



AirPrime HL76xx

AT Commands Interface Guide



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5.0	February 13, 2017	Updated: <ul style="list-style-type: none"> 10.18 +CGEQNEG Command: 3G Negotiated Quality of Service Profile 10.19 +CGREG Command: GPRS Network Registration Status 10.24 +WPPP Command: PDP Context Authentication Configuration 12.7.1 +KCNXCFG Command: GPRS Connection Configuration 12.13.1 +KHTTPCFG Command: HTTP Connection Configuration 13.6 +WDSI Command: Device Services Indication 13.8 +WDSS Command: Device Services Session 14.1 +WMTXPOWER Command: Test RF Tx 14.2 +WMRXPOWER Command: Test RF Rx 17 M2M Service Optimization Commands 18.2.7 Error Case Examples
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9.0	June 05, 2018	Updated: <ul style="list-style-type: none"> 5.67 +WESHDOWN Command: Emergency Shutdown 18.2.3 CMS Error Codes

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>> 1. Introduction

This document presents the AT Command Set for the AirPrime HL76xx series of embedded modules. AirPrime HL76xx variants covered in this manual are:

- HL7618
- HL7618RD
- HL7648
- HL7650
- HL7688
- HL7690
- HL7692

Table headers indicate the HL76xx variant(s) that support the documented command.

1.1. Reference Configuration

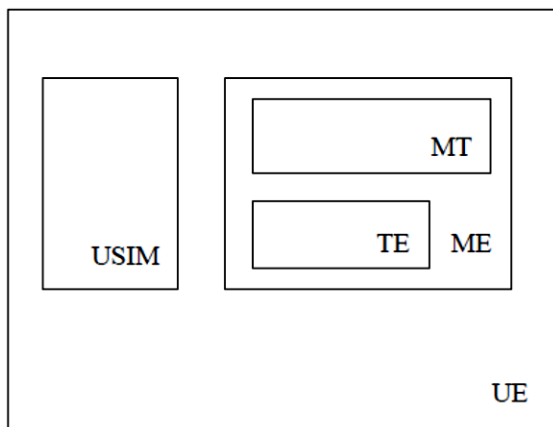


Figure 1. Reference Configuration

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 as listed in the table below.

Table 1. Types of Extended AT Commands

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 parameter values are underlined – this is the value used when a parameter value is not specified. Note that factory values may be configured differently from the default value.

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: **ATZE1+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 terminals (USB/UART) configured in AT commands mode in general.

Note that:

- URCs are not sent to terminals configured in Data/NMEA/Traces modes.
- For buffered URCs related to AT commands +CMTI (+CNMI), +CIEV (+CMER) and +CGEV (+CGEREP),
 - they are sent when at least one AT terminal is in AT command mode;
 - they are sent to the terminals that are in AT command mode, discarded for the terminals in Data mode.
- In sleep mode, URCs wake up the module and are sent to the terminals in AT command mode.
- URCs of some features (e.g. IP AT commands) are only sent to terminals that initiates the configurations (e.g. +KIPCFG).

1.4. PDP Context Usage

1.4.1. Verizon Modules

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 another 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 another 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).
- PDP connection of CID=1 is maintained activated for IMS in the LTE network.

Caution: *Two failed activation attempts (+CGACT, DUN, 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.*

1.4.2. Non-Verizon Modules

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

- CID=1 is reserved for IMS by LTE protocol stack
- CID=5 is reserved for Sierra Wireless AirVantage (AVMS)

Note that:

- CID=1 is locked by AT+HBHV=2 (PDP context related AT commands return error response).
- PDP connection of CID=1 is maintained activated for IMS in LTE network

Caution: *Failed activation attempts (+CGACT, DUN, etc.) due to invalid/incorrect APN blocks the corresponding CID from further attempts until data retry condition releases PDP context blocking.*

1.5. SMS Commands

Note: *This section is only applicable to Verizon modules.*

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 the firmware supports automatic conversion of 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, the following should be noted:

- +XCMGS3GPP2 and +XCMT3GPP2 are still available for sending and receiving SMS messages in 3GPP2 SMS PDU format.
- "Reply Option DAK_REQ" in 3GPP2 SMS is different from TP-SRR in 3GPP SMS as normal SMS should be received as a "status report".
- SMS over IMS Implementation is based on 3GPP2 Spec C.S0015-A v1.0 which does not support SMS memory full status acknowledgement as for 3GPP. Hence, mobile terminated SMS (MT-SMS) are discarded when MT-SMS is received while SMS memory is full.
- Only some selected fields of 3GPP SMS PDU are supported in 3GPP2 SMS mode. This means the other 3GPP SMS PDU fields are ignored by 3GPP2 SMS mode, e.g. +CSCA. The following table maps these parameter differences.

3GPP2 SMS PDU Fields	3GPP SMS PDU Fields
Message Identifier MESSAGE_TYPE	TP-Message-Type-Indicator TP-MTI
Message Identifier MESSAGE_ID	TP-Message-Reference TP-MR
Message Identifier HEADER_IND	TP-User-Data-Header-Indicator TP-UDHI
User Data MSG_ENCODING	TP-Data-Coding-Scheme TP-DCS*
User Data MESSAGE_TYPE	TP-Message-Type-Indicator TP-MTI
User Data NUM_FIELDS	TP-User-Data-Length TP-UDL
User Data CHARi	TP-User Data TP-UD
Validity Period – Absolute YEAR (00-99)	TP-VP (Absolute format) TP-VP
Validity Period – Absolute MONTH (01-12)	TP-VP (Absolute format) TP-VP
Validity Period – Absolute DAY	TP-VP (Absolute format) TP-VP
Validity Period – Absolute HOURS (00 - 23)	TP-VP (Absolute format) TP-VP
Validity Period – Absolute MINUTES (00 -59)	TP-VP (Absolute format) TP-VP
Validity Period – Absolute SECONDS (00 - 59)	TP-VP (Absolute format) TP-VP
Validity Period – Relative VALIDITY	TP-VP (Relative format) TP-VP
Reply Option DAK_REQ	TP-Status-Report-Request TP-SRR
Multiple Encoding User Data MSG_ENCODING	TP-Data-Coding-Scheme TP-DCS
Multiple Encoding User Data NUM_FIELDS	TP-User-Data-Length TP-UDL
Multiple Encoding User Data CHARi	TP-User-Data TP-UD

* For TP-DCS in 3GPP SMS PDU, only the character set (GSM 7-bit default alphabet, 8-bit and UCS2-16-bit) are mapped to MSG_ENCODING; "Message Class" is not mapped.

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
CUG	Closed User Group
DAC	Digital to Analog Converter
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

Abbreviation	Definition
DSR	Data Set Ready
DTE	Date 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
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

Abbreviation	Definition
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
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

Abbreviation	Definition
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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> +++	<u>Response</u> OK
<u>Reference</u> V.25Ter	<u>Notes</u> <ul style="list-style-type: none"> • 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> A/	<u>Response</u> Depends 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> ATO[<n>]	<u>Response</u> TA returns to data mode from command mode: CONNECT <text>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p>If connection is not successfully resumed: NO CARRIER</p> <p><u>Parameter</u> <n> 0 Switch from command mode to data mode 1 – 200 Session ID</p>
<p><u>Reference</u> V.25Ter</p>	<p><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.</p>

2.4. E Command: Enable Echo Command

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Execute command</i></p> <p><u>Syntax</u> ATE[<value>]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameter</u> <value> <u>0</u> Echo OFF 1 Echo ON</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Execute command</i></p> <p><u>Syntax</u> ATQ[<n>]</p>	<p><u>Response</u> OK (if <n> = 0) Nothing (if <n> = 1)</p> <p><u>Parameter</u> <n> <u>0</u> Result codes transmitted by TA 1 No result codes transmitted by TA</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 seconds to wait for connection completion

2.9. V Command: TA Response Format

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> ATV[value]	<u>Response</u> In case of information responses, 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Write command</i>	
<u>Syntax</u> ATX[<value>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <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>	<ul style="list-style-type: none"> 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> AT&C<value>	<u>Response</u> OK <u>Parameter</u> <value> 0 DCD line is always active 1 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.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> AT&D<value>	<u>Response</u> OK or +CME ERROR: <err> <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> <ul style="list-style-type: none"> • This command only applies to data calls. • DTR/AT&D is only applicable to the USB AT port; it has no effect on UART1. • If <value> is not numeric, the command response is ERROR.

2.13. &F Command: Restore Factory Settings

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> AT&F[<value>]	<u>Response</u> OK <u>Parameter</u> <value> <u>0</u> 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. &W Command: Save Stored Profile

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Execute command</i></p> <p><u>Syntax</u> AT&W[<value>]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u> <value> <u>0</u> Save in STORED PROFILE 0 1 Save in STORED PROFILE 1</p>
<p><u>Reference</u> V.25Ter</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • This command saves the current configuration in a non-erasable place. • &R, S05, S06 and S08 have no effect. Their parameters are not saved in non-volatile memory.
<p><u>Examples</u></p>	<p>AT&W // Save current configuration to Profile 0 OK</p> <p>AT&W0 // Save current configuration to Profile 0 OK</p> <p>AT&W1 // Save current configuration to Profile 1 OK</p>

2.15. &V Command: Display Current Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Execute command</i></p> <p><u>Syntax</u> AT&V[<value>]</p>	<p><u>Response</u> ACTIVE PROFILE: <current configuration> STORED PROFILE 0: <user default configuration> STORED PROFILE 1: <manufacturer configuration> OK</p> <p><u>Parameter</u> <value> <u>0</u> Profile number</p> <p>This command indicates the result of certain actions as shown below:</p> <div style="text-align: center;"> <pre> graph TD AP[Active Profile] SP[Stored profile] DS[Default Settings] AP -- ATZ --> SP SP -- AT&W --> AP AP -- AT&F --> DS </pre> </div>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> 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. Registers S05, S06 and S08 have no effect. They are only implemented for compliance with V.25ter. Their parameters are always read as values 8, 2 and 2 respectively. &R has no effect and it is not defined in the V.25ter specification. It is only implemented here for compatibility purposes. Its parameter is always read as 1.
<p><u>Example</u></p>	<p>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</p>

2.16. &K Command: Flow Control Option

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692							
<p><i>Execute command</i></p> <p><u>Syntax</u> AT&K[<mode>]</p>	<p><u>Response</u> OK</p> <p><u>Parameter</u></p> <table border="0"> <tr> <td><mode></td> <td><u>0</u></td> <td>Disable all flow control</td> </tr> <tr> <td></td> <td>3</td> <td>Enable bi-directional hardware flow control</td> </tr> </table>	<mode>	<u>0</u>	Disable all flow control		3	Enable bi-directional hardware flow control
<mode>	<u>0</u>	Disable all flow control					
	3	Enable bi-directional hardware flow control					
<p><u>Reference</u> V.25ter</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> 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 is always ON); it has no effect on the USB AT port. This command is not supported in MUX mode; flow control is not supported in the DLC channel. 						

2.17. &S Command: DSR Option

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Write command</i>	
<u>Syntax</u> AT&S [<override>]	<u>Response</u> OK <u>Parameter</u> <override> 0 DSR signal is always ON 1 DSR signal is always OFF
<u>Reference</u> V.25ter	<u>Notes</u> This is a dummy command and has no effect on the DSR signal.

2.18. +IPR Command: Set Fixed Local/DTE Rate

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+IPR=?	<u>Response</u> With Autobaud: +IPR: (list of supported auto detectable <baud_rate> values)[,(list of fixed only <baud_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> 115200 (default value) For HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692: 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 230400, 460800, 500000, 750000, 921600, 1843200, 3000000, 3250000, 6000000 For HL7650: 0 (autobaud), 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 230400, 460800, 500000, 750000, 921600, 1843200, 3000000, 3250000, 3686400, 4000000, 6000000

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Notes</u>	<ul style="list-style-type: none"> • 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 when AT&W is entered. It is not automatically saved after a +IPR write command. • 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.

2.19. L Command: Monitor Speaker Loudness

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
<i>Write command</i>	
<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.

2.20. M Command: Monitor Speaker Mode

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
<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.



3. General AT Commands

3.1. I Command: Request Identification Information

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

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>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

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:
 <3G FW version name>
 OK

Parameters

<model> Model identifier

<version name> Firmware version string
 HL7618, HL7618RD, HL7688, HL7690 and HL7692 follow the format:
 AHL75xx_TEST.0.0.141506 <...> (test firmware)
 AHL75xx.1.0.141506.<...> (official firmware)

HL7648 and HL7650 follow 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 (without 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> Firmware 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 with secure boot
 NON-FUSED Non-fused module

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference	Notes
V.25ter	<ul style="list-style-type: none"> • ATI3 is identical to AT+GMR and AT+CGMR. • ATI0 and ATI are identical to AT+GMM and AT+CGMM.
Examples	<pre> ATI HL7618 //When using an HL7618 module OK ATI0 HL7618 //When using an HL7618 module OK # For fused modules ATI4 FUSED OK # For non-fused modules ATI4 NON-FUSED OK # Examples on a test firmware for HL7648/HL7650 ATI1 SWIMCB71XX-G.00.00.163500 OK ATI3 SWIMCB71XX-G.00.00.163500.201609261356.01 OK # Example of a test firmware with TEST as the version name ATI3 BHL7618_TEST.0.0.154401.201511132200.x7120_2 OK # Examples on official firmware ATI1 HL7618.3.0 //When using an HL7618 module OK ATI3 BHL7618.3.0.154401.201511132200.x7120_2 OK </pre>

3.2. Z Command: Reset and Restore User Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> ATZ[<value>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <value> 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CGMM=?	<u>Response</u> OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 HL7618 //When using an HL7618 module OK

3.5. +CGMR Command: Request Revision Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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>Note</u> This command is identical to AT13 and AT+GMR.
<u>Examples</u>	AT+CGMR AHL7618_TEST.0.0.153200.201508220500.x7120_1 // test HL7618 firmware OK
	AT+CGMR AHL7618.1.0.153200.201508220500.x7120_1 // official HL7618 firmware OK

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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> <ul style="list-style-type: none"> • This command is identical to AT+GSN. • This command can work with or without a SIM. • See also AT+KGSN.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><u>Parameters</u></p> <p><IMEI> 15 digits IMEI (8 digits for TAC + 6 digits for SNR + 1 check digit)</p> <p><IMEISV> 16 digits IMEISV (8 digits for TAC + 6 digits for SNR + 2 SVN digits)</p> <p><IMEISV_STR> Formatted string; <15 digits>-<Check digit> SV: <Software version></p> <p><FSN> 14 digits Serial Number</p> <p><FSN-BB> 16 digits Serial Number + BB</p>
Reference Sierra Wireless Proprietary	<p><u>Notes</u></p> <p>This command has been developed to provide the IMEI SV and Serial Number through an AT command and it can work without a SIM.</p>
<u>Examples</u>	<p>AT+KGSN=0 +KGSN: 351578000023006 OK</p> <p>AT+KGSN=1 +KGSN: 3515780000230001 OK</p> <p>AT+KGSN=2 +KGSN: 35157800002300-6 SV:01 OK</p> <p>AT+KGSN=3 +KGSN: 0123456789ABCD OK</p> <p>AT+KGSN=4 +KGSN: 0123456789ABCD01 OK</p>

3.8. +HWREV Command: Request Hardware Revision

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u></p> <p>AT+HWREV=?</p>	<p><u>Response</u></p> <p>OK</p>
<i>Read command</i>	
<p><u>Syntax</u></p> <p>AT+HWREV?</p>	<p><u>Response</u></p> <p>Hardware revision: X.Y OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><u>Parameter</u> X.Y These are the HH numbers in FSN (returned by TTYWWDNNNNPPHH-BB)</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u> This command works with or without a SIM.</p>
<p><u>Example</u></p>	<p>Assuming FSN=TTYWWDNNNNPP01-BB AT+HWREV? Hardware revision: 0.1 OK</p>

3.9. +CSCS Command: Set TE Character Set

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+CSCS=?</p>	<p><u>Response</u> +CSCS: (list of supported <vail>s) OK</p>
<p><i>Read command</i></p>	
<p><u>Syntax</u> AT+CSCS?</p>	<p><u>Response</u> +CSCS: <vail> OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p><i>Write command</i></p>	
<p><u>Syntax</u> AT+CSCS= [<vail>]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameter</u> <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)</p>
<p><u>Notes</u></p>	<p><vail> is saved in non-volatile memory per AT port over module reboot.</p>

3.10. +CIMI Command: Request International Mobile Subscriber Identity

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 or +CME ERROR: <err>
	<u>Parameter</u> <IMSI> International Mobile Subscriber Identity

3.11. +GMI Command: Request Manufacturer Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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.
<u>Example</u>	AT+GMM HL7618 //When using an HL7618 module OK

3.13. +GMR Command: Request Revision Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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>Note</u> This command is identical to AT13 and AT+CGMR.
<u>Examples</u>	AT+CGMR AHL7618_TEST.0.0.153200.201508220500.x7120_1 // test HL7618 firmware OK
	AT+CGMR AHL7618.1.0.153200.201508220500.x7120_1 // official HL7618 firmware OK

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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> <ul style="list-style-type: none"> This command is identical to AT+CGSN. This command can work with or without a SIM. See also AT+KGSN.

3.15. +CMUX Command: Multiplexing Mode

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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>,<port_speed>,<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 0 Basic option 1 Advanced option (not supported)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

	<p><subset> <u>0</u> UIH frames used only 1 UI frames used only (not supported) 2 I frames used only (not supported)</p> <p><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</p> <p><N1> 1 – 1509 Maximum frame size. Default value = <u>31</u> (64 if Advanced option is used)</p> <p><T1> 1 – 255 Acknowledgement time in units of ten milliseconds. Default value = <u>10</u> (100 ms)</p> <p><N2> 0 – 5 Maximum number of re-transmissions. Default value = <u>3</u></p> <p><T2> 2 – 255 Response time for the multiplexer control channel in units of ten milliseconds. Default value = 30 (300 ms). Note that <T2> must be longer than <T1>.</p> <p><T3> 1 – 255 Wake up response timer in seconds. Currently not supported; in case of read command, 0 is returned.</p> <p><k> 1 – 7 Window size for advanced operation with error recovery options. Currently not supported; in case of read command, 0 is returned.</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • 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; the parameters become active only after sending OK. • The "+++" escape sequence is not supported in the DLC port in CMUX mode. Alternatively, DTR can be used to switch from data mode to command mode, or use another DLC port to send AT commands. • The module handles the frame data step by step in CMUX mode. If there are any wrong data in the frame, e.g. wrong CRC, nothing will be returned to the terminal, and the module will wait for a valid frame data. • If the AT+CFUN command is entered with <rst>=1, all open CMUX channels will be closed and the module will reset. • There is no activity timeout to return to AT mode after entering MUX mode. • MUX DLC ports are not persistent over power cycles. After a power cycle, DLC ports need to be re-established. • When an established MT call is hanged up from the caller side, NO CARRIER will only be sent to the port on which the call was established (i.e. the port on which ATD/ATA was sent). • Advanced CMUX options mentioned in 3GPP 27.010 are not supported.

3.16. +GCAP Command: Request Complete TA Capability List

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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
<u>Notes</u>	<ul style="list-style-type: none"> • 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</pre>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<pre>at+wimei=35461006003582 // Enter 14-digit IMEI OK at+wimei? +WIMEI: 354610060035829 OK</pre>

3.18. +KODIS Command: Access ODIS Information

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
<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 <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> <ul style="list-style-type: none"> 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>	<pre>at+kodis? +KODIS: 1,"HMAN1","HMOD1","HSW1","HUID1" OK</pre>

HL7648 and HL7688	
	<pre>at+kodis=1,"HostMan","HostMode","01.00","HostID" OK at+kodis? +KODIS: 1,"HostMan","HostMode","01.00","HostID" OK</pre>

3.19. &R Command: RTS and CTS Option

Note: For HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
<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 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

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
<i>Test command</i>	
<u>Syntax</u> AT+FMI=?	<u>Response</u> OK
<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

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
<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 HL7688 OK

3.22. \N Command: Data Transmission Mode

Note: For HL7648, HL7688, HL7690 and HL7692 only.

HL7648, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> ATN<x>	<u>Response</u> OK
	<u>Parameter</u> <x> 0 Transparent mode 4, 6 RLP mode (non-transparent)
<u>Notes</u>	This command has no effect and 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.

3.23. N Command: Negotiate Handshake Option

Note: For HL7648, HL7688, HL7690 and HL7692 only.

HL7648, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> ATN[<option>]	<u>Response</u> OK <u>Parameter</u> <option> 0 – 9
<u>Notes</u>	This command has no effect and 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. S5 Command: Write Command Line Editing Character

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Read command</i>	
<u>Syntax</u> ATS5?	<u>Response</u> <n> OK
<i>Write command</i>	
<u>Syntax</u> ATS5=<n>	<u>Response</u> OK <u>Parameters</u> <n> 8 Only 8 (backspace) is supported
<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.

3.25. S6 Command: Pause before Blind Dialing

Note: For HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
<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.

3.26. S8 Command: Comma Dial Modifier Time

Note: For HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
<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.

3.27. W Command: Extended Result Code

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 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.

3.28. B Command: Data Rate Selection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> ATB<rate>	<u>Response</u> OK <u>Parameter</u> <rate> 0 – 99 Data rate
<u>Reference</u> V.25Ter	<u>Notes</u> <ul style="list-style-type: none"> This command has no effect and was only implemented for compliance with V.25ter. Parameters are ignored and are not saved in non-volatile memory. Refer to AT+CBST regarding CSD data rate. (CSD is not applicable to the HL7650.)

3.29. S2 Command: Set Character for the Escape Sequence (Data to Command Mode)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Read command</i>	
<u>Syntax</u> ATS2?	<u>Response</u> <n> OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Write command</i>	
<u>Syntax</u> ATS2=<n>	<u>Response</u> OK <u>Parameter</u> <n> Only 43 ("+") is supported
<u>Reference</u> V.25Ter	<u>Notes</u> <ul style="list-style-type: none"> This command has no effect and was only implemented for compliance with V.25ter. Parameters are ignored and are not saved in non-volatile memory <n> will not be shown by the AT&V command.

3.30. S3 Command: Command Line Termination Character

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690 only.

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690	
<i>Read command</i>	
<u>Syntax</u> ATS3?	<u>Response</u> <n> OK
<i>Write command</i>	
<u>Syntax</u> ATS3=<n>	<u>Response</u> OK <u>Parameters</u> <n> 13 Command line termination character <CR>: carriage return
<u>Reference</u> V.25Ter	<u>Notes</u> This command has no effect and was only implemented for compliance with V.25ter. Parameters are ignored and are not saved in non-volatile memory.

3.31. S10 Command: Automatic Disconnect Delay

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690 only.

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690	
<i>Read command</i>	
<u>Syntax</u> ATS10?	<u>Response</u> <time> OK

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690	
<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 for compliance with V.25ter. Parameters are ignored and are not saved in non-volatile memory.

3.32. S11 Command: DTMF Dialing Speed

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690 only.

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690	
<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 for compliance with V.25ter. Parameters are ignored and are not saved in non-volatile memory.



4. Call Control Commands

4.1. D Command: Dial Number

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> ATD=?</p>	<p><u>Response</u> 1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ ! OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> ATD?</p>	<p><u>Response</u> 1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ ! OK</p>
<p><i>Execute command</i></p> <p><u>Syntax</u> ATD[<n>]</p>	<p><u>Response</u></p> <p>OK If successfully connected</p> <p>CONNECT Connection has been established</p> <p>RING The DCE has detected an incoming call signal from the network</p> <p>NO CARRIER The connection cannot be established</p> <p>BUSY Engaged (busy) signal detected</p> <p>NO ANSWER If no hang up is detected after a fixed network timeout</p> <p>CONNECT <data rate> Same as CONNECT but includes the data rate</p> <p>RING CTM The MS has detected an incoming CTM call signal from the network; this code is proprietary</p> <p>CONNECT FAX Same as CONNECT but includes the indication related to a fax call</p> <p><u>Parameter</u></p> <p><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)</p>
<p><u>Reference</u> V.25Ter</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • This command may generally be aborted when receiving an ATH command during execution. • Response "OK" may arrive just after the ATD command or after the call is active (see AT+COLP). • <n> is ignored when it is set to ",", "T", "!", "W" or "@" • When an established MT call is hanged up from the caller side, NO CARRIER will only be sent to the port on which the call was established (i.e. the port on which ATD was sent).

4.4. +CR Command: Service Reporting Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CR=?</p>	<p><u>Response</u> +CR: (list of supported <mode>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CR?</p>	<p><u>Response</u> +CR: <mode> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CR= [<mode>]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u></p> <p><mode> 0 Disables reporting 1 Enables reporting</p> <p><serv> ASYNC Asynchronous transparent SYNC Synchronous transparent REL ASYNC Asynchronous non-transparent REL SYNC Synchronous non-transparent GPRS [<L2P>] GPRS</p>
<p><u>Notes</u></p>	<p>The optional <L2P> proposes a layer 2 protocol to use between the MT and the TE. It is defined in +CGDATA command.</p>

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CRC=?</p>	<p><u>Response</u> +CRC: (list of supported <mode>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CRC?</p>	<p><u>Response</u> +CRC:<mode> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CRC= [<mode>]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameter</u> <mode> 0 Disable extended format 1 Enable extended format</p>
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +CRING: <type></p> <p><u>Parameter</u> <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</p> <p><priority> (Optional) EMLPP priority level of the incoming call by paging, notification or setup message.</p> <p><subaddr> String type subaddress of format specified by <satype></p> <p><satype> Type of subaddress octet in integer format</p> <p><PDP_type>, <PDP_addr>, <APN> As defined in AT+CGDCONT command</p> <p><L2P> (Optional) proposes a layer 2 protocol to use between the MT and the TE.</p>

4.6. +CSTA Command: Select Type of Address

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CSTA=?</p>	<p><u>Response</u> +CSTA: (list of supported <type>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CSTA?</p>	<p><u>Response</u> +CSTA: <type> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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.

4.7. +CMOD Command: Call Mode

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

4.8. +CEER Command: Extended Error Report

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CEER=?	<u>Response</u> OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Write command</i>	
<p><u>Syntax</u> AT+CEER</p>	<p><u>Response</u> +CEER: <category>[,<cause>,<descriptions>] OK</p> <p><u>Parameters</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"</p> <p><cause> Digit representing the error cause sent internally or by the network. Refer to 18.2.2 CEER Error Codes for more information.</p> <p><description> Verbose string containing the textual representation of <cause>. Refer to 18.2.2 CEER Error Codes for more information.</p>

4.9. +CSNS Command: Single Numbering Scheme

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u> AT+CSNS=?</p>	<p><u>Response</u> +CSNS: (list of supported <mode>) OK</p>
<i>Read command</i>	
<p><u>Syntax</u> AT+CSNS?</p>	<p><u>Response</u> +CSNS:<mode> OK</p>
<i>Write command</i>	
<p><u>Syntax</u> AT+CSNS= [<mode>]</p>	<p><u>Response</u> OK</p> <p><u>Parameter</u> <mode> 4 Data</p>

4.10. +CBST Command: Select Bearer Service Type

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692																																																																															
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CBST=?</p>	<p><u>Response</u> +CBST: (list of supported <speed>s),(list of supported <name>s),(list of supported <ce>s) OK</p>																																																																														
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CBST?</p>	<p><u>Response</u> +CBST: <speed>,<name>,<ce> OK</p>																																																																														
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CBST= [<speed> [,<name>[,<ce>]]]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>CME ERROR: <err></p> <p><u>Parameters</u></p> <table border="0"> <tr> <td style="vertical-align: top;"><speed></td> <td style="vertical-align: top;">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> <tr> <td></td> <td>70</td> <td>4800 bps (V.110 or X.31 flag stuffing)</td> </tr> <tr> <td></td> <td>71</td> <td>9600 bps (V.110 or X.31 flag stuffing)</td> </tr> <tr> <td></td> <td>75</td> <td>14400 bps (V.110 or X.31 flag stuffing)</td> </tr> <tr> <td></td> <td>79</td> <td>19200 bps (V.110 or X.31 flag stuffing)</td> </tr> <tr> <td></td> <td>80</td> <td>28800 bps (V.110 or X.31 flag stuffing)</td> </tr> <tr> <td></td> <td>81</td> <td>38400 bps (V.110 or X.31 flag stuffing)</td> </tr> <tr> <td></td> <td>82</td> <td>48000 bps (V.110 or X.31 flag stuffing)</td> </tr> <tr> <td></td> <td>83</td> <td>56000 bps (V.110 or X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI or RDI service to get FTM)</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)		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 to get FTM)
<speed>	0	Autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service)																																																																													
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HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	84 64000 bps (X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI service 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>	0 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>	0 Transparent 1 Non-transparent 2 Both, transparent preferred 3 Both, non-transparent preferred

4.11. +XCALLSTAT Command: Set Reporting Call Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+XCALLSTAT =?	<u>Response</u> +XCALLSTAT: (list of supported <enable>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+XCALLSTAT ?	<u>Response</u> +XCALLSTAT: <enable> OK
<i>Write command</i>	
<u>Syntax</u> AT+XCALLSTAT =<enable>	<u>Response</u> OK or +CME ERROR: <error>
	<u>Parameter</u> <enable> 0 Reporting disabled 1 Reporting enabled

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

Unsolicited Notification

Reponse

+XCALLSTAT: <call_id><stat>

Parameters

<call_id> Indicates the call identification (GSM 02.30 4.5.5.1)

<stat> Indicates the voice call status

- 0 Active
- 1 Hold
- 2 Dialling (MO call)
- 3 Alerting (MO call; ringing for the remote party)
- 4 Ringing (MT call)
- 5 Waiting (MT call)
- 6 Disconnected
- 7 Connected (indicates the completion of a call setup first time for MT and MO calls – this is reported in addition to the active state)



5. Mobile Equipment Control and Status Commands

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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
<i>Write command</i>	
<u>Syntax</u> AT+CAMM= [<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

5.2. +CCWE Command: Call Meter Maximum Event

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Write command</i>	
<u>Syntax</u> AT+CCWE= <mode>	<u>Response</u> OK or +CME ERROR: <err>
	<u>Parameter</u> <mode> 0 Disable the call meter warning event 1 Enable the call meter warning event

5.3. +CCLK Command: Real Time Clock

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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.

5.4. +CIND Command: Indicator Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CIND=?</p>	<p><u>Response</u></p> <p>For HL7618, HL7618RD and HL7688: +CIND: ("call",(0-1)),("roam",(0-1)) OK</p> <p>For HL7648, HL7650, HL7690 and HL7692: +CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0-1)),("message",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-1)) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CIND?</p>	<p><u>Response</u></p> <p>For HL7618, HL7618RD and HL7688: +CIND: <call>,<roam> OK</p> <p>For HL7648, HL7650, HL7690 and HL7692: +CIND: <battchg>,<signal>,<service>,<message>,<call>,<roam>,<smsfull> OK</p> <p><u>Parameters</u></p> <p><battchg> 0 – 5 Battery level 0 Lowest level 4 Highest level 5 Battery is charging (not supported)</p> <p><signal> 0 – 5 Signal quality level 0 Lowest level signal 5 Highest level signal</p> <p><service> Network service availability 0 Network service is not available 1 Network service is available</p> <p><message> Message reception 0 No message is received 1 Message is received</p> <p><call> Calling in progress 0 Service is not available 1 Service is available</p> <p><roam> Roaming indicator 0 Home network 1 Roaming</p> <p><smsfull> SMS memory storage 0 Memory available 1 Memory full</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> This command can be used without a SIM. <smsfull> is only supported for memory 3 with “SM” and “ME” storage type. If a different storage type is used with memory 3, <smsfull> is always 0.
<p><u>Examples</u></p>	<pre>// Test command on HL7648, HL7650, HL7690 and HL7692 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 on HL7648, HL7650, HL7690 and HL7692 AT+CIND? +CIND: 0,1,1,0,0,0,0 // Indicates signal level = 1 and service is available OK</pre>

5.5. +CLAC Command: List Available AT Commands

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Execute command</i></p>	
<p><u>Syntax</u> AT+CLAC</p>	<p><u>Response</u> <AT command 1> [<CR><LF><AT command 2>[.]] OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameter</u> <AT command> AT command (including the prefix “AT”)</p>
<p><u>Notes</u></p>	<p>This command provides the AT Command list available for the user.</p>

5.6. +CFUN Command: Set Phone Functionality

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+CFUN=?</p>	<p><u>Response</u> +CFUN: (list of supported <fun>s), (list of supported <rst>s) OK</p> <p>or</p> <p>+CME ERROR: <err></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CFUN?</p>	<p><u>Response</u> +CFUN: <power_mode>,<STK_mode></p> <p>or</p> <p>+CME ERROR: <err></p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CFUN=<fun> [,<rst>]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u></p> <p><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</p> <p>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.</p> <p><rst> Reset value</p> <p>If <fun> = 1 or 4:</p> <p> 0 Do not reset MT before resetting it to <fun> power level 1 Reset MT before setting it to <fun> power level</p> <p>If <fun> = 31, 32, 35 or 36:</p> <p> 0 SIM is switched OFF 1 SIM is switched ON</p> <p>If <fun> = 33 or 34:</p> <p> 0 SIM reset not needed 1 SIM reset needed</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	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
<STK_mode>	0 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

5.7. +CMER Command: Mobile Equipment Event Reporting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i> <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
<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> 0 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. (Not supported on the HL7688.) 1 Discard unsolicited result codes when the 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 the TA-TE link is reserved (e.g. in online data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE. (Not supported on the HL7688.)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><keyp> <u>0</u> No keypad event reporting</p> <p><disp> <u>0</u> No display event reporting</p> <p><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 the indicator. Only indicator events which are not caused by +CIND shall be indicated by the TA to the TE.</p> <p><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)</p>
<i>Unsolicited Notification</i>	<p><u>Responses</u></p> <ul style="list-style-type: none"> • +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 <p>Refer to +CIND for more information regarding indicator control.</p>
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> This command can be used without a SIM.
<u>Example</u>	<pre> 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 </pre>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<pre># 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 # 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</pre>

5.8. +CMEE Command: Report Mobile Termination Error

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CMEE=?	<u>Response</u> +CMEE: (list of supported <n>s) OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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.

5.9. +CCID Command: Request SIM Card Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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>
<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

5.10. +FMR Command: Request Revision Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

5.11. +CPIN Command: Enter Pin

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CPIN=?	<u>Response</u> OK
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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

5.12. +CPIN2 Command: Enter Pin2

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CPIN2=?	<u>Response</u> OK
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692			
	<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)

5.13. +CPUC Command: Price per Unit and Currency

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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
<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

5.14. +CPAS Command: Phone Activity Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692													
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CPAS=?</p>	<p><u>Response</u> +CPAS: (list of supported <pas>es) OK</p> <p>or</p> <p>+CME ERROR: <err></p>												
<p><i>Execute command</i></p> <p><u>Syntax</u> AT+CPAS</p>	<p><u>Response</u> +CPAS: <pas> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameter</u> <pas></p> <table border="0"> <tr> <td>0</td> <td>Ready (ME allows commands from TA/TE)</td> </tr> <tr> <td>1</td> <td>Unavailable (ME does not allow commands from TA/TE)</td> </tr> <tr> <td>2</td> <td>Unknown (ME is not guaranteed to respond to instructions)</td> </tr> <tr> <td>3</td> <td>Ringing (ME is ready for commands from TA/TE, but the ringer is active)</td> </tr> <tr> <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>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>	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)
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)												

5.15. +CSQ Command: Signal Quality

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CSQ=?</p>	<p><u>Response</u> +CSQ: (list of supported <rssi>s),(list of supported <ber>s) OK</p>
<p><i>Execute command</i></p> <p><u>Syntax</u> AT+CSQ</p>	<p><u>Response</u> +CSQ: <rssi>,<ber></p> <p>or</p> <p>+CME ERROR: <err></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><u>Parameters</u></p> <p><rssI> 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</p> <p><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</p>
<u>Notes</u>	<ul style="list-style-type: none"> For LTE, <rssI> 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.

5.16. +KCELL Command: Cell Environment Information

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u> AT+KCELL=?</p>	<p><u>Response</u> +KCELL: (list of supported <revision>s) OK</p>
<i>Read command</i>	
<p><u>Syntax</u> AT+KCELL?</p>	<p><u>Response</u> OK</p>
<i>Write command</i>	
<p><u>Syntax</u> AT+KCELL= <revision></p>	<p><u>Response</u></p> <p>For GSM cells: +KCELL: <nbGSMcells>[,<cell_typei>,<ARFCNi>,<BSICi>,<PLMNi>,<LACi>,<GSM_Cli>,<RSSIi>,<GSM_TA>][,<cell_typei>,<ARFCNi>,<BSICi>,<PLMNi>,<LACi>,<Cli>,<RSSIi>][...]]</p> <p>For UMTS cells: +KCELL: <nbUMTScells>[,<cell_typek>,<dl_UARFCNk>,<PLMNk>,<LACk>,<UMTS_Clk>,<scrambling_codek>,<rscpk>,<ecnok>[,<pathlossk>]][...]]</p> <p>For LTE cells: +KCELL: <nbLTEcells>[,<cell_type>,<PLMN>,<LTE_CI>,<PhyCellInd>,<trackingAreaCode>,<RSRPResult>,<RSRQResult>,<LTE_TA>][<cell_type>,[[Earfcn>,[<PhyCellID>,[<RSRPResult>,[<RSRQResult>]]]]]][...]]</p> <p>OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

Parameters	
<revision>	Reserved for future development (only 0 for the moment)
<nbGSMcells>	$0 \leq i \leq 7$ Number of base stations available
<cell_type>	0 GSM serving cell 1 GSM neighbor cell 2 UMTS serving cell 3 UMTS neighbor cell 4 UMTS detected cell 5 LTE serving cell 6 LTE neighbor cell
<ARFCN>	0 – 1023 Absolute Radio Frequency Channel Number in decimal format
<BSIC>	0 – 63 Base Station Identity Code in 6 bits decimal format
<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
<GSM_CI>	Cell ID, 4 hexadecimal digits, e.g. ABCD
<RSSI>	0 – 63 Received signal level of the BCCH carrier. The indicated value is an offset which should be added to –110 dBm to get a value in dBm. See the formula specified in TS 05.08 Radio Subsystem Link Control
<GSM_TA>	0 – 63 Timing advance; only available for serving cell 255 Not available (there is no active CS/PS connection)
<nbUMTScells>	$0 \leq k \leq 25$ Number of UMTS base stations available
<dl_UARFCN>	DL UARFCN of serving cell in decimal format. The range can be found at 3GPP TS 25.101
<UMTS_CI>	Cell ID, 8 hexadecimal digits, 32 bits
<scrambling code>	0 – 511 Downlink scrambling code in decimal format
<rscp>	0 – 91 Received Signal Code Power. The power level in one chip <u>255</u> Invalid/default value
<ecno>	0 – 24 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 <u>255</u> Invalid/default value
<pathloss>	46 dB to 158 dB Path loss in decimal format 255 Not available
<nbLTEcells>	$0 \leq k \leq 33$ Number of LTE base stations available

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><LTE_CI> Cell Identity in 8 hexadecimal digits with length = 28 bits. (Ref: 3GPP TS 36.331, 6.3.4, CellIdentity IE)</p> <p><PhyCellInd> 0 – 503 Physical Cell ID (Ref: 3GPP TS 36.331, 6.3.4, PhysCellId IE)</p> <p><TrackingAreacode> Tracking Area Code (Ref: 3GPP TS 36.331, 6.3.4, TrackingAreaCode IE) Integer type with length = 16 bits</p> <p><RSRPResult> 0 – 97 Reference Signal Received Power (Ref: 3GPP TS 36.331, 6.3.5, RSRP-Range IE)</p> <p><RSRQResult> 0 – 34 Reference Signal Received Quality (Ref: 3GPP TS 36.331, 6.3.5, RSRQ-Range IE)</p> <p><LTE_TA> 0 – 1282 Timing advance (as per [3GPP 36.321])</p> <p><Earfcn> 0 – 0xFFFF Carrier frequency of the neighbor cell designated by the EUTRA Absolute Radio Frequency Channel Number (EARFCN) (Ref: 3GPP TS 36.101, 5.7.3)</p> <p><PhyCellInd> 0 – 503 Physical Cell ID (Ref: 3GPP TS 36.331, 6.3.4, PhysCellId IE)</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> This command provides information related to the network environment and can be used, for example, for localization calculation. This command can only be used with a SIM. The cell information can only be retrieved when the UE stays in attached mode. If no cell information is provided but the radio access technology is supported, +KCELL:0 is returned.

