AT Commands Interface Guide

AirPrime HL76xx

SIERRA WIRELESS®

4118395
6.2
June 26, 2017

Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless modem are used in a normal manner with a well-constructed network, the Sierra Wireless modem should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Sierra Wireless accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless modem, or for failure of the Sierra Wireless modem to transmit or receive such data.

Safety and Hazards

Do not operate the Sierra Wireless modem in areas where cellular modems are not advised without proper device certifications. These areas include environments where cellular radio can interfere such as explosive atmospheres, medical equipment, or any other equipment which may be susceptible to any form of radio interference. The Sierra Wireless modem can transmit signals that could interfere with this equipment. Do not operate the Sierra Wireless modem in any aircraft, whether the aircraft is on the ground or in flight. In aircraft, the Sierra Wireless modem **MUST BE POWERED OFF**. When operating, the Sierra Wireless modem can transmit signals that could interfere with various onboard systems.

Note: *Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open. Sierra Wireless modems may be used at this time.*

The driver or operator of any vehicle should not operate the Sierra Wireless modem while in control of a vehicle. Doing so will detract from the driver or operator's control and operation of that vehicle. In some states and provinces, operating such communications devices while in control of a vehicle is an offence.

Limitations of Liability

This manual is provided "as is". Sierra Wireless makes no warranties of any kind, either expressed or implied, including any implied warranties of merchantability, fitness for a particular purpose, or noninfringement. The recipient of the manual shall endorse all risks arising from its use.

The information in this manual is subject to change without notice and does not represent a commitment on the part of Sierra Wireless. SIERRA WIRELESS AND ITS AFFILIATES SPECIFICALLY DISCLAIM LIABILITY FOR ANY AND ALL DIRECT, INDIRECT, SPECIAL, GENERAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE OR ANTICIPATED PROFITS OR REVENUE ARISING OUT OF THE USE OR INABILITY TO USE ANY SIERRA WIRELESS PRODUCT, EVEN IF SIERRA WIRELESS AND/OR ITS AFFILIATES HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR THEY ARE FORESEEABLE OR FOR CLAIMS BY ANY THIRD PARTY.

Notwithstanding the foregoing, in no event shall Sierra Wireless and/or its affiliates aggregate liability arising under or in connection with the Sierra Wireless product, regardless of the number of events, occurrences, or claims giving rise to liability, be in excess of the price paid by the purchaser for the Sierra Wireless product.

Patents

This product may contain technology developed by or for Sierra Wireless Inc.

This product includes technology licensed from QUALCOMM®.

This product is manufactured or sold by Sierra Wireless Inc. or its affiliates under one or more patents licensed from InterDigital Group and MMP Portfolio Licensing.

Copyright

© 2017 Sierra Wireless. All rights reserved.

Trademarks

Sierra Wireless®, AirPrime®, AirLink®, AirVantage®, WISMO®, ALEOS® and the Sierra Wireless and Open AT logos are registered trademarks of Sierra Wireless, Inc. or one of its subsidiaries.

Watcher® is a registered trademark of NETGEAR, Inc., used under license.

Windows® and Windows Vista® are registered trademarks of Microsoft Corporation.

Macintosh® and Mac OS X® are registered trademarks of Apple Inc., registered in the U.S. and other countries.

QUALCOMM® is a registered trademark of QUALCOMM Incorporated. Used under license.

Other trademarks are the property of their respective owners.

Contact Information

Sales information and technical support, including warranty and returns	Web: sierrawireless.com/company/contact-us/ Global toll-free number: 1-877-687-7795 6:00 am to 6:00 pm PST
Corporate and product information	Web: sierrawireless.com

Document History

Version	Date	Updates
1.0	February 03, 2016	Creation
1.1	February 15, 2016	Updated 5.37 +KSLEEP Command: Power Management Control for UART
2.0	April 20, 2016	Added: • 2.11 &C Command: Set Data Carrier Detect (DCD) Function Mode • 2.12 &D Command: Set Data Terminal Ready (DTR) Function Mode • 2.14 &W Command: Save Stored Profile • 2.15 &V Command: Display Current Configuration • 2.16 &K Command: Flow Control Option • 2.17 &S Command: DSR Option • 3.15 +CMUX Command: Multiplexing Mode • 5.17 +KCELL Command: Cell Environment Information • 5.22 +KSIMDET Command: SIM Detection • 5.32 +KTEMPMON Command: Temperature Monitor • 5.37 +KSLEEP Command: Power Management Control for UART • 5.46 +KRIC Command: Ring Indicator Control • 5.48 +KUSBCOMP Command: Set USB Composition • 5.49 +WMUSBVCC Command: USB VCC Detection Setting • 9 Audio Commands • 12 Protocol Specific Commands • 13 AVMS Commands • 14 Test Commands • 18.2.5 FTP Reply Codes • 18.2.6 AVMS Error Codes • 18.5 TCP Commands Examples • 18.6 UDP Commands Examples • 18.7 FTP Commands Examples • 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table
	May 16, 2016	Added: • 5.50 +KLTEMUTE Command: Mute LTE TX • 5.51 +KSYNC Command: Application Synchronization Signal • 12.13 HTTP Client Specific Commands • 12.14 HTTPS Client Specific Commands • 12.15 SSL Certificate Manager • 18.2.7 Error Case Examples • 18.8 HTTP Commands Examples
	June 02, 2016	Added 5.52 +KLTEPARAM Command: LTE Parameters
	June 29, 2016	Updated: • 14.1 +WMTXPOWER Command: Test RF Tx • 14.2 +WMRXPOWER Command: Test RF Rx
2.1	July 04, 2016	Added: • 5.53 +KBND Command: Current Networks Band Indicator • 5.54 +KSRAT Command: Set Radio Access Technology • 5.55 *PSRDBS Command: Change Frequency Band

Version	Date	Updates
3.0	August 11, 2016	Added: • 5.56 +CMEC Command: Mobile Equipment Control Mode • 5.57 +CPOF Command: Power Off • 5.58 +KGSMAD Command: GSM/LTE Antenna Detection • 5.59 +KSREP Command: Mobile Start-up Reporting • 5.60 +WMANTSEL Command: Select Main / Diversity Antenna for LTE • 12.9 SSL Configuration • 17 M2M Service Optimization Commands
		Updated: • 5.5 +CIND Command: Indicator Control • 5.8 +CMER Command: Mobile Equipment Event Reporting • 5.52 +KLTEPARAM Command: LTE Parameters • 12.10.1 +KTCPCFG Command: TCP Connection Configuration • 12.13.1 +KHTTPCFG Command: HTTP Connection Configuration
	August 15, 2016	Updated 6.8 +CPOL Command: Preferred PLMN List
	September 05, 2016	Removed HL7618 support from: • 12.14 HTTPS Client Specific Commands • 12.15 SSL Certificate Manager
	September 09, 2016	Added: • 5.61 +KSIMSEL Command: SIM Selection • 5.62 +BOOTDWLCFG Command: Boot Configuration for Firmware Download
	September 21, 2016	Added: • 5.63 +CALA Command: Set Alarm • 5.64 +CALD Command: Delete Alarm • 5.65 +KCCINFO Command: Camped Cell Information
		Updated: • 5.52 +KLTEPARAM Command: LTE Parameters • 10.19 +CGREG Command: GPRS Network Registration Status
	October 06, 2016	Updated: • 5.5 +CIND Command: Indicator Control • 5.8 +CMER Command: Mobile Equipment Event Reporting • 5.53 +KBND Command: Current Networks Band Indicator • 5.54 +KSRAT Command: Set Radio Access Technology • 5.55 *PSRDBS Command: Change Frequency Band
4.0	November 11, 2016	Added: • HL7648, HL7650 and HL7688 support • 9.3 +CLVL Command: Loudspeaker Volume Level • 9.4 +KECHO Command: Echo Cancellation • 9.5 +KNOISE Command: Echo Suppression • 9.6 +KPC Command: Peak Compressor • 9.7 +KST Command: Side Tone • 9.8 +KVGR Command: Receive Gain Selection • 9.9 +KVGT Command: Transmit Gain Selection • 9.10 +VGR Command: Receive Gain Selection • 9.11 +VGT Command: Transmit Gain Selection • 9.12 +VIP Command: Initialize Voice Parameters • 9.13 +CODECINFO Command: Display Audio Codec Information

Version	Date	Updates
4.0	November 11, 2016	Added: • 9.14 +KSRAP Command: Save or Restore Audio Parameters • 9.15 +WVR Command: Voice Codec Selection • 9.16 +VTD Command: Tone Duration • 9.17 +VTS Command: DTMF and Tone Generation
		Updated: • 5.17 +KCELL Command: Cell Environment Information • 5.53 +KBND Command: Current Networks Band Indicator • 5.54 +KSRAT Command: Set Radio Access Technology • 5.55 *PSRDBS Command: Change Frequency Band • 14.1 +WMTXPOWER Command: Test RF Tx • 14.2 +WMRXPOWER Command: Test RF Rx
5.0	February 13, 2017	Added: • HL7618RD support • 3.28 B Command: Data Rate Selection • 3.29 S2 Command: Set Character for the Escape Sequence (Data to Command Mode) • 3.30 S3 Command: Command Line Termination Character • 3.31 S10 Command: Automatic Disconnect Delay • 3.32 S11 Command: DTMF Dialing Speed • 5.68 +CCED Command: Cell Environment Description • 6.15 +KAAT Command: GPRS Automatic Attach • 17.10 +MSOFACTORYPOLICY Command: Factory Policy
		Updated: • 2.11 &C Command: Set Data Carrier Detect (DCD) Function Mode • 2.12 &D Command: Set Data Terminal Ready (DTR) Function Mode • 2.14 &W Command: Save Stored Profile • 2.15 &V Command: Display Current Configuration • 2.16 &K Command: Flow Control Option • 2.17 &S Command: DSR Option • 2.18 IPR Command: Set Fixed Local/DTE Rate • 3.15 +CMUX Command: Multiplexing Mode • 3.19 &R Command: RTS and CTS Option • 3.24 S5 Command: Write Command Line Editing Character • 3.25 S6 Command: Pause before Blind Dialing • 3.26 S8 Command: Comma Dial Modifier Time • 4.3 D Command: Dial Number • 5.17 +KCELL Command: Cell Environment Information • 5.50 +KLTEMUTE Command: Mute LTE TX • 5.51 +KSYNC Command: Application Synchronization Signal • 5.52 +KLTEPARAM Command: LTE Parameters • 6.4 +CNUM Command: Subscriber Number • 8.9 +CNMI Command: New Message Indication • 9.1 +KPCMCFG Command: Configure PCM Digital Audio • 9.4 +KECHO Command: Echo Cancellation • 10.2 +CGACT Command: Activate or Deactivate PDP Context • 10.5 +CGTFT Command: Traffic Flow Template

