txt" AT+KFTPCRCV=-1,,,"/sample.txt" AT+KFTPCRCV=1,,,"/sample.txt",2 AT+KFTPCRCV=1,,,"/sample.txt",-1
	AT+KFTPSND=0,,,"/sample.txt" AT+KFTPSND=-1,,,"/sample.txt" AT+KFTPSND=1,,,"/sample.txt",2 AT+KFTPSND=1,,,"/sample.txt",-1
	AT+KFTPDEL=0,,,"/sample.txt" AT+KFTPDEL=-1,,,"/sample.txt" AT+KFTPDEL=1,,,"/sample.txt",2 AT+KFTPDEL=1,,,"/sample.txt",-1
	AT+KTCPSND=1,0
	AT+KTCPCRCV=1,0
	AT+KUDPSND=1,"116.66.221.43",5043,0
	AT+KUDPCRCV=1,0
+CME ERROR: 917 A parameter is missing	AT+KFTPCFG=1, AT+KFTPCFG=
	AT+KFTPCLOSE=,
	AT+KFTPCRCV=1,,,
	AT+KFTPSND=1,,,
	AT+KFTPDEL=1,, AT+KFTPDEL=,
+CME ERROR: 919 Feature is not available	AT+KTCPACKINFO=1
+CME ERROR: 932 The format of a parameter is invalid	AT+KFTPCFG=a,"ftp.kernel.org" AT+KFTPCFG=1,"ftp.kernel.org",,,,,? AT+KFTPCFG=1,"ftp.kernel.org",,,,,,?
	AT+KFTPCNX=a AT+KFTPCNX=#
	AT+KFTPCLOSE=b AT+KFTPCLOSE=1,?
	AT+KFTPCFGDEL=C AT+KFTPCFGDEL=#

Error Codes	Corresponding Examples
+CME ERROR: 932 The format of a parameter is invalid	AT+KFTPRCV=D,,,"/sample.txt" AT+KFTPRCV=#,,,"/sample.txt" AT+KFTPRCV=1,,,"/sample.txt",?
	AT+KFTPSND=E,,,"/sample.txt" AT+KFTPSND=#,,,"/sample.txt" AT+KFTPSND=1,,,"/sample.txt",? AT+KFTPSND=1,,,"/sample.txt",,?
	AT+KFTPDEL=f,,,"/sample.txt" AT+KFTPDEL=#,,,"/sample.txt" AT+KFTPDEL=1,,,"/sample.txt",?
	AT+KCGPADDR=a

18.3. Commands without Pin Code Requirement

Most AT Commands are rejected (i.e. an error is returned to the DTE) if the valid PIN code has not been entered.

The **main** commands which can be sent without the PIN code include:

- ATD (emergency calls)
- AT+CPIN
- ATI
- AT+CGMI, AT+GMI
- AT+CGMM, AT+GMM
- AT+CGMR, AT+GMR
- AT+CGSN, AT+GSN
- AT+CPAS
- AT+CIND
- AT+CMEE
- AT+IPR
- ATE, ATV, ATS, ATZ
- AT&F, AT&D, AT&C
- AT+CBST
- AT+CLVL

This list may be modified in case of special needs from the customer (contact Sierra Wireless directly to treat this kind of request)

Note: Some commands require the PIN2 code.