5.17. +KGPIO Command: Hardware IO Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KGPIO=?</p>	<p><u>Response</u> +KGPIO: (list of supported <IO>s),(list of supported <cde>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KGPIO?</p>	<p><u>Response</u> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KGPIO=<IO>,<cde></p>	<p><u>Response</u> If <cde> = 2: +KGPIO: <IO>,<current_value> OK</p> <p>else OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><u>Parameters</u></p> <p><IO> 1 – 8, 10, 11, 13 – 15 Selected IO</p> <p><cde> 0 Reset the selected IO 1 Set the selected IO 2 Request the current value of the IO</p> <p><current_value> 0 GPIO is Low 1 GPIO is High</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • The current configuration is saved in non-volatile memory over module reboot. • Check the configuration of +KGPIOCFG when +CME ERROR: 3 is issued. • GPIO 3 is used for SIM detection by default; it cannot be reconfigured. • 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 a SIM.
<p><u>Examples</u></p>	<p>Make GPIO1 output high/low level</p> <p>AT+KGPIOCFG=1,0,2 //Configure GPIO1 as output mode; <pull mode> must //be "no pull"</p> <p>OK</p> <p>AT+KGPIO=1,1 //Set GPIO1</p> <p>OK</p> <p>AT+KGPIO=1,0 //Reset GPIO1</p> <p>OK</p> <p>Define input/output mode for GPIO1</p> <p>AT+KGPIOCFG=1,1,0 //Configure GPIO1 as input mode;<pull mode> is "pull down"</p> <p>OK</p> <p>AT+KGPIO=1,2 //Request the current value of GPIO1</p> <p>+KGPIO: 1,1 //Value is HIGH for GPIO1</p> <p>OK</p> <p>at+kgpio=?</p> <p>+KGPIO: (1,2,4,5,6,7,8,10,11,13,14,15),(0-2)</p> <p>OK</p> <p>at+kgpio=9,1 //Set GPIO9, and it should return ERROR</p> <p>+CME ERROR: 3</p>

5.18. +KGPIOCFG Command: GPIO Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KGPIOCFG=?</p>	<p><u>Response</u> +KGPIOCFG: (list of supported <n>s),(list of supported <dir>s), (list of supported <pull mode>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KGPIOCFG?</p>	<p><u>Response</u> +KGPIOCFG: <n>,<dir>,<pull mode>[<CR><LF> +KGPIOCFG: <n>,<dir>,<pull mode> [...]] OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KGPIOCFG=<n>,<dir>,<pull mode></p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <p><n> 1 – 8, 10, 11, 13 –15 GPIO number</p> <p><dir> Direction 0 Output 1 Input</p> <p><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</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • This command provides configuration for +KGPIOCFG command. • The current configuration is saved in non-volatile memory before a reset. • By default, GPIO 3 is used by SIM detection; it cannot be reconfigured. • 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 a SIM.
<p><u>Examples</u></p>	<p>at+kgpiocfg=1,0,0 // When setting GPIO1 as Output, with incorrect <pull mode> ERROR</p> <p>at+kgpiocfg=1,0,1 // When setting GPIO1 as Output, with incorrect <pull mode> ERROR</p> <p>at+kgpiocfg=1,0,2 // When setting GPIO1 as Output, with correct <pull mode> OK</p> <p>at+kgpiocfg=1,1,0 // When setting GPIO1 as Input, with pull down OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<pre>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) 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>

5.19. +KADC Command: Analog Digital Converter

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KADC=?</p>	<p><u>Response</u> +KADC: (list of supported <Meas id>s),(list of supported <Meas time>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KADC= <Meas id>, <Meas time></p>	<p><u>Response</u> +KADC: <Meas result>,<Meas id>,<Meas time>[,<Temperature>]</p> <p><u>Parameters</u> <Meas id> Measurement ID</p> <ul style="list-style-type: none"> 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 ADC0 (not supported on the HL7688)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692													
	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												
Reference Sierra Wireless Proprietary	Notes <ul style="list-style-type: none"> • 10 bits converter. • VBATT does not support no constraint measurement time. • This command can be used without a SIM. • Available range for voltage input are as follows: <table border="1"> <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>ADC0</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	ADC0	0 - 1.2	ADC1	0 - 1.2
<Meas id>	Range (V)												
VBATT	3.2 - 4.5												
VCOIN	0 - 1.8												
THERM	0 - 1.2												
ADC0	0 - 1.2												
ADC1	0 - 1.2												

5.20. +CSIM Command: Generic SIM Access

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command	
Syntax AT+CSIM=?	Response OK
Write command Syntax AT+CSIM= <length>, <command>	Response +CSIM: <length>,<response> OK or +CME ERROR: <err> Parameters <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

5.21. +KSIMDET Command: SIM Detection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692							
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KSIMDET=?</p>	<p><u>Response</u> +KSIMDET: (list of supported <mod>s) OK</p>						
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KSIMDET?</p>	<p><u>Response</u> +KSIMDET: <mod> OK</p>						
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KSIMDET= <mod></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u></p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;"><mod></td> <td style="padding-right: 20px;">0</td> <td>Disable SIM detection</td> </tr> <tr> <td></td> <td>1</td> <td>Enable SIM detection</td> </tr> </table>	<mod>	0	Disable SIM detection		1	Enable SIM detection
<mod>	0	Disable SIM detection					
	1	Enable SIM detection					
<p><u>Notes</u></p>	<ul style="list-style-type: none"> 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. <mod> setting is kept even after the module reboots. 						
<p><u>Examples</u></p>	<pre><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</pre>						

5.22. +CLAN Command: Read Language

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CLAN=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+CLAN?	<u>Response</u> +CLAN: <In>
	<u>Parameter</u> <In> Two letter abbreviation of the language. The language codes, as defined in ISO 639, consists of two characters, e.g. "sv", "en" etc.

5.23. +CCHO Command: Open Logical Channel

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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: <ul style="list-style-type: none"> • '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

5.24. +CCHC Command: Close Logical Channel

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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).

5.25. +CGLA Command: Generic UICC Logical Channel Access

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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).

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

Notes

When invalid parameter is given, an empty response is returned:
AT+CGLA=257,14,"TW010100002100" //invalid parameter
+CGLA: 0,""
OK

5.26. +CRLA Command: Restricted UICC Logical Channel Access

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

Write command

Syntax

AT+CRLA=
<sessionid>,
<command>
[,<file id>[,<P1>,
<P2>,<P3>
[,<data>
[,<pathid>]]]]>

Response

+CRLA: <sw1>,<sw2>[,<response>]
OK
 or
+CME ERROR: <err>

Parameters

<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> 176 READ BINARY
 178 READ RECORD
 192 GET RESPONSE
 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.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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.
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5.27. +CUAD Command: UICC Application Discovery

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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.

5.28. +CRSM Command: Restricted SIM Access

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<i>Test command</i>	
<u>Syntax</u> AT+CRSM=?	<u>Response</u> OK
<i>Write command</i>	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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 fullfiled / 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.
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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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
	<p><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.</p> <p><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).</p>
<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.

5.29. +CEAP Command: EAP Authentication

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Write command</i>	
<p><u>Syntax</u> AT+CEAP= <dfname>, <EAPMethod>, <EAP packet data>[,<DFeap>]</p>	<p><u>Response</u> +CEAP: <EAPsessionid>,<EAP packet response> OK</p> <p>or +CME ERROR: <err></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

	<p><u>Parameters</u></p> <p><dfname> String type in hexadecimal format. All selectable applications are represented in the UICC by an AID coded on 1 to 16 bytes.</p> <p><EAPMethod> String type in hexadecimal format. The value range for 1-byte format and for 8 bytes expanded format is defined in RFC 3748.</p> <p><EAP packet data> String type in hexadecimal format</p> <p><DFeap> String type in hexadecimal format</p> <p><EAPsessionid> 1 – 4294967295 Identifier of the EAP session to be used to retrieve the EAP parameters with +CERP command.</p> <p><EAP packet response> String type in hexadecimal format</p>
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5.30. +CERP Command: EAP Retrieve Parameters

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<i>Execute command</i>	
<u>Syntax</u>	<u>Response</u>
AT+CERP= <EAPsessionid>, <EAPparameter>	+CERP: <EAP parameter response> OK
	or
	+CME ERROR: <err>
	<u>Parameters</u>
	<EAPparameter> 1 Keys 2 Status 3 Identity 4 Pseudonym
	<EAPsessionid> 1 – 4294967295 Identifier of the EAP session to be used to retrieve the EAP parameters corresponding to an active EAP session.
	<EAP parameter response> String type in hexadecimal format

5.31. +KTEMPMON Command: Temperature Monitor

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KTEMPMON =?</p>	<p><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</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KTEMPMON ?</p>	<p><u>Response</u> +KTEMPMON: <mod>,<temperature>,<urcMode>,<action>,<hystTime>,<repGPIO> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KTEMPMON =<mod>, [<temperature>],<urcMode> [,<action>],<hystTime> [,<repGPIO>]]]]]</p>	<p><u>Response</u> +KTEMPMON: <level>,<value> OK</p> <p><u>Parameters</u></p> <p><mod> <u>0</u> Disable the module's internal temperature monitor 1 Enable the module's internal temperature monitor</p> <p><temperature> Temperature limit before the module acts as defined by <action>. Default value: <u>0</u></p> <p><urcMode> <u>0</u> Disables the presentation of the temperature monitor URC 1 Enables the presentation of the temperature monitor URC</p> <p><action> <u>0</u> 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.</p> <p><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.</p> <p><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.</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Notes</u>	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> -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 ± 2°C. Check available GPIOs with +KGPIOCFG when using this command.

5.32. +CTZU Command: Automatic Time Zone Update

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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
<i>Write command</i>	
<u>Syntax</u> AT+CTZU =<onoff>	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <onoff> 0 Disable automatic time zone update via NITZ 1 Enable automatic time zone update via NITZ
<u>Notes</u>	<ul style="list-style-type: none"> <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.)

5.33. +CTZR Command: Time Zone Reporting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CTZR=?</p>	<p><u>Response</u> +CTZR: (list of supported <onoff>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CTZR?</p>	<p><u>Response</u> +CTZR: <onoff> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CTZR =<onoff></p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameter</u> <onoff> <u>0</u> Disable time zone change event reporting 1 Enable time zone change event reporting</p>
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +CTZV: <tz>,<time> XNITZINFO: <timzone_variance>,<time> +CTZDST: <dst></p> <p><u>Parameters</u> <tz> Integer value indicating the time zone</p> <p><time> String type value in format "YY/MM/dd,hh:mm:ss" wherein the characters indicate year, month, date, hour, minutes and seconds.</p> <p><dst> Daylight sabings time value <u>0</u> Disable time zone change event reporting and URC +XNITZINFO, +CTZDST <u>1</u> Enable time zone change event reporting and URC +XNITZINFO, +CTZDST</p> <p><timzone_variance> String of format "GMT+HH:MM" or "GMT-HH:MM" (for example, GMT+5:30)</p>
<p><u>Reference</u> [27.007] §8.41</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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

5.34. +XDATACHANNEL Command: Configure Data Channel

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+XDATACHANNEL=?</p>	<p><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</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+XDATACHANNEL=<mode>,<csd_gprs_flag>,<ctrl_tid_path>,<tid_path>[,<connect_flag>[,<cid>]]</p>	<p><u>Response</u> OK or +CME ERROR: <err></p> <p><u>Parameters</u></p> <p><mode> 0 Disable routing 1 Enable routing 2 Query current setting for the channel where the command is executed (other parameters will be ignored)</p> <p><csd_gprs_flag> 0 Configure channel for a CSD connection 1 Configure channel for a GPRS connection</p> <p><ctrl_tid_path> Terminal for which the data routing mechanism shall be enabled in string format (e.g.: "/mux/5")</p> <p><tid_path> Terminal to which a data call shall be routed in string format (e.g.: "/mux/5")</p> <p><connect_flag> 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)</p> <p><cid> Numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands)</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • 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.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

	<ul style="list-style-type: none"> • +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. • CSD is not allowed on the HL7650. • <connect_flag> affects both AT+CGDATA and ATD PS data call setup commands, but should only be used with AT+CGDATA for proper NCM connection setup. • When <connect_flag>=2, "CONNECT" and "NO CARRIER" are sent as unsolicited response codes in the control channel specified by <ctrl_tid_path>, and the OK terminal response is still returned as a terminal response for AT+CGDATA.
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5.35. +XCELLINFO Command: Provide Cell Information

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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>,[<RSRPRResult>,[<RSRQResult>]]]]] OK or +XCELLINFO:<mode><type><MCC>,<MNC>,<CI>,<PhyCellInd>,<TrackingAreaCode>,<RSRPRResult>,<RSRQResult>,<TA> OK
<i>Write command</i>	
<u>Syntax</u> AT+XCELLINFO=<mode>	<u>Response</u> OK or +CME ERROR: <err>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

	<p><u>Parameters</u></p> <p><mode> 0 Disable periodic reporting 1 Enable reporting 2 Currently not used (for backward compatibility)</p> <p><type> 2 UMTS serving cell 3 UMTS neighbor cell 4 UMTS detected cell 5 LTE serving cell 6 LTE neighbor cell</p> <p><RxLev> See command +CGED</p> <p><t_advance> Signal strength; only valid for the serving cell</p> <p><MCC> 0 – 999 Mobile country code</p> <p><MNC> 0 – 999 Mobile network code</p> <p><CI> Cell identity, 28-bit integer type</p> <p><PhysCellId> 0 – 503 Physical cell ID</p> <p><TrackingAreaCode> Tracking area code, 16-bits integer type</p> <p><RSRPResult> 0 – 97 Reference signal received power</p> <p><RSRQResult> 0 – 34 Reference signal reference quality</p> <p><TA> 0 – 1282 Timing advance</p> <p><Earfcn> Carrier frequency of the neighbor cell designated by the EUTRA absolute radio frequency</p> <p><PhyCellID> 0 – 503 Physical cell ID of the neighbor cell</p> <p><RSRPResult> 0 – 97 Average RSRP of the neighbor cell</p> <p><RSRQResult> 0 – 34 Average RSRQ of the neighbor cell</p>
<p><i>Unsolicited Notification</i></p>	<p><u>Response for UMTS cells:</u> +XCELLINFO:<type>,<MCC>,<MNC>,<LAC>,<CI>,<scrambling_code>,<dl_frequency>,<rscp>,<ecn0>,<pathloss></p> <p><u>Response for LTE serving cell:</u> +XCELLINFO:<type><MCC>,<MNC>,<CI>,<PhyCellInd>,<TrackingAreaCode>,<RSRPResult>,<RSRQResult>,<TA></p> <p><u>Response for LTE neighbor cell:</u> +XCELLINFO: <type>,[<Earfcn>,<PhyCellID>,< RSRPResult>,<RSRQResult>]]]]]</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Notes	<ul style="list-style-type: none"> If information for neighbor cell (LAC, CI, MCC and MNC) is not present, then values for LAC, CI, MCC and MNC are expected to be invalid (FFFF or 65535). For example, FFFF will be returned for LAC and CI, and 65535 will be returned for MCC and MNC, which are out of the expected range. This command returns invalid values for ACTIVE SET neighboring cells and returns correct values for serving cell.

5.36. +KSLEEP Command: Power Management Control for UART

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692							
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KSLEEP=?</p>	<p><u>Response</u> +KSLEEP: (list of supported <mngt>s) OK</p>						
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KSLEEP?</p>	<p><u>Response</u> +KSLEEP: <mngt> OK</p>						
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KSLEEP= <mngt></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u> <mngt></p> <table border="0"> <tr> <td style="padding-right: 20px;">0</td> <td>The UART doesn't go to sleep mode when the DTR is active (low level). The DTR must be active to send AT commands.</td> </tr> <tr> <td style="padding-right: 20px;"><u>1</u></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 style="padding-right: 20px;">2</td> <td>The UART never goes in sleep mode regardless of the DTR state</td> </tr> </table>	0	The UART doesn't go to sleep mode when the DTR is active (low level). The DTR must be active to send AT commands.	<u>1</u>	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
0	The UART doesn't go to sleep mode when the DTR is active (low level). The DTR must be active to send AT commands.						
<u>1</u>	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						
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> 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. 						
<p><u>Example</u></p>	<pre>AT+KSLEEP=? +KSLEEP: (0-2) OK AT+KSLEEP? +KSLEEP: 2 OK AT+KSLEEP=0 // Change settings to mode 0 OK</pre>						

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<pre>AT+KSLEEP? +KSLEEP: 0 OK AT+KSLEEP=2 // Change settings to mode 2 OK AT+KSLEEP? +KSLEEP: 2 OK</pre>

5.37. +HBHV Command: Configure General System Behavior

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+HBHV=?</p>	<p><u>Response</u> +HBHV: (0,2,3),(0,1) +HBHV: 1,(0-2) ... OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+HBHV?</p>	<p><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</p>
<p><i>Write command</i></p> <p><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></p>	<p><u>Response</u> OK</p> <p><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</p> <p><omadm_reg_mode> OMADM client bootstrapping behavior 0 Disables bootstrapping initiated by the client 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 2 Enables bootstrapping initiates by the client on the next successful registration regardless of the above-mentioned criteria.</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><omadm_reg_state> Bootstrap registration state</p> <p>0 The client hasn't been bootstrapped yet (no server-initiated session has happened before)</p> <p>1 The client has been bootstrapped before with a successful server-initiated session</p> <p><pdp_unlock_mode> PDP unlock mode</p> <p>For Verizon modules:</p> <p>0 Protects the reserved PDP contexts (1, 2, 11 – 20) from being modified accidentally</p> <p>1 Unlocks the protection on the reserved PDP contexts</p> <p>For non-Verizon modules:</p> <p>0 Protects the reserved PDP context (1) from being modified accidentally</p> <p>1 Unlocks the protection on the reserved PDP context</p> <p><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?)</p> <p>0 Disabled. Shows APN given by the network (e.g. "ltemobile.apn.mnc720.mcc302.gprs", "vzwims.mnc480.mcc311.gprs")</p> <p>1 Enabled. Shows the original APN saved in non-volatile memory</p>
Notes	<ul style="list-style-type: none"> • <omadm_reg_mode> only affects Verizon modules. • <omadm_reg_mode> will automatically be changed from "2" to "1" after the server initialized session was successfully processed. • Verizon modules' OMADM client uses customized bootstrapping defined in the OMADM specification, i.e. with Verizon OMADM server connection configurations preloaded. However, the module still needs to be bootstrapped before the OMADM client can work with the Verizon OMADM server. There are two mechanisms to complete this bootstrapping: <ol style="list-style-type: none"> 1. Bootstrapping initiated by the server – the IMEI/IMSI are pre-registered to Verizon's OMADM database and bootstrapping is initiated automatically by the OMADM server through a DM session. 2. Bootstrapping initiated by the client – the module initiates a DM session to the Verizon OMADM server that performs the bootstrapping. <p>The default option <omadm_reg_mode>=1 enables the module to perform bootstrapping automatically via mechanism 2.</p> • For <pdp_unlock_mode> = 0, the CID 1 lock is only effective when the device is registered to an LTE home network, to avoid effects to IMS connection. For roaming or non-LTE networks, CID 1 can be modified to work with the network but CID=1 should be erased after use (i.e. using AT+CGDCONT=1).

5.38. +CIREP Command: IMS Network Reporting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command	
Syntax	Response
AT+CIREP=?	+CIREP: (list of supported <reporting>s) OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CIREP?</p>	<p><u>Response</u> +CIREP: <reporting>,<nwimsvops> OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CIREP= <reporting></p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u></p> <p><reporting> 0 Disable reporting 1 Enable reporting</p> <p><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</p> <p><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</p>
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +CIREPI: <nwimsvops> +CIREPH: <svcch></p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • <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.

5.39. +CIREG Command: Registration Information

Note: For HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CIREG=?</p>	<p><u>Response</u> +CIREG: (list of supported <n>s) OK</p>

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
<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 0 Disable reporting 1 Enable reporting (parameter <reg_info>) 2 Enable extended reporting (parameter <reg_info> and <ext_info>) <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

5.40. +GST Command: General System Status Information

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+GST=?	<u>Response</u> +GST: (list of supported <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+GST?	<u>Response</u> ... (display all responses of <mode>s) OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+GST= <mode></p>	<p><u>Response</u> For <mode>=0: ... (display all responses of <mode>s) OK</p> <p>For <mode>=1: +GST: <rtc_time>,<up_time> OK</p> <p>For <mode>=2: +GST: <port device string> OK</p> <p><u>Parameters</u></p> <p><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)</p> <p><rtc_time> RTC time in seconds since 1970 Jan 1</p> <p><up_time> System boot up time in seconds</p> <p><port device string> String type; unique AT port device string e.g. "/USBCDC/0" /USBCDC/0 → ACM0 AT port /USBCDC/2 → ACM2 AT port</p>

5.41. +CESQ Command: Extended Signal Quality

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CESQ=?</p>	<p><u>Response</u> +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</p>
<p><i>Execute command</i></p> <p><u>Syntax</u> AT+CESQ</p>	<p><u>Response</u> +CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

Parameters	
<rxlev>	Integer type; received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4)
0	rssI < -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
<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	Ec/Io < -24 dB
1	-24 dB ≤ Ec/Io < -23.5 dB
2	-23.5 dB ≤ Ec/Io < -23 dB
...	
47	-1 dB ≤ Ec/Io < -0.5 dB
48	-0.5 dB ≤ Ec/Io < 0 dB
49	0 dB ≤ Ec/Io
255	Not known or not detectable
<rsrq>	Integer type; reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7)
0	rsrq < -19.5 dB
1	-19.5 dB ≤ rsrq < -19 dB
2	-19 dB ≤ rsrq < -18.5 dB
...	
32	-4 dB ≤ rsrq < -3.5 dB
33	-3.5 dB ≤ rsrq < -3 dB
34	-3 dB ≤ 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	rsrp < -140 dBm
1	-140 dBm ≤ rsrp < -139 dBm
2	-139 dBm ≤ rsrp < -138 dBm

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	... 95 -46 dBm ≤ rsrp < -45 dBm 96 -45 dBm ≤ rsrp < -44 dBm 97 -44 dBm ≤ rsrp 255 Not known or not detectable
<u>Notes</u>	<ul style="list-style-type: none"> • 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> 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.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+XCSQ=?	<u>Response</u> +XCSQ: (list of supported <n>s) OK
<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>

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692																																					
<p><i>Test command</i></p> <p><u>Syntax</u> AT+XCESQ=?</p>	<p><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</p>																																				
<p><i>Read command</i></p> <p><u>Syntax</u> AT+XCESQ?</p>	<p><u>Response</u> +XCESQ: <n>,<rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<rssnr> OK</p>																																				
<p><i>Write command</i></p> <p><u>Syntax</u> AT+XCESQ= [<n>]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u></p> <p><rxlev> Integer type; received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4)</p> <table style="margin-left: 20px;"> <tr><td>0</td><td>rssl < -110 dBm</td></tr> <tr><td>1</td><td>-110 dBm ≤ rssi < -109 dBm</td></tr> <tr><td>2</td><td>-109 dBm ≤ rssi < -108 dBm</td></tr> <tr><td>...</td><td></td></tr> <tr><td>61</td><td>-50 dBm ≤ rssi < -49 dBm</td></tr> <tr><td>62</td><td>-49 dBm ≤ rssi < -48 dBm</td></tr> <tr><td>63</td><td>-48 dBm ≤ rssi</td></tr> <tr><td>99</td><td>Not known or not detectable</td></tr> </table> <p><ber> Integer type; channel bit error rate (in percent)</p> <table style="margin-left: 20px;"> <tr><td>0 – 7</td><td>As RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4</td></tr> <tr><td>99</td><td>Not known or not detectable</td></tr> </table> <p><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)</p> <table style="margin-left: 20px;"> <tr><td>0</td><td>rscp < -120 dBm</td></tr> <tr><td>1</td><td>-120 dBm ≤ rscp < -119 dBm</td></tr> <tr><td>2</td><td>-119 dBm ≤ rscp < -118 dBm</td></tr> <tr><td>...</td><td></td></tr> <tr><td>94</td><td>-27 dBm ≤ rscp < -26 dBm</td></tr> <tr><td>95</td><td>-26 dBm ≤ rscp < -25 dBm</td></tr> <tr><td>96</td><td>-25 dBm ≤ rscp</td></tr> <tr><td>255</td><td>Not known or not detectable</td></tr> </table>	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	0 – 7	As RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4	99	Not known or not detectable	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
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255	Not known or not detectable																																				

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

	<p><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)</p> <p>0 Ec/lo < -24 dB</p> <p>1 -24 dB ≤ Ec/lo < -23.5 dB</p> <p>2 -23.5 dB ≤ Ec/lo < -23 dB</p> <p>...</p> <p>47 -1 dB ≤ Ec/lo < -0.5 dB</p> <p>48 -0.5 dB ≤ Ec/lo < 0 dB</p> <p>49 0 dB ≤ Ec/lo</p> <p>255 Not known or not detectable</p> <p><rsrq> Integer type; reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7)</p> <p>0 rsrq < -19.5 dB</p> <p>1 -19.5 dB ≤ rsrq < -19 dB</p> <p>2 -19 dB ≤ rsrq < -18.5 dB</p> <p>...</p> <p>32 -4 dB ≤ rsrq < -3.5 dB</p> <p>33 -3.5 dB ≤ rsrq < -3 dB</p> <p>34 -3 dB ≤ rsrq</p> <p>255 Not known or not detectable</p> <p><rsrp> Integer type; reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4)</p> <p>0 rsrp < -140 dBm</p> <p>1 -140 dBm ≤ rsrp < -139 dBm</p> <p>2 -139 dBm ≤ rsrp < -138 dBm</p> <p>...</p> <p>95 -46 dBm ≤ rsrp < -45 dBm</p> <p>96 -45 dBm ≤ rsrp < -44 dBm</p> <p>97 -44 dBm ≤ rsrp</p> <p>255 Not known or not detectable</p> <p><rssnr> Integer type; radio signal strength noise ration value</p> <p>-100 RSSNR ≤ -50 dB</p> <p>-99 -50 dB < RSSNR ≤ -49.5 dB</p> <p>-98 -49.5 dB < RSSNR ≤ -49 dB</p> <p>...</p> <p>-1 -1 dB < RSSNR ≤ -0.5 dB</p> <p>0 -0.5 dB < RSSNR ≤ 0 dB</p> <p>1 0 dB < RSSNR ≤ 0.5 dB</p> <p>...</p> <p>98 49 dB ≤ RSSNR < 49.5 dB</p> <p>99 49.5 dB ≤ RSSNR < 50 dB</p> <p>100 50 dB ≤ RSSNR</p> <p>255 Not known or not detectable</p>
<i>Unsolicited Notification</i>	<p><u>Response</u></p> <p>+XCESQI: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<rssnr></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<u>Notes</u>	<ul style="list-style-type: none"> • 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.
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5.44. +WEXTCLK Command: External Clocks Setting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<i>Test command</i>	
<u>Syntax</u> AT+WEXTCLK=?	<u>Response</u> +WEXTCLK: (list of supported <output>s),(list of supported <status>es) OK
<i>Read command</i>	
<u>Syntax</u> AT+WEXTCLK?	<u>Response</u> +WEXTCLK: <output>,<status> +WEXTCLK: <output>,<status> OK
<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>	<ul style="list-style-type: none"> • 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 can be used without a SIM.

5.45. +KRIC Command: Ring Indicator Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KRIC=?</p>	<p><u>Response</u> +KRIC: (list of supported <mask>),(list of supported <shape>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KRIC?</p>	<p><u>Response</u> +KRIC: <mask>,<shape> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KRIC= <mask> [,<shape>]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <p><mask> Use of RI signal</p> <p>0x00 RI is not used</p> <p>0x01 RI is activated on incoming calls (+CRING, RING)</p> <p>0x02 RI is activated on SMS (+CMT, +CMTI)</p> <p>0x04 RI is activated on SMS-CB (+CBM, +CBMI)</p> <p>0x08 RI is activated on USSD (+CUSD)</p> <p>0x10 RI is activated on voice call connect or disconnect (+CIEV: 5,x)</p> <p><shape> Signal shape (only available for incoming calls)</p> <p>0 Repeat pulses. The total length of the pulse is equivalent to the transfer of the RING or CRING notification</p> <p>1 Always active. The signal is set to be active during the whole incoming call notification</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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, SMS-CB, USSD, etc. • This command can be used without a SIM. • If <shape> is omitted, the previously saved value will be used.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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>

5.46. +CPWROFF Command: Switch MS Off

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CPWROFF=?	<u>Response</u> OK
<i>Execute 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>	<ul style="list-style-type: none"> • Not specifying a parameter value for the execute command will perform normal IMSI detach before powering down. • <mode>=1 will perform fast power down (~100 to 300 ms) without an IMSI detach request being sent to the network.

5.47. +KUSBCOMP Command: Set USB Composition

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692													
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KUSBCOMP =?</p>	<p><u>Response</u> +KUSBCOMP: (list of supported <mode>s) OK</p>												
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KUSBCOMP ?</p>	<p><u>Response</u> +KUSBCOMP: <mode> OK</p>												
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KUSBCOMP =<mode></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; vertical-align: top;"><mode></td> <td style="width: 5%; vertical-align: top;">0</td> <td style="vertical-align: top;"> 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 </td> </tr> <tr> <td style="vertical-align: top;">1</td> <td style="vertical-align: top;">1</td> <td style="vertical-align: top;"> 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 </td> </tr> <tr> <td style="vertical-align: top;">2</td> <td style="vertical-align: top;">2</td> <td style="vertical-align: top;"> 1 MBIM and 3 CDC-ACM, (VID: 0x0807 PID: 0x0911) MBIM0 – MBIM Network interface USB0 – AT / modem port USB1 – Traces port USB2 – AT / modem port </td> </tr> <tr> <td style="vertical-align: top;">3</td> <td style="vertical-align: top;">3</td> <td style="vertical-align: top;"> 3 CDC-ACM and 4 NCM and 1 AUDIO, (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 AUDIO – Audio interface for Audio over USB </td> </tr> </table>	<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	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	2	1 MBIM and 3 CDC-ACM, (VID: 0x0807 PID: 0x0911) MBIM0 – MBIM Network interface USB0 – AT / modem port USB1 – Traces port USB2 – AT / modem port	3	3	3 CDC-ACM and 4 NCM and 1 AUDIO, (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 AUDIO – Audio interface for Audio over USB
<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	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	2	1 MBIM and 3 CDC-ACM, (VID: 0x0807 PID: 0x0911) MBIM0 – MBIM Network interface USB0 – AT / modem port USB1 – Traces port USB2 – AT / modem port											
3	3	3 CDC-ACM and 4 NCM and 1 AUDIO, (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 AUDIO – Audio interface for Audio over USB											

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p>4 1 MBIM and 3 CDC-ACM and 1 AUDIO, (VID: 0x0807 PID: 0x0911)</p> <p>MBIM0 – MBIM Network interface USB0 – AT / modem port USB1 – Traces port USB2 – AT / modem port AUDIO – Audio interface for Audio over USB</p>
<u>Notes</u>	<ul style="list-style-type: none"> • 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. • Configuration is not updated when <mode> = 2, 3 or 4 if a firmware downgrade is performed. • <mode> = 3 and 4 are only available on the HL7648.
<u>Examples</u>	<pre> AT+KUSBCOMP=0 OK AT+KUSBCOMP=5 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 >>>> </pre>

5.48. +WMUSBVCC Command: USB VCC Detection Setting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+WMUSBVCC =<mode></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u> <mode> 0 USB detection if Vbus > 4.75V 1 USB detection if Vbus > 2.5V (e.g., for PC mini-card applications)</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • <mode> is saved to non-volatile memory over module reset. • This command can be used without a SIM.
<p><u>Examples</u></p>	<pre> 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 </pre>

5.49. +KLTEMUTE Command: Mute LTE TX

Note: For HL7650, HL7690 and HL7692 only.

HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KLTEMUTE= ?</p>	<p><u>Response</u> +KLTEMUTE: (list of supported <mode>s),(list of supported <duration>s), (list of supported <ind>s) OK</p> <p>or +CME ERROR: <err></p>

HL7650, HL7690 and HL7692	
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KLTEMUTE?</p>	<p><u>Response</u> +KLTEMUTE: <mode>,<duration>,<ind> OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KLTEMUTE= <mode> [,<duration> [,<ind>]]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u></p> <p><mode> Enable or Disable LTE TX mute 0 The feature is deactivated; the LTE transmit power emission is unmuted 1 The feature is activated, and the LTE transmit power emission is currently muted</p> <p><duration> Mute duration (only used when <mode>=1) Range: 5s – 120s; default value = <u>30</u></p> <p><ind> Unsolicited result code mode 0 Disable LTE TX mute unsolicited result code 1 Disable LTE TX mute unsolicited result code +KLTEMUTE: <mode></p>
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +KLTEMUTE: <state>,<duration> 1 // start LTE mute with duration <state> 0 // stop LTE mute</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • If AT+KLTEMUTE=1 is resent within <duration> after it has already been sent, then it will not take any effect. The <duration> timer will not be reactivated and will continue to run as expected. • If AT+KLTEMUTE=0 is sent within <duration> after AT+KLTEMUTE=1 is sent, then the <duration> timer will be killed, and mute will be deactivated. • If AT+KLTEMUTE=0 is sent while mute is not activated, then the AT command does not take any effect. • When the feature is activated, the <mode> parameter will be automatically reset to 0 after the <duration> mute timer expires. • At module power up, by default, <mode> is always 0. • This command can only be used with a SIM.
<p><u>Examples</u></p>	<p>AT+KLTEMUTE=? +KLTEMUTE: (0-1),(5-120),(0-1) OK</p> <p>AT+KLTEMUTE? // Read the current settings +KLTEMUTE: 0,30,0 OK</p> <p>AT+KLTEMUTE=1,40,1 // Activate LTE TX mute during 40s OK +KLTEMUTE: 1 // LTE TX mute is started</p>

HL7650, HL7690 and HL7692	
	AT+KLTEMUTE? +KLTEMUTE: 1, 40,1 OK

5.50. +KSYNC Command: Application Synchronization Signal

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<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 For backward compatibility, HL7618/90 does not support CS network registration. 3 Manage the generation of signal according to PS network registration status; OFF Not registered/Initialization/Registered denied/no SIM card ON Registered to the network <IO> 1 – 8, 10, 11, 13 – 15 GPIO used as output <Duty Cycle> 1 – 100 In percent; only effective when <mode>=1 Default value = 50

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<p><Pulse Duration> 10 – 65535 In milliseconds; only effective when <mode>=1 Default value = <u>1000</u></p>
<u>Notes</u>	<ul style="list-style-type: none"> • Parameter settings are automatically saved in non-volatile memory. • <Duty Cycle> and <Pulse Duration> can be configured regardless of <mode>. • 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 the timer; this feature cannot be used if either the LED ON/OFF cycle is less than 5ms. “LED ON cycle” is <Pulse Duration>*<Duty Cycle> while “LED OFF cycle” is <Pulse Duration> - “LED ON cycle”. • <mode>=2 is kept for compatibility with other HL series LTE-only products which do not support CS, e.g. HL7618, HL7618RD and HL7690.
<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>

5.51. +KLTEPARAM Command: LTE Parameters

Note: For HL7650, HL7690 and HL7692 only.

HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KLTEPARAM=?</p>	<p><u>Response</u> +KLTEPARAM: (list of supported <mode>s) OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KLTEPARAM?</p>	<p><u>Response</u> +KLTEPARAM: <mode>,<qrxlevmin>,<T3402-dur>,<T3402-stat>,<T3412-dur>,<T3412-stat> OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KLTEPARAM=<mode></p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u> <mode> URC reporting mode 0 Disable URC reporting 1 Enable URC reporting</p> <p><qrxlevmin> -70 to 22 qRxLevMin in dBm. Default value = <u>32767</u> This parameter is omitted if it is not available</p> <p><T3402-dur> T3402 duration in ms. Default value = <u>720000</u> (12 min) This parameter is omitted if it is not available</p> <p><T3402-stat> T3402 timer status. This parameter is omitted if it is not available 0 Stopped 1 Running</p> <p><T3412-dur> T3412 duration in ms. Default value = <u>3240000</u> (54 min) This parameter is omitted if it is not available</p> <p><T3412-stat> T3412 timer status. This parameter is omitted if it is not available 0 Stopped 1 Running</p>
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +KLTEPARAM: <qrxlevmin>,<T3402-dur>,<T3402-stat>,<T3412-dur>,<T3412-stat></p>

HL7650, HL7690 and HL7692	
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • The qrxlevmin is defined according to 3GPP specification TS 36.304 section 5.2.4.7. • The EMM timer T3402 and T3412 are defined according to 3GPP specification TS 24.301 section 5.3.5 – 5.3.6. • <mode> is reset to 0 automatically after reboot. • The command can only be used with a SIM. • Parameter values are only available after the module is registered to the network. • URC is presented when the value is updated by the network.
<p><u>Examples</u></p>	<pre> AT+KLTEPARAM=? +KLTEPARAM: (0-1) OK AT+KLTEPARAM? // Read the current settings when the // module is registered to the network +KLTEPARAM: 0,-60,720000,0,3240000,1 OK AT+KLTEPARAM=1 // Enable URC message OK +KLTEPARAM: -60,720000,0,3240000,1 // URC message AT+KLTEPARAM? // Read command when the module is not // registered to the network +KLTEPARAM: 0,,,,, OK </pre>

5.52. +KBND Command: Current Networks Band Indicator

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692													
<p><i>Test command</i></p>													
<p><u>Syntax</u> AT+KBND=?</p>	<p><u>Response</u> +KBND: (list of supported <bnd>s) OK</p>												
<p><i>Read command</i></p>													
<p><u>Syntax</u> AT+KBND?</p>	<p><u>Response</u> +KBND: <bnd> OK</p> <p><u>Parameter</u> <bnd> Band in hexadecimal format</p> <table> <tr> <td>0x00000000</td> <td>Not available</td> <td></td> </tr> <tr> <td>0x00000002</td> <td>GSM 900 MHz</td> <td>(HL7692 only)</td> </tr> <tr> <td>0x00000004</td> <td>DCS 1800 MHz</td> <td>(HL7692 only)</td> </tr> <tr> <td>0x00000010</td> <td>UMTS Band I (2100 MHz)</td> <td>(HL7650 only)</td> </tr> </table>	0x00000000	Not available		0x00000002	GSM 900 MHz	(HL7692 only)	0x00000004	DCS 1800 MHz	(HL7692 only)	0x00000010	UMTS Band I (2100 MHz)	(HL7650 only)
0x00000000	Not available												
0x00000002	GSM 900 MHz	(HL7692 only)											
0x00000004	DCS 1800 MHz	(HL7692 only)											
0x00000010	UMTS Band I (2100 MHz)	(HL7650 only)											

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	0x00000020 UMTS Band II (1900 MHz) (HL7688 only) 0x00000040 UMTS Band V (850 MHz) (HL7650 and HL7688) 0x00000100 UMTS Band VIII (900 MHz) (HL7650 only) 0x00000800 LTE Band 2 (1900 MHz) (HL7648 and HL7688) 0x00001000 LTE Band 3 (1800 MHz) (HL7650, HL7690 and HL7692) 0x00002000 LTE Band 4 (1700 MHz) (HL7618, HL7618RD, HL7648 and HL7688) 0x00004000 LTE Band 5 (850 MHz) (HL7650 and HL7688) 0x00010000 LTE Band 13 (700 MHz) (HL7618 and HL7618RD) 0x00020000 LTE Band 17 (700MHz) (HL7688 only) 0x00040000 LTE Band 28 (700 MHz) (HL7650 only) 0x00800000 LTE Band 8 (900MHz) (HL7650, HL7690 and HL7692) 0x01000000 LTE Band 20 (800MHz) (HL7690 and HL7692) 0x02000000 LTE Band 12 (700 MHz) (HL7648 only)
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> This command returns the GSM, UMTS or LTE band that the module is currently using. This command cannot be used without a SIM.

5.53. +KSRAT Command: Set Radio Access Technology

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692															
<u>Test command</u> <u>Syntax</u> AT+KSRAT=?	<u>Response</u> +KSRAT: (list of supported <mode>s) OK														
<u>Read command</u> <u>Syntax</u> AT+KSRAT?	Get current band <u>Response</u> +KSRAT: <mode> OK														
<u>Write command</u> <u>Syntax</u> AT+KSRAT= <mode>	Set current mode <u>Response</u> OK <u>Parameter</u> <mode> <table style="margin-left: 20px;"> <tr><td>1</td><td>GSM only</td></tr> <tr><td>2</td><td>UMTS only</td></tr> <tr><td>5</td><td>LTE only</td></tr> <tr><td>6</td><td>Search for UMTS first then LTE</td></tr> <tr><td>7</td><td>Search for LTE first then UMTS</td></tr> <tr><td>8</td><td>Search for GSM first then LTE</td></tr> <tr><td>9</td><td>Search for LTE first then GSM</td></tr> </table>	1	GSM only	2	UMTS only	5	LTE only	6	Search for UMTS first then LTE	7	Search for LTE first then UMTS	8	Search for GSM first then LTE	9	Search for LTE first then GSM
1	GSM only														
2	UMTS only														
5	LTE only														
6	Search for UMTS first then LTE														
7	Search for LTE first then UMTS														
8	Search for GSM first then LTE														
9	Search for LTE first then GSM														

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • This command can be used without a SIM. • <mode> is automatically stored in persistent memory. • Settings take effect immediately. • The HL7650 and HL7688 support both UMTS and LTE; the HL7618, HL7618RD, HL7648 and HL7690 only support LTE; and the HL7692 supports both GSM and LTE. • Setting the <mode> of +KSRAT automatically corrects the <band> of *PSRDBS if the two values conflict with each other. For example, when the <band> of *PSRDBS is set to GSM only, changing the <mode> of +KSRAT to LTE only will also correct <band> of *PSRDBS to the original or all LTE bands of *PSRDBS.