Version	Date	Updates
5.0	February 13, 2017	Updated: • 10.18 +CGEQNEG Command: 3G Negotiated Quality of Service Profile • 10.19 +CGREG Command: GPRS Network Registration Status • 10.24 +WPPP Command: PDP Context Authentication Configuration • 12.7.1 +KCNXCFG Command: GPRS Connection Configuration • 12.13.1 +KHTTPCFG Command: HTTP Connection Configuration • 13.6 +WDSI Command: Device Services Indication • 13.8 +WDSS Command: Device Services Session • 14.1 +WMTXPOWER Command: Test RF Tx • 14.2 +WMRXPOWER Command: Test RF Rx • 17 M2M Service Optimization Commands • 18.2.7 Error Case Examples
		Deleted 13.1 +WDSA Command: Change Account for DM Connection
5.1	March 03, 2017	Deleted: • 10.23 +XCEDATA Command: Establish ECM Data Connection • 17.10 +MSOFACTORYPOLICY Command: Factory Policy
6.0	May 17, 2017	Added: • 5.69 +WESHDOWN Command: Emergency Shutdown • 5.70 +KMCLASS Command: Change GPRS and EGPRS Multislot Class
		Updated: • 2.10 X Command: Result Code Selection and Call Progress Monitoring Control • 2.16 &K Command: Flow Control Option • 2.18 IPR Command: Set Fixed Local/DTE Rate • 3.23 N Command: Negotiate Handshake Option • 3.24 S5 Command: Write Command Line Editing Character • 3.27 W Command: Extended Result Code • 3.28 B Command: Data Rate Selection • 3.29 S2 Command: Set Character for the Escape Sequence (Data to Command Mode) • 5.17 +KCELL Command: Cell Environment Information • 5.36 +XCELLINFO Command: Provide Cell Information • 5.51 +KSYNC Command: Application Synchronization Signal • 5.54 +KSRAT Command: Set Radio Access Technology • 5.55 *PSRDBS Command: Change Frequency Band • 5.60 +WMANTSEL Command: Select Main / Diversity Antenna for LTE • 5.68 +CCED Command: Cell Environment Description • 9.12 +VIP Command: Initialize Voice Parameters • 9.13 +CODECINFO Command: Display Audio Codec Information • 10.18 +CGEQNEG Command: 3G Negotiated Quality of Service Profile • 12.12.4 +KFTPSND Command: Send FTP Files • 12.13.1 +KHTTPCFG Command: HTTP Connection Configuration • 12.13.2 +KHTTPCNX Command: Start the HTTP Connection • 12.14.1 +KHTTPSCFG Command: HTTPS Connection Configuration

Version	Date	Updates
6.0	May 17, 2017	Updated: • 14.1 +WMTXPOWER Command: Test RF Tx • 14.2 +WMRXPOWER Command: Test RF Rx • Table 9 Non-Generic Error Case Examples
6.1	May 25, 2017	Updated: • 4.10 +CEER Command: Extended Error Report • 18.2.2 CEER Error Codes
6.2	June 26, 2017	Updated: • 3.15 +CMUX Command: Multiplexing Mode • 3.22 \N Command: Data Transmission Mode • 3.28 B Command: Data Rate Selection • 4.10 +CEER Command: Extended Error Report • 5.35 +XDATACHANNEL Command: Configure Data Channel • 5.36 +XCELLINFO Command: Provide Cell Information • 6.10 +CREG Command: Network Registration • 8.15 +CSDH Command: Show Text Mode Parameters • 17 M2M Service Optimization Commands • 18.4 GSM 27.010 Multiplexing Protocol

Contents

1. INTRODUCTION 20

1.1. Reference Configuration 20

1.2. AT Command Principles 20

1.2.1. Parameters 21

1.2.2. Answers and Responses 21

1.2.3. Multiple AT Commands on the Same Command Line 21

1.2.4. AT Commands on Separate Lines 22

1.3. Unsolicited Result Codes (URCs) 22

1.4. PDP Context Usage 22

1.5. SMS Commands 23

1.6. Document Modification 23

1.7. Abbreviations 23

2. V25TER AT COMMANDS 28

2.1. +++ Command: Switch from Data Mode to Command Mode 28

2.2. A/ Command: Repeat Previous Command Line 28

2.3. O Command: Switch from Command Mode to Data Mode 28

2.4. E Command: Enable Echo Command 29

2.5. Q Command: Set Result Code Presentation Mode 29

2.6. S0 Command: Set Number of Rings before Automatic Call Answering 30

2.7. S4 Command: Set Response Formatting Character 30

2.8. S7 Command: Set Delay for Connection Completion 31

2.9. V Command: TA Response Format 31

2.10. X Command: Result Code Selection and Call Progress Monitoring Control 32

2.11. &C Command: Set Data Carrier Detect (DCD) Function Mode 32

2.12. &D Command: Set Data Terminal Ready (DTR) Function Mode 33

2.13. &F Command: Restore Factory Settings 33

2.14. &W Command: Save Stored Profile 34

2.15. &V Command: Display Current Configuration 34

2.16. &K Command: Flow Control Option 35

2.17. &S Command: DSR Option 36

2.18. IPR Command: Set Fixed Local/DTE Rate 36

2.19. L Command: Monitor Speaker Loudness 37

2.20. M Command: Monitor Speaker Mode 37

3. GENERAL AT COMMANDS 38

3.1. I Command: Request Identification Information 38

3.2. Z Command: Reset and Restore User Configuration 41

3.3. +CGMI Command: Request Manufacturer Identification 41

3.4. +CGMM Command: Request Model Identification 41
3.5. +CGMR Command: Request Revision Identification 42
3.6. +CGSN Command: Request Product Serial Number Identification (IMEI) 43
3.7. +KGSN Command: Request Product Serial Number and Software Version 43
3.8. +HWREV Command: Request Hardware Revision 44
3.9. +CSCS Command: Set TE Character Set 45
3.10. +CIMI Command: Request International Mobile Subscriber Identity 46
3.11. +GMI Command: Request Manufacturer Identification 46
3.12. +GMM Command: Request Model Identification 47
3.13. +GMR Command: Request Revision Identification 47
3.14. +GSN Command: Request Product Serial Number (IMEI) 48
3.15. +CMUX Command: Multiplexing Mode 48
3.16. +GCAP Command: Request Complete TA Capability List 50
3.17. +WIMEI Command: IMEI Write and Read 50
3.18. +KODIS Command: Access ODIS Information 51
3.19. &R Command: RTS and CTS Option 52
3.20. +FMI Command: Request Manufacturer Identification 52
3.21. +FMM Command: Request Model Identification 53
3.22. \N Command: Data Transmission Mode 53
3.23. N Command: Negotiate Handshake Option 54
3.24. S5 Command: Write Command Line Editing Character 54
3.25. S6 Command: Pause before Blind Dialing 55
3.26. S8 Command: Comma Dial Modifier Time 55
3.27. W Command: Extended Result Code 56
3.28. B Command: Data Rate Selection 56
3.29. S2 Command: Set Character for the Escape Sequence (Data to Command Mode) 56
3.30. S3 Command: Command Line Termination Character 57
3.31. S10 Command: Automatic Disconnect Delay 57
3.32. S11 Command: DTMF Dialing Speed 58

4. CALL CONTROL COMMANDS 59

4.1. A Command: Answer a Call 59
4.2. H Command: Hook Control 59
4.3. D Command: Dial Number 59
4.4. D> Command: Direct Dialing from Phonebook 60
4.5. +CHUP Command: Hang up Call 61
4.6. +CR Command: Service Reporting Control 61
4.7. +CRC Command: Set Cellular Result Codes for Incoming Call Indication 62
4.8. +CSTA Command: Select Type of Address 63
4.9. +CMOD Command: Call Mode 63

4.10. +CEER Command: Extended Error Report 64
4.11. +CSNS Command: Single Numbering Scheme 65
4.12. +CBST Command: Select Bearer Service Type 65

5. MOBILE EQUIPMENT CONTROL AND STATUS COMMANDS 67

5.1. +CACM Command: Accumulated Call Meter 67
5.2. +CAMM Command: Accumulated Call Meter (Maximum) 67
5.3. +CCWE Command: Call Meter Maximum Event 68
5.4. +CCLK Command: Real Time Clock 69
5.5. +CIND Command: Indicator Control 69
5.6. +CLAC Command: List Available AT Commands 70
5.7. +CFUN Command: Set Phone Functionality 71
5.8. +CMER Command: Mobile Equipment Event Reporting 72
5.9. +CMEE Command: Report Mobile Termination Error 75
5.10. +CCID Command: Request SIM Card Identification 75
5.11. +FMR Command: Request Revision Identification 76
5.12. +CPIN Command: Enter Pin 77
5.13. +CPIN2 Command: Enter Pin2 78
5.14. +CPUC Command: Price per Unit and Currency 78
5.15. +CPAS Command: Phone Activity Status 79
5.16. +CSQ Command: Signal Quality 80
5.17. +KCELL Command: Cell Environment Information 80
5.18. +KGPIO Command: Hardware IO Control 83
5.19. +KGPIOCFG Command: GPIO Configuration 84
5.20. +KADC Command: Analog Digital Converter 86
5.21. +CSIM Command: Generic SIM Access 87
5.22. +KSIMDET Command: SIM Detection 87
5.23. +CLAN Command: Read Language 88
5.24. +CCHO Command: Open Logical Channel 89
5.25. +CCHC Command: Close Logical Channel 89
5.26. +CGLA Command: Generic UICC Logical Channel Access 90
5.27. +CRLA Command: Restricted UICC Logical Channel Access 90
5.28. +CUAD Command: UICC Application Discovery 91
5.29. +CRSM Command: Restricted SIM Access 92
5.30. +CEAP Command: EAP Authentication 94
5.31. +CERP Command: EAP Retrieve Parameters 94
5.32. +KTEMPMON Command: Temperature Monitor 95
5.33. +CTZU Command: Automatic Time Zone Update 96
5.34. +CTZR Command: Time Zone Reporting 97
5.35. +XDATACHANNEL Command: Configure Data Channel 98

5.36. +XCELLINFO Command: Provide Cell Information 99
5.37. +KSLEEP Command: Power Management Control for UART 100
5.38. +HBHV Command: Configure General System Behavior 102
5.39. +CIREP Command: IMS Network Reporting 103
5.40. +CIREG Command: Registration Information 104
5.41. +GST Command: General System Status Information 105
5.42. +CESQ Command: Extended Signal Quality 106
5.43. +XCSQ Command: Radio Signal Strength and Quality with URC Support 107
5.44. +XCESQ Command: Extended Signal Quality with URC Support 108
5.45. +WEXTCLK Command: External Clocks Setting 110
5.46. +KRIC Command: Ring Indicator Control 111
5.47. +CPWROFF Command: Switch MS Off 112
5.48. +KUSBCOMP Command: Set USB Composition 113
5.49. +WMUSBVCC Command: USB VCC Detection Setting 114
5.50. +KLTEMUTE Command: Mute LTE TX 115
5.51. +KSYNC Command: Application Synchronization Signal 117
5.52. +KLTEPARAM Command: LTE Parameters 118
5.53. +KBND Command: Current Networks Band Indicator 120
5.54. +KSRAT Command: Set Radio Access Technology 121
5.55. *PSRDBS Command: Change Frequency Band 121
5.56. +CMEC Command: Mobile Equipment Control Mode 123
5.57. +CPOF Command: Power Off 123
5.58. +KGSMAD Command: GSM/LTE Antenna Detection 124
5.59. +KSREP Command: Mobile Start-up Reporting 125
5.60. +WMANTSEL Command: Select Main / Diversity Antenna for LTE 126
5.61. +KSIMSEL Command: SIM Selection 128
5.62. +BOOTDWLCFG Command: Boot Configuration for Firmware Download 130
5.62.1. Description 130
5.62.2. Syntax 132
5.63. +CALA Command: Set Alarm 134
5.64. +CALD Command: Delete Alarm 135
5.65. +KCCINFO Command: Camped Cell Information 136
5.66. +CALM Command: Alert Sound Mode 137
5.67. +CRSL Command: Ringer Sound Level 138
5.68. +CCED Command: Cell Environment Description 139
5.69. +WESHDOWN Command: Emergency Shutdown 142
5.70. +KMCLASS Command: Change GPRS and EGPRS Multislot Class 143

