AirPrime HL78xx

AT Commands Interface Guide

SIERRA WIRELESS®

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Document History

Version	Date	Updates
1.0	May 21, 2018	Creation
2.0	July 13, 2018	Added: • 2.5 &F Command: Restore Factory Settings • 2.6 &V Command: Display Current Configuration • 2.7 &W Command: Write Current Configuration • 2.8 Z Command: Reset and Restore User Configuration • 2.9 +IPR Command: Set Fixed Local/DTE Rate • 3.6 +KGSN Command: Request Product Serial Number and Software Version • 5.8 +KSREP Command: Mobile Start-up Reporting • 5.16 +CEDRXS Command: eDRX Setting • 5.21 +KGPIO Command: Hardware IO Control • 5.22 +KGPIOCFG Command: GPIO Configuration • 5.23 +KCELL Command: Cell Environment Information • 5.30 +KCARRIERCFG Command: Set Operator • 8.2 +CGACT Command: PDP Context Activate or Deactivate • 9.12 UDP Specific Commands • 12.1 Command Timeout and Other Information • 12.5 How to Use UDP Specific Commands
		Updated: • 2.4 &K Command: Flow Control Option • 3.5 +CGSN Command: Request Product Serial Number Identification (IMEI) • 3.7 +CSCS Command: Set TE Character Set • 4.3 +CMEE Command: Report Mobile Termination Error • 5.1 +CCLK Command: Real Time Clock • 5.4 +CFUN Command: Set Phone Functionality • 5.5 +CPIN Command: Enter Pin • 5.10 +CCHO Command: Open Logical Channel • 5.11 +CCHC Command: Close Logical Channel • 5.12 +CRSM Command: Restricted SIM Access • 5.14 +CTZR Command: Time Zone Reporting • 6.1 +CLCK Command: Facility Lock • 6.2 +CPWD Command: Change Password • 6.4 +COPS Command: Operator Selection • 6.5 +CPOL Command: Preferred PLMN List • 6.6 +CREG Command: Network Registration • 6.7 +CPLS Command: Select Preferred PLMN List • 6.8 +CEREG Command: EPS Network Registration Status • 7.9 +CNMI Command: New Message Indication • 7.11 +CSMP Command: Set Text Mode Parameters • 8.9 +CGEREP Command: Packet Domain Event Reporting • 9.11.5 +KTCPCLOSE Command: Close Current TCP Operation • 12.2 Result Codes and Unsolicited Messages • 10 AVMS Commands

Version	Date	Updates
2.0	July 13, 2018	Deleted: • 1.2.3 Multiple AT Commands on the Same Command Line • 5.4 CMER Command: Mobile Equipment Event Reporting • 5.6 +CCID Command: Request SIM Card Identification
3.0	July 31, 2018	Added: • 2.10 &C Command: Set Data Carrier Detect (DCD) Function Mode • 2.11 &D Command: Set Data Terminal Ready (DTR) Function Mode • 2.12 &S Command: DSR Option • 2.13 &R Command: RTS/CTS Option • 2.15 S4 Command: Set Response Formatting Character • 3.11 +CMUX Command: Multiplexer • 3.12 +WPPP Command: PDP Context Authentication Configuration • 5.17 +CEDRXRDP Command: eDRX Read Dynamic Parameters • 5.24 +KSLEEP Command: Power Management Control • 5.25 +KRIC Command: Ring Indicator Control • 5.26 +CPOF Command: Power Off • 5.27 +CPWROFF Command: Power Off • 5.28 +WIMEI Command: IMEI Write and Read • 5.29 +KSYNC Command: Application Synchronization Signal • 8.7 +CGCONTRDP Command: PDP Context Read Dynamic Parameter • 8.8 +CGSCONTRDP Command: Secondary PDP Context Read Dynamic Parameter • 9.9 SSL Configuration • 9.10 SSL Certificate Manager • 9.11.9 +KTCP_IND Notification: TCP Status • 9.11.10 +KTCPSTART Command: Start a TCP Connection in Direct Data Flow • 10.1 +WDSC Command: Device Services Configuration
		Updated: • <cnx cfg> in 9 Protocol Specific Commands • 10.5 +WDSI Command: Device Services Indications
4.0	October 02, 2018	Added: • 1.4 SIM Application Toolkit • 4.1 D Command: Dial Number • 5.2 +CCID Command: Request SIM Card Identification
		Updated: • 2.5 &F Command: Restore Factory Settings • 2.6 &V Command: Display Current Configuration • 2.7 &W Command: Write Current Configuration • 3.6 +KGSN Command: Request Product Serial Number and Software Version • 5.14 +CTZR Command: Time Zone Reporting • 5.19 +KBNDCFG Command: Set Configured LTE Band(s) • 5.20 +KBND Command: Get Active LTE Band(s) • 5.21+KGPIO Command: Hardware IO Control • 5.22 +KGPIOCFG Command: GPIO Configuration • 5.23 +KCELL Command: Cell Environment Information

Version	Date	Updates
4.0	October 02, 2018	Updated: • 5.24 +KSLEEP Command: Power Management Control • 5.25 +KRIC Command: Ring Indicator Control • 5.29 +KSYNC Command: Application Synchronization Signal • 5.30 +KCARRIERCFG Command: Set Operator • 9.3 Session ID • 9.8.3 +KIPOPT Command: General Options Configuration • 9.9 SSL Configuration • 9.10.1 +KCERTSTORE Command: Store Root CA and Local Certificates to Internal Storage • 9.10.2 +KPRIVKSTORE Command: Store Private Key Associated to a Local Certificate • 10 AVMS Commands • Table 4 Command Timeout
4.1	October 03, 2018	Updated: • 1.4 SIM Application Toolkit • 10.1 +WDSC Command: Device Services Configuration
4.2	October 04, 2018	Updated 5.19 +KBNDCFG Command: Set Configured LTE Band(s)
5.0	October 29, 2018	Added: • 2.16 +IFC Command: DTE-DCE Local Flow Control • 3.13 +HWREV Command: Request Hardware Revision • 5.31 +KMON Command: Enable/Disable Monitor Mode
		Updated: • 2.9 +IPR Command: Set Fixed Local/DTE Rate • 3.1 I Command: Request Identification Information • 3.12 +WPPP Command: PDP Context Authentication Configuration • 5.1 +CCLK Command: Real Time Clock • 5.7 +CSQ Command: Signal Quality • 5.8 +KSREP Command: Mobile Start-up Reporting • 5.15 +CPSMS Command: Power Saving Mode setting • 5.16 +CEDRXS Command: eDRX Setting • 5.17 +CEDRXRDP Command: eDRX Read Dynamic Parameters • 5.23 +KCELL Command: Cell Environment Information • 5.24 +KSLEEP Command: Power Management Control • 6.4 +COPS Command: Operator Selection • 6.8 +CEREG Command: EPS Network Registration Status • 8.11 +CGSMS Command: Select Service for MO SMS Messages • 9.11.1 +KTCPCFG Command: TCP Connection Configuration • 9.12.1 +KUDPCFG Command: UDP Connection Configuration • 10.6 +WDSR Command: Device Services Reply • 10.7 +WDSS Command: Device Services Session • Table 4 Command Timeout
5.1	October 30, 2018	Updated 6.4 +COPS Command: Operator Selection
6.0	November 27, 2018	Added: • 5.32 +KSRAT Command: Set Radio Access Technology • 11 Test Commands

Version	Date	Updates
6.0	November 27, 2018	Updated: • 2.9 +IPR Command: Set Fixed Local/DTE Rate • 2.10 &C Command: Set Data Carrier Detect (DCD) Function Mode • 2.11 &D Command: Set Data Terminal Ready (DTR) Function Mode • 2.12 &S Command: DSR Option • 3.7 +CSCS Command: Set TE Character Set • 3.12 +WPPP Command: PDP Context Authentication Configuration • 4.2 +CEER Command: Extended Error Report • 5.4 +CFUN Command: Set Phone Functionality • 5.6 +CPAS Command: Phone Activity Status • 5.16 +CEDRXS Command: eDRX Setting • 5.18 +CESQ Command: Extended Signal Quality • 5.19 +KBNDCFG Command: Set Configured LTE Band(s) • 5.20 +KBND Command: Get Active LTE Band(s) • 5.24 +KSLEEP Command: Power Management Control • 5.30 +KCARRIERCFG Command: Set Operator • 6.4 +COPS Command: Operator Selection • 6.5 +CPOL Command: Preferred PLMN List • 6.6 +CREG Command: Network Registration • 6.8 +CEREG Command: EPS Network Registration Status • 9.4 Connection of PDP Contexts • 9.8.3 +KIPOPT Command: General Options Configuration • 9.9 SSL Configuration • 9.12.2 +KUDPRCV Command: Receive Data through a UDP Connection • Table 4 Command Timeout • 12.3.2 CEER Error Codes
		Deleted: • 6.3 CNUM Command: Subscriber Number • 7 Phone Book Management

Contents

List of Tables

1. Introduction

This document presents the AT command set for the AirPrime HL78xx series of embedded modules.

1.1. Reference Configuration

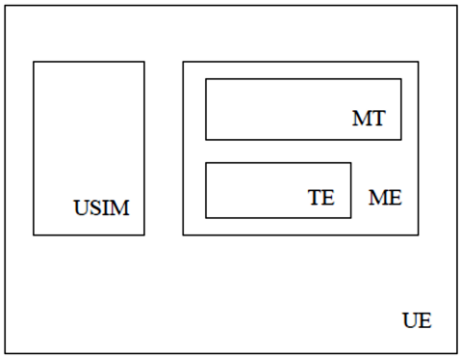


Figure 1. Reference Configuration

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, default parameters are underlined and 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 special case of a TA setup for no answer).

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

Classical messages	**OK** or **ERROR**
Extended Error message (see AT+CMEE)	**+CME ERROR: <n>**
	(See Appendix for the different values for **<n>**)
Numeric Mode	**<n>** with: <**n>** = 0 ⇔ OK or **<n>** is an error code

1.2.3. AT Commands on Separate Lines

When a series of AT commands are entered 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 channels (UART) configured in AT command mode.

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

1.4. SIM Application Toolkit

SIM Toolkit modes cannot be managed by AT commands. By default, SIM Toolkit is active and in silent mode.

1.5. Document Modification

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

Information provided for the commands are subject to change without notice.

1.6. 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 Error 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
DSR	Data Set Ready

Abbreviation	Definition
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
MNC	Mobile Network Code
MNP	Microcom Networking Protocol

Abbreviation	Definition
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
RI	Ring Indicator
RIL	Radio Interface Layer
RLP	Radio Link Protocol

Abbreviation	Definition
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

HL7800	
Execute command Syntax **+++**	 Response **OK**
Reference V.25Ter	Notes • 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 **ATO[n]**. • Line needs one second silence before and one second after (do not end with terminating character). • The "+" character may be changed with **ATS2**. • The +++ characters are not transmitted in the data flow.

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

HL7800	
Test command Syntax **ATO[<n>]**	 Response TA returns to data mode from command mode: **CONNECT <text>** If connection is not successfully resumed: **NO CARRIER** Parameter **<n>** 0 Switch from command mode to data mode 1 – 200 Session ID
Reference V.25Ter	Notes **ATO** is the alternative command to the +++ escape sequence described in section 2.1. When a data call has been established and TA is in command mode, **ATO** causes the TA to resume the data connection and return to data mode.

2.3. E Command: Enable Echo Command

HL7800	
Execute command Syntax **ATE[<value>]**	 Response **OK** or **+CME ERROR: <err>** Parameter **<value>** 0 Echo OFF 1 Echo ON
Notes	• This setting determines whether the TA echoes characters received from the TE in the command state. • <value> is set for all AT ports.

2.4. &K Command: Flow Control Option

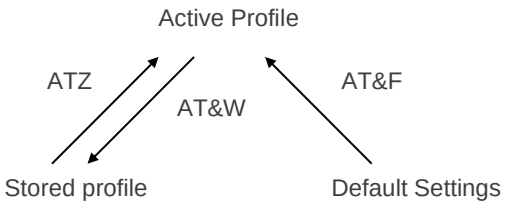
HL7800	
Execute command Syntax **AT&K[<mode>]**	 Response **OK** Parameter **<mode>** 0 Disable all flow control 3 Enable RTS/CTS flow control
Reference Rockwell Rev4	Notes Sierra Wireless recommends the use of hardware flow control.

2.5. &F Command: Restore Factory Settings

HL7800	
Execute command Syntax **AT&F[<value>]**	 Response **OK** Parameter **<value>** 0 or Omitted Restore parameters to factory settings

HL7800	
Reference V.25Ter	Notes • See also **AT&V**. • Restore factory settings to active profile. • Default factory settings for HL78xx are: **E1 Q0 V1 X4 &C1 &D1 &R1 &S0 +IFC=2,2 &K3 +IPR=115200 +FCLASS0 S00:0 S01:0 S03:13 S04:10 S05:8 S07:255 S08:0 S10:1**
Examples	**AT&F** **OK** **AT&F0** **OK** **AT&F1** **ERROR**

2.6. &V Command: Display Current Configuration

HL7800	
Execute command Syntax **AT&V[<value>]**	Response **ACTIVE PROFILE:** **<current configuration>** **STORED PROFILE 0:** **<user0 default configuration>** **STORED PROFILE 1:** **<user1 default configuration>** **OK** Parameter **<value>** 0 or Omitted All Profiles
Reference Sierra Wireless Proprietary	Notes • 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 manufactory, the product and the user setup. • **AT&V** lists **+IFC** and **S01** parameters which are directly editable. **+IFC** answer reflects the flow control parameters set by **AT&K**.
Example	**E1 Q0 V1 X4 &C1 &D1 &R1 &S0 +IFC=2,2 &K3 +IPR=115200 +FCLASS0 S00:0 S01:0 S03:13 S04:10 S05:8 S07:255 S08:0 S10:1** This command indicates the result of certain actions as shown below: 

2.7. &W Command: Write Current Configuration

HL7800	
Execute command Syntax **AT&W[<value>]**	 Response **OK** Parameter **<value>** 0 or Omitted — Save in STORED PROFILE 0 1 — Save in STORED PROFILE 1
Reference V.25Ter	Notes • This command saves the current configuration in a non-erasable place. • See also **AT&V**. Configuration saved: E — Echo Q — Set result code presentation mode V — Verbose X — Extended result code &C — DCD control &D — DTR behavior &R — RTS control &S — DSR control +IFC — Reflect Flow Control set by **AT&K** &K — Flow control +IPR — Set Fixed Local/DTE Rate FCLASS — FCLASS S0 — Set number of rings before automatically answering the call S3 — Write command line termination character S4 — Set response formatting character S5 — Write command line editing character S7 — Set number of seconds to wait for connection completion S8 — Comma dial modifier time S10 — Automatic disconnect delay
Example	**AT&W** // Save current configuration to Profile 0 **OK** **AT&W0** // Save current configuration to Profile 0 **OK** **AT&W1** // Save current configuration to Profile 1 **OK**

2.8. Z Command: Reset and Restore User Configuration

HL7800	
Execute command Syntax **ATZ[<value>]**	 Response **OK** Parameter **<value>** 0 Reset and restore user configuration with profile 0 1 Reset and restore user configuration with profile 1
Reference V.25ter	Notes See also AT&V

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

HL7800	
Test command Syntax **AT+IPR=?**	 Response **+IPR: (**list of supported auto-detectable **<rate>**s**)[,(**list of fixed-only **<rate>**s**)]** **OK**
Read command Syntax **AT+IPR?**	 Response **+IPR: <rate>** **OK**
Write command Syntax **AT+IPR=<rate>**	 Response **OK** or **ERROR** Parameter **<rate>** Rate in bits per second 4800, 9600, 19200, 38400, 57600, 115200 (default value), 230400, 460800
Reference ITU-T V.250	Notes • Configuration is saved in non-volatile memory using **AT&W**. • Once the **OK** response is received, the new <rate> is effective after about 2s.

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

HL7800	
Execute command Syntax **AT&C<value>**	 Response **OK** Parameter **<value>** 0 DCD line is always active 1 DCD line is active in the presence of data carrier only (data call ongoing)
Reference V.25Ter	Notes See data stored by **&W** for default value.

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

HL7800	
Execute command Syntax **AT&D<value>**	 Response **OK** Parameters **<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 drop from active to inactive - disconnect data call, change to command mode.
Reference V.25Ter	Notes See data stored by **&W** for default value.

2.12. &S Command: DSR Option

HL7800	
Execute command Syntax **AT&S [<override>]**	 Response **OK** Parameter **<override>** 0 or Omitted DSR signal is always active 1 DSR signal is always inactive

HL7800	
Reference V.25ter	Notes See data stored by **&W** for default value.

2.13. &R Command: RTS/CTS Option

HL7800	
Execute command Syntax **AT&R<option>**	 Response **OK** Parameter **<option>** 1 In sync mode, CTS is always ON (RTS transitions are ignored). In async mode, CTS will only drop if required by the flow control.
Notes	This selects how the modem controls CTS. CTS operation is modified if hardware flow control is selected (see **AT&K**). The parameter value, if valid, is written to S21 bit2.

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

HL7800	
Read command Syntax **ATS2?**	 Response **<n>** **OK**
Write command Syntax **ATS2=<n>**	 Response **OK** Parameter **<n>** Only 43 ("+") is supported
Reference V.25Ter	Notes • 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.

2.15. S4 Command: Set Response Formatting Character

HL7800	
Read command Syntax **ATS4?**	 Response **<n>** **OK**
Write command Syntax **ATS4=<n>**	 Response **OK** Parameter **<n>** 10 Response formatting character <LF>: line feed.
Reference V.25Ter	Notes • <n> determines the character recognized by TA to terminate answer line. The value is set to 10 and cannot be changed. • See data stored by **&W** for default value.

2.16. +IFC Command: DTE-DCE Local Flow Control

HL78xx	
Test command Syntax **AT+IFC=?**	 Response **+IFC: (**list of supported **<DCE_by_DTE>**s**),(**list of supported **<DTE_by_DCE>**s**)** **OK**
Read command Syntax **AT+IFC?**	 Response **+IFC: <DCE_by_DTE>,<DTE_by_DCE>** **OK**
Write command Syntax **AT+IFC=** **<DCE_by_DTE>,** **<DTE_by_DCE>**	 Response **OK** Parameters **<DCE_by_DTE>** Local flow control parameter 0 None 2 RTS (default value) **<DTE_by_DCE>** Local flow control parameter 0 None 2 CTS (default value)

HL78xx	
Reference Sierra Wireless Proprietary	Notes • Hardware flow control is only effective for AT UART. • Configuration is saved in non-volatile memory using **AT&W**. • The valid pairs of values for **AT+IFC** are '0,0' and '2,2' as only 'Auto RTS CTS - Hardware' flow control or no flow control are supported. • **+IFC** response reflects the flow control parameters set by the **AT&K** command.
Examples	**AT+IFC=?** **+IFC: (0,2),(0,2)** **OK** // Possible settings: **AT+IFC=0,0** **OK** **AT+IFC?** **+IFC: 0,0** **OK** **AT+IFC=2,2** **OK** **AT+IFC?** **+IFC: 2,2** **OK**

3. General AT Commands

3.1. I Command: Request Identification Information

HL7800	
Execute command Syntax **ATI[<n>]**	Response // depends on <n> **OK** Parameters **<n>** 0 or Omitted Display model information (equivalent to +CGMM/+GMM) 3 Display revision identification (equivalent to +CGMR/+GMR) 8 Display modem software version 9 Display component details: <Long revision identification> <Build Date and Time> IMEI-SV: <IMEI-SV version> Legato RTOS: <Legato RTOS version and binary date> <Component>: <Component version> <Component>: <Component version> <Component>: <Component version> … **<Long revision identification>** ASCII string **<Build Date and Time>** YYYY/MM/DD HH:MM:SS **<Legato RTOS version and binary date>** ASCII string **<IMEI-SV version>** 16 digits IMEISV (8 digits for TAC + 6 digits for SNR + 2 SVN digits) **<Component>** Embedded software component type; ASCII string "atSwi" "UBOOT" "Apps" "Modem Apps" "MAC" "PHY" "PMP" **<Component version>** Version of the software component; ASCII string
Reference V.25ter	Notes • **ATI3** is identical to **AT+GMR** and **AT+CGMR**. • **ATI** is identical to **AT+GMM** and **AT+CGMM**.

HL7800	
Examples	**ATI** **HL7800** // When using an HL7800 module; model identification can be // customer dependent **OK** **ATI0** **HL7800** **OK** **ATI3** **AHL7800.1.2.0.20171116** **OK** **ATI8** **HL7800.1.2.3** **OK** **ATI9** **HL7800.1.2.3** **AHL78xx.1.2.3.1.RK_01_00_00_00_14.20171211** **2017/12/11 11:44:30** **IMEI: 3533470800001402** **Legato RTOS: 17.06.0.rc5 2017/12/31 12:10** **atSwi: 01.02** **UBOOT: 01.02** **Apps: RKAPP_01_00_00_00_15__e41c9ccf65c771ccf41885ea1fbb762b320f3886** **Modem Apps: ALT1250_01_00_00_00_04_MA** **MAC: ALT1250_01_00_00_00_11_FW** **PHY: 12.10.158472** **PMP: 165845** **OK**

3.2. +CGMI/+GMI Command: Request Manufacturer Identification

HL7800	
Test command Syntax **AT+CGMI=?** **AT+GMI=?**	 Response **OK**
Execute command Syntax **AT+CGMI** **AT+GMI**	 Response **Sierra Wireless** **OK**

HL7800	
Examples	**AT+CGMI** **Sierra Wireless** **OK** **AT+GMI** **Sierra Wireless** **OK**

3.3. +CGMM/+GMM Command: Request Model Identification

HL7800	
Test command Syntax **AT+CGMM=?** **AT+GMM=?**	 Response **OK**
Execute command Syntax **AT+CGMM** **AT+GMM**	 Response **<model>** **OK** Parameter **<model>** Model indentification text; maximum of 2048 characters (including line terminators)
Notes	This command is identical to **ATI** and **ATI0**.
Examples	**AT+CGMM** **HL7800** //When using an HL7800 module **OK** **AT+GMM** **HL7800** //When using an HL7800 module **OK**

3.4. +CGMR/+GMR Command: Request Revision Identification

HL7800	
Test command Syntax **AT+CGMR=?** **AT+GMR=?**	 Response **OK**
Execute command Syntax **AT+CGMR** **AT+GMR**	 Response **<SW release>** **OK** Parameter **<SW release>** Software release
Notes	This command is identical to **ATI3**.
Examples	**AT+CGMR** **AHL7800.1.2.3.1.20171211** **OK** **AT+GMR** **AHL7800.1.2.3.1.20171211** **OK**

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

HL7800	
Test command Syntax **AT+CGSN=?**	 Response **+CGSN: (**list of supported **<snt>**s**)** **OK**
Execute command Syntax **AT+CGSN** **[=<snt>]**	 Response When <snt>=0 (or omitted) and command is successful: **<sn>** **OK** When <snt>=1 and command is successful: **+CGSN: <imei>** **OK** When <snt>=2 and command is successful: **+CGSN: <imeisv>** **OK**

HL7800	
	When <snt>=3 and command is successful: **+CGSN: <svn>** **OK** or **+CME ERROR: <err>** Parameters **<snt>** 0 Returns the IMEI 1 Returns the IMEI 2 Returns the IMEISV 3 Returns the SVN **<sn>, <imei>** International Mobile Station Equipment Identity **<imeisv>** International Mobile Station Equipment Identity and Software Version Number **<svn>** Software Version Number
Reference 27.007 Rev13	Notes • This command can work with or without a SIM. • See also **AT+KGSN**.