5.54. *PSRDBS Command: Change Frequency Band

HL7618, HL7618RD, HI7648, HL7650, HL7688, HL7690 and HL7692																																														
<p><i>Test command</i></p> <p><u>Syntax</u> AT*PSRDBS=?</p>	<p><u>Response</u> *PSRDBS: (list of supported <mode>s), (list of supported <band>s) OK</p>																																													
<p><i>Read command</i></p> <p><u>Syntax</u> AT*PSRDBS?</p>	<p><u>Response</u> *PSRDBS: <band> OK</p>																																													
<p><i>Write command</i></p> <p><u>Syntax</u> AT*PSRDBS= <mode>,<band></p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <table border="0"> <tr> <td style="padding-right: 10px;"><mode></td> <td style="padding-right: 10px;">0</td> <td>Set <band> at next switch on</td> </tr> <tr> <td></td> <td>1</td> <td>Set <band> immediately</td> </tr> </table> <table border="0"> <tr> <td style="padding-right: 10px;"><band></td> <td colspan="2">Bit field type parameter. To set several bands, sum up the values</td> </tr> <tr> <td>2</td> <td>GSM 900 MHz</td> <td>(HL7692 only)</td> </tr> <tr> <td>8</td> <td>DCS 1800 MHz</td> <td>(HL7692 only)</td> </tr> <tr> <td>32</td> <td>UMTS Band I (2100 MHz)</td> <td>(HL7650 only)</td> </tr> <tr> <td>64</td> <td>UMTS Band II (1900 MHz)</td> <td>(HL7688 only)</td> </tr> <tr> <td>128</td> <td>UMTS Band V (850 MHz)</td> <td>(HL7650 and HL7688)</td> </tr> <tr> <td>512</td> <td>UMTS Band VIII (900 MHz)</td> <td>(HL7650 only)</td> </tr> <tr> <td>4096</td> <td>LTE Band 2 (1900 MHz)</td> <td>(HL7648 and HL7688)</td> </tr> <tr> <td>8192</td> <td>LTE Band 3 (1800 MHz)</td> <td>(HL7650, HL7690 and HL7692)</td> </tr> <tr> <td>16384</td> <td>LTE Band 4 (1700 MHz)</td> <td>(HL7618, HL7618RD, HL7648 and HL7688)</td> </tr> <tr> <td>32768</td> <td>LTE Band 5 (850 MHz)</td> <td>(HL7650 and HL7688)</td> </tr> <tr> <td>131072</td> <td>LTE Band 13 (700 MHz)</td> <td>(HL7618 and HL7618RD)</td> </tr> <tr> <td>262144</td> <td>LTE Band 17 (700MHz)</td> <td>(HL7688 only)</td> </tr> </table>	<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		2	GSM 900 MHz	(HL7692 only)	8	DCS 1800 MHz	(HL7692 only)	32	UMTS Band I (2100 MHz)	(HL7650 only)	64	UMTS Band II (1900 MHz)	(HL7688 only)	128	UMTS Band V (850 MHz)	(HL7650 and HL7688)	512	UMTS Band VIII (900 MHz)	(HL7650 only)	4096	LTE Band 2 (1900 MHz)	(HL7648 and HL7688)	8192	LTE Band 3 (1800 MHz)	(HL7650, HL7690 and HL7692)	16384	LTE Band 4 (1700 MHz)	(HL7618, HL7618RD, HL7648 and HL7688)	32768	LTE Band 5 (850 MHz)	(HL7650 and HL7688)	131072	LTE Band 13 (700 MHz)	(HL7618 and HL7618RD)	262144	LTE Band 17 (700MHz)	(HL7688 only)
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HL7618, HL7618RD, HI7648, HL7650, HL7688, HL7690 and HL7692			
	524288	LTE Band 28 (700 MHz)	(HL7650 only)
	16777216	LTE Band 8 (900 MHz)	(HL7650, HL7690 and HL7692)
	33554432	LTE Band 20 (800 MHz)	(HL7690 and HL7692)
	67108864	LTE Band 12 (700 MHz)	(HL7648 only)
Reference Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> Selection can be one or more (up to two) GSM bands, one or more (up to three) UMTS bands, and one or more (up to five) LTE bands. Setting the <band> of *PSRDBS automatically corrects the <mode> of +KSRAT if the two values conflict with each other. For example, when the <mode> of +KSRAT is GSM only, changing the <band> of *PSRDBS to LTE band only will also correct the <mode> of +KSRAT to LTE only. Likewise, when the <mode> of +KSRAT is GSM only, changing the <band> of *PSRDBS to LTE+GSM bands will also correct <mode> of +KSRAT to dual LTE and GSM mode. 		

5.55. +CMEC Command: Mobile Equipment Control Mode

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<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 the 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 purposes. Parameters are ignored and are not saved in non-volatile memory.

5.56. +CPOF Command: Power Off

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> AT+CPOF	<u>Response</u> OK
<u>Notes</u>	<ul style="list-style-type: none"> This command powers the module off. It is equivalent to AT+CFUN=0. "OK" is immediately returned after the power off sequence is started.

5.57. +KGSMAD Command: GSM/LTE Antenna Detection

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692										
<i>Test command</i>										
<u>Syntax</u> AT+KGSMAD=?	<u>Response</u> +KGSMAD: (list of supported <mod>s),(list of supported <urcmode>s),(list of supported <interval>s),(list of supported <detGPIO>s),(list of supported <repGPIO>s) OK									
<i>Read command</i>										
<u>Syntax</u> AT+KGSMAD?	<u>Response</u> +KGSMAD: <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO> OK									
<i>Write command</i>										
<u>Syntax</u> AT+KGSMAD= <mod> [<urcmode> [,<interval> [,<detGPIO> [,<repGPIO>]]]]	<u>Response</u> OK <u>Parameters</u> <table> <tr> <td><mod></td> <td>0</td> <td>Disable antenna detection</td> </tr> <tr> <td></td> <td>1</td> <td>Periodic antenna detection</td> </tr> <tr> <td></td> <td>2</td> <td>Instantaneous antenna detection</td> </tr> </table> <u><urcmode></u> URC presentation mode. This is only applicable if <mod>=1 0 Disable the presentation of antenna detection URC 1 Enable the presentation of antenna detection URC <u><interval></u> 45 – 3600 Interval between two detections, in seconds. This is only applicable if <mod>=1. Default value = <u>120</u> <u><detGPIO></u> 1 – 8, 10, 11, 13 – 15 GPIO to be used as input by the antenna detection algorithm. Default value = <u>5</u>	<mod>	0	Disable antenna detection		1	Periodic antenna detection		2	Instantaneous antenna detection
<mod>	0	Disable antenna detection								
	1	Periodic antenna detection								
	2	Instantaneous antenna detection								

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<p><repGPIO> 1 – 8, 10, 11, 13 –15 GPIO to be used as output by the antenna detection algorithm to report the antenna’s condition. This is only applicable if <mod>=1. Default value = <u>7</u></p>
Notes	<ul style="list-style-type: none"> • <repGPIO> is set to LOW when the antenna is connected, set to HIGH otherwise. • If the antenna detection algorithm detects a change in the antenna status, the module is notified by URC +KGSMD: <presence> where <presence>: <ul style="list-style-type: none"> 0 - antenna connected 1 - antenna connector short circuited to ground 2 - antenna connector short circuited to power 3 - antenna not detected (open) • GPIOs may be already used by +KSIMDET, +KGNSSAD, +KSYNC, and +KTEMPMON; use +KGPIOCFG to check if a GPIO is already used by another interface/command prior to using this command. • Instantaneous activation doesn’t affect a periodic activation that has already been started.

5.58. +KSREP Command: Mobile Start-up Reporting

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KSREP=?</p>	<p><u>Response</u> +KSREP: (list of supported <mode>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KSREP?</p>	<p><u>Response</u> +KSREP: <mode>,<stat>,<PB ready> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KSREP= <mode></p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u> <mode> Unsolicited result code mode 0 Disable the start-up URC 1 Enable the start-up URC</p> <p><stat> Module status 0 The module is ready to receive commands for the TE. No access code is required 1 The module is waiting for an access code. Use AT+CPIN? to determine the code</p>

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<p>2 The SIM card is not present 3 The module is in "SIM lock" state 4 Unrecoverable error 5 Unknown state</p> <p><PB ready> Phone book status 0 Phone book is not ready 1 Phone book is ready for read and write</p>
<i>Unsolicited Notification</i>	<p><u>Response</u> +KSUP: <stat></p>
<u>Reference</u> Sierra Wireless Proprietary	<p><u>Notes</u></p> <ul style="list-style-type: none"> • URC +KSUP: <stat> will only be displayed once after reboot if <mode>=1. • If <mode>=0, +PBREADY and +SIM URC notifications will not be sent at the start-up process. However, they will still be sent afterwards during normal module operation. • This command can be used without a SIM. • <mode> is saved in non-volatile memory.
<u>Example</u>	<pre>// SIM Card is inserted AT+KSREP? +KSREP: 1,0,1 // <mode>=1. The module and phone book are ready OK AT+KSREP=? +KSREP: (0-1) OK AT+KSREP=0 // Set mode to 0 OK AT+KSREP? +KSREP: 0,0,1 // Mode is changed to 0 and save to non-volatile memory OK // Reboot the module AT+KSREP? +KSREP: 0,0,1 // Mode=0 which is restored from non-volatile memory 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 is not present, and the phone book is not ready OK +SIM: 1 // Insert SIM card +PBREADY // Phone Book is ready AT+KSREP? +KSREP: 1,0,1 // Start-up reporting is enabled. Both module and phone book // are ready OK</pre>

5.59. +WMANTSEL Command: Select Main / Diversity Antenna for LTE

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+WMANTSEL=?</p>	<p><u>Response</u> +WMANTSEL: (list of supported <MODE>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+WMANTSEL?</p>	<p><u>Response</u> +WMANTSEL: <MODE> OK</p>
<p><i>Write Command</i></p> <p><u>Syntax</u> AT+WMANTSEL=<MODE></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u> <MODE> Mode of operations for main and diversity antennas For LTE-only variants, <MODE> is coded as a single decimal number <digit-L>; while for variants that support both LTE and UMTS, <MODE> is coded as a 2-digit BCD number [<digit-U>]<digit-L></p> <p style="margin-left: 40px;"><digit-L> Digit for LTE</p> <ul style="list-style-type: none"> 0 Use main and diversity antenna on LTE 1 Only use main antenna on LTE 2 Only use diversity antenna on LTE <p style="margin-left: 40px;"><digit-U> Digit for UMTS</p> <ul style="list-style-type: none"> 0 Use main and diversity antenna on UMTS 1 Only use main antenna on UMTS 2 Only use diversity antenna on UMTS
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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.
<p><u>Examples</u></p>	<p>// For variants that only support LTE (e.g. HL7690 and HL7692)</p> <pre>at+wmantSEL? +WMANTSEL: 0 OK at+cops=2 // Deregister from network OK at+wmantSEL=1 // Only select only main antenna OK at+cops=0 // Re-register to network OK</pre>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

	<pre> at+cops=2 // Deregister from network OK at+wmantssel=2 // Only select diversity antenna OK at+cops=0 // Re-register to network OK // For variants that support both UMTS and LTE (e.g. HL7650 and HL7688) at+wmantssel? // Read command +WMANTSEL: 00 OK at+wmantssel=? // Test command +WMANTSEL: (0-2,00-02,10-12,20-22) OK at+wmantssel=11 // Write command to enable main antenna only for both UMTS // and LTE OK at+wmantssel? // Read back the inputted value +WMANTSEL: 11 OK </pre>
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5.60. +KSIMSEL Command: SIM Selection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<i>Test command</i>	
<p><u>Syntax</u> AT+KSIMSEL=?</p>	<p><u>Response</u> +KSIMSEL: (list of supported <mode>s),(list of supported <GPIO>s) OK</p>
<i>Read command</i>	
<p><u>Syntax</u> AT+KSIMSEL?</p>	<p><u>Response</u> +KSIMSEL: <mode>[,<GPIO>[,<sim_used>]] OK</p>
<i>Write command</i>	
<p><u>Syntax</u> AT+KSIMSEL= <mode> [, <GPIO>]</p>	<p><u>Response</u> OK</p> <p>If <mode> = 4: +KSIMSEL: <mode>,<sim1_pres>,<sim2_pres> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><u>Parameters</u></p> <p><mode> SIM selection mode</p> <p>0 SIM selection disable</p> <p>1 Force to select the 1st external SIM. The 2nd external SIM presence will be ignored.</p> <p>2 Force to select the 2nd external SIM. The 1st external SIM presence will be ignored.</p> <p>3 Select the 1st external SIM if present, else select the 2nd external SIM if present.</p> <p>4 Read SIM cards presence status</p> <p><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.</p> <p><sim_used> 1 The 1st external SIM currently used 2 The 2nd external SIM currently used</p> <p><sim1_pres> 0 The 1st external SIM is not present 1 The 1st external SIM is present</p> <p><sim2_pres> 0 The 2nd external SIM is not present 1 The 2nd external SIM is present</p>
<u>Notes</u>	<ul style="list-style-type: none"> 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 +KGPIO. 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 or 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 </pre>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<p>AT+KSIMSEL? +KSIMSEL:1,6 OK</p> <p>AT+KSIMSEL=0 OK</p> <p>AT+KSIMSEL=3,6 OK</p> <p>AT+KSIMSEL? +KSIMSEL: 3,6,1 OK</p> <p>AT+KSIMSEL=0 OK</p> <p>AT+KSIMSEL=3 OK</p> <p>AT+KSIMSEL? +KSIMSEL: 3,6,2 OK</p> <p>AT+KSIMSEL=4 +KSIMSEL: 4,0,1 OK</p>	<p>// 1st SIM active and GPIO 6 is used for SIM selection</p> <p>// Disable SIM select functionality</p> <p>// Enable SIM select functionality. SIM selection will be performed. SIM slot status = the 1st SIM is present, the 2nd SIM is absent</p> <p>// SIM selection performed. GPIO 6 is used as selection pin and the 1st external SIM is currently activated</p> <p>// Disable SIM select functionality</p> <p>// Re-enable SIM select functionality. SIM selection will be performed. SIM slot status = the 1st SIM is absent, the 2nd SIM is present</p> <p>// SIM selection performed. GPIO 6 is used as selection pin and the 2nd external SIM is currently activated</p> <p>// 1st external SIM is absent and 2nd external SIM is present</p>
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5.61. +BOOTDWLCFG Command: Boot Configuration for Firmware Download

5.61.1. 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.

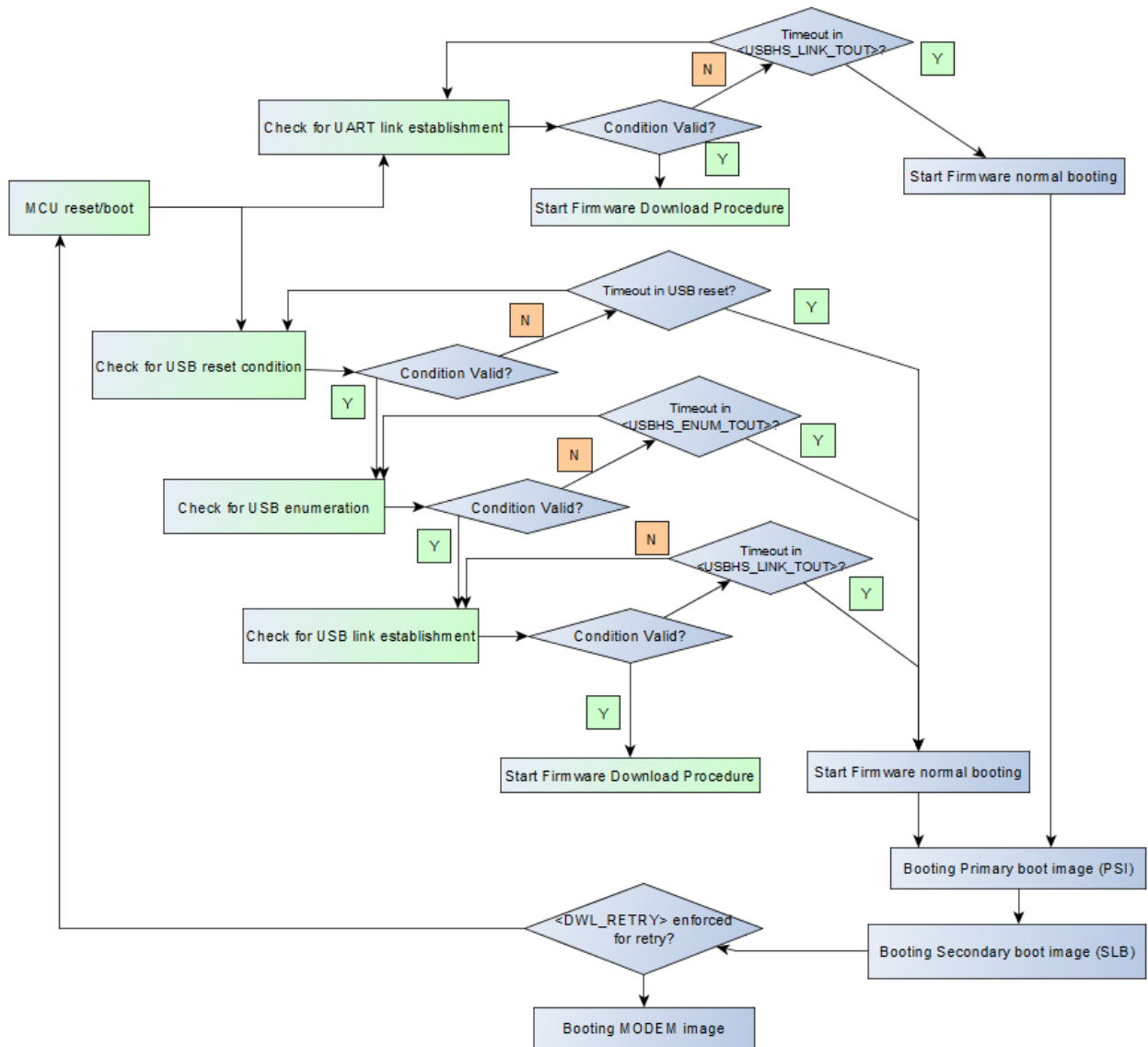


Figure 2. Firmware Download Request Detection Sequence

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 2. 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 3. 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.

5.61.2. Syntax

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+BOOTDWLCFG=?</p>	<p><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</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+BOOTDWLCFG?</p>	<p><u>Response</u> +BOOTDWLCFG: <USBHS_ENUM_TOUT>,<USBHS_LINK_TOUT>,<DWL_RETRY> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692																									
<p><i>Write command</i></p> <p><u>Syntax</u> AT+ BOOTDWLCFG= [<USBHS_ENUM _TOUT> [,<USBHS_LINK_ TOUT> [,<DWL_RETRY> [,<SYS_REBOOT >]]]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <p><USBHS_ENUM_TOUT> USB enumeration time out value</p> <table border="0"> <tr><td><u>0</u></td><td>3s</td></tr> <tr><td>1</td><td>30s</td></tr> <tr><td>2</td><td>60s</td></tr> <tr><td>3</td><td>90s</td></tr> </table> <p><USBHS_LINK_TOUT> USB link establishment time out value</p> <table border="0"> <tr><td><u>0</u></td><td>1s</td></tr> <tr><td>1</td><td>30s</td></tr> <tr><td>2</td><td>60s</td></tr> <tr><td>3</td><td>90s</td></tr> </table> <p><DWL_RETRY> Desired firmware download retry count when firmware download conditions are not met (i.e. the download program didn't start)</p> <table border="0"> <tr><td><u>0</u></td><td>No retry</td></tr> <tr><td>1 – 10</td><td>Number of retries</td></tr> </table> <p><SYS_REBOOT> System reboot options after executing this command</p> <table border="0"> <tr><td><u>0</u></td><td>Do not reboot</td></tr> <tr><td>1</td><td>Reboot immediately without network deregistration</td></tr> </table>	<u>0</u>	3s	1	30s	2	60s	3	90s	<u>0</u>	1s	1	30s	2	60s	3	90s	<u>0</u>	No retry	1 – 10	Number of retries	<u>0</u>	Do not reboot	1	Reboot immediately without network deregistration
<u>0</u>	3s																								
1	30s																								
2	60s																								
3	90s																								
<u>0</u>	1s																								
1	30s																								
2	60s																								
3	90s																								
<u>0</u>	No retry																								
1 – 10	Number of retries																								
<u>0</u>	Do not reboot																								
1	Reboot immediately without network deregistration																								
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> ▪ 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. <p>Basically, the conditions above are terminate conditions that time out values are effective only once.</p> • 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: <ul style="list-style-type: none"> ▪ 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>: <ul style="list-style-type: none"> ▪ 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. <p>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.</p> 																								

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Examples</u>	<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>

5.62. +CALA Command: Set Alarm

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CALA=?	<u>Response</u> +CALA: ("yy/MM/dd, hh:mm:ss"),(list of supported <n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CALA?	<u>Response</u> [+CALA: <time>,<n>] OK
<i>Write command</i>	
<u>Syntax</u> AT+CALA= <time>[,<n>]	<u>Response</u> OK or +CME ERROR: <err>

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<p><u>Parameters</u></p> <p><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</p> <p><n> Alarm index</p>
<i>Unsolicited Notification</i>	<p><u>Response</u></p> <p>+CALV: <value></p> <p><u>Parameter</u></p> <p><value> Alarm state</p> <p>1 Alarm is enabled</p>
Reference Sierra Wireless Proprietary	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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>

5.63. +CALD Command: Delete Alarm

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u></p> <p>AT+CALD=?</p>	<p><u>Response</u></p> <p>OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CALD=<n></p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameter</u> <n> Alarm index</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> This command can be used without a SIM. This write command is only effective when the alarm has already been set by AT+CALA.
<p><u>Examples</u></p>	<p>AT+CALD=? // Test command OK</p> <p>AT+CALD=1 // Delete the alarm OK</p>

5.64. +KCCINFO Command: Camped Cell Information

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KCCINFO=?</p>	<p><u>Response</u> +KCCINFO: (list of supported <mode>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KCCINFO?</p>	<p><u>Response</u> +KCCINFO: <mode>,<CI>,<RAC>,<TAC> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KCCINFO= <mode></p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u></p> <p><mode> 0 Camped cell parameters change event notification is disabled 1 Camped cell parameters change event notification is enabled</p> <p><CI> 4-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><RAC> 1-byte routing area code in hexadecimal format. FF will be displayed if routing area identity information is invalid.</p> <p><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.</p>
<i>Unsolicited Notification</i>	<p><u>Response</u> +KCCINFO: <CI>,<RAC>,<TAC></p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> This command is used to enable or disable the unsolicited response which informs about any change in camped cell parameters. This command works with a SIM card. <mode> is automatically stored in persistent memory. Settings take effect immediately.
<u>Examples</u>	<pre> AT+KCCINFO=1 // Set mode to 1 OK AT+KCCINFO=? // Test command +KCCINFO: (0-1) OK AT+COPS=0 // Attach to network OK +KCCINFO: "00006773","01","FFFF" // URC display after attached to network AT+KCCINFO? // Read command +KCCINFO: 1,"00006773","01","FFFF" OK </pre>

5.65. +CALM Command: Alert Sound Mode

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
<i>Test command</i>	
<p><u>Syntax</u> AT+CALM=?</p>	<p><u>Response</u> +CALM: (list of supported <mode>s) OK</p>
<i>Read command</i>	
<p><u>Syntax</u> AT+CALM?</p>	<p><u>Response</u> +CALM: <mode> OK</p>

HL7648 and HL7688	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CALM= <mode></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u> <mode> <u>0</u> Normal mode 1 Silent mode (all sounds from the MT are prevented)</p>
<p><u>Reference</u> [27.007] § 8.20</p>	<p><u>Examples</u> AT+CALM? +CALM: 0 OK</p> <p>AT+CALM=1 OK</p> <p>AT+CALM=? +CALM: (0-1) OK</p>

5.66. +CRSL Command: Ringer Sound Level

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CRSL=?</p>	<p><u>Response</u> +CRSL: (list of supported <level>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CRSL?</p>	<p><u>Response</u> +CRSL: <level> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CRSL= <level></p>	<p><u>Response</u> OK</p> <p><u>Parameter</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.</p>

HL7648 and HL7688	
<p><u>Reference</u> [27.007] § 8.21</p>	<p><u>Examples</u> AT+CRSL? +CRSL: 0 OK</p> <p>AT+CRSL=1 OK</p> <p>AT+CRSL=? +CRSL: (0-3) OK</p>

5.67. +WESHDOWN Command: Emergency Shutdown

Note: For HL7650, HL7690 and HL7692 only.

HL7650, HL7690 and HL7692										
<p><i>Test command</i></p> <p><u>Syntax</u> AT+WESHDOWN=?</p>	<p><u>Response</u> +WESHDOWN: (list of supported <mode>s), (list of supported <gpio_index>es) OK</p>									
<p><i>Read command</i></p> <p><u>Syntax</u> AT+WESHDOWN?</p>	<p><u>Response</u> +WESHDOWN: <mode>[,<gpio_index>] OK</p>									
<p><i>Write command</i></p> <p><u>Syntax</u> AT+WESHDOWN=<mode>[,<gpio_index>]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR <err></p> <p><u>Parameters</u></p> <table> <tr> <td><mode></td> <td>0</td> <td>Disable emergency shutdown feature by GPIO</td> </tr> <tr> <td></td> <td>1</td> <td>Enable emergency shutdown feature by GPIO</td> </tr> <tr> <td></td> <td>2</td> <td>Trigger emergency shutdown</td> </tr> </table> <hr/> <p><i>Note:</i> Due to the quick shutdown of the module, the OK response sent by AT+WESHDOWN=2 might not be received by the application.</p> <p><gpio_index> 1 – 8 (for the HL7650) 1, 2, 4 – 8, 10, 11, 13 – 15 (for the HL7690 and HL7692)</p> <p>Defines which GPIO will be used as input to trigger the emergency shutdown on the falling edge. Default value = <u>4</u></p>	<mode>	0	Disable emergency shutdown feature by GPIO		1	Enable emergency shutdown feature by GPIO		2	Trigger emergency shutdown
<mode>	0	Disable emergency shutdown feature by GPIO								
	1	Enable emergency shutdown feature by GPIO								
	2	Trigger emergency shutdown								

HL7650, HL7690 and HL7692	
<p><u>Reference</u> Sierra Wireless Proprietary Command</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • <gpio_index> is only used when <mode> = 1. • Parameters are not saved in non-volatile memory. They must be configured each time the module boots up. • GPIOs may already be used by +KSIMDET, +KSYNC, +KTEMPMON, +KGSMD, +KSIMSLOT, etc. • Only GPIO 4 is available for use in the HL7650. Since this GPIO is also used to detect the insertion/removal of SIM2, this feature is disabled when emergency shutdown is activated. • This command can be used without a SIM.
<p><u>Examples</u></p>	<pre> AT+WESHDOWN=? +WESHDOWN: (0-2),(1,2,4-8,10,11,13-15) // for the HL7690 and HL7692 +WESHDOWN: (0-2),(1-8) // for the HL7650 OK AT+WESHDOWN? +WESHDOWN: 0 // Emergency shutdown by GPIO is not active OK AT+WESHDOWN=1,4 // Activate emergency shutdown on GPIO4 OK AT+WESHDOWN? +WESHDOWN: 1,4 // A falling edge on GPIO4 will shut the module down OK AT+WESHDOWN=2 OK // Module shuts down </pre>

5.68. +KMCLASS Command: Change GPRS and EGPRS Multislot Class

Note: For HL7618, HL7650, HL7688, HL7690 and HL7692 only.

HL7618, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+KMCLASS=?</p>	<p><u>Response</u> +KMCLASS: (list of supported <mclass>es) OK</p>
<p><i>Read command</i></p>	<p>Get Multislot Class</p>
<p><u>Syntax</u> AT+KMCLASS?</p>	<p><u>Response</u> +KMCLASS: <mclass> OK</p>

HL7618, HL7650, HL7688, HL7690 and HL7692																																																																								
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KMCLASS= <mclass></p>	<p>Set Multislot Class for GPRS and EGPRS</p> <p><u>Response</u> OK</p> <p><u>Parameter</u> <mclass> Multislot class</p> <table border="1"> <thead> <tr> <th rowspan="2">Multislot Class</th> <th colspan="3">Maximum Number of Slots</th> </tr> <tr> <th>Rx</th> <th>Tx</th> <th>Sum</th> </tr> </thead> <tbody> <tr><td>1</td><td>1</td><td>1</td><td>2</td></tr> <tr><td>2</td><td>2</td><td>1</td><td>3</td></tr> <tr><td>3</td><td>2</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>3</td><td>1</td><td>4</td></tr> <tr><td>5</td><td>2</td><td>2</td><td>4</td></tr> <tr><td>6</td><td>3</td><td>2</td><td>4</td></tr> <tr><td>7</td><td>3</td><td>3</td><td>4</td></tr> <tr><td>8</td><td>4</td><td>1</td><td>5</td></tr> <tr><td>9</td><td>3</td><td>2</td><td>5</td></tr> <tr><td>10</td><td>4</td><td>2</td><td>5</td></tr> <tr><td>11</td><td>4</td><td>3</td><td>5</td></tr> <tr><td>12 (default)</td><td>4</td><td>4</td><td>5</td></tr> <tr><td>30</td><td>5</td><td>1</td><td>6</td></tr> <tr><td>31</td><td>5</td><td>2</td><td>6</td></tr> <tr><td>32</td><td>5</td><td>3</td><td>6</td></tr> <tr><td>33</td><td>5</td><td>4</td><td>6</td></tr> </tbody> </table>	Multislot Class	Maximum Number of Slots			Rx	Tx	Sum	1	1	1	2	2	2	1	3	3	2	2	3	4	3	1	4	5	2	2	4	6	3	2	4	7	3	3	4	8	4	1	5	9	3	2	5	10	4	2	5	11	4	3	5	12 (default)	4	4	5	30	5	1	6	31	5	2	6	32	5	3	6	33	5	4	6
Multislot Class	Maximum Number of Slots																																																																							
	Rx	Tx	Sum																																																																					
1	1	1	2																																																																					
2	2	1	3																																																																					
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7	3	3	4																																																																					
8	4	1	5																																																																					
9	3	2	5																																																																					
10	4	2	5																																																																					
11	4	3	5																																																																					
12 (default)	4	4	5																																																																					
30	5	1	6																																																																					
31	5	2	6																																																																					
32	5	3	6																																																																					
33	5	4	6																																																																					
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> This AT command works with a SIM card inserted in the modem. <mclass> changes take effect immediately and is automatically stored in non-volatile memory. 																																																																							

5.69. +LOGLV Command: Trace Logging Level

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+LOGLV=?</p>	<p><u>Response</u> +LOGLV: (list of supported <level>s) OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692																	
<p><i>Read command</i></p> <p><u>Syntax</u> AT+LOGLV?</p>	<p><u>Response</u> Before Firmware 30.01: OK</p> <p>Firmware 30.01 onwards: <level>,<xsys_state> OK</p>																
<p><i>Execute command</i></p> <p><u>Syntax</u> AT+LOGLV= <level></p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;"><level></td> <td>System trace levels</td> </tr> <tr> <td>"Off"</td> <td>Turn off all traces</td> </tr> <tr> <td>"low", "low0" ... "lowN"</td> <td>Enable less trace</td> </tr> <tr> <td>"med", "med0" ... "medN"</td> <td>Enable medium level of trace</td> </tr> <tr> <td>"high", "high0" ... "highN"</td> <td>Enable most traces</td> </tr> </table> <p><xsys_state> State of internal system trace configurations (AT+XSYS TRACE)</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">0</td> <td>Configuration set by +LOGLV is not modified</td> </tr> <tr> <td>1</td> <td>Configuration set by +LOGLV is modified externally</td> </tr> <tr> <td>2</td> <td>Not configured by +LOGLV yet</td> </tr> </table> <p>Note that this parameter is only available from Firmware 30.01 onwards.</p>	<level>	System trace levels	"Off"	Turn off all traces	"low", "low0" ... "lowN"	Enable less trace	"med", "med0" ... "medN"	Enable medium level of trace	"high", "high0" ... "highN"	Enable most traces	0	Configuration set by +LOGLV is not modified	1	Configuration set by +LOGLV is modified externally	2	Not configured by +LOGLV yet
<level>	System trace levels																
"Off"	Turn off all traces																
"low", "low0" ... "lowN"	Enable less trace																
"med", "med0" ... "medN"	Enable medium level of trace																
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0	Configuration set by +LOGLV is not modified																
1	Configuration set by +LOGLV is modified externally																
2	Not configured by +LOGLV yet																
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • "med" is the recommended setting for getting debug traces in general cases. • "Off" is the recommended setting to ensure the module's best performance. • The set of trace configurations configured by <level> is persistent over module boot. 																



6. Network Service Related Commands

6.1. +CAOC Command: Advice of Charge

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CAOC=?	<u>Response</u> +CAOC: (list of supported <mode>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CAOC?	<u>Response</u> +CAOC: <mode> OK
<i>Write command</i>	
<u>Syntax</u> AT+CAOC= [<mode>]	<u>Response</u> +CAOC: <ccm> OK or +CME ERROR: <err> <u>Parameters</u> <mode> 0 Query CCM value 1 Deactivate unsolicited notification (+CCCM) 2 Activate unsolicited notification <ccm> String type; three bytes of the current call meter value in hexadecimal format
<i>Unsolicited Notification</i>	<u>Response</u> +CCCM: <ccm>

6.2. +CUSD Command: Unstructured Supplementary Service Data

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CUSD=?	<u>Response</u> +CUSD: (list of supported <n>s) OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692													
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CUSD?</p>	<p><u>Response</u> +CUSD: <n> OK</p>												
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CUSD=[<n>[,<str>[,<dcs>]]]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u> <n> Enables or disables the presentation of an unsolicited result code 0 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)</p> <p><str> String type USSD-string (when <str> parameter is not given, network is not interrogated)</p> <p><dcs> Cell Broadcast Data Coding Scheme in integer format (default value: 0)</p> <p><m></p> <table border="0"> <tr> <td>0</td> <td>No further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation)</td> </tr> <tr> <td>1</td> <td>Further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation)</td> </tr> <tr> <td>2</td> <td>USSD terminated by network</td> </tr> <tr> <td>3</td> <td>Other local client has responded</td> </tr> <tr> <td>4</td> <td>Operation not supported</td> </tr> <tr> <td>5</td> <td>Network time out</td> </tr> </table>	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
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												
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +CUSD: <m>[,<str>,<dcs>]</p>												
<p><u>Notes</u></p>	<p><n> is saved in non-volatile memory per AT port over module reboot.</p>												

6.3. +CLCK Command: Facility Lock

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CLCK=?</p>	<p><u>Response</u> +CLCK: (list of supported <fac>s) OK</p> <p>or +CME ERROR: <err></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

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" BAOC (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

<class> 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CNUM=?</p>	<p><u>Response</u> OK</p>
<p><i>Execute command</i></p> <p><u>Syntax</u> AT+CNUM</p>	<p><u>Response</u> +CNUM: [<alpha1>,<number1>,<type1>,<speed>,<service>,<itc>][<CR><LF> +CNUM: [<alpha2>,<number2>,<type2>,<speed>,<service>,<itc>][...] OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u></p> <p><alphax> Optional alphanumeric string associated with <numberx>; used character set should be the one selected with command +CSCS</p> <p><numberx> String type phone number of format specified by <typex></p> <p><typex> Type of address octet in integer format</p> <p><speed> As defined in 27.007 sub clause 6.7, corresponding to +CBST setting</p> <p><service> Service related to the phone number</p> <ul style="list-style-type: none"> 0 Asynchronous modem 1 Synchronous modem 2 PAD Access (asynchronous) 3 Packet Access (synchronous) 5 Fax <p><itc> Information transfer capability</p> <ul style="list-style-type: none"> 0 3.1kHz 1 UDI
<p><u>Note</u></p>	<p>MSISDN information should be stored in the SIM card before using +CNUM.</p>

6.5. +COLP Command: Connected Line Identification Presentation

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+COLP=?</p>	<p><u>Response</u> +COLP: (list of supported <n>s) OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Read command</i>	
<u>Syntax</u> AT+COLP?	<u>Response</u> +COLP: <n>,<m> OK
<i>Execute command</i>	
<u>Syntax</u> AT+COLP=[<n>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameters</u> <n> 0 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>	<ul style="list-style-type: none"> 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+COPS=?</p>	<p><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</p> <p>or +CME ERROR: <err></p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+COPS?</p>	<p><u>Response</u> +COPS: <mode>[,<format>,<oper>[,<AcT>]] OK</p> <p>or +CME ERROR: <err></p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+COPS= [<mode> [,<format> [,<oper> [,< AcT>]]]]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u></p> <p><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</p> <p><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</p> <p><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)</p> <p><stat> 0 Unknown networks 1 Network available 2 Current (registered) 3 Forbidden network</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><Act> 0 GSM 2 UMTS 7 LTE</p> <p><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</p> <p>Note that this parameter only supports R7 Protocol Stack onwards.</p>
<u>Notes</u>	<ul style="list-style-type: none"> • 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. • +CME ERROR: 22 is returned if AT+COPS=0 is sent while data transmission is ongoing.

6.8. +CPOL Command: Preferred PLMN List

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CPOL=?</p>	<p><u>Response</u> +CPOL: (list of supported <index>es),(list of supported <format>s) OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CPOL?</p>	<p><u>Response</u> +CPOL: <index1>,<format>,<oper1>[,<GSM_Act1>,<GSM_Compact_Act1>,<UTRAN_Act1>,<EUTRAN_Act1>][<CR><LF> +CPOL: <index2>,<format>,<oper2>[,<GSM_Act2>,<GSM_Compact_Act2>,<UTRAN_Act2>,<EUTRAN_Act2>][...] OK</p> <p>or</p> <p>+CME ERROR: <err></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CPOL= [<index>] [<format> [<oper> [<GSM_Act>, <GSM_Compact_AcT>,<UTRAN_AcT>,<EUTRAN_AcT>]]]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u></p> <p><index> Integer type; order number of operator in the SIM/USIM preferred operator list</p> <p><format> 0 Long format alphanumeric <oper> 1 Short format alphanumeric <oper> 2 Numeric <oper></p> <p><opern> String type; <format> indicates if the format is alphanumeric or numeric</p> <p><GSM_Act> 0 GSM access technology not selected 1 GSM access technology selected</p> <p><GSM_Comp_AcT> 0 GSM compact access technology not selected 1 GSM compact access technology selected</p> <p><UTRA_AcT> 0 UTRA access technology not selected 1 UTRA access technology selected</p> <p><EUTRA_AcT> 0 EUTRA access technology not selected 1 EUTRA access technology selected</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CPWD=?</p>	<p><u>Response</u> +CPWD: list of supported (<fac>,<pwdlength>)s OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CPWD= <fac>,<oldpwd>,<newpwd></p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><u>Parameters</u></p> <p><fac></p> <p>"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)</p> <p>"SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued)</p> <p>"AO" BAO (Barr All Outgoing Calls)</p> <p>"OI" BOIC (Barr Outgoing International Calls)</p> <p>"OX" BOIC-exHC (Barr Outgoing International Calls except to Home Country)</p> <p>"AI" BAIC (Barr All Incoming Calls)</p> <p>"IR" BIC-Roam (Barr Incoming Calls when Roaming outside the home country)</p> <p>"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>)</p> <p>"PN" Network Personalization</p> <p>"PU" Network subset Personalization</p> <p>"PP" Service Provider Personalization</p> <p>"PC" Corporate Personalization</p> <p><oldpwd> String type containing the old password</p> <p><newpwd> String type containing the new password</p> <p><pwdlength> Length of password</p>

6.10. +CREG Command: Network Registration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CREG=?</p>	<p><u>Response</u> +CREG: (list of supported <n>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CREG?</p>	<p><u>Response</u> +CREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]] OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CREG=[<n>]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692															
	<p><u>Parameters</u></p> <p><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>]]</p> <p><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</p> <p><lac> String type; two-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)</p> <p><ci> String type; four-byte UTRAN/E-UTRAN cell ID in hexadecimal format</p> <p><Act></p> <table border="0"> <tr><td>0</td><td>GSM</td></tr> <tr><td>2</td><td>UTRAN</td></tr> <tr><td>3</td><td>GSM with EGPRS</td></tr> <tr><td>4</td><td>UTRAN with HSDPA</td></tr> <tr><td>5</td><td>UTRAN with HSUPA</td></tr> <tr><td>6</td><td>UTRAN with HSDPA and HSUPA</td></tr> <tr><td>7</td><td>E-UTRAN</td></tr> </table>	0	GSM	2	UTRAN	3	GSM with EGPRS	4	UTRAN with HSDPA	5	UTRAN with HSUPA	6	UTRAN with HSDPA and HSUPA	7	E-UTRAN
0	GSM														
2	UTRAN														
3	GSM with EGPRS														
4	UTRAN with HSDPA														
5	UTRAN with HSUPA														
6	UTRAN with HSDPA and HSUPA														
7	E-UTRAN														
<i>Unsolicited Notification</i>	<p><u>Response</u></p> <p>When <n>=1 and there is a change in the ME network registration status code: +CREG: <stat></p> <p>When <n>=2 and there is a change in the network cell: +CREG: <stat>[,<lac>,<ci>[,<Act>]]</p>														
<u>Notes</u>	<n> is saved in non-volatile memory per AT port over module reboot.														