6. NETWORK SERVICE RELATED COMMANDS 145

6.1. +CAOC Command: Advice of Charge 145
6.2. +CUSD: Unstructured Supplementary Service Data 145

6.3. +CLCK Command: Facility Lock 146
6.4. +CNUM Command: Subscriber Number 148
6.5. +COLP Command: Connected Line Identification Presentation 148
6.6. +COPN Command: Read Operator Name 149
6.7. +COPS Command: Operator Selection 150
6.8. +CPOL Command: Preferred PLMN List 151
6.9. +CPWD Command: Change Password 152
6.10. +CREG Command: Network Registration 153
6.11. +CSSN Command: Supplementary Service Notification 154
6.12. +CPLS Command: Select Preferred PLMN List 155
6.13. +CEREG Command: EPS Network Registration Status 156
6.14. +CEMODE Command: UE Modes of Operation for EPS 157
6.15. +KAAT Command: GPRS Automatic Attach 158

7. PHONE BOOK MANAGEMENT 160

7.1. +CPBF Command: Find Phonebook Entries 160
7.2. +CPBR Command: Read Current Phonebook Entries 161
7.3. +CPBS Command: Select Phonebook Memory Storage 162
7.4. +CPBW Command: Write Phonebook Entry 163
7.5. +PBREADY URC: Phonebook Ready 165

8. SMS COMMANDS 166

8.1. Parameters Definition 166
8.1.1. Message Storage Parameters 166
8.1.2. Message Data Parameters 167
8.2. +CMGD Command: Delete Message 168
8.3. +CMGF Command: Set Message Format 169
8.4. +CMGL Command: List Messages 170
8.5. +CMGR Command: Read Message 170
8.6. +CMGS Command: Send Message 171
8.7. +CMGW Command: Write Message to Memory 172
8.8. +CMSS Command: Send Message from Storage 173
8.9. +CNMI Command: New Message Indication 173
8.10. +CSCB Command: Select Cell Broadcast Message Type 175
8.11. +CSCA Command: Service Center Address 175
8.12. +CSMP Command: Set Text Mode Parameters 176
8.13. +CSMS Command: Select Message Service 176
8.14. +CPMS Command: Preferred Message Storage 177
8.15. +CSDH Command: Show Text Mode Parameters 178
8.16. +XCMGS3GPP2 Command: Send 3GPP2 SMS Message 179
8.17. +XCMT3GGP2 Command: Enable or Disable the 3GPP2 MT SMS URC 179

9. AUDIO COMMANDS 181

9.1. +KPCMCFG Command: Configure PCM Digital Audio 181
9.2. +WMAUDIOLOOP Command: Audio Test 183
9.3. +CLVL Command: Loudspeaker Volume Level 184
9.4. +KECHO Command: Echo Cancellation 185
9.5. +KNOISE Command: Echo Suppression 186
9.6. +KPC Command: Peak Compressor 188
9.7. +KST Command: Side Tone 189
9.8. +KVGR Command: Receive Gain Selection 190
9.9. +KVGT Command: Transmit Gain Selection 191
9.10. +VGR Command: Receive Gain Selection 192
9.11. +VGT Command: Transmit Gain Selection 193
9.12. +VIP Command: Initialize Voice Parameters 194
9.13. +CODECINFO Command: Display Audio Codec Information 195
9.14. +KSRAP Command: Save or Restore Audio Parameters 196
9.15. +WVR Command: Voice Codec Selection 197
9.16. +VTD Command: Tone Duration 198
9.17. +VTS Command: DTMF and Tone Generation 199

10. PACKET DOMAIN COMMANDS 200

10.1. +CGATT Command: PS Attach or Detach 200
10.2. +CGACT Command: Activate or Deactivate PDP Context 200
10.3. +CGANS Command: PDP Context Activation Manual Response 201
10.4. +CGCMOD Command: Modify PDP Context 202
10.5. +CGTFT Command: Traffic Flow Template 202
10.6. +CGCLASS Command: GPRS Mobile Station Class 204
10.7. +CGDCONT Command: Define PDP Context 205
10.8. +CGDSCONT Command: Define Secondary PDP Context 207
10.9. +CGDATA Command: Enter Data State 208
10.10. +CGED Command: GPRS Cell Environment 208
10.11. +CGEREP Command: Packet Domain Event Reporting 217
10.12. +CGAUTO Command: Automatic Response 218
10.13. +CGPADDR Command: Show PDP Address 219
10.14. +CGQMIN Command: Quality of Service Profile (Minimum) 220
10.15. +CGEQMIN Command: 3G Quality of Service Profile (Minimum) 221
10.16. +CGQREQ Command: Request Quality of Service Profile 223
10.17. +CGEQREQ Command: 3G Request Quality of Service Profile 224
10.18. +CGEQNEG Command: 3G Negotiated Quality of Service Profile 226
10.19. +CGREG Command: GPRS Network Registration Status 228
10.20. +CGSMS Command: Select Service for MO SMS Messages 229

10.21. +CRLP Command: Select Radio Link Protocol 230
10.22. +XDNS Command: Dynamic DNS Request 230
10.23. +CGPIAF Command: Printing IP Address Format 231
10.24. +WPPP Command: PDP Context Authentication Configuration 232

11. SIM APPLICATION TOOLKIT AT COMMANDS 234

11.1. +STKPRO Command: Display List of Supported Proactive Commands 234
11.2. +STKTR Command: Enter Response 237
11.3. +STKENV Command: Send a SIM APPL TK Envelope Command 240
11.4. +STKPROF Command: Terminal Profile Data 241
11.5. +STKCC Notification: SIM – APPL – TK Call Control 241
11.6. +STKCNF Notification: SIM – APPL – TK Proactive Session Status 242
11.7. *PSSTKI Command: SIM Toolkit Configuration 242

12. PROTOCOL SPECIFIC COMMANDS 246

12.1. Preliminary Comments 246
12.2. IP Address Format in AT Commands 246
12.3. Session ID 246
12.4. Connection of PDP Contexts 246
12.5. Buffer Length of AT Commands 246
12.6. Parameter Format of AT Commands 247
12.7. Connection Configuration 247
12.7.1. +KCNXCFG Command: GPRS Connection Configuration 247
12.7.2. +KCNXTIMER Command: Connection Timer Configuration 248
12.7.3. +KCNXPROFILE Command: Current Profile Connection Configuration 249
12.7.4. +KCGPADDR Command: Display PDP Address 250
12.7.5. +KCNX_IND Notification: Connection Status Notification 251
12.7.6. +KCNXUP Command: Bring the PDP Connection Up 251
12.7.7. +KCNXDOWN Command: Bring the PDP Connection Down 252
12.8. Common Configuration 253
12.8.1. +KPATTERN Command: Custom End of Data Pattern 253
12.8.2. +KURCCFG Command: Enable or Disable the URC from Protocol Commands 254
12.8.3. +KIPOPT Command: General Options Configuration 255
12.9. SSL Configuration 257
12.9.1. +KSSLCRYPTO Command: Cipher Suite Configuration 257
12.9.2. +KSSLCFG Command: SSL Configuration 258
12.10. TCP Specific Commands 260
12.10.1. +KTCPCFG Command: TCP Connection Configuration 260
12.10.2. +KTCPCNX Command: Start TCP Connection 261
12.10.3. +KTCPRCV Command: Receive Data through a TCP Connection 262
12.10.4. +KTCPSND Command: Send Data through a TCP Connection 263
12.10.5. +KTCPCLOSE Command: Close Current TCP Operation 264
12.10.6. +KTCPDEL Command: Delete a Configured TCP Session 264
12.10.7. +KTCP_SRVREQ Notification: Incoming Client Connection Request 265

12.10.8. +KTCP_DATA Notification: Incoming Data through a TCP Connection.....266
12.10.9. +KTCP_IND Notification: TCP Status.....267
12.10.10. +KTCPSTAT Command: Get TCP Socket Status.....267
12.10.11. +KTCPSTART Command: Start a TCP Connection in Direct Data Flow.....268
12.10.12. +KTCP_ACK Notification: Status Report for Latest TCP Data.....269
12.10.13. +KTCPACKINFO Command: Poll ACK Status for the Latest Data.....269
12.11. UDP Specific Commands.....270
12.11.1. +KUDPCFG Command: UDP Connection Configuration.....270
12.11.2. +KUDPRCV Command: Receive Data through a UDP Connection.....272
12.11.3. +KUDPSND Command: Send Data through a UDP Connection.....273
12.11.4. +KUDPCLOSE Command: Close Current UDP Operation.....274
12.11.5. +KUDPDEL Command: Delete a Configured UDP Session.....275
12.11.6. +KUDP_IND Notification: UDP Status.....275
12.11.7. +KUDP_DATA Notification: Incoming Data through a UDP Connection.....275
12.12. FTP Client Specific Commands.....276
12.12.1. +KFTPCFG Command: FTP Configuration.....276
12.12.2. +KFTPCNX Command: Start FTP Connection.....278
12.12.3. +KFTPRCV Command: Receive FTP Files.....279
12.12.4. +KFTPSND Command: Send FTP Files.....280
12.12.5. +KFTPDEL Command: Delete FTP Files.....281
12.12.6. +KFTP_IND Notification: FTP Status.....282
12.12.7. +KFTPCLOSE Command: Close Current FTP Connection.....283
12.12.8. +KFTPCFGDEL Command: Delete a Configured FTP Session.....283
12.13. HTTP Client Specific Commands.....284
12.13.1. +KHTTPCFG Command: HTTP Connection Configuration.....284
12.13.2. +KHTTPCNX Command: Start the HTTP Connection.....285
12.13.3. +KHTTPHEADER Command: Set the HTTP Request Header.....286
12.13.4. +KHTTPGET Command: Get HTTP Server Information.....287
12.13.5. +KHTTPHEAD Command: Get HTTP Headers.....288
12.13.6. +KHTTPPOST Command: Perform HTTP Post.....288
12.13.7. +KHTTPCLOSE Command: Close an HTTP Connection.....289
12.13.8. +KHTTPDEL Command: Delete a Configured HTTP Session.....290
12.13.9. +KHTTP_IND Notification: HTTP Status.....290
12.14. HTTPS Client Specific Commands.....291
12.14.1. +KHTTPSCFG Command: HTTPS Connection Configuration.....291
12.14.2. +KHTTPSCNX Command: Start HTTPS Connection.....293
12.14.3. +KHTTPSHEADER Command: Set the HTTPS Request Header.....294
12.14.4. +KHTTPSGET Command: Get Information from HTTPS Server.....294
12.14.5. +KHTTPSHEAD Command: Retrieve HTTP Headers.....295
12.14.6. +KHTTPSPOST Command: Send Data to HTTPS Server.....296
12.14.7. +KHTTPSCLOSE Command: Close an HTTPS Connection.....297
12.14.8. +KHTTPSDEL Command: Close an HTTPS Connection.....298
12.14.9. +KHTTPS_IND Notification: HTTPS Status.....298
12.15. SSL Certificate Manager.....299
12.15.1. +KCERTSTORE Command: Store Root CA and Local Certificates to Internal Storage.....299