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

HL7800	
Test command Syntax **AT+KGSN=?**	 Response **+KGSN:** (list of supported **<number type>**s) **OK**
Execute command Syntax **AT+KGSN=<number type>**	 Response 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**

HL7800	
	If **<number type>** = 4 **+KGSN: <CSN>** **OK** Parameters **<IMEI>** 15-digit IMEI (8 digits for TAC + 6 digits for SNR + 1 check digit) **<IMEISV>** 16-digit IMEISV (8 digits for TAC + 6 digits for SNR + 2 SVN digits) **<IMEISV_STR>** Formatted string: <14 digits>-<Check digit> SV: <Software version> **<FSN>** 14-digit Serial Number **<CSN>** Customer Serial Number (limited to 2048 characters)
Reference Sierra Wireless Proprietary	Notes This command is used to get the IMEI (International Mobile Equipment Identity) and the software revision.
Examples	**AT+KGSN=0** **+KGSN: 351578000023006** **OK** **AT+KGSN=1** **+KGSN: 3515780000230001** **OK** **AT+KGSN=2** **+KGSN: 35157800002300-6 SV:01** **OK** **AT+KGSN=3** **+KGSN: T5640400011101** **OK** **AT+KGSN=4** **+KGSN: 00000000000000** **OK**

3.7. +CSCS Command: Set TE Character Set

HL7800	
Test command Syntax **AT+CSCS=?**	 Response **+CSCS:** (list of supported **<chset>**s) **OK**

HL7800	
Read command Syntax **AT+CSCS?**	 Response **+CSCS: <chset>** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+CSCS=** **[<chset>]**	 Response **OK** or **+CME ERROR: <err>** Parameter **<chset>** "UCS2" 16-bit universal multiple-octet coded character set (ISO/IEC 10646) "8859-1" ISO 8859 Latin 1-character set "IRA" International reference alphabet "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 converstions to the original MT character set shall be done "PCCP437" PC character set code page 437
Reference 27.007 Rev8	Notes • This command only affects SMS AT commands. • The value of <chset> is saved in non-volatile memory.

3.8. +CIMI Command: Request International Mobile Subscriber Identity

HL7800	
Test command Syntax **AT+CIMI=?**	 Response **OK**
Execute command Syntax **AT+CIMI**	 Response **<IMSI>** **OK** or **+CME ERROR: <err>** Parameter **<IMSI>** International Mobile Subscriber Identity
Reference	27.007 Rev12

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

HL7800	
Test command Syntax **AT+GSN=?**	 Response **OK**
Execute command Syntax **AT+GSN**	 Response **<IMEI>** (identification text for determination of the individual ME) **OK**
Reference 27.007 Rev13	Notes • This command can work with or without a SIM. • See also **AT+KGSN**.

3.10. +GCAP Command: Request Complete TA Capability List

HL7800	
Execute command Syntax **AT+GCAP**	 Response **+GCAP: +CLTE-M1** **OK**
Reference	ITU-T V.250

3.11. +CMUX Command: Multiplexer

HL7800	
Test command Syntax **AT+CMUX=?**	 Response **+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**
Read command Syntax **AT+CMUX?**	 Response **+CMUX: <mode>,<subset>,<port speed>,<N1>,<T1>,<N2>,<T2>,<T3>[,<k>]** **OK**

HL7800

Write command

Syntax
AT+CMUX=<mode>[,[<subset>][,[<port_speed>][,[<N1>][,[<T1>][,[<N2>][,[<T2>][,[<T3>][,[<k>]]]]]]]]

Response
OK

or
+CME ERROR: <error>
OK

Parameters
<mode> Multiplexer Transparency Mechanism
0 Basic option
1 Advanced option (not supported)

<subset>
0 UIH frames used only
1 UI frames used only; currently not supported
2 I frames used only; currently not supported

<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
7 460 800 bit/s
8 1 Mbit/s

<N1> 1 – 1509 Maximum frame size; default value = 31 (64 if advanced option is used)

<T1> 1 – 255 Acknowledgement timer in units of ten milliseconds; default value = 10 (100 ms)

<N2> 0 – 100 Maximum number of re-transmissions; default value = 3. Note that currently, only range 0 – 5 is supported

<T2> 2 – 255 Response timer for the multiplexer control channel in units of ten milliseconds; default value = 30 (300 ms). Note that <T2> must be longer than <T1>.

<T3> 1 – 255 Wake up response timer in seconds; default value = 10. This parameter is currently not supported. In case of read command, 0 is returned.

<k> 1 – 7 Window size for Advanced operation with Error Recovery options; default value = 2. This parameter is currently not supported. In case of read command, 0 is returned.

Reference
[27.007] § 5.7

Notes
- This command enables the multiplexing protocol control channel as defined in 3GPP GSM27.010. It sets parameters for the Control Channel (DLC0). If optional parameters are left out, the default values are used except for <port speed>; the current baudrate for the communication channel will remain (the read command provides current baudrate). The final response code **OK** or **CME ERROR: <err>** is returned using the old interface speed; the parameters become active only after sending **OK**.

HL7800	
	• 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 **AT+CFUN** 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).

3.12. +WPPP Command: PDP Context Authentication Configuration

HL7800	
Test command Syntax **AT+WPPP=?**	Response **+WPPP:** (list of supported **<Auth>**s),(list of supported **<cid>**s) **OK**
Read command Syntax **AT+WPPP?**	Response **+WPPP: <Auth>,[<cid>],[<username>],[<password>]** **OK**
Write command Syntax **AT+WPPP= <Auth>,[<cid>], [<username>], [<password>]**	Response **OK** or **+CME ERROR <err>** Parameters **<Auth>** Type of authentication supported 0 None 1 PAP 2 CHAP **<cid>** PDP context identifier used in **+CGDCONT**. If this parameter is omitted, the <Auth> setting applies to all PDP contexts. In this case, there must be at least one PDP context defined in **AT+CGDCONT**. If this parameter is present, the <Auth> setting applies to this PDP context. In both cases, the parameters are saved into non-volatile memory. **<username>** Login for the APN. String type, up to 64 characters **<password>** Password for the APN. String type, up to 64 characters

HL7800	
Reference Sierra Wireless Proprietary Command	Notes The write command can be used only if the module has no PDP context activated. To set the parameters, it is required to deactivate the context or switch the radio off before sending the write command and reactivate or switch the radio on after.
Examples	**AT+WPPP=?** **+WPPP: (0-2),(1-5)** **OK** **AT+WPPP=1,1,"myusername","mypassword"** **OK** **AT+WPPP?** **+WPPP: 1,1,"myusername","mypassword"** **OK**

3.13. +HWREV Command: Request Hardware Revision

HL7800	
Test command Syntax **AT+HWREV=?**	 Response **OK**
Execute command Syntax **AT+HWREV**	 Response **+HWREV: <hardware revision>** **OK** Parameter **<hardware revision>** Module hardware revision represented by 2 digits, separated by a decimal point
Reference Sierra Wireless Proprietary Command	Note • This command gives the module's hardware revision. • This command is available even if SIM is not inserted.
Examples	**AT+HWREV=?** **OK** **AT+HWREV** **+HWREV: 1.0** **OK**

4. Call Control Commands

4.1. D Command: Dial Number

<table>
<tr><th colspan="2">HL7800</th></tr>
<tr><td>Test command

<u>Syntax</u>
ATD=?</td><td>

<u>Response</u>
1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ !
OK</td></tr>
<tr><td>Read command

<u>Syntax</u>
ATD?</td><td>

<u>Response</u>
1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ !
OK</td></tr>
<tr><td>Execute command

<u>Syntax</u>
ATD[<n>]</td><td>

<u>Response</u>
OK If successfully connected
CONNECT Connection has been established
RING The DCE has detected an incoming call signal from the network
NO CARRIER The connection cannot be established
BUSY Engaged (busy) signal detected
NO ANSWER If no hang up is detected after a fixed network timeout
CONNECT <data rate> Same as CONNECT but includes the data rate
RING CTM The MS has detected an incoming CTM call signal from the network; this code is proprietary
CONNECT FAX Same as CONNECT but includes the indication related to a fax call

<u>Parameter</u>
<n> String of dialing digits and optionally V.25ter modifiers (dialing digits): 0-9, * , #, +, A, B, C, D, P, T, W, ,, @, ! (maximum length: 20 digits)</td></tr>
<tr><td><u>Reference</u>
V.25Ter</td><td><u>Notes</u>
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).</td></tr>
<tr><td><u>Examples</u></td><td>ATD*99***3#
CONNECT
~ÿ}#À!}!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~~ÿ}#À!}!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~~ÿ}#À!}!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~~ÿ}#À!}!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~~ÿ}#À!}!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~~ÿ}#À!}!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~~ÿ}#À!}!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~~ÿ}#À!}!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~~ÿ}#À!}!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~
NO CARRIER</td></tr>
</table>

HL7800	
	ATD=? **1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ !** **OK**

4.2. +CEER Command: Extended Error Report

HL7800	
Test command Syntax **AT+CEER=?**	 Response **OK**
Write command Syntax **AT+CEER**	 Response **+CEER: <report>** **OK** Parameter **<report>** Error information given by the network in text format. Empty if no report is available. Possible <report> values are listed in 12.3.2 CEER Error Codes.
Reference	27.007 Rev12

4.3. +CMEE Command: Report Mobile Termination Error

HL7800	
Test command Syntax **AT+CMEE=?**	 Response **+CMEE:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CMEE?**	 Response **+CMEE: <n>** **OK**
Execute command Syntax **AT+CMEE=[<n>]**	 Response **OK** Parameter **<n>** 0 Disable +CME ERROR: <err> result code and use ERROR instead 1 +CME ERROR: <err> result code and use numeric <err> values
Reference	27.007 Rev12

5. Mobile Equipment Control and Status Commands

5.1. +CCLK Command: Real Time Clock

HL7800	
Test command Syntax **AT+CCLK=?**	 Response **OK**
Read command Syntax **AT+CCLK?**	 Response **+CCLK: <time>** or **+CME ERROR: <err>**
Write command Syntax **AT+CCLK=<time>**	 Response **OK** or **+CME ERROR: <err>** Parameter **<time>** String type value with format "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (last two digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range = -96 to +96). E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"
Reference 27.007 Rev12	Notes • Currently, when **AT+CTZU=0** is set, then time is set with **AT+CCLK=<time>** • <time> is not retained after a power cycle or software reset and it cannot be updated by NITZ or SIB16.

5.2. +CCID Command: Request SIM Card Identification

HL7800	
Test command Syntax **AT+CCID=?**	 Response **OK**

HL7800	
Read command Syntax **AT+CCID?**	 Response **+CCID: <ICCID>** **OK** or **+CME ERROR: <error>**
Execute command Syntax **AT+CCID**	 Response **+CCID: <ICCID>** **OK** or **+CME ERROR: <error>** Parameter **<ICCID>** Integrated Circuit Card ID of the SIM card

5.3. +CLAC Command: List Available AT Commands

HL7800	
Execute command Syntax **AT+CLAC**	 Response **<AT command 1>** **[<CR><LF><AT command 2>[..]]** **OK** or **+CME ERROR: <err>** Parameter **<AT command>** AT command (including the prefix “AT”)
Notes	This command provides the AT command list available for the user.

5.4. +CFUN Command: Set Phone Functionality

HL7800	
Test command Syntax **AT+CFUN=?**	 Response **+CFUN:** (list of supported **<fun>**s), (list of supported **<rst>**s) **OK** or **+CME ERROR: <err>**
Read command Syntax **AT+CFUN?**	 Response **+CFUN: <fun>** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+CFUN=<fun>[,<rst>]**	 Response **OK** or **+CME ERROR: <err>** Parameters **<fun>** 0 Minimum functionality 1 Full functionality 4 Disable phone both transmit and receive RF circuits 5 – 127 Not supported **<rst>** 0 Do not reset the MT before setting it to <fun> power level 1 Reset the MT before setting it to <fun> power level.
Reference 27.007 Rev11	Notes **AT+CFUN=4,1** is not supported.

5.5. +CPIN Command: Enter Pin

HL7800	
Test command Syntax **AT+CPIN=?**	 Response **OK**

HL7800	
Read command Syntax **AT+CPIN?**	 Response **+CPIN: <code>** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+CPIN=<pin> [,<newpin>]**	 Response **OK** or **+CME ERROR: <err>** Parameters **<code>** READY — MT is not pending for any password SIM PIN — MT is waiting for SIM PIN to be given SIM PUK — MT is waiting for SIM PUK to be given SIM PIN2 — MT is waiting 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 ME does not block its operation). PH-SIM PIN — MT is waiting for the phone-to-SIM card password to be given PH-NET PIN — MT is waiting for the network personalization password to be given **<pin>, <newpin>** String type values
Reference	27.007 Rev12

5.6. +CPAS Command: Phone Activity Status

HL7800	
Test command Syntax **AT+CPAS=?**	 Response **+CPAS:** (list of supported **<pas>**es) **OK** or **+CME ERROR: <err>**

HL7800	
Execute command Syntax **AT+CPAS**	 Response **+CPAS: <pas>** **OK** or **+CME ERROR: <err>** Parameter **<pas>** 0 Ready (ME allows commands from TA/TE)
Reference 27.007 Rev12	Notes This command reflects the data connection status.

5.7. +CSQ Command: Signal Quality

HL7800	
Test command Syntax **AT+CSQ=?**	 Response **+CSQ:** (list of supported **<rssi>**s),(list of supported **<ber>**s) **OK**
Execute command Syntax **AT+CSQ**	 Response **+CSQ: <rssi>,<ber>** **OK** or **+CME ERROR: <err>** Parameters **<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 **<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
Reference	27.007 Rev12

5.8. +KSREP Command: Mobile Start-up Reporting

HL7800	
Test command Syntax **AT+KSREP=?**	 Response **+KSREP:** (list of supported **<act>**s) **OK**
Read command Syntax **AT+KSREP?**	 Response **+KSREP: <act>,<stat>** **OK**
Write command Syntax **AT+KSREP=<act>**	 Response **OK** Parameters **<act>** Indicates if the module must send an unsolicited code during the startup 0 The module doesn't send an unsolicited code 1 The module will send an unsolicited code **<stat>** This code indicates the status of the module 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. (The **AT+CPIN?** command can be used to determine it) 2 The SIM card is not present 3 The module is in "SIMlock" state 4 Unrecoverable error 5 Unknown state 6 Inactive SIM
Unsolicited Notification	Response **+KSUP: <stat>**
Reference Sierra Wireless Proprietary	Notes • Current configuration is kept in non-volatile memory after reset. • The unsolicited notification is sent once after the boot process, and after waking up from LITE HIBERNATE or HIBERNATE.

5.9. +CSIM Command: Generic SIM Access

HL7800	
Test command Syntax **AT+CSIM=?**	 Response **OK**

HL7800	
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
Reference 27.007 Rev12	Notes Compared to **+CRSM**, the definition of **+CSIM** allows the TE to take more control over the SIM-ME interface. The locking and unlocking of the interface may be done by a special <command> value or automatically by TA/ME (by interpreting the <command> parameter). In case the TE application does not use the unlock command (or does not send a <command> causing automatic unlock) in a certain timeout value, ME may release the locking.

5.10. +CCHO Command: Open Logical Channel

HL7800	
Test command Syntax **AT+CCHO=?**	 Response **OK**
Write command Syntax **AT+CCHO= <dfname>**	 Response **<session_id>** **OK** or **+CME ERROR: <err>** Parameters **<dfname>** All selectable applications in the UICC are referenced by a DF name coded on 1 – 16 bytes **<sessionid>** Session ID to target a specific application on the USIM using logical channels mechanisms.
Reference	27.007 Rev12

5.11. +CCHC Command: Close Logical Channel

HL7800	
Test command Syntax **AT+CCHC=?**	 Response **OK**
Write command Syntax **AT+CCHC= <session_id>**	 Response **OK** or **+CME ERROR: <err>** Parameter **<sessionid>** Session ID to target a specific application on the USIM using logical channels mechanisms.
Reference	27.007 Rev12

5.12. +CRSM Command: Restricted SIM Access

HL7800	
Test command Syntax **AT+CRSM=?**	 Response **OK**
Write command Syntax **AT+CRSM= <command> [,<fileid>[,<P1>, <P2>,<P3> [,<data> [,<pathid>]]]]**	 Response **+CRSM: <sw1>,<sw2>[,<response>]** **OK** or **+CME ERROR: <err>** Parameters **<command>** 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS 203 RETRIEVE DATA 219 SET DATA **<fileid>** Integer type; this is the identifier of an elementary data file on the SIM. Mandatory for every command except STATUS.

HL7800	
	<P1>, <P2>, <P3> Integer type defining the request. These parameters are mandatory for every command, except GET RESPONE and STATUS. The values are described in 3GPP TS 51.011 [28] **<data>** Information to be written to the SIM **<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). This parameter will only be used in the mode "select by path from MF" as defined in ETSI TS 102 221 [60]. **<sw1>, <sw2>** Integer type containing from information the SIM about the execution of the actual command. These parameters are delivered to the TE in either successful or failed executions of the command. **<response>** Response of successful completion of the command previously issued. STATUS and GET RESPONSE returns data, which gives information about the current elementary data field. This information includes the type of file and its size (refer to 3GPP TS 51.011 [28]). After READ BINARY, READ RECORD or RETRIEVE DATA commands, the requested data will be returned. <response> is not returned after a successful UPDATE BINARY, UPDATE RECORD or SET DATA command.
Reference 27.007 Rev12	Notes By using this command instead of the generic SIM access command, **+CSIM**, the DTE application has an easier but more limited access to the SIM database.

5.13. +CTZU Command: Automatic Time Zone Update

HL7800	
Test command Syntax **AT+CTZU=?**	 Response **+CTZU:** (list of supported **<onoff>**s) **OK**
Read command Syntax **AT+CTZU?**	 Response **+CTZU: <onoff>** **OK**
Write command Syntax **AT+CTZU =<onoff>**	 Response **OK** or **+CME ERROR: <err>** Parameter **<onoff>** 0 Disable automatic time zone update via NITZ 1 Enable automatic time zone update via NITZ
Reference	27.007 Rev12

5.14. +CTZR Command: Time Zone Reporting

HL7800	
Test command Syntax **AT+CTZR=?**	 Response **+CTZR:** (list of supported **<reporting>**s) **OK**
Read command Syntax **AT+CTZR?**	 Response **+CTZR: <reporting>** **OK**
Write command Syntax **AT+CTZR= <reporting>**	 Response **OK** or **+CME ERROR: <err>** Parameters **<reporting>** 0 Disable time zone change event reporting 1 Enable time zone change event reporting with URC **+CTZV: <tz>** 2 Enable time zone change event reporting with URC **+CTZE: <tz>,<dst>,[<time>]** **<tz>** Sum of the local time zone (difference between the local time and GMT expressed in quarters of an hour) plus daylight saving time. The format is "±zz", expressed as a fixed width, 2-digit integer with range -48 to +56. To maintain a fixed width, numbers in the range -9 to +9 are expressed with a leading zero, e.g. "-09", "+00" and "+09". **<dst>** 0 <tz> includes no adjustment for Daylight Saving Time 1 <tz> includes +1 hour (equals 4 quarters in <tz>) adjustment for Daylight Saving Time 2 <tz> includes +2 hours (equals 8 quarters in <tz>) adjustment for Daylight Saving Time **<time>** Local time in format "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). Local time can be derived by the MT from information provided by the network at the time of delivering time zone information and will be present in the unsolicited result code for extended time zone and local time reporting if the universal time is provided by the network.
Reference 27.007 Rev12	Notes • <reporting> is saved into non-volatile memory when the write command is sent. • URCs are enabled on all AT ports, including CMUX DLC.

5.15. +CPSMS Command: Power Saving Mode setting

HL7800	
Test command Syntax **AT+CPSMS=?**	 Response **+CPSMS: (**list of supported **<mode>**s**),** **(**list of supported **<Requested_Periodic-RAU>**s**),** **(**list of supported **<Requested_GPRS-READY-timer>**s**),** **(**list of supported **<Requested_Periodic-TAU>**s**),** **(**list of supported **<Requested_Active-Time>**s**)**
Read command Syntax **AT+CPSMS?**	 Response **+CPSMS: <mode>,** **[<Requested_Periodic-RAU>],** **[<Requested_GPRS-READY-timer>],** **[<Requested_Periodic-TAU>],** **[<Requested_Active-Time>]**
Write command Syntax **AT+CPSMS=** **[<mode>** **[,<Requested_** **Periodic-RAU>** **[,<Requested_** **GPRS-READY-** **timer>** **[,<Requested_** **Periodic-TAU>** **[,<Requested_** **Active-Time>]]]]]**	 Response **OK** Parameters **<mode>** Indication to disable or enable the use of PSM in the UE; integer type 0 Disable the use of PSM 1 Enable the use of PSM **<Requested_Periodic-RAU>** Requested extended periodic RAU. String type; one byte in an 8 bit-format **<Requested_GPRS-READY-timer>** Requested GPRS READY timer value (T3314) to be allocated to the UE in GERAN/UTRAN. String type; one byte in an 8-bit format **<Requested_Periodic-TAU>** Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. String type; one byte in an 8-bit format. **<Requested_Active-Time>** Requested Active Time value (T3324) to be allocated to the UE. String type; one byte in an 8-bit format.
Reference	27.007 Rev12

5.16. +CEDRXS Command: eDRX Setting

HL7800	
Test command Syntax **AT+CEDRXS=?**	 Response **+CEDRXS: (**list of supported **<mode>**s**),(**list of supported **<AcT-type>**s**),(**list of supported **<Requested_eDRX_value>**s**)**
Read command Syntax **AT+CEDRXS?**	 Response **[+CEDRXS: <AcT-type>, <Requested_eDRX_value>** **[<CR><LF>+CEDRXS: <AcT-type>, <Requested_eDRX_value>** **[…]]]** **OK**
Write command Syntax **+CEDRXS=** **[<mode>** **[,<AcT-type>** **[,<Requested_** **eDRX_value>]]]**	 Response **OK** Parameters **<mode>** Integer type, indicates to disable or enable the use of eDRX in the UE 0 Disable the use of eDRX 1 Enable the use of eDRX 2 Enable the use of eDRX and enable the unsolicited result code **+CEDRXP: <AcT-type>[,<Requested_eDRX_value>** **[,<NW-provided_eDRX_value>[,<Paging_time_window>]]]** 3 Disable the use of eDRX and discard all parameters for eDRX **<AcT-type>** Integer type, indicates the type of access technology 0 Access technology is not using eDRX (not supported) 4 E-UTRAN (WB-S1 mode) 5 E-UTRAN (NB-S1 mode) (not supported) **<Requested_eDRX_value>** String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element. **<NW-provided_eDRX_value>** String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element **<Paging_time_window>** String type; half a byte in a 4-bit format. The paging time window referes to bit 8 to 5 of octet 3 of the Extended DRX parameters information element
Reference	27.007 Rev13

5.17. +CEDRXRDP Command: eDRX Read Dynamic Parameters

HL7800	
Test command Syntax **AT+ CEDRXRDP=?**	 Response **OK**
Read command Syntax **AT+CEDRXRDP**	 Response **+CEDRXRDP: <AcT-type>[,<Requested_eDRX_value[,<NW-provided_eDRX_value>[,<Paging_time_window>]]]** **OK** Parameters **<AcT-type>** Indicates the type of access technology 0 Access technology does not use eDRX 4 E-UTRAN (WB-S1 mode) 5 E-UTRAN (NB-S1 mode) **<Requested_eDRX_value>** String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element. **<NW-provided_eDRX_value>** String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element **<Paging_time_window>** String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element
Reference TS 27.007 Rev13	Notes This command is used to specify the relationship between the type of access technology and the requested eDRX value.