18.4. GSM 27.010 Multiplexing Protocol

Main Options	BASIC	YES
	ADVANCED	YES
	advanced WITH ERROR RECOVERY	NO
Frames	SABM	YES
	UA	YES
	DM	YES
	DISC	YES
	I (ERM)	NO
	RR (ERM)	NO
	RNR (ERM)	NO
	REJ (ERM)	NO
	UI	YES
	UIH	YES
Multiplexer Controls	DLC parameters negotiation (PN) (optional)	YES
	Power Saving control (PSC)	YES
	Multiplexer Close Down (CLD)	YES
	Test Command (Test)	YES
	Flow control On Command (Fcon)	YES
	Flow control Off Command (Fcoff)	YES
	Modem Status Command (MSC)	YES
	Non-Supported Command response (NSC)	YES
	Remote Port Negotiation (RPN). (optional)	NO
	Remote Line Status command (RLS). (optional)	YES
	Service Negotiation Command (SNC)	NO
Convergence Layers	Type 1 - Unstructured Octet Stream	YES
	Type 2 - Unstructured Octet Stream with flow control, break signal handling and transmission of v24 signal states	YES
	Type 3 – Uninterruptible Framed Data	NO
	Type 4 - Interruptible Framed Data	NO
CMUX Parameters	Link speed	9600, 19200, 38400, 57600, 115200
	Maximum frame size	1540
	Acknowledgment timer	100
	Maximum number of retransmissions	100
	Response timer for control channel	30
	Wake up response timer	10 seconds
Others	Wake up procedure (see [RE2] sub clause 5.4.7)	YES
	Priority management	YES
	DLCI number limitation	8

18.5. TCP Commands Examples

18.5.1. Client Mode

AT&K3 OK	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK	Set GPRS parameters (APN, login, password)
AT+KTCPCFG=1,0,"www.google.com",80 +KTCPCFG: 1 OK	Set IP address and port number Returns session ID 1
AT+KTCPCNX=1 OK	Initiate the connection
AT+KTCPSND=1,18 CONNECT ...Data send... OK +KTCP_DATA: 1,1380	Send data with the EOF string at the end "GET / HTTP / 1.0 --EOF--Pattern"
AT+KTCPCRV=1, 1380 CONNECT HTTP/1.0 200 OK Cache-Control: private, max-age=0 ... a lot of data... --EOF--Pattern-- OK +KTCP_DATA: 1,1380	Read data +KTCP_DATA notification
AT+KTCPCRV=1,1380 CONNECT er{padding-bottom:7px !important}#gbar,#guser{font- ... a lot of data... --EOF--Pattern-- OK +KTCP_DATA: 1,1380	Read received data
AT+KTCPCLOSE=1,1 OK	Close session 1
AT+KTCPDEL=1 OK	Delete session 1
AT+KTCPCFG? OK	No session is available

18.5.2. Server Mode

In this simple example, we emulate a daytime server. This server listens to port 13 and for each connection it returns the date.

AT&K3 OK	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK	Set GPRS parameters (APN, login, password)
AT+KTCPCFG=1,1,,13 +KTCPCFG: 1 OK	Set TCP listener and port number Returns session ID 1
AT+KTCPCNX=1 OK	Initiate the server
AT+KCGPADDR +KCGPADDR: 0,"10.35.125.89" OK	Get the IP address to initiate a connection request with a client
+KTCP_SRVREQ: 1,2	A client requests a connection (session ID 2)
AT+KTCPSND=2,15 CONNECT ...Date and time... OK	Data is sent to the client read
+KTCP_SRVREQ: 1,3 +KTCP_NOTIF: 2, 4	Another client requests a connection (session ID 3); child mode for session 3 Client (session 2) closes the connection
AT+KTCPSND=3,15 CONNECT ...Date and time... OK	Data is sent to the client
AT+KTCPCLOSE=3,1 OK	Close client session 3 and then session 3 is deleted automatically (child mode for session 3)
AT+KTCPCLOSE=1,1 OK	Close server session 1
AT+KTCPDEL=1 OK	Delete session 1