6.11. +CSSN Command: Supplementary Service Notification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u></p> <p>AT+CSSN=?</p>	<p><u>Response</u></p> <p>+CSSN: (list of supported <n>s), (list of supported <m>s) OK</p>
<i>Read command</i>	
<p><u>Syntax</u></p> <p>AT+CSSN?</p>	<p><u>Response</u></p> <p>+CSSN: <n>,<m> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CSSN=[<n> [,<m>]]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><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</p> <p><m> <u>0</u> Disable +CSSU result code presentation status to the TE 1 Enable +CSSU result code presentation status to the TE</p>
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +CSSI: <code1>[,<index>] +CSSU: <code2>[<index> [,<number>,<type>]]</p> <p><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</p> <p><index> <u>0</u> – 9 Index 10 No index (prefer to take from subscriber data)</p> <p><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</p> <p><number> String type phone of format specified by <type></p> <p><type> Type of address octet in Integer format</p>
<p><u>Notes</u></p>	<p><n> and <m> are saved in non-volatile memory per AT port over module reboot.</p>

6.12. +CPLS Command: Select Preferred PLMN List

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CPLS=?</p>	<p><u>Response</u> +CPLS: (list of supported <cpls_list>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CPLS?</p>	<p><u>Response</u> +CPLS: <cpls_list> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CPLS= [<cpls_list>]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameter</u> <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</p>

6.13. +CEREG Command: EPS Network Registration Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CEREG=?</p>	<p><u>Response</u> +CEREG: (list of supported <n>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CEREG?</p>	<p><u>Response</u> +CEREG: <n>,<stat>[,<tac>,<ci>[,<AcT>]] OK</p>
<p><i>Execute command</i></p> <p><u>Syntax</u> AT+CEREG= [<n>]</p>	<p><u>Response</u> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	or +CME ERROR: <err> <u>Parameters</u> <n> 0 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Test command</u> <u>Syntax</u> AT+CEMODE=?	<u>Response</u> +CEMODE: (list of supported <mode>s) OK
<u>Read command</u> <u>Syntax</u> AT+CEMODE?	<u>Response</u> +CEMODE: <mode> OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 (default value for HL7618 and HL7618RD) 1 CS/PS mode 1 of operation (default value for HL7650, HL7688 and HL7692) 2 CS/PS mode 2 of operation (default value for HL7648 and HL7690) 3 PS mode 1 of operation
<u>Notes</u>	<mode> is saved in non-volatile memory over module reboot.

6.15. +KAAT Command: GPRS Automatic Attach

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690 only.

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690							
<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 border="0"> <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> <ul style="list-style-type: none"> 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>						

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690

```
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  
  
<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
```

>> 7. Phone Book Management

7.1. +CPBF Command: Find Phonebook Entries

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CPBF=?</p>	<p><u>Response</u> +CPBF: [<nlength>],[<tlength>],[<glength>],[<slength>],[<elength>] OK</p> <p>or +CME ERROR: <err></p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CPBF= <findtext></p>	<p><u>Response</u> [+CPBF:<index1>,<number>,<type>,<text>[,<hidden>]][,<group>][,<adnumber>] [,<adtype>][,<secondtext>][,<email>]] OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u> <index1>, <index2>, <index> Integer type values in the range of location numbers of phonebook memory</p> <p><number> String type phone number of format <type></p> <p><type> Type of address octet in integer format</p> <p><text> String type field of maximum length <tlength>; character set as specified by command +CSCS</p> <p><group> String type field of maximum length <glength>; character set as specified by command +CSCS</p> <p><adnumber> String type phone number of format <adtype></p> <p><adtype> Type of address octet in integer format</p> <p><secondtext> String type field of maximum length <slength>; character set as specified by command +CSCS</p> <p><email> String type field of maximum length <elength>; character set as specified by command +CSCS</p> <p><nlength> Integer type value indicating the maximum length of field <number></p> <p><tlength> Integer type value indicating the maximum length of field <text></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><glength> Integer type value indicating the maximum length of field <group></p> <p><slength> Integer type value indicating the maximum length of field <secondtext></p> <p><elength> Integer type value indicating the maximum length of field <email></p> <p><hidden> Indicates if the entry is hidden or not</p> <p>0 Phonebook entry not hidden</p> <p>1 Phonebook entry hidden</p>
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CPBR=?</p>	<p><u>Response</u> +CPBR: (list of supported <index>es),[<nlength>],[<tlength>],[<glength>],[<alength>],[<slength>],[<elength>] OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CPBR= <index1> [,<index2>]</p>	<p><u>Response</u> [+CPBR: <index1>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]][[...]] OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u> <index1>, <index2>, <index> Integer type values in the range of location numbers of phonebook memory</p> <p><number> String type phone number of format <type></p> <p><type> Type of address octet in integer format</p> <p><text> String type field of maximum length <tlength></p> <p><hidden> Indicates if the entry is hidden or not – only available if a UICC with an active USIM application is present</p> <p>0 Phonebook entry not hidden</p> <p>1 Phonebook entry hidden</p> <p><group> String type field of maximum length <glength></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><adnumber> String type phone number of format <adtype></p> <p><adtype> Type of address octet in integer format</p> <p><secondtext> String type field of maximum length <slength></p> <p><email> String type field of maximum length <elength></p> <p><nlength> Integer type value indicating the maximum length of field <number></p> <p><tlength> Integer type value indicating the maximum length of field <text></p> <p><glength> Integer type value indicating the maximum length of field <group></p> <p><alength> Integer type value indicating the maximum length of field <adnumber></p> <p><slength> Integer type value indicating the maximum length of field <secondtext></p> <p><elength> Integer type value indicating the maximum length of field <email></p>
<u>Notes</u>	<ul style="list-style-type: none"> 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p>or +CME ERROR:<err></p> <p><u>Parameters</u> <storage> "FD" SIM/USIM fixdialing phonebook "LD" SIM/UICC last dialing 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-dialing-number (EF_BDN) phonebook (only valid with PIN2) "SN" SIM service-dialing-number (EF_SDN) phonebook (read only)</p> <p><password> String type value representing the PIN2-code required when selecting PIN2 code locked <storage>s above</p> <p><used> Integer type value indicating the number of used locations in the selected memory</p> <p><total> Integer type value indicating the total number of locations in the selected memory</p>
<u>Notes</u>	Set command selects phonebook memory storage <storage>, which is used by other phonebook commands.

7.4. +CPBW Command: Write Phonebook Entry

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u> AT+CPBW=?</p>	<p><u>Response</u> +CPBW: (list of supported <index>es),[<nlength>],(list of supported <type>s),[<tlength>],[<glength>],[<alength>],[<slength>],[<elength>] OK</p>
<i>Read command</i>	
<p><u>Syntax</u> AT+CPBW?</p>	<p><u>Response</u> +CPBW: <written_index> OK</p> <p>or +CPBW:-1 OK</p>

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 HL7618 and HL7618RD 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 SMSs 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 | " <u>REC UNREAD</u> " | Received unread message (i.e. new message) |
| 1 | "REC READ" | Received read message |
| 2 | "STO UNSENT" | Stored unsent message (only applicable to SMSs) |
| 3 | "STO SENT" | Stored sent message (only applicable to SMSs) |
| 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 <toda>.
- <data> In the case of user data in text mode responses; format:
- if <dc> 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 Π (GSM 7-bit default alphabet 23) is presented as 17 (IRA 49 and 55))
 - if <dc> 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 <dc> 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 <dc> 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 value 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 145 if the first character of <da> is "+"; otherwise, default value is 129
- <tooa> 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 = 167) 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
- <dcs> SMS Data Coding Scheme (default value = 0), 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CMGD=?	<u>Response</u> +CMGD: (list of supported <index>es),(list of supported <delflag>s)] OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CMGD= <index> [,<delflag>]</p>	<p><u>Response</u> OK</p> <p>or +CMS ERROR: <err></p> <p><u>Parameters</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</p>
<p><u>Notes</u></p>	<p>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.</p>

8.3. +CMGF Command: Set Message Format

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CMGF=?</p>	<p><u>Response</u> +CMGF: (list of supported <mode>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CMGF?</p>	<p><u>Response</u> +CMGF: <mode> OK</p>
<p><i>Execute command</i></p> <p><u>Syntax</u> AT+CMGF= [<mode>]</p>	<p><u>Response</u> OK</p> <p>or +CMS ERROR: err></p> <p><u>Parameter</u> <mode> <u>0</u> PDU mode (default when implemented) 1 Text mode</p>
<p><u>Notes</u></p>	<p><mode> is saved in non-volatile memory per AT port over module reboot.</p>

8.4. +CMGL Command: List Messages

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CMGL=?</p>	<p><u>Response</u> +CMGL: (list of supported <stat>s) OK</p>
<p><i>Execute command</i></p> <p><u>Syntax</u> AT+CMGL [=<stat>]</p>	<p><u>Response</u></p> <p>If in text mode, command is successful and SMS-SUBMITs and/or SMS-DELIVERs: +CMGL: <index>,<stat>, <oa/da>,<alpha>, [<scts>][,<toa/toda>,<length>] <CR><LF><data><CR><LF> +CMGL: <index>,<stat>, <da/oa>,<alpha>, [<scts>][,<toa/toda>, <length>] <CR><LF><data> [...]</p> <p>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>[...]</p> <p>If in text mode, command is successful and SMS-COMMANDs: +CMGL: <index>,<stat>,<fo>,<ct> [<CR><LF> +CMGL: <index>,<stat>, <fo>,<ct>[...]</p> <p>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>[...]</p> <p>If in PDU mode and command is successful: +CMGR: <stat>,<alpha>,<length><CR><LF><pdu></p> <p>or +CMS ERROR: <err></p> <p><u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.</p>

8.5. +CMGR Command: Read Message

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CMGR=?</p>	<p><u>Response</u> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CMGR= <index></p>	<p><u>Response</u></p> <p>If text mode (+CMGF=1), command is successful, and SMS-DELIVER: +CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data></p> <p>if text mode (+CMGF=1), command is successful, and SMS-SUBMIT: +CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data></p> <p>if text mode (+CMGF=1), command is successful, and SMS-STATUS-REPORT: +CMGR: <stat>,<fo>,<mr>,[<ra>], [<tora>],<scts>,<d_t>,<st></p> <p>if text mode (+CMGF=1), command is successful, and SMS-COMMAND: +CMGR: <stat>, <fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><cdata></p> <p>if text mode (+CMGF=1), command is successful, and CBM storage: +CMGR: <stat>,<sn>, <mid>,<dcs>,<page>,<pages><CR><LF><data></p> <p>if PDU mode (+CMGF=0) and command is successful: +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu></p> <p>or +CMS ERROR: <err></p> <p><u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.</p>

8.6. +CMGS Command: Send Message

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CMGS=?</p>	<p><u>Response</u> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> If text mode (+CMGF=1): AT+CMGS=<da> [,<toda>]<CR> text is entered <ctrl-Z/ESC></p>	<p><u>Response</u></p> <p>If text mode (+CMGF=1) and sending is successful: [+CMGS: <mr>[,<scts>]] OK</p> <p>if PDU mode (+CMGF=0) and sending is successful: [+CMGS: <mr>] OK</p> <p>or +CMS ERROR: <err></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p>If PDU mode (+CMGF=0): AT+CMGS= <length><CR> PDU is given <ctrl-Z/ESC></p>	<p><u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+CMGW=?</p>	<p><u>Response</u> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> If text mode (+CMGF=1): AT+CMGW[= <oa/da> [,<tooa/toda> [,<stat>]]]<CR> text is entered <ctrl-Z/ESC></p> <p>If PDU mode (+CMGF=0): AT+CMGW= <length>[,<stat>] <CR> PDU is given <ctrl-Z/ESC></p>	<p><u>Response</u> +CMGW: <index> OK</p> <p>or +CMS ERROR: <err></p> <p><u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Notes</u>	<ul style="list-style-type: none"> • 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CMSS=?	<u>Response</u> OK
<i>Write command</i>	
<u>Syntax</u> AT+CMSS= <index>[,<da> [,<toda>]]	<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>	<ul style="list-style-type: none"> • 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. • +CMSS: <mr>[,<scts>] is not available in intermediate response when SMS is sent over IMS using 3GPP2 SMS PDU format and protocol, e.g. in the Verizon network.

8.9. +CNMI Command: New Message Indication

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CNMI=?</p>	<p><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</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CNMI?</p>	<p><u>Response</u> +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> +CNMI=[<mode> [<mt>,<bm>,<ds>,<bfr>]]]</p>	<p><u>Response</u> OK or +CMS ERROR: <err></p> <p><u>Parameters</u></p> <p><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.</p> <p> 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE.</p> <p> 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.</p> <p><mt> <u>0</u> No indications are routed to the TE.</p> <p> 1 Result code is sent when ME does not have any other display device other than the AT interface</p> <p> 2 Acknowledgement command must be sent when +CSMS <service> = 1 and ME does not have any other display device other than the AT interface</p> <p> 3 Acknowledgement command must be sent when +CSMS <service> = 1</p> <p><bm> <u>0</u> No CBM indications are routed to the TE.</p> <p> 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></p> <p> 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)</p> <p> 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</p> <p><ds> <u>0</u> No SMS-STATUS-REPORTs are routed to the TE.</p> <p> 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)</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p>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></p> <p><bfr> 0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> = 1 – 3 is entered</p> <p>1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> = 1 – 3 is entered</p>
<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>	<p>AT+CNMI=1 // Write command OK</p> <p>AT+CNMI=? // Test command +CNMI: (0-2),(0-3),(0-3),(0-2),(0-1) OK</p> <p>AT+CNMI? // Read command +CNMI: 1,0,0,0,0 OK</p>

8.10. +CSCB Command: Select Cell Broadcast Message Type

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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> 0 Accepts messages that are defined in <mids> and <dcss> 1 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.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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>,<dcs> OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CSMP=[<fo> [<vp>[,<pid> [<dc>]]]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.</p>

8.13. +CSMS Command: Select Message Service

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692							
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CSMS=?</p>	<p><u>Response</u> +CSMS: (list of supported <service>s) OK</p>						
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CSMS?</p>	<p><u>Response</u> +CSMS: <service>,<mt>,<mo>,<bm> OK</p>						
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CSMS= <service></p>	<p><u>Response</u> +CSMS: <mt>,<mo>,<bm> OK</p> <p>or +CMS ERROR: <err></p> <p><u>Parameters</u></p> <table style="margin-left: 20px;"> <tr> <td style="padding-right: 10px;"><service></td> <td style="padding-right: 20px;"><u>0</u></td> <td>3GPP TS 23.040 and 3GPP TS 23.041</td> </tr> <tr> <td></td> <td><u>1</u></td> <td>3GPP TS 23.040 and 3GPP TS 23.041 (the requirement of setting <service> =1 is mentioned in the corresponding command description)</td> </tr> </table> <p><mt> Message terminated messages 0 Type not supported 1 Type supported</p> <p><mo> Message originated messages 0 Type not supported 1 Type supported</p> <p><bm> Broadcast type messages 0 Type not supported 1 Type supported</p>	<service>	<u>0</u>	3GPP TS 23.040 and 3GPP TS 23.041		<u>1</u>	3GPP TS 23.040 and 3GPP TS 23.041 (the requirement of setting <service> =1 is mentioned in the corresponding command description)
<service>	<u>0</u>	3GPP TS 23.040 and 3GPP TS 23.041					
	<u>1</u>	3GPP TS 23.040 and 3GPP TS 23.041 (the requirement of setting <service> =1 is mentioned in the corresponding command description)					

8.14. +CPMS Command: Preferred Message Storage

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CPMS=?</p>	<p><u>Response</u> +CPMS: (list of supported <mem1>s), (list of supported <mem2>s), (list of supported <mem3>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CPMS?</p>	<p><u>Response</u> +CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> OK</p> <p>or</p> <p>+CMS ERROR: <err></p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CPMS= <mem1> [,<mem2> [,<mem3>]]</p>	<p><u>Response</u> +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK</p> <p>or</p> <p>+CMS ERROR: <err></p> <p><u>Parameters</u> For parameter information and values, refer to section 8.1 Parameters Definition.</p>
<u>Notes</u>	<mem1>, <mem2> and <mem3> are saved in non-volatile memory over module reboot.

8.15. +CSDH Command: Show Text Mode Parameters

Note: For HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CSDH=?</p>	<p><u>Response</u> +CSDH: (list of supported <show>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CSDH?</p>	<p><u>Response</u> +CSDH: <show> OK</p>

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
<i>Write command</i>	
<u>Syntax</u> AT+CSDH= [<show>]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <show> 0 Do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) 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

Note: For HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
<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>Parameters</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

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
Notes	<ul style="list-style-type: none"> Entered text should be formatted as follows: <ul style="list-style-type: none"> 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

Note: For HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
Test command	
<u>Syntax</u> AT+XCMT3GPP2 =?	<u>Response</u> +XCMT3GPP2: (list of supported <n>s) OK
Write command	
<u>Syntax</u> AT+XCMT3GPP2 =<n>	<u>Response</u> OK or +CMS ERROR: <err> <u>Parameters</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
Unsolicited Notification	<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
Notes	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. +KPCMCFG Command: Configure PCM Digital Audio

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KPCMCFG=?</p>	<p><u>Response</u> For the HL7618, HL7618RD without VoLTE, HL7688, HL7690 and HL7695: +KPCMCFG: (list of supported <Mode>s), (list of supported <SamplingCtrl>s), (list of <BitClk>s) OK</p> <p>For the HL7618RD with VoLTE, HL7648 and HL7650: +KPCMCFG: (list of supported <Mode>s), (list of supported <SamplingCtrl>s), (list of <BitClk>s),(list of <SampleRate>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KPCMCFG?</p>	<p><u>Response</u> For the HL7618, HL7618RD without VoLTE, HL7688, HL7690 and HL7695: +KPCMCFG: <Mode>,<SamplingCtrl>,<BitClk> OK</p> <p>For the HL7618RD with VoLTE, HL7648 and HL7650: +KPCMCFG: <Mode>,<SamplingCtrl>,<BitClk>,<SampleRate> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> For the HL7618, HL7618RD without VoLTE, HL7688, HL7690 and HL7695: AT+KPCMCFG =<Mode> [,<SamplingCtrl> [,<BitClk>]]</p> <p>For the HL7618RD with VoLTE, HL7648 and HL7650: AT+KPCMCFG =<Mode> [,<SamplingCtrl> [,<BitClk> [,<SampleRate>]]]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <p><Mode> PCM mode</p> <p>0 Master</p> <p>1 Slave</p> <p><SamplingCtrl> Sampling clock edge control</p> <p>0 Falling edge</p> <p>1 Rising edge</p> <p><BitClk> PCM bit clock</p> <p>0 256 kHz</p> <p>1 384 kHz</p> <p>2 512 kHz</p> <p><SampleRate> PCM sample rate</p> <p>0 8kS/s</p> <p>1 16kS/s</p> <p>This parameter is only available on the HL7648 and HL7650</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • Settings will take effect immediately; no reset is required. • Parameters are saved and kept after reset. • This command can be used without a SIM. • The sampling rate is fixed at 8 kS/s for the HL7618, HL7618RD without VoLTE, HL7688, HL7690 and HL7692. • 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>.
<p><u>Examples</u></p>	<pre>// Example using an HL7618 module: 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 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 // Example using an HL7648 module: 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 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 //newconfiguration. 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</pre>

9.2. +WMAUDIOLOOP Command: Audio Test

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+ WMAUDIOLOOP =?</p>	<p><u>Response</u> +WMAUDIOLOOP: (list of supported <ENABLE>s),(list of supported <TXORGAN>s), (list of supported <RXORGAN>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+ WMAUDIOLOOP ?</p>	<p><u>Response</u> +WMAUDIOLOOP: <ENABLE>[,<TXORGAN>,<RXORGAN>] OK Note that parameters <TXORGAN> and <RXORGAN> are only available if <ENABLE>=1.</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+ WMAUDIOLOOP =<ENABLE>, <TXORGAN>, <RXORGAN></p>	<p><u>Response</u> OK</p> <p><u>Error Case</u> +CME ERROR: 3 (when a non-supported <TXORGAN> or <RXORGAN> is used)</p> <p><u>Parameters</u></p> <p><ENABLE> 0 Stop the audio loop test 1 Execute the audio loop</p> <p><TXORGAN> Audio input used as reference for the audio loop 0 PCM in 1 Reserved</p> <p><RXORGAN> Audio output used to loop the audio input 0 PCM out 1 Reserved</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u> Audio loop activation involves some restrictions on the use of other AT commands:</p> <ul style="list-style-type: none"> • It must not be enabled when: <ul style="list-style-type: none"> ▪ Communications is active ▪ A tone is under generation • It must be disabled (if active) before opening up communications. • Tone generation and sidetone modifications are not possible when the audio loop is active.
<p><u>Examples</u></p>	<p>AT+WMAUDIOLOOP=? +WMAUDIOLOOP: (0-1),(0-1),(0-1) OK</p> <p>AT+WMAUDIOLOOP? +WMAUDIOLOOP: 0 OK</p> <p>AT+WMAUDIOLOOP=1,0,0 OK //Started audio loop</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<pre>AT+WMAUDIOLOOP? +WMAUDIOLOOP: 1,0,0 OK AT+WMAUDIOLOOP=0,0,0 OK //Stopped audio loop</pre>

9.3. +CLVL Command: Loudspeaker Volume Level

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<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> <ul style="list-style-type: none"> The value of <level> is not saved; it will return to its nominal value after the module is reset. This command is supported on the HL7618RD when using a VoLTE-capable software.
<u>Examples</u>	<pre>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</pre>

9.4. +KECHO Command: Echo Cancellation

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692																																													
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KECHO=?</p>	<p><u>Response</u> +KECHO: (list of supported <mode>s),(list of supported <param>s) OK</p>																																												
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KECHO?</p>	<p><u>Response</u> +KECHO: <status>,<param_1>,...,<param_n> OK</p>																																												
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KECHO= <mode> [,<param_1>,..., <param_n>]</p>	<p><u>Response</u> OK</p> <p><u>Parameter</u></p> <p><mode></p> <table style="margin-left: 20px;"> <tr><td>0</td><td>Deactivate echo cancellation for narrowband</td></tr> <tr><td>1</td><td>Activate echo cancellation for narrowband</td></tr> <tr><td>2</td><td>Deactivate echo cancellation for wideband</td></tr> <tr><td>3</td><td>Activate echo cancellation for wideband</td></tr> </table> <p><status> Echo cancellation status</p> <table style="margin-left: 20px;"> <tr><td>0</td><td>Deactivated</td></tr> <tr><td>1</td><td>Activated</td></tr> </table> <p><param_n></p> <ul style="list-style-type: none"> • NLMSTaps_band_x stands for number of LMS (Least Mean Squares) filter taps in frequency band x. • Parameters should be bounded by the follow constrain. • $NLMSTaps_band_0 + 2*(NLMSTaps_band_1+...+ NLMSTaps_band_5) < 2000$ <table style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th>#</th> <th>Name</th> <th>Range</th> <th>Default Handset Profile</th> </tr> </thead> <tbody> <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>1-994</td><td>2</td></tr> <tr><td>5</td><td><NLMSTaps_band_4></td><td>1-994</td><td>2</td></tr> <tr><td>6</td><td><NLMSTaps_band_5></td><td>1-994</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> </tbody> </table>	0	Deactivate echo cancellation for narrowband	1	Activate echo cancellation for narrowband	2	Deactivate echo cancellation for wideband	3	Activate echo cancellation for wideband	0	Deactivated	1	Activated	#	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>	1-994	2	5	<NLMSTaps_band_4>	1-994	2	6	<NLMSTaps_band_5>	1-994	2	7	<NLMS_Block_Length>	1, 2, 4, 5, 8	1
0	Deactivate echo cancellation for narrowband																																												
1	Activate echo cancellation for narrowband																																												
2	Deactivate echo cancellation for wideband																																												
3	Activate echo cancellation for wideband																																												
0	Deactivated																																												
1	Activated																																												
#	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>	1-994	2																																										
5	<NLMSTaps_band_4>	1-994	2																																										
6	<NLMSTaps_band_5>	1-994	2																																										
7	<NLMS_Block_Length>	1, 2, 4, 5, 8	1																																										
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • Settings will take effect immediately. • Parameters are saved and kept after reset. • This command can be used without a SIM card. • +VIP can affect the value of this command's parameters. • This command is supported on the HL7618RD when using a VoLTE-capable software. 																																												

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<u>Examples</u>	<pre> AT+KECHO? //Shows the current configuration +KECHO: 1,100,100,100,2,2,2,1 +KECHO: 3,100,100,100,100,100,100,1 OK AT+KECHO=0 //Turn off the echo cancellation OK AT+KECHO? +KECHO: 0,100,100,100,2,2,2,1 //Echo cancellation is deactivated for +KECHO: 3,100,100,100,100,100,100,1 //narrowband 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 AT+KECHO=2 //Turn off echo cancellation for narrowband OK AT+CFUN=1,1 OK AT+KECHO? +KECHO: 1,150,100,100,2,2,2,1 //Parameters are retained after reset +KECHO: 2,100,100,100,100,100,100,1 OK </pre>

9.5. +KNOISE Command: Echo Suppression

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<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

HL7618RD, HL7648, HL7650, HL7688 and HL7692

Write command

Syntax

AT+KNOISE=
<rx_mode>,
<tx_mode>
[,<rx_param_1>,
...,<rx_param_5>
,<tx_param_1,...,
<tx_param_5>]

Response

OK

Parameters

<rx_mode> Receive mode
 0 Deactivate downlink noise suppression
 1 Activate downlink noise suppression
 2 Deactivate downlink noise suppression for wideband
 3 Activate downlink noise suppression for wideband

<tx_mode> Transmit mode
 0 Deactivate uplink noise suppression
 1 Activate uplink noise suppression
 2 Deactivate uplink noise suppression for wideband
 3 Activate uplink noise suppression for wideband

<rx_status> Receive noise suppression status
 0 Deactivated
 1 Activated
 2 Deactivated for wideband
 3 Activated for wideband

<tx_status> Transmit noise suppression status
 0 Deactivated
 1 Activated
 2 Deactivated for wideband
 3 Activated for wideband

<rx_param_1> 0-65535 Minimum attenuation
 Default handset profile value = 12000

<rx_param_2> 0-65535 Over-estimation factor for band 0
 Default handset profile value = 10000

<rx_param_3> 0-65535 Over-estimation factor for all other bands
 Default handset profile value = 10000

<rx_param_4> 0-65535 Exponent factor of the NR
 Default handset profile value = 1000

<rx_param_5> 0-65535 Over-estimation factor for all other bands
 Default handset profile value = 16384

<tx_param_1> 0-65535 Minimum attenuation
 Default handset profile value = 6000

<tx_param_2> 0-65535 Over-estimation factor for band 0
 Default handset profile value = 9000

<tx_param_3> 0-65535 Over-estimation factor for all other bands
 Default handset profile value = 10000

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
	<p><tx_param_4> 0-65535 Exponent factor of the NR Default handset profile value = <u>1800</u></p> <p><tx_param_5> 0-65535 Over-estimation factor for all other bands Default handset profile value = <u>19660</u></p>
Reference Sierra Wireless Proprietary	<p><u>Notes</u></p> <ul style="list-style-type: none"> • Settings will take effect immediately. • Parameters are saved and kept after reset. • This command can be used without a SIM card. • <rx_mode> and <tx_mode> sets are stored and handled for wideband and narrowband separately in each write command. • +VIP can affect the value of this command's parameters. • Wideband audio filters are only supported in UMTS and VoLTE.
<u>Examples</u>	<p>AT+KNOISE=? +KNOISE: (0-3),(0-3),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535) OK</p> <p>AT+KNOISE? //Shows the current configuration +KNOISE: 1,1,12000,10000,10000,1000,16384, 6000,9000,10000,1800,19660 +KNOISE: 3,3,12000,10000,10000,1000,16384, 6000,9000,10000,1800,19660 OK</p> <p>AT+KNOISE=0,0 //Disable uplink and downlink noise suppression for narrowband OK</p> <p>AT+KNOISE=1,1,6500,10000,10000,1000,16384, 6000,9000,10000,1800,19660 //Enable uplink and downlink noise suppression with new parameters for narrowband OK</p> <p>AT+KNOISE=3,2,6300,10000,10000,1000,16384, 6000,9000,10000,1800,19660 //Disable uplink and enable downlink noise suppression with new parameters for wideband OK</p> <p>AT+KNOISE=1,3 ERROR // Narrowband and wideband cannot be set within the same // write command</p> <p>AT+CFUN=1,1 OK</p> <p>AT+KNOISE? +KNOISE: 1,1,6500,10000,10000,1000,16384, 6000,9000,10000,1800,19660 +KNOISE: 3,2,6300,10000,10000,1000,16384, 6000,9000,10000,1800,19660 //Parameters are retained after reset OK</p>

9.6. +KPC Command: Peak Compressor

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KPC=?</p>	<p><u>Response</u> +KPC: (list of supported <rx_mode>s), (list of supported <tx_mode>s) [<CR><LF>+KPC: (list of supported <rx_mode>s), (list of supported <tx_mode>s) [...]] OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KPC?</p>	<p><u>Response</u> +KPC: <rx_mode>,<tx_mode> [<CR><LF>+KPC: <rx_mode>,<tx_mode> [...]] OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KPC= <rx_mode>, <tx_mode></p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <p><rx_mode> 0 Disable for narrowband 1 Enable for narrowband (handset profile default for narrowband) 2 Disable for wideband 3 Enable for wideband (handset profile default for wideband)</p> <p><tx_mode> 0 Disable 1 Enable (handset profile default for narrowband) 2 Disable for wideband 3 Enable for wideband (handset profile default for wideband)</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • Settings will take effect immediately. • Parameters are saved and kept after reset. • <rx_mode> and <tx_mode> sets are stored and handled for wideband and narrowband separately in each write command. • This command can be used without a SIM card. • +VIP can affect the value of this command's parameters. • Wideband audio filters are only supported in UMTS and VoLTE.
<p><u>Examples</u></p>	<p>AT+VIP? //Check the current audio profile +VIP: 0 OK</p> <p>AT+KPC=? +KPC: (0-3),(0-3) OK</p> <p>AT+KPC? //Shows the current value +KPC: 1,1 +KPC: 3,3 OK</p>

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
AT+KPC=1,0 OK	//Activate the rx peak compressor only
AT+KPC? +KPC: 1,0 +KPC: 3,3 OK	
AT+KPC=2,3 OK	//Deactivate rx peak compressor for wideband
AT+KPC? +KPC: 1,0 +KPC: 2,3 OK	//Narrowband and wideband cannot be set within the same write //command
AT+KPC=1,3 ERROR	
AT+VIP=1 OK	//Switch to headset profile
AT+KPC? +KPC: 0,0 +KPC: 2,2 OK	//Peak compressor status is different in different audio profiles

9.7. +KST Command: Side Tone

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<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

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
	<p><u>Parameter</u></p> <p><level> 0 – 16 Side tone value (side tone gain from -14 dB to +18 dB in steps of 2) 20 Disable sidetone</p>
<p><u>Reference</u></p> <p>Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • Settings will take effect immediately. • Parameters are saved and kept after reset. • This command can be used without a SIM card. • This command is supported on the HL7618RD when using a VoLTE-capable software.
<p><u>Examples</u></p>	<pre> 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 AT+CFUN=1,1 OK AT+KST? +KST: 20 //Parameters are retained after reset OK </pre>

9.8. +KVGR Command: Receive Gain Selection

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u></p> <p>AT+KVGR=?</p>	<p><u>Response</u></p> <p>+KVGR: (list of supported <n>s) OK</p>
<p><i>Read command</i></p>	
<p><u>Syntax</u></p> <p>AT+KVGR?</p>	<p><u>Response</u></p> <p>+KVGR: <n> OK</p>
<p><i>Write command</i></p>	
<p><u>Syntax</u></p> <p>AT+KVGR=<n></p>	<p><u>Response</u></p> <p>OK</p>

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
	<p><u>Parameter</u> <n> -21 to 6 Digital gain of the downlink path in dB. Default value = <u>0</u></p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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. • This command is supported on the HL7618RD when using a VoLTE-capable software.
<p><u>Examples</u></p>	<p>AT+KVGR="-21" //Receive gain is set to 21dB less than the nominal gain OK</p> <p>AT+KVGR="-22" //Input is out of range ERROR</p> <p>AT+KVGR="6" //Receive gain is set to 6dB more than the nominal gain OK</p> <p>AT+KVGR="7" //Input is out of range ERROR</p> <p>AT+VGR=87 //Receive gain is set to -20.5dB less than the nominal gain by //+VGR OK</p> <p>AT+KVGR? //+KVGR response truncates the decimal part of the actual gain +KVGR: -20 OK</p>

9.9. +KVG T Command: Transmit Gain Selection

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+KVG T=?</p>	<p><u>Response</u> +KVG T: (list of supported <n>s) OK</p>
<p><i>Read command</i></p>	
<p><u>Syntax</u> AT+KVG T?</p>	<p><u>Response</u> +KVG T: <n> OK</p>
<p><i>Write command</i></p>	
<p><u>Syntax</u> AT+KVG T=<n></p>	<p><u>Response</u> OK</p>

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
	<p><u>Parameter</u> <n> -21 to 6 Digital gain of the uplink path in dB. Default value = <u>0</u></p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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. • This command is supported on the HL7618RD when using a VoLTE-capable software.
<p><u>Examples</u></p>	<p>AT+KVGT="-21" //Transmit gain is set to 21dB less than the nominal gain OK</p> <p>AT+KVGT="-22" //Input is out of range ERROR</p> <p>AT+KVGT="6" //Transmit gain is set to 6dB more than the nominal gain OK</p> <p>AT+KVGT="7" //Input is out of range ERROR</p> <p>AT+VGT=87 //Transmit gain is set to -20.5dB less than the nominal gain by //+VGT OK</p> <p>AT+KVGT? //+KVGT response truncates the decimal part of the actual gain +KVGT: -20 OK</p>

9.10. +VGR Command: Receive Gain Selection

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+VGR=?</p>	<p><u>Response</u> +VGR: (list of supported <n>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+VGR?</p>	<p><u>Response</u> +VGR: <n> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+VGR=<n></p>	<p><u>Response</u> OK</p>

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
	<p><u>Parameter</u></p> <p><n> 86 ≤ n ≤ 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)</p>
<p><u>Reference</u> [27.007] § C.2.5</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> 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). This command is supported on the HL7618RD when using a VoLTE-capable software.
<p><u>Examples</u></p>	<p>AT+VGR=86 //Receive gain is set to 21 dB less than the nominal gain OK</p> <p>AT+VGR=85 //Input is out of range ERROR</p> <p>AT+VGR=140 //Receive gain is set to 6 dB more than the nominal gain OK</p> <p>AT+VGR=141 //Input is out of range ERROR</p>

9.11. +VGT Command: Transmit Gain Selection

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+VGT=?</p>	<p><u>Response</u> +VGT: (list of supported <n>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+VGT?</p>	<p><u>Response</u> +VGT: <n> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+VGT=<n></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u></p> <p><n> 86 ≤ n ≤ 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)</p>

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><u>Reference</u> [27.007] § C.2.5</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> 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). This command is supported on the HL7618RD when using a VoLTE-capable software.
<p><u>Examples</u></p>	<p>AT+VGT=86 //Transmit gain is set to 21 dB less than the nominal gain OK</p> <p>AT+VGT=85 //Input is out of range ERROR</p> <p>AT+VGT=140 //Transmit gain is set to 6 dB more than the nominal gain OK</p> <p>AT+VGT=141 //Input is out of range ERROR</p>

9.12. +VIP Command: Initialize Voice Parameters

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+VIP=?</p>	<p><u>Response</u> +VIP: (list of <profile>s),(list of supported <persistence>s) OK</p>
<p><i>Read command</i></p>	
<p><u>Syntax</u> AT+VIP?</p>	<p><u>Response</u> +VIP: <profile>,<persistence> OK</p>
<p><i>Write command</i></p>	
<p><u>Syntax</u> AT+VIP= <profile> [,<persistence>]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <p><profile> Audio profile</p> <p>0 Handset</p> <p>1 Headset</p> <p>2 Handsfree + back speaker</p> <p>5 TTY</p> <p>23 Basic (no specific transducer defined)</p> <p><persistence> Persistence of <profile> after a call is disconnected</p> <p>0 <profile> will be reset to 0</p> <p>1 <profile> will not be reset to 0</p>

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><u>Reference</u> [27.007] § C.2.6</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • This command can be used without a SIM card. • <profile> takes effect in the next call. • When <persistence>=0, <profile> is automatically returned to its default value after a call is disconnected. • Parameters are not saved in non-volatile memory. • This command is supported on the HL7618RD when using a VoLTE-capable software.
<p><u>Examples</u></p>	<p>AT+VIP? //Shows the current configuration +VIP: 0,0 OK</p> <p>AT+VIP=1 //Turn to headset profile OK</p> <p>AT+VGT=140 //Transmit gain of headset profile is changed to 140 OK</p> <p>AT+VIP=0 //Turn to handset profile OK</p> <p>AT+VGT? //Transmit gain of handset profile is still 128 +VGT: 128 OK</p>

9.13. +CODECINFO Command: Display Audio Codec Information

Note: For HL7650, HL7688 and HL7692 only.

HL7650, HL7688 and HL7692					
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CODECINFO =?</p>	<p><u>Response</u> +CODECINFO: (list of supported <MODE>s) OK</p>				
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CODECINFO ?</p>	<p><u>Response</u> +CODECINFO: <MODE> OK</p>				
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CODECINFO =<MODE></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u> <MODE></p> <table border="0"> <tr> <td>0</td> <td>Disable codec info unsolicited message</td> </tr> <tr> <td>1</td> <td>Enable codec info unsolicited message</td> </tr> </table>	0	Disable codec info unsolicited message	1	Enable codec info unsolicited message
0	Disable codec info unsolicited message				
1	Enable codec info unsolicited message				

HL7650, HL7688 and HL7692	
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • <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: +CODECINFO: 0 GSM_FR +CODECINFO: 1 GSM_HR +CODECINFO: 2 GSM_EFR +CODECINFO: 3 FR_AMR +CODECINFO: 4 HR_AMR +CODECINFO: 5 UMTS_AMR +CODECINFO: 6 UMTS_AMR2 +CODECINFO: 10 UMTS_AMR_WB
<p><u>Examples</u></p>	<pre> 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 </pre>

9.14. +KSRAP Command: Save or Restore Audio Parameters

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+KSRAP=?</p>	<p><u>Response</u> +KSRAP: (list of supported <level>s) OK</p>

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KSRAP= <level></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u> <level> 2 Restore audio parameters in non-volatile memory to their default values</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • This command changes the values in the non-volatile memory immediately; settings take effect in the next speech call. • This command is supported on the HL7618RD when using a VoLTE-capable software.
<p><u>Example</u></p>	<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 ksrp=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

Note: For HL7650, HL7688 and HL7692 only.

HL7650, HL7688 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+WVR=?</p>	<p><u>Response</u> +WVR: (list of supported <aud_coding_type_2G>s),(list of supported <aud_coding_type_3G>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+WVR?</p>	<p><u>Response</u> +WVR: <aud_coding_type_2G>,<aud_coding_type_3G> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+WVR= [<aud_coding_type_2G>] [,<aud_coding_type_3G>]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u> <aud_coding_type_2G> Supported 2G types (not supported) 5 FR, EFR, HR, AMR-FR, AMR-HR</p> <p><aud_coding_type_3G> Supported 3G types 3 UMTS AMR v2 4 UMTS AMR v2, UMTS, AMR-WB</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • This command allows the configuration of supported 3G voice codecs of the device; although the final codec decision is actually 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.
<p><u>Example</u></p>	<pre> 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 </pre>

9.16. +VTD Command: Tone Duration

Note: For HL7650, HL7688 and HL7692 only.

HL7650, HL7688 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+VTD=?</p>	<p><u>Response</u> +VTD: (list of supported <n>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+VTD?</p>	<p><u>Response</u> +VTD: <n> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+VTD=<n></p>	<p><u>Response</u> OK</p> <p><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</p>
<p><u>Reference</u> [27.007] § C.2.12</p>	<p><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.</p>

9.17. +VTS Command: DTMF and Tone Generation

Note: For HL7618RD, HL7648, HL7650, HL7688 and HL7692 only.

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+VTS=?</p>	<p><u>Response</u> +VTS: (list of supported <DTMF>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+VTS= “<DTMF>₁, <DTMF>₂, ..., <DTMF>_n”</p>	<p><u>Response</u> OK</p>

HL7618RD, HL7648, HL7650, HL7688 and HL7692	
<p>or</p> <p>AT+VTS= “{<DTMF>₁, <DURATION>₁}, {<DTMF>₂, <DURATION>₂}, ... {<DTMF>_n, <DURATION>_n}”</p>	<p><u>Parameters</u></p> <p><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.</p> <p><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.</p>
<p><u>Reference</u> [27.007] § C.2.11</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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. • Input character string without quotes in the write command is supported for compatibility purposes. • This command is supported on the HL7618RD when using a VoLTE-capable software.



10. Packet Domain Commands

For additional details about PDP context use for the HL7618 and HL7618RD, refer to section 1.4 PDP Context Usage.

10.1. +CGATT Command: PS Attach or Detach

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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>Parameter</u> <state> State of PS attachment <u>0</u> Detached <u>1</u> Attached

10.2. +CGACT Command: Activate or Deactivate PDP Context

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CGACT=?	<u>Response</u> +CGACT: (list of supported <state>s) OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CGACT?</p>	<p><u>Response</u> +CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>,<state> [...]] OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CGACT= [<state> [,<cid> [,<cid> [...]]]]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>ERROR</p> <p><u>Parameters</u> <state> State of PDP context activation 0 Deactivated 1 Activated</p> <p><cid> Numeric parameter which specifies a particular PDP context definition.</p>
<u>Notes</u>	Up to three (3) PDP contexts can be active at once.