5.18. +CESQ Command: Extended Signal Quality

HL7800	
Test command Syntax **AT+CESQ=?**	 Response **+CESQ: (**list of supported **<rxlev>**s**),(**list of supported **<ber>**s**),(**list of supported **<rscp>**s**),(**list of supported **<ecno>**s**),(**list of supported **<rsrq>**s**),(**list of supported **<rsrp>**s**)** **OK**
Execute command Syntax **AT+CESQ**	 Response **+CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>** **OK**

HL7800	
	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) 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) 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 … 95 -46 dBm ≤ rsrp < -45 dBm 96 -45 dBm ≤ rsrp < -44 dBm 97 -44 dBm ≤ rsrp 255 Not known or not detectable
Reference 27.007 Rev12	Notes • If the current serving cell is not a GERAN cell, <rxlev> and <ber> are set to value 99. • If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rscp> 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.

HL7800	
	• Consequently, the HL7800 will return: ▪ 99 for <rxlev> and <ber> ▪ 255 for <rscp> and <ecno>

5.19. +KBNDCFG Command: Set Configured LTE Band(s)

Warning: *RF bands must be set prior to using the module. It is highly recommended to limit the number of enabled RF bands to lessen power consumption. Additionally, the number of enabled RF bands should be limited to avoid prolonged scanning operations. Scanning operations take place regardless of number of RF bands enabled but will take longer if too many bands are enabled. Refer to section 5 of AirPrime HL7800-M MNO and RF Band Customization at Customer Production Site Application Note (reference number: 2174213) for details.*

HL7800	
Test command Syntax **AT+KBNDCFG=?**	Response **+KBNDCFG: <RAT>,**(list of supported **<bnd bitmap>**s) **OK**
Read command Syntax **AT+KBNDCFG?**	Response **+KBNDCFG: <RAT>,**(list of configured **<bnd bitmap>**s) **OK**
Write command Syntax **AT+KBNDCFG =<RAT>,<bnd bitmap>**	Response **+KBNDCFG: <RAT>,(<bnd bitmap>**s to configure) **OK** Parameters **<RAT>** Radio Access Technology 0 CAT-M1 (this is the only RAT available on the HL7800-M) 1 NB1 2 GSM (for HL7802 only) **<bnd bitmap>** Band bitmap in hexadecimal format without the 0x prefix. This is the logical representation of 1<<(BandNumber -1). (Currently only used for RAT CAT-M1 and NB-1) 0000 00000000 **00000000** Not available 0000 00000000 **00000001** LTE Band 1 (2000 MHz) 0000 00000000 **00000002** LTE Band 2 (1900 MHz) 0000 00000000 **00000004** LTE Band 3 (1800 MHz) 0000 00000000 **00000008** LTE Band 4 (1700 MHz) 0000 00000000 00000010 LTE Band 5 (850 MHz)

HL7800	
	0000 00000000 00000080 LTE Band 8 (900MHz) 0000 00000000 00000100 LTE Band 9 (1900MHz) 0000 00000000 00000200 LTE Band 10 (2100MHz) 0000 00000000 00000800 LTE Band 12 (700 MHz) 0000 00000000 00001000 LTE Band 13 (700 MHz) 0000 00000000 00002000 LTE Band 14 (700 MHz) 0000 00000000 00010000 LTE Band 17 (700 MHz) 0000 00000000 00020000 LTE Band 18 (800MHz) 0000 00000000 00040000 LTE Band 19 (800MHz) 0000 00000000 00080000 LTE Band 20 (800MHz) 0000 00000000 01000000 LTE Band 25 (1900MHz) 0000 00000000 02000000 LTE Band 26 (800 MHz) 0000 00000000 04000000 LTE Band 27 (800 MHz) 0000 00000000 08000000 LTE Band 28 (700MHz) 0002 00000000 00000000 LTE Band 66 (1800MHz)
Reference Sierra Wireless Proprietary	Notes • This command sets the configured LTE band(s) on which the module can operate. • When using the write command, radio re-initialization is necessary to consider new configured band(s). Otherwise, **AT+KBND?** won't be functional. This can be done by resetting the module (**AT+CUN=1,1**). • When using the write command, the answer will return the entered <bnd bitmap>. • To get the list of configured band(s), use **AT+KBNDCFG?**. • To get the list of supported band(s), use **AT+KBNDCFG=?**. • Only bands returned by **+KBNDCFG=?** for available RAT can be configured. • To avoid a long scanning duration, it is necessary to limit the number of bands to the targeted network. • Switching RAT is possible with the **+KSRAT** command.
Examples	**AT+KSRAT?** **+KSRAT: 0** // Get active RAT: CAT-M1 **OK** **AT+KBNDCFG=0,7** // Set LTE Bands 1, 2, 3 selected; no 0x prefix for CAT-M1 **+KBNDCFG: 0,7** **OK** **AT+CFUN=1,1** // Force initialization of radio to consider new configured bands **AT+KBNDCFG?** // Get configured network bands **+KBNDCFG: 0,00000000000000000007 //** LTE bands 1, 2, 3 for CAT-M1 **+KBNDCFG: 1,0** **+KBNDCFG: 2,0** **OK** **AT+KBNDCFG=?** // Get supported network bands **+KBNDCFG: 0,0002000000000F0F3B9F** // bands 1, 2, 3, 4, 5, 8, 9, 10, 12, 13, // 14, 17, 18, 19, 20, 25, 26, 27, 28, 66 // for CAT-M1 **+KBNDCFG: 1,0002000000000B0F389F** // bands 1, 2, 3, 4, 5, 8, 12, 13, 14, 17, // 18, 19, 20, 25, 26, 28, 66 for NB1 **+KBNDCFG: 2,0** **OK**

HL7800	

	AT+KBNDCFG=0,0 **//** Not defined
	+CME ERROR: 3
	
	AT+KBNDCFG=0,189F // Set LTE Bands 1, 2, 3, 4, 5, 8, 12, 13 for CAT-M1
	+KBNDCFG: 0,189F
	OK
	
	AT+KSRAT=1
	OK
	
	// Automatic reboot of module to force initialization of radio to consider new configured
	// bands
	
	AT+KSRAT? // Get active RAT
	+KSRAT: 1 // Active RAT is NB-1
	OK
	
	AT+KBNDCFG? // Get configured network bands
	+KBNDCFG:0,0
	+KBNDCFG:1,00000000000000000000E **//** LTE bands 1,2,3 for NB1
	+KBNDCFG:2,0
	OK

5.20. +KBND Command: Get Active LTE Band(s)

HL78xx	
Read command Syntax **AT+KBND?**	Response **+KBND: <RAT>,**(the active **<bnd bitmap>**) **OK** Parameters **<RAT>** Radio Access Technology 0 CAT-M1 (this is the only RAT available on the HL7800-M) 1 NB1 2 GSM (for HL7802 only) **<bnd bitmap>** Band bitmap in hexadecimal format without the 0x prefix. This is the logical representation of 1<<(BandNumber -1). (Currently only used for RAT CAT-M1 or NB-1) 0000 00000000 **00000000** Not available 0000 00000000 **00000001** LTE Band 1 (2000 MHz) 0000 00000000 **00000002** LTE Band 2 (1900 MHz) 0000 00000000 **00000004** LTE Band 3 (1800 MHz) 0000 00000000 **00000008** LTE Band 4 (1700 MHz)

HL78xx	
	0000 00000000 00000010 LTE Band 5 (850 MHz) 0000 00000000 00000080 LTE Band 8 (900MHz) 0000 00000000 00000100 LTE Band 9 (1900MHz) 0000 00000000 00000200 LTE Band 10 (2100MHz) 0000 00000000 00000800 LTE Band 12 (700 MHz) 0000 00000000 00001000 LTE Band 13 (700 MHz) 0000 00000000 00002000 LTE Band 14 (700 MHz) 0000 00000000 00010000 LTE Band 17 (700 MHz) 0000 00000000 00020000 LTE Band 18 (800MHz) 0000 00000000 00040000 LTE Band 19 (800MHz) 0000 00000000 00080000 LTE Band 20 (800MHz) 0000 00000000 01000000 LTE Band 25 (1900MHz) 0000 00000000 02000000 LTE Band 26 (800 MHz) 0000 00000000 04000000 LTE Band 27 (800 MHz) 0000 00000000 08000000 LTE Band 28 (700MHz) 0002 00000000 00000000 LTE Band 66 (1800MHz)
Reference Sierra Wireless Proprietary	Notes • This command returns the LTE band that the module is currently using and the corresponding RAT. • If the module is not registered to a network or if there is no current active band, the returned bitmap is 0. • **+CME ERROR: 3** is returned is case of bad syntax. • When using **AT+KBNDCFG=<RAT>,<bnd bitmap>**, radio re-initialization is necessary to consider new configured band(s). Otherwise, **AT+KBND?** won't be functional. This can be done by resetting the module (**AT+CUN=1,1**). • Switching RAT is possible with the **+KSRAT** command.
Examples	**AT+KBND?** // Get the activated network band: LTE band 66 for CAT-M1 **+KBND**: **0,00020000000000000000** **OK** **AT+KBND?** // Get the activated network band: no active band **+KBND**: **0,00000000000000000000** **OK**

5.21. +KGPIO Command: Hardware IO Control

HL7800	
Test command Syntax **AT+KGPIO=?**	 Response **+KGPIO:** (list of supported **<IO>**s),(list of supported **<cde>**s) **OK**
Read command Syntax **AT+KGPIO?**	 Response **OK**

HL7800	
Write command Syntax **AT+KGPIO=<IO>, <cde>**	 Response If <cde> = 2: **+KGPIO: <IO>, <current_value>** **OK** Else **OK** Parameters **<IO>** 1 - 3, 5 - 8, 10, 11, 14, 15 Selected IO **<cde>** 0 Reset the selected IO 1 Set the selected IO 2 Request the current value of the IO **<current_value>** 0 GPIO is Low 1 GPIO is High
Notes	• The current configuration is saved in non-volatile memory after a reset. • Check the configuration of **+KGPIOCFG** when **+CME ERROR: 3** issued. • **AT+KGPIO=?** returns a dynamic list of supported GPIO. GPIOs assigned to a specific purpose are not listed. • This command can be used without SIM.
Examples	**AT+KGPIO=?** **+KGPIO: (1,2,3,5,6,7,8,10,11,14,15),(0-2)** **OK** **AT+KGPIO?** **OK** **AT+KGPIOCFG=1,0,2** **AT+KGPIO=1,1** **OK** **AT+KGPIO=1,0** **OK**

5.22. +KGPIOCFG Command: GPIO Configuration

HL7800	
Test command Syntax **AT+KGPIOCFG=?**	 Response **+KGPIOCFG**: (list of supported **<n>**s),(list of supported **<dir>**s), (list of supported **<pull mode>**s) **OK**

HL7800	
Read command Syntax **AT+KGPIOCFG?**	Response **+KGPIOCFG: <n>,<dir>,<pull mode>[<CR><LF>** **+KGPIOCFG: <n>,<dir>,<pull mode>** **[...]]** **OK**
Write command Syntax **AT+KGPIOCFG= <n>,<dir>, <pull mode>**	Response **OK** Parameters **<n>** 1 – 3, 5 – 8, 10, 11, 14, 15 GPIO number **<dir>** Direction 0 Output 1 Input **<pull mode>** 0 Pull down. Internal pull down resistor available. Only used in input mode. 1 Pull up. Internal pull up resistor available. Only used in input mode. 2 No pull. Internal pull up/down resistor NOT available. Only used in output mode.
Notes	• The current configuration is saved in non-volatile memory before a reset. • Pull down/up mode provides a stable input level. • **AT+KGPIOCFG=?** and **AT+KGPIOCFG?** return a dynamic list of supported GPIOs. GPIOs assigned to a specific purpose are not listed. • This command can be used without SIM.
Examples	**AT+KGPIOCFG=?** **+KGPIOCFG: (1,2,3,5,6,7,8,10,11,14,15),(0-1),(0-2)** **OK** **AT+KGPIOCFG?** **+KGPIOCFG: 1,0,2** **+KGPIOCFG: 2,0,2** **+KGPIOCFG: 3,0,2** **+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: 14,0,2** **+KGPIOCFG: 15,0,2** **OK** **AT+KGPIOCFG=1,0,2** **OK** **AT+KGPIOCFG=1,1,1** **OK**

5.23. +KCELL Command: Cell Environment Information

HL7800	
Test command Syntax **AT+KCELL=?**	 Response **+KCELL:** (list of supported **<revision>**s) **OK**
Read command Syntax **AT+KCELL?**	 Response **OK**
Write command Syntax **AT+KCELL= <revision>**	 Response **+KCELL: 0** **+KCELL: 0** **+KCELL: <nbLTEcells>[,<cell_type>,<PLMN>,<LTE_CI>,<PhyCellInd>, <trackingAreaCode>,<RSRPResult>,<RSRQResult>,<LTE_TA>][<cell_type>, [[Earfcn>,[<PhyCellID>,[<RSRPResult>,[<RSRQResult>]]]]][…]]** **OK** Parameters **<revision>** 0 Reserved for future development **<cell_type>** 0 GSM serving cell (Not supported) 1 GSM neighbor cell (Not supported) 2 UMTS serving cell (Not supported) 3 UMTS neighbor cell (Not supported) 4 UMTS detected cell (Not supported) 5 LTE serving cell 6 LTE neighbor cell **<PLMN>** PLMN identifiers (3 bytes) in hexadecimal format, made of MCC (Mobile Country Code), and MNC (Mobile Network Code) **<nbLTEcells>** 0 ≤ k ≤ 33 Number of LTE base stations available **<LTE_CI>** Cell Identity in 8 hexadecimal digits with length = 28 bits. (Ref: 3GPP TS 36.331, 6.3.4, CellIdentity IE) **<PhyCellInd>** 0 – 503 Physical Cell ID (Ref: 3GPP TS 36.331, 6.3.4, PhysCellId IE) **<TrackingAreacode>** Tracking Area Code (Ref: 3GPP TS 36.331, 6.3.4, Tracking AreaCode IE) Integer type with length = 16 bits **<RSRPResult>** 0 – 97 Reference Signal Received Power (Ref: 3GPP TS 36.331, 6.3.5, RSRP-Range IE) **<RSRQResult>** 0 – 34 Reference Signal Received Quality (Ref: 3GPP TS 36.331, 6.3.5, RSRQ-Range IE)

HL7800	
	<LTE_TA> 0 – 1282 Timing advance (as per [3GPP 36.321]) **<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)
Notes	• This command provides information related to the network environment and can be used, for example, for localization calculation. • The first two lines are 2G and UMTS cells, which are not supported so **+KCELL: 0**. • This command can only be used with a SIM. The cell information can only be retrieved when the UE stays in attached mode.
Examples	**AT+KCELL=?** **+KCELL: 0** **OK** **AT+KCELL=0** **+KCELL: 0** **+KCELL: 0** **+KCELL: 3,5, 54f460, c437406,322,54140,34,14,0,6,1424,266,32,9,6,1424,28,30,5** **OK**

5.24. +KSLEEP Command: Power Management Control

AirPrime HL78xx modules offer 3 types of power saving management:

- Hardware controlled (DTR signal) – sleep mode permission is driven by a HW signal (DTR). If the signal is active (low level), the module doesn't enter sleep mode.
- Standalone – standalone sleep mode. The module decides by itself when it enters sleep mode.
- Forbidden – sleep mode always disabled.

And 3 levels of power saving mode (from lightest to deepest):

- Sleep
- Lite Hibernate
- Hibernate

For more details, refer to AirPrime HL7800 Low Power Modes Application Note (reference number: 2174229).

Table 2. AT+KSLEEP Command Description

HL7800	
Test command Syntax **AT+KSLEEP=?**	 Response **+KSLEEP: (**list of supported **<mngt>**s**)[,(**list of supported **<level>**s**)[,(**list of supported **<delay>**s**)]** **OK**
Read command Syntax **AT+KSLEEP?**	 Response **+KSLEEP: <mngt>[,<level>[,<delay>]]** **OK**
Write command Syntax **AT+KSLEEP= <mngt>[,<level> [,<delay>]]**	 Response **OK** Parameters **<mngt>** Defines how the module enter and leave power saving mode 0 Sleep mode permission is driven by a HW signal (DTR). If the signal is active (low level), the module doesn't enter sleep mode. 1 Standalone sleep mode. The module decides by itself when it enters sleep mode. 2 Sleep mode is always disabled **<level>** Defines the lowest power saving mode that the module can enter. This parameter is mandatory when <mngt>=0 or 1; not allowed for <mngt>=2. 0 Sleep 1 Lite Hibernate 2 Hibernate **<delay>** 0 – 99 Duration of delay before the module enters power saving mode after reboot in seconds
Reference Sierra Wireless Proprietary	Notes • Current configuration is kept in non-volatile memory after reset. • Only hardware signals impact power saving management (modem signals over MUX will not).
Examples	**AT+KSLEEP=?** **+KSLEEP: (0-2)[,(0-2)[,(0-99)]]]** **OK** **AT+KSLEEP?** **+KSLEEP: 0,0,0** **OK** **AT+KSLEEP=1,2** **OK** **AT+KSLEEP?** **+KSLEEP: 1,2,0** **OK** **AT+KSLEEP=2** **OK**

HL7800	
	AT+KSLEEP? **+KSLEEP: 2** **OK** **AT+KSLEEP=0,1,10** **OK** **AT+KSLEEP?** **+KSLEEP: 0,1,10** **OK**

5.25. +KRIC Command: Ring Indicator Control

HL7800	
Test command Syntax **AT+KRIC=?**	Response **+KRIC:** (list of supported **<masks>**s),(list of supported **<shape>**s),(list of supported **<pulse duration>**s),(list of supported **<Ri inverse gpio>**s) **OK**
Read command Syntax **AT+KRIC?**	Response **+KRIC: <masks>,<shape>,<pulse duration>,<RI inverse gpio>** **OK**
Write command Syntax **AT+KRIC= <mask> [,<shape> [,<pulse duration>[,<RI inverse gpio]]]**	Response **OK** Parameters **<mask>** Use of RI signal 0x00 RI not used 0x10 RI activated on network state (**+CIEV**) 0x20 RI activated on TCP connection request (**+KTCP_SRVREQ**) 0x40 RI activated on TCP Data reception (**+KTCP_DATA**) 0x80 RI activated on UDP Data reception (**+KUDP_DATA**) **<shape>** Signal shape – only available for incoming calls 0 Repeat pulses. The total length of the pulse is equivalent to the transfer of the RING or CRING notification **<pulse duration>** 1 – 5 RI pulse durations in seconds **<RI inverse gpio>** GPIO number to notify event instead of RI 0 Event notified on RI pin 2 Event notified on GPIO2

HL7800	
Reference Sierra Wireless Proprietary	Notes • The current configuration is kept in non-volatile memory after a reset. • Write command is only sent once to define the RI behavior. • Do not use the command during an incoming call, etc. • This command can be used without a SIM. • If <shape> is omitted, the previously saved value will be used. • When a specified event occurs, the RI is asserted for the defined length of time then it is de-asserted. If multiple events happen during an assertion, the time for assert will be extended. For example, if a second RI event occurs before the RI signal is de-asserted, the RI signal will be kept asserted for <pulse_duration> time after this second RI event. In this scenario, the RI pulse could exceed the time that **+KRIC** was set for a single event. • When the event is notified on GPIO2 instead of the RI pin, the GPIO is active low so the pulse goes from low voltage level to high voltage level then low voltage level. Whereas when the RI pin is active low, the pulse on RI goes from high voltage level to low voltage level then high voltage level.

5.26. +CPOF Command: Power Off

HL7800	
Execute command Syntax **AT+CPOF**	 Response **OK**
Notes	• This command powers the module off. • **OK** is immediately returned before the power off sequence. • The only way to wake the module up is to set the WAKEUP pin high.

5.27. +CPWROFF Command: Power Off

HL7800	
Test command Syntax **AT+CPWROFF=?**	 Response **OK**
Execute command Syntax **AT+CPWROFF [=<mode>]**	 Response **OK** or **ERROR** Parameter **<mode>** Power down mode 1 Fast power down mode

HL7800	
Notes	• Not specifying a parameter value for the execute command will perform normal IMSI detach before powering down. • <mode>=1 will perform fast power down without an IMSI detach request being sent to the network. • The only way to wake the module up is to set the WAKEUP pin high.

5.28. +WIMEI Command: IMEI Write and Read

HL7800	
Test command Syntax **AT+WIMEI=?**	 Response **OK**
Read command Syntax **AT+WIMEI?**	 Response **+WIMEI: <IMEI>** **OK**
Write command Syntax **AT+WIMEI= <IMEI>**	 Response **+WIMEI: <IMEI>** **OK** Parameter **<IMEI>** 14 or 15-digit IMEI as defined in GSM 23.003
Notes	• 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. • Customers take on the responsibility of adhering to 3GPP TS 22.016, Section 2 – General requirements when using this command. This includes ensuring that each IMEI is within the allocated range and is unique to the ME in which it resides, as well as ensuring that detailed records of produced and delivered MEs are kept.

Examples	// Default IMEI
	at+wimei?
	+WIMEI: 012345478901237
	OK
	
	// Enter 15-digit IMEI
	at+wimei=354610060035829
	OK
	
	at+wimei?
	+WIMEI: 354610060035829
	OK
	
	// Enter 14-digit IMEI
	at+wimei=35461006003582
	OK

HL7800	
	at+wimei? **+WIMEI: 354610060035829** **OK**

5.29. +KSYNC Command: Application Synchronization Signal

HL7800	
Test command Syntax **AT+KSYNC=?**	 Response **+KSYNC:** (list of supported **<mod>**),(list of supported **<IO>s**) **OK**
Read command Syntax **AT+KSYNC?**	 Response **+KSYNC: <mode>,<IO>** **OK**
Write command Syntax **AT+KSYNC= <mod>,<IO>**	 Response **+KSYNC: <IO>, <current_value>** **OK** Parameters **<mod>** Synchronization signal mode 0 Disable the generation of synchronization signal 2 Manage the generation of signal according to network status: **Permanently ON** – The module is powered on, but not registered in the network **Slow flash (LED is ON for 200ms, OFF for 2s)** – The module is powered on and registered in the network **OFF** – The module is either switched off or the flash LED has been disabled by the user **<IO>** 1 - 3, 5 - 8, 10, 11, 14, 15, 20 Defines which GPIO is used as output to indicate the network status
Notes	• <mod> and <IO> settings are automatically saved. • This command will force the GPIO pins as output, regardless of the **AT+KGPIOCFG** configuration. • Only one GPIO signal can be generated at any time. • This command can be used without a SIM.

HL7800	
Examples	**AT+KSYNC=?** **+KSYNC: (0,2),(1,2,3,5,6,7,8,10,11,14,15,20)** **OK** **AT+KSYNC=2,1** **OK** **AT+KSYNC?** **+KSYNC: 2,1** **OK** **AT+KSYNC=2,1** **OK**

5.30. +KCARRIERCFG Command: Set Operator

Warning: *Operator must be set prior to using the module. Refer to section 6 of AirPrime HL7800-M MNO and RF Band Customization at Customer Production Site Application Note (reference number: 2174213) for details.*

HL7800	
Test command Syntax **AT+ KCARRIERCFG= ?**	Response **+KCARRIERCFG: (**list of supported **<operator_idx>**es**)** **OK**
Read command Syntax **AT+ KCARRIERCFG?**	Response **+KCARRIERCFG: <operator_idx>** **OK**
Write command Syntax **AT+ KCARRIERCFG =<operator_idx>**	Response **OK** Parameter **<operator_idx>** 0 Default 1 Verizon 2 CMCC 3 RJIL 4 KDDI 5 AT&T 6 USCC 7 Docomo 8 Softbank 9 LGU+ 10 KT 11 T-Mobile 12 SKT 13 TELSTRA

HL7800	
Reference Sierra Wireless Proprietary	Notes Configuration is saved immediately in non-volatile memory. The answer to the write command is therefore displayed a few seconds after it is sent.
Examples	**AT+KCARRIERCFG=?** **+KCARRIERCFG: (0-13)** **OK** **AT+KCARRIERCFG?** **+KCARRIERCFG: 0** // Default configuration selected **OK** **AT+KCARRIERCFG=1** // Set Verizon configuration **OK**

5.31. +KMON Command: Enable/Disable Monitor Mode

HL7800	
Test command Syntax **AT+KMON=?**	 Response **+KMON: (0-2)** **OK**
Read command Syntax **AT+KMON?**	 Response **+KMON: <n>** **OK**
Write command Syntax **AT+KMON=<n>**	 Response **OK** or **+CME ERROR: 3** Parameter **<n>** Monitor mode configuration 0 Monitor mode disabled (automatic reboot when a crash occurs) 1 Monitor mode enabled (no automatic reboot, backtrace provided for analysis) 2 Mixed monitor mode (backtrace is provided before automatic reboot)
Reference Sierra Wireless Proprietary	Notes • This command provides the ability to deactivate monitor mode for customer conifgurations. • Monitor mode is a special state in which the module enters when a software exception happens. The module displays the backtrace and all low-level information needed for debug. Monitor mode prevents the module from rebooting since it must be manually reset. • Monitor mode must be deactivated when customer configuration is applied.