18.5.3. Polling for the Status of a Socket

AT&K3 OK	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK	Set GPRS parameters (APN, login, password)
AT+KTCPCFG=1,0,"www.google.com",80 +KTCPCFG: 1 OK	Set TCP Server address and port number Returns session ID 1
AT+KURCCFG="TCP",0 OK	Disable TCP unsolicited messages
AT+KTCPCNX=1 OK	Initiate connection, use session 1
AT+KTCPSTAT=1 +KTCPSTAT: 3,-1,0,0 OK	Poll the connection status Connection is UP
AT+KTCPSND=1,3000 CONNECT <...Data send...> OK	Send data on socket 1 for 3000 bytes or less. Data can be sent after CONNECT Send the EOF string to finish. The EOF pattern should be defined using the +KPATTERN command.
AT+KTCPSTAT=1 +KTCPSTAT: 3,-1,1234,0 OK	Poll the connection status Connection is up, with 1234 unsent bytes
AT+KTCPSTAT=1 +KTCPSTAT: 3,-1,100,0 OK	Poll the connection status Connection is up, with 100 unsent bytes
AT+KTCPSTAT=1 +KTCPSTAT: 3,-1,0,0 OK	Poll the connection status Connection is up, all bytes have been sent
AT+KTCPSTAT=1 +KTCPSTAT: 3,-1,0,320 OK	Poll the connection status Connection is up with 320 bytes available for reading
AT+KTCPRCV=1,320 CONNECT <... a lot of data...> --EOF--Pattern-- OK	Read 320 bytes on socket 1 Data are sent after CONNECT

AT+KTCPCLOSE=1,1 OK	Close session 1
AT+KTCPDEL=1 OK	Delete session 1

18.5.4. End to End TCP Connection

AT&K3 OK	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK	Set GPRS parameters (APN, login, password)
AT+KTCPCFG=1,0,"www.google.com",80 +KTCPCFG: 1 OK	Set the TCP server address and port number Returns session ID 1
AT+KTCPSTART=1 CONNECT ...Data sent.....Data received.....Data sent... ...Data sent.....Data received.....Data sent... +++ OK	Initiate connection, use session 1 Message CONNECT: connection to server is established, data can be sent Use +++ to enter command mode
ATO1 CONNECT ...Data sent.....Data received.....Data sent... ...Data sent.....Data received.....Data sent... OK	Use ATO<session_id> to switch back to data mode
AT+KTCPCLOSE=1,1 OK	Toggle DTR (if using AT&D1 or AT&D2 configuration) to enter command mode Close the session
AT+KTCPDEL=1 OK	Delete the configured session

18.5.5. Error Case for End to End TCP Connection

AT+KTCPSTART=1 NO CARRIER +KTCP_NOTIF: 1,<tcp_notif>	Try to initiate connection Connection failed, see the value of <tcp_notif>
AT+KTCPSTART=1 CONNECT ...Data sent.....Data received.....Data sent... ...Data sent.....Data received.....Data sent... NO CARRIER +KTCP_NOTIF: 1,<tcp_notif>	Initiate connection Exchange some data
	An error occurs during connection (network lost, server closed, etc.)

18.5.6. Use Cases for AT+KTCPACKINFO and <URC-ENDTCP-enable> Option

This section describes the behavior of AT+KTCPACKINFO when the <URG-ENDTCP> option is used with AT+KTCPCFG.

18.5.6.1. <URC-ENDTCP-enable> is Disabled (default setting)

AT+KCNXCFG=1,"GPRS","CMNET"	
OK	
AT+KTCPCFG=1,0,"202.170.131.76",2000	
+KTCPCFG: 1	
OK	
AT+KTCPCFG?	
+KTCPCFG: 1,0,0,0,, "202.170.131.76",2000,,0,0	<URC-ENDTCP-enable> is disabled
OK	
AT+KTCPCNX=1	Connect to TCP server
OK	
AT+KTCPSEND=1,10	Use command to send 10 bytes
CONNECT	
0123456789--EOF--Pattern--	Write to serial
OK	The URC "+KTCP_ACK" is not displayed
AT+KTCPACKINFO=1	
+CME ERROR: operation not allowed	Error is returned because <URC-ENDTCP-enable> is disabled