10.3. +CGANS Command: PDP Context Activation Manual Response

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CGANS=?</p>	<p><u>Response</u> +CGANS: (list of supported <response>s), (list of supported <L2P>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CGANS= [<response>, [<L2P> ,<cid>]]]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u> <response> 0 Reject the request (default value if omitted) 1 Accept and request that the PDP context be activated</p> <p><L2P> String parameter indicating the layer 2 protocol to be used (see +CGDATA)</p> <p><cid> Numeric parameter that specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT). Parameter <response> allows the TE to accept or reject the request.</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Notes</u>	<ul style="list-style-type: none"> • 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CGCMOD=?	<u>Response</u> +CGCMOD: (list of <cid>s associated with active contexts) OK
<i>Write command</i>	
<u>Syntax</u> AT+CGCMOD= [<cid>[,<cid> [,...]]]	<u>Response</u> OK or +CME ERROR: <err> <u>Parameter</u> <cid> Numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT)

10.5. +CGTFT Command: Traffic Flow Template

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CGTFT=?	<u>Response</u> +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)

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	<p><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.'</p> <p><flow label (ipv6)> Numeric value in hexadecimal format with value range from 00000 to FFFFF. Valid for IPv6 only</p> <p><direction> Specifies the transmission direction in which the packet filter shall be applied</p> <p>1 Uplink 2 Downlink 3 Birectional (up and downlink ; default if omitted)</p>
<u>Notes</u>	<ul style="list-style-type: none"> 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. +CGTFT=<cid> causes all of the packet filters in the TFT for context number <cid> to become undefined.

10.6. +CGCLASS Command: GPRS Mobile Station Class

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

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Notes

- <class> is saved in non-volatile memory over module reboot.
- The read command returns the mode of operation set by the TE, independent of the current serving cell capability and independent of the current serving cell access technology. If no value has been previously set by the TE, the returned value is the highest mode of operation that can be supported by the MT.

10.7. +CGDCONT Command: Define PDP Context

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Test command

Syntax

AT+CGDCONT=?

Response

+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

Read command

Syntax

AT+CGDCONT?

Response

[+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

Write command

Syntax

AT+CGDCONT=
 [<cid>
 [,<PDP_type>
 [,<APN>
 [,<PDP_addr>
 [,<d_comp>
 [,<h_comp>
 [,<IPv4AddrAlloc>
 >[,<emergency_
 indication>
 [,<PCSCF_
 discovery>
 [,<IM_CN_
 Signalling_Flag_
 Ind>]]]]]]]]]

Response

OK
 or
 ERROR

Parameters

<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

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	<p><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.</p> <p><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. 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.</p> <p><d_comp> PDP data compression (applicable for SNDTCP only) 0 Off (default if value if omitted) 1 On (manufacturer preferred compression) 2 V.42 bis</p> <p><h_comp> PDP header compression 0 Off (default if value if omitted) 1 On (manufacturer preferred compression) 2 RFC1144 (applicable for SNDTCP only) 3 RFC2507 4 RFC3095 (applicable for PDCP only)</p> <p><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</p> <p><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> <p><P-CSCF_discovery> Numeric parameter that influences how the MT/TA requests get the P-CSCF address 0 Preference of P-CSCF address discovery is not influenced by +CGDCONT 1 Preference of P-CSCF address discovery through NAS signalling</p> <p><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</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> ▪ If the requested APN is listed in the ACL, the context definition will be performed.

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	<ul style="list-style-type: none"> ▪ 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. • PDP should be deactivated using +CGACT before updating the PDP context and activated using +CGACT after the PDP context has been updated. • If the PDP context is reconfigured, the PDP context must be reactivated using AT+CGACT=0,1 to be able to retrieve the IP address.
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10.8. +CGDSCONT Command: Define Secondary PDP Context

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<i>Test command</i>	
<p><u>Syntax</u> AT+CGDSCONT=?</p>	<p><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</p>
<i>Read command</i>	
<p><u>Syntax</u> AT+CGDSCONT?</p>	<p><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</p>
<i>Write command</i>	
<p><u>Syntax</u> AT+CGDSCONT=[<cid>,<p_cid> [,<d_comp> [,<h_comp> [,<IM_CN_Signalling_Flag_Ind>]]]]]</p>	<p><u>Response</u> OK or ERROR</p> <p><u>Parameter</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>

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	<p><p_cid> Primary PDP Context Identifier. Numeric parameter that specifies a particular PDP context definition which has been specified by +CGDCONT. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test command.</p> <p><d_comp> PDP data compression (applicable for SNDCP only)</p> <p><u>0</u> Off (default value if omitted)</p> <p>1 On (manufacturer preferred compression)</p> <p>2 V.42 bis</p> <p><h_comp> PDP header compression</p> <p><u>0</u> Off (default value if omitted)</p> <p>1 On (manufacturer preferred compression)</p> <p>2 RFC1144 (applicable for SNDCP only)</p> <p>3 RFC2507</p> <p>4 RFC3095 (applicable for PDCP only)</p> <p><IM_CN_Signalling_Flag_Ind> Numeric parameter used to indicate whether the PDP context is for IM CN subsystem related signaling only or not</p> <p>0 UE indicates that the PDP context is not for IM CN subsystem-related signaling only</p> <p>1 UE indicates that the PDP context is for IM CN subsystem-related signaling only</p>

10.9. +CGDATA Command: Enter Data State

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CGDATA=?</p>	<p><u>Response</u> +CGDATA: (list of supported <L2P>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CGDATA = [<L2P> [,<cid> [,<cid> [...]]]</p>	<p><u>Response</u> CONNECT (followed by data transfer)</p> <p>or CME ERROR: <err></p> <p><u>Parameters</u> <L2P> String parameter that indicates the layer 2 protocol to be used between the TE and MT</p> <p>PPP Point-to-point protocol for a PDP such as IP</p> <p>M-OPT-PPP MS supports manufacturing specific protocol</p> <p>M-HEX MS supports manufacturing specific protocol</p> <p>M-RAW_IP MS supports manufacturing specific protocol</p> <p><cid> Numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT)</p>

10.10. +CGED Command: GPRS Cell Environment

Note: For HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CGED=?</p>	<p><u>Response</u> +CGED: (list of supported <mode>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CGED?</p>	<p><u>Response</u> +CGED: <mode> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CGED=[<mode>]</p>	<p><u>Response</u> 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_off set>,<tmp_offset>,<penalty_t>,<c1>,<c2>,<ch_type>,<ch_mode>,<txpwr>,<dtx_us ed>,<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></p> <hr style="border: 1px solid red;"/> <p><i>Note: Neighbour cell content may be repeated up to 6 times.</i></p> <p>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>,<pf_c_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</p> <p>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></p>

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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>,RJCZ: <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>, B:<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>
 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>,
 MeasId :<meas_id>, EventId :,<par 3>,<par 4>,<par 5>,<par 6>,...,<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_c

 ell_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

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<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
<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

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<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
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

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<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 ccch by network

<NCO> 0 – 3 NETWORK_CONTROL_ORDER (GPRS_Cell_Options)

<NOM> 0 – 3 NETWORK OPERATION MODE (GPRS_Cell_Options)

<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
    
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<p> <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 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 </p>

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692

<p><release_cause> Integer value with range from 0 – 99</p> <p><out_of_service> 0 – 1</p> <p><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.</p> <p><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.</p> <p><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.</p> <p><hierarchical_cell_structure> 0 – 1</p> <p><high_mobility_detected> 0 – 1</p> <p><limited_mode> 0 – 1</p> <p><dlpc_power_up_commands_count> L1 related data counter</p> <p><dlpc_power_down_commands_count> L1 related data counter</p> <p><ulpc_power_up_commands_count> L1 related data counter</p> <p><ulpc_power_down_commands_count> L1 related data counter</p> <p><compressed_mode> Flag indicating if Compressed Mode is Active or not</p> <p><tx_ul_pwr_ctrl_alg> Tx Uplink Power Control Algorithm</p> <p><drx_cycle_length> DRX Cycle Length value 2^k</p> <p><ciphering> Indicates whether GSM Ciphering may be ON or OFF</p> <p><ps_data_transferred> 0 – 1</p> <p><power_saving_mode> 0 – 1</p> <p><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</p> <p><scrambling_code> Integer value with range from 0 – 511</p>

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692

<rscp> Received Signal Code Power with range from 0 – 91; 255 for invalid/default value

<ecno> Energy per chip/noise with range from 0 – 24; 255 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

<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_reselecection_total> Integer value with range from 0 – 999

<ir_cell_reselecection_counter> Integer value with range from 0 – 999

<attempted_ir_cell_reselecection> 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

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<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>.
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10.11. +CGEREP Command: Packet Domain Event Reporting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p>+CGEV: ME PDN ACT <cid>[,<reason>] The mobile termination has activated a context</p> <p>+CGEV: NW ACT <p_cid>, <cid>, <event_type> The network has activated a context</p> <p>+CGEV: ME ACT <p_cid>, <cid>, <event_type> The network has responded to an ME initiated context activation</p> <p>+CGEV: NW PDN DEACT <cid> The network has deactivated a context</p> <p>+CGEV: ME PDN DEACT <cid> The mobile termination has deactivated a context</p> <p>+CGEV: NW DEACT <p_cid>, <cid>, <event_type> The network has deactivated a context</p> <p>+CGEV: ME DEACT <p_cid>, <cid>, <event_type> The network has responded to an ME initiated context deactivation request</p> <p>+CGEV: NW MODIFY <cid>, <change_reason>, <event_type> The network has modified a context</p> <p>+CGEV: ME MODIFY <cid>, <change_reason>, <event_type> The mobile termination has modified a context</p> <p><u>Parameters</u></p> <p><reason> 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</p> <p><event_type> 0 Informational event 1 Information request, acknowledgement required</p> <p><change_reason> 0 TFT only changed 1 QoS only changed 2 Both TFT and QoS changed</p>	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u> AT+CGAUTO=?</p>	<p><u>Response</u> +CGAUTO: (list of supported <n>s) OK</p>
<i>Read command</i>	
<p><u>Syntax</u> AT+CGAUTO?</p>	<p><u>Response</u> +CGAUTO: <n> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CGAUTO= [<n>]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameter</u> <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 <u>3</u> Modem compatibility mode, packet domain and circuit switched calls 4 Turn on automatic negative response for packet domain only</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CGPADDR=?</p>	<p><u>Response</u> +CGPADDR: (list of supported <cid>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CGPADDR= [<cid> ,<cid> [,...]]]</p>	<p><u>Response</u> +CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]] [<CR><LF> +CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]]][...]] OK</p> <p><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.</p> <p><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.</p> <p>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>.</p> <p>Both <PDP_addr_1> and <PDP_addr_2> are omitted if none are available.</p> <p>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.</p> <p>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.</p>

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

Note: For HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CGQMIN=?</p>	<p><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) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CGQMIN?</p>	<p><u>Response</u> +CGQMIN: <cid>, <precedence>, <delay>, <reliability>, <peak>, <mean> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CGQMIN= [<cid> [,<precedence> [,<delay> [,<reliability> [,<peak> [,<mean>]]]]]]</p>	<p><u>Response</u> OK</p> <p>or ERROR</p> <p><u>Parameters</u> <cid> Numeric parameter that specifies a particular PDP context definition. Refer to the defined values under the +CGDCONT command.</p> <p><precedence> Numeric parameter for the precedence class</p> <p><delay> Numeric parameter for the delay class</p> <p><reliability> Numeric parameter for the reliability class</p> <p><peak> Numeric parameter for the peak throughput class</p> <p><mean> Numeric parameter for the mean throughput class</p>
<p><u>Notes</u></p>	<p>If a value is omitted for a particular class then the value is considered to be unspecified.</p>

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

Note: For HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CGEQMIN=?</p>	<p><u>Response</u></p> <p>+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)]</p> <p>[<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)] [...]]</p> <p>ERROR</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CGEQMIN?</p>	<p><u>Response</u></p> <p>+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>]</p> <p>[<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>] [...]]</p> <p>Error</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CGEQMIN= [<cid>[, <Traffic_class> [, <Maximum_bitrate_UL> [, <Maximum_bitrate_DL> [, <Guaranteed_bitrate_UL> [, <Guaranteed_bitrate_DL> [, <Delivery_order></p>	<p><u>Response</u></p> <p>OK</p> <p>or</p> <p>ERROR</p> <p><u>Parameter</u></p> <p><cid> Numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands).</p>

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
	<p><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</p> <p>0 PDP context is not optimized 1 PDP context is optimized</p> <p><PDP_type> Refer to +CGDCONT and +CGDSCONT commands.</p>
<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

Note: For HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u> AT+CGQREQ=?</p>	<p><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) OK</p>
<i>Read command</i>	
<p><u>Syntax</u> AT+CGQREQ?</p>	<p><u>Response</u> +CGQREQ: <cid>, <precedence>, <delay>, <reliability>, <peak>, <mean> OK</p>
<i>Write command</i>	
<p><u>Syntax</u> AT+CGQREQ = [<cid> [,<precedence> [,<delay> [,<reliability> [,<peak> [,<mean>]]]]]]</p>	<p><u>Response</u> OK</p> <p>or ERROR</p> <p><u>Parameters</u> <cid> Numeric parameter that specifies a particular PDP context definition.</p> <p><precedence> Numeric parameter that specifies the precedence class</p> <p><delay> Numeric parameter that specifies the delay class</p> <p><reliability> Numeric parameter that specifies the reliability class</p> <p><peak> Numeric parameter that specifies the peak throughput class</p> <p><mean> Numeric parameter that specifies the mean throughput class.</p>

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692

Notes

- 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.

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

Note: For HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692

Test command

Syntax

AT+CGEQREQ=?

Response

+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)] [...]]

Read command

Syntax

AT+CGEQREQ?

Response

+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>] [...]]

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
	<p><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</p> <p><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</p> <p><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</p> <p>0 Characteristics of SDUs is unknown 1 Charactersitics of SDUs correspond to a speech source</p> <p><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</p> <p>0 PDP context is not optimized 1 PDP context is optimized</p> <p><PDP_type> Refer to +CGDCONT and +CGDSCONT commands.</p>
<u>Notes</u>	If a value is omitted for a particular class then the value is considered to be unspecified.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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> [...]]]	<p><u>Response</u></p> <p>+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></p> <p>[<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>[...]]</p> <p><u>Parameters</u></p> <p><cid> numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands)</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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'.

<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

<Signaling_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'.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Notes</u>	<ul style="list-style-type: none"> If a value is omitted for a particular class then the value is considered to be unspecified. Parameter details can be referenced from 3GPP specifications TS24.008 section 10.5.6.5 and TS23.107 section 6.4.3.1.
<u>Examples</u>	<pre> 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,"0E0","0E0",3,0,0,0,0 OK </pre>

10.19. +CGREG Command: GPRS Network Registration Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+CGREG=?	<u>Response</u> +CGREG: (list of supported <n>s) OK
<i>Read command</i>	
<u>Syntax</u> AT+CGREG?	<u>Response</u> +CGREG: <n>,<stat>[,<lac>,<ci>[,<AcT>,<rac>]] OK
<i>Write command</i>	
<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>]] <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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p>3 Registration denied 4 Unknown 5 Registered, roaming 8 Attached for emergency bearer services only (only applicable when <AcT>=2, 4, 5, 6)</p> <p><lac> String type; two-byte location area code in hexadecimal format. "FFFF" indicates that the location area code is invalid and that the <rac> value should also be ignored.</p> <p><ci> String type; two-byte cell ID in hexadecimal format for GSM; or four-byte UTRAN/E-UTRAN cell ID in hexadecimal format</p> <p><Act> 0 GSM 1 GSM Compact 2 UTRAN 3 GSM with EGPRS 4 UTRAN with HSDPA 5 UTRAN with HSUPA 6 UTRAN with HSDPA and HSUPA 7 E-UTRAN</p> <p><rac> String type; one-byte routing area code in hexadecimal format. "00" indicates that the routing area code is invalid. It has the same meaning as "FF" specified in the +KCCINFO command.</p>
<i>Unsolicited Notification</i>	<p>Response +CGREG: <stat> +CGREG: <stat>[,<lac>,<ci>[,<Act>,<rac>]]</p>
<i>Reference</i> Sierra Wireless Proprietary	<p>Notes <n> is saved in non-volatile memory per AT port over module reboot.</p>
<i>Examples</i>	<p>AT+CGREG? // Read command +CGREG: 0,0 OK</p> <p>AT+CGREG=? // Test command +CGREG: (0-2) OK</p> <p>AT+CGREG=2 // Set mode to 2 OK</p> <p>AT+COPS=0 OK +CGREG: 1,"008C","6771",0,"01" // URC displayed after attaching to network</p>

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 <u>Parameter</u> <service> Indicates the service or service preference to be used 0 Packet Domain <u>1</u> 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Write command</i>	
<p><u>Syntax</u> AT+CRLP= [<iws>[,<mws> [,<T1>[,<N2>]]]]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u> <iws> IWF to MS window size</p> <p><mws> MS to IWF window size</p> <p><T1> Acknowledgement timer (in units of 10 ms)</p> <p><N2> Retransmission attempts</p>

10.22. +XDNS Command: Dynamic DNS Request

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692									
<i>Test command</i>									
<p><u>Syntax</u> AT+XDNS=?</p>	<p><u>Response</u> +XDNS: (list of supported <cid>s),(list of supported <mode>s) OK</p>								
<i>Read command</i>									
<p><u>Syntax</u> AT+XDNS?</p>	<p><u>Response</u> +XDNS: <cid>, <primary DNS>, <secondary DNS #1> [+XDNS: <cid>, <primary DNS>, <secondary DNS #2> [...]] OK</p>								
<i>Write command</i>									
<p><u>Syntax</u> AT+XDNS=<cid>,<mode></p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u> <cid> Context ID</p> <p><mode></p> <table border="0"> <tr> <td style="padding-right: 20px;">0</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>	0	Disable dynamic DNS request	1	Enable dynamic DNS request (IPv4)	2	Enable dynamic DNS request (IPv6)	3	Enable dynamic DNS request (IPv4v6)
0	Disable dynamic DNS request								
1	Enable dynamic DNS request (IPv4)								
2	Enable dynamic DNS request (IPv6)								
3	Enable dynamic DNS request (IPv4v6)								

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><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 "0.0.0.0" 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.</p>
<u>Notes</u>	<ul style="list-style-type: none"> • Each <secondary DNS> is displayed in one separate line of "+XDNS: ..." response. • The count of <secondary DNS> ranges from 0 to 16. • When the count of <secondary DNS> is 0, it is returned as "0.0.0.0".

10.23. +CGPIAF Command: Printing IP Address Format

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+CGPIAF=?</p>	<p><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)</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+CGPIAF?</p>	<p><u>Response</u> +CGPIAF: <IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+CGPIAF= [<IPv6_AddressFormat>,<IPv6_SubnetNotation> [,<IPv6_LeadingZeros>,<IPv6_CompressZeros>]]]]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u> <IPv6_AddressFormat> 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.</p> <p><IPv6_SubnetNotation> Specifies the subnet notation for remote address and subnet mask. This parameter setting does not apply if <IPv6_AddressFormat> = 0. 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</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><IPv6_LeadingZeros> Specifies whether leading zeros are omitted or not. This parameter setting does not apply if <IPv6_AddressFormat> = 0.</p> <p><u>0</u> Leading zeros are omitted</p> <p>1 Leading zeros are included</p> <p><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.</p> <p><u>0</u> No zero compression</p> <p>1 Use zero compression</p> <p>If the address is unspecified (all bytes are zeros), "::" will be displayed.</p>
<u>Notes</u>	Parameters are saved in non-volatile memory per AT port over module reboot.

10.24. +WPPP Command: PDP Context Authentication Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u></p> <p>AT+WPPP=?</p>	<p><u>Response</u></p> <p>+WPPP: (list of supported <Auth>s),[(list of supported <cid>s)]</p> <p>OK</p>
<i>Read command</i>	
<p><u>Syntax</u></p> <p>AT+WPPP?</p>	<p><u>Response</u></p> <p>+WPPP: <Auth>,[<cid>],[<username>],[<password>]</p> <p>OK</p>
<i>Write command</i>	
<p><u>Syntax</u></p> <p>AT+WPPP= <Auth>,[<cid>], [<username>], [<password>]</p>	<p><u>Response</u></p> <p>OK</p> <p>or</p> <p>+CME ERROR <err></p> <p><u>Parameters</u></p> <p><Auth> Type of authentication supported</p> <p><u>0</u> None</p> <p>1 PAP</p> <p>2 CHAP</p> <p><cid> 1 – 20 PDP context identifier used in +CGDCONT. If omitted, the configuration is set for all PDP contexts.</p> <p><username> Login for the APN. String type, up to 30 characters</p> <p><password> Password for the APN. String type, up to 30 characters</p>
<u>Notes</u>	<ul style="list-style-type: none"> +WPPP is available even if the SIM card has not been inserted. Parameters are stored in non-volatile memory.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692Examples**AT+WPPP=?****+WPP: (0-2),(1-20)****OK****AT+WPPP=1,1,"myusername","mypassword"****OK****AT+WPPP?****+WPPP: 1,1,"myusername","mypassword"****OK**

11. SIM Application Toolkit Commands

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+STKPRO=?	<u>Response</u> +STKPRO: (01,05,16,17,18,19,20,21,32,33,34,35,36,37,38,40,52,53,64) OK
<i>Unsolicited Notification</i>	<p><u>Response</u> +STKPRO: <proactive_cmd>...</p> <p>Details of which are as follows:</p> <ul style="list-style-type: none"> • +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, <dcs>, <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>, <dcs>, <hex_string>, <icon_id> • +STKPRO: 34, <type>, <dcs>, <hex_string>, <icon_id> • +STKPRO: 35, <type>, <dcs>, <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, <dcs>, <hex_string>, <icon_id> • +STKPRO: 52, <type>, <alpha>, <icon_id> • +STKPRO: 53, <language> • +STKPRO: 64, <cmd_qualifier>, <alpha_id>, <icon_refrence>, <dialing_number>, <reconnect_interval>, <reconnect_unit>, <idle_interval>, <idle_unit>, <bearer_type>, <bearer_parameter>, <buffer_size>, <login_dcs>, <login_text>, <password_dcs>, <password_text>, <transport_level>, <transport_port>, <sub_address>, <destination_address_type>, <destination_address> <p><u>Parameters</u> <alpha>, <alpha_1>, <alpha_2>, <item_text>, <default text> Text string</p> <p><dsc> Data coding scheme</p> <p><default_item> Default items (s. item_id)</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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
 39 Timer management
 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

<ss_data> Data string

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<type>	Integer as command qualifier; possible value "4" means language
<tone>	<ul style="list-style-type: none"> 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>	<ul style="list-style-type: none"> 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> <ul style="list-style-type: none"> 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> <ul style="list-style-type: none"> 0 Minutes 1 Seconds 2 Tenth of a second
<bearer_type>	<ul style="list-style-type: none"> 1 Circuit switched 2 Packet switched 3 Default 255 Invalid
<bearer_parameter>	Hex string that gived 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.
<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.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<p><login_text> Specifies user authentication data is requested by the bearer connection. Coding based on <login_dcs>.</p> <p><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.</p> <p><password_text> Specifies user authentication data if requested by the bearer connection. Coding based on <password_dcs>.</p> <p><transport_level> Transport layer protocol of the UICC/terminal connection</p> <table border="0"> <tr><td>1</td><td>UDP</td></tr> <tr><td>2</td><td>TCP</td></tr> <tr><td>255</td><td>Invalid; no transport protocol specified</td></tr> </table> <p><transport_port> Integer that specifies the transport port</p> <p><sub_address> Called party subaddress (for CS bearers only)</p> <p><dsc> Data coding scheme</p> <table border="0"> <tr><td><destination_address_type></td><td>33</td><td>IPv4 IP address</td></tr> <tr><td></td><td>87</td><td>IPv6 IP address</td></tr> <tr><td></td><td>255</td><td>Invalid; unknown address type</td></tr> </table> <p><destination_address> Hex string that specifies the destination point of the connection</p>	1	UDP	2	TCP	255	Invalid; no transport protocol specified	<destination_address_type>	33	IPv4 IP address		87	IPv6 IP address		255	Invalid; unknown address type	
1	UDP															
2	TCP															
255	Invalid; no transport protocol specified															
<destination_address_type>	33	IPv4 IP address														
	87	IPv6 IP address														
	255	Invalid; unknown address type														

11.2. +STKTR Command: Enter Response

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

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> +STKPRO)	Decimal code that indicates the proactive command (refer to
<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
	5 Command performed but modified by call control by SIM
	6 Command performed successfully, limited service

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

	<p>7 Command performed with modification</p> <p>16 Proactive SIM session terminated by the user</p> <p>17 Backward move in the proactive SIM session requested by the user</p> <p>18 No response from user</p> <p>19 Help information required by the user</p> <p>20 USSD or SS transaction terminated by the user</p> <p>32 ME currently unable to process command</p> <p>33 Network currently unable to process the command</p> <p>34 User did not accept call set-up request</p> <p>35 User cleared down call before connection or network release</p> <p>36 Action in contradiction with the current timer state</p> <p>37 Interaction with call control by SIM, temporary problem</p> <p>38 Launch browser generic error code</p> <p>48 Command beyond ME's capabilities</p> <p>49 Command type not understood by ME</p> <p>50 Command data not understood by ME</p> <p>51 Command number not known by ME</p> <p>52 SS return error</p> <p>53 SMS RP ERROR</p> <p>54 Error, required values are missing</p> <p>55 USSD return error</p> <p>56 Multiple card command error (if class "a" is supported)</p> <p>57 Interaction with call control by SIM or MO, short message control by SIM</p> <p>58 Bearer independent protocol error (if class "e" is supported)</p> <p><buffer size> Size of the allocated buffer</p> <p><open_channel_id> 1 – 7 Channel ID 0 Invalid</p> <p><link_status> Specifies whether link is established or packet data service is activated</p> <p>1 Enabled</p> <p>0 Disabled</p> <p><channel_status_state> Link state</p> <p>00 No further information can be given</p> <p><bearer_description_type> Bearer type which can be used to decode the bearer description value</p> <p>01 Circuit switched UTA_SIM_TK_BEARER</p> <p>02 Packet switched UTA_SIM_TK_BEARER (GPRS)</p> <p>03 Terminal default UTA_SIM_TK_BEARER</p> <p>255 Invalid bearer value; indicates an unknown bearer type which is not supported by the interface version</p> <p><bearer_description_params> Hexadecimal string; gives detailed information dependent on the bearer type</p> <p><address_type> Type of address</p> <p>33 IPv4 IP address</p> <p>87 IPv6 IP address</p>
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11.4. +STKPROF Command: Terminal Profile Data

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692													
<i>Unsolicited Notification</i>	<u>Response</u> +STKCC: <cc_command>... Details of which are as follows: <ul style="list-style-type: none"> • +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> <table border="0"> <tr> <td><cc_command></td> <td>1</td> <td>Set up call</td> </tr> <tr> <td></td> <td>2</td> <td>Send SS</td> </tr> <tr> <td></td> <td>3</td> <td>Send USSD</td> </tr> <tr> <td></td> <td>4</td> <td>Send SM</td> </tr> </table> <res_val> Call control result value	<cc_command>	1	Set up call		2	Send SS		3	Send USSD		4	Send SM
<cc_command>	1	Set up call											
	2	Send SS											
	3	Send USSD											
	4	Send SM											

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<alpha>	Text string
<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<i>Unsolicited Notification</i>	<p><u>Response</u> +STKCNF: <proactive_cmd>,<result>,<add_result>,<sw1></p> <p><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</p>
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11.7. *PSSTKI Command: SIM Toolkit Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692													
	<p><u>Parameter</u></p> <table> <tr> <td><mode></td> <td>0</td> <td>No unsolicited result code will be sent to the TE; the TE will not send proactive commands to the module.</td> </tr> <tr> <td></td> <td>1</td> <td>Manual mode. Any unsolicited result codes will be sent to the TE. The TE had to acknowledge with a +STKPRO notification.</td> </tr> <tr> <td></td> <td>2</td> <td>Auto acknowledge mode. The module answers to STK without the TE. Any unsolicited result codes will be sent to the TE.</td> </tr> <tr> <td></td> <td>3</td> <td>Auto acknowledge mode without sending unsolicited result codes to the TE.</td> </tr> </table>	<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.
<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.											
<p><u>Reference</u></p> <p>Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • This command cannot be used without a SIM. • <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: <ul style="list-style-type: none"> ▪ Where basic Yes/No responses are expected: <ul style="list-style-type: none"> ▪ 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): <ul style="list-style-type: none"> ▪ SET UP IDLE MODE TEXT ▪ DISPLAY TEXT ▪ PLAY TONE ▪ REFRESH 												
<p><u>Examples</u></p>	<pre> <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+stctr=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 </pre>												

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

```

// 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