HL7800	
	• New configuration is written into flash. There is no need to re-enter it at each module reboot. • Configuration is not applied dynamically. Module must be rebooted after the configuration has been changed. • If the asked configuration is the same as the current one, nothing is changed into the flash filesystem. • The global configuration command (**+SWITRACEMODE**) automatically activates/deactivates monitor mode depending on the configuration. For customer/log configurations, monitor mode is deactivated; and activated for all other configurations.
Examples	**AT+KMON=?** **+KMON: (0-2)** **OK** **AT+KMON?** **+KMON: 0** **OK** **AT+KMON=0** // disable monitor mode **OK** **AT+KMON=1** // enable monitor mode **OK**

5.32. +KSRAT Command: Set Radio Access Technology

HL7800	
Test command Syntax **AT+KSRAT=?**	 Response **+KSRAT:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+KSRAT?**	 Response **+KSRAT: <mode>** **OK**
Write command Syntax **AT+KSRAT= <mode>**	 Response **OK** Parameter **<mode>** 0 CAT-M1 only (this is the only RAT available on the HL7800-M) 1 NB1 only 2 GSM only (for HL7802 only)

HL7800	
Examples	**AT+KSRAT=?** **//** Available modes **+KSRAT: (0-1)** // CAT-M1, NB1 RAT **OK** **AT+KSRAT?** **+KSRAT: 0** // CAT-M1 current RAT **OK** **AT+KSRAT=1** // Set NB1 RAT and reboot of the module to force initialization of // radio to consider new RAT. **OK** **AT+KSRAT?** **+KSRAT: 1** // NB1 current RAT **OK**
Reference Sierra Wireless Proprietary	Notes • <mode> is persistent after reset. • The write command automatically reboots the module to force a re-initialization of the radio with the selected RAT.

6. Network Service Related Commands

6.1. +CLCK Command: Facility Lock

HL7800	
Test command Syntax **AT+CLCK=?**	 Response **+CLCK:** (list of supported **<fac>**s) **OK** or **+CME ERROR: <err>**
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) "PN" Network Personalization "PU" Network subset Personalization **<mode>** 0 Unlock 1 Lock 2 Query status **<status>** 0 Not active 1 Active **<passwd>** String type; shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD **<classx>** Sum of integers each representing a class of information (default value = 7) 2 Data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128) 4 Fax (facsimile services)

HL7800	
	8 Short message service 16 Data circuit sync 32 Data circuit async 64 Dedicated packet access 128 Dedicated PAD access
Reference	27.007 Rev12

6.2. +CPWD Command: Change Password

HL7800	
Test command Syntax **AT+CPWD=?**	 Response **+CPWD:** list of supported (**<fac>,<pwdlength>**)s **OK**
Write command Syntax **AT+CPWD= <fac>,<oldpwd>, <newpwd>**	 Response **OK** or **+CME ERROR: <err>** Parameters **<fac>** "PS" PH-SIM (lock Phone to SIM/UICC card installed in the currently selected card slot) (MT asks for the password when other than current SIM/UICC card is inserted; MT may remember certain previously used cards thus not requiring password when they are inserted) "P2" SIM PIN2 password specified for the facility from the user interface or with a command. "SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) "PN" Network Personalization "PU" Network subset Personalization **<oldpwd>** String type containing the old password **<newpwd>** String type containing the new password **<pwdlength>**Length of password
Reference	27.007 Rev12

6.3. +COPN Command: Read Operator Name

HL7800	
Test command Syntax **AT+COPN=?**	 Response **OK**
Execute command Syntax **AT+COPN**	 Response **+COPN: <numeric1>,<alpha1>[<CR><LF>** **+COPN: <numeric2>,<alpha2>** **[...]]** **OK** or **+CME ERROR: <err>** Parameters **<numeric>** String type; operator in numeric format (see **+COPS**) **<alpha>** String type; operator in long alphanumeric format (see **+COPS**)
Reference	27.007 Rev12

6.4. +COPS Command: Operator Selection

HL7800	
Test command Syntax **AT+COPS=?**	 Response **+COPS: [**list of supported **(<stat>**, long alphanumeric **<oper>**, short alphanumeric **<oper>**, numeric **<oper>[,< AcT>])**s**][,,(**list of supported **<mode>**s**),(**list of supported **<format>**s**)]** **OK** or **+CME ERROR: <err>**
Read command Syntax **AT+COPS?**	 Response **+COPS: <mode>[,<format>,<oper>[,<AcT>]]** **OK** or **+CME ERROR: <err>**

HL7800	
Write command Syntax **AT+COPS=** **[<mode>** **[,<format>** **[,<oper>** **[,< AcT>]]]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<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 **<format>** 0 Long alphanumeric; if network name is not available it displays a combination of MCC and MNC in string format 1 Short alphanumeric 2 Numeric **<oper>** String type given in format <format>; this field may be up to 16 character long for long alphanumeric format, up to 8 characters for short alphanumeric format and 5 characters long for numeric format (MCC/MNC codes) **<stat>** 0 Unknown networks 1 Network available 2 Current (registered) 3 Forbidden network **<AcT>** 7 E-UTRAN 9 E-UTRAN (NB-S1 mode)
Reference 27.007 Rev12	Notes **AT+COPS=?** is only available when the device is not in RRC Connected state (when it still has data to transmit or receive). **AT+COPS=?** will return ERROR if the device is in RRC Connected state. To ensure that the device is not in RRC Connected state, the device can be explicitly detached from the network using **AT+CGATT=0**, for example.

6.5. +CPOL Command: Preferred PLMN List

HL7800	
Test command Syntax **AT+CPOL=?**	Response **+CPOL:** (list of supported **<index>**es),(list of supported **<format>**s) **OK** or **+CME ERROR: <err>**

HL7800	
Read command Syntax **AT+CPOL?**	Response **+CPOL: <index1>,<format>,<oper1>[,<EUTRAN_AcT>][<CR><LF>** **+CPOL: <index2>,<format>,<oper2>[,<EUTRAN_AcT>][...]]** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+CPOL=** **[<index>]** **[,<format>** **[,<oper>]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<index>** Integer type; order number of operator in the SIM/USIM preferred operator list **<format>** 0 Long format alphanumeric <oper> 1 Short format alphanumeric <oper> 2 Numeric <oper> **<opern>** String type; <format> indicates if the format is alphanumeric or numeric **<EUTRA_AcT>** 0 EUTRA access technology not selected 1 EUTRA access technology selected
Reference	27.007 Rev12

6.6. +CREG Command: Network Registration

HL7800	
Test command Syntax **AT+CREG=?**	Response **+CREG:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CREG?**	Response **+CREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]** **OK OK**
Write command Syntax **AT+CREG=[<n>]**	Response **OK** or **+CME ERROR: <err>**

HL7800	
	Parameters **<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>]]** 3 Enable network registration, location information and cause value information unsolicited result code **+CREG:<stat>[,[<lac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]** **<stat>** Circuit mode registration status 0 Not registered, ME is not currently searching a new operator to register to 1 Registered, home network 2 Not registered, but ME is currently searching a new operator to register to 3 Registration denied 4 Unknown 5 Registered, roaming **<lac>** String-type; 2-byte location area code in hexadecimal format (e.g. "00C3") **<ci>** String-type; 4-byte cell ID in hexadecimal format **<AcT>** 7 E-UTRAN 9 E-UTRAN (NB-S1 mode) **<cause_type>** Type of <reject_cause> 0 <reject_cause> contains an MM cause value (see 3GPP TS 24.008 [8] Annex G) 1 <reject_cause> contains a manufacturer specific cause **<reject_cause>** Cause of the failed registration
Reference	27.007 Rev12

6.7. +CPLS Command: Select Preferred PLMN List

HL7800	
Test command Syntax **AT+CPLS=?**	 Response **+CPLS:** (list of supported **< list>**s) **OK**
Read command Syntax **AT+CPLS?**	 Response **+CPLS: < list>** **OK**

HL7800	
Write command Syntax **AT+CPLS=[<cpls_list>]**	Response **OK** or **+CME ERROR: <err>** Parameter **<list>** 0 User controlled PLMN selector with Access Technology $EF_{PLMNwAcT}$. If not found in the SIM/UICC, then the PLMN preferred list is $EF_{PLMNsel}$ (this file is only available in SIM card or GSM application selected in UICC) 1 Operator controlled PLMN selector with Access Technology $EF_{OPLMNwAcT}$ 2 HPLMN selector with Access Technology $EF_{HPLMNwAcT}$
Reference	27.007 Rev12

6.8. +CEREG Command: EPS Network Registration Status

HL7800	
Test command Syntax **AT+CEREG=?**	Response **+CEREG:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CEREG?**	Response when <n>=0, 1, 2 or 3 and command is successful: **+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>[,<cause_type>,<reject_cause>]]]** **OK** when <n>=4 or 5 and command is successful: **+CEREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]** **OK**
Execute command Syntax **AT+CEREG=[<n>]**	Response **OK** or **+CME ERROR: <err>** Parameters **<n>** 0 Disable network registration unsolicited result code 1 Enable network registration unsolicited result code **+CEREG: <stat>** 2 Enable network registration and location information unsolicited result code **+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]]**

HL7800

3 Enable network registration, location information and EMM cause value information unsolicited result code
+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]

4 For a UE that wants to apply PSM, enable network registration and location information unsolicited result code
+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,,[,[<Active-Time>],[<Periodic-TAU>]]]]

5 For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code
+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]

<stat> Indicates the EPS registration status
0 Not registered; MT is currently not searching for an operator to register to
1 Registered, home network
2 Not registered but MT is currently trying to attach or searching for an operator to register to
3 Registration denied
4 Unknown (e.g. out of E-UTRAN coverage)
5 Registered, roaming
6 Registered for "SMS only", home network (not applicable)
7 Registered for "SMS only", roaming (not applicable)
8 Attached for emergency bearer services only
9 Registered for "CSFB not preferred", home network (not applicable)
10 Registered for "CSFB not preferred", roaming (not applicable)

<tac> 2-byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)

<ci> String-type; 4-byte E-UTRAN cell ID in hexadecimal format

<AcT> Access technology of the serving cell
0 GSM (not applicable)
1 GSM Compact (not applicable)
2 UTRAN (not applicable)
3 GSM with EGPRS (not applicable)
4 UTRAN with HSDPA (not applicable)
5 UTRAN with HSUPA (not applicable)
6 UTRAN with HSDPA and HSUPA (not applicable)
7 E-UTRAN
9 E-UTRAN (NB-S1 mode)

<cause_type> Indicates the type of <reject_cause>
0 <reject_cause> contains an EMM cause value (see 3GPP TS 24.301 [83] Annex A)
1 <reject_cause> contains a manufacturer-specific cause

<reject_cause> Cause of the failed registration

<Active-Time> 1-byte in an 8-bit format. Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 [8] Table 10.5.163/3GPP TS 24.008. Also see 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82].

HL7800	
	<Periodic-TAU> 1-byte in an 8-bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. Also see 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82].
Reference	27.007 Rev12

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

HL7800	
Test command Syntax **AT+CEMODE=?**	Response **+CEMODE:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CEMODE?**	Response **+CEMODE: <mode>** **OK**
Write command Syntax **AT+CEMODE=[<mode>]**	Response **OK** or **+CME ERROR: <err>** Parameter **<mode>** Indicates mode of operation 0 PS mode 2 of operation 1 CS/PS mode 1 of operation 2 CS/PS mode 2 of operation 3 PS mode 1 of operation
Reference	27.007 Rev12

7. SMS Commands

7.1. 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.

7.1.1. 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 **+CMSS** and **+CMGW**); refer to <mem1> for defined values. Default value is "SM".

<mem3> String type; preferred memory to which received SMs are to be stored (unless forwarded directly to TE; refer to **+CNMI**); refer <mem1> for defined values; received CBMs are always stored in "BM" (or some manufacturer specific storage) unless directly forwarded to TE; received status reports are always stored in "SR" (or some manufacturer specific storage) unless directly forwarded to TE. Default value is "SM".

<stat> Status of message in memory. Integer type in PDU mode, or string type in text mode. Available values are as follows:

0	"REC UNREAD"	Received unread message (i.e. new message)
1	"REC READ"	Received read message
2	"STO UNSENT"	Stored unsent message (only applicable to SMs)
3	"STO SENT"	Stored sent message (only applicable to SMs)
4	"ALL"	All messages (only applicable to **+CMGL** command)

<total1> Integer type; total number of message locations in <mem1>

<total2> Integer type; total number of message locations in <mem2>

<total3> Integer type; total number of message locations in <mem3>

<used1> Integer type; number of messages currently in <mem1>

<used2> Integer type; number of messages currently in <mem2>

<used3> Integer type; number of messages currently in <mem3>

7.1.2. 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 +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 +cscs). Type of address is given by <toda>.

<data> In the case of user data in text mode responses; format:

- if <dcs> indicates that GSM 7-bit default alphabet is used and <fo> indicates that user data header indication is not set
  - if TE character set other than "HEX" (refer to +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 <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that user data header indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

In the case of CBS: CBM Content of Message in text mode responses; format:

- if <dcs> indicates that GSM 7-bit default alphabet is used
  - if TE character set other than "HEX" (refer to +cscs); ME/TA converts GSM alphabet into current TE character set
  - if TE character set is "HEX"; ME/TA converts each 7-bit character of the GSM 7-bit default alphabet into two IRA character long hexadecimal number
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used; ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

<length> Integer type vlayue indicating the length of the actual TP data unit in octets in PDU mode. This is 140 characters long according to 8-bit GSM coding scheme.

In text mode, the maximum length of an SMS depends on the used coding scheme (160 characters if 7-bit).

<mid> CBM Message Identifier in integer format

<mn> TP-Message-Number in integer format

<mr> Message reference in integer format

<oa> Origiantion 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 +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 **+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

7.2. +CMGD Command: Delete Message

HL7800	
Test command Syntax **AT+CMGD=?**	Response **+CMGD:** (list of supported **<index>**es)[,(list of supported **<delflag>**s)] **OK**
Write command Syntax **AT+CMGD=<index>[,<delflag>]**	Response **OK**

HL7800	
	or **+CMS ERROR: <err>** Parameters **<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
Notes	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.

7.3. +CMGF Command: Set Message Format

HL7800	
Test command Syntax **AT+CMGF=?**	 Response **+CMGF:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CMGF?**	 Response **+CMGF: <mode>** **OK**
Execute command Syntax **AT+CMGF= [<mode>]**	 Response **OK** or **+CMS ERROR: err>** Parameter **<mode>** 0 PDU mode (default when implemented) 1 Text mode
Notes	<mode> is saved in non-volatile memory per AT port over module reboot.

7.4. +CMGL Command: List Messages

HL7800	
Test command Syntax **AT+CMGL=?**	 Response **+CMGL:** (list of supported **<stat>**s) **OK**
Execute command Syntax **AT+CMGL [=<stat>]**	 Response If in text mode, command is successful and SMS-SUBMITs and/or SMS-DELIVERs: **+CMGL: <index>,<stat>, <oa/da>,[<alpha>], [<scts>][,<tooa/toda>,<length>] <CR><LF><data>[<CR><LF>** **+CMGL: <index>,<stat>, <da/oa>,[<alpha>], [<scts>][,<tooa/toda>, <length>] <CR><LF><data>** **[...]]** If in text mode, command is successful and SMS-STATUS-REPORTs: **+CMGL: <index>, <stat>,<fo>, <mr>, [<ra>], [<tora>], <scts>, <d-t>,<st>[<CR><LF>** **+CMGL: <index>, <stat>, <fo>, <mr>,[<ra>], [<tora>],<scts>,<d_t>,<st>[...]]** If in text mode, command is successful and SMS-COMMANDs: **+CMGL: <index>,<stat>,<fo>,<ct> [<CR><LF>** **+CMGL: <index>,<stat>, <fo>,<ct>[...]]** If in text mode, command is successful and CBM storage: **+CMGL: <index>,<stat>,<sn>, <mid>, <page>,<pages> <CR><LF><data>[<CR><LF>** **+CMGL: <index>,<stat>,<sn>, <mid>,<page>,<pages><CR><LF><data>[...]]** If in PDU mode and command is successful: **+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>** or **+CMS ERROR: <err>** Parameters For parameter information and values, refer to section 7.1 Parameters Definition.

7.5. +CMGR Command: Read Message

HL7800	
Test command Syntax **AT+CMGR=?**	 Response **OK**

HL7800	

Write command
 	
Syntax
AT+CMGR=<index>
	Response
	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>
	
	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>
	
	if text mode (+CMGF=1), command is successful, and SMS-STATUS-REPORT:
	+CMGR: <stat>,<fo>,<mr>,[<ra>], [<tora>],<scts>,<d_t>,<st>
	
	if text mode (+CMGF=1), command is successful, and SMS-COMMAND:
	+CMGR: <stat>, <fo>,<ct>[, <pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><cdata>]
	
	if text mode (+CMGF=1), command is successful, and CBM storage:
	+CMGR: <stat>,<sn>, <mid>,<dcs>,<page>,<pages><CR><LF><data>
	
	if PDU mode (+CMGF=0) and command is successful:
	+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>
	
	or
	+CMS ERROR: <err>
	
	Parameters
	For parameter information and values, refer to section 7.1 Parameters Definition.

7.6. +CMGS Command: Send Message

HL7800	
Test command Syntax **AT+CMGS=?**	Response **OK**
Write command Syntax If text mode (+CMGF=1): **AT+CMGS=<da>[,<toda>]<CR>** **text is entered** **<ctrl-Z/ESC>**	Response If text mode (+CMGF=1) and sending is successful: **[+CMGS: <mr>[,<scts>]]** **OK** if PDU mode (+CMGF=0) and sending is successful: **[+CMGS: <mr>]** **OK** or **+CMS ERROR: <err>**

HL7800	
If PDU mode (+CMGF=0): **AT+CMGS= <length><CR> PDU is given <ctrl-Z/ESC>**	Parameters For parameter information and values, refer to section 7.1 Parameters Definition.
Notes	• 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 **+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.

7.7. +CMGW Command: Write Message to Memory

HL7800	
Test command Syntax **AT+CMGW=?**	Response **OK**
Write command Syntax If text mode (+CMGF=1): **AT+CMGW[= <oa/da> [,<tooa/toda> [,<stat>]]]<CR> text is entered <ctrl-Z/ESC>** If PDU mode (+CMGF=0): **AT+CMGW= <length>[,<stat>] <CR> PDU is given <ctrl-Z/ESC>**	Response **+CMGW: <index>** **OK** or **+CMS ERROR: <err>** Parameters For parameter information and values, refer to section 7.1 Parameters Definition.
Notes	• 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 **+CMGS**.

7.8. +CMSS Command: Send Message from Storage

HL7800	
Test command Syntax **AT+CMSS=?**	 Response **OK**
Write command Syntax **AT+CMSS=<index>[,<da>[,<toda>]]**	 Response If text mode (+CMGF=1) and sending issuccessful: **+CMSS: <mr>[,<scts>]** If PDU mode (+CMGF=0) and sending is successful: **+CMSS: <mr>** **OK** or **+CMS ERROR: <err>** Parameters For parameter information and values, refer to section 7.1 Parameters Definition.
Notes	• 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.

7.9. +CNMI Command: New Message Indication

HL7800	
Test command Syntax **AT+CNMI=?**	 Response **+CNMI:** (list of supported **<mode>**s), (list of supported **<mt>**s), (list of supported **<bm>**s), (list of supported **<ds>**es), (list of supported **<bfr>**s) **OK**
Read command Syntax **AT+CNMI?**	 Response **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>** **OK**

HL7800

Write command

Syntax
+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]

Response
OK

or
+CMS ERROR: <err>

Parameters

<mode>
1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE.
2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.

<mt>
0 No indications are routed to the TE.
1 Result code is sent when ME does not have any other display device other than the AT interface
2 Acknowledgement command must be sent when +CSMS <service> = 1 and ME does not have any other display device other than the AT interface

<bm>
0 No CBM indications are routed to the TE.
2 New CBMs are routed directly to the TE using unsolicited result code: **+CBM: <length><CR><LF><pdu>** (PDU mode enabled); or **+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>** (text mode enabled)

<ds>
0 No SMS-STATUS-REPORTs are routed to the TE.
1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: **+CDS: <length><CR><LF><pdu>** (PDU mode enabled) or **+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** (text mode enabled)
2 If SMS-STATUS-REPORT is stored in ME/TA, indication of the memory location is routed to the TE using unsolicited result code: **+CDSI: <mem>,<index>**

<bfr>
0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> = 1 – 3 is entered
1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> = 1 – 3 is entered

Notes
<mode>, <mt>, <bm> and <ds> are saved in non-volatile memory over module reboot; URC is available on the port that executes the command.

Examples

```
AT+CNMI=1                                   // Write command
OK

AT+CNMI=?                                   // Test command
+CNMI: (1-2),(0-2),(0,2),(0-2),(0-1)
OK

AT+CNMI?                                    // Read command
+CNMI: 1,0,0,0,0
OK
```

7.10. +CSCA Command: Service Center Address

HL7800	
Test command Syntax **AT+CSCA=?**	 Response **OK**
Read command Syntax **AT+CSCA?**	 Response **+CSCA: <sca>,<tosca>** **OK**
Write command Syntax **AT+CSCA=<sca>[,<tosca>]**	 Response **OK** or **+CMS ERROR: <err>** Parameters For parameter information and values, refer to section 7.1 Parameters Definition.

7.11. +CSMP Command: Set Text Mode Parameters

HL7800	
Test command Syntax **AT+CSMP=?**	 Response **+CSMP:** (list of supported **<fo>**s), (list of supported **<vp>**s), (list of supported **<pid>**s, (list of supported **<dcs>**s) **OK**
Read command Syntax **AT+CSMP?**	 Response **+CSMP: <fo>,<vp>,<pid>,<dcs>** **OK**
Write command Syntax **AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]**	 Response **OK** Parameters For parameter information and values, refer to section 7.1 Parameters Definition.

7.12. +CSMS Command: Select Message Service

HL7800	
Test command Syntax **AT+CSMS=?**	 Response **+CSMS:** (list of supported **<service>**s) **OK**
Read command Syntax **AT+CSMS?**	 Response **+CSMS: <service>,<mt>,<mo>,<bm>** **OK**
Write command Syntax **AT+CSMS= <service>**	 Response **+CSMS: <mt>,<mo>,<bm>** **OK** or **+CMS ERROR: <err>** Parameters **<service>** 0 3GPP TS 23.040 and 3GPP TS 23.041 1 3GPP TS 23.040 and 3GPP TS 23.041 (the requirement of setting <service> =1 is mentioned in the corresponding command description) **<mt>** Message terminated messages 0 Type not supported 1 Type supported **<mo>** Message originated messages 0 Type not supported 1 Type supported **<bm>** Broadcast type messages 0 Type not supported 1 Type supported

7.13. +CPMS Command: Preferred Message Storage

HL7800	
Test command Syntax **AT+CPMS=?**	 Response **+CPMS:** (list of supported **<mem1>**s), (list of supported **<mem2>**s), (list of supported **<mem3>**s) **OK**

HL7800	
Read command Syntax **AT+CPMS?**	Response **+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>** **OK** or **+CMS ERROR: <err>**
Write command Syntax **AT+CPMS= <mem1> [,<mem2> [,<mem3>]]**	Response **+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>** **OK** or **+CMS ERROR: <err>** Parameters For parameter information and values, refer to section 7.1 Parameters Definition.
Notes	<mem1>, <mem2> and <mem3> are saved in non-volatile memory over module reboot.