18.5.6.2. <URC-ENDTCP-enable> is Enabled

AT+KCNXCFG=1,"GPRS","CMNET"	
OK	
AT+KTCPCFG=1,0,"202.170.131.76",2000,,1	Set <URC-ENDTCP-enable> to 1, enable
+KTCPCFG: 1	URC "+KTCP_ACK"
OK	
AT+KTCPCFG?	
+KTCPCFG: 1,0,0,0,"202.170.131.76",2000,,0,1	<URC-ENDTCP-enable> is enabled
OK	
AT+KTCPCNX=1	Connect to TCP server
OK	
AT+KTCPSEND=1,10	Receive 10 bytes
CONNECT	Connect to TCO server
0123456789--EOF--Pattern--	Write to serial
OK	
+KTCP_ACK: 1, 1	After a short time, URC "+KTCP_ACK" states that the latest TCP data has arrived on the remote side
AT+KTCPACKINFO=1	Poll the status of the latest TCP data
+KTCPACKINFO: 1, 1	
OK	
AT+KTCPSEND=1,1000	Send 1000 bytes
CONNECT	
<1000bytes and --EOF--Pattern>	Write to serial
OK	
AT+KTCPACKINFO=1	URC "+KTCP_ACK" not got yet
+KTCPACKINFO: 1, 2	Poll the status of the latest TCP data
OK	The status of the latest TCP data is unknown
+KTCP_ACK: 1, 0	Since the "OK" of the latest "+KTCPSEND", 64 seconds has elapsed
AT+KTCPACKINFO=1	URC "+KTCP_ACK" indicates that data has not arrived on the remote side yet. The network may not be good.
+KTCPACKINFO: 1, 0	Poll the status of the latest TCP data
OK	The status of the latest TCP data is "failure": not all data has been received by the remote side

18.6. UDP Commands Examples

18.6.1. Client Mode

AT&K3 OK	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password",,, OK	Set GPRS parameters (APN, login, password)
AT+KUDPCFG=1,0 +KUDPCFG: 1 OK	Create a new UDP socket (returned session 1) with the parameters associated to the connection profile ID number 0
AT+KUDPSND= 1,"82.234.17.52",32,18 CONNECT <...Data sent...> --EOF--Pattern-- OK	Send UDP data after "CONNECT"
+KUDP_DATA: 1,35 AT+KUDPRCV=1, 35 CONNECT This is a simple UDP Protocol test --EOF--Pattern-- OK	Received notification that indicates the presence of 35 bytes in the socket Try to read 35 bytes from session 1
+KUDP_RCV: "82.234.17.52",32 +KUDP_DATA: 1,35 AT+KUDPRCV=1, 18 CONNECT This is a simple --EOF--Pattern-- OK	Received notification that indicates the presence of 35 bytes in the socket
+KUDP_DATA_MISSED: 1,17 AT+KUDPCLOSE=1 OK	Try to read 18 bytes from session 1 There are 17 unread bytes left and missed in the UDP socket
AT+KUDPCFG? OK	Close the UDP session No sessions are available anymore

18.6.2. Server Mode

AT&K3 OK	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK	Set GPRS parameters (APN, login, password)
AT+KUDPCFG=1,1,3000 +KUDPCFG: 1 OK	Set UDP listener (port 3000). Initiate the server. Session ID is 1
AT+KUDPCFG? +KUDPCFG: 1,0,1,3000 OK	Check if the server is initiated
AT+KCGPADDR +KCGPADDR: 0, "192.168.0.71" OK	Get local IP address
+KUDP_DATA: 1,9	Data comes in from some client
AT+KUDPRCV=1,9 CONNECT DATA TEST--EOF--Pattern-- OK	Read received data
+KUDP_RCV: "10.10.10.5",1111	This data was sent from "10.10.10.5" (port:1111)
AT+KUDPSND=1,"10.10.10.5",3100,18 CONNECT <18 bytes data ended with "--EOF--Pattern--"> OK	Send 18 bytes to a remote server (port:3100)
AT+KUDPCLOSE=1 OK	Close the UDP server. The session is also deleted at the same time
AT+KUDPCFG? OK	No sessions are available anymore