12.15.2. +KPRIVKSTORE Command: Store Private Key Associated to a Local Certificate ... 300
12.15.3. +KCERTDELETE Command: Delete Local Certificate from the Index ... 301
12.15.4. +KPRIVKDELETE Command: Delete Private Key from the Index ... 301

13. AVMS COMMANDS ... 303

13.1. +WDSC Command: Device Services Configuration ... 303
13.2. +WDSD Command: Device Services Local Download ... 305
13.3. +WDSE Command: Device Services Error ... 305
13.4. +WDSF Command: Device Services Fallback ... 307
13.5. +WDSG Command: Device Services General Status ... 308
13.6. +WDSI Command: Device Services Indication ... 309
13.7. +WDSR Command: Device Services Reply ... 311
13.8. +WDSS Command: Device Services Session ... 313
13.9. +WDSM Command: Manage Device Services ... 315

14. TEST COMMANDS ... 317

14.1. +WMTXPOWER Command: Test RF Tx ... 317
14.2. +WMRXPOWER Command: Test RF Rx ... 320

15. NV RELATED COMMANDS ... 324

15.1. Auto Generation of NV Backup Files ... 324
15.2. Auto Recovery from Backup NV Files ... 324
15.3. +NVBU Command: NV Backup Status and Control ... 325
15.4. +NVBU_IND Notification: NV Backup Status Notification ... 327

16. BOARD SUPPORT COMMANDS ... 328

16.1. +WCARRIER Command: Show Carrier Name ... 328

17. M2M SERVICE OPTIMIZATION COMMANDS ... 329

17.1. +MSOSTATUS Command: Operating Status ... 329
17.2. +MSORTCSTATUS Command: Display Trust RTC Status ... 330
17.3. +MSOPOLICY Command: Update MSO Policies ... 330
17.4. +MSORETRYINFO Command: Read Retry Information ... 332
17.5. +MSOMONITOR Command: Monitoring Status Control ... 333
17.6. +MSOMONITORVALUE Command: Read Monitored Data ... 333
17.7. +MSOEVTLOGSTATUS Command: Event Log Status ... 335
17.8. +MSOEVTLOGPUSH Command: Event Log Push ... 336
17.9. +MSOEVTLOG Command: Read Event Log ... 336

18. APPENDIX ... 338

18.1. Result Codes and Unsolicited Messages ... 338
18.2. Error Codes ... 339
18.2.1. CME Error Codes ... 339
18.2.2. CEER Error Codes ... 341

18.2.3. CMS Error Codes 350
18.2.4. GPRS Error Codes 352
18.2.5. FTP Reply Codes 353
18.2.6. AVMS Error Codes 354
18.2.7. Error Case Examples 354
18.3. Commands without Pin Code Requirement 361
18.4. GSM 27.010 Multiplexing Protocol 362
18.5. TCP Commands Examples 363
18.5.1. Client Mode 363
18.5.2. Server Mode 364
18.5.3. Polling for the Status of a Socket 365
18.5.4. End to End TCP Connection 366
18.5.5. Error Case for End to End TCP Connection 367
18.5.6. Use Cases for AT+KTCPACKINFO and <URC-ENDTCP-enable> Option 367
18.6. UDP Commands Examples 369
18.6.1. Client Mode 369
18.6.2. Server Mode 370
18.6.3. Use Cases for KTCP_DATA and KUDP_DATA 371
18.7. FTP Commands Examples 373
18.7.1. Client Mode 373
18.7.2. "FTP Resume" Use Case 374
18.8. HTTP Commands Examples 375
18.9. Switch Data/Command Mode DTR +++ ATO Behavior Table 377

List of Tables

Table 1. Types of Extended AT Commands 21
Table 2. Time Out Values 132
Table 3. Extended Time Out Values 132
Table 4. Tag 128 MN_GENERAL_PROBLEM with Causes 349
Table 5. Tag 129 MN_INVOKE_PROBLEM with Causes 350
Table 6. Tag 130 MN_RETURN_RESULT_PROBLEM with Causes 350
Table 7. Tag 131 MN_RETURN_ERROR_PROBLEM with Causes 350
Table 8. Generic Error Case Examples 354
Table 9. Non-Generic Error Case Examples 355
Table 10. Internet Error Case Examples 357

1. Introduction

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

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

1.1. Reference Configuration

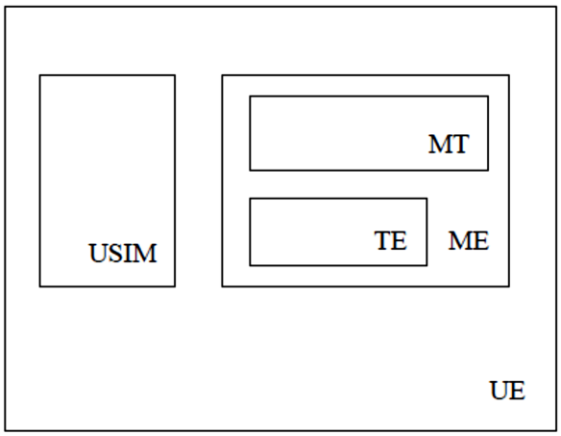


Figure 1. Reference Configuration

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

1.2. AT Command Principles

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

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

Four kinds of extended AT commands are implemented as listed in the table below.

Table 1. Types of Extended AT Commands

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

1.2.1. Parameters

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

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

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

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

1.2.2. Answers and Responses

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

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

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

1.2.3. Multiple AT Commands on the Same Command Line

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

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

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

Example:

Command: **ATZE1+CBST=7,0,1;+CBST?**

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

OK

1.2.4. AT Commands on Separate Lines

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

1.3. Unsolicited Result Codes (URCs)

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

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

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

1.4. PDP Context Usage

Note: This section is only applicable to HL7618 and HL7618RD.

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

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

Note that:

- CID=1 to CID=4 are managed by Verizon OMADM administration. These APNs may be updated by the VZW OMADM server, e.g. after server's initialized DM session, or after a SIM card change.
- CID=3 to CID=10 are intended for customer use if other APN/PDP context is needed (e.g. APN for private network). Note that:
  - CID=3 or 4 may be updated by the VZW OMADM server
  - CID=5 is reserved for AVMS, but can be used by customer if AVMS feature is not used
  - It is recommended to use CID=6 to CID=10 in customer application if other APN/PDP context is needed

- CID=11 to CID=20 are disabled (related AT commands return error response) as maximum PDP context (APN parameter list) is 10 entries for Verizon data retry restriction. These CIDs can only be used properly provided that their IP-type and APN are the same as one configured in CID=1 to CID=10.
- CID=1 or 2 and CID=11-20 are locked by AT+HBHV=2 (related AT commands return error response).

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

1.5. SMS Commands

Note: This section is only applicable to HL7618 and HL7618RD.

SMS is sent over IMS in the Verizon network using 3GPP2 SMS PDU format and protocol. Generally, 3GPP AT commands do not work with 3GPP2 SMS, but additional support is added in the HL7618 and HL7618RD to convert input SMS from 3GPP format to 3GPP2 format. This allows the use of 3GPP AT commands like +CMGS, +CNMI and +CMGD to send, show or delete SMS messages as if the SMS is sent, received or stored in 3GPP SMS PDU format.

However, +XCMGS3GPP2 and +XCMT3GGP2 are still available for sending and receiving SMS messages in 3GPP2 SMS PDU format.

1.6. Document Modification

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

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

1.7. Abbreviations

Abbreviation	Definition
ACM	Accumulated Call Meter
ADC	Analog Digital Converter
ADN	Abbreviated Dialing Number (Phonebook)
AMR	Adaptive Multi-Rate
AMR-FR	AMR Full Rate (full rate speech version 3)
AMR-HR	AMR Half Rate (half rate speech version 3)
AOC	Advice Of Charge
APN	Access Point Name
ARN	Address Resolution Protocol
ARFCN	Absolute Radio Frequency Channel Number
ASCII	American Standard Code for Information Interchange
AT	ATtention; Hayes Standard AT command Set
BCCH	Broadcast Channel
BER	Bit Err Rate
BM	Broadcast Message Storage

Abbreviation	Definition
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
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

Abbreviation	Definition
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
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

Abbreviation	Definition
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
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

Abbreviation	Definition
TA	Terminal Adaptor
TBF	Temporary Block Flow
TE	Terminal Equipment
TTY	TeleTYpe
TON/NPI	Type Of Number/Numbering Plan Identification
TX	Transmission
UART	Universal Asynchronous Receiver Transmitter
UCS2	Universal Character Set 2 Character table (2-byte coding)
UDUB	User Determined User Busy
UIH	Unnumbered Information with Header check
USB	Universal Serial Bus
USSD	Unstructured Supplementary Service Data

2. V25ter AT Commands

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 the ATO[n] command. • Line needs one second silence before and one second after (do not end with terminating character). • The "+" character may be changed with the ATS2 command (see following chapters). • The +++ characters are not transmitted in the data flow.

2.2. A/ Command: Repeat Previous Command Line

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **A/**	Response Depends on the previous command
Reference V.25Ter	Notes Line does not need to end with terminating character.

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

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

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

2.4. E Command: Enable Echo Command

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATE[<value>]**	Response **OK** or **+CME ERROR: <err>** Parameter **<value>** 0 Echo OFF 1 Echo ON
Notes	• This setting determines whether or not the TA echoes characters received from TE during the command state. • <value> is saved in non-volatile memory per AT port over module reboot.

2.5. Q Command: Set Result Code Presentation Mode

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATQ[<n>]**	Response **OK** (if **<n>** = 0) Nothing (if **<n>** = 1) Parameter **<n>** 0 Result codes transmitted by TA 1 No result codes transmitted by TA
Notes	• Specifies whether or not the TA transmits any result code to the TE. Information text transmitted in response is not affected by this setting. • <n> is saved in non-volatile memory per AT port over module reboot.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **ATS0?**	Response **<n>** **OK**
Write command Syntax **ATS0=<n>**	Response **OK** Parameter **<n>** 0 Automatic answering deactivated 1 – 255 Number of rings before automatically answering
Notes	In data mode (after any CONNECT) automatic call answering does not work that means that incoming calls are not automatically answered during data mode.

2.7. S4 Command: Set Response Formatting Character

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **ATS4?**	Response **<n>** **OK**
Write command Syntax **ATS4=<n>**	Response **OK** Parameter **<n>** 10 Response formatting character <LF>: line feed
Notes	This parameter determines the character recognized by TA to terminate answer line (10 = <LF> by default); it cannot be changed.