7.14. +CSDH Command: Show Text Mode Parameters

HL7800	
Test command Syntax **AT+CSDH=?**	Response **+CSDH:** (list of supported **<show>**s) **OK**
Read command Syntax **AT+CSDH?**	Response **+CSDH: <show>** **OK**
Write command Syntax **AT+CSDH= [<show>]**	Response **OK** or **+CME ERROR: <err>**

HL7800			
	Parameter		
	<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** resultcode, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>
		1	Show values in result codes

7.15. +CMT Notification: Received SMSPP Content

HL7800	
Unsolicited Notification	Response **+CMT: [<alpha>], <length><CR><LF><pdu>** **+CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>] <CR> <LF> <data>**
Reference [27.005]	Notes • All parameters are extracted from received message. • Detailed header information is shown in text mode result codes according to **+CSDH**.

8. Packet Domain Commands

8.1. +CGATT Command: PS Attach or Detach

HL7800	
Test command Syntax **AT+CGATT=?**	 Response **+CGATT:** (list of supported **<state>**s) **OK**
Read command Syntax **AT+CGATT?**	 Response **+CGATT: <state>** **OK**
Write command Syntax **AT+CGATT= [<state>]**	 Response **OK** or **ERROR** Parameter **<state>** State of PS attachment 0 Detached 1 Attached
Reference	27.007 Rev12

8.2. +CGACT Command: PDP Context Activate or Deactivate

HL7800	
Test command Syntax **AT+CGACT=?**	 Response **+CGACT:** (list of supported **<state>**s) **OK**
Read command Syntax **AT+CGACT?**	 Response **[+CGACT: <cid>,<state>]** **[<CR><LF>+CGACT: <cid>,<state>** **[...]]** **OK**

HL7800	
Write command Syntax **AT+CGACT=[<state>[,<cid>[,<cid>[,...]]]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<state>** Indicates the state of PDP context activation 0 Deactivated 1 Activated **<cid>** Numeric parameter which specifies a particular PDP context definition
Reference 27.007 Rev12	Notes The modules include an internal stack that may automatically activate or deactivate PDP context. Use this command with caution.

8.3. +CGCMOD Command: Modify PDP Context

HL7800	
Test command Syntax **AT+CGCMOD=?**	Response **+CGCMOD:** (list of **<cid>**s addociated with active contexts) **OK**
Write command Syntax **AT+CGCMOD=[<cid>[,<cid>[,...]]]**	Response **OK** or **+CME ERROR: <err>** Parameter **<cid>** Numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** and **+CGDSCONT**)
Reference	27.007 Rev10

8.4. +CGTFT Command: Traffic Flow Template

HL7800	
Test command Syntax **AT+CGTFT=?**	Response **+CGTFT: <PDP_type>,** (list of supported **<packet filter identifier>**s) , (list of supported **<evaluation precedence index>**s), (list of supported **<source address and subnet mask>**s), (list of supported **<protocol number (ipv4) / next header (ipv6)>**s), (list of supported **<destination port range>**s), (list of supported **<source port range>**s), (list of supported **<ipsec security parameter index (spi)>**s), (list of supported **<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>**s), (list of supported **<flow label (ipv6)**>s), (list of supported **<direction>**s) **[<CR><LF>+CGTFT: <PDP_type>,** (list of supported **<packet filter identifier>**s), (list of supported **<evaluation precedence index>**s), (list of supported **<source address and subnet mask>**s), (list of supported **<protocol number (ipv4) / next header (ipv6)>**s), (list of supported **<destination port range>**s),(list of supported **<source port range>**s), (list of supported **<ipsec security parameter index (spi)>**s), (list of supported **<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>**s), (list of supported **<flow label (ipv6)**>s), (list of supported **<direction>**s)**[...]]**
Read command Syntax **AT+CGTFT?**	Response **+CGTFT: <cid>, <packet filter identifier>,<evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction>** **[<CR><LF>+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction>** **[...]]**
Execute command Syntax **AT+CGTFT= [<cid>,[<packet filter identifier>, <evaluation precedence index> [,<source address and subnet mask> [,<protocol number (ipv4) / next header (ipv6)> [,<destination port range> [,<source port range> [,<ipsec security parameter index (spi)> [,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>**	Response **OK** or **ERROR** Parameter **<cid>** Numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** and **+CGDSCONT**) **<packet filter identifier>** Numeric parameter with value range from 1 to 16 **<evaluation precedence index>** Numeric parameter with value range from 0 to 255 **<source address and subnet mask>** String tpe given as a dot-separated numeric (0 – 255) parameter of the form "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13. a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8. m9.m10.m11.m12.m13.m14.m15.m16" for IPv6

HL7800	
[,<flow label (ipv6)>, <direction>]]]]]]]]]	**<protocol number (ipv4) / next header (ipv6)>** Numeric parameter with value range from 0 to 255 **<destination port range>** String type given as a dot-separated numeric (0 – 65535) parameter on the form 'f.t.' **<source port range>** String type given as a dot-separated numeric (0 – 65535) parameter on the form 'f.t.' **<ipsec security parameter index (spi)>** Numeric value in hecadecimal format with value range from 00000000 to FFFFFFFF **<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>** String type given as a dot-separated numeric (0 – 255) parameter on the form 't.m.' **<flow label (ipv6)>** Numeric value in hecadecimal format with value range from 00000 to FFFFF. Valid for IPv6 only **<direction>** Specifies the transmission direction in which the packet filter shall be applied 1 Uplink 2 Downlink 3 Birectional (up and downlink; default if omitted)
Reference 27.007 Rev12	Notes • 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 packet filters in the TFT for context number <cid> to become undefined.

8.5. +CGDCONT Command: Define PDP Context

HL7800	
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 ofsupported **<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 ofsupported **<IPv4AddrAlloc>**s),(list of supported **<emergency_indication>**s),(list of supported **<PCSCF_discovery>**s),(list of supported **<IM_CN_Signalling_Flag_Ind>**s) **[...]]** **OK**

HL7800	
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**
Execute 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 **<APN>** Access Point Name String parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. **<PDP_address>** String parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using **+CGPADDR**. Note that IPv6 address obtained on LTE will be prefixed with a constant 8-byte address "FE.80.00.00.00.00.00.00" if the network has not provided any. **<d_comp>** PDP data compression (applicable for SNDCP only) 0 Off (default if value if omitted) 1 On (manufacturer preferred compression) 2 V.42 bis **<h_comp>** PDP header compression 0 Off (default if value if omitted) 1 On (manufacturer preferred compression) 2 RFC1144 (applicable for SNDCP only) 3 RFC2507 4 RFC3095 (applicable for PDCP only)

HL7800	
	<IPv4AddrAlloc> Numeric parameter that controls how MT/TA requests to get IPv4 address information 0 IPv4 address allocated through NAS signalling 1 IPv4 address allocated through DHCP **<emergency_indication>** Indicates whether the PDP contect is for emergency bearer services or not 0 PDP context is not for emergency bearer services 1 PDP context is for emergency bearer services **<P-CSCF_discovery>** Numeric parameter that influences how the MT/TA requests get the P-CSCF address 0 Preference of P-CSCF address discovery not influences by **+CGDCONT** 1 Preference of P-CSCF address discovery through NAS signalling **<IM_CN_Signalling_Flag_Ind>** Numeric parameter used to indicate whether the PDP context is for IM CN subsystem related signaling only or not 0 UE indicates that the PDP context is not for IM CN subsystem-related signaling only 1 UE indicates that the PDP context is for IM CN subsystem-related signaling only
Reference 27.007 Rev12	Notes • If the command is used only with the one parameter <cid>, it means that the corresponding PDP context becomes undefined. • The APN Control List (ACL) will only be checked if a USIM is inserted. Before performing context definition, it will check if the ACL-service is enabled and activated. If yes, all APNs from ACL of EF-ACL of the USIM will be read out and compared with the requested APN. ▪ If the requested APN is listed in the ACL, the context definition will be performed. ▪ If the requested APN is empty ("") and ACL contains "network provided APN", the context definition will also be requested. ▪ If the APN is not listed in the ACL, the command returns error. ▪ If the ACL-service is not enabled or not activated in the USIM or a GSM-SIM is inserted the context definition will be performed without any checks. • Parameters are saved in non-volatile memory over module reboot.

8.6. +CGDSCONT Command: Define Secondary PDP Context

HL7800	
Test command Syntax **AT+CGDSCONT=?**	Response **+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**

HL7800	
Read command Syntax **AT+CGDSCONT?**	Response **[+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**
Execute command Syntax **AT+CGDSCONT=** **[<cid>,<p_cid>** **[,<d_comp>** **[,<h_comp>** **[,<IM_CN_** **Signalling_Flag_** **Ind>]]]]**	Response **OK** or **ERROR** Parameter **<cid>** PDP Context Identifier. A numeric parameter that specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of the permitted values (minimum value = 1) is returned by the test command. **<p_cid>** Primary PDP Context Identifier. Numeric parameter that specifies a particular PDP context definition which has been specified by +CGDCONT. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test command. **<d_comp>** PDP data compression (applicable for SNDCP only) 0 Off (default value if omitted) 1 On (manufacturer preferred compression) 2 V.42 bis **<h_comp>** PDP header compression 0 Off (default value if omitted) 1 On (manufacturer preferred compression) 2 RFC1144 (applicable for SNDCP only) 3 RFC2507 4 RFC3095 (applicable for PDCP only) **<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
Reference	27.007 Rev12

8.7. +CGCONTRDP Command: PDP Context Read Dynamic Parameter

HL7800	
Test command Syntax **+CGCONTRDP=?**	 Response **+CGCONTRDP:** (list of **<cid>**s associated with active contexts) **OK**
Execute command Syntax **+CGCONTRDP [=<cid>]**	 Response **+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]]][** **+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]]]** **[...]]** or **ERROR** Parameters **<cid>** Integer type; specifies a particular non-secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see **+CGDCONT** and **+CGDSCONT**). **<bearer_id>** Numeric parameter which identifies the bearer; EPS Bearer in EPS **<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. **<local_addr and subnet_mask>** String type; shows the IP address and subnet mask of the MT. The string is given as dot-separated numeric (0-255) parameters. **<gw_addr>** String type; shows the Gateway Address of the MT. The string is given as dot-separated numeric (0-255) parameters. **<DNS_prim_addr>** String parameter which shows the IP Address of the primary DNS Server **<DNS_sec_addr>** String parameter which shows the IP address of the secondary DNS Server **<P_CSCF_prim_addr>** String parameter which shows the IP Address of the primary P-CSCF Server **<P_CSCF_sec_addr>** String parameter which shows the IP Address of the secondary P-CSCF Server **<IM_CN_Signalling_Flag>** Shows whether the PDP context is for IM CN subsystem-related signalling only or not. 0 PDP context is not for IM CN subsystem-related signalling only 1 PDP context is for IM CN subsystem-related signalling only

HL7800	
	<LIPA_indication> Indicates that the PDP context provides connectivity using a LIPA PDN connection. This parameter cannot be set by the TE. 0 Indication not received that the PDP context provides connectivity using a LIPA PDN connection 1 Indication received that the PDP context provides connectivity using a LIPA PDN connection
Reference	27.007 Rev11

8.8. +CGSCONTRDP Command: Secondary PDP Context Read Dynamic Parameter

HL7800	
Test command Syntax **+CGSCONTRDP=?**	Response **+CGCONTRDP**: (list of **<cid>**s associated with active contexts) **OK**
Execute command Syntax **+CGSCONTRDP [=<cid>]**	Response **+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>]]** **+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>] [...]]** or **ERROR** Parameters **<cid>** Integer type; specifies a particular active secondary PDP context or Traffic Flows definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see **+CGDCONT** and **+CGDSCONT**). **<p_cid>** Integer type; specifies a particular PDP context definition or default EPS context Identifier which has been specified by **+CGDCONT**. The parameter is local to the TE-MT interface (see **+CGDSCONT**) **<bearer_id>** Numeric parameter which identifies the bearer; EPS Bearer in EPS **<IM_CN_Signalling_Flag>** Shows whether the PDP context is for IM CN subsystem-related signalling only or not. 0 PDP context is not for IM CN subsystem-related signalling only 1 PDP context is for IM CN subsystem-related signalling only
Reference	27.007 Rev11

8.9. +CGEREP Command: Packet Domain Event Reporting

HL7800

Test command

Syntax
AT+CGEREP=?

Response
+CGEREP: (list of supported **<mode>**s),(list of supported **<bfr>**s)
OK

Read command

Syntax
AT+CGEREP?

Response
+CGEREP: <mode>, <bfr>
OK

or
ERROR

Write command

Syntax
AT+CGEREP=[<mode>[,<bfr>]]

Response
OK

or
ERROR

Parameters

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

Unsolicited Notification

Response

+CGEV: NW DETACH	The network has forces a PS detach
+CGEV: NW CLASS <class>	The network has forced a change of MT class
+CGEV: ME CLASS <class>	The mobile termination has forced a change of MT class
+CGEV: ME PDN ACT <cid>[,<reason>]	The mobile termination has activated a context
+CGEV: NW ACT <p_cid>, <cid>, <event_type>	The network has activated a context
+CGEV: ME ACT <p_cid>, <cid>, <event_type>	The network has responded to an ME initiated context activation
+CGEV: NW PDN DEACT <cid>	The network has deactivated a context
+CGEV: ME PDN DEACT <cid>	The mobile termination has deactivated a context
+CGEV: NW DEACT <p_cid>, <cid>, <event_type>	The network has deactivated a context

HL7800	
	+CGEV: ME DEACT <p_cid>, <cid>, <event_type> The network has responded to an ME initiated context deactivation request **+CGEV: NW MODIFY <cid>, <change_reason>, <event_type>** The network has modified a context **+CGEV: ME MODIFY <cid>, <change_reason>, <event_type>** The mobile termination has modified a context Parameters **<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 **<event_type>** 0 Informational event 1 Information request, acknowledgement required **<change_reason>** 0 TFT only changed 1 QoS only changed 2 Both TFT and QoS changed
Reference	27.007 Rev12

8.10. +CGPADDR Command: Show PDP Address

HL7800	
Test command Syntax **AT+CGPADDR=?**	Response **+CGPADDR:** (list of supported **<cid>**s) **OK**
Write command Syntax **AT+CGPADDR=[<cid>,<cid>[,...]]]**	Response **+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]]** **[<CR><LF>** **+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]]][...]]** **OK** Parameters **<cid>** Numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** and **+CGDSCONT**). If no <cid> is specified, the addresses for all defined contexts are returned. **<PDP_addr_1>, <PDP_addr_2>** String that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by **+CGDCONT** and **+CGDSCONT** when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. Both <PDP_addr_1> and <PDP_addr_2> are omitted if none are available.

HL7800	
	Both <PDP_addr_1> and <PDP_addr_2> are included when both Ipv4 and Ipv6 addresses are assigned, with <PDP_addr_1> containing the IPv4 address and <PDP_addr_2> containing the IPv6 address. The string is given as dot-separated numeric (0 – 255) parameter of the form: a1.a2.a3.a4 for IPv4 and a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6.
Reference	27.007 Rev12

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

HL7800	
Test command Syntax **AT+CGSMS=?**	Response **+CGSMS:** (list of currently available **<service>**s) **OK**
Read command Syntax **AT+CGSMS?**	Response **+CGSMS: <service>** **OK**
Write command Syntax **AT+CGSMS= [<service>]**	Response **OK** or **ERROR** Parameter **<service>** Indicates the service or service preference to be used 0 Packet Domain 1 Circuit Switched
Reference 27.007 Rev12	Notes In 4G RAT, Packet Domain service means IMS messaging on EPS bearers and Circuit Switched service means transmission on Signalling Gateways.

9. Protocol Specific Commands

9.1. Preliminary Comments

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

- TCP
- UDP

9.2. 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 HL78xx 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

9.3. 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 10. Currently, the maximum number of simultaneous connected sessions is 6.

9.4. Connection of PDP Contexts

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

When a PDP context is active, the configuration of **+KCNXCFG** must be consistent with the configuration of **+CGDCONT**; otherwise, an error will be returned when creating a connection with **+KCNXUP**, **+KCTPCNX** or **+KUDPCFG**. Therefore, with an active PDP context, in **+KCNXCFG**:

- <af> must be consistent with **+CGDCONT <PDP_type>**, and
- <APN> must be identical to **+CGDCONT <APN>** or must be set to the empty string “”.

9.5. 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.

9.6. 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.

9.7. Connection Configuration

9.7.1. +KCNXCFG Command: GPRS Connection Configuration

HL7800	
Test command Syntax **AT+KCNXCFG=?**	 Response **+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>,<ip_v6>,<dns1_v6>,<dns2_v6>** **OK**
Read command Syntax **AT+KCNXCFG?**	 Response **+KCNXCFG: <cnx cnf>, "GPRS", <apn>,<login>,<password>,<af>,<ip>,<dns1>, <dns2>[,<ip_v6>,<dns1_v6>,<dns2_v6>],<state>** **[...]>** **OK**
Write command Syntax **AT+KCNXCFG= <cnx cnf>, "GPRS",<apn> [,[<login>] [,[<password>] [,<af> [,[<ip>]**	 Response **OK** Parameters **<cnx cnf>** PDP context configuration. Numeric parameter which specifies a particular PDP context configuration

HL7800	
[,[<dns1>] [,<dns2>]]]] [,[<ip_v6>] [,[<dns1_v6>] [,<dns2_v6>]]]]]]	**<apn>** (Access Point Name) a string parameter (max size 63 bytes), logical name used to select the GGSN or the external packet data network. **<login>** string type (max size 24 bytes), indicates the user name of the cnx **<password>** string type (max size 24 bytes), indicates the password of the cnx **<af>** Address family used for the connection (up to 3GPP Release 7 compliant) IPV4 IPv4 only IPV6 IPv6 only IPV4V6 IPv4 and IPv6 **<ip>** String type. Static IP not supported only dynamic address supported, the value should be “0.0.0.0” or an empty string. **<dns1>, <dns2>** String type. If the mobile is supposed to work with dynamic DNS addresses, the value should be “0.0.0.0” or an empty string. **<ip_v6>** IPV6 String type. If the mobile is supposed to work with a dynamic address, the value should be “::” or an empty string. **<dns1_v6>, <dns2_v6>** IPV6 String type. If the mobile is supposed to work with dynamic DNS addresses, the value should be “::” or an empty string. **<state>** Connection state 0 Disconnected 1 Connecting 2 Connected 3 Idle, down counting for disconnection 4 Disconnecting
Reference Sierra Wireless Proprietary	Notes • <ip> IP static not supported • 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. **AT+KCNXCFG** 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 correspond to PDP context ID. • 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.

9.7.2. +KCNXTIMER Command: Connection Timer Configuration

HL7800	
Test command Syntax **AT+KCNXTIMER =?**	 Response **+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**
Read command Syntax **AT+KCNXTIMER ?**	 Response **+KCNXTIMER: <cnx cnf>,<tim1>,<nbtrial>,<tim2>,<idletime>** **[…]** **OK**
Write command Syntax **AT+KCNXTIMER =<cnx cnf>[,[<tim1>][,[<nbrtrial>][,<tim2>][,<idletime>]]]]**	 Response **OK** Parameters **<cnx cnf>** PDP context configuration. Numeric parameter which specifies a particular PDP context configuration **<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. **<nbtrial>** Attempt times from1 – 4 (2 by default). The module will try to activate the PDP context for a maximum of <nbtrial> times. **<tim2>** 0 – 300s (60 s by default) 0 Deactivated (connection will not close by itself) For client sockets, module will try to connect to the server within <tim2>s; if <tim2> expires, it will give up the connection. **<idletime>** 0 – 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.
Reference Sierra Wireless Proprietary	Notes This command will only have impact on TCP and UDP.

9.7.3. +KCNXPROFILE Command: Current Profile Connection Configuration

HL7800	
Test command Syntax **AT+ KCNXPROFILE =?**	 Response **+KCNXPROFILE:** (list of possible **<cnx cnf>**s) **OK**
Read command Syntax **AT+ KCNXPROFILE?**	 Response **+KCNXPROFILE: <cnx cnf>** **OK**
Write command Syntax **AT+ KCNXPROFILE= <cnx cnf>**	 Response **OK** Parameter **<cnx cnf>** PDP context configuration. Numeric parameter which specifies a particular PDP context configuration
Reference Sierra Wireless Proprietary	Notes This command sets the default PDP context configuration ID for **+KTCPCFG** and **+KUDPCFG**, if <cnx cnf> parameter is not given in these commands.

9.7.4. +KCGPADDR Command: Display PDP Address

HL7800	
Test command Syntax **AT+KCGPADDR =?**	 Response **+KCGPADDR:** (list of possible **<cnx_cnf>**s) **OK**
Write command Syntax For all <cnx_cnf>s: **AT+KCGPADDR** For specific <cnx_cnf>s: **AT+KCGPADDR= <cnx_cnf>**	 Response **+KCGPADDR: <cnx cnf>, <PDP_addr_1>** **[[+KCGPADDR: <cnx cnf>, <PDP_addr_2>]** **…]** **OK** Parameters **<cnx cnf>** PDP context configuration. 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

HL7800	
Reference Sierra Wireless Proprietary	Notes • This AT command can be used after **+KTCPCNX**, **+KUDPCFG**, etc. to display the local IP address of the module • For IPv6, more than one PDP addresses corresponding to the interface may be displayed.

9.7.5. +KCNX_IND Notification: Connection Status Notification

HL7800	
Unsolicited Notification	Response **+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) Parameters **<cnx cnf>** PDP context configuration. Numeric parameter which specifies a particular PDP context configuration **<status>** PDP connection status 0 Disconnected due to network 1 Connected 2 Failed to connect, <tim1> timer is started if <attempt> is less than <nbtrail> 3 Closed 4 Connecting 5 Idle time down counting started for disconnection 6 Idle time down counting canceled **<af>** 0 IPV4 1 IPV6 **<tim1>** Refer to **+KCNXTIMER** **<attempt>** Current attempt of bringing up of PDP connection **<nbtrial>** Refer to **+KCNXTIMER** **<idletime>** Refer to **+KCNXTIMER**
Reference	Sierra Wireless Proprietary

9.7.6. +KCNXUP Command: Bring the PDP Connection Up

HL7800	
Test command Syntax **AT+KCNXUP=?**	 Response **+KCNXUP:** (list of possible **<cnx_cnf>**s) **OK**
Write command Syntax **AT+KCNXUP=<cnx_cnf>**	 Response **OK** Parameter **<cnx cnf>** PDP context configuration. Numeric parameter which specifies a particular PDP context configuration
Reference Sierra Wireless Proprietary	Notes • 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.

9.7.7. +KCNXDOWN Command: Bring the PDP Connection Down

HL7800			
Test command Syntax **AT+KCNXDOWN=?**	 Response **+KCNXDOWN:** (list of possible **<cnx_cnf>**s),(list of possible **<mode>**s) **OK**		
Write command Syntax **AT+KCNXDOWN=<cnx_cnf>[,<mode>]**	 Response **OK** Parameters **<cnx cnf>** PDP context configuration. Numeric parameter which specifies a particular PDP context configuration **<mode>**	0	Cancels the reservation of the activated PDP connection previously configured by **+KCNXUP**
		1	Similar to 0, but deactivates the PDP connection even if the active session exists
Reference	Sierra Wireless Proprietary		

9.8. Common Configuration

9.8.1. +KPATTERN Command: Custom End of Data Pattern

HL7800	
Test command Syntax **AT+KPATTERN =?**	 Response **OK**
Read command Syntax **AT+KPATTERN?**	 Response **+KPATTERN: <EOF pattern>** **OK**
Write command Syntax **AT+KPATTERN =<EOF pattern>**	 Response **OK** or **+CME ERROR <err>** Parameter **<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).
Reference Sierra Wireless Proprietary	Notes • 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>.