18.6.3. Use Cases for KTCP_DATA and KUDP_DATA

18.6.3.1. KTCP_DATA and KUDP_DATA without Data Auto Retrieval – Client Mode

<pre>AT+KCNXCFG=1,"GPRS","CMNET" OK AT+KTCPCFG=1,0,"202.170.131.76",2000 +KTCPCFG: 1 OK AT+KTCPCNX=1 OK +KTCP_DATA: 1,10 AT+KTCPRCV=1,10 CONNECT 0123456789--EOF--Pattern-- OK AT+KUDPCFG=1,0 +KUDPCFG: 2 OK +KUDP_DATA: 2,8 AT+KUDPRCV=2,8 CONNECT 01234567--EOF--Pattern-- OK +KUDP_RCV: "202.170.131.76",2001</pre>	Connect to TCP server 10 bytes have arrived Receive the 10 bytes that arrived Open a UDP socket 8 bytes have arrived Read the data
---	--

18.6.3.2. KTCP_DATA and KUDP_DATA without Data Auto Retrieval – Server Mode

<pre>AT+KTCPCFG=1,1,13 +KTCPCFG: 1 OK AT+KTCPCNX=1 OK AT+KCGPADDR +KCGPADDR: 0,"10.35.125.89" OK +KTCP_SRVREQ: 1,2 +KTCP_SRVREQ: 1,3 +KTCP_DATA: 2,10</pre>	Configure a TCP server socket Open the listen port Session 2 is set Session 3 is set 10 bytes have arrived at session 2
---	--

+KTCP_DATA: 3,8 AT+KTCPCRV=2,10 CONNECT 0123456789--EOF--Pattern-- OK AT+KTCPCRV=3,8 CONNECT 01234567--EOF--Pattern-- OK AT+KUDPCFG=1,1,3000 +KUDPCFG: 4 OK +KUDP_DATA: 4,8 AT+KUDPCRV=4,8 CONNECT 01234567--EOF--Pattern-- OK +KUDP_RCV: "202.170.131.76",2001	8 bytes have arrived at session 3 Receive the 10 bytes in session 2 Receive the 8 bytes in session 3 Open a UDP socket in server mode 8 bytes have arrived Receive the 8 bytes
--	--

18.6.3.3. KTCP_DATA and KUDP_DATA with Data Auto Retrieval – Client Mode

AT+KCNXCFG=1,"GPRS","CMNET" OK AT+KTCPCFG=0,0,"202.170.131.76",2000,,1 +KTCPCFG: 1 OK AT+KTCPCNX=1 OK +KTCP_DATA: 1,10,0123456789 AT+KUDPCFG=0,0,3000,1 +KUDPCFG: 2 OK +KUDP_DATA: 2,8,"202.170.131.76",2001,01234567	When <data_mode> = 1, data will be received by the URC "+KTCP_DATA" Connect to TCP server 10 bytes have arrived. The data are presented in the URC directly When <data_mode> = 1, data will be received by the URC "+KUDP_DATA" 8 bytes have arrived. The data are presented in the URC directly
--	---

18.6.3.4. KTCP_DATA and KUDP_DATA with Data Auto Retrieval – Server Mode

AT+KTCPCFG=1,1,,13,1 +KTCPCFG: 1 OK	When <data_mode> = 1, all child connections will display data in URC mode. Data will be received by the URC "+KTCP_DATA:"
AT+KTCPCNX=1 OK	Open the listen port
AT+KCGPADDR +KCGPADDR: 1,"10.35.125.89" OK +KTCP_SRVREQ: 1,2 +KTCP_SRVREQ: 1,3 +KTCP_DATA: 2,10,0123456789 +KTCP_DATA: 3,8,01234567	10 bytes have arrived in session 2 8 bytes have arrived in session 3 Data are presented in the URC directly
AT+KUDPCFG=1,1,3000,1 +KUDPCFG: 4 OK +KUDP_DATA: 4,8,"202.170.131.76",2001,01234567	Open a UDP socket in server mode. Data will be received by the URC "+KUDP_DATA:" 8 bytes have arrived. Data are presented in the URC directly