2.8. S7 Command: Set Delay for Connection Completion

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **ATS7?**	Response **<n>** **OK**
Write command Syntax **ATS7=<n>**	Response **OK** Parameter **<n>** 1 – 255 Number of seconds to wait for connection completion

2.9. V Command: TA Response Format

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATV[value]**	Response In case of information responses the format is: for V0: **<text><CR><LF>** for V1: **<CR><LF><text><CR><LF>** In case of result codes the format is: for V0: **<numeric code><CR>** for V1: **<CR><LF><verbose code><CR><LF>** or **+CME ERROR: <err>** Parameter **<value>** 0 Short result code format: <numeric code> 1 Long result code format: <verbose code>
Notes	<n> is saved in non-volatile memory per AT port over module reboot.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **ATX[<value>]**	Response **OK** or **+CME ERROR: <err>** Parameter **<value>** 0 or omitted — CONNECT result code only returned, dial tone and busy detection are both disabled 1 — CONNECT<text> result code only returned, dial tone and busy detection are both disabled 2 — CONNECT<text> result code returned, dial tone detection is enabled, busy detection is disabled 3 — CONNECT<text> result code returned, dial tone detection is disabled, busy detection is enabled 4 — CONNECT<text> result code returned, dial tone and busy detection are both enabled
Notes	• This command defines the result code to be returned, as well as sets the dial tone or busy detection features. • <value> is saved in non-volatile memory per AT port over module reboot.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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
Reference V.25Ter	Notes DCD/AT&C is only applicable to the USB AT port; it has no effect on UART1.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT&D<value>**	Response **OK** Parameter **<value>** 0 TA ignores status on DTR 1 DTR drops from active to inactive. Change to command mode while retaining the connected data call 2 DTR drops from active to inactive. Disconnect data call, change to command mode. Auto-answer is off during DTR inactive state
Reference V.25Ter	Notes • This command only applies to data calls. • DTR/AT&D is only applicable to the USB AT port; it has no effect on UART1.

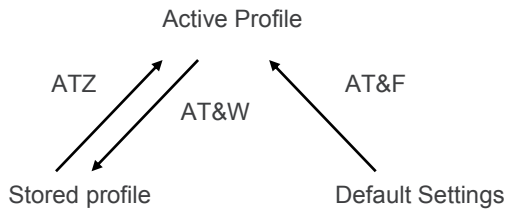
2.13. &F Command: Restore Factory Settings

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT&F[<value>]**	Response **OK** Parameter **<value>** 0 or Omitted Restore STORED PROFILE 0 and 1 to factory settings
Reference V.25Ter	Notes This command also restores the factory settings to the active profile.
Examples	**AT&F** **OK** **AT&F0** **OK** **AT&F1** **ERROR**

2.14. &W Command: Save Stored Profile

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT&W[<value>]**	Response **OK** Parameters **<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. • &R, S05, S06 and S08 have no effect. Their parameters are not saved in non-volatile memory.
Examples	**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**

2.15. &V Command: Display Current Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT&V[<value>]**	Response **ACTIVE PROFILE: <current configuration>** **STORED PROFILE 0: <user default configuration>** **STORED PROFILE 1: <manufacturer configuration>** **OK** Parameter **<value>** 0 Profile number This command indicates the result of certain actions as shown below: 

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 manufacturer, the product and the user setup. • Registers S05, S06 and S08 have no effect. They are only implemented for compliance with V.25ter. Their parameters are always read as values 8, 2 and 2 respectively. • &R has no effect and it is not defined in the V.25ter specification. It is only implemented here for compatibility purposes. Its parameter is always read as 1.
Example	**AT&V** **ACTIVE PROFILE:** **E1 Q0 V1 X0 &C1 &D1 &R:1 &S0 &K0 +IPR:115200 +FCLASS0** **S00:0 S01:0 S04:10 S05:8 S06:2 S07:255 S08:2** **STORED PROFILE 0:** **E1 Q0 V1 X0 &C1 &D1 &R:1 &S0 &K3 +IPR:115200 +FCLASS0** **S00:0 S01:0 S04:10 S05:8 S06:2 S07:255 S08:2** **STORED PROFILE 1:** **E1 Q0 V1 X0 &C1 &D1 &R:1 &S0 &K3 +IPR:115200 +FCLASS0** **S00:0 S01:0 S04:10 S05:8 S06:2 S07:255 S08:2** **OK**

2.16. &K Command: Flow Control Option

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT&K[<mode>]**	Response **OK** Parameter **<mode>** 0 or omitted Disable all flow control 3 Enable bi-directional hardware flow control
Reference V.25ter	Notes • Use AT&V0 to display the current flow control setting. • Sierra Wireless recommends the use of hardware flow control. • AT&K3 hardware flow control is only effective for UART1 and +KSLEEP=2 (UART always ON); it has no effect on the USB AT port. • This command is not supported in MUX mode; flow control is not supported in the DLC channel.

2.17. &S Command: DSR Option

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

2.18. IPR Command: Set Fixed Local/DTE Rate

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+IPR=?**	Response With Autobaud: **+IPR:** (list of supported auto detectable **<baud_rate>**s)[,(list of fixed only **<baud_rate>**s)] **OK** Without Autobaud: **+IPR:** ()[,(list of fixed only **<baud_rate>**s)] **OK**
Read command Syntax **AT+IPR?**	Response **+IPR: <baud_rate>** **OK**
Write command Syntax **AT+IPR= <baud_rate>**	Response **OK** or **+CME ERROR: <err>** Parameter **<baud_rate>** 115200 (default value) For HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692: 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 230400, 460800, 500000, 750000, 921600, 1843200, 3000000, 3250000, 6000000 For HL7650: 0 (autobaud), 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 230400, 460800, 500000, 750000, 921600, 1843200, 3000000, 3250000, 3686400, 4000000, 6000000

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Notes	• Not all listed rates may be available as they depend on the target. • The full range of data rate values may be reduced depending on hardware or other criteria. • <baud_rate> is saved in non-volatile memory per AT port over module reboot when AT&W is entered. It is not automatically saved after a +IPR write command. • After autobaud is activated on a UART port, the next AT command can be entered at a different speed. +IPR is then set to the speed of this command. Autobaud is then automatically deactivated. • When autobaud is activated on a USB COM port, any speed provided by the USB driver is accepted. AT+IPR? responds with +IPR: 0 regardless of USB speed used.

2.19. L Command: Monitor Speaker Loudness

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
Write command Syntax **ATL [<volume>]**	Response **OK** Parameter **<volume>** 0 – 9
Notes	The responses of this command are compliant with the recommendation but this command has no effect.

2.20. M Command: Monitor Speaker Mode

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
Write command Syntax **ATM[<mode>]**	Response **OK** Parameter **<mode>** 0 – 65535
Notes	The responses of this command are compliant with the recommendation but this command has no effect.

3. General AT Commands

3.1. I Command: Request Identification Information

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATI[<value>]**	Response If <value> = 0 or omitted: **<model>** **OK** If <value> = 1: **<short version name>** **OK** If <value> = 3: **<version name>** **OK** If <value> = 4: **<fuse state>** **OK** If <value> = 9: **<version name>** **<model>** **<short version name>** **<chipset>** **<fuse state>** **<build date & time>** **<source rev>** **OK** If <value> = 10: **Modem-Firmware:** **<version name>** **<model>** **<short version name>** **<chipset>** **<fuse state>** **<build date & time>** **<source rev>** **Primary-Boot:** **<version name>** **<build date & time>** **<source rev>**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	Secondary-Boot: **<version name>** **<build date & time>** **<source rev>** **Update-Agent:** **<version name>** **<build date & time>** **<source rev>** **4G-Firmware:** **<4G FW version name>** **3G-Firmware:** **<3G FW version name>** **OK** <u>Parameters</u> **<model>** Model identifier **<version name>** Firmware version string HL7618, HL7618RD, HL7688, HL7690 and HL7692 follow the format: AHL75xx_TEST.0.0.141506 <…> (test firmware) AHL75xx.1.0.141506.<…> (official firmware) HL7648 and HL7650 follow the format: <prefix>.<major no.>.<minor no.>.<baseline no.>.<date-time>.<integration> of size: <variable, up to 32 characters>.<2digits>.<2digits >.<6digits >.<12digits>.<2digits> Note that test firmware will have <major no.>.<minor no.> = 00.00. For example: SWIMCB71XX-G.00.00.163500.201609231719.01 (test firmware) SWIMCB71XX-G.01.00.163500.201609231719.01 (official firmware) **<short version name>** Firmware version string in short format (without date and time) For example: HL75xx_TEST.0.0 (test firmware) HL75xx.1.0 (official firmware) **<4G FW version name>** 4G Firmware version string **<3G FW version name>** 3G Firmware version string **<chipset>** Chipset name **<build date & time>** Firmware build time in format YYYY-MM-DD HH:MM:SS **<source rev>** Source code revision in version control **<fuse state>** Fuse state information FUSED Fused module with secure boot NON-FUSED Non-fused module

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference V.25ter	Notes • ATI3 is identical to AT+GMR and AT+CGMR. • ATI0 and ATI are identical to AT+GMM and AT+CGMM.
Examples	**ATI** **HL7618** //When using an HL7618 module **OK** **ATI0** **HL7618** //When using an HL7618 module **OK** # For fused modules **ATI4** **FUSED** **OK** # For non-fused modules **ATI4** **NON-FUSED** **OK** # Examples on a test firmware for HL7648/HL7650 **ATI1** **SWIMCB71XX-G.00.00.163500** **OK** **ATI3** **SWIMCB71XX-G.00.00.163500.201609261356.01** **OK** # Example of a test firmware with TEST as the version name **ATI3** **BHL7618_TEST.0.0.154401.201511132200.x7120_2** **OK** # Examples on official firmware **ATI1** **HL7618.3.0** //When using an HL7618 module **OK** **ATI3** **BHL7618.3.0.154401.201511132200.x7120_2** **OK**

3.2. Z Command: Reset and Restore User Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATZ<value>**	Response **OK** or **+CME ERROR: <err>** Parameter **<value>** 0 Reset and restore user configuration with profile 0 1 Reset and restore user configuration with profile 1

3.3. +CGMI Command: Request Manufacturer Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGMI=?**	Response **OK**
Execute command Syntax **AT+CGMI**	Response **(manufacturer identification text)** **OK**
Reference [27.007] § 5.1	Note This command is identical to AT+GMI.
Example	**AT+CGMI** **Sierra Wireless** **OK**

3.4. +CGMM Command: Request Model Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGMM=?**	Response **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT+CGMM**	Response **<mode>** **OK** Parameter **<model>** Model identifier
Reference [27.007] § 5.2	Note This command is identical to AT+GMM, ATI and ATI0.
Example	**AT+CGMM** **HL7618** //When using an HL7618 module **OK**

3.5. +CGMR Command: Request Revision Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGMR=?**	Response **OK**
Execute command Syntax **AT+CGMR**	Response **(model revision identification text)** **OK**
Reference [27.007] § 5.3	Note This command is identical to ATI3 and AT+GMR.
Examples	**AT+CGMR** **AHL7618_TEST.0.0.153200.201508220500.x7120_1** // test HL7618 firmware **OK** **AT+CGMR** **AHL7618.1.0.153200.201508220500.x7120_1** // official HL7618 firmware **OK**

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGSN=?**	Response **OK**
Execute command Syntax **AT+CGSN**	Response **<IMEI>** (identification text for determination of the individual ME) **OK**
Reference V.25ter	Notes • This command is identical to AT+GSN. • This command can work with or without a SIM. • See also AT+KGSN.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KGSN=?**	Response **+KGSN:** (list of supported **<number type>**s) **OK**
Write 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** If **<number type>** = 4: **+KGSN: <FSN-BB>** **OK**

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

3.8. +HWREV Command: Request Hardware Revision

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+HWREV=?**	Response **OK**
Read command Syntax **AT+HWREV?**	Response **Hardware revision: X.Y** **OK** Parameter **X.Y** These are the HH numbers in FSN (returned by TTYWWDNNNNPP**HH**-BB)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference Sierra Wireless Proprietary	Notes This command works with or without a SIM.
Example	Assuming FSN=TTYWWDNNNNPP**01**-BB **AT+HWREV?** **Hardware revision: 0.1** **OK**

3.9. +CSCS Command: Set TE Character Set

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CSCS=?**	Response **+CSCS:** (list of supported **<vail>**s) **OK**
Read command Syntax **AT+CSCS?**	Response **+CSCS: <vail>** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+CSCS= [<vail>]**	Response **OK** or **+CME ERROR: <err>** Parameter **<vail>** "GSM" GSM default alphabet (3GPP TS 23.038) "HEX" Character strings only consist of hexadecimal numbers from 00 to FF. For example, “032FE6” equals three 8-bit characters with decimal values 3, 47 and 230. No converstions to the original MT character set shall be done "IRA" International reference alphabet (ITU-T T.50) "UCS2" 16-bit universal multiple-octet coded character set (ISO/IEC 10646)
Notes	<vail> is saved in non-volatile memory per AT port over module reboot.