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

HL7800	
Test command Syntax **AT+KURCCFG=?**	 Response **+KURCCFG:** (list of supported **<protoopt>**s),(list of supported **<noti_act>**s),(list of supported **<indi_act>**s) **OK**
Read command Syntax **AT+KURCCFG?**	 Response **+KURCCFG: list of supported (<protoopt>,<noti_act>,<indi_act>)** **OK**
Write command Syntax **AT+KURCCFG=<protoopt>,<noti_act>[,<indi_act>]**	 Response **OK** Parameters **<protoopt>** Protocol option to enable/disable URC "TCPC" TCP client session "TCPS" TCP server session "UDPC" UDP client session "UDPS" UDP server session "TCP" Both TCP client and TCP server sessions "UDP" Both UDP client and UDP server sessions **<noti_act>** 1 Enable URC (like **+KTCP_NOTIF**) 0 Disable URC **<indi_act>** 1 Enable URC (like **+KTCP_SRVREQ**, **+KTCP_IND**, **+KTCP_DATA**, **+KUDP_DATA**, **+KUDP_RCV**, etc.) 0 Disable URC
Reference Sierra Wireless Proprietary	Notes • 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.
Examples	To disable URC: **AT+KURCCFG="TCP",0** **OK** Test and read command: **AT+KURCCFG=?** **+KURCCFG: ("TCPC","TCPS","UDPC","UDPS","TCP","UDP"),(0,-1),(0-1)** **OK**

HL7800	
	AT+KURCCFG? **+KURCCFG: "TCPC",1,1** **+KURCCFG: "TCPS",1,1** **+KURCCFG: "UDPC",1,1** **+KURCCFG: "UDPS",1,1** **OK**

9.8.3. +KIPOPT Command: General Options Configuration

HL7800	
Test command Syntax **AT+KIPOPT=?**	Response **+KIPOPT: 0,<UDP>,(1-100),(8-1472),(8-1452)** **+KIPOPT: 0,<TCP-based>,(0-100),(0,8-1460),(0,8-1440)** **+KIPOPT: 3,(0-1),(0-1)** **OK**
Read command Syntax **AT+KIPOPT?**	Response **+KIPOPT: 0,<proto>,<wait time>,<send size v4>,<send size v6>]** **[...]** **+KIPOPT: 3,<stop_on_error>, <stop_on_peer>** **OK**
Write command Syntax If <option_id>=0 **AT+KIPOPT=<option_id>,<proto>,<wait time>[,<send size v4>[,<send size v6>]]** If <option_id>=1 **AT+KIPOPT=<option_id>** If <option_id>=2 **AT+KIPOPT=<option_id>** If <option_id>=3 **AT+KIPOPT=<option_id>,<stop_on_error>,<stop_on_peer>**	Response **OK** or **+CME ERROR<err>** Parameters **<option_id>** Option ID 0 Wait time, send size threshold configuration 1 Internal use or compatibility purposes 2 Internal use or compatibility purposes 3 PDP connection deactivated behavior 4 Internal use or compatibility purposes **<proto>** Protocol, string type “TCPC” TCP client session “TCPS” TCP server session “UDPC” UDP client session “UDPS” UDP server session “TCP” Both client and server TCP sessions “UDP” Both client and server UDP sessions

HL7800	
If<option_id>=4 **AT+KIPOPT= <option_id>, <ssl_ver>**	**<wait time>** Timeout for configuring the packet segmentation on the IP network side; it specifies the timeout after which the buffered data will be sent to the peer irrespective of data packet size. Value is in 100 ms units. Range: For UDP: 1 – 100, default value = 2 For TCP: 0 – 100, default value = 1. Note that value = 0 has the same effect as having value = 1 due to the limitation from +KPATTERN detection timing **<send size v4>** Data packet size for IPv4 sessions. This parameter specifies the minimum data packet size that needs to be sent to the peer. Range: For UDP: 8 – 1472, default value = 1020 For TCP: 0, 8 – 1460, default value = 0 (disabled) **<send size v6>** Data packet size for IPv6 sessions. This parameter specifies the minimum data packet size that needs to be sent to the peer. Range: For UDP: 8 – 1452, default value = 1020 For TCP: 0, 8 – 1440, default value = 0 (disabled). Note that value = 0 uses a wait time of 100 ms. **<stop_on_error>** PDP connection deactivation behavior when a session is closed due to any error 0 Do not request to stop the connection 1 Request to stop the connection **<stop_on_peer>** PDP connection deactivation behavior when a session is closed by a peer/server 0 Do not request to stop the connection 1 Request to stop the connection
Reference Sierra Wireless Proprietary	Notes • 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 minimum 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 is sent as a UDP packet For TCP based protocol: data is copied to socket first-in-first-out buffer for transmission, but packet segmentation is not guaranteed to be <send size> • <send size v4> and <send size v6> impacts the detection of <EOF pattern>. Refer to the notes of **+KPATTERN** for more information.

9.9. SSL Configuration

9.9.1. +KSSLCRYPTO Command: Cipher Suite Configuration

HL7800	
Test command Syntax **AT+ KSSLCRYPTO=?**	 Response **+KSSLCRYPTO: <profile_id>,<mkey_Algo>,<auth_algo>,<enc_algo>,<mac_algo>, <tls_ver>,<auth>** **OK**
Read command Syntax **AT+ KSSLCRYPTO?**	 Response **+KSSLCRYPTO: <profile_id>,<mkey_algo>,<auth_algo>,<enc_algo>,<mac_algo>, <tls_ver>,<auth>** **[…]]** **OK**
Write command Syntax **AT+ KSSLCRYPTO= <profile_id>, <mkey_Algo>, <auth_algo>, <enc_algo>, <mac_algo>, <tls_ver>,<auth>**	 Response **OK** Parameters **<profile_id>** Index of a set of parameters for configuring one SSL profile **<mkey_algo>** Key exchange algorithm selection 1 RSA 8 ECDHE **<auth_algo>** Authentication algorithm selection 1 RSA 2 ECDSA **<enc_algo>** Encryption algorithm selection 16 AES-128-CCM 32 AES-256-CCM 64 AES-128-CBC 256 AES-128-CCM-8 512 AES-256-CCM-8 8192 AES-128-GCM 16384 AES-256-GCM **<mac_algo>** Message authentication code algorithm selection 0 NULL 4 SHA256 8 SHA384 **<tls_ver>** Cipher suite version selection. 4 TLS 1.2

HL7800	
	<auth> Authentication 0 No authentication 1 Authenticate server 2 Provide client certificate to server 3 Authenticate server and provide client certificate to server
Reference	Sierra Wireless Proprietary

Refer to the following table for the list of cipher suites supported by the AirPrime HL78xx.

Table 3. Supported Cipher Suites

NIST Name	<mkey_algo>	<auth_algo>	<enc_algo>	<mac_algo>
TLS-RSA-WITH-AES-128-GCM-SHA256	RSA	RSA	AES-128-GCM	SHA256
TLS-RSA-WITH-AES-256-GCM-SHA384	RSA	RSA	AES-256-GCM	SHA384
TLS-RSA-WITH-AES-128-CCM	RSA	RSA	AES-128-CCM	NULL
TLS-RSA-WITH-AES-256-CCM	RSA	RSA	AES-256-CCM	NULL
TLS-RSA-WITH-AES-128-CCM-8	RSA	RSA	AES-128-CCM-8	NULL
TLS-RSA-WITH-AES-256-CCM-8	RSA	RSA	AES-256-CCM-8	NULL
TLS-ECDHE-RSA-WITH-AES-128-CBC-SHA256	ECDHE	RSA	AES-128-CBC	SHA256
TLS-ECDHE-RSA-WITH-AES-128-GCM-SHA256	ECDHE	RSA	AES-128-GCM	SHA256
TLS-ECDHE-ECDSA-WITH-AES-128-CBC-SHA256	ECDHE	ECDSA	AES-128-CBC	SHA256
TLS-ECDHE-ECDSA-WITH-AES-128-GCM-SHA256	ECDHE	ECDSA	AES-128-GCM	SHA256
TLS-ECDHE-ECDSA-WITH-AES-256-GCM-SHA384	ECDHE	ECDSA	AES-256-GCM	SHA384
TLS-ECDHE-ECDSA-WITH-AES-128-CCM	ECDHE	ECDSA	AES-128-CCM	NULL
TLS-ECDHE-ECDSA-WITH-AES-256-CCM	ECDHE	ECDSA	AES-256-CCM	NULL
TLS-ECDHE-ECDSA-WITH-AES-128-CCM-8	ECDHE	ECDSA	AES-128-CCM-8	NULL
TLS-ECDHE-ECDSA-WITH-AES-256-CCM-8	ECDHE	ECDSA	AES-256-CCM-8	NULL

9.9.2. +KSSLCFG Command: SSL Configuration

HL7800	
Test command Syntax **AT+KSSLCFG=?**	 Response **+KSSLCFG: <option id>,<option>** **OK**

HL7800	
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 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)

9.10. SSL Certificate Manager

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

HL7800	
Test command Syntax **AT+ KCERTSTORE=?**	Response **+KCERTSTORE: (**list of possible **<data_type>**s**),(**range of possible lengths of **<NbData>),(**list of possible **<index>**es**)** **OK**

HL7800	
Read command Syntax **AT+ KCERTSTORE?**	Response **+KCERTSTORE:** **[root_cert,<index>,<NbData><CR><LF>** **<File_data><CR><LF>]** **[local_cert,<index>,<NbData><CR><LF>** **<File_data> <CR><LF>]** **[...]** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+ KCERTSTORE= <data_type> [,<NbData> [,<index>]]**	Response **CONNECT** **OK** or **+CME ERROR: <err>** Parameters **<data_type>** 0 Root certificate 1 Local certificate **<NbData>** 1 – 3000 Number of bytes to read/write **<index>** Stored root/local certificate index. If a root/local certificate is already stored at the index, it will be overloaded Value range: 0 If <data_type> = 0 0 – 2 If <data_type> = 1 **<File_data>** File data in bytes
Reference Sierra Wireless Proprietary	Notes • 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. • **ATO** is not available for this command. • It is highly recommended to configure the module for hardware flow control before using this command.

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

HL7800	
Test command Syntax **AT+ KPRIVKSTORE =?**	 Response **+KPRIVKSTORE: (**list of possible **<index>**s**),(** range of possible lengths of **<NbData>)** **OK**
Read command Syntax **AT+ KPRIVKSTORE?**	 Response **+KPRIVKSTORE:** **private_key,<index>,<NbData><CR><LF>** **<File_data> <CR><LF>** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+ KPRIVKSTORE= <index> [,<NbData>]**	 Response **CONNECT** **OK** or **+CME ERROR: <err>** Parameters **<index>** 0 – 2 Index of the stored local certificate associated to this private key **<NbData>** 1 – 3000 Number of bytes to read/write (mandatory for both reading and writing) **<File_data>** File data in bytes
Reference Sierra Wireless Proprietary	Notes • 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. • **ATO** is not available for this command. • It is highly recommended to configure the module for hardware flow control before using this command.

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

HL7800	
Test command Syntax **AT+ KCERTDELETE =?**	Response **+KCERTDELETE: (**list of possible **<data_type>**s**),(**list of possible **<index>**s**)** **OK**
Read command Syntax **AT+ KCERTDELETE?**	Response **+KCERTDELETE:** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+ KCERTDELETE= <data_type> [,<index>]**	Response **OK** or **+CME ERROR: <err>** Parameters **<data_type>** 0 Root certificate 1 Local certificate **<index>** Stored local certificate index Value range: 0 If <data_type> = 0 0 – 2 If <data_type> = 1
Reference	Sierra Wireless Proprietary

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

HL7800	
Test command Syntax **AT+ KPRIVKDELETE =?**	Response **+KPRIVKDELETE: (**list of possible **<index>**es**)** **OK**

HL7800	
Write command Syntax **AT+ KPRIVKDELETE= <index>**	Response **OK** or **+CME ERROR: <err>** Parameter **<index>** 0 – 2 Stored private key index
Reference	Sierra Wireless Proprietary

9.11. TCP Specific Commands

9.11.1. +KTCPCFG Command: TCP Connection Configuration

HL78xx	
Test command Syntax **AT+KTCPCFG=?**	Response **+KTCPCFG: (**list of possible **<cnx_cnf>**s**),(**list of possible **<mode>**s**), <remote-name/ip>,(**list of possible **<tcp_port >**s**),(**list of possible **<source_port>**s**),(**list of possible **<data_mode>**s**),(**list of possible **<URC-ENDTCP-enable>**s**),(**list of possible **<af>s),<cipher_index>,(**list of possible **<restore_on_boot>**s**)** **OK**
Read command Syntax **AT+KTCPCFG?**	Response **+KTCPCFG: <session_id>,<status>,<cnx cnf>,<mode>[,<serverID>], <tcp remote address>,<tcp_port>[,<source_port>],<data_mode>, <URC-ENDTCP-enable>,<af>,<cipher_index>[,<restore_on_boot>] […]]**
Write command Syntax **AT+KTCPCFG= [<cnx cnf>], <mode>, [<tcp remote address>],<tcp_ port>[,[<source_ port>][,[<data_ mode>][,[<URC-ENDTCP-enable>][,[<af>][, [<cipher_suite>] [,[<restore_on_ boot>]]]]]]]**	Response **+KTCPCFG: <session_id>** **OK** Parameters **<cnx cnf>** Index of a set of parameters for configuring one TCP session (see **+KCNXCFG**) **<session_id>** TCP session index

HL78xx	
	<mode> 0 Client 1 Server 2 Child (generated by server sockets) 3 Secure client **<tcp remote address>** IP address string or explicit name of the remote server. For server configuration, this parameter is left blank **<tcp_port>** TCP port number; numeric parameter with range 1 – 65535. This parameter is the listening port for a server configuration. **<status>** Connection state of the selected socket 0 Disconnected 1 Connected **<serverID>** Server session ID index. Only for sockets in Child mode **<source_port>** Numeric parameter (0-65535). Specifies the local TCP port number. This parameter is left blank for a server configuration. **<data_mode>** 0 Do not display <data> in URC (default setting) 1 Display <data> in URC (not supported) **<URC-ENDTCP-enable>** 0 Do not display URC "+KTCP_ACK" 1 Display URC "+KTCP_ACK" **<af>** Address family used for the connection. 0 IPV4 1 IPV6 **<cipher_index>** Cipher suite profile index to use for a secured socket; defined by **+KSSLCRYPTO** **<restore_on_boot>** Restore session on boot (only for server socket) 0 Session is not restored on boot 1 Session is restored on boot
Reference Sierra Wireless Proprietary	Notes • 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 10. • For child session, the property <data_mode> will be kept the same as the server socket's setting. • This command can be used before setting up **+KCNXCFG**. 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.

9.11.2. +KTCPCNX Command: Start TCP Connection

HL78xx	
Test command Syntax **AT+KTCPCNX=?**	 Response **+KTCPCNX: (**list of possible **<session_id>**s**)** **OK**
Write command Syntax **AT+KTCPCNX= <session_id>**	 Response **OK** or **+CME ERROR: <err>** **+KTCP_NOTIF: <session_id>, <tcp_notif>** Parameters **<session_id>** TCP session index **<tcp_notif>** Integer type. Indicates the cause of the TCP connection failure 0 Network error 1 No more sockets available; max. number already reached 2 Memory problem 3 DNS error 4 TCP disconnection by the server or remote client 5 TCP connection error 6 Generic error 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
Reference Sierra Wireless Proprietary	Notes This command is used for connecting to a remote server or listening to a bound port, depending on the selected mode of <session_id>.

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

HL78xx	
Test command Syntax **AT+KTCPRCV=?**	 Response **+KTCPRCV: (**list of possible **<session_id>**s**),(**list of possible **<ndata>**s**)** **OK**

HL78xx	
Write command Syntax **AT+KTCPRCV= <session_id>, <ndata>**	Response **CONNECT** **…<EOF pattern>** **OK** or **+KTCP_NOTIF: <session_id>,<tcp_notif>** Parameters **<session_id>** TCP session index **<ndata>** Number of bytes the device wants to receive (max value 4294967295) **<tcp_notif>** See command **AT+KTCPCNX**
Reference Sierra Wireless Proprietary	Notes • This function is used to receive <ndata> data bytes through a previously opened TCP socket. • <ndata> indicates the max data number that the terminal wishes to receive. If the TCP socket contains more data than <ndata> bytes then only <ndata> bytes will be received. If the TCP socket contains less data than <ndata> bytes then only TCP socket's data will be received. • <EOF pattern> would be added at the end of data automatically. • When <ndata> (max value) bytes or only available data in the TCP socket have been received, the module returns to command state and returns OK. • It is highly recommended to configure the module for hardware flow control using **AT&K3** before using this command. • Refer to **AT&D** for the behavior of DTR drop.

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

HL78xx	
Test command Syntax **AT+KTCPSND=?**	Response **+KTCPSND: (**list of possible **<session_id>**s**),(**list of possible **<ndata>**s**)** **OK**
Write command Syntax **AT+KTCPSND= <session_id>, <ndata>**	Response **CONNECT** **OK** or **NO CARRIER** **+CME ERROR: <err>** **+KTCP_NOTIF: <session_id>,<tcp_notif>**

HL78xx	
	Parameters **<session_id>** TCP session index **<ndata>** Number of bytes (max value = 4294967295) **<tcp_notif>** See command **AT+KTCPCNX**
Reference Sierra Wireless Proprietary	Notes • 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 can also be ended by <EOF pattern>, +++ or DTR.

9.11.5. +KTCPCLOSE Command: Close Current TCP Operation

HL78xx	
Test command Syntax **AT+KTCPCLOSE=?**	Response **+KTCPCLOSE: (**list of possible **<session_id>**s**), (**list of possible **<closing_type>**s**)** **OK**
Write command Syntax **AT+KTCPCLOSE=<session_id>[,<closing_type>]**	Response **OK** or **+CME ERROR: <err>** **NO CARRIER** **+KTCP_NOTIF: <session_id>, <tcp_notif>** Parameters **<session_id>** TCP session index **<closing_type>** 1 The TCP connection is properly closed, which means that data sent to the module by **AT+KTCPSND** will be sent to the TCP server and acknowledged before the socket is closed. **<tcp_notif>** See **AT+KTCPCNX**
Reference Sierra Wireless Proprietary	Notes • 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.

9.11.6. +KTCPDEL Command: Delete a Configured TCP Session

HL78xx	
Test command Syntax **AT+KTCPDEL=?**	 Response **+KTCPDEL:** (list of possible **<session_id>**s**)** **OK**
Write command Syntax **AT+KTCPDEL= <session_id>**	 Response **OK** or **+CME ERROR: <err>** Parameter **<session_id>** TCP session index
Reference Sierra Wireless Proprietary	Notes The session must be closed (using **+KTCPCLOSE**) before using this command.

9.11.7. +KTCP_SRVREQ Notification: Incoming Client Connection Request

HL78xx	
Unsolicited Notification	Response **+KTCP_SRVREQ: <session_id>,<subsession_id>,<client_ip>,<client_port>** Parameters **<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
Examples	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**

HL78xx	

	Start the TCP servers
	AT+KTCPCNX=1 //listen on port 179
	OK
	
	AT+KTCPCNX=2 //listen on port 180
	OK
	
	Show the TCP servers' IP address
	AT+KCGPADDR
	+KCGPADDR: 0,"192.168.1.49"
	OK
	//Incoming connection request from remote client, shows ip address and port of remote //client
	
	+KTCP_SRVREQ: 1,3,"192.168.0.32",4614
	//incoming a connection request from "192.168.0.32" via listening port 179, the remote //port is 4614
	
	+KTCP_SRVREQ: 2,4,"10.10.10.110",4665
	//incoming a connection request from "10.10.10.110" via listening port 180, the remote //port is 4665
	
	+KTCP_SRVREQ: 2,5,"10.10.10.110",4668
	//incoming a connection request from the same ip via the same listening port, the remote //port is 4668
	
	+KTCP_SRVREQ: 1,6,"192.168.1.117",1739
	//incoming a connection request from "192.168.1.117" via listening port 179, the remote //port is 1739
	
	+KTCP_NOTIF: 4,4
	//the connection of sub session id 4 (on listening port 180) is closed.
	
	+KTCP_SRVREQ: 2,4,"10.10.10.8",4672
	//incoming a connection request from "10.10.10.8" via listening port 180, the remote port //is 4672

Reference Sierra Wireless Proprietary	Notes • 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 **+KTCPSND**, **+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.

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

HL78xx	
Unsolicited Notification	Response **+KTCP_DATA: <session_id>,<ndata available>[,<data>]** Parameters **<session_id>** TCP session index **<ndata available>** For <data_mode> = 0, maximum number of bytes to be read in the TCP receive buffer; for <data_mode> = 1, maximum number of bytes to be read in <data> **<data>** Data in octet. The length of data is specified by <ndata_available>
Reference Sierra Wireless Proprietary	Notes • 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.

9.11.9. +KTCP_IND Notification: TCP Status

HL78xx	
Unsolicited Notification	Response **+KTCP_IND: <session_id>,<status>** Parameters **<session_id>** TCP session index **<status>** TCP session status. 1 session is set up and ready for operation
Reference	Sierra Wireless Proprietary

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

HL78xx	
Test command Syntax **AT+KTCPSTART =?**	 Response **OK**

HL78xx	
Read command Syntax **AT+KTCPSTART ?**	 Response **OK**
Write command Syntax **AT+KTCPSTART =<session_id>**	 Response **CONNECT** **OK** or **+CME ERROR: an error occurs, syntax error** **+KTCP_NOTIF: <session_id>,<tcp_notif> : an error occurs** Parameters **<session_id>** TCP session index **<tcp_notif>** See **AT+KTCPCNX**
Reference Sierra Wireless Proprietary	Notes • 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 **+KTCPCNX**, this command does not restart the connection and the module directly enters direct data flow. • The data session can also be ended by <EOF pattern>, +++ or DTR.

9.12. UDP Specific Commands

9.12.1. +KUDPCFG Command: UDP Connection Configuration

HL7800	
Test command Syntax **AT+KUDPCFG=?**	 Response **+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**),(**list of possible **<restore_on_boot>**s**)** **OK**

HL7800

Read command

Syntax
AT+KUDPCFG?

Response
+KUDPCFG: <session_id>,<cnx cnf>,<mode>,<port>,<data_mode>,<udp remote address>,<udp_port>,<af>,<restore_on_boot>
[…]
OK

Write command

Syntax
AT+KUDPCFG=[<cnx cnf>],<mode>[,[<port>][,[<data_mode>][,[<udp remote address>][,[<udp_port>][,[<af>][,[<restore_on_boot>]]]]]]]

Response
+KUDPCFG: <session_id>
OK

or
+CME ERROR: <err>
+KUDP_NOTIF: <session_id>, <udp_notif>

Parameters
<session_id> UDP session index

<mode> 0 Client
1 Server

<port> 0 – 65535 Port (0 = random)

<cnx cnf> PDP context configuration. Numeric parameter which specifies a particular PDP context 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 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 (not supported)

<udp remote address> IP address string or explicit name of the remote host, Default is empty (given by **+KUDPSND**).

<udp_port> 0 – 65535 UDP peer port; given by **+KUDPSND**

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

<restore_on_boot> Restore session on boot (only for server socket)
0 Session is not restored on boot
1 Session is restored on boot

HL7800	
Reference Sierra Wireless Proprietary	Notes • 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.