18.7. FTP Commands Examples

18.7.1. Client Mode

AT&K3 OK	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password",,, OK	Set GPRS parameters (APN, login, password)
AT+KFTPCFG=1,"ftp.test.fr","userlogin","userpassword",21,0 OK	Set FTP server address, login, password and port number
AT+KPATTERN="--EOF--Pattern--" OK	Customize the End of File pattern
AT+KFTPSND=0,,"Dir","TestFile.txt",0 CONNECT F6E6E656374696F6E20746573742E--EOF--Pattern-- OK	Send data and store them in "TestFile.txt" from the FTP server. Data are presented with the EOF string.

AT+KFTPRCV=0,"Dir","Testfile.txt",0 CONNECT F6E6E656374696F6E20746573742E--EOF--Pattern-- OK	Read the file named "TestFile.txt" from ftp server, data are sent and end by EOF string
AT+KFTPDEL=0,"Dir","TestFile.txt" OK	Delete the file called "TestFile.txt" in the FTP server
AT+KFTPCLOSE=0 OK	Close the connection

18.7.2. "FTP Resume" Use Case

18.7.2.1. Resume Feature when Transmitting Data to Serial Link

AT+KCNXCFG=1,"GPRS","CMNET" OK	
AT+KFTPCFG=1,"202.170.131.76","administrator","8ik,(OL>",21,0 +KFTPCFG: 1 OK	
AT+KFTPRCV=1,,,"111111.txt",0 CONNECT 750aaaaaaaa..... aaaaa250bbbbbbb--EOF--Pattern-- +KFTP_ERROR: 1, 421	Total of 760 data from the serial link The result code indicates that the download met with some problems which may be due to control or data connection lost
AT+KFTPRCV=1,,,"111111.txt",0,760 bbbbbb.....bbbbbbbbbend--EOF--Pattern-- OK	Try to resume transfer by using the offset 760. Total data from the serial link should be 240 The complete file "111111.txt" can be obtained by combining the data received from the two separate downloads

18.7.2.2. Use Case when FTP Server does not Support the Resume Feature

<pre>AT+KCNXCFG=1,"GPRS","CMNET" OK AT+KFTPCFG=1,"202.170.131.76","administrator","8ik,(OL>",21,0 +KFTPCFG: 1 OK AT+KFTPRCV=1,,,"11111.txt",0 CONNECT 750aaaaaaaa.....aaaaa250bbbbbbb--EOF--Pattern-- +KFTP_ERROR: 1,421 AT+KFTP_RCV=1,,,"11111.txt",0,760 CONNECT --EOF--Pattern-- +KFTP_ERROR: 1,502</pre>	
	Total of 760 data from the serial link The result code indicates that the download met with some problems which may be due to control or data connection lost ERROR 502 means that some commands in the procedure are not supported by the server

18.8. HTTP Commands Examples

AT&K3 OK	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK	Set GPRS parameters (APN, login, password)
AT+KCNXTIMER=1,60,2,70 OK	Set Timers
AT+KHTTPCFG=1,"www.google.com",80,1 +KHTTPCFG: 1 OK	Set HTTP address, port number and http version
AT+KHTTPHEADER=1 CONNECT Accept: text/html If-Modified-Since: Saturday, 15-January-2000 14:37:11 GMT OK	Set the header of the request Send HTTP data after "CONNECT". The data should be ended with the EOF string.
AT+KHTTPGET=1, "/index.html" CONNECT HTTP/1.0 200 OK Cache-Control: private, max-age=0 Date: Tue, 24 Jun 2008 02:11:35 GMT Expires: -1 Content-Type: text/html; charset=ISO-8859-1	Get the web page HTTP server response