3.10. +CIMI Command: Request International Mobile Subscriber Identity

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

3.11. +GMI Command: Request Manufacturer Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+GMI=?**	Response **OK**
Execute command Syntax **AT+GMI**	Response **(manufacturer identification text)** **OK**
Reference [27.007] § 5.1	Note This command is identical to AT+CGMI.
Example	**AT+GMI** **Sierra Wireless** **OK**

3.12. +GMM Command: Request Model Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+GMM=?**	 Response **OK**
Execute command Syntax **AT+GMM**	 Response **<model>** **OK** Parameter **<mode>** Model identifier
Reference [27.007] § 5.2	Note This command is identical to AT+CGMM, ATI and ATI0.
Example	**AT+GMM** **HL7618** //When using an HL7618 module **OK**

3.13. +GMR Command: Request Revision Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+GMR=?**	 Response **OK**
Execute command Syntax **AT+GMR**	 Response **(model revision identification text)** **OK**
Reference [27.007] § 5.3	Note This command is identical to ATI3 and AT+CGMR.
Examples	**AT+CGMR** **AHL7618_TEST.0.0.153200.201508220500.x7120_1** // test HL7618 firmware **OK** **AT+CGMR** **AHL7618.1.0.153200.201508220500.x7120_1** // official HL7618 firmware **OK**

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+GSN=?**	Response **OK**
Execute command Syntax **AT+GSN**	Response **<IMEI>** (identification text for determination of the individual ME) **OK**
Reference V.25ter	Notes • This command is identical to AT+CGSN. • This command can work with or without a SIM. • See also AT+KGSN.

3.15. +CMUX Command: Multiplexing Mode

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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** or **+CME ERROR: <err>** **OK**
Write command Syntax **AT+CMUX=** **<mode>** **[,<subset>** **[,<port_speed>** **[,<N1>[,<T1>** **[,<N2>[,<T2>** **[,<T3>[,<k>]]]]]]]]**	Response **OK** or **+CME ERROR: <err>** **OK** Parameters **<mode>** Multiplexer transparency mechanism 0 Basic option 1 Advanced option (not supported)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<subset> 0 UIH frames used only 1 UI frames used only (not supported) 2 I frames used only (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 1 Mbit/s **<N1>** 1 – 1509 Maximum frame size. Default value = 31 (64 if Advanced option is used) **<T1>** 1 – 255 Acknowledgement time in units of ten milliseconds. Default value = 10 (100 ms) **<N2>** 0 – 5 Maximum number of re-transmissions. Default value = 3 **<T2>** 2 – 255 Response time for the multiplexer control channel in units of ten milliseconds. Default value = 30 (300 ms). Note that <T2> must be longer than <T1>. **<T3>** 1 – 255 Wake up response timer in seconds. Currently not supported; in case of read command, 0 is returned. **<k>** 1 – 7 Window size for advanced operation with error recovery options. Currently not supported; in case of read command, 0 is returned.
Notes	• This command enables the multiplexing protocol control channel as defined in GSM07.10. • The AT command sets parameters for the Control Channel. If parameters are left out the default values are used. If no autobauding is supported, a customer related interface speed is pre selected. The final response code OK or CME ERROR: <err> is returned using the old interface speed; the parameters become active only after sending OK. • The "+++" escape sequence is not supported in the DLC port in CMUX mode. Alternatively, DTR can be used to switch from data mode to command mode, or use another DLC port to send AT commands. • The module handles the frame data step by step in CMUX mode. If there are any wrong data in the frame, e.g. wrong CRC, nothing will be returned to the terminal, and the module will wait for a valid frame data. • If the AT+CFUN command is entered with <rst>=1, all open CMUX channels will be closed and the module will reset. • There is no activity timeout to return to AT mode after entering MUX mode. • MUX DLC ports are not persistent over power cycles. After a power cycle, DLC ports need to be re-established. • When an established MT call is hanged up from the caller side, NO CARRIER will only be sent to the port on which the call was established (i.e. the port on which ATD/ATA was sent).

3.16. +GCAP Command: Request Complete TA Capability List

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT+GCAP**	Response **+GCAP:** list of **<name>**s **OK**
Example	**+GCAP:+FCLASS,+CGSM** **OK**

3.17. +WIMEI Command: IMEI Write and Read

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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. • The NV backup of the static calibrated NV partition which stores the IMEI is automatically updated after successfully executing the write command (i.e. backup is updated when OK is returned).
Examples	**at+wimei?** **+WIMEI: 012345478901237** // Default IMEI **OK** **at+wimei=354610060035829** // Enter 15-digit IMEI **OK** **at+wimei?** **+WIMEI: 354610060035829** **OK**

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

3.18. +KODIS Command: Access ODIS Information

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
Test command Syntax **AT+KODIS=?**	Response **OK**
Read command Syntax **AT+KODIS?**	Response **+KODIS: <index>,“<hostMan>”,“<hostMod>”,“<hostSwV>”,“<hostPlasmaID>”** **OK**
Write command Syntax **AT+KODIS=** **<index>,** **<hostMan>,** **<hostMod>,** **<hostSwV>,** **<hostPlasmaID>**	Response **OK** or **+CME ERROR: <err>** Parameters **<index>** Index number of the following parameters **<hostMan>** Host manufacturer of ODIS node (ATT) **<hostMod>** Host model of ODIS node (ATT) **<hostSwV>** Host software version of ODIS node (ATT) **<hostPlasmaID>** Host plasma ID of ODIS node (ATT)
Reference Sierra Wireless Proprietary	Notes • This command is used for modifying host device details required by specific ODIS test cases in AT&T. • The maximum number of characters in the parameters listed above is 31. Characters beyond the maximum limit will be ignored.
Examples	**at+kodis?** **+KODIS: 1,"HostMan","HostMod","HostSwV","HostPlasmaID"** **OK** **at+kodis=1,"HostMan","HostMode","01.00","HostPlasmaID"** **OK**

HL7648 and HL7688	
	at+kodis? **+KODIS: 1,"HostMan","HostMode","01.00","HostPlasmaID"** **OK**

3.19. &R Command: RTS and CTS Option

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

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
Write 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 command has no effect and is not defined in the V.25ter specification; it was only implemented for compatibility reasons. Parameters are ignored and are not saved in non-volatile memory.

3.20. +FMI Command: Request Manufacturer Identification

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
Test command Syntax **AT+FMI=?**	Response **OK**
Execute command Syntax **AT+FMI**	Response **(manufacturer identification text)** **OK**
Reference [27.007] § 5.1	Example **AT+FMI** **Sierra Wireless** **OK**

3.21. +FMM Command: Request Model Identification

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
Test command Syntax **AT+FMM=?**	Response **OK**
Execute command Syntax **AT+FMM**	Response **<model>** **OK** Parameter **<model>** Model identifier
Reference [27.007] § 5.2	Example **AT+FMM** **HL7688** **OK**

3.22. \N Command: Data Transmission Mode

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

HL7648, HL7688, HL7690 and HL7692	
Execute command Syntax **AT\N<x>**	Response **OK** Parameter **<x>** 0 Transparent mode 4, 6 RLP mode (non-transparent)
Notes	This command has no effect and is not defined in the V.25ter specification; it was only implemented for compatibility reasons. Parameters are ignored and are not saved in non-volatile memory.

3.23. N Command: Negotiate Handshake Option

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

HL7648, HL7688, HL7690 and HL7692	
Execute command Syntax **ATN[<option>]**	Response **OK** Parameter **<option>** 0 – 9
Notes	This command has no effect and is not defined in the V.25ter specification; it was only implemented for compatibility reasons. Parameters are ignored and are not saved in non-volatile memory.

3.24. S5 Command: Write Command Line Editing Character

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **ATS5?**	Response **<n>** **OK**
Write command Syntax **ATS5=<n>**	Response **OK** Parameters **<n>** 8 Only 8 (backspace) is supported
Reference V.25Ter	Notes This command has no effect and was only implemented to comply with V.25ter. Parameters are ignored and are not saved in non-volatile memory.

3.25. S6 Command: Pause before Blind Dialing

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

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
Write command Syntax **ATS6=<time>**	Response **OK** Parameters **<time>** 0 – 999
Reference V.25ter	Notes This command has no effect and was only implemented to comply with V.25ter. Parameters are ignored and are not saved in non-volatile memory.

3.26. S8 Command: Comma Dial Modifier Time

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

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
Read command Syntax **ATS8?**	Response **<time>** **OK**
Write command Syntax **ATS8=<time>**	Response **OK** Parameters **<time>** 0 – 255
Reference V.25ter	Notes This command has no effect and was only implemented to comply with V.25ter. Parameters are ignored and are not saved in non-volatile memory.

3.27. W Command: Extended Result Code

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **ATW<mode>**	Response **OK** Parameter **<mode>** 0 or Omitted Only CONNECT will be shown 1 CONNECT<connection speed> will be shown
Notes	This command has no effect and is not defined in the V.25ter specification; it was only implemented for compatibility reasons. Parameters are ignored and are not saved in non-volatile memory.

3.28. B Command: Data Rate Selection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATB<rate>**	Response **OK** Parameter **<rate>** 0 – 99 Data rate
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. • Refer to AT+CBST regarding CSD data rate. (CSD is not applicable to the HL7650.)

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 • <n> will not be shown by the AT&V command.

3.30. S3 Command: Command Line Termination Character

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

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690	
Read command Syntax **ATS3?**	Response **<n>** **OK**
Write command Syntax **ATS3=<n>**	Response **OK** Parameters **<n>** 13 Command line termination character <CR>: carriage return
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.

3.31. S10 Command: Automatic Disconnect Delay

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690	
Write command Syntax **ATS10=<time>**	Response **OK** Parameter **<time>** 1 – 254 Number of tenths of a second of delay
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.

3.32. S11 Command: DTMF Dialing Speed

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

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690	
Write command Syntax **ATS11=<time>**	Response **OK** Parameter **<time>** 0 – 999
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.