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

HL7800	
Test command Syntax **AT+KUDPRCV=?**	Response **+KUDPRCV:** (list of possible **<session_id>**s),(list of possible **<ndata>**s) **OK**
Write command Syntax **AT+KUDPRCV= <session_id>, <ndata>**	Response **CONNECT** **…<EOF pattern>** **OK** **+KUDP_RCV: <udp remote address>,<udp remote port>** or **NO CARRIER** **+CME ERROR: <err>** **+KUDP_NOTIF: <session_id>, <udp_notif>** **+KUDP_DATA_MISSED: <session_id>, <ndata missed>** Parameters **<session_id>** UDP session index **<ndata>** Number of bytes the device wants to receive (max value 4294967295) **<udp remote address>** IP address string of the remote host **<udp remote port>** 0 – 65535 Remote UDP port **<udp_notif>** See **AT+KUDPCFG** **<ndata missed>** Number of bytes left in the UDP socket

HL7800	
Reference Sierra Wireless Proprietary	Notes • 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.

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

HL7800	
Test command Syntax **AT+KUDPSND=?**	 Response **+KUDPSND: (**list of possible **<session_id>**s**),<remote-name/ip>,(**list of possible **<udp_port>**s**),(**list of possible **<ndata>**s**)** **OK**
Write command Syntax **AT+KUDPSND= <session_id>, <udp remote address>, <udp_port>, <ndata>**	 Response **CONNECT** **OK** or **NO CARRIER** **+CME ERROR: <err>** **+KUDP_NOTIF: <session_id>,<udp_notif>** Parameters **<session_id>** UDP session index **<udp remote address>** IP address string or explicit name of the remote host **<udp_port>** 1 – 65535 UDP peer port **<ndata>** Number of bytes (max value 4294967295) **<udp_notif>** See **AT+KUDPCFG**

HL7800	
Reference Sierra Wireless Proprietary	Notes • 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 can also be ended by <EOF pattern>, +++ or DTR.

9.12.4. +KUDPCLOSE Command: Close Current UDP Operation

HL7800	
Test command Syntax **AT+KUDPCLOSE=?**	Response **+KUDPCLOSE: (**list of possible **<session_id>**s**),(**list of possible **<keep_cfg>**s**)** **OK**
Write command Syntax **AT+KUDPCLOSE=<session_id>[,<keep_cfg>]**	Response **OK** or **+KUDP_NOTIF: <session_id>, <udp_notif>** Parameters **<session_id>** UDP session index **<udp_notif>** See **AT+KUDPCFG** **<keep_cfg>** Specifies whether to delete the session configuration after closing it or not 0 Delete the session configuration 1 Keep the session configuration
Reference Sierra Wireless Proprietary	Notes • 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.

9.12.5. +KUDPDEL Command: Delete a Configured UDP Session

HL7800	
Test command Syntax **AT+KUDPDEL=?**	 Response **+KUDPDEL: (**list of possible **<session_id>**s**)** **OK**
Write command Syntax **AT+KUDPDEL= <session_id>**	 Response **OK** or **+CME ERROR: <err>** Parameters **<session_id>** UDP session index
Reference Sierra Wireless Proprietary	Notes The session must be closed (using **+KUDPCLOSE**) before using this command.

9.12.6. +KUDP_IND Notification: UDP Status

HL7800	
Unsolicited Notification	Response **+KUDP_IND: <session_id>,<status>** Parameters **<session_id>** UDP session index **<status>** UDP session status. 1 Session is set up and ready for operation
Reference	Sierra Wireless Proprietary

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

HL7800	
Unsolicited Notification	Response **+KUDP_DATA: <session_id>,<ndata available>[,<udp remote address>,<udp remote port>,<data>]**

HL7800	
	Parameters **<session_id>** UDP session index **<ndata available>** Number of bytes to be read **<udp remote address>** IP address string of the remote host **<udp remote port>** 0 – 65535 Remote UDP port **<data>** Data in octet. The length of data is specified by <ndata_available>.
Reference Sierra Wireless Proprietary	Notes • 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** 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**.

10. AVMS Commands

Note: Two IP sessions are required during an AVMS FOTA session (connection to AirVantage and FOTA upgrade). Refer to section 9.3 Session ID for session ID details.

10.1. +WDSC Command: Device Services Configuration

HL7800	
Test command Syntax **AT+WDSC=?**	 Response **+WDSC: (0-2,5,6),(**list of supported **<State>**s**)** **+WDSC: 3,(**list of supported **<State>**s**)** **+WDSC: 4,(**list of supported **<Timer_1>**s**),(**list of supported **<Timer_2>**s**),(**list of supported **<Timer_3>**s**),(**list of supported **<Timer_4>**s**),(**list of supported **<Timer_5>**s**),(**list of supported **<Timer_6>**s**),(**list of supported **<Timer_7>**s**),(**list of supported **<Timer_8>**s**)** **OK**
Read command Syntax **AT+WDSC?**	 Response **+WDSC: 0,<State>** **+WDSC: 1,<State>** **+WDSC: 2,<State>** **+WDSC: 3,<State>** **+WDSC: 4,<Timer_1>[[,<Timer_2>]...[,<Timer_n>]]** **+WDSC: 5,<State>** **+WDSC: 6,<State>** **OK**
Write command Syntax For <Mode>= 0, 1, 2, 3, 5, 6: **AT+WDSC= <Mode>,<State>** For <Mode>=4: **AT+WDSC= <Mode>, <Timer_1> [[,<Timer_2>]... [,<Timer_n>]]**	 Response **OK** or **+CME ERROR <err>** Parameters **<Mode>** 0 User agreement for AVMS connection When this mode is activated, an indication (see **+WDSI** for more information) is returned by the embedded module to request for an agreement before connecting to the server 1 User agreement for package download When this mode is activated, an indication (see **+WDSI** for more information) is returned by the embedded module to request for an agreement before downloading any package 2 User agreements for package install When this mode is activated, an indication (see **+WDSI** for more information) is returned by the embedded module to request for an agreement before installing any package

HL7800	
	3 Polling mode The embedded module will initiate a connection to the Device Services server according to the defined timer 4 Retry mode If an error occurs during a connection to the Device Services server (WWAN DATA establishment failed, http error code received), the embedded module will initiate a new connection according to the defined timers. This mechanism is persistent to the reset. 5 User agreements for device reboot When this mode is activated, an indication (see **+WDSI** for more information) is returned by the embedded module to request for an agreement before rebooting the device 6 User agreements for application uninstall (SW update) When this mode is activated, an indication (see **+WDSI** for more information) is returned by the embedded module to request for an agreement before uninstalling an application. **<State>** Status of the mode For <Mode> = 0, 1, 2, 5 or 6: 0 Disabled (default value) 1 Enabled For <Mode> = 3: Range = 0 – 525600 (units:min) 0 The polling mode is deactivated **<Timer_1>** Timer between the first failed connection and the next attempt. Range = 0 – 20160 (units: min). 0 The retry mode is deactivated 15 Default value **<Timer_n>** Timer between the nth failed attempt connection and the (n+1)th connection (n ≤ 7). 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
Reference Sierra Wireless Proprietary Command	Notes • 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 without sending the **&W** command. 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 **+WDSS**.

HL7800	
Examples	**AT+WDSC=?** **+WDSC:(0-2,5,6),(0-1)** **+WDSC:3,(0-525600)** **+WDSC:4,(0-20160),(1-20160),(1-20160),(1-20160),(1-20160),(1-20160),(1-20160)** **OK** **AT+WDSC?** // All modes are deactivated except retry mode which is used with default timers **+WDSC: 0,0** **+WDSC: 1,0** **+WDSC: 2,0** **+WDSC: 3,0** **+WDSC: 4,15,60,240,960,2880,10080,10080** **+WDSC: 5,0** **+WDSC: 6,0** **OK** **AT+WDSC=0,1** **OK** **AT+WDSC?** **+WDSC: 0,1** **+WDSC: 1,0** **+WDSC: 2,0** **+WDSC: 3,0** **+WDSC: 4,15,60,240,960,2880,10080,10080** **+WDSC: 5,0** **+WDSC: 6,0** **OK**

10.2. +WDSD Command: Device Services Local Download

HL7800	
Test command Syntax **AT+WDSD=?**	 Response **+WDSD:** (list of supported **<Size>**s) **OK**
Write command Syntax **AT+WDSD= <Size>**	 Response **<NACK>** *// User sends data* **OK** or **+CME ERROR <err>** Parameter **<Size>** 1 – <maximum size> Package size in bytes

HL7800	
Reference Sierra Wireless Proprietary	Notes • This command is available when the module has finished its initialization. • The response to **AT+WDSD=<Size>** is the <NACK> character when the device is ready to receive data using the 1K-Xmodem or 128-Xmodem protocol. • 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.
Examples	**AT+WDSD=?** **+WDSD: (1-24643584)** **OK** **AT+WDSD=1024** //download a 1kBytes package **<NACK>** //the device is ready to receive data //send data **OK** //All data are well received by the module **+WDSI: 3** //A package is ready to install (see **+WDSI** and **+WDSR**)

10.3. +WDSE Command: Device Services Error

HL7800	
Execute command Syntax **AT+WDSE**	Response **[+WDSE:<HTTP_Status>]** **OK** **+CME ERROR <err>** Parameter **<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

HL7800	
	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 505 HTTP version not supported If no session was made with the server, AT+WDSE only returns OK, without +WDSE: <HTTP_Status> intermediary response.
Reference Sierra Wireless Proprietary Command	Notes This command is available when the embedded module has finished the Device Services initialization (see +WDSI) and when the AVMS services are in activated state (see +WDSG).
Examples	**AT+WDSS=1,1** //A session was made with the server **OK** **AT+WDSE** **+WDSE: 200** //The last HTTP response received is “OK” **OK**

10.4. +WDSG Command: Device Services General Status

HL7800	
Test command Syntax **AT+WDSG=?**	 Response **OK**
Write command Syntax **AT+WDSG**	 Response **+WDSG: <Indication>,<State>** **[+WDSG: <Indication>,<State>[…]]** **OK** or **+CME ERROR <err>**

HL7800	
	Parameters **<Indication>** Integer type 0 Device services activation state 1 Session and package indication **<State>** Status of indication For <Indication>=0 0 Device services are prohibited. Devices services will never be activated. 1 Device services are deactivated. Connection parameters to a device services must be provisioned. 2 Device services have to be provisioned. NAP parameters must be provisioned. 3 Device services are activated. If a device has never been activated (first use of device services on this device), <State> is set to 1. The connection parameters are automatically provisioned, no action is needed from the user. For <Indication>=1 0 No session or package 1 A session is under treatment 2 A package is available on the server. 3 A package was downloaded and ready to install When a package was installed or a recovery was made, <State> is set to 0.
Reference Sierra Wireless Proprietary Command	Notes This command is available when the embedded module has finished the Device Services initialization (see **+WDSI**).
Examples	**AT+WDSG=?** **OK** **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**

10.5. +WDSI Command: Device Services Indications

HL7800	
Test command Syntax **AT+WDSI=?**	 Response **+WDSI:** (list of supported **<Level>**s) **OK**
Read command Syntax **AT+WDSI?**	 Response **[+WDSI: <Level>]** **OK**

HL7800

Write command

Syntax
AT+WDSI=<Level>

Response
OK

or
+CME ERROR <err>

Parameters

<Level> Indication level, bit field (default value = 0)

Bit set to 0 Indication deactivated

Bit set to 1 Indication activated

0 No indication

1 Activate the initialization end indication (<Event> = 0)

2 Activate the server request for a user agreement indication (<Event> = 1, 2, 3, 24 and 25)

4 Activate the authentication indications (<Event> = 4 and 5)

8 Activate the session indication (<Event> = 6, 7, 8 and 23)

16 Activate the package download indications (<Event> = 9, 10 and 11)

32 Activate the certified downloaded package indication (<Event> = 12 and 13)

64 Activate the update indications (<Event> = 14, 15 and 16)

256 Activate download progress indication (<Event> = 18)

512 Activate memory pre-emption indication (<Event> = 19)

1024 Activate User Pin request indication for bootstrap (<Event> = 20)

2048 Reserved

4096 Activate Bootstrap event indications (<Event> = 23)

<Event>

0 Device services are initialized and can be used. Devices services are initialized when the SIM is registered on network and a dedicated NAP is configured.

1 The Device Services server requests the device to make a connection. The device requests a user agreement to allow the module to make the connection. The response can be sent using **+WDSR** and this indication can be returned by the device if the user has activated the user agreement for connection.

2 The Device Services server requests the device to make a package download. The device requests a user agreement to allow the module to make the download. The response can be sent using **+WDSR** and this indication can be returned by the device if the user has activated the user agreement for download.

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** and this indication can be returned by the device if the user has activated the user agreement for install.

4 The embedded module starts authentication with the server

5 Authentication with the server failed. This event is sent when the server rejects the device authentication request. Example of rejection cause: authentication keys mismatch.

6 Authentication has succeeded, and session with the server started.

7 Session with the server failed. This event is sent when the server rejects the device connection request. Example of rejection cause: device not registered on server side.

8 Session with the server is finished. Example of session termination cause: connection loss, user initiated using +WDSS=1,0 or reboot.

9 A package is available on the server and can be downloaded by the module. A <Data> parameter is returned indicating the package size in kB

HL7800

	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** 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** 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 Reserved 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 Reserved 22 Reserved 23 Session type (only in LWM2M protocol) 24 The Device Services server requests the device to make a reboot. The device requests a user agreement to allow the embedded module to reboot. The response can be sent using **+WDSR** and this indication can be returned by the device if the user has activated the user agreement for connection. 25 The Device Services server requests the device to uninstall a SW application. The device requests a user agreement to allow the embedded modeule to uninstall an application. The response can be sent using **+WDSR** and this indication can be returned by the device if the user has activated the user agreement for uninstall. **<Data>** Specific data for some <Event> For<Event>=9, <Data> indicates the package size in bytes, which will be downloaded For<Event>=17, <Data> indicates if the fallback was asked by the user or applied because a recovery was necessary 0 Automatic recovery (a recovery mechanism was made) 1 Fallback asked by the user (see **+WDSF** for more information) For<Event>=18, <Data> indicates the download progress in percentage For<Event>=21, <Data> indicates the provisioned parameters 0 Reserved 1 Alarm (see **+CALA**) 2 Reserved 3 Greeting (see **+CGMI**) 4 Preferred PLMN (see **+CPOL**) 5 PDP context (see **+CGDCONT** and **+WDSS**) 6 SIM PIN code activation state (see **+CLCK**) 7 Reserved 8 GPRS class (see **+CGCLASS**) 9 Device Service Polling mode (see **+WDSC** for more information) 10 Network selection (see **+COPS** for more information) 11 Reserved 12 Retry mode (see **+WDSC** for more information (mode 4)) 13 MSISDN (see **+CPBS** for more information)

HL7800	
Unsolicited Notification	Response **+WDSI: <Event>[,<Data>]**
Reference Sierra Wireless Proprietary Command	Notes • This command is available when the embedded module has finished its initialization. • To receive **+WDSI** indications, the Device Services should be in activated state (see **+WDSG** for more information).
Examples	**AT+WDSI=?** **+WDSI: (0-127,256-383,4096-4223,4352-4479)** **OK** **AT+WDSI?** **+WDSI: 0** *// All indications are deactivated* **OK** **AT+WDSI=207** **OK** **+WDSI: 1** *// The devices services server requests a connection to the // embedded module* **AT+WDSR=1** *// Accept the connection* **OK** **+WDSI: 4** *// The embedded module will send the first data to the // AirPrime Management Services server* **+WDSI: 6** *// The authentication succeeded* **+WDSI: 8** *// The session with the server is over* **+WDSI: 9,1000** *// A package will be downloaded, the size is 1kbytes* **+WDSI: 18,"1%"** *// 1% was downloaded* **+WDSI: 18,"100%"** *// The whole package was downloaded* **+WDSI: 10** *// The whole package was stored in flash*

10.6. +WDSR Command: Device Services Reply

HL7800	
Test command Syntax **AT+WDSR=?**	Response **+WDSR:** (list of supported **<Reply>**s),(list of supported **<Timer>**s) **OK**
Write command Syntax **AT+WDSR= <Reply> [,<Timer>]**	Response **OK** or **+CME ERROR <err>** Parameters **<Reply>** Reply to user agreement request (see **+WDSI**) 0 Delay the connection to the server 1 Accept the connection to the server

HL7800	
	2 Delay the download 3 Accept the download 4 Accept the install 5 Delay the install 6 Accept the device reboot 7 Delay the device reboot 8 Accept the application uninstall 9 Delay the application uninstall **<timer>** Timer until a new User agreement request is returned by the module. This parameter is only available for <Reply>=0, 2, 5, 7 or 9. Units: minutes. Range is from 0 to 1440. Default value = 30.
Reference Sierra Wireless Proprietary Command	Notes • This command is available when the embedded module has finished the Device Services initialization (see **+WDSI**) and when the AVMS services are in activated state (see **+WDSG**) • It is not possible to refuse: ▪ an install request (**AT+WDSR=5,0**), and will return +CME ERROR: 3. ▪ a device reboot request (**AT+WDSR=7,0**) and will return +CME ERROR: 3. ▪ an uninstall request (**AT+WDSR=9,0**) and 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 newt start up.
Examples	**AT+WDSR=?** **+WDSR: (0-9),(0-1440)** **OK** **+WDSI: 1** *//The device Services server requests the device to make a connection to //the server. The user is requested to allow the connection.* **AT+WDSR=1** **OK** **+WDSI: 3** *//A user agreement is requested to install a package* **AT+WDSR=5,10** *//A delay of 10 minutes is requested* **OK** **+WDSI: 3** *//10 minutes later, a new user agreement is requested to install a package* **AT+WDSR=4** *//The install is requested* **OK**

10.7. +WDSS Command: Device Services Session

HL7800	
Test command Syntax **AT+WDSS=?**	Response **+WDSS: 1,(**list of supported **<Action>**s for this **<Mode>)** **+WDSS: 2,(**range of supported PDP context identifiers**)** **OK**

HL7800

Read command

Syntax
AT+WDSS?

Response
[+WDSS: 1,<Action>]
[+WDSS: 2,<Cid>]
OK

Write command

Syntax
For <mode>=1
AT+WDSS=
<Mode>,
<Action>

For <mode>=2
AT+WDSS=
<Mode>,
<Cid>

Response
OK

or
+CME ERROR <err>

Parameters
<Mode> 0 Deprecated and cannot be used anymore. Instead, use <Mode>=2 to set the profile to be used, and configure it using **AT+CGDCONT**.
1 User initiated connection to the Device Services server
2 PDP context identifier configurations for Device Services

<Action> For <Mode>=1 only
0 Release the current connection to the Device Services server
1 Establish a connection to the Device Services server

<Cid> For <Mode>=2 only, PDP context identifier

Reference
Sierra Wireless Proprietary Command

Notes
- This command is available when the embedded module has finished the Device Services initialization (see **+WDSI**)
- **AT+WDSS?** command only returns OK if no APN is defined.
- When a request is sent to the embedded module to resume an inexistent or unsuspended session, +CME ERROR: 3 is returned.
- When a request is sent to the embedded module to release an inexistent session, +CME ERROR: 3 is returned.
- When the PDP context cannot be activated because of bad AirPrime Management Services NAP configuration, the embedded module will use a NAP defined by **+CGDCONT** to activate the dedicated PDP context (but the initial NAP configuration is not erased).
- The activation is done if the embedded module is registered on the network. If the embedded module is not registered when the command is performed, the activation will be done at the next network registration (even if the embedded module resets).

Examples

AT+WDSS?
OK

AT+WDSS=?
+WDSS: 1,(0-1)
+WDSS: 2,(1-1)
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

11. Test Commands

11.1. +WMTXPOWER Command: Test RF Tx

HL78xx	
Test command Syntax **AT+ WMTXPOWER=?**	Response **+WMTXPOWER:** (list of supported **<ENABLE>**s),(list of supported**<BAND>**s),(list of supported**<CHANNEL>**s),(list of supported**<POWER_LEVEL>**s),(list of supported **<TX_TYPE>**s),(list of supported **<BANDWIDTH>**s) **OK**
Read command Syntax **AT+ WMTXPOWER?**	Response **+WMTXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>, <TX_TYPE>[,<BANDWIDTH>]]** **OK** Note that parameters <BAND>, <CHANNEL>, <POWER_LEVEL> and <TX_TYPE> are only available if <ENABLE>=1. <BANDWIDTH> is only available if <ENABLE>=1 and if <TX_TYPE>=0
Write command Syntax **AT+ WMTXPOWER= <ENABLE> [,<BAND>, <CHANNEL>, <POWER_ LEVEL>, <TX_TYPE> [,<BANDWIDTH>]]**	Response **OK** Parameters **<ENABLE>** 0 Stop the burst emission 1 Start the burst emission **<BAND>** Tx burst band emission. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. 1 Band 1 2 Band 2 3 Band 3 4 Band 4 5 Band 5 8 Band 8 9 Band 9 10 Band 10 12 Band 12 13 Band 13 14 Band 14 17 Band 17 18 Band 18 19 Band 19 20 Band 20 25 Band 25 26 Band 26 27 Band 27 28 Band 28 66 Band 66

HL78xx	
	<CHANNEL> Tx burst channel emission. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0 If <BAND>=1 18000 – 18599 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>=9 21800 – 22149 If <BAND>=10 22150 – 22749 If <BAND>=12 23010 – 23179 If <BAND>=13 23180 – 23279 If <BAND>=14 23280 – 23379 If <BAND>=17 23730 – 23849 If <BAND>=18 23850 – 23999 If <BAND>=19 24000 – 24149 If <BAND>=20 24150 – 24449 If <BAND>=25 26040 – 26689 If <BAND>=26 26690 – 27039 If <BAND>=27 27040 – 27209 If <BAND>=28 27210 – 27659 If <BAND>=66 131972 – 132671 **<POWER_LEVEL>** Absolute output power. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. Range: 0 (0 dBm) to 2300 (23 dBm) for all bands **<TX_TYPE>** defines the type of transmitted signal. This parameter is not allowed if <ENABLE>=0. 0 SC-FDMA 1 CW (continuous waveform). For customers, which don't have CMW tester but only a spectrum analyzer. **<BANDWIDTH>** For SC-FDMA only, defines the bandwidth of Tx burst emissions. This parameter is not allowed if <ENABLE>=0 or if <TX_TYPE>=1**.** 0 1.4M
Reference Sierra Wireless Proprietary	Notes • Before using this command, it is necessary to verify that the configured LTE band(s) on which the module can operate is correctly set by using either **AT+KBNDCFG** to read the configured band(s), or **AT+KBNDCFG** to set the configured LTE band(s) . • This command is not available if **AT+WMRXPOWER** is enabled. • The module must be restarted after using this command.
Examples	**AT+WMTXPOWER=?** **+WMTXPOWER: (0-1),(1,2,3,4,5,8,9,10,12,13,14,17,18,19,20,25,26,27,28,66),(18000–18599,18600–19199,19200–19949,19950–20399,20400–20649,21450–21799,21800-22149,22150-22749,23010–23179,23180–23279,23280-23379,23730-23849,23850–23999,24000–24149,24150–24449,26040-26689,26690–27039,27040-27209,27210–27659,131972-132671),(0-2300),(0-1),(0)** **OK** **AT+WMTXPOWER=1,2,18600,2300,0,0** // A Tx is emitted at Earfcn 18600 with a power **OK** // level of 23dbm and with a SC-FDMA Tx type // and with a bandwidth of 1,4Mhz.