```

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

```

//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 HL76xx embedded module:

- 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. +KTCP CNX) 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. +KTCP CLOSE).

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KCNXCFG=?</p>	<p><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</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KCNXCFG?</p>	<p><u>Response</u> +KCNXCFG: <cnx cnf>, "GPRS", <apn>, <login>, <password>, <af>, <ip>, <dns1>, <dns2>[, <ip_v6>, <dns1_v6>, <dns2_v6>], <state> [...] OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KCNXCFG= <cnx cnf>, "GPRS", <apn> [, <login>] [, <password>] [, <af> [, <ip>] [, <dns1>] [, <dns2>]]]] [, <ip_v6>] [, <dns1_v6>] [, <dns2_v6>]]]]]]]]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u> <cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration</p> <p><apn> (Access Point Name) a string parameter (max size 63 bytes), logical name used to select the GGSN or the external packet data network.</p> <p><login> string type (max size 24 bytes), indicates the user name of the cnx</p> <p><password> string type (max size 24 bytes), indicates the password of the cnx</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><af> Address family used for the connection</p> <p><u>IPV4</u> IPv4 only IPV6 IPv6 only IPV4V6 IPv4 and IPv6</p> <p><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.</p> <p><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.</p> <p><ip_v6> IPV6 String type. If the mobile is supposed to work with a dynamic address, the value should be "::" or an empty string.</p> <p><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.</p> <p><state> Connection state</p> <p>0 Disconnected 1 Connecting 2 Connected 3 Idle, down counting for disconnection 4 Disconnecting</p>
Reference Sierra Wireless Proprietary	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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 in subsequent 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 correspond 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 reuse of existing activated PDP context is required, <apn> can be set as an empty string or as the existing APN string returned by +CGDCONT read command.

12.7.2. +KCNXTIMER Command: Connection Timer Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<p><u>Syntax</u></p> <p>AT+KCNXTIMER =?</p>	<p><u>Response</u></p> <p>+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</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KCNXTIMER ?</p>	<p><u>Response</u> +KCNXTIMER: <cnx cnf>,<tim1>,<nbtrial>,<tim2>,<idletime> [...] OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KCNXTIMER =<cnx cnf>[, [<tim1>][, [<nbtrial>] [,<tim2>] [,<idletime>]]]]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <p><cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration</p> <p><tim1> 1 – 120 s (30 s by default) If the 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.</p> <p><nbtrial> Attempt times from 1 – 4 (2 by default). The module will try to activate the PDP context for a maximum of <nbtrial> times.</p> <p><tim2> 0 – 300s 0 Deactivated (connection will not close by itself) 60 Default value</p> <p>For client sockets, module will try to connect to the server within <tim2>s; if <tim2> expires, it will give up the connection.</p> <p><idletime> 0 – 1800 s (30 s 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.</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u> This command will only have impact on TCP, UDP, FTP, HTTP and HTTP specific commands (+KTCPCNX, +KTCPSTART, +KUDPCFG, +KFTPCFG, etc.)</p>

12.7.3. +KCNXPROFILE Command: Current Profile Connection Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+ KCNXPROFILE =?</p>	<p><u>Response</u> +KCNXPROFILE: (list of possible <cnx cnf>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+ KCNXPROFILE?</p>	<p><u>Response</u> +KCNXPROFILE: <cnx cnf> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 +KTCP CFG, +KUDPCFG, +KFTPCFG, +KHTT PCFG and +KHTT PSCFG, if <cnx cnf> parameter is not given in these commands.

12.7.4. +KCGPADDR Command: Display PDP Address

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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> <ul style="list-style-type: none"> This AT command can be used after +KTCP CNX, +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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Unsolicited Notification</i>	<p><u>Response</u></p> <p>+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)</p> <p><u>Parameters</u></p> <p><cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration</p> <p><status> PDP connection status</p> <p>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</p> <p><af> 0 IPV4 1 IPV6</p> <p><tim1> Refer to +KCNXTIMER</p> <p><attempt> Current attempt of bringing up of PDP connection</p> <p><nbtrial> Refer to +KCNXTIMER</p> <p><idletime> Refer to +KCNXTIMER</p>
<u>Reference</u>	Sierra Wireless Proprietary

12.7.6. +KCNXUP Command: Bring the PDP Connection Up

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+KCNXUP=?	<p><u>Response</u></p> <p>+KCNXUP: (list of possible <cnx_cnf>s) OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KCNXUP= <cnx_cnf></p>	<p><u>Response</u> OK</p> <p><u>Parameter</u> <cnx_cnf> 1 – 5 PDP context configuration – a numeric parameter which specifies a particular PDP context configuration</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692					
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KCNXDOWN =?</p>	<p><u>Response</u> +KCNXDOWN: (list of possible <cnx_cnf>s),(list of possible <mode>s) OK</p>				
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KCNXDOWN =<cnx_cnf> [,<mode>]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u> <cnx_cnf> 1 – 5 PDP context configuration – a numeric parameter which specifies a particular PDP context configuration</p> <p><mode></p> <table> <tr> <td>0</td> <td>Cancels the reservation of the activated PDP connection previously configured by +KCNXUP</td> </tr> <tr> <td>1</td> <td>Similar to 0, but deactivates the PDP connection even if the active session exists</td> </tr> </table>	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
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				
<p><u>Reference</u></p>	<p>Sierra Wireless Proprietary</p>				

12.8. Common Configuration

12.8.1. +KPATTERN Command: Custom End of Data Pattern

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KPATTERN =?</p>	<p><u>Response</u> OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KPATTERN?</p>	<p><u>Response</u> +KPATTERN: <EOF pattern> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KPATTERN =<EOF pattern></p>	<p><u>Response</u> OK</p> <p>or +CME ERROR <err></p> <p><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).</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KURCCFG=?</p>	<p><u>Response</u> +KURCCFG: (list of supported <protoopt>s),(list of supported <noti_act>s),(list of supported <indi_act>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KURCCFG?</p>	<p><u>Response</u> +KURCCFG: list of supported (<protoopt>,<noti_act>,<indi_act>) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KURCCFG= <protoopt>, <noti_act> [,<indi_act>]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <p><protoopt> Protocol option to enable/disable URC</p> <p>"TCPC" TCP client session</p> <p>"TCPS" TCP server session</p> <p>"UDPC" UDP client session</p> <p>"UDPS" UDP server session</p> <p>"FTP" FTP client session</p> <p>"HTTP" HTTP client session</p> <p>"HTTPS" HTTPS client session</p> <p>"TCP" Both TCP client and TCP server sessions</p> <p>"UDP" Both UDP client and UDP server sessions</p> <p><noti_act> <u>1</u> Enable URC (like +KTCP_NOTIF, +KFTP_ERROR, etc.) 0 Disable URC</p> <p><indi_act> <u>1</u> Enable URC (like +KTCP_SRVREQ, +KTCP_IND, +KTCP_DATA, +KUDP_DATA, +KUDP_RCV, +KFTP_IND, etc.) 0 Disable URC</p>
<p><u>Examples</u></p>	<p>To disable URC: AT+KURCCFG="TCP",0 OK</p> <p>Test and read command: AT+KURCCFG=? +KURCCFG: ("TCPC","TCPS","UDPC","UDPS","FTP","HTTP","HTTPS","TCP","UDP"),(0,-1),(0-1) OK</p> <p>AT+KURCCFG? +KURCCFG: "TCPC",1,1 +KURCCFG: "TCPS",1,1 +KURCCFG: "UDPC",1,1 +KURCCFG: "UDPS",1,1</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	+KURCCFG: "FTP",1,1 +KURCCFG: "HTTP",1,1 +KURCCFG: "HTTPS",1,1 OK
Reference Sierra Wireless Proprietary	Notes <ul style="list-style-type: none"> Enabling or disabling +KTCP_NOTIF unsolicited messages is only useful when 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax AT+KIOPT=?	Response +KIOPT: 0,<UDP>,(1-400),(8-1472),(8-1452) +KIOPT: 0,<TCP-based>,(0-400),(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
Read command Syntax AT+KIOPT?	Response +KIOPT: 0,<proto>,<wait time>,<send size v4>,<send size v6>,<wait time adj v4>,<send size adj v4>,<wait time adj v6>,<send size adj v6> [...] +KIOPT: 1,<http_chunked> +KIOPT: 2,<http_max_redirect> +KIOPT: 3,<stop_on_error>,<stop_on_peer> +KIOPT: 4,<ssl_ver> OK
Write command Syntax If <option_id>=0: AT+KIOPT= <option_id>,<proto>,<wait time> [,<send size v4> [,<send size v6>]]	Response OK or +CME ERROR<err>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<p>If <option_id>=1: AT+KIOPT= <option_id>, <http_chunked></p> <p>If <option_id>=2: AT+KIOPT= <option_id>, <http_max_redirect></p> <p>If <option_id>=3: AT+KIOPT= <option_id>, <stop_on_error>, <stop_on_peer></p> <p>If <option_id>=4: AT+KIOPT= <option_id>, <ssl_ver></p>	<p><u>Parameters</u></p> <p><option_id> Option ID</p> <p>0 Wait time, send size threshold configuration</p> <p>1 HTTP chunked transfer encoding</p> <p>2 HTTP maximum redirection</p> <p>3 PDP connection deactivated behavior</p> <p>4 SSL version for use in +KHTTPS</p> <p><proto> Protocol, string type</p> <p>“TCPC” TCP client session</p> <p>“TCPS” TCP server session</p> <p>“UDPC” UDP client session</p> <p>“UDPS” UDP server session</p> <p>“FTP” FTP client session</p> <p>“HTTP” HTTP client session</p> <p>“HTTPS” HTTP server session</p> <p>“TCP” Both client and server TCP sessions</p> <p>“UDP” Both client and server UDP sessions</p> <p><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.</p> <p>Range:</p> <p>For UDP: 1 – 400, default value = 2</p> <p>For TCP: 0 – 400, default value = 1. Note that value = 0 has the same effect as having value = 1 due to the limitation from +KPATTERN detection timing</p> <p><wait time adj v4> Actual value of <wait time> being used for IPV4 sessions, adjusted based on <send size v4></p> <p><wait time adj v6> Actual value of <wait time> being used for IPV6 sessions, adjusted based on <send size v6></p> <p><send size v4> Data packet size for IPv4 sessions. This parameter specifies the data packet size that needs to be sent to the peer.</p> <p>Range:</p> <p>For UDP: 8 – 1472, default value = 1020</p> <p>For TCP: 0, 8 – 1460, default value = 0 (disabled)</p> <p><send size adj v4> Actual value of <send size v4> being used</p> <p><send size v6> Data packet size for IPv6 sessions. This parameter specifies the data packet size that needs to be sent to the peer.</p> <p>Range:</p> <p>For UDP: 8 – 1452, default value = 1020</p> <p>For TCP: 0, 8 – 1440, default value = 0 (disabled). Note that value = 0 uses a wait time of 100 ms.</p> <p><send size adj v6> Actual value of <send size v6> being used</p> <p><http_chunked> “Chunked” transfer encoding for HTTP POST</p> <p>0 Data sent with HTTP POST are not encoded</p> <p>1 Data sent with HTTP POST are automatically encoded using “chenked” transfer encoding</p>
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HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><http_max_redirect> Maximum redirection allowed for HTTP GET. Range: 8 – 255; default value = <u>0</u></p> <p><stop_on_error> PDP connection deactivation behavior when a session is closed due to any error</p> <p><u>0</u> Do not request to stop the connection</p> <p><u>1</u> Request to stop the connection</p> <p><stop_on_peer> PDP connection deactivation behavior when a session is closed by a peer/server</p> <p><u>0</u> Do not request to stop the connection</p> <p><u>1</u> Request to stop the connection</p> <p><ssl_ver> SSL version for use in +KHTTPS</p> <p><u>0</u> TLS version 1.1</p> <p><u>1</u> TLS version 1.0</p> <p><u>2</u> TLS version 1.2</p>
<p><u>Reference</u></p> <p>Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • "chunked" transfer encoding for HTTP POST is applicable and effective only for HTTP version 1.1. • 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), and threshold = 4000 is used internally, actual values can be read in <send size adj v4> and <send size adj v6> respectively • On physical UART, <wait time> is adjusted automatically to match with <send size v4> and <send size v6>; actual values can be read in <wait time adj v4> and <wait time adj v6> respectively. The adjustment is to use a minimum value by this formula: $\text{<wait time adj>} = 200\text{ms} + \text{estimated time to received data chunk of size <send size>, i.e. value in 100ms unit} = 2 + 10 * \text{<send size>} / (\text{BAUD} / 10).$ E.g. for <send size> = 1020, with BAUD 115200, <wait time adj> = $2 + 10 * 1020 / 11520 = 2$ (200ms) with BAUD 9600, <wait time adj> = $2 + 10 * 1020 / 960 = 12$ (1200ms) • The maximum transmission unit (MTU) is 1500 bytes. • After starting a connection or running SSL Certificate write commands, <ssl_ver> is fixed and cannot be changed until module reboot. • <send size v4> and <send size v6> impacts the detection of <EOF pattern>. Refer to the notes of +KAPTTERN for more information.

12.9. SSL Configuration

12.9.1. +KSSLCRYPTO Command: Cipher Suite Configuration

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KSSLCRYPTO=?</p>	<p><u>Response</u> +KSSLCRYPTO: <profile_id>,<mkey_Algo>,<auth_algo>,<enc_algo>,<mac_algo>,<tls_ver>,<auth>,<tls_ver>,<auth> OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KSSLCRYPTO?</p>	<p><u>Response</u> + KSSLCRYPTO: <profile_id>,<mkey_algo>,<auth_algo>,<enc_algo>,<mac_algo>,<tls_ver>,<auth> [...]</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KSSLCRYPTO= <profile_id>,<mkey_Algo>,<auth_algo>,<enc_algo>,<mac_algo>,<tls_ver>,<auth></p>	<p><u>Response</u> OK</p> <p><u>Parameters</u> <profile_id> Index of a set of parameters for configuring one SSL profile</p> <p><mkey_algo> Key exchange algorithm selection 1 RSA key exchange</p> <p><auth_algo> Authentication algorithm selection 1 RSA authentication</p> <p><enc_algo> Encryption algorithm selection 4 RC4 64 AES 128 128 AES 256 8192 AES128GCM</p> <p><mac_algo> Message authentication code algorithm selection 1 MD5 2 SHA1 64 AEAD</p> <p><tls_ver> Cipher suite version selection. 1 TLS 1.0 4 TLS 1.2</p> <p><auth> Authentication 0 No authentication 1 Authenticate server 2 Provide client certificate to server 3 Authenticate server and provide client certificate to server</p>

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692

Reference
Sierra Wireless
Proprietary

12.9.2. +KSSLCFG Command: SSL Configuration

Note: For HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692

Test command

Syntax

AT+KSSLCFG=?

Response

**+KSSLCFG:<option id>,<option>
OK**

Read command

Syntax

AT+KSSLCFG?

Response

**+KSSLCFG:0,<TLS Version>
+KSSLCFG:2,<Session Mode>
OK**

Write command

Syntax

**AT+KSSLCFG
=<option id>,
<option>**

Response

If <option_id> = 0:
**AT+KSSLCFG=<option_id>,<TLS Version>
OK**

If <option_id> = 1:
**AT+KSSLCFG=<option_id>,<Random Seed>
OK**

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)

12.10. TCP Specific Commands

12.10.1. +KTCPCFG Command: TCP Connection Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KTCPCFG=?</p>	<p><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),<cipher_index> OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KTCPCFG?</p>	<p><u>Response</u> +KTCPCFG: <session_id>,<status>,<cnx_cnf>,<mode>[,<serverID>], <tcp remote address>,<tcp_port>[,<source_port>],<data_mode>,<URC-ENDTCP-enable>,<af>,<cipher_index> [...]</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KTCPCFG= [<cnx_cnf>], <mode>, [<tcp remote address>], <tcp_port>[[, [<source_port>] [, [<data_mode>], [<URC-ENDTCP-enable>]]],<af> [,<cipher_suite>]</p>	<p><u>Response</u> +KTCPCFG: <session_id> OK</p> <p><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) 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.</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><data_mode> <u>0</u> Do not display <data> in URC (default setting) 1 Display <data> in URC</p> <p><URC-ENDTCP-enable> <u>0</u> Do not display URC "+KTCP_ACK" (default setting) 1 Display URC "+KTCP_ACK"</p> <p><af> Address family used for the connection. <u>0</u> IPV4 1 IPV6</p> <p><cipher_index> Cipher suite profile index to use for a secured socket; defined by +KSSLCRYPTO</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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+KTCPACKINFO 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.

12.10.2. +KTCP CNX Command: Start TCP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KTCP CNX=?</p>	<p><u>Response</u> +KTCP CNX: (list of possible <session_id>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KTCP CNX= <session_id></p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err> +KTCP_NOTIF: <session_id>, <tcp_notif></p> <p><u>Parameters</u> <session_id> TCP session index</p> <p><tcp_notif> Integer type. Indicates the cause of the TCP connection failure 0 Network error 1 No more sockets available; max. number already reached</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	2 Memory problem 3 DNS error 4 TCP disconnection by the server or remote client 5 TCP connection error 6 Generic error 7 Fail to accept client request's 8 Data sending is OK but KTCPSND was waiting for more or less characters 9 Bad session ID 10 Session is already running 11 All sessions are used 12 Socket connection timeout error 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.>

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 or +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> <ul style="list-style-type: none"> 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.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

	<ul style="list-style-type: none"> • 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.
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12.10.4. +KTCPSND Command: Send Data through a TCP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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 or 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+KTCPNXX
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> • All the data will be sent out ignoring <ndata>. If data sent is not equal to <ndata> then +KTCP_NOTIF will be displayed. • <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.

12.10.5. +KTCPCLOSE Command: Close Current TCP Operation

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KTCPCLOSE=?</p>	<p><u>Response</u> +KTCPCLOSE: (list of possible <session_id>s), (list of possible <closing_type>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KTCPCLOSE=<session_id> [,<closing_type>]</p>	<p><u>Response</u> OK or +CME ERROR: <err> NO CARRIER +KTCP_NOTIF: <session_id>, <tcp_notif></p> <p><u>Parameters</u></p> <p><session_id> TCP session index</p> <p><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.</p> <p><tcp_notif> See command AT+KTCPCTX</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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 it's been closed. • CID=1 is used for IMS/LTE registration and must be kept activated when RAT is LTE.

12.10.6. +KTCPDEL Command: Delete a Configured TCP Session

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KTCPDEL=?</p>	<p><u>Response</u> +KTCPDEL: (list of possible <session_id>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KTCPDEL=<session_id></p>	<p><u>Response</u> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	or +CME ERROR: <err> <u>Parameter</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.

12.10.7. +KTCP_SRVREQ Notification: Incoming Client Connection Request

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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> Numeric parameter (0-65535); port of the incoming client
<u>Examples</u>	<pre> //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+KTCPN=1 //listen on port 179 OK AT+KTCPN=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 </pre>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p>+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</p> <p>+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</p> <p>+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</p> <p>+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</p> <p>+KTCP_NOTIF: 4,4 //the connection of sub session id 4 (on listening port 180) is closed.</p> <p>+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</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +KTCP_DATA: <session_id>,<ndata available>[,<data>]</p> <p><u>Parameters</u> <session_id> TCP session index</p> <p><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></p> <p><data> Data in octet. The length of data is specified by <ndata_available></p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> 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.

12.10.9. +KTCP_IND Notification: TCP Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +KTCP_IND: <session_id>,<status></p> <p><u>Parameters</u> <session_id> TCP session index</p> <p><status> TCP session status. 1 session is set up and ready for operation</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	

12.10.10. +KTCPSTAT Command: Get TCP Socket Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+KTCPSTAT=?</p>	<p><u>Response</u> OK</p>
<p><i>Read command</i></p>	
<p><u>Syntax</u> AT+KTCPSTAT?</p>	<p><u>Response</u> OK</p>
<p><i>Write command</i></p>	
<p><u>Syntax</u> For all TCP session IDs: AT+KTCPSTAT</p> <p>or AT+KTCPSTAT=<session_id></p>	<p><u>Response</u> +KTCPSTAT: <session_id>,<status>,<tcp_notif>,<rem_data>,<rcv_data> [...] OK</p> <p>or +KTCPSTAT: <status>,<tcp_notif>,<rem_data>,<rcv_data> OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><u>Parameters</u></p> <p><session_id> TCP session index</p> <p><status> TCP socket state</p> <p>0 Socket not defined, use +KTCPCFG to create a TCP socket</p> <p>1 Socket is only defined but not used</p> <p>2 Socket is opening and connecting to the server, cannot be used</p> <p>3 Connection is up, socket can be used to send/receive data</p> <p>4 Connection is closing, it cannot be used, wait for status 5</p> <p>5 Socket is closed</p> <p><tcp_notif> -1 if socket/connection is OK, <tcp_notif> if an error has happened</p> <p><rem_data> Remaining bytes in the socket buffer, waiting to be sent</p> <p><rcv_data> Received bytes, can be read with +KTCPCRV command</p>
<p><u>Reference</u></p> <p>Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> The socket buffer's size for sending is 17520 bytes. This command returns +CME ERROR: 910 (Bad Session ID) for undefined <session_id>s.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u></p> <p>AT+KTCPSTART =?</p>	<p><u>Response</u></p> <p>OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u></p> <p>AT+KTCPSTART ?</p>	<p><u>Response</u></p> <p>OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u></p> <p>AT+KTCPSTART =<session_id></p>	<p><u>Response</u></p> <p>CONNECT</p> <p>OK</p> <p>or</p> <p>+CME ERROR: an error occurs, syntax error</p> <p>+KTCP_NOTIF: <session_id>,<tcp_notif> : an error occurs</p> <p><u>Parameters</u></p> <p><session_id> TCP session index</p> <p><tcp_notif> See command AT+KTCPCNX</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> • 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 one KTCPSTART session can be used. • Can be used in 07.10 multiplexer. • If the session is successfully connected by +KTCP CNX, 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.
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12.10.12. +KTCP_ACK Notification: Status Report for Latest TCP Data

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<i>Unsolicited Notification</i>	<u>Response</u> +KTCP_ACK: <session_id>,<result> <CR><LF> <u>Parameters</u> <table border="0"> <tr> <td><session_id></td> <td></td> <td>TCP session index</td> </tr> <tr> <td><result></td> <td>0</td> <td>Data sent failure: not all data has been received by remote side</td> </tr> <tr> <td></td> <td>1</td> <td>Data sent success: all the data has already been received by the remote side</td> </tr> </table>	<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
<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								
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> • This URC is enabled or disabled by parameter <URC-ENDTCP-enable> of command +KTCP CFG. The URC is disabled by default. • See section 18.5.6 Use Cases for AT+KTCPACKINFO and <URC-ENDTCP-enable> Option. 									

12.10.13. +KTCPACKINFO Command: Poll ACK Status for the Latest Data

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<i>Test command</i> <u>Syntax</u> AT+KTCPACKINFO=?	<u>Response</u> OK
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HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 or +CME ERROR: <err> <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; or no data transfer has happened yet 2 The status is unknown yet
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> 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, +KTCPPACKINFO returns 1.

12.11. UDP Specific Commands

12.11.1. +KUDPCFG Command: UDP Connection Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+KUDPCFG=?	<u>Response</u> For HL7618, HL7648, HL7650, HL7688, HL7690 and HL7692: +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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	For HL7618RD: +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),<udp_filter> OK
<i>Read command</i> <u>Syntax</u> AT+KUDPCFG?	<u>Response</u> For HL7618, HL7648, HL7650, HL7688, HL7690 and HL7692: +KUDPCFG: <session_id>,<cnx cnf>,<mode>,<port>,<data_mode>,<udp remote address>,<udp_port>,<af> [...] OK For HL7618RD: +KUDPCFG: <session_id>,<cnx cnf>,<mode>,<port>,<data_mode>,<udp remote address>,<udp_port>,<af>,<udp_filter> [...] OK
<i>Write command</i> <u>Syntax</u> For HL7618, HL7648, HL7650, HL7688, HL7690 and HL7692: AT+KUDPCFG= [<cnx cnf>], <mode>[,<port>] [,<data_mode>], [<udp remote address>] , <udp_port>,<af>] For HL7618RD: AT+KUDPCFG= [<cnx cnf>], <mode>[,<port>] [,<data_mode>], [<udp remote address>] , <udp_port>,<af>,<udp_filter>]	<u>Response</u> +KUDPCFG: <session_id> OK or +CME ERROR: <err> +KUDP_NOTIF: <session_id>, <udp_notif> <u>Parameters</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). <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 for more or less characters 9 Bad session ID 10 Session is already running 11 All sessions are used <data_mode> 0 Do not display <data> in URC (Default setting) 1 Display <data> in URC

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><udp remote address> IP address string or explicit name of the remote host, Default is empty (given by +KUDPSND).</p> <p><udp_port> <u>0</u> – 65535 UDP peer port; given by +KUDPSND</p> <p><af> Address family used for the connection. <u>0</u> IPV4 1 IPV6</p> <p><udp_filter> IP filter for downlink UDP; data is filtered out by IP filter settings and can support both normal IP address and CIDR notation which can be used for representing subnet mask. For example, "10.10.10.10/32" and "fcb1:cafe::1/128" can either be used depending on the value of <af>. Default value = "0.0.0.0/0" when <af>=0, and "::/0" when <af>=1. This parameter is only available on the HL7618RD</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> 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 to start the connection properly.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KUDPRCV=?</p>	<p><u>Response</u> +KUDPRCV: (list of possible <session_id>s),(list of possible <ndata>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KUDPRCV= <session_id>, <ndata></p>	<p><u>Response</u> CONNECT ...<EOF pattern> OK +KUDP_RCV: <session_id>,<udp remote address>,<udp remote port>,<ndata available></p> <p>or</p> <p>NO CARRIER +CME ERROR: <err> +KUDP_NOTIF: <session_id>, <udp_notif> +KUDP_DATA_MISSED: <session_id>, <ndata missed></p> <p><u>Parameters</u> <session_id> UDP session index</p> <p><ndata> Number of bytes the device wants to receive (max value 4294967295)</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><udp remote address> IP address string of the remote host</p> <p><udp remote port> 0 – 65535 Remote UDP port</p> <p><ndata available> Number of bytes to be read in first received packet</p> <p><udp_notif> See command AT+KUDPCFG</p> <p><ndata missed> Number of bytes left in the UDP socket</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KUDPSND=?</p>	<p><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</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KUDPSND= <session_id>, <udp remote address>, <udp_port>, <ndata></p>	<p><u>Response</u> CONNECT OK</p> <p>or NO CARRIER +CME ERROR: <err> +KUDP_NOTIF: <session_id>,<udp_notif></p> <p><u>Parameters</u> <session_id> UDP session index</p> <p><udp remote address> IP address string or explicit name of the remote host</p> <p><udp_port> 1 – 65535 UDP peer port</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><ndata> Number of bytes (max value 4294967295)</p> <p><udp_notif> See command AT+KUDPCFG</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • All data will be sent out ignoring <ndata>. If data sent is not equal to <ndata> then +KUDP_NOTIF will be displayed. • <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 value for both parameters is 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.

12.11.4. +KUDPCLOSE Command: Close Current UDP Operation

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+KUDPCLOSE =?</p>	<p><u>Response</u> +KUDPCLOSE: (list of possible <session_id>s),(list of possible <keep_cfg>s) OK</p>
<p><i>Write command</i></p>	
<p><u>Syntax</u> AT+KUDPCLOSE =<session_id> [,<keep_cfg>]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>+KUDP_NOTIF: <session_id>, <udp_notif></p> <p><u>Parameters</u> <session_id> UDP session index</p> <p><udp_notif> See command AT+KUDPCFG</p> <p><keep_cfg> Specifies whether to delete the session configuration after closing it or not</p> <p><u>0</u> Delete the session configuration <u>1</u> Keep the session configuration</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> This function closes the UDP session. If there is no other session running, the PDP context will be released. This function will delete the session configuration if <keep_cfg> = 0. CID=1 is used for IMS/LTE registration and must be kept activated when RAT is LTE.
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12.11.5. +KUDPDEL Command: Delete a Configured UDP Session

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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 or +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.

12.11.6. +KUDP_IND Notification: UDP Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Unsolicited Notification</i>	<p><u>Response</u> +KUDP_DATA: <session_id>,<ndata available>[,<udp remote address>,<udp remote port>,<data>]</p> <p><u>Parameters</u> <session_id> UDP session index</p> <p><ndata available> Number of bytes to be read</p> <p><udp remote address> IP address string of the remote host</p> <p><udp remote port> 0 – 65535 Remote UDP port</p> <p><data> Data in octet. The length of data is specified by <ndata_available>.</p>
<u>Reference</u> Sierra Wireless Proprietary	<p><u>Notes</u></p> <ul style="list-style-type: none"> 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.

12.12. FTP Client Specific Commands

12.12.1. +KFTPCFG Command: FTP Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+KFTPCFG=?	<p><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)</p> <p>OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KFTPCFG?</p>	<p><u>Response</u> +KFTPCFG: <session_id>,<cnx cnf>,<server_name>,<login>,<password>,<port_number>,<mode>,<started>,<af></p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KFTPCFG= [<cnx cnf>], <server_name> [,<login> [,<password> [,<port_number> [,<mode>] [,<start>] [,<af>]]]]</p>	<p><u>Response</u> +KFTPCFG:<session_id> OK</p> <p>or +KFTP_ERROR: <session_id>,<ftp cause></p> <p><u>Parameters</u></p> <p><cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration</p> <p><session_id> FTP session index</p> <p><server_name> IP address string of the ftp server or domain name of the server</p> <p><login> String type, indicates the user name to be used during the FTP connection</p> <p><password> String type, indicates the password to be used during the FTP connection</p> <p><port_number> 1 – 65535 Indicates the remote command port (<u>21</u> by default)</p> <p><mode> Indicates the initiator of the FTP connection 0 Active. The server is initiator of the FTP data connection <u>1</u> 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</p> <p><start> Specifies whether to start the FTP connection immediately. 0 Start the FTP connection later by +KFTPCNX <u>1</u> Start the FTP connection immediately</p> <p><started> Specifies whether to the FTP connection is started 0 FTP connection is not started yet 1 FTP connection is started</p> <p><af> Address family used for the connection. <u>0</u> IPV4 1 IPV6</p> <p><ftp_cause> Integer type that indicates the cause of the FTP connection failure. 0 The 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 code from the FTP server. See section 18.2.5 FTP Reply Codes</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> The write command sets the server name, login, password, port number and mode for FTP operations. This command (with <start> = 0) can be used before setting up +KCNXCFG. Note however that the latter is required to start the connection properly. The result of the FTP connection is notified using unsolicited response.
<u>Example</u>	AT+KFTPCFG=1,"ftp.connect.com","username","password",21,0

12.12.2. +KFTPCNX Command: Start FTP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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 or NO CARRIER +CME ERROR: <err> +KFTP_ERROR: <session_id>,<ftp cause> <u>Parameters</u> <session_id> FTP session index <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 code from the FTP server. See section 18.2.5 FTP Reply Codes
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> This command is used to start the FTP connection created by +KFTPCFG with <start>=0. +KFTPCNV, +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.

12.12.3. +KFTPRCV Command: Receive FTP Files

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KFTPRCV=?</p>	<p><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</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KFTPRCV= <session_id>, [<local_uri>, [<server_path>, <file_name> [,<type_of_file> [,<offset>]]</p>	<p><u>Response</u> CONNECT <EOF_pattern> OK</p> <p>or</p> <p>+CME ERROR<err> NO CARRIER +KFTP_ERROR: <session_id>,<ftp cause></p> <p><u>Parameters</u> <session_id> FTP session index</p> <p><local_uri> This argument must be empty. It is reserved for compatibility of command syntax.</p> <p><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</p> <p><file_name> string type. Indicates the name of the file to download</p> <p><type_of_file> Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 Binary (default value) 1 ASCII</p> <p><offset> 0 – 4294967295 Integer type indicating the offset to “resume transfer”. See section 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.</p> <p><EOF_pattern> End of file notification. See +KPATTERN for value</p> <p><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 code from the FTP server. See section 18.2.5 FTP Reply Codes</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

Reference	Notes
Sierra Wireless Proprietary	<ul style="list-style-type: none"> An FTP connection must have been achieved using AT+KFTPCFG before using this command. The user will receive the entire data stream after sending the +KFTPCV command. 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 section 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 should 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, the 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.

12.12.4. +KFTPSND Command: Send FTP Files**HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692**

Test command	Response
<u>Syntax</u> AT+KFTPSND=?	+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
<u>Write command</u> <u>Syntax</u> AT+KFTPSND= <session_id>, [<local_uri>, [<server_path>], <file_name> [,<type of file>] [,<append>]	<u>Response</u> CONNECT OK or +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 <u>0</u> Binary <u>1</u> ASCII

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><append> Numeric type. Indicates using "append" or not when uploading.</p> <p><u>0</u> Do not use "append". If the file already exists then the file will be overridden</p> <p>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</p> <p><EOF pattern> End of file notification. See +KPATTERN for values</p> <p><ftp_cause> Integer type that indicates the cause of the FTP connection failure.</p> <p>0 Sending or the retrieving was impossible due to request timeout</p> <p>1 Impossible to connect to the server due to DNS resolution failure</p> <p>2 Impossible to download a file due to connection troubles.</p> <p>3 Download was impossible due to connection timeout</p> <p>4 No network available</p> <p>5 Flash access trouble</p> <p>6 Flash memory full</p> <p>7 Network error</p> <p>XXX Three-digit reply codes from the FTP server. See section 18.2.5 FTP Reply Codes</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • An FTP connection must have been achieved using AT+KFTPCFG before using this command. • 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.

12.12.5. +KFTPDEL Command: Delete FTP Files

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KFTPDEL=?</p>	<p><u>Response</u> +KFTPDEL: (list of possible <session_id>s),<server_path>,<file_name>,(list of possible <type>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KFTPDEL= <session_id>, [<server_path>], <file_name> [,<type>]</p>	<p><u>Response</u> OK</p> <p>or</p> <p>+CME ERROR <err> NO CARRIER +KFTP_ERROR: <session_id>,<ftp cause></p> <p><u>Parameters</u> <session_id> FTP session index</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><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</p> <p><file_name> String type. Indicates the name of the file to delete</p> <p><type> Numeric type. Indicates the type of file (ASCII or binary) to transfer</p> <p>0 Binary 1 ASCII</p> <p><ftp_cause> Integer type that indicates the cause of the FTP connection failure</p> <p>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</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> An FTP connection must have been achieved using AT+KFTPCFG before using this command. The result of the delete operation is notified using unsolicited response.

12.12.6. +KFTP_IND Notification: FTP Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Unsolicited Notification</i></p>	<p><u>Response</u> +KFTP_IND: <session_id>,<status>[,<data_len>]</p> <p><u>Parameters</u></p> <p><session_id> FTP session index</p> <p><status> FTP session status</p> <p>1 Session is set up and ready for operation 2 The last FTP command is executed successfully</p> <p><data_len> Byte length of data downloaded/uploaded to/from the terminal (+KFTPCV/+KFTPSND)</p>
<p><u>Reference</u></p>	<p>Sierra Wireless Proprietary</p>

12.12.7. +KFTPCLOSE Command: Close Current FTP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KFTPCLOSE=?</p>	<p><u>Response</u> +KFTPCLOSE: (list of possible <session_id>s),(list of possible <keep_cfg>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KFTPCLOSE=<session_id>[,<keep_cfg>]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u> <session_id> FTP session index</p> <p><keep_cfg> Specifies whether to delete the session configuration after closing it or not 0 Delete the session configuration 1 Keep the session configuration</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u> This command will close the connection to the FTP server.</p>

12.12.8. +KFTPCFGDEL Command: Delete a Configured FTP Session

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KFTPCFGDEL=?</p>	<p><u>Response</u> +KFTPCFGDEL: (list of possible <session_id>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KFTPCFGDEL=<session_id></p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameter</u> <session_id> FTP session index</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u> The session must be closed (using +KFTPCLOSE) before using this command.</p>

12.13. HTTP Client Specific Commands

Note: All commands in this sub-section are for the HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

12.13.1. +KHTTPCFG Command: HTTP Connection Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692									
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KHTTPCFG=?</p>	<p><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</p>								
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KHTTPCFG?</p>	<p><u>Response</u> +KHTTPCFG: <session_id>,<cnx_cnf>,<http_server>,<http_port>,<http_version>,<login>,<password>,<started>,<af>,<cipher_index> OK</p>								
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KHTTPCFG= [<cnx_cnf>], <http_server> [,<http_port> [,<http_version> [,<login> [,<password>] [,<start>] [,<af>]]] [,<cipher_index>]]</p>	<p><u>Response</u> +KHTTPCFG: <session_id> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u> <cnx_cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see KCNXCFCG)</p> <p><session_id> HTTP session index</p> <p><http_server> IP address string or explicit name of the remote server</p> <p><http_port> Numeric parameter (1-65535), 80 by default</p> <p><http_version></p> <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> <p><login> String type, indicates the user name to be used during the HTTP connection</p> <p><password> String type, indicates the password to be used during the HTTP connection</p>	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	HTTP 1.1(by default)								
1	HTTP 1.0								
2	HTTP 1.1 over TLS (HTTPS)								
3	HTTP 1.0 over TLS (HTTPS)								

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<p><start> Specifies whether to start the HTTP connection immediately or not</p> <p>0 Start the HTTP connection later using +KHTTPCNX</p> <p>1 Start the HTTP connection immediately</p> <p><started> Specifies whether the HTTP connection has been started</p> <p>0 The HTTP connection has not been started yet</p> <p>1 The HTTP connection has already been started</p> <p><af> Address family used for the connection. Default is IPV4.</p> <p>0 IPV4</p> <p>1 IPV6</p> <p><cipher_index> Cipher suite profile index to use for a secured socket; defined by +KSSLCRYPTO</p>
<p><u>Reference</u></p> <p>Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • <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]

12.13.2. +KHTTPCNX Command: Start the HTTP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u></p> <p>AT+KHTTPCNX=?</p>	<p><u>Response</u></p> <p>+KHTTPCNX: (list of possible <session_id>s)</p> <p>OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u></p> <p>AT+KHTTPCNX=<session_id></p>	<p><u>Response</u></p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p>+KHTTP_ERROR: <session_id>, <http_notif></p> <p><u>Parameters</u></p> <p><session_id> HTTP session index</p> <p><http_notif> Integer type. Indicates the cause of the HTTP connection failure</p> <p>4 DNS error</p> <p>5 HTTP connection error due to internal trouble</p>

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	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> <ul style="list-style-type: none"> 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.

12.13.3. +KHTTPHEADER Command: Set the HTTP Request Header

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<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 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> <ul style="list-style-type: none"> 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. +KHTTPGET Command: Get HTTP Server Information

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KHTTPGET=?</p>	<p><u>Response</u> +KHTTPGET: (list of possible <session_id>s),<request_uri >,(list of possible <show_resp>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KHTTPGET=<session_id>,<request_uri> [<show_resp>]</p>	<p><u>Response</u> CONNECT ...<EOF pattern> OK</p> <p>or</p> <p>NO CARRIER +CME ERROR: <err> +KHTTP_ERROR: <session_id>, <http_notif></p> <p><u>Parameters</u></p> <p><session_id> HTTP session index</p> <p><request_uri> string type, indicates the information url to get during the HTTP connection</p> <p><http_notif> Integer type. Indicates the cause of the HTTP connection failure</p> <p>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</p> <p><show_resp> Whether to show HTTP response and HTTP headers</p> <p>0 Do not show response and headers 1 Show response and headers (default)</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • <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.

12.13.5. +KHTTPHEAD Command: Get HTTP Headers

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KHTTPHEAD =?</p>	<p><u>Response</u> +KHTTPHEAD: (list of possible <session_id>s),<request_uri> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KHTTPHEAD =<session_id>,<request_uri></p>	<p><u>Response</u> CONNECT ...<EOF pattern> OK</p> <p>or</p> <p>NO CARRIER +CME ERROR: <err> +KHTTP_ERROR: <session_id>, <http_notif></p> <p><u>Parameters</u></p> <p><session_id> HTTP session index</p> <p><request_uri> String type, indicates the information URL to get during HTTP connection</p> <p><http_notif> Integer type. Indicates the cause of the HTTP connection failure</p> <p>4 DNS error</p> <p>5 HTTP connection error due to internal trouble</p> <p>6 HTTP connection timeout</p> <p>9 Triple plus (+++) error (switch to command mode)</p> <p>10 HTTP has no data</p> <p>11 HTTP has partial data</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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

12.13.6. +KHTTPPOST Command: Perform HTTP Post

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KHTTPPOST =?</p>	<p><u>Response</u> +KHTTPPOST: (list of possible <session_id>s),<local_uri>,<request_uri>,(list of possible <show_resp>s) OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KHTTPPOST = <session_id>,<local_uri>,<request_uri> [<show_resp>]</p>	<p><u>Response</u> CONNECT ...<EOF pattern> OK</p> <p>or</p> <p>NO CARRIER +CME ERROR: <err> +KHTTP_ERROR: <session_id>, <http_notif></p> <p><u>Parameters</u></p> <p><session_id> HTTP session index</p> <p><local_uri> This argument must be empty. It is reserved for compatibility of command syntax.</p> <p><request_uri> String type, the request data of the HTTP connection</p> <p><http_notif> Integer type. Indicates the cause of the HTTP connection failure</p> <p>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</p> <p><show_resp> Whether to show HTTP response and HTTP headers</p> <p>0 Do not show HTTP response and headers <u>1</u> Show HTTP response and headers (default)</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • <session_id> is always 0. • 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. +KHTTPCLOSE Command: Close an HTTP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KHTTPCLOSE=?</p>	<p><u>Response</u> +KHTTPCLOSE: (list of possible <session_id>s), (list of possible <keep_cfg>s) OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<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

12.13.8. +KHTTPDEL Command: Delete a Configured HTTP Session

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<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>	<u>Notes</u>
Sierra Wireless Proprietary	The HTTP session must be closed (using +KHTTPCLOSE) before using this command.

12.13.9. +KHTTP_IND Notification: HTTP Status

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<i>Unsolicited Notification</i>	<u>Response</u> +KHTTP_IND: <session_id>,<status>[,<data_len>,<st_code>,<st_reason>]

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<p><u>Parameters</u></p> <p><session_id> HTTP session index</p> <p><status> HTTP session status</p> <p>1 Session is set up and ready for operation</p> <p>3 The last HTTP command is executed successfully</p> <p><data_len> Byte length of data downloaded/uploaded to/from the terminal (using +KHTTPHEAD, +KHTTPGET, or +KHTTPPOST)</p> <p><st_code> HTTP response status code</p> <p><st_reason> HTTP response status reason string</p>
<u>Reference</u>	Sierra Wireless Proprietary

12.14. HTTPS Client Specific Commands

Note: All commands in this sub-section are for the HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

12.14.1. +KHTTPSCFG Command: HTTPS Connection Configuration

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KHTTPSCFG =?</p>	<p><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</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KHTTPSCFG ?</p>	<p><u>Response</u> +KHTTPSCFG: <session_id>,<cnx_cnf>,<http_server>,<https_port>,<http_version>,<cipher suite>,<sec_level>,<login>,<password>,<started>,<af> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KHTTPSCFG =[<cnx_cnf>],<http_server>[,<https_port>[,<http_version>[,<cipher_suite>[,<sec_level>[,<login>[,<password>]]]]]</p>	<p><u>Response</u> +KHTTPSCFG: <session_id> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u></p>

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p>[,<start>] [,<af>]]]]]]</p>	<p><cnx cnf> 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see +KCNXCFG).</p> <p><session_id> HTTPS session index</p> <p><http_server> IP address string or explicit name of the remote server</p> <p><https_port> Numeric parameter (1-65535), <u>443</u> by default.</p> <p><http_version> <u>0</u> HTTP 1.1 1 HTTP 1.0</p> <p><cipher_suite></p> <p><u>0</u> TLS_RSA_CHOOSE_BY_SERVER</p> <p>1 TLS_RSA_WITH_RC4_128_MD5</p> <p>2 TLS_RSA_WITH_RC4_128_SHA</p> <p>3 TLS_RSA_WITH_DES_CBC_SHA (not supported)</p> <p>4 TLS_RSA_WITH_3DES_EDE_CBC_SHA (not supported)</p> <p>5 TLS_RSA_EXPORT1024_WITH_DES_CBC_SHA (not supported)</p> <p>6 TLS_RSA_WITH_AES_128_CBC_SHA</p> <p>7 TLS_RSA_WITH_AES_256_CBC_SHA</p> <p>8 TLS_RSA_WITH_AES_128_GCM_SHA256</p> <p><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)</p> <p><login> String type, indicates the username to be used during the HTTPS connection.</p> <p><password> String type, indicates the password to be used during the HTTPS connection.</p> <p><start> Specifies whether to start the HTTPS connection immediately or not</p> <p><u>0</u> Start the HTTPS connection later using +KTTSCNX</p> <p><u>1</u> Start the HTTPS connection immediately</p> <p><started> Specifies whether the HTTPS connection has been started</p> <p><u>0</u> The HTTPS connection has not been started yet</p> <p><u>1</u> The HTTPS connection has already been started</p> <p><af> Address family used for the connection</p> <p><u>0</u> IPV4</p> <p><u>1</u> IPV6</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • <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.

HL7618RD, HL7648, HL7650, HL7690 and HL7692

- 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.

12.14.2. +KHTTPSCNX Command: Start HTTPS Connection**HL7618RD, HL7648, HL7650, HL7690 and HL7692**

<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 HTTP connection error due to internal trouble 6 HTTP connection timeout 7 Flash access trouble 8 Flash memory full 9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP has partial data 12 SSL connection error 13 SSL initialization error
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> • 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.

12.14.3. +KHTTPSHEADER Command: Set the HTTPS Request Header

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KHTTPSHEADER=?</p>	<p><u>Response</u> +KHTTPSHEADER: (list of possible <session_id>s), <local_uri> OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KHTTPSHEADER?</p>	<p><u>Response</u> +KHTTPSHEADER: <session_id>,<count> [...]</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KHTTPSHEADER=<session_id>[,<local_uri>]</p>	<p><u>Response</u> OK or +CME ERROR: <err></p> <p><u>Parameters</u> <session_id> HTTPS session index</p> <p><local_uri> This argument must be empty. It is reserved for compatibility of command syntax.</p> <p><count> HTTPS header count</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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.

12.14.4. +KHTTPSGET Command: Get Information from HTTPS Server

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KHTTPSGET=?</p>	<p><u>Response</u> +KHTTPSGET: (list of possible <session_id>s),<request_uri>,(list of possible <show_resp>s) OK</p>

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<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 HTTP connection error due to internal trouble 6 HTTP connection timeout 7 Flash access trouble 8 Flash memory full 9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP 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> <ul style="list-style-type: none"> 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.

12.14.5. +KHTTPSHEAD Command: Retrieve HTTP Headers

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+ KHTTPSHEAD=?	<u>Response</u> +KHTTPSHEAD: (list of possible <session_id>s),<request_uri> OK

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KHTTPSHEAD= <session_id>, <request_uri></p>	<p><u>Response</u> CONNECT ...<EOF pattern> OK</p> <p>or</p> <p>NO CARRIER +CME ERROR: <err> +KHTTPS_ERROR: <session_id>, <http_notif></p> <p><u>Parameters</u> <session_id> HTTPS session index</p> <p><request_uri> String type, indicates the information URL to get during HTTPS connection</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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.

12.14.6. +KHTTPSPOST Command: Send Data to HTTPS Server

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KHTTPSPOST=?</p>	<p><u>Response</u> +KHTTPSPOST: (list of possible <session_id>s),<local_uri>,<request_uri>,(list of possible <show_resp>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KHTTPSPOST= <session_id>, <local_uri>, <request_uri> [,<show_resp>]</p>	<p><u>Response</u> CONNECT ...<EOF pattern> OK</p> <p>or</p> <p>NO CARRIER +CME ERROR: <err> +KHTTPS_ERROR: <session_id>, <http_notif></p> <p><u>Parameters</u> <session_id> HTTPS session index</p> <p><local_uri> This argument must be empty. It is reserved for compatibility of command syntax.</p>

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<p><request_uri> String type, indicates the request data of the HTTPS connection</p> <p><http_notif> Integer type. Indicates the cause of the HTTPS connection failure</p> <p>4 DNS error</p> <p>5 HTTP connection error due to internal trouble</p> <p>6 HTTP connection timeout</p> <p>7 Flash access trouble</p> <p>8 Flash memory full</p> <p>9 Triple plus (+++) error (switch to command mode)</p> <p>10 HTTP has no data</p> <p>11 HTTP has partial data</p> <p>12 SSL connection error</p> <p>13 SSL initialization error</p> <p><show_resp> Defines whether HTTPS response and HTTPS headers are shown</p> <p>0 Do not show HTTPS response and headers</p> <p>1 Show HTTPS response and headers</p>
<p><u>Reference</u></p> <p>Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> 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.

12.14.7. +KHTTPSCLOSE Command: Close an HTTPS Connection

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u></p> <p>AT+ KHTTPSCLOSE =?</p>	<p><u>Response</u></p> <p>+KHTTPSCLOSE: (list of possible <session_id>s), (list of possible <keep_cfg>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u></p> <p>AT+ KHTTPSCLOSE= <session_id> [,<keep_cfg>]</p>	<p><u>Response</u></p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u></p> <p><session_id> HTTPS session index</p> <p><keep_cfg> Specified whether to delete the session configuration after closing it</p> <p>0 Delete the session configuration</p> <p>1 Keep the session configuration</p>

HL7618RD, HL7648, HL7650, HL7690 and HL7692

Reference
Sierra Wireless
Proprietary

12.14.8. +KHTTSPDEL Command: Close an HTTPS Connection

HL7618RD, HL7648, HL7650, HL7690 and HL7692

Test command

Syntax

**AT+KHTTSPDEL
=?**

Response

**+KHTTSPDEL: (list of possible <session_id>s)
OK**

Write command

Syntax

**AT+KHTTSPDEL
=<session_id>**

Response

OK

or
+CME ERROR: <err>

Parameter

<session_id> HTTPS session index

Reference

Sierra Wireless
Proprietary

Notes

The session must be closed (using +KHTTSPCLOSE) before using this command.

12.14.9. +KHTTSP_IND Notification: HTTPS Status

HL7618RD, HL7648, HL7650, HL7690 and HL7692

*Unsolicited
Notification*

Response

+KHTTSP_IND: <session_id>,<status>[,<data_len>]

Parameters

<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 +KHTTSPHEAD, +KHTTSPGET, or +KHTTSPPOST)

Reference

Sierra Wireless Proprietary

12.15. SSL Certificate Manager

Note: All commands in this sub-section are for the HL7648, HL7650, HL7690 and HL7692 only.

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

HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KCERTSTORE=?</p>	<p><u>Response</u> +KCERTSTORE: (list of possible <data_type>s),(range of possible lengths of <NbData>), (list of possible <index>es) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+KCERTSTORE?</p>	<p><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</p> <p>or +CME ERROR: <err></p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KCERTSTORE= <data_type> [,<NbData> [,<index>]]</p>	<p><u>Response</u> CONNECT OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameters</u> <data_type> 0 Root certificate 1 Local certificate</p> <p><NbData> Number of bytes to read/write. Value range: 1-3000.</p> <p><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</p> <p><File_data> File data in bytes</p>

HL7648, HL7650, HL7690 and HL7692	
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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.

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

HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p>	
<p><u>Syntax</u> AT+KPRIVKSTORE=?</p>	<p><u>Response</u> +KPRIVKSTORE: (list of possible <index>s),(range of possible lengths of <NbData>) OK</p>
<p><i>Read command</i></p>	
<p><u>Syntax</u> AT+KPRIVKSTORE?</p>	<p><u>Response</u> +KPRIVKSTORE private_key,<index>,<NbData><CR><LF> <File_data> <CR><LF> OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p><i>Write command</i></p>	
<p><u>Syntax</u> AT+KPRIVKSTORE= <index> [,<NbData>]</p>	<p><u>Response</u> CONNECT OK</p> <p>or</p> <p>+CME ERROR: <err></p> <p><u>Parameters</u></p> <p><index> Index of the stored local certificate associated to this private key. Value range: 0 – 2</p> <p><NbData> Number of bytes to read/write (mandatory for both reading and writing). Value range: 1-3000.</p> <p><File_data> File data in bytes</p>

HL7648, HL7650, HL7690 and HL7692	
<u>Reference</u> Sierra Wireless Proprietary	<u>Notes</u> <ul style="list-style-type: none"> 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.

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

HL7648, HL7650, HL7690 and HL7692	
<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 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

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

HL7648, HL7650, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+KPRIVKDELETE=?</p>	<p><u>Response</u> +KPRIVKDELETE: (list of possible <index>es) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+KPRIVKDELETE=<index></p>	<p><u>Response</u> OK</p> <p>or +CME ERROR: <err></p> <p><u>Parameter</u> <index> Stored private key index. Value range: 0 – 2</p>
<u>Reference</u>	Sierra Wireless Proprietary

>> 13. AVMS Commands

13.1. +WDSC Command: Device Services Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+WDSC=?</p>	<p><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</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+WDSC?</p>	<p><u>Response</u> +WDSC: 0,<State> +WDSC: 1,<State> +WDSC: 2,<State> +WDSC: 3,<State> +WDSC: 4,<Timer_1>[[,<Timer_2>]...[,<Timer_n]] OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> For <Mode>= 0, 1, 2 or 3 AT+WDSC=<Mode>,<State></p> <p>For <Mode>= 4 AT+WDSC=<Mode>,<timer_1>[[,<Timer_2>]...[,<Timer_n>]]</p>	<p><u>Response</u> OK</p> <p>or +CME ERROR <err></p> <p><u>Parameters</u> <Mode> Integer type</p> <p>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 AirPrime Management Services server</p> <p>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</p> <p>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</p> <p>3 Polling mode The embedded module will initiate a connection to the Device Services server according to the defined timer</p> <p>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.</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><State> Integer type; mode status For <Mode> = 0, 1 or 2 0 Disabled (default value) 1 Enabled For <Mode> = 3 Value in range 0 – 525600 (units = min) 0 The polling mode is deactivated</p> <p><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 15 Default value</p> <p><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</p>
<u>Notes</u>	<ul style="list-style-type: none"> • 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>	<p>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</p> <p>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</p> <p>AT+WDSC=0,1 OK</p> <p>AT+WDSC? +WDSC: 0,1 +WDSC: 1,0 +WDSC: 2,0 +WDSC: 3,0 +WDSC: 4,15,60,240,960,2880,10080,10080 OK</p>

13.2. +WSDS Command: Device Services Local Download

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+WSDS=?</p>	<p><u>Response</u> +WSDS: (list of supported <Size>s) OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+WSDS= <Size></p>	<p><u>Response</u> <NACK> <i>// User sends data</i> OK</p> <p>or</p> <p>+CME ERROR <err></p> <p><u>Parameter</u> <Size> 1 – 24643584 Package size in bytes</p>
<p><u>Examples</u></p>	<p>AT+WSDS=? +WSDS: (1-24643584) OK</p> <p>AT+WSDS=1024 <i>//download a 1kBytes package</i> <NACK> <i>//the device is ready to receive data</i> <i>//Send data</i></p> <p>OK <i>//All data are well received by the module</i> +WDSI: 3 <i>//A package is ready to install (see +WDSI and +WDSR</i> <i>//commands)</i></p>
<p><u>Reference</u> Sierra Wireless Proprietary Command</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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 must 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.

13.3. +WDSE Command: Device Services Error

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Execute command</i>	
<u>Syntax</u> AT+WDSE	<u>Response</u> [+WDSE:<HTTP_Status>] OK or +CME ERROR <err> <u>Parameter</u> <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 time-out 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	505 HTTP version not supported If no session was made with the server, AT+WDSE only returns OK , without +WDSE: <HTTP_Status> intermediary response.
<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+WDSS=1,1 //A session was made with the server OK AT+WDSE +WDSE: 200 //The last HTTP response received is "OK" OK

13.4. +WDSF Command: Device Services Fallback

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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).

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Examples</u>	<p>AT+WDSF? //a reverse package is present, deletion impossible</p> <p>+WDSF: 1,1</p> <p>+WDSF: 2,0</p> <p>OK</p> <p>AT+WDSF=1 //downgrade to the previous installation</p> <p>OK</p> <p>+WDSI: 17,1 //downgrade the package successfully done, displayed only if //+WDSI indication is activated</p>

13.5. +WDSG Command: Device Services General Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+WDSG=?	<u>Response</u> OK
<i>Execute command</i>	
<u>Syntax</u> AT+WDSG	<p><u>Response</u></p> <p>+WDSG: <Indication>,<State> [+WDSG: <Indication>,<State>[...]]</p> <p>OK</p> <p>or</p> <p>+CME ERROR <err></p> <p><u>Parameters</u></p> <p><Indication> Integer type</p> <p>0 Device services activation state</p> <p>1 Session and package indication</p> <p><State> Status of indication</p> <p>For <Indication>=0</p> <p>0 Device services are prohibited. Devices services will never be activated.</p> <p>1 Device services are deactivated. Connection parameters to a device services have to be provisioned.</p> <p>2 Device services must be provisioned. NAP parameters must be provisioned.</p> <p>3 Device services are activated.</p> <p>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.</p> <p>For <Indication>=1</p> <p>0 No session or package</p> <p>1 A session is under treatment</p> <p>2 A package is available on the server.</p> <p>3 A package was downloaded and ready to install</p> <p>When a package was installed or a recovery was made, <State> is set to 0.</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Notes</u>	This command is available when the embedded module has finished the Device Services initialization (see +WDSI).
<u>Examples</u>	<p>AT+WDSG=? OK</p> <p>AT+WDSG +WDSG: 0,3 //Device services are activated, +WDSG: 1,0 //No session to the server, no patch to download or to install OK</p>

13.6. +WDSI Command: Device Services Indication

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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>	<p><u>Response</u> OK</p> <p>or +CME ERROR <err></p> <p><u>Parameters</u> <Level> Indication level, bit field (default value = 0) Bit set to 0 Indication deactivated Bit set to 1 Indication activated</p> <ul style="list-style-type: none"> 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 and13) 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

- | | | |
|----------------------|----|--|
| <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 AirPrime Management Services server |
| | 13 | Downloaded package is not certified to be sent by the AirPrime 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 AirPrime 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

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	<p>For<Event>=17, <Data> indicates if the fallback was asked by the user or applied because a recovery was necessary</p> <p>0 Automatic recovery (a recovery mechanism was made)</p> <p>1 Fallback asked by the user (see +WDSF for more information)</p> <p>For<Event>=18, <Data> indicates the download progress in percentage</p> <p>For<Event>=21, <Data> indicates the provisioned parameters</p> <p>0 Reserved</p> <p>1 Reserved</p> <p>2 Reserved</p> <p>3 Reserved</p> <p>4 Reserved</p> <p>5 Reserved</p> <p>6 Reserved</p> <p>7 Reserved</p> <p>8 Reserved</p> <p>9 Device Service polling mode (see +WDSC command for more information)</p> <p>10 Reserved</p> <p>11 Reserved</p> <p>12 Reserved</p> <p>13 Reserved</p>
<u>Unsolicited Notification</u>	<p><u>Response</u></p> <p>+WDSI: <Event>[,<Data>]</p>
<u>Notes</u>	<ul style="list-style-type: none"> • 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). • <Level> is stored in non-volatile memory. The default value can be restored using AT&F. • When the AVMS status is updated, the +WDSI unsolicited response will be displayed according to the AVMS status change at the same time. If there is a power loss when the AVMS status is updating but it was updated successfully, the +WDSI unsolicited response may be lost.
<u>Examples</u>	<p>AT+WDSI=?</p> <p>+WDSI: (0-2047)</p> <p>OK</p> <p>AT+WDSI?</p> <p>+WDSI: 0 // All indications are deactivated</p> <p>OK</p> <p>AT+WDSI=207</p> <p>OK</p> <p>+WDSI: 1 // The devices services server requests a connection to the embedded module</p> <p>AT+WDSR=1 // Accept the connection</p> <p>OK</p> <p>+WDSI: 4 // The embedded module will send the first data to the AirPrime Management Services server</p> <p>+WDSI: 6 // The authentication succeeded</p> <p>+WDSI: 8 // The session with the server is over</p> <p>+WDSI: 9,1000 // A package will be downloaded, the size is 1kbytes</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	+WDSI: 18, "1%" // 1% was downloaded
	+WDSI: 18, "100%" // The whole package was downloaded
	+WDSI: 10 // The whole package was stored in flash

13.7. +WDSR Command: Device Services Reply

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<i>Test command</i>	
<u>Syntax</u> AT+WDSR=?	<u>Response</u> +WDSR: (list of supported <Reply>s),(list of supported <Timer>s) OK
<i>Write command</i>	
<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 = 30. Value 0 indicates that the application refuses the user agreement (impossible when <Reply>=5).
<u>Notes</u>	<ul style="list-style-type: none"> 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.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Examples</u>	<p>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.</p> <p>AT+WDSR=1 OK +WDSI: 3 //A user agreement is requested to install a package</p> <p>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</p> <p>AT+WDSR=4 //The install is requested OK</p>

13.8. +WDSS Command: Device Services Session

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<u>Test command</u>	
<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
<u>Read command</u>	
<u>Syntax</u> AT+WDSS?	<u>Response</u> [+WDSS: 0,<Apn>[,<User>],<Cid>] [+WDSS: 1,<Action>] OK
<u>Write command</u>	
<u>Syntax</u> For <Mode>=0: AT+WDSS= <Mode>[,<Apn> [,<User> [,<Pwd>[,<Cid>]]]	<u>Response</u> OK or +CME ERROR <err>
For <Mode>=1 AT+WDSS= <Mode>[, <Action>	<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. For empty string, see <Cid>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><User> Login for the APN. String type, up to 30 characters</p> <p><Pwd> Password for the APN. String type, up to 30 characters</p> <p><Cid> 1 – 5 Context ID used for AVMS PDP activation</p> <p>For connection to the server: If the PDP of <Cid> has already been activated:</p> <ul style="list-style-type: none"> • when <Apn> is set as an empty string, AVMS connection will directly reuse the PDP of that <Cid>, or • when <Apn> is set as a non-empty string, it will check if <Apn> matches with +CGDCONT settings to reuse the connection <p>Otherwise, it will activate with APN <Apn>.</p> <p><Action> For <Mode>=1 only</p> <p><u>0</u> Release the current connection to the Device Services Server</p> <p>1 Establish a connection to the Device Services Server</p>
<u>Notes</u>	<ul style="list-style-type: none"> • 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+WDS? 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. • 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. • If reuse of existing activated PDP context is required for all internet connections, set the <Cid> accordingly. For example, in LTE, if the internet connection uses PDP of cid1, then <Cid> should be 1. • AT+WDS=0 will remove all stored information (<Apn>, <User>, <Pwd> and <Cid>). <Apn> will become unprovisioned, but not an empty string.
<u>Examples</u>	<p>AT+WDS? OK //No APN defined</p> <p>AT+WDS=? +WDS: 0, 50,30,30,(1-5) +WDS: 1,(0-1) OK</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