<pre> Set-Cookie: PREF=ID=ae1c663417e7799e:NW=1:TM=1214273495:LM=121 4273495:S=5Uq9kExK4aTEv_cx; expires=Thu, 24-Jun-2010 02:11:35 GMT; path=/; domain=.google.com Server: gws Connection: Close <html><head><meta http-equiv="content-type" ... a lot of data... --EOF--Pattern-- OK AT+KHTTPHEAD=1, "/index.html" CONNECT HTTP/1.0 200 OK Cache-Control: private, max-age=0 Date: Tue, 24 Jun 2008 02:11:35 GMT Expires: -1 Content-Type: text/html; charset=ISO-8859-1 Set-Cookie: PREF=ID=ae1c663417e7799e:NW=1:TM=1214273495:LM=121 4273495:S=5Uq9kExK4aTEv_cx; expires=Thu, 24-Jun-2010 02:11:35 GMT; path=/; domain=.google.com Server: gws Connection: Close OK AT+KHTTPHEADER=1 CONNECT Accept: text/html Context-Length: 64 OK AT+KHTTPPOST=1,, "/get.cgi" CONNECT <...Data send...> HTTP/1.0 200 OK Content-Type: text/plain Context-Length: 37 Your data have been accepted. --EOF--Pattern-- OK </pre>	Get the headers of the web page HTTP server response Send the data to the HTTP server Length of HTTP 1.0 POST data should be specified by HTTP header field Context-Length, otherwise HTTP server may not expect any data to be uploaded and should close the connection. 64 bytes of data Send HTTP data after "CONNECT" HTTP server response
--	--

18.9. Switch Data/Command Mode DTR +++ ATO Behavior Table

When the module is in data mode and the connection encounters an error, NO CARRIER terminal response is shown and the module is switched back to command mode.

The following table shows the behavior when trying to switch mode (when connection is running properly):

- Case 1: "+++" is used to switch from data mode to command mode, and the service is suspended.
- Case 2: If AT&D1 is set, "DTR drop" is used to switch from data mode to command mode, but the service is suspended.
- Case 3: If AT&D2 is set, "DTR drop" is used to switch from data mode to command mode, and the service is stopped.
- Case 4: If AT&D0 is set, "DTR drop" has no any impact on the mode switch.
- Case 5: ATO[n] is used to switch from command mode to data mode.

	Case1/Case5 +++/ATO[n]	Case2/Case5 DTR1/ATO[n]	Case3/Case5 DTR2/ATO[n]	Case4/Case5 DTR0
TCP/UDP: +KTCPSND: Send data +KTCPRCV: Receive data +KUDPSND: Send data +KUDPRCV: Receive data +KTCPSTART: Direct data flow	OK / CONNECT	OK / CONNECT	NO CARRIER / NO CARRIER (disconnect)	NO IMPACT
FTP: +KFTPRCV: Download FTP files +KFTPSND: Upload FTP files	OK / NO CARRIER (disconnect)	OK / NO CARRIER (disconnect)	NO CARRIER / NO CARRIER (disconnect)	NO IMPACT
HTTP: +KHTTPGET: Get information +KHTTPHEAD: Get head of information +KHTTPPOST: Send data +KHTTPHEADER: Set the HTTP Request Header	OK / NO CARRIER (disconnect)	OK / NO CARRIER (disconnect)	NO CARRIER / NO CARRIER (disconnect)	NO IMPACT
HTTPS: +KHTTPSGET: Get information +KHTTPSHEAD: Get head of information +KHTTPSPOST: Send data +KHTTPSHEADER: Set the HTTPS Request Header	OK / NO CARRIER (disconnect)	OK / NO CARRIER (disconnect)	NO CARRIER / NO CARRIER (disconnect)	NO IMPACT