4. Call Control Commands

4.1. A Command: Answer a Call

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATA**	Response **---------|---------- -- | ATA | OK** or **+CME ERROR: <err>**

4.2. H Command: Hook Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATH** or **ATH0**	Response: **OK** or **ERROR**

4.3. D Command: Dial Number

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **ATD=?**	Response **1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ !** **OK**
Read command Syntax **ATD?**	Response **1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ !** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATD[<n>]**	Response **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 Parameter **<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)
Reference V.25Ter	Notes • This command may generally be aborted when receiving an ATH command during execution. • Resposne “OK” may arrive just after the ATD command or after the call is actually 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).
Examples	**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~~ÿ}#À!}!} }4}"}&} } } } }%}&R}8}0D}'}"}(}"ná~** **NO CARRIER** **ATD=?** **1 2 3 4 5 6 7 8 9 0 * # + A B C D P T W , @ !** **OK**

4.4. D> Command: Direct Dialing from Phonebook

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **ATD><str>** **ATD>[<mem>]** **<n>**	Response See ATD Parameters **<str>** Alphanumeric field (if possible all available memories should be searched for correct entry)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<mem> Memory storage ("ME", "SM", etc.) **<n>** Entry location
Notes	For memory storage locations, see AT+CPBS.

4.5. +CHUP Command: Hang up Call

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CHUP=?**	Response **OK**
Execute command Syntax **AT+CHUP**	Response **OK** or **+CME ERROR: <err>**
Notes	This command hangs up waiting/active MT calls and MO calls.

4.6. +CR Command: Service Reporting Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CR=?**	Response **+CR:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CR?**	Response **+CR: <mode>** **OK**
Write command Syntax **AT+CR=** **[<mode>]**	Response **OK** or **+CME ERROR: <err>**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	Parameters **<mode>** 0 Disables reporting 1 Enables reporting **<serv>** ASYNC Asynchronous transparent SYNC Synchronous transparent REL ASYNC Asynchronous non-transparent REL SYNC Synchronous non-transparent GPRS [<L2P>] GPRS
Notes	The optional <L2P> proposes a layer 2 protocol to use between the MT and the TE. It is defined in +CGDATA command.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CRC=?**	Response **+CRC:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CRC?**	Response **+CRC:<mode>** **OK**
Write command Syntax **AT+CRC=** **[<mode>]**	Response **OK** or **+CME ERROR: <err>** Parameter **<mode>** 0 Disable extended format 1 Enable extended format
Unsolicited Notification	Response **+CRING: <type>** Paramerter **<type>** ASYNC [,<priority>[,<subaddr>,<satype>]] Asynchronous transparent SYNC [,<priority>[,<subaddr>,<satype>]] Synchronous transparent REL ASYNC [,<priority>[,<subaddr>,<satype>]] Asynchronous non transparent REL SYNC [,<priority>[,<subaddr>,<satype>]] Synchronous non transparent CTM [,<priority>[,<subaddr>,<satype>]] Incoming CTM call CTM2 [,<priority>[,<subaddr>,<satype>]] Incoming CTM call at line 2 GPRS <PDP_type>, <PDP_addr>[, [<L2P>][,<APN>]] GPRS network request for PDP context activation

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<priority> (Optional) EMLPP priority level of the incoming call by paging, notification or setup message. **<subaddr>** String type subaddress of format specified by <satype> **<satype>** Type of subaddress octet in integer format **<PDP_type>, <PDP_addr>, <APN>** As defined in AT+CGDCONT command **<L2P>** (Optional) proposes a layer 2 protocol to use between the MT and the TE.

4.8. +CSTA Command: Select Type of Address

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CSTA=?**	Response **+CSTA:** (list of supported **<type>**s) **OK**
Read command Syntax **AT+CSTA?**	Response **+CSTA: <type>** **OK**
Write command Syntax **AT+CSTA= <type>**	Response **OK** or **+CME ERROR: <err>** Parameter **<type>** 129 Dial string begins with a digit, or is a local number 145 Dial string includes international access code character "+"
Notes	<type> is saved in non-volatile memory over module reboot.

4.9. +CMOD Command: Call Mode

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+CMOD?**	Response **+CMOD: <mode>** **OK**
Write command Syntax **AT+CMOD= [<mode]**	Response **OK** or **+CME ERROR: <err>** Parameter **<mode>** 0 Single mode

4.10. +CEER Command: Extended Error Report

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CEER=?**	Response **OK**
Write command Syntax **AT+CEER**	Response **+CEER: <category>[,<cause>,<descriptions>]** **OK** Parameter **<category>** "No report available" "CC setup error" "CC modification error" "CC release" "SM attach error" "SM detach" "SM activation error" "SM deactivation" "SS network error cause" "SS network reject cause" "SS network GSM cause" **<cause>** Digit representing the error cause sent internally or by the network. Refer to 18.2.2 CEER Error Codes for more information. **<description>** Verbose string containing the textual representation of <cause>. Refer to 18.2.2 CEER Error Codes for more information.

4.11. +CSNS Command: Single Numbering Scheme

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

4.12. +CBST Command: Select Bearer Service Type

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CBST=?**	Response **+CBST:** (list of supported **<speed>**s),(list of supported **<name>**s),(list of supported **<ce>**s) **OK**
Read command Syntax **AT+CBST?**	Response **+CBST: <speed>,<name>,<ce>** **OK**
Write command Syntax **AT+CBST= [<speed> [,<name>[,<ce>]]]**	Response **OK** or **CME ERROR: <err>** Parameters **<speed>** 0 Autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service) 4 2400 bps (V.22bis) 5 2400 bps (V.26ter) 6 4800 bps (V.32) 7 9600 bps (V.32)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692			
		12	9600 bps (V.34)
		14	14400 bps (V.34)
		15	19200 bps (V.34)
		16	28800 bps (V.34)
		17	33600 bps (V.34)
		39	9600 bps (V.120)
		43	14400 bps (V.120)
		47	19200 bps (V.120)
		48	28800 bps (V.120)
		49	38400 bps (V.120)
		50	48000 bps (V.120)
		51	56000 bps (V.120)
		68	2400 bps (V.110 or X.31 flag stuffing)
		70	4800 bps (V.110 or X.31 flag stuffing)
		71	9600 bps (V.110 or X.31 flag stuffing)
		75	14400 bps (V.110 or X.31 flag stuffing)
		79	19200 bps (V.110 or X.31 flag stuffing)
		80	28800 bps (V.110 or X.31 flag stuffing)
		81	38400 bps (V.110 or X.31 flag stuffing)
		82	48000 bps (V.110 or X.31 flag stuffing)
		83	56000 bps (V.110 or X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI or RDI service in order to get FTM)
		84	64000 bps (X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI service in order to get FTM)
		115	56000 bps (bit transparent)
		116	64000 bps (bit transparent)
		120	32000 bps (PIAFS32k)
		121	64000 bps (PIAFS64k)
		130	28800 bps (multimedia)
		131	32000 bps (multimedia)
		132	33600 bps (multimedia)
		133	56000 bps (multimedia)
		134	64000 bps (multimedia)
	<name>	0	Data circuit asynchronous (UDI or 3.1 kHz modem)
		1	Data circuit synchronous (UDI or 3.1 kHz modem)
		4	Data circuit asynchronous (RDI)
		5	Data circuit synchronous (RDI)
	<ce>	0	Transparent
		1	Non-transparent
		2	Both, transparent preferred
		3	Both, non-transparent preferred

5. Mobile Equipment Control and Status Commands

5.1. +CACM Command: Accumulated Call Meter

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CACM=?**	Response **OK**
Read command Syntax **AT+CACM?**	Response **+CACM: <acm>** **OK**
Write command Syntax **AT+CACM= [<passwd>]**	Response **OK** or **+CME ERROR: <err>** Parameters **<passwd>** SIM PIN2 as a string type **<acm>** Accumulated call meter value similarly coded as <ccm> in command +CAOC as string type

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CAMM=?**	Response **OK**
Read command Syntax **AT+CAMM?**	Response **+CAMM: <acmmax>** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+CAMM=** **[<acmmax>** **[,<passwd>]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<acmmax>** String type containing the accumulated call meter maximum value coded in hexadecimal format. Value 0 disables the ACMmax feature **<passwd>** SIM PIN2

5.3. +CCWE Command: Call Meter Maximum Event

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CCWE=?**	Response **+CCWE:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CCWE?**	Response **+CCWE: <mode>** **OK**
Write command Syntax **AT+CCWE=** **<mode>**	Response **OK** or **+CME ERROR: <err>** Parameter **<mode>** 0 Disable the call meter warning event 1 Enable the call meter warning event

5.4. +CCLK Command: Real Time Clock

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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; format is "yy/MM/dd,hh:mm:ss+/-TZ", where characters indicate year (last two digits), month, day, hour, minutes, seconds and time zone (optional).
Notes	Year must be 2004 or later.

5.5. +CIND Command: Indicator Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CIND=?**	Response **+CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0-1)),("message",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-1))** **OK**
Read command Syntax **AT+CIND?**	Response **+CIND: <battchg>,<signal>,<service>,<call>,<smsfull>** **OK** Parameters **<battchg>** 0 – 5 Battery level 0 Lowest level 4 Highest level 5 Battery is charging (not supported)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<signal> 0 – 5 Signal quality level 0 Lowest level signal 5 Highest level signal **<service>** Network service availability 0 Network service is not available 1 Network service is available **<message>** Message reception 0 No message is received 1 Message is received **<call>** Calling in progress 0 Service is not available 1 Service is available **<roam>** Roaming indicator 0 Home network 1 Roaming **<smsfull>** SMS memory storage 0 Memory available 1 Memory full
Reference Sierra Wireless Proprietary	Notes • This command can be used without a SIM. • <message> and <smsfull> are only supported for memory 3 with “SM” and “ME” storage type. If a different storage type is used with memory 3, <message> and <smsfull> parameters are always 0.