```

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 LTE with only one PDP context is allowed
at+cgdcont?
+CGDCONT: 1,"IP","broadband","10.191.8.184",0,0,0,0,0
OK

at+wdss=0,"broadband",,,1
OK

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 for reusing activated PDP
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
    
```

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<pre>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>

13.9. +WDSM Command: Manage Device Services

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+WDSM=?</p>	<p><u>Response</u> +WDSM: (list of supported <Mode>s),(list of supported <State>s) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+WDSM?</p>	<p><u>Response</u> +WDSM: 0,<State> +WDSM: 1,<State> OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+WDSM= <Mode>,<State></p>	<p><u>Response</u> OK</p> <p>or +CME ERROR <err></p> <p><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.</p> <p><State> Status of <Mode> <u>0</u> Disable (default value) 1 Enable (not supported)</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u> <State> is automatically stored in non-volatile memory. AT&F command has no impact on these values.</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

Examples

```

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+ WMTXPOWER=?</p>	<p><u>Response</u> +WMTXPOWER: (list of supported <ENABLE>s),(list of supported 2G <BAND>s),(list of supported 2G <CHANNEL>s),(list of supported 2G <POWER_LEVEL>s),(list of supported <MULTISLOT>s) +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</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+ WMTXPOWER?</p>	<p><u>Response</u> For GSM: +WMTXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>,<MULTISLOT>] OK</p> <p>For UMTS: +WMTXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>] OK</p> <p>For LTE: +WMTXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>,<BANDWIDTH>] OK</p> <p>Note that parameters <BAND>, <CHANNEL>, <POWER_LEVEL>, <MULTISLOT> and <BANDWIDTH> are only available if <ENABLE>=1.</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+ WMTXPOWER= <ENABLE>, [,<BAND>, <CHANNEL>, <POWER_ LEVEL>, [<MULTISLOT>],[<BANDWIDTH>]]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u> <ENABLE> 0 Stop the burst emission 1 Start the burst emission</p> <p><BAND> Tx burst band emission. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. For GSM: 900 GSM900 band 1800 DCS band</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

For UMTS:

- 1 Band I (2100 band)
- 2 Band II (1900 band)
- 5 Band V (850 band)
- 8 Band VIII (700 band)

For LTE:

- 2 PCS
- 3 DCS
- 4 AWS
- 5 CLR
- 8 E-GSM
- 12 Lower SMH blocks A/B/C
- 13 Upper SMH block C
- 17 Lower SMH blocks B/C
- 20 EU Digital Dividend
- 28 APT

<CHANNEL> Tx burst channel emission. This is a mandatory parameter if **<ENABLE>=1**, but is not allowed if **<ENABLE>=0**.

For GSM:

- If **<BAND>=900** 0 – 124, 975 – 1023
- If **<BAND>=1800** 512 – 885

For UMTS:

- If **<BAND>=1** 9612 – 9888
- 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
- If **<BAND>=8** 2712 – 2863

For LTE:

- If **<BAND>=2** 18600 – 19199
- If **<BAND>=3** 19200 – 19949
- If **<BAND>=4** 19950 – 20399
- If **<BAND>=5** 20400 – 20649
- If **<BAND>=8** 21450 – 21799
- If **<BAND>=12** 23010 – 23179
- If **<BAND>=13** 23180 – 23279
- If **<BAND>=17** 23730 – 23849
- If **<BAND>=20** 24150 – 24449
- If **<BAND>=28** 27210 – 27659

<POWER_LEVEL> Tx burst power. This is a mandatory parameter if **<ENABLE>=1**, but is not allowed if **<ENABLE>=0**.

Range:

- 5 (33 dBm) to 19 (5 dBm) for GSM900 bands
- 0 (30 dBm) to 15 (0 dBm) for GSM1800 bands
- 0 (0 dBm) to 384 (24 dBm) for all UMTS bands
- 0 (0 dBm) to 368 (23 dBm) for all LTE bands

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<p><MULTISLOT> Defines the slot used in Tx burst emissions. This parameter is not allowed if <ENABLE>=0 and is only applicable with GSM bands.</p> <p><u>0</u> Emit on one-time slot (GSM) 1 Emit on two-time slots (GPRS compliant) 2 Emit on three-time slots 3 Emit on four-time slots</p> <p><BANDWIDTH> Defines the bandwidth of Tx burst emissions. This parameter is not allowed if <ENABLE>=0 and is only applicable with LTE bands.</p> <p><u>0</u> 1.4MHz 1 3 MHz 2 5 MHz 3 10 MHz 4 15 MHz 5 20 MHz</p>
<p><u>Reference</u> Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • Burst must be sent on all TDMA frames. • 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.
<p><u>Examples</u></p>	<pre>// Using an HL7690 module: at+wmtxpower=? +WMTXPOWER: (0-1),(3,8,20),(19200-19949,21450-21799,24150-24449),(0-368),(0-5) OK at+wmtxpower=1,3,19575,0,3 // Tx burst is emitted at Uarfcn 19575 OK at+wmtxpower=0 OK at+wmtxpower=1,8,21799,0,3 // Tx burst is emitted at Uarfcn 21799 OK at+wmtxpower=0 OK // Using an HL7692 module: at+wmtxpower=? +WMTXPOWER: (0-1),(900,1800),(0-124,975-1023,512-885),(5-19,0-15),(0-3) +WMTXPOWER: (0-1),(3,8,20),(19200-19949,21450-21799,24150-24449),(0-368),(0-5) OK at+wmtxpower=1,900,0,19,0 // A Tx burst is emitted at Earfcn 0 OK at+wmtxpower=1,1800,512,15,0 // A Tx burst is emitted at Earfcn 512 OK // Using an HL7648 module: at+wmtxpower=? +WMTXPOWER: (0-1),(2,4,12),(18600-19199,19950-20399,23010-23179),(0-368),(0-5) OK</pre>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

```

at+wmtxpower=1,2,18600,0,0 // A Tx burst is emitted at Earfcn 18600
OK

at+wmtxpower=0
OK

// Using an HL7650 module:
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)
+WMTXPOWER: (0-1),(2,4,12,17),(18600-19199,19950-20399,23010-23179,23730-
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

```

14.2. +WMRXPOWER Command: Test RF Rx

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

<i>Test command</i>	
<u>Syntax</u> AT+ WMRXPOWER=?	<u>Response</u> +WMRXPOWER: (list of supported <ENABLE>s),(list of supported 2G <BAND>s),(list of supported 2G <CHANNEL>s) +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>,<EXP_POWER>] OK Note that parameters <BAND>, <CHANNEL> and <EXP_POWER> are only available if <ENABLE>=1. <EXP_POWER> is only applicable for GSM.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

Write command

Syntax

**AT+
WMRXPOWER=
<ENABLE>
[,<BAND>,
<CHANNEL>,
[<EXP_POWER>]
]**

Response

For GSM:
**+WMRXPOWER: <POWER1>
OK**

For UMTS and LTE:
**+WMRXPOWER: <POWER1>,<POWER2>
OK**

Parameters

<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 GSM:
900 GSM900 band
1800 DCS band

For UMTS:
1 Band I (2100 band)
2 Band II (1900 band)
5 Band V (850 band)
8 Band VIII (700 band)

For LTE:
2 PCS
3 DCS
4 AWS
5 CLR
8 E-GSM
12 Lower SMH blocks A/B/C
13 Upper SMH block C
17 Lower SMH blocks B/C
20 EU Digital Dividend
28 APT

<CHANNEL> Rx channel to read. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0.

For GSM:
If <BAND>=900 0 – 124, 975 – 1023
If <BAND>=1800 512 – 885

For UMTS:
If <BAND>=1 10562 – 10838
If <BAND>=2 9662 – 9938
If <BAND>=5 4357 – 4458
If <BAND>=8 2937 – 3088

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

```
at+wrxpower=1,4,1950 // Read Earfcn 1950
+WMRXPOWER: -95.0,-108.8 // Rx power -95.0 dBm at primary antenna
// Rx power -108.8 dBm at secondary antenna
OK

// Using an HL7650 module:
at+wrxpower=?
+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)
+WMRXPOWER: (0-1),(2,4,12,17),(600-1199,1950-2399,5010-5179,5730-5849)
OK

at+wrxpower=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+wrxpower=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
```

➤➤ | 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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+NVBU=?</p>	<p><u>Response</u> +NVBU: (0-2) OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+NVBU?</p>	<p>Returns list of NV backup with the format: +NVBU: <file id>,<backup date>,<backup firmware version></p> <p><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</p> <p><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</p>
<p><i>Write command</i></p> <p><u>Syntax</u> For <mode> = 0 or 1 AT+NVBU= <mode> [,<parti_id>]</p> <p>For <mode> = 2 AT+NVBU= <mode>[,<clear>]</p>	<p><u>Response</u> For <mode>=0 or 1 OK</p> <p>For <mode>=2 and <clear>=0 <log data 0> [<log data 1>] ... [<log data n>] OK</p> <p>For <mode>=2 and <clear>=1 OK</p> <p><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</p> <p><log data> NV backup operations log data</p> <p><parti_id> 0 Static Calibrated NV 1 Static Fixed NV partition 2 Dynamic NV partition 3 All NV partitions</p> <p><clear log> 0 Read log 1 Clear log</p>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<p><u>Reference</u></p> <p>Sierra Wireless Proprietary</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • 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. • This command can be used without a SIM. • <mode>=2 is for retrieving log for R&D analysis and not fully documented, generally: <ul style="list-style-type: none"> ▪ USER=0 for operations triggered by the firmware ▪ USER=1 for manual operations
<p><u>Example</u></p>	<pre># automatic backup files generation after FW upgrade, notified by +NVBU_IND +NVBU_IND: 0,0,"2015/11/16 04:23:33","BHL7618.3.0.154401.201511132200.x7120_2" +NVBU_IND: 0,1,"2015/11/16 04:23:33","BHL7618.3.0.154401.201511132200.x7120_2" +NVBU_IND: 0,2,"2015/11/16 04:23:33","BHL7618.3.0.154401.201511132200.x7120_2" # manual generation of backup files from existing NV partitions AT+NVBU=0,3 OK +NVBU_IND: 0,0,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2" +NVBU_IND: 0,1,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2" +NVBU_IND: 0,2,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2" # manual restore of backup files to original NV partitions AT+NVBU=1,3 OK +NVBU_IND: 1,0,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2" +NVBU_IND: 1,1,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2" +NVBU_IND: 1,2,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2" <module reboots automatically> # to retrieve the list of NV related operations done by the Firmware at+nvbu=2 [2015/11/16 04:02:49] BULO: MDM- BHL7618.3.0.154401.201511132200.x7120_2 [2015/11/16 04:02:49] BUFL: GENERATE USER=0 FILE=3 LAS=0,0,0 [2015/11/16 04:02:49] BUFM: ENCODE F=0 REF=0 CNT=15/15 41 [2015/11/16 04:02:49] BUFM: ENCODE F=1 REF=0 CNT=16/16 31 [2015/11/16 04:02:49] BUFM: ENCODE F=2 REF=42 CNT=41/41 57 [2015/11/16 04:23:39] BUFL: GENERATE USER=1 FILE=3 LAS=0,0,0 [2015/11/16 04:23:39] BUFM: ENCODE F=0 REF=0 CNT=15/15 41 [2015/11/16 04:23:39] BUFM: ENCODE F=1 REF=0 CNT=16/16 31 [2015/11/16 04:23:39] BUFM: ENCODE F=2 REF=42 CNT=41/41 57 [2015/11/16 04:23:43] BUFL: RESTORE USER=1 FILE=3 LAS=0,0,0 [2015/11/16 04:23:43] BUFM: DECODE-2 F=0 REF=1 CNT=15/15 15,41</pre>

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

[2015/11/16 04:23:43] BUFM: DECODE-2 F=1 REF=1 CNT=16/16 16,31
 [2015/11/16 04:23:43] BUFM: DECODE-2 F=2 REF=43 CNT=41/41 41,57
 OK

15.4. +NVBU_IND Notification: NV Backup Status Notification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692

*Unsolicited
Notification*

Response

+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>]]

...

Parameters

<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.