HL78xx	
	AT+WMTXPOWER=1,2,18600,2300,1 // A Tx is emitted at Earfcn 18600 with a power **OK** // level of 23dbm and with a Continuous // Waveform Tx type. **AT+WMTXPOWER=0** **OK**

11.2. +WMRXPOWER Command: Test RF Rx

HL78xx	
Test command Syntax **AT+ WMRXPOWER=?**	Response **+WMRXPOWER:** (list of supported **<ENABLE>**s),(list of supported **<BAND>**s), (list of supported **<CHANNEL>**s) **OK**
Read command Syntax **AT+ WMRXPOWER?**	Response **+WMRXPOWER: <ENABLE>[,<BAND>,<CHANNEL>]** **OK** Note that parameters <BAND> and <CHANNEL> are only available if <ENABLE>=1.
Write command Syntax **AT+ WMRXPOWER= <ENABLE> [,<BAND>, <CHANNEL>]**	Response **+WMRXPOWER: <POWER1>** **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. 1 Band 1 2 Band 2 3 Band 3 4 Band 4 5 Band 5 8 Band 8 9 Band 9 10 Band 10 12 Band 12 13 Band 13 14 Band 14 17 Band 17 18 Band 18 19 Band 19

HL78xx	
	20 Band 20 25 Band 25 26 Band 26 27 Band 27 28 Band 28 66 Band 66 **<CHANNEL>** Rx channel to read. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. If <BAND>=1 0 – 599 If <BAND>=2 600 – 1199 If <BAND>=3 1200 – 1949 If <BAND>=4 1950 – 2399 If <BAND>=5 2400 – 2649 If <BAND>=8 3450 – 3799 If <BAND>=9 3800 – 4149 If <BAND>=10 4150 – 4749 If <BAND>=12 5010 – 5179 If <BAND>=13 5180 – 5279 If <BAND>=14 5280 – 5379 If <BAND>=17 5730 – 5849 If <BAND>=18 5850 – 5999 If <BAND>=19 6000 – 6149 If <BAND>=20 6150 – 6449 If <BAND>=25 8040 – 8689 If <BAND>=26 8690 – 9039 If <BAND>=27 9040 – 9209 If <BAND>=28 9210 – 9659 If <BAND>=66 66436 – 67335 **<POWER1>** Received power at primary antenna in dBm
Reference Sierra Wireless Proprietary	Notes • Before using this command, it is necessary to verify that the configured LTE band(s) on which the module can operate is correctly set by using either **AT+KBNDCFG** to read the configured band(s), or **AT+KBNDCFG** to set the configured LTE band(s). • This command is not available if **AT+WMTXPOWER** is enabled. • For Rx tests, the 2 followings waveforms can be applied to the UE antenna: ▪ a continuous waveform, in which case it is recommended to use a 1Mhz offset to central frequency to avoid DC interference. ▪ an LTE signal, in which case it is recommended to use a continuous FDD radio frame, which occupies all subcarriers including the ones dedicated for PBCH/PSC/SSC.
Examples	**AT+WMRXPOWER=?** **+WMRXPOWER: (0-1),(1,2,3,4,5,8,9,10,12,13,14,17,18,19,20,25,26,27,28,66),(0–599,600-1199,1200–1949,1950-2399, 2400–2649,3450–3799,3800-4149,4150-4749,5010-5179,5180–5279,5280-5379,5730-5849,5850–5999,6000–6149, 6150–6449,8040-8689,8690–9039,9040-9209,9210–9659,66436-67335)** **OK** **AT+WMRXPOWER=1,4,1950** // Read Earfcn 1950 **+WMRXPOWER: -95.0** // Rx power -95.0 dBm at antenna **OK**

12. Appendix

12.1. Command Timeout and Other Information

The following table provides additional information for commands supported by the HL78xx modules.

Cells in the following table are color-coded to indicate the **recommended** timeout for AT commands; note that time is subject to change depending on SIM cards and networks.

Legend:

	2 seconds
	5 seconds
	30 seconds
	60 seconds
	120 seconds
	No advised timeout: Data size dependent
🡻	Command can be written in non-volatile memory

Table 4. Command Timeout

Chapter	Command Description	HL7800
V25TER AT Commands		
2.1	+++ Command: Switch from Data Mode to Command Mode	
2.2	O Command: Switch from Command Mode to Data Mode	
2.3	E Command: Enable Command Echo	
2.4	&K Command: Flow Control Option	
2.5	&F Command: Restore Manufactory Configuration	
2.6	&V Command: Display Current Configuration	
2.7	&W Command: Save Stored Profile	🡻
2.8	Z Command: Reset and Restore User Configuration	
2.9	+IPR Command: Set Fixed Local Rate	🡻
2.10	&C Command: Set Data Carrier Detect (DCD) Function Mode	
2.11	&D Command: Set Data Terminal Ready (DTR) Function Mode	
2.12	&S Command: DSR Option	
2.13	&R Command: RTS/CTS Option	
2.14	S2 Command: Set Character for the Escape Sequence (Data to Command Mode)	
2.15	S4 Command: Set Response Formatting Character	
2.16	+IFC Command: DTE-DCE Local Flow Control	
General AT Commands		
3.1	I Command: Request Identification Information	
3.2	+CGMI/+GMI Command: Request Manufacturer Identification	
3.3	+CGMM/+GMM Command: Request Model Identification	
3.4	+CGMR/+GMR Command: Request Revision Identification	
3.5	+CGSN Command: Request Product Serial Number Identification (IMEI)	

Chapter	Command Description	HL7800
3.6	+KGSN Command: Request Product Serial Number Identification and Software Version	
3.7	+CSCS Command: Set TE Character Set	↓
3.8	+CIMI Command: Request International Subscriber Identity	
3.9	+GSN Command: Request Product Serial Number Identification (IMEI)	
3.10	+GCAP Command: Request Complete TA Capability List	
3.11	+CMUX Command: Multiplexer	
3.12	+WPPP Command: PDP Context Authentication Configuration	
3.13	+HWREV Command: Request Hardware Revision	
Call Control Commands		
4.2	+CEER Command: Extended Error Report	
4.3	+CMEE Command: Report Mobile Termination Error	↓
Mobile Equipment Control and Status Commands		
5.1	+CCLK Command: Real Time Clock	
5.2	+CCID Command: Request SIM Card Identification	
5.3	+CLAC Command: List All Available AT Commands	
5.4	+CFUN Command: Set Phone Functionality	
5.5	+CPIN Command: Enter PIN	
5.6	+CPAS Command: Phone Activity Status	
5.7	+CSQ Command: Signal Quality	
5.8	+KSREP Command: Mobile Start-Up Reporting	↓
5.9	+CSIM Command: Generic SIM Access	
5.10	+CCHO Command: Open Logical Channel	
5.11	+CCHC Command: Close Logical Channel	
5.12	+CRSM Command: SIM Restricted Access	
5.13	+CTZU Command: Automatic Time Zone Update	↓
5.14	+CTZR Command: Time Zone Reporting	↓
5.15	+CPSMS Command: Power Saving Mode setting	
5.16	+CEDRXS Command: eDRX setting	
5.18	+CESQ Command: Extended Signal Quality	
5.19	+KBNDCFG Command: Set Configured LTE Band(s)	↓
5.20	+KBND Command: Get Active LTE Band(s)	↓
5.21	+KGPIO Command: Hardware IO Control	↓
5.22	+KGPIOCFG Command: User GPIO Configuration	↓
5.23	+KCELL Command: Cell Environment Information	
5.24	+KSLEEP Command: Power Management Control	↓
5.25	+KRIC Command: Ring Indicator Control	
5.26	+CPOF Command: Power Off	
5.27	+CPWROFF Command: Power Off	
5.27	+CPWROFF Command: Power Off (when +CPWROFF=1)	
5.28	+WIMEI Command: IMEI Write and Read	↓
5.29	+KSYNC Command: Application Synchronization Signal	↓
5.30	+KCARRIERCFG Command: Set operator	↓
5.31	+KMON Command: Enable/Disable Monitor Mode	↓

Chapter	Command Description	HL7800
5.32	+KSRAT Command: Set Radio Access Technology	↓
Network Service Related Commands		
6.2	+CPWD Command: Change Password	
6.3	+COPN Command: Read Operator Name	
6.4	+COPS Command: Operator Selection	
6.5	+CPOL Command: Preferred PLMN List	↓
6.6	+CREG Command: Network Registration	↓
6.7	+CPLS Command: Selection of Preferred PLMN List	
6.8	+CEREG Command: EPS Network Registration Status	↓
6.9	+CEMODE Command: UE Modes of Operation for EPS	
SMS AT Commands		
7.2	+CMGD Command: Delete SMS Message	
7.3	+CMGF Command: Select SMS Message Format	↓
7.4	+CMGL Command: List SMS Messages from Preferred Storage	
7.5	+CMGR Command: Read SMS Message	
7.6	+CMGS Command: Send SMS Message	
7.7	+CMGW Command: Write SMS Message to Memory	
7.8	+CMSS Command: Send SMS Message from Storage	
7.9	+CNMI Command: New SMS Message Indication	↓
7.10	+CSCA Command: SMS Service Center Address	↓
7.11	+CSMP Command: Set SMS Text Mode Parameters	
7.12	+CSMS Command: Select Message Service	
7.13	+CPMS Command: Preferred Message Storage	
7.14	+CSDH Command: Show Text Mode Parameters	
7.15	+CMT Notification: Received SMSPP Content	
Packet Domain Commands		
8.1	+CGATT Command: PS Attach or Detach	
8.2	+CGACT Command: PDP Context Activate or Deactivate	
8.3	+CGCMOD Command: Modify PDP Context	
8.4	+CGTFT Command: Traffic Flow Template	
8.5	+CGDCONT Command: Define PDP Context	
8.6	+CDGSCONT Command: Define Secondary PDP Context	
8.7	+CGEREP Command: GPRS Event Reporting	↓
8.10	+CGPADDR Command: Show PDP Address	
8.11	+CGSMS Command: Select Service for MO SMS Messages	
Protocol Specific Commands – Connection Configuration		
9.7.1	+KCNXCFG Command: GPRS Connection Configuration	
9.7.2	+KCNXTIMER Command: Connection Timer Configuration	
9.7.3	+KCNXPROFILE Command: Connection Current Profile Configuration	
9.7.4	+KCGPADDR Command: Show PDP Address	
9.7.5	+KCNX_IND Notification: Connection Status Notification	
9.7.6	+KCNXUP Command: Bring the PDP Connection Up	
9.7.7	+KCNXDOWN Command: Bring the PDP Connection Down	

Chapter	Command Description	HL7800
Protocol Specific Commands – Common Configuration		
9.8.1	+KPATTERN Command: Custom End Of Data Pattern	
9.8.2	+KURCCFG Command: Enable or Disable the URC from TCP Commands	
9.8.3	+KIPOPT Command: General Options Configuration	
TCP Specific Commands		
9.11.1	+KTCPCFG Command: TCP Connection Configuration	
9.11.2	+KTCPCNX Command: TCP Connection	
9.11.3	+KTCPRCV Command: Receiving Data through a TCP Connection	
9.11.4	+KTCPSND Command: Sending Data through a TCP Connection	
9.11.5	+KTCPCLOSE Command: Closing Durrent TCP Operation	
9.11.6	+KTCPDEL Command: Delete a Configured TCP Session	
9.11.7	+KTCP_SRVREQ Notification: Incoming client's connection request	
9.11.8	+KTCP_DATA Notification: Incoming Data through a TCP Connection	
UDP Specific Commands		
9.12.1	+KUDPCFG Command: UDP Connection Configuration	
9.12.2	+KUDPRCV Command: Receive data through an UDP Connection	
9.12.3	+KUDPSND Command: Send data through an UDP Connection	
9.12.4	+KUDPCLOSE Command: Close current UDP operation	
9.12.5	+KUDPDEL Command: Delete a Configured UDP Session	
9.12.6	+KUDP_IND Notification: UDP Status	
9.12.7	+KUDP_DATA Notification: Incoming data through a UDP Connection	
AVMS Commands		
10.1	+WDSC Command: Device Services Configuration	
10.2	+WDSD Command: Device Services Local Ddownload	
10.3	+WDSE Command: Device Services Eerror	
10.4	+WDSG Command: Device Services General Status	
10.5	+WDSI Command: Device Services Indications	
10.6	+WDSR Command: Device Services Reply	
10.7	+WDSS Command: Device Services Session	
Test Commands		
11.1	+WMTXPOWER Command: Test RF Tx	
11.2	+WMRXPOWER Command: Test RF Rx	

12.2. Result Codes and Unsolicited Messages

Verbose Result Code	Numeric	Type	Description
+CME ERROR: <err>	Like verbose	Final	
+CMS ERROR: <err>	Like verbose	Final or unsolicited	
+CBM	Like verbose	Unsolicited	
+CDS	Like verbose	Unsolicited	
+COLP: <number>,<type> [,<subaddr>,<satype>[,<alpha>]]	Like verbose	Intermediate	

Verbose Result Code	Numeric	Type	Description
+CR: <type>	Like verbose	Intermediate	
+CREG: <stat>[,<lac>,<ci>]	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
OK	0	Final	Acknowledges execution of a command line
RING	2	Unsolicited	Incoming call signal from network

12.3. Error Codes

12.3.1. 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

<err> Code	Meaning
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
50	Incorrect parameters
99	Resource limitation
100	Unknown
103	Illegal MS
106	Illega lME
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

<err> Code	Meaning
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 10)
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
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

12.3.2. CEER Error Codes

<report>
IMSI_UNKNOWN_IN_HLR
ILLEGAL_UE
ILLEGAL_ME
EPS_SERVICES_NOT_ALLOWED
EPS_AND_NON_EPS_SERVICES_NOT_ALLOWED
UE_IDENTITY_CANNOT_BE_DERIVED_BY_THE_NETWORK
IMPLICITLY_DETACHED
PLMN_NOT_ALLOWED

<report>
TRACKING_AREA_NOT_ALLOWED
ROAMING_NOT_ALLOWED_IN_THIS_TRACKING_AREA
EPS_SERVICES_NOT_ALLOWED_IN_THIS_PLMN
NO_SUITABLE_CELLS_IN_TRACKING_AREA
MSC_TEMPORARILY_NOT_REACHABLE
NETWORK_FAILURE
CS_DOMAIN_NOT_AVAILABLE
MAC_FAILURE
SYNCH_FAILURE
CONGESTION
UE_SECURITY_CAPABILITIES_MISMATCH
SECURITY_MODE_REJECTED_UNSPECIFIED
NOT_AUTHORIZED_FOR_THIS_CSG
SEMANTICALLY_INCORRECT_MESSAGE
INVALID_MANDATORY_INFORMATION
MESSAGE_TYPE_NON_EXISTENT
MESSAGE_TYPE_NOT_COMPATIBLE_WITH_THE_PROTOCOL_STAT
INFORMATION_ELEMENT_NOT_EXISTENT
CONDITIONAL_IEI_ERROR
MESSAGE_NOT_COMPATIBLE_WITH_THE_PROTOCOL_STATE
PROTOCOL_ERROR_UNSPECIFIED
OPERATOR_DETERMINED_BARRING
INSUFFICIENT_RESOURCES
UNKNOWN_OR_MISSING_APN
UNKNOWN_PDN_TYPE
USER_AUTHENTICATION_FAILED
ACTIVATION_REJECTED_BY_SERVING_GW_OR_PDN_GW
ACTIVATION_REJECTED_UNSPECIFIED
SERVICE_OPTION_NOT_SUPPORTED
REQUESTED_SERVICE_OPTION_NOT_SUBSCRIBED
SERVICE_OPTION_TEMPORARILY_OUT_OF_ORDER
PTI_ALEARDY_IN_USE
REGULAR_DEACTIVATION
EPS_QoS_NOT_ACCEPTED
NETWORK_FAILURE
FEATURE_NOT_SUPPORTED
SEMANTIC_ERROR_IN_THE_TFT_OPERATION
SYNTACTICAL_ERROR_IN_THE_TFT_OPERATION
UNKNOWN_EPS_BEARER_CONTEXT
SEMANTIC_ERRORS_IN_PACKET_FILTERS
SYNTACTICAL_ERRORS_IN_PACKET_FILTERS
EPS_BEARER_CONTEXT_WITHOUT_TFT_ALREADY_ACTIVATED
PTI_MISMATCH
LAST_PDN_DISCONNECTION_NOT_ALLOWED

<report>
PDN_TYPE_IPV4_ONLY_ALLOWED
PDN_TYPE_IPV6_ONLY_ALLOWED
SINGLE_ADDRESS_BEARERS_ONLY_ALLOWED
ESM_INFORMATION_NOT_RECEIVED
PDN_CONNECTION_DOES_NOT_EXIST
MULTIPLE_PDN_CONNECTIONS_FOR_APN_NOT_ALLOWED
COLLISION_WITH_NETWORK_REQUEST
INVALID_PTI_VALUE
ESM_SEMANTICALLY_INCORRECT_MESSAGE
ESM_INVALID_MANDATORY_INFORMATION
MESSAGE_TYPE_NON_EXISTENT_OR_NOT_IMPLEMENTED
MESSAGE_TYPE_NOT_COMPATIBLE_WITH_THE_PROTOCOL_STATE
INFORMATION_ELEMENT_NON_EXISTENT_OR_NOT_IMPLEMENTED
CONDITIONAL_IE_ERROR
ESM_MESSAGE_NOT_COMPATIBLE_WITH_THE_PROTOCOL_STATE
ESM_PROTOCOL_ERROR_UNSPECIFIED
APN_RESTRICTION_VALUE_INCOMPATIBLE_WITH_ACTIVE_EPS_BEARER_CONTEXT

12.3.3. CMS Error Codes

<err> Code	Meaning
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state
99	Information element non-existent or not implemented
111	Protocol error, unspecified

<err> Code	Meaning
127	Interworking, unspecified
128	Telematic interworking not supported
129	Short message Type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be executed
161	Command unsupported
175	Unspecified TP-Command error
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	D0 SIM SMS storage full
209	No SMS storage capability in SIM
210	Error in MS
211	Memory Capacity Exceeded
212	SIM Application Toolkit Busy
213	SIM data download error
255	Unspecified error cause
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure
321	Invalid memory index

<err> Code	Meaning
322	Memory full
330	SMSC address unknown
331	no network service
332	Network timeout
340	NO +CNMA ACK EXPECTED
500	Unknown error
606	ME Busy – CM server request already pending

12.3.4. 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.

12.4. How to Use TCP Commands

12.4.1. Client Mode

AT&K3 **OK**	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password",“IPV4”,"0.0.0.0","0.0.0.0","0.0.0.0" **OK**	Set GPRS parameters (APN, login, password)
AT+KTCPCFG=1,0,"www.google.com",80 **+KTCPCFG: 1** **OK**	Set IP address and port number Returns session ID
AT+KTCPCNX=1 **OK**	Initiate the connection
AT+KTCPSND=1,18 **CONNECT** **…Data send…** **OK** **+KTCP_DATA: 1,1380**	Send data with KPATTERN string at the end. e.g. “GET / HTTP/1.0 --EOF--Pattern--"
AT+KTCPRCV=1, 1380 **CONNECT** **HTTP/1.0 200 OK** **Cache-Control: private, max-age=0** **… a lot of data…** **--EOF--Pattern--** **OK** **+KTCP_DATA: 1,1380**	DATA read +KTCP_DATA notification
AT+KTCPRCV=1,1380 **CONNECT** **er{padding-bottom:7px !important}#gbar,#guser{font-** **… a lot of data…** **--EOF--Pattern--** **OK** **+KTCP_DATA: 1,1380**	DATA read
AT+KTCPCLOSE=1,1 **OK**	Close session 1
AT+KTCPDEL=1 **OK**	Delete session 1
AT+KTCPCFG? **OK**	No session is available

12.4.2. Server Mode

A daytime server is emulated in the following example. The server listens to port 13, and returns the date for each connection.

AT&K3 **OK**	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password",“IPV4”,"0.0.0.0","0.0.0.0","0.0.0.0" **OK**	Set GPRS parameters (APN, login, password)
AT+KTCPCFG=1,1,,13 **+KTCPCFG: 1** **OK**	Set TCP listener and port number Returns session 1
AT+KTCPCNX=1 **OK**	Initiate the server
AT+KCGPADDR **+KCGPADDR: 0,"10.35.125.89"** **OK**	Get the IP address to initiate a connection request with a client
+KTCP_SRVREQ: 1,2	A client requests a connection (subsession 2)
AT+KTCPSND=2,15 **CONNECT** **…Date and time…** **OK**	Data is sent to the client read (based on subsession 2)
+KTCP_SRVREQ: 1,3	Another client requests a connection (subsession 3); child mode for session 3
+KTCP_NOTIF: 2, 4	Client (subsession 2) closes the connection
AT+KTCPSND=3,15 **CONNECT** **…Date and time…** **OK**	Data is sent to the client
+KTCP_DATA: 3,6	Data received from client (subsession 3)
AT+KTCPRCV=3,6 **CONNECT** **… Data… --EOF--Pattern--** **OK**	Read data received from client
AT+KTCPCLOSE=3,1 **OK**	Close client subsession 3 and then subsession 3 is deleted automatically

AT+KTCPCLOSE=1,1 **OK**	Close server session 1
AT+KTCPDEL=1 **OK**	Delete session 1

12.5. How to Use UDP Specific Commands

12.5.1. Client Mode

AT&K3 **OK**	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password",,, **OK**	Set GPRS parameters (APN, login, password)
AT+KUDPCFG=1,0 **+KUDPCFG: 1** **OK**	Create a new UDP socket (returned session 1) with the parameters associated to the connection profile id number 0
AT+KUDPSND= 1,"82.234.17.52",32,18 **CONNECT** **…Data sent…** **--EOF--Pattern--** **OK**	Send UDP data after “CONNECT”
+KUDP_DATA: 1,35	Received notification that indicates the presence of 35 bytes in the socket
AT+KUDPRCV=1, 35 **CONNECT** **This is a simple UDP Protocol test** **-EOF--Pattern--** **OK**	Try to read 35 bytes from session 1
+KUDP_RCV: "82.234.17.52",32 **+KUDP_DATA: 1,35**	Received notification that indicates the presence of 35 bytes in the socket
AT+KUDPRCV=1, 16 **CONNECT** **This is a simple** **-EOF--Pattern--** **OK**	Same test but try to read 16 bytes from session 1
+KUDP_DATA_MISSED: 1,19	There are 19 unread bytes left and missed in the UDP socket

AT+KUDPCLOSE=1 **OK** **AT+KUDPCFG?** **OK**	Definitely close the UDP session and at the same time session is deleted No sessions are available now

12.5.2. Use Cases for KTCP_DATA and KUDP_DATA (with/without data auto retrieval)

1) Previous features are kept (ascending compatibility of the AT commands) - Client mode

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=0,0** **+KUDPCFG: 2** **OK** **+KUDP_DATA: 2,8** **AT+KUDPRCV=2,8** **CONNECT** **01234567--EOF--Pattern--** **OK** **+KUDP_RCV: "202.170.131.76",2001**	 Connect to TCP server URC tells us that 10 bytes arrived Use KTCPRCV command to receive those 10 bytes Open a UDP socket URC tells us that 8 bytes arrived Use command to receive those 8 bytes

2) New optional feature: URC takes out the data - Client mode

AT+KCNXCFG=1,"GPRS","CMNET" **OK**	
AT+KTCPCFG=0,0,"202.170.131.76",2000,,1	Extend a parameter for the new feature When setting to 1, data will be received by the URC “+KTCP_DATA:”
+KTCPCFG: 1 **OK**	
AT+KTCPCNX=1 **OK**	Connect to TCP server
+KTCP_DATA: 1,10,0123456789	10 bytes arrived. The URC takes them out directly
AT+KUDPCFG=0,0,3000,1	Extend a parameter for the new feature When setting to 1, data will be received by the URC “+KUDP_DATA:”
+KUDPCFG: 2 **OK**	
+KUDP_DATA: 2,8,"202.170.131.76",2001,01234567	8 bytes arrived. The URC takes them out directly