Reference

Sierra Wireless
Proprietary

Notes

The list of <NV ID> is expressed in 16 hexadecimal numbers per line.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692Examples

```
# 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,"2015/11/16
04:23:39","BHL7618.3.0.154401.201511132200.x7120_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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
<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>Parameter</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: VZW // when using a Verizon module OK
	at+wcarrier +WCARRIER: AT&T // when using a non-Verizon module OK

17. M2M Service Optimization Commands

Note: All commands in this section are for the HL7650 only.

17.1. +MSOSTATUS Command: Operating Status

HL7650	
<i>Test command</i>	
<u>Syntax</u> AT+MSOSTATUS=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+MSOSTATUS?	<u>Response</u> +MSOSTATUS: "SC","All","ACCEPT", "", "" +MSOSTATUS: "SC","LTE","ACCEPT", "", "" +MSOSTATUS: "SC","USSD","ACCEPT", "", "" +MSOSTATUS: "SC","Reset","ACCEPT", "", "" +MSOSTATUS: "SC","SMS","ACCEPT", "", "" +MSOSTATUS: "SC","PDP","RETRY", "", "" +MSOSTATUS: "RULE","RETRY","TRUE", "" +MSOSTATUS: "COND","NETEVT","TRUE","PDP", ">=",5,"COUNT:0,5,0,0,0" +MSOSTATUS: <status> OK
<i>Write command</i>	
<u>Syntax</u> AT+MSOSTATUS=<status>	<u>Response</u> OK
	<u>Parameters</u> <status> 0 MSO disabled 1 MSO enabled
<u>Notes</u>	The MSO operating status is stored in non-volatile memory.
<u>Examples</u>	AT+MSOSTATUS=0 // Disables the MSO module OK
	AT+MSOSTATUS=1 // Enables the MSO module OK

17.2. +MSORTCSTATUS Command: Display Trust RTC Status

HL7650	
<i>Test command</i>	
<u>Syntax</u> AT+MSORTCSTATUS=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+MSORTCSTATUS?	<u>Response</u> +MSORTCSTATUS: <status> OK
<i>Write command</i>	
<u>Syntax</u> AT+MSORTCSTATUS=<status>	<u>Response</u> OK <u>Parameter</u> <status> <u>0</u> MSO gets local time using RTC, and NITZ time zone if available <u>1</u> MSO gets local time from the RTC
<u>Notes</u>	<ul style="list-style-type: none"> Local time is required in MSO for ToD rules and rules with fixed window network events. If the local time is not available, then all ToD rules and rules with fixed window network events are ignored. The MSO RTC status is stored in non-volatile memory.
<u>Examples</u>	AT+MSORTCSTATUS=1 // MSO uses the RTC for local time OK AT+MSORTCSTATUS=0 // MSO uses NITZ for local time (if available) OK

17.3. +MSOPOLICY Command: Update MSO Policies

HL7650	
<i>Test command</i>	
<u>Syntax</u> AT+MSOPOLICY=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+MSOPOLICY?	<u>Response</u> +MSOPOLICY: <policy data> OK

HL7650	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+MSOPOLICY =<mode></p>	<p><u>Response</u> <policy data><CTRL-Z> OK</p> <p><u>Parameter</u> <mode> 1 Update MSO policy</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> Previously written policies to the device are erased during this operation. Policies are generated using the MSO Policy Editor Tool (MPET). Additionally, note that MSO is disabled while the policy is being updated. An MSO policy update will enable the MSO module status after the operation completes successfully; else, MSO will clear the policies on the device and disable the MSO module status. The device requires a reset after a new MSO policy is written to it. The maximum policy size is based on the maximum sizes of all the SCs, rules and schedules. The MSO policy status is stored in non-volatile memory.
<p><u>Example</u></p>	<pre> AT+MSOPOLICY=1 // MSO updates the policy and starts executing b4f1b8df0002010017020003010a010a1401141e010103010a030a1401141e010201f30 1000100012a1100010000010401c002000000000001000105000200030005000600080 009001600160022002201010000010401c001000000000001000103000200030006000 60008000902010001010401c0010000000000010001030007000700100010001600160 3010002010401c000000000000000100010400080008001a001b001d002300260026040 10001010401c0000000000000001000101001c001c05010002010401c00000000000000 1000201002700270601000402010900000401c002000000000001000101000b000b070 1000602010900000401c001000000000001000102000b000b000e000e0801000402010 a00000401c002000000000001000102000c00c000d000d0901000602010a00000401c 001000000000001000102000c00c000d000d0a01000402010b00000401c0020000000 00001000101000f000f0b01000602010b00000401c001000000000001000101000f000f 0c010007010401c00400000000000100010a00080008000a000a00150016001c001e00 2600260029002a002f002f0032003200450045005100510d010007010401c0040000000 0000100010200110011001500150e02010401c000000000000001000101002200220f0 101000104019002000000000001000201001100111001010101040190010000000000 100020100110011<CTRL-Z> OK AT+MSOPOLICY? // MSO returns the current policy data +MSOPOLICY: b4f1b8df0002010017020003010a010a1401141e010103010a030a1401141e010201f30 1000100012a1100010000010401c002000000000001000105000200030005000600080 009001600160022002201010000010401c001000000000001000103000200030006000 60008000902010001010401c0010000000000010001030007000700100010001600160 3010002010401c000000000000000100010400080008001a001b001d002300260026040 10001010401c0000000000000001000101001c001c05010002010401c00000000000000 1000201002700270601000402010900000401c002000000000001000101000b000b070 1000602010900000401c001000000000001000102000b000b000e000e0801000402010 a00000401c002000000000001000102000c00c000d000d0901000602010a00000401c 001000000000001000102000c00c000d000d0a01000402010b00000401c0020000000 00001000101000f000f0b01000602010b00000401c001000000000001000101000f000f 0c010007010401c00400000000000100010a00080008000a000a00150016001c001e00 2600260029002a002f002f0032003200450045005100510d010007010401c0040000000 0000100010200110011001500150e02010401c000000000000001000101002200220f0 101000104019002000000000001000201001100111001010101040190010000000000 100020100110011 OK </pre>

17.4. +MSORETRYINFO Command: Read Retry Information

HL7650	
<p><i>Test command</i></p> <p><u>Syntax</u> AT+MSORETRYINFO=?</p>	<p><u>Response</u> OK</p>
<p><i>Read command</i></p> <p><u>Syntax</u> AT+MSORETRYINFO?</p>	<p><u>Response</u> +MSORETRYINFO: <rule>,<cid>,<obj>,<time>,<count>,<error> <rule>,<cid>,<obj>,<time>,<count>,<error> ... OK</p>
<p><i>Write command</i></p> <p><u>Syntax</u> AT+MSORETRYINFO=<mode>,<rule>[,<cid>]</p>	<p><u>Response</u> OK</p> <p><u>Parameters</u></p> <p><mode> 0 Resets given retry schedule</p> <p><obj> 0 CREG (all) 1 GPRS Attach (all) 2 PDP Activation 3 CREG (manual) 4 CREG (auto) 5 GPRS Attach (manual) 6 GPRS Attach (auto) 7 MO-SMS 8 LTE Attach 9 Socket Connection 10 DNS Query</p>
<p><u>Notes</u></p>	<ul style="list-style-type: none"> • This command shows all the rules with objects that currently blocked due to a retry schedule. Additionally, this command can also be used to reset any outstanding MSO retry schedules. • The MSO retry schedule states are stored in non-volatile memory.
<p><u>Examples</u></p>	<p>AT+MSORETRYINFO? // MSO displays all active retry schedules 0,1,2,1,29,17 OK</p> <p>AT+MSORETRYINFO=0,0,1 // MSO uses resets given the retry schedule OK</p>

17.5. +MSOMONITOR Command: Monitoring Status Control

HL7650	
<i>Test command</i>	
<u>Syntax</u> AT+MSOMONITOR=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+MSOMONITOR?	<u>Response</u> +MSOMONITOR: <mode>,<value>,<period> OK
<i>Write command</i>	
<u>Syntax</u> AT+MSOMONITOR=<mode>[,<value>][,<period>]	<u>Response</u> OK <u>Parameters</u> <mode> 0 MSO monitoring disabled 1 MSO monitoring enabled <period> 0 Minutes 1 Hours 2 Days
<u>Notes</u>	<ul style="list-style-type: none"> The MSO monitoring period is the time period which upon expiry all monitored values are reset to zero. The MSO monitoring state is stored in non-volatile memory.
<u>Examples</u>	AT+MSOMONITOR=1,1,1 // MSO updates the current monitoring configuration OK AT+MSOMONITOR? +MSOMONITOR: 1,1,1 // MSO displays the current monitoring configuration OK

17.6. +MSOMONITORVALUE Command: Read Monitored Data

HL7650	
<i>Test command</i>	
<u>Syntax</u> AT+MSOMONITORVALUE=?	<u>Response</u> OK

HL7650	
<p><i>Write command</i></p> <p><u>Syntax</u> AT+MSO MONITORVALUE =<id>[,<cid>] [,<sc>]</p>	<p><u>Response</u> +MONITORVALUE: <value> OK</p> <p><u>Parameters</u></p> <p><id> 0 CREG request count 1 CREG success count 2 CREG error count 3 CREG blocked count 4 CREG duration (seconds) 5 GPRS attach request count 6 GPRS attach success count 7 GPRS attach error count 8 GPRS attach blocked count 9 GPRS attach duration (seconds) 10 PDP request count 11 PDP success count 12 PDP error count 13 PDP blocked count 14 PDP duration (seconds) 15 PDP status 16 MO-SMS request count 17 MO-SMS success count 18 MO-SMS error count 19 MO-SMS blocked count 20 MO-SMS bytes sent 21 Device reset count 22 Device reset time 23 Socket send request count 24 Socket send block count 25 Socket send bytes 26 Socket receive bytes 27 LTE attach request count 28 LTE attach success count 29 LTE attach error count 30 LTE attach block count 31 LTE attach duration 32 Socket connect request count 33 Socket connect success count 34 Socket connect error count 35 Socket connect block count 36 DNS query request count 37 DNS query success count 38 DNS query error count 39 DNS query block count</p> <p><cid> PDP activation ID (only applicable if the monitored value is a PDP value)</p> <p><sc> Socket data assigned user-defined service class ID (only applicable if the monitored value is a socket type)</p>
<u>Note</u>	The MSO monitored values are stored in non-volatile memory.

HL7650	
<u>Examples</u>	<p>AT+MSOMONITORVALUE=0 +MONITORVALUE: 1 // MSO retrieves the current CREG request count OK</p> <p>AT+MSOMONITORVALUE=11,1 +MONITORVALUE: 3 // MSO retrieves the current PDP activation // success count for context ID 1 OK</p> <p>AT+MSOMONITORVALUE=25,16 +MONITORVALUE: 150 // MSO retrieves the current number of UL data // bytes assigned to user defined service class 16 OK</p>

17.7. +MSOEVLOGSTATUS Command: Event Log Status

HL7650	
<i>Test command</i>	
<u>Syntax</u> AT+MSOEVLOG STATUS=?	<u>Response</u> OK
<i>Read command</i>	
<u>Syntax</u> AT+MSOEVLOG STATUS?	<u>Response</u> +MSOEVLOGSTATUS: <cmd> OK
<i>Write command</i>	
<u>Syntax</u> AT+MSOEVLOG STATUS=<cmd>	<u>Response</u> OK <u>Parameter</u> <cmd> 0 Disable MSO event logging 1 Enable MSO event logging (no overwrite when full) 2 Enable MSO event logging (overwrite buffer)
<u>Note</u>	The MSO event log state is stored in non-volatile memory.
<u>Examples</u>	<p>AT+MSOEVLOGSTATUS? +MSOEVLOGSTATUS: 1 // MSO displays the current event logging // configuration OK</p> <p>AT+MSOEVLOGSTATUS=1 // MSO updates the current event logging // configuration OK</p>

HL7650	
<u>Note</u>	This command retrieves up to 100 of the oldest MSO event log records since the last event log record read.
<u>Example</u>	<pre> AT+MSOEVTLG? +MSOEVTLG: Up5LfwAAAAr////+AAAAAQAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAHdtX21 zb19zb2NrQ3JIYXRIAAAAAAAAAAAAAAAAAAAAAAA Up5LgAAAAr////+AAAAAQAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAHdtX21 zb19zb2NrQ3JIYXRIAAAAAAAAAAAAAAAAAAAAAAA Up5LhgAAAAYAAAABAAAAAAAAAQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1 zb19wZHBfY3R4X2FjdGI2X3JzcAAAAAAAAAAAAAA Up3bBwAAABtSndsHUUp3bBwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1z b190aW1IX3N5bmNfdXBkYXRIAAAAAAAAAAAAAAA Up3bBwAAABEAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG 1zb19ncm91cF9hZGRyX3Jlc3RvcmlUAAAAAAAAAAAA Up3bBwAAABEAAAABAAAAAAAAAAAAAAAAAAAAAG 1zb19ncm91cF9hZGRyX3Jlc3RvcmlUAAAAAAAAAAAA Up3bBwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG 1zb19zY19yZXN0b3JIAAAAAAAAAAAAAAA Up3bBwAAAAAAAAADAAAAAAAAAAAAAAAAAAAAAG 1zb19zY19yZXN0b3JIAAAAAAAAAAAAAAA Up3bBwAAAAAAAAFAAAAAAAAAAHgAAAAAAAAAAAAAG1 zb19zY19yZXN0b3JIAAAAAAAAAAAAAAA Up3bBwAAAAAAAAAGAAAAAAAAAAAAAAAAAAAAAG 1zb19zY19yZXN0b3JIAAAAAAAAAAAAAAA Up3bBwAAAAEAAAAAAAAAAAAAAAAEAQAAAAAAAAABAAAAAG 1zb19uYXJfcmlVzdG9yZQAAAAAAAAAAAAAA Up3bBwAAAAQAAAAABAAACwAAAAAAAAAAAAAG 1zb19kcGlfcHJvY2Vzc19zb2NrZXRfdG9fc2MAAAAA Up3bBwAAAAQAAAAAAACwAAAAAAAAAAAAAG 1zb19kcGlfcHJvY2Vzc19zb2NrZXRfdG9fc2MAAAAA OK // MSO displays up to the latest 100 base64 encoded records to the console. The results // above can be saved to a file which can then be parsed using the MSO event log // decoding python application to output a text version of the event logs. </pre>

>> 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>,<dcs>]	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 DIALTONE	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	Unknown
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" state
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
925	Failed to decode HTTP header's name, missing ':'
926	Failed to decode HTTP header's value, missing 'cr/lf'
927	HTTP header's name is an empty string
928	HTTP header's value is an empty string
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 / SIM not allowed
6	Channel unacceptable / Phone not allowed
7	EPS services not allowed
8	Operator determined barring / GPRS service and non-GPRS service not allowed
11	SOS/emergency calls only, PLMN not allowed
12	SOS/emergency calls only, LA not allowed
13	SOS/emergency calls only, roaming not allowed in LA
14	EPS services not allowed in this PLMN
15	No suitable cells in location area
16	Normal call clearing
17	User busy
18	No user responding
19	ESM failure
21	Call rejected
22	Number changed / No cause information available
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

<cause>	<description>
35	No cause information available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion / No cause information available
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
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 SMDCP 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, serving GW or PDN GW

<cause>	<description>
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
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
152	Single address bearers only allowed
153	ESM information only allowed
154	ESM information not received
155	PDN connection does not exist
156	Collision with network initiated request
159	Unsupported QCI value
160	Bearer handling not supported
165	Maximum number of EPS bearers reached
166	Requested APN not supported in current RAT and PLMN combination
181	Invalid PTI value
182	APN restriction value incompatible with active EPS bearer context
183	PTI already in use
184	EPS QoS not accepted
185	Invalid EPS bearer identity
186	PTI mismatch
187	Last PDN disconnection not allowed
188	PDN type IPv4 only allowed
189	PDN type IPv6 only allowed
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

<cause>	<description>
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
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

<cause>	<description>
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
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)

<cause>	<description>
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

18.2.2.1. SS Error Codes

18.2.2.1.1. SS Network Error Cause

According to 3GPP 24.008, section 4.5 except for internal errors 0 and 255.

<cause>	<description>
0	MN_MS_INT_SS_ERROR - This is used when the SS operation was unsuccessful due to an MS internal reason
255	MN_MS_INT_SS_TIME_OUT - This is used when the SS operation was unsuccessful due to a missing answer from the network
1	MN_UNKNOWN_SUBSCRIBER
9	MN_ILLEGAL_SUBSCRIBER
10	MN_BEARER_SERVICE_NOT_
11	MN_TELESERVICE_NOT_PROVISIONED
12	MN_ILLEGAL_EQUIPMENT
13	SYNONYM MN_CALL_BARRED
16	MN_ILLEGAL_SS_OPERATION
17	MN_SS_ERROR_STATUS
18	MN_SS_NOT_AVAILABLE
19	MN_SS_SUBSCRIPTION_VIOLATION
20	MN_SS_INCOMPATIBILITY
21	MN_FACILITY_NOT_SUPPORTED
27	MN_ABSENT_SUBSCRIBER
29	MN_SHORT_TERM_DENIAL
30	MN_LONG_TERM_DENIAL
34	MN_SYSTEM_FAILURE
35	MN_DATA_MISSING
36	MN_UNEXPECTED_DATA_VALUE
37	MN_PW_REGISTRATION_FAILURE
38	MN_NEGATIVE_PW_CHECK
43	MN_NUMBER_OF_PW_ATTEMPTS_VIOLATION
54	MN_POS_METHOD_FAILURE
71	MN_UNKNOWN_ALPHABET
72	MN_USSD_BUSY
121	MN_REJECTED_BY_USER
122	MN_REJECTED_BY_NETWORK

<cause>	<description>
123	MN_DEFLECTION_TO_SERVER_SUBSCRIBED
124	MN_SPECIAL_SERVICE_CODE
125	MN_INVALID_DEFLECTED_NUMBER
126	MN_MAX_NUMBER_OF_MPTY_PARTICIPANTS_EXCEEDED
127	MN_RESOURCES_NOT_AVAILABLE

18.2.2.1.2. SS Network GSM Cause

According to 3GPP 24.008, section 10.5.4.11 "Cause". All values greater than 255 are internal values.

<cause>	<description>
1	MN_UNASSIGNED_NUMBER
3	MN_NO_ROUTE
6	MN_CHANNEL_UNACCEPTABLE
8	MN_OPERATOR_BARRING
16	MN_NORMAL_CALL_CLEARING
17	MN_USER_BUSY
18	MN_NO_USER_RESPONDING
19	MN_USER_ALERTING_NO_ANSWER
21	MN_CALL_REJECTED
22	MN_NUMBER_CHANGED
26	MN_NON_SELECTED_USER_CLEARING
27	MN_DESTINATION_OUT_OF_ORDER
28	MN_INVALID_NUMBER_FORMAT
29	MN_FACILITY_REJECTED
30	MN_RESPONSE_TO_STATUS_ENQUIRY
31	MN_NORMAL_UNSPECIFIED
34	MN_NO_CIRCUIT_AVAILABLE
38	MN_NETWORK_OUT_OF_ORDER
41	MN_TEMPORARY_FAILURE
42	MN_SWITCH_CONGESTION
43	MN_ACCESS_INFORMATION_DISCARDED
44	MN_REQUESTED_CIRCUIT_NOT_AVAILABLE
47	MN_RESOURCES_UNAVAILABLE
49	MN_QUALITY_UNAVAILABLE
50	MN_FACILITY_NOT_SUBSCRIBED
55	MN_INCOMING_CALLS_BARRED_IN_CUG
57	MN_BEARER_CAPABILITY_NOT_ALLOWED
58	MN_BEARER_CAPABILITY_NOT_AVAILABLE
63	MN_SERVICE_NOT_AVAILABLE
65	MN_BEARER_SERVICE_NOT_IMPLEMENTED
68	MN_ACM_GREATER_OR_EQUAL_TO_ACM_MAX
69	MN_FACILITY_NOT_IMPLEMENTED

<cause>	<description>
70	MN_ONLY_RESTRICTED_DIGITAL
79	MN_SERVICE_NOT_IMPLEMENTED
81	MN_INVALID_TI
87	MN_USER_NOT_IN_CUG
88	MN_INCOMPATIBLE_DESTINATION
91	MN_INVALID_TRANSIT_NETWORK
95	MN_SEMANTICS_INCORRECT
96	MN_INVALID_MANDATORY_INFORMATION
97	MN_UNKNOWN_MESSAGE_TYPE_1
98	MN_UNEXPECTED_MESSAGE_TYPE
99	MN_UNEXPECTED_IE
100	MN_CONDITIONAL_IE_ERROR
101	MN_UNKNOWN_MESSAGE_TYPE_2
102	MN_RECOVERY_ON_TIMER_EXPIRY
111	MN_PROTOCOL_ERROR
127	MN_INTERWORKING
256	MN_VOID_CAUSE
257	MN_OUT_OF_MEMORY
258	MN_INVALID_PARAM
259	MN_DATA_CALL_ACTIVE
260	MN_SPEECH_CALL_ACTIVE
261	MN_DTMF_REJECTED_DURING_MO_CALL_SETUP
262	MN_MOC_SETUP_REJ_DUE_TO_MISSING_ACM_INFO_IND
263	MN_TEMPORARY_FORBIDDEN_CALL_ATTEMPT
264	MN_CALLED_PARTY_IS_BLACKLISTED
265	MN_BLACKLIST_IS_FULL_NO_AUTO_CALL_ATTEMPTS
266	MN_TEMPORARY_FORBIDDEN_CALL_ATTEMPT_NO_SERVICE
267	MN_TEMPORARY_FORBIDDEN_CALL_ATTEMPT_LIMITED_SERVICE
268	MN_CLIENT_TEMPORARY_BARRED
269	MN_DUAL_SERVICE_CALL_ACTIVE
270	MN_ATC_FCLASS_NOT_SPEECH
271	MN_SI_UNKNOWN_ERROR
272	MN_DTMF_REJECTED_DUE_TO_CALL_HELD_OR_MPARTY
273	MN_CLIENT_NOT_REGISTERED
274	MN_ACTIVE_CLIENT_GONE
275	MN_DTMF_REJECTED_DUE_TO_DATA_TRANSMISSION
276	MN_NO_APPROPRIATE_DTMF_ENTRY
277	MN_SIM_STATUS_FAILURE
278	MN_REJ_BY_CALL_CONTROL
279	MN_FDN_FAILED
280	MN_BDN_FAILED
281	MN_ONLY_ERROR
282	MN_NOT_IN_SPEECH_CALL

<cause>	<description>
283	MN_CCBS_POSSIBLE
283	MN_INVALID_ALS_LINE
284	MN_INVALID_ALS_LINE
285	MN_LND_OVERFLOW
286	MN_DTMF_REJECTED_NO_TCH_AVAILABLE
287	MN_NW_FAILURE_UNSPECIFIED
288	MN_MS_NO_SERVICE
289	MN_MS_ACCESS_CLASS_BARRED
290	MN_MS_NO_RESOURCE
291	MN_MS_SERVICE_BUSY
292	MN_MS_FAILURE_UNSPECIFIED
293	MN_DTMF_REJECTED_DUE_TO_SUP_TIMER_EXPIRY
300	MN_SIMTK_SETUP_MODE_NOT_SUPPORTED
301	MN_MMI_NOT_REGISTERED
302	MN_SIMTK_SETUP_REJ_DUE_TO_MISSING_ACM_INFO_IND
303	MN_SIMTK_SETUP_REJECTED_BY_THE_USER
304	MN_SIMTK_SETUP_REJECTED_TIME_OUT
305	MN_SIMTK_CALL_CONNECTED
306	MN_DISCONNECT_DUE_TO_SIMTK_SETUP
307	MN_SIMTK_SETUP_REJ_DUE_TO_PENDING_SIMTK_SETUP
308	MN_SIMTK_CALL_CONNECTED_NO_ICON_DISPLAY
309	MN_PENDING_SIMTK_SETUP
310	MN_SIMTK_SIM_RESET
311	MN_SIMTK_DTMF_TRANSMITTED
312	MN_SIMTK_DTMF_TRANSMITTED_NO_ICON_DISPLAY
313	MN_USER_DID_NOT_ACCEPT_CALL_SETUP
314	MN_PROACTIVE_SIM_APPL_TERMINATED_BY_USER
315	MN_SIMTK_ME_UNABLE_SCREEN_BUSY
316	MN_SIMTK_ME_UNABLE_NO_SPECIFIC_CAUSE
317	MN_SIMTK_UNSPECIFIED
318	MN_SETUP_SS_ERR
319	MN_SIMTK_NET_UNABLE_NO_SPECIFIC_CAUSE
320	MN_SIMTK USSD_TRANSACTION_TERMINATED_BY_USER
330	MN_PHONEBOOK_NOT_AVAILABLE
331	MN_ATC_NO_MATCHING_PHONEBOOK_ENTRY
332	MN_ATC_INVALID_DIALED_NUMBER
333	MN_ATC_SETUP_TEMPORARY_BLOCKED
334	MN_ATC_NO_PERMISSION
335	MN_ATC_INVALID_CALL_SETTINGS
336	MN_ATC_BLOCKING_CALL_PRESENT

18.2.2.1.3. SS Network Reject Cause

According to 3GPP 24.080, 3.6.7, table 3.13.

Table 4. Tag 128 MN_GENERAL_PROBLEM with Causes

From 3GPP 24.008, table 3.14.

<cause>	<description>
0	MN_UNRECOGNIZED_COMPONENT
1	MN_MISTYPED_COMPONENT
2	MN_BADLY_STRUCTURED_COMPONENT

Table 5. Tag 129 MN_INVOKE_PROBLEM with Causes

From 3GPP 24.008, table 3.15.

<cause>	<description>
0	MN_DUPLICATE_INVOKE_ID
1	MN_UNRECOGNIZED_OPERATION
2	MN_MISTYPED_PRO_PARAMETER
3	MN_RESOURCE_LIMITATION
4	MN_INITIATING_RELEASE
5	MN_UNRECOGNIZED_LINKED_ID
6	MN_LINKED_RESPONSE_UNEXPECTED
7	MN_UNEXPECTED_LINKED_OPERATION
130	MN_RETURN_RESULT_PROBLEM

Table 6. Tag 130 MN_RETURN_RESULT_PROBLEM with Causes

From 3GPP 24.008, table 3.16.

<cause>	<description>
0	MN_UNRECOGNIZED_INVOKE_ID
1	MN_RETURN_RESULT_UNEXPECTED
2	MN_MISTYPED_RES_PARAMETER

Table 7. Tag 131 MN_RETURN_ERROR_PROBLEM with Causes

<cause>	<description>
0	MN_UNRECOGNIZED_ERROR_INVOKE_ID
1	MN_RETURN_ERROR_UNEXPECTED
2	MN_UNRECOGNIZED_ERROR
3	MN_UNEXPECTED_ERROR
4	MN_MISTYPED_ERROR_PARAMETER

18.2.3. CMS Error Codes

<err> Code	Meaning
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
17	Network failure
21	Short message transfer rejected
22	Memory capacity exceeded
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
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

<err> Code	Meaning
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
287	Network failure unspecified
290	Network no resource
296	Radio resource not available due to dual SIM operation
297	Out of service due to dual SIM operation
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
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 acknowledgement expected
500	Unknown error
512	Relay path acknowledgement
513	SMS timer expired
514	SMS forwarding availability failed
515	SMS forwarding availability aborted
516	Invalid TP-MESSAGE-Type indicator
517	No TP-Status report in phase 1
518	No TP-Reject-Duplicate in phase 1

<err> Code	Meaning
519	No TP-Reply-Path in phase 1
520	No TP-User-Data-Header in phase 1
521	Missing TP-Validity-Period
522	Invalid TP-Service-Centre-Time-Stamp
523	Missing TP-Destination-Address
524	Invalid TP-Destination-Address
525	Missing Service-Centre-Address
526	Invalid Service-Centre-Address
527	Invalid alphabet
528	Invalid TP-User-Data-Length
529	Missing TP-User-Data
530	TP-User-Data too long (large)
531	No command request in phase 1
532	Command request invalid TP-Destination Address
533	Command request invalid TP-User-Data Length
534	Command request invalid TP-User-Data
535	Command request invalid TP-Command-Type
536	MN MNR creation failed
538	MS network connection lost
539	Pending MO SM transfer
540	MO SMS rejected by SIM MO SMS control
541	RP ERROR OK
542	RP ERROR OK no icon display
543	FDN check failed
544	Service Centre Address (SCA) FDN failed
545	Destination Address (DA) FDN failed
546	BDN check failed
547	Unspecified SMS PP error
548	No route to destination
549	Channel unacceptable
555	No circuit/channel available
556	Access information discarded
557	Requested circuit/channel not available by other side
558	Quality of service unavailable
560	Bearer capability not authorized
561	Bearer capability not presently available
562	Service or option not available, unspecified
563	Bearer service not implemented
564	ACM equal to or greater than ACMmax
565	Only restricted digital information bearer capability is available
566	Service or option not implemented, unspecified
567	User not member of CUG
568	Incompatible by destination

<err> Code	Meaning
569	Invalid transit network selection
571	Message not compatible with protocol state
572	Recovery on timer expiry
576	Data call active
577	Speech call active
579	MOC setup rejected due to missing ACM info
580	Temporary forbidden call attempt
581	Called party is blacklisted
583	Temporary forbidden call attempt no service
584	Temporary forbidden call attempt limited service
585	Client temporary barred
586	Dual service call active
587	ATC FCLASS not speech
590	Client not registered
591	Active client gone
595	Rejected by call control
596	FDN failed
597	BDN failed
601	Invalid ALS line
604	MM no service (out of coverage)
605	MM access class barred (RR_REL_IND during RR conn. establishment)
606	ME Busy – CM server request already pending
608	Rejected due to SUP timer expiry
609	Rejected due to USSD busy
610	Rejected due to SS busy
612	SIM toolkit request is rejected because another SIM toolkit request is pending
614	Rejected because SIM toolkit request is not yet answered by the user
615	MN setup SS error
616	Call controller blocked (other call command pending)
618	Environment parameter not set correctly (FCLASS/CMOD)
619	Other blocking call present
620	Lower layer failure
621	The authentication procedure failed
622	The packet-switched registration procedure failed
623	CM service reject from the network
624	The ABORT message was received from the network
625	Timer expiry
626	IMSI detach was initiated
627	Normal RR connection release (2G)
628	Registration failed
630	Failure due to handover
631	Link establishment failure
632	Random access failure

<err> Code	Meaning
633	Radio link aborted
634	Lower layer failure in layer 1
635	Immediate assignment reject
636	Failure due to paging
637	Abnormal release unspecified
638	Abnormal release channel unacceptable
639	Abnormal release timer expired
640	Abnormal release no act on radio path
641	Preemptive release
642	UTRAN configuration unknown
643	Handover impossible
644	Channel mode unacceptable
647	Lower layer failure from NW
649	Conditional IE error
650	No cell allocation available
653	Re-establishment reject
654	Directed sigconn re-establishment
656	Release of RRC connection without network activity (3G) lower layer failure downlink
657	Lower layer failure uplink
658	Cell barred due to authentication failure
659	Signalling connection release
660	CS connection release triggered by MM
661	RRC connection establishment failure
662	RRC connection establishment reject with redirection
663	Resource conflict
664	Layer failure in layer 2
665	L2 cause T200 expiry N200 plus 1 times
669	RR connection release due to band change (2G)
670	Release of the RRC connection due to out of service in cell_fach (3G)
671	Release of the RRC connection due to not matching PLMN in shared networks (3G)
672	Error happens while call is already disconnected/late error
674	SIM toolkit cannot initiate a call because MMI is not registered
675	SIM toolkit call setup request is rejected due user did not accept
676	Proactive SIM application terminated by user
677	SIM toolkit originated SIM reset (refresh request)
680	Dial string/number incorrect

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
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

FTP Reply Code	Meaning
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 8. Generic Error Case Examples

Error Codes	Corresponding Examples
+CME ERROR: 3 when execute command is not supported	AT+SWITRC AT+COREDUMP AT+LOGLV AT+NVBU 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 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

Error Codes	Corresponding Examples
<p>+CME ERROR: 3 when action command is not supported</p>	<p>AT+KUSBCOMP AT+BOOTDWLCFG AT+KLTEMUTE AT+KSYNC AT+KLTEPARAM AT+KAAT AT+CMEC AT+KGSMAD AT+CALA AT+CALD</p>
<p>If basic type AT commands are executed as extended test/read/write AT commands, ERROR is returned (not +CME ERROR)</p>	<p>ATE=? ERROR</p> <p>ATE? ERROR</p> <p>ATV? ERROR</p> <p>ATO=? ERROR</p> <p>ATX? ERROR</p>
<p>+CME ERROR: 3 is returned for invalid CID parameter</p>	<p>AT+CGDCONT=2858756478 +CME ERROR: 3</p> <p>AT+CGAUTO=879248 +CME ERROR: 3</p> <p>AT+CGCLASS=p +CME ERROR: 3</p> <p>AT+XGAUTH=a +CME ERROR: 3</p> <p>AT+CGPADDR=23 +CME ERROR: 3</p>

Table 9. Non-Generic Error Case Examples

Error Codes	Corresponding Examples
<p>+CME ERROR: 3 instead of ERROR is returned for some cases in some SREG or basic AT commands. This is for backward compatibility reason.</p>	<p>ATB100 +CME ERROR: 3</p> <p>ATB=? ERROR</p> <p>ATB? ERROR</p>

Error Codes	Corresponding Examples
<p>+CME ERROR: 3 instead of ERROR is returned for some cases in some SREG or basic AT commands. This is for backward compatibility reason.</p>	<p>ATB=0 ERROR ATB +CME ERROR: 3</p>
<p>+CME ERROR: 16 (incorrect password) instead of +CME ERROR: 18 (PUK2 required) is returned when PIN2 is blocked in AT+CPIN2 write command; while +CME ERROR: 12 (PUK required) is returned when PIN is blocked in AT+CPIN write command.</p>	<p>AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="22222222","5678" OK AT+CPIN="5678" +CME ERROR: 16 AT+CPIN="5678" +CME ERROR: 16 AT+CPIN="5678" +CME ERROR: 12 AT+CPIN? +CPIN: SIM PUK OK AT+CPIN="11111111","1234" OK</p>
<p>+CME ERROR: 18 (SIM PUK2 REQUIRED) instead of +CME ERROR: 50 (INCORRECT PARAMETERS) is returned for +CPIN2 when PUK2 is required while only PIN2 was inputted +CME ERROR: 12 (SIM PUK REQUIRED) instead of +CME ERROR: 50 (INCORRECT PARAMETERS) is returned for +CPIN when PUK is required while only PIN was inputted</p>	<p>AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" // Incorrect PIN2 – 4th time +CME ERROR: 18 AT+CPIN2="22222222","5678" OK AT+CPIN="5678" +CME ERROR: 16 AT+CPIN="5678" +CME ERROR: 16</p>

Error Codes	Corresponding Examples
+CME ERROR: 18 (SIM PUK2 REQUIRED) instead of +CME ERROR: 50 (INCORRECT PARAMETERS) is returned for +CPIN2 when PUK2 is required while only PIN2 was inputted	AT+CPIN="5678" +CME ERROR: 12 AT+CPIN="5678" // Incorrect PIN1 – 4th time +CME ERROR: 12
+CME ERROR: 12 (SIM PUK REQUIRED) instead of +CME ERROR: 50 (INCORRECT PARAMETERS) is returned for +CPIN when PUK is required while only PIN was inputted	AT+CPIN? +CPIN: SIM PUK OK AT+CPIN="11111111","1234" OK

Table 10. Internet Error Case Examples

Error Codes	Corresponding Examples
+CME ERROR: 907 Generic error/Unsupported read command	AT+KHTTPHEAD? AT+KHTTPGET? AT+KHTTPREAD? AT+KHTTPPOST? AT+KHTTPCLOSE? AT+KHTTPSGET? AT+KHTTPSHHEAD? AT+KHTTPSPPOST? AT+KHTTPSCLOSE? AT+KFTPCNX? AT+KFTPCLOSE? AT+KFTPCFGDEL? AT+KFTPCRV? AT+KFTPSND? AT+KFTPDEL? AT+KUDPDEL? AT+KUDPCLOSE? AT+KUDPCRV? AT+KUDPSND? AT+KTCPSND? AT+KTCPCRV? 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+KHTTPHEADER=1,0,"" AT+KHTTPHEADER=1,"file" AT+KHTTPPOST=1,0,"" AT+KHTTPPOST=1,"file","" AT+KHTTPSPPOST=1,0,"" AT+KHTTPSPPOST=1,1,"" AT+KHTTPSPPOST=1,"file",""

Error Codes	Corresponding Examples
+CME ERROR: 915 A parameter is not expected	AT+KHTTPSHEADER=1,0 AT+KHTTPSHEADER=1,1 AT+KHTTPSHEADER=1,"file" AT+KFTPCRCV=1,0,,"/sample.txt" AT+KFTPCRCV=1,1,,"/sample.txt" AT+KFTPCRCV=1,"file",,"/sample.txt"
+CME ERROR: 916 A parameter has an invalid range of values	AT+KHTTPGET=0,"/" AT+KHTTPGET=1,"/",2 AT+KHTTPHEADER=0 AT+KHTTPHEAD=0,"/" AT+KHTTPCLOSE=0 AT+KHTTPCLOSE=1,-1 AT+KHTTPPOST=0,,"/" AT+KHTTPPOST=1,,"/",2 AT+KHTTPCFG=0,"www.example.com" AT+KHTTPCFG=1,"www.example.com",65536 AT+KHTTPCFG=1,"www.example.com",,,,2 AT+KHTTPSCFG=0,"www.kernel.org" AT+KHTTPSCFG=-1,"www.kernel.org" AT+KHTTPSCFG=1,"www.kernel.org",65536 AT+KHTTPSCFG=1,"www.kernel.org",-1 AT+KHTTPSCFG=1,"www.kernel.org",,2 AT+KHTTPSCFG=1,"www.kernel.org",,,8 AT+KHTTPSCFG=1,"www.kernel.org",,-1 AT+KHTTPSCFG=1,"www.kernel.org",,,,4 AT+KHTTPSCFG=1,"www.kernel.org",,,,,,2 AT+KHTTPSCFG=1,"www.kernel.org",,,,,,-1 AT+KHTTSGET=1,"/",2 AT+KHTTSGET=1,"/",-1 AT+KHTTSHHEAD=0,"/" AT+KHTTSHHEAD=-1,"/" AT+KHTTSPPOST=0,,"/" AT+KHTTSPPOST=-1,,"/" AT+KHTTSPPOST=1,,"/",2 AT+KHTTSPPOST=1,,"/",-1 AT+KHTTSHHEADER=0 AT+KHTTSHHEADER=-1 AT+KHTTSPCLOSE=0 AT+KHTTSPCLOSE=-1 AT+KHTTSPCLOSE=1,2 AT+KHTTSPCLOSE=1,-1 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",,,,,,-1 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

Error Codes	Corresponding Examples
<p>+CME ERROR: 916 A parameter has an invalid range of values</p>	<p>AT+KFTPCFGDEL=0 AT+KFTPCFGDEL=-1</p> <p>AT+KFTPRCV=0,,,"/sample.txt" AT+KFTPRCV=-1,,,"/sample.txt" AT+KFTPRCV=1,,,"/sample.txt",2 AT+KFTPRCV=1,,,"/sample.txt",-1</p> <p>AT+KFTPSND=0,,,"/sample.txt" AT+KFTPSND=-1,,,"/sample.txt" AT+KFTPSND=1,,,"/sample.txt",2 AT+KFTPSND=1,,,"/sample.txt",-1</p> <p>AT+KFTPDEL=0,"/sample.txt" AT+KFTPDEL=-1,"/sample.txt" AT+KFTPDEL=1,"/sample.txt",2 AT+KFTPDEL=1,"/sample.txt",-1</p> <p>AT+KTCPSND=1,0 AT+KTCPRCV=1,0 AT+KUDPSND=1,"116.66.221.43",5043,0 AT+KUDPRCV=1,0</p>
<p>+CME ERROR: 917 A parameter is missing</p>	<p>AT+KHTTPGET=,"/" AT+KHTTPGET=1, AT+KHTTPGET=,</p> <p>AT+KHTTPHEADER=,</p> <p>AT+KHTTPHEAD=,"/" AT+KHTTPHEAD=1, AT+KHTTPHEAD=,</p> <p>AT+KHTTPCLOSE=,</p> <p>AT+KHTTPPOST=,"/" AT+KHTTPPOST=1,,</p> <p>AT+KHTTPCFG=1, AT+KHTTPCFG=,</p> <p>AT+KHTTPSCFG=1, AT+KHTTPSCFG=1,www.kernel.org AT+KHTTPSCFG=,</p> <p>AT+KHTTPSGET=,"/" AT+KHTTPSGET=1, AT+KHTTPSGET=,</p> <p>AT+KHTTPSHHEAD=,"/" AT+KHTTPSHHEAD=1, AT+KHTTPSHHEAD=,</p> <p>AT+KHTTPSPPOST=,"/" AT+KHTTPSPPOST=1,,</p> <p>AT+KHTTPSHHEADER=,</p> <p>AT+KHTTPSCLOSE=,</p> <p>AT+KFTPCFG=1, AT+KFTPCFG=</p> <p>AT+KFTPCLOSE=,</p> <p>AT+KFTPRCV=1,,</p> <p>AT+KFTPSND=1,,</p> <p>AT+KFTPDEL=1,, AT+KFTPDEL=,,</p>

Error Codes	Corresponding Examples
+CME ERROR: 918 Feature is not supported	AT+KHTTTPSCFG=1,"www.kernel.org",,,1 AT+KHTTTPSCFG=1,"www.kernel.org",,,3
+CME ERROR: 919 Feature is not available	AT+KTCPACKINFO=1
+CME ERROR: 932 The format of a parameter is invalid	AT+KHTTTPGET=a,"/"
	AT+KHTTTPHEADER=a
	AT+KHTTTPHEAD=a,"/"
	AT+KHTTTPCLOSE=a AT+KHTTTPCLOSE=1,?
	AT+KHTTTPPOST=a,,/" AT+KHTTTPPOST=1,,"/,?
	AT+KHTTTPCFG=a,"www.example.com" AT+KHTTTPCFG=1,"www.example.com",,,? AT+KHTTTPCFG=1,"www.example.com",a AT+KHTTTPCFG=1,"www.example.com",,,,,?
	AT+KHTTTPSCFG=a,"www.kernel.org" AT+KHTTTPSCFG=1,"www.kernel.org",a AT+KHTTTPSCFG=1,"www.kernel.org",, AT+KHTTTPSCFG=1,"www.kernel.org",,,?
	AT+KHTTTPSGET=a,"/" AT+KHTTTPSGET=1,""/,?
	AT+KHTTTPSHEAD=a,"/"
	AT+KHTTTPSPOST=a,,/" AT+KHTTTPSPOST=1,,"/,?
	AT+KHTTTPSHEADER=a
	AT+KHTTTPSCLOSE=a AT+KHTTTPSCLOSE=1,?
	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=#
	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.

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+CBST

This list may be modified in case of special needs from the customer. Contact Sierra Wireless to request modifications. Note that some commands may also 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)	NO
	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

<p>AT&K3 OK</p>	Hardware flow control activation
<p>AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK</p>	Set GPRS parameters (APN, login, password)
<p>AT+KTCPCFG=1,0,"www.google.com",80 +KTCPCFG: 1 OK</p>	Set IP address and port number Returns session ID 1
<p>AT+KTCPCNX=1 OK</p>	Initiate the connection
<p>AT+KTCPSEND=1,18 CONNECT ...Data send... OK</p>	Send data with the EOF string at the end "GET / HTTP / 1.0 --EOF--Pattern"
<p>+KTCP_DATA: 1,1380</p>	
<p>AT+KTCPRCV=1, 1380 CONNECT HTTP/1.0 200 OK Cache-Control: private, max-age=0 ... a lot of data... --EOF--Pattern-- OK</p>	Read data
<p>+KTCP_DATA: 1,1380</p>	+KTCP_DATA notification
<p>AT+KTCPRCV=1,1380 CONNECT er{padding-bottom:7px !important}#gbar,#guser{font- ... a lot of data... --EOF--Pattern-- OK</p>	Read received data
<p>+KTCP_DATA: 1,1380</p>	
<p>AT+KTCPCLOSE=1,1 OK</p>	Close session 1
<p>AT+KTCPDEL=1 OK</p>	Delete session 1
<p>AT+KTCPCFG? OK</p>	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.

<p>AT&K3 OK</p>	<p>Hardware flow control activation</p>
<p>AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK</p>	<p>Set GPRS parameters (APN, login, password)</p>
<p>AT+KTCPCFG=1,1,,13 +KTCPCFG: 1 OK</p>	<p>Set TCP listener and port number Returns session ID 1</p>
<p>AT+KTCPCNX=1 OK</p>	<p>Initiate the server</p>
<p>AT+KCGPADDR +KCGPADDR: 0,"10.35.125.89" OK</p>	<p>Get the IP address to initiate a connection request with a client</p>
<p>+KTCP_SRVREQ: 1,2</p>	<p>A client requests a connection (session ID 2)</p>
<p>AT+KTCPSND=2,15 CONNECT ...Date and time... OK</p>	<p>Data is sent to the client read</p>
<p>+KTCP_SRVREQ: 1,3 +KTCP_NOTIF: 2, 4</p>	<p>Another client requests a connection (session ID 3); child mode for session 3 Client (session 2) closes the connection</p>
<p>AT+KTCPSND=3,15 CONNECT ...Date and time... OK</p>	<p>Data is sent to the client</p>
<p>AT+KTCPCLOSE=3,1 OK</p>	<p>Close client session 3 and then session 3 is deleted automatically (child mode for session 3)</p>
<p>AT+KTCPCLOSE=1,1 OK</p>	<p>Close server session 1</p>
<p>AT+KTCPDEL=1 OK</p>	<p>Delete session 1</p>

18.5.3. Polling for the Status of a Socket

<pre>AT&K3 OK</pre>	<p>Hardware flow control activation</p>
<pre>AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK</pre>	<p>Set GPRS parameters (APN, login, password)</p>
<pre>AT+KTCPCFG=1,0,"www.google.com",80 +KTCPCFG: 1 OK</pre>	<p>Set TCP Server address and port number Returns session ID 1</p>
<pre>AT+KURCCFG="TCP",0 OK</pre>	<p>Disable TCP unsolicited messages</p>
<pre>AT+KTCPCNX=1 OK</pre>	<p>Initiate connection, use session 1</p>
<pre>AT+KTCPSTAT=1 +KTCPSTAT: 3,-1,0,0 OK</pre>	<p>Poll the connection status Connection is UP</p>
<pre>AT+KTCPSND=1,3000 CONNECT <...Data send...> OK</pre>	<p>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.</p>
<pre>AT+KTCPSTAT=1 +KTCPSTAT : 3,-1,1234,0 OK</pre>	<p>Poll the connection status Connection is up, with 1234 unsend bytes</p>
<pre>AT+KTCPSTAT=1 +KTCPSTAT : 3,-1,100,0 OK</pre>	<p>Poll the connection status Connection is up, with 100 unsend bytes</p>
<pre>AT+KTCPSTAT=1 +KTCPSTAT : 3,-1,0,0 OK</pre>	<p>Poll the connection status Connection is up, all bytes have been sent</p>
<pre>AT+KTCPSTAT=1 +KTCPSTAT : 3,-1,0,320 OK</pre>	<p>Poll the connection status Connection is up with 320 bytes available for reading</p>
<pre>AT+KTCPRCV=1,320 CONNECT <... a lot of data...> --EOF--Pattern-- OK</pre>	<p>Read 320 bytes on socket 1 Data are sent after CONNECT</p>

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	Set the TCP server address and port number
+KTCPCFG: 1 OK	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	Initiate connection
...Data sent.....Data received.....Data sent... ...Data sent.....Data received.....Data sent...	Exchange some data
NO CARRIER +KTCP_NOTIF: 1,<tcp_notif>	An error occurs during connection (network lost, server closed, etc.)

18.5.6. Use Cases for AT+KTCPPACKINFO and <URC-ENDTCP-enable> Option

This section describes the behavior of AT+KTCPPACKINFO when the <URC-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 OK	<URC-ENDTCP-enable> is disabled
AT+KTCPCNX=1 OK	Connect to TCP server
AT+KTCPSND=1,10 CONNECT 0123456789--EOF--Pattern-- OK	Use command to send 10 bytes Write to serial
AT+KTCPPACKINFO=1 +CME ERROR: operation not allowed	The URC "+KTCP_ACK" is not displayed Error is returned because <URC-ENDTCP-enable> is disabled

18.5.6.2. <URC-ENDTCP-enable> is Enabled

<p>AT+KCNXCFG=1,"GPRS","CMNET" OK</p>	
<p>AT+KTCPCFG=1,0,"202.170.131.76",2000,,1 +KTCPCFG: 1 OK</p>	<p>Set <URC-ENDTCP-enable> to 1, enable URC "+KTCP_ACK"</p>
<p>AT+KTCPCFG? +KTCPCFG: 1,0,0,0,"202.170.131.76",2000,,0,1 OK</p>	<p><URC-ENDTCP-enable> is enabled</p>
<p>AT+KTCPCNX=1 OK</p>	<p>Connect to TCP server</p>
<p>AT+KTCPNSD=1,10 CONNECT 0123456789--EOF--Pattern-- OK</p>	<p>Receive 10 bytes Connect to TCO server Write to serial</p>
<p>+KTCP_ACK: 1, 1</p>	<p>After a short time, URC "+KTCP_ACK" states that the latest TCP data has arrived on the remote side</p>
<p>AT+KTCPACKINFO=1 +KTCPACKINFO: 1, 1 OK</p>	<p>Poll the status of the latest TCP data</p>
<p>AT+KTCPNSD=1,1000 CONNECT <1000bytes and --EOF--Pattern→ OK</p>	<p>Send 1000 bytes Write to serial</p>
<p>AT+KTCPACKINFO=1 +KTCPACKINFO: 1, 2 OK</p>	<p>URC "+KTCP_ACK" not got yet Poll the status of the latest TCP data The status of the latest TCP data is unknown</p>
<p>+KTCP_ACK: 1, 0</p>	<p>Since the "OK" of the latest "+KTCPNSD", 64 seconds has elapsed URC "+KTCP_ACK" indicates that data has not arrived on the remote side yet. The network may not be good.</p>
<p>AT+KTCPACKINFO=1 +KTCPACKINFO: 1, 0 OK</p>	<p>Poll the status of the latest TCP data The status of the latest TCP data is "failure": not all data has been received by the remote side</p>

18.6. UDP Commands Examples

18.6.1. Client Mode

<pre>AT&K3 OK</pre>	<p>Hardware flow control activation</p>
<pre>AT+KCNXCFG=1,"GPRS","APN","log","password",,, OK</pre>	<p>Set GPRS parameters (APN, login, password)</p>
<pre>AT+KUDPCFG=1,0 +KUDPCFG: 1 OK</pre>	<p>Create a new UDP socket (returned session 1) with the parameters associated to the connection profile ID number 0</p>
<pre>AT+KUDPSND= 1,"82.234.17.52",32,18 CONNECT <...Data sent...> --EOF--Pattern-- OK</pre>	<p>Send UDP data after "CONNECT"</p>
<pre>+KUDP_DATA: 1,35</pre>	<p>Received notification that indicates the presence of 35 bytes in the socket</p>
<pre>AT+KUDPRCV=1, 35 CONNECT This is a simple UDP Protocol test --EOF--Pattern-- OK</pre>	<p>Try to read 35 bytes from session 1</p>
<pre>+KUDP_RCV: "82.234.17.52",32 +KUDP_DATA: 1,35</pre>	<p>Received notification that indicates the presence of 35 bytes in the socket</p>
<pre>AT+KUDPRCV=1, 18 CONNECT This is a simple --EOF--Pattern-- OK</pre>	<p>Try to read 18 bytes from session 1</p>
<pre>+KUDP_DATA_MISSED: 1,17</pre>	<p>There are 17 unread bytes left and missed in the UDP socket</p>
<pre>AT+KUDPCLOSE=1 OK</pre>	<p>Close the UDP session</p>
<pre>AT+KUDPCFG? OK</pre>	<p>No sessions are available anymore</p>

18.6.2. Server Mode

<p>AT&K3 OK</p>	<p>Hardware flow control activation</p>
<p>AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK</p>	<p>Set GPRS parameters (APN, login, password)</p>
<p>AT+KUDPCFG=1,1,3000 +KUDPCFG: 1 OK</p>	<p>Set UDP listener (port 3000). Initiate the server. Session ID is 1</p>
<p>AT+KUDPCFG? +KUDPCFG: 1,0,1,3000 OK</p>	<p>Check if the server is initiated</p>
<p>AT+KCGPADDR +KCGPADDR: 0, "192.168.0.71" OK</p>	<p>Get local IP address</p>
<p>+KUDP_DATA: 1,9</p>	<p>Data comes in from some client</p>
<p>AT+KUDPRCV=1,9 CONNECT DATA TEST--EOF--Pattern-- OK</p>	<p>Read received data</p>
<p>+KUDP_RCV: "10.10.10.5",1111</p>	<p>This data was sent from "10.10.10.5" (port:1111)</p>
<p>AT+KUDPSND=1,"10.10.10.5",3100,18 CONNECT <18 bytes data ended with "--EOF--Pattern--"> OK</p>	<p>Send 18 bytes to a remote server (port:3100)</p>
<p>AT+KUDPCLOSE=1 OK</p>	<p>Close the UDP server. The session is also deleted at the same time</p>
<p>AT+KUDPCFG? OK</p>	<p>No sessions are available anymore</p>

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>	<p>Connect to TCP server</p> <p>10 bytes have arrived</p> <p>Receive the 10 bytes that arrived</p> <p>Open a UDP socket</p> <p>8 bytes have arrived</p> <p>Read the data</p>
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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 </pre>	<p>Configure a TCP server socket</p> <p>Open the listen port</p>
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<pre> +KTCP_SRVREQ: 1,2 +KTCP_SRVREQ: 1,3 +KTCP_DATA: 2,10 +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 </pre>	<p>Session 2 is set Session 3 is set 10 bytes have arrived at session 2 8 bytes have arrived at session 3</p> <p>Receive the 10 bytes in session 2</p> <p>Receive the 8 bytes in session 3</p> <p>Open a UDP socket in server mode</p> <p>8 bytes have arrived</p> <p>Receive the 8 bytes</p>
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18.6.3.3. KTCP_DATA and KUDP_DATA with Data Auto Retrieval – Client Mode

<pre> 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 </pre>	<p>When <data_mode> = 1, data will be received by the URC "+KTCP_DATA"</p> <p>Connect to TCP server</p> <p>10 bytes have arrived. The data are presented in the URC directly</p> <p>When <data_mode> = 1, data will be received by the URC "+KUDP_DATA"</p> <p>8 bytes have arrived. The data are presented in the URC directly</p>
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18.6.3.4. KTCP_DATA and KUDP_DATA with Data Auto Retrieval – Server Mode

<pre>AT+KTCPCFG=1,1,,13,1 +KTCPCFG: 1 OK</pre>	<p>When <data_mode> = 1, all child connections will display data in URC mode. Data will be received by the URC "+KTCP_DATA:"</p>
<pre>AT+KTCPCNX=1 OK</pre>	<p>Open the listen port</p>
<pre>AT+KCGPADDR +KCGPADDR: 1,"10.35.125.89" OK</pre>	
<pre>+KTCP_SRVREQ: 1,2 +KTCP_SRVREQ: 1,3 +KTCP_DATA: 2,10,0123456789 +KTCP_DATA: 3,8,01234567</pre>	<p>10 bytes have arrived in session 2 8 bytes have arrived in session 3 Data are presented in the URC directly</p>
<pre>AT+KUDPCFG=1,1,3000,1 +KUDPCFG: 4 OK +KUDP_DATA: 4,8,"202.170.131.76",2001,01234567</pre>	<p>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</p>

18.7. FTP Commands Examples

18.7.1. Client Mode

<pre>AT&K3 OK</pre>	<p>Hardware flow control activation</p>
<pre>AT+KCNXCFG=1,"GPRS","APN","log","password",,, OK</pre>	<p>Set GPRS parameters (APN, login, password)</p>
<pre>AT+KFTPCFG=1,"ftp.test.fr","userlogin","userpassword",21,0 OK</pre>	<p>Set FTP server address, login, password and port number</p>
<pre>AT+KPATTERN="--EOF--Pattern--" OK</pre>	<p>Customize the End Of File pattern</p>
<pre>AT+KFTPSND=0,,"Dir","TestFile.txt",0 CONNECT F6E6E656374696F6E20746573742E--EOF--Pattern-- OK</pre>	<p>Send data and store them in "TestFile.txt" from the FTP server. Data are presented with the EOF string.</p>

<pre>AT+KFTPCV=0,,"Dir","Testfile.txt",0 CONNECT F6E6E656374696F6E207465737442E--EOF--Pattern-- OK AT+KFTPDEL=0,"Dir","TestFile.txt" OK AT+KFTPCLOSE=0 OK</pre>	<p>Read the file named "TestFile.txt" from ftp server, data are sent and end by EOF string</p> <p>Delete the file called "TestFile.txt" in the FTP server</p> <p>Close the connection</p>
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18.7.2. "FTP Resume" Use Case

18.7.2.1. Resume Feature when Transmitting Data to Serial Link

<pre>AT+KCNXCFG=1,"GPRS","CMNET" OK AT+KFTPCFG=1,"202.170.131.76","administrator","8ik,(OL>" ,21,0 +KFTPCFG: 1 OK AT+KFTPCV=1,,,"111111.txt",0 CONNECT 750aaaaaaaa..... aaaaa250bbbbbbb--EOF--Pattern-- +KFTP_ERROR: 1, 421 AT+KFTPCV=1,,,"111111.txt",0,760 bbbbbb.....bbbbbbend--EOF--Pattern-- OK</pre>	<p>Total of 760 data from the serial link</p> <p>The result code indicates that the download met with some problems which may be due to control or data connection lost</p> <p>Try to resume transfer by using the offset 760.</p> <p>Total data from the serial link should be 240</p> <p>The complete file "111111.txt" can be obtained by combining the data received from the two separate downloads</p>
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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+KFTPCV=1,,,"111111.txt",0 CONNECT 750aaaaaaaaa..... aaaaa250bbbbbb--EOF--Pattern-- +KFTP_ERROR: 1,421 AT+KFTPCV=1,,,"111111.txt",0,760 CONNECT --EOF--Pattern-- +KFTP_ERROR: 1,502 </pre>	<p>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</p> <p>ERROR 502 means that some commands in the procedure are not supported by the server</p>
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18.8. HTTP Commands Examples

Note: For the HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692 only.

<pre> AT&K3 OK AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" OK AT+KCNXTIMER=1,60,2,70 OK AT+KHTTPCFG=1,"www.google.com",80,1 +KHTTPCFG: 1 OK AT+KHTTPEHEADER=1 CONNECT Accept : text/html If-Modified-Since : Saturday, 15-January-2000 14:37:11 GMT OK </pre>	<p>Hardware flow control activation</p> <p>Set GPRS parameters (APN, login, password)</p> <p>Set Timers</p> <p>Set HTTP address, port number and http version</p> <p>Set the header of the request</p> <p>Send HTTP data after "CONNECT". Data should end with the EOF string.</p>
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<pre> 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 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 </pre>	<p>Get the web page</p> <p>HTTP server response</p>
<pre> 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 </pre>	<p>Get the headers of the web page</p> <p>HTTP server response</p>
<pre> AT+KHTTPHEADER=1 CONNECT Accept : text/html Context-Length: 64 OK </pre>	<p>Send data to the HTTP server</p> <p>Length of HTTP 1.0 POST data should be specified by the HTTP header field Context-Length, otherwise the HTTP server may not expect any data to be uploaded and should close the connection.</p>
<pre> 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>	<p>Send HTTP data after "CONNECT"</p> <p>HTTP server response</p>

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 +KTCPCRV: Receive data +KUDPSND: Send data +KUDPCRV: Receive data +KTCPSTART: Direct data flow	OK / CONNECT	OK / CONNECT	NO CARRIER / NO CARRIER (disconnect)	NO IMPACT
FTP: +KFTPCRV: Download FTP files +KFTPSEND: 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 HTTP request header	OK / NO CARRIER (disconnect)	OK / NO CARRIER (disconnect)	NO CARRIER / NO CARRIER (disconnect)	NO IMPACT
SSL: +KCERTSTORE: Store root CA +KPRIVKSTORE: Store private key	OK / NO CARRIER (abort)	OK / NO CARRIER (abort)	NO CARRIER / NO CARRIER (abort)	NO IMPACT

Note the following:

- When a data session is suspended, it can be resumed by ATO<session_id>.
- For IP AT commands that supports <ndata>:
 - Data sessions completed with <ndata> are not suspended.
 - Data sessions with unspecified <ndata> (omitted in AT command) are suspended.
 - Data sessions with <ndata> but incomplete (less than <ndata> are sent/received) are suspended.
- For IP AT commands that do not support <ndata> (e.g. +KTCPSTART), data sessions are suspended.
- Only one data session can be suspended per <session_id>; the latest suspension clears the last suspension status. For example, the suspension of +KTCPCV clears the suspension status of +KTCPSND such that ATO resumes +KTCPCV instead of +KTCPSND.