Examples	// Test command
	AT+CIND=?
	+CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0-1)),("message",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-1))
	OK
	
	// Read command
	AT+CIND?
	+CIND: 0,1,1,0,0,0,0 // Indicates signal level = 1 and service is available
	OK

5.6. +CLAC Command: List Available AT Commands

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT+CLAC**	Response **<AT command 1>** **[<CR><LF><AT command 2>[..]]** **OK**

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

5.7. +CFUN Command: Set Phone Functionality

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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: <power_mode>,<STK_mode>** or **+CME ERROR: <err>**
Write command Syntax **AT+CFUN=<fun> [,<rst>]**	Response **OK** or **+CME ERROR: <err>** Parameters **<fun>** 0 Switch off MS 1 Full functionality 4 Disable both phone’s transmit and receive RF circuits; airplane mode 5 Fast detach 6 Enable SIMTK and fetching of proactive commands 7 Disable SIMTK and enable fetching of proactive commands 8 Disable fetching of proactive commands 15 Perform hidden reset (reset MS without resetting SIM) 16 Simulate reset (reset MS including SIM) 27 Perform SIM reset and restore previous PIN validation state (reset SIM without resetting MS) 31 Disable single stack with an option to power off/power on single (U)SIM card 32 Disable all stacks with an option to power off/power on single (U)SIM card 33 Enable single stack with an option to reset (U)SIM card

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	34 Enable all stacks with an option to reset (U)SIM cards 35 Power off/power on single (U)SIM card 36 Power off/power on all (U)SIM cards 37 Reset single stack 38 Reset all stacks 39 Perform operator selection based on last stored selection mode (automatic or manual). If manual, this command will trigger attach in manual mode without providing a PLMN. The last selection mode (automatic or manual mode) will be maintained in non-volatile memory as part of the AT+COPS command. Note that when <fun> = 0, 15 or 16, the OK response may be missed due to race conditions, as MT may switch off by the time the OK response is triggered. **<rst>** Reset value If <fun> = 1 or 4: 0 Do not reset MT before resetting it to <fun> power level 1 Reset MT before setting it to <fun> power level If <fun> = 31, 32, 35 or 36: 0 SIM is switched OFF 1 SIM is switched ON If <fun> = 33 or 34: 0 SIM reset not needed 1 SIM reset needed If <fun> = 27 0 Hidden SIM reset (MS is not informed of SIM reset) 1 Normal SIM reset (MS is informed of SIM reset) **<power_mode>** 1 MS is switched ON 2 Invalid mode 4 Airplane mode **<STK_mode>** 0 Inactive state 6 Enable the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM card 7 Disable the SIM-toolkit interface and enable fetching of proactive commands by SIM-APPL from the SIM card 8 Disable fetching of proactive commands by SIM-APPLU from the SIM card

5.8. +CMER Command: Mobile Equipment Event Reporting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CMER=?**	Response **+CMER:** (list of supported **<mode>**s),(list of supported **<keyp>**s),(list of supported **<disp>**s),(list of supported **<ind>**s),(list of supported **<bfr>**s) **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+CMER?**	Response **+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr>** **OK**
Write command Syntax **AT+CMER= [<mode>[,<keyp> [,<disp>[,<ind> [,<bfr>]]]]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<mode>** 0 Buffer unsolicited result codes in the TA; if TA result code buffer is full, codes can be buffered in some other place or the oldest ones can be discarded 1 Discard unsolicited result codes when the TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE 2 Buffer unsolicited result codes in the TA when the TA-TE link is reserved (e.g. in online data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE **<keyp>** 0 No keypad event reporting **<disp>** 0 No display event reporting **<ind>** 0 No indicator event reporting 1 Indicator event reporting using result code **+CIEV: <ind>,<value>**. <ind> indicates the indicator order number (as specified for +CIND) and <value> is the new value of the indicator. Only indicator events which are not caused by +CIND shall be indicated by the TA to the TE. **<bfr>** 0 TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1 or 2 is entered. 1 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1 or 2 is entered (OK response shall be given before flushing the codes)
Unsolicited Notification	Responses • **+CIEV: 1,(0-5)** indicates the battery charging level • **+CIEV: 2,(0-5)** indicates the received signal level • **+CIEV: 3,(0-1)** indicates the network service status • **+CIEV: 4,(0-1)** indicates the message status • **+CIEV: 5,(0-1)** indicates the active call status • **+CIEV: 6,(0-1)** indicates the roaming status • **+CIEV: 7,(0-1)** indicates the sms full status Refer to +CIND for more information regarding indicator control.
Reference Sierra Wireless Proprietary	Notes This command can be used without a SIM.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Example	**at+cmer=?** **+CMER: (1-2),0,0,(0-1),(0-1)** **OK** **at+cmer=2,,,1** **OK** # mode =2 : enable indication if AT link is available # ind = 1 : enable indicator event report (+CIND) **at+cmer?** **+CMER: 2,0,0,1,0** **OK** # +CMER setting can be preserved after boot **at+cfun=1,1** **OK** **at+cmer?** **+CMER: 2,0,0,1,0** **OK** # roaming status = 0 update on registration status change **+CIEV: 6,0** **+PBREADY** # enable +CMER <mode> = 0 buffering **at+cmer=0** **OK** **at+cfun=4** **OK** **at+cfun=1** **OK** # wait for registration, one +CIEV: 6 should be buffered, some +CGEV buffered **at+creg?** **+CREG: 0,1** **OK** # buffered +CIEV is flushed with <bfr>=1 and <mode>=2 **at+cmer=2,,,,1** **OK** **+CIEV: 6,0** **at+cmer=0** **OK** **at+cfun=4** **OK** **at+cfun=1** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	# wait for registration, one +CIEV: 6 should be buffered, some +CGEV buffered **at+creg?** **+CREG: 0,1** **OK** # buffered +CIEV is cleared with <bfr>=1 and <mode>=2 **at+cmer=2,,,,0** **OK**

5.9. +CMEE Command: Report Mobile Termination Error

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CMEE=?**	Response **+CMEE:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CMEE?**	Response **+CMEE: <n>** **OK**
Write 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 2 +CME ERROR: <err> result code and use verbose <err> values
Notes	<n> is saved in non-volatile memory per AT port over module reboot.

5.10. +CCID Command: Request SIM Card Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CCID=?**	Response **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+CCID?**	Response **+CCID: <ICCID>** **OK** or **+CME ERROR: <err>**
Execute command Syntax **AT+CCID**	Response **+CCID: <ICCID>** **OK** or **+CME ERROR: <err>** Parameter **<ICCID>** Integrated Circuit Card ID of the SIM card

5.11. +FMR Command: Request Revision Identification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+FMR=?**	Response **OK**
Execute command Syntax **AT+FMR**	Response **<revision>,<sv>** **OK** or **+CME ERROR: <err>** Parameters **<revision>** Revised version from IMEISV of the mobile station **<sv>** Software version from IMEISV of the mobile station

5.12. +CPIN Command: Enter Pin

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CPIN=?**	Response **OK**
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>** Values when queried using the read command READY MT is not pending for any password SIM PIN MT is waiting for SIM PIN to be given SIM PUK MT is waiting for SIM PUK to be given SIM PIN2 MT is waiting SIM PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that MT does not block its operation) SIM PUK2 MT is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that ME does not block its operation). PH-NET PIN MT is waiting for the network personalization password to be given PH-NET PUK MT is waiting network personalization unblocking password to be given PH-NETSUB PIN MT is waiting network subset personalization password to be given PH-NETSUB PUK MT is waiting network subset personalization unblocking password to be given PH-SP PIN MT is waiting service provider personalization password to be given PH-SP PUK MT is waiting service provider personalization unblocking password to be given PH-CORP PIN MT is waiting corporate personalization password to be given PH-CORP PUK MT is waiting corporate personalization unblocking password to be given **<pin>, <newpin>** String type values

5.13. +CPIN2 Command: Enter Pin2

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CPIN2=?**	Response **OK**
Read command Syntax **AT+CPIN2?**	Response **+CPIN:code** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+CPIN2= <puk2/oldpin2> [,<newpin2>]** or **AT+CPIN2= <oldpin2>**	Response **OK** or **+CME ERROR: <err>** Parameters **<puk2/oldpin2>**, **<newpin2>** String type values **<code>** READY — MT is not pending for any password SIM PIN2 — MT is waiting for SIM PIN2 to be given (this "code" is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that MT does not block its operation) SIM PUK2 — MT is waiting for SIM PUK2 to be given (this "code" is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that MT does not block its operation)

5.14. +CPUC Command: Price per Unit and Currency

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CPUC=?**	Response **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+CPUC?**	Response **+CPUC: <currency>,<ppu>** **OK**
Write command Syntax **AT+CPUC= <currency>, <ppu> [,<passwd>]**	Response **OK** or **+CME ERROR: <err>** Parameters **<currency>** String type containing the three-character currency code (e.g. GBP, EUR) **<ppu>** String type containing the price per unit; dot is used as a decimal separator **<passwd>** String type containing SIM PIN2

5.15. +CPAS Command: Phone Activity Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CPAS=?**	Response **+CPAS:** (list of supported **<pas>**es) **OK** or **+CME ERROR: <err>**
Execute command Syntax **AT+CPAS**	Response **+CPAS: <pas>** **OK** or **+CME ERROR: <err>** Parameter **<pas>** 0 Ready (ME allows commands from TA/TE) 1 Unavailable (ME does not allow commands from TA/TE) 2 Unknown (ME is not guaranteed to respond to instructions) 3 Ringing (ME is ready for commands from TA/TE, but the ringer is active) 4 Call in progress (ME is ready for commands from TA/TE, but a call is in progress) 5 Asleep (ME is unable to process commands from TA/TE because it is in a low function-ality state)

5.16. +CSQ Command: Signal Quality

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** 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
Notes	• For LTE, <rssi> is scaled from the current radio signal strength (RSRP) value of the serving cell. RSRP is defined according to 3GPP TS 36.133 section 9.1.4, from -140 dBm to -44 dBm with 1 dB resolution. • For LTE, <ber> is scaled to 0 – 7 from RSRQ signal quality 34 – 0. RSRQ is defined according to specification 3GPP 36.133 section 9.1.7, from -19.5 dBm to -3 dBm with 0.5 dB resolution.

5.17. +KCELL Command: Cell Environment Information

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+KCELL= <revision>**	Response For GSM cells: **+KCELL: <nbGSMcells>[,<cell_typei>,<ARFCNi>,<BSICi>,<PLMNi>,<LACi>, <GSM_CIi>,<RSSIi>,<GSM_TA>][,<cell_typei>,<ARFCNi>,<BSICi>,<PLMNi>, <LACi>,<CIi>,<RSSIi>][…]]** For UMTS cells: **+KCELL: <nbUMTScells>[,<cell_typeK>,<dl_UARFCNK>,<PLMNK>,<LACK>, <UMTS_CIK>,<scrambling_codeK>,<rscpK>,<ecnoK>[,<pathlossK>]][…]]** **OK** For LTE cells: **+KCELL: <nbLTEcells>[,<cell_type>,<PLMN>,<LTE_CI>,<PhyCellInd>, <trackingAreaCode>,<RSRPResult>,<RSRQResult>,<LTE_TA>][<cell_type>,[[Earfcn>, [<PhyCellID>,[<RSRPResult>,[<RSRQResult>]]]]][…]]** **OK** Parameters **<revision>** Reserved for future development (only 0 for the moment) **<nbGSMcells>** 0 ≤ i ≤ 7 Number of base stations available **<cell_type>** 0 GSM serving cell 1 GSM neighbor cell 2 UMTS serving cell 3 UMTS neighbor cell 4 UMTS detected cell 5 LTE serving cell 6 LTE neighbor cell **<ARFCN>** 0 – 1023 Absolute Radio Frequency Channel Number in decimal format **<BSIC>** 0 – 63 Base Station Identity Code in 6 bits decimal format **<PLMN>** PLMN identifiers (3 bytes) in hexadecimal format, made of MCC (Mobile Country Code), and MNC (Mobile Network Code) **<LAC>** Location Area in hexadecimal format, 4 digits **<GSM_CI>** Cell ID, 4 hexadecimal digits, e.g. ABCD **<RSSI>** 0 – 63 Received signal level of the BCCH carrier. The indicated value is an offset which should be added to –110 dBm to get a value in dBm. See the formula specified in TS 05.08 Radio Subsystem Link Control **<GSM_TA>** 0 – 63 Timing advance; only available for serving cell 255 Not available (there is no active CS/PS connection) **<nbUMTScells>** 0 ≤ k ≤ 25 Number of UMTS base stations available **<dl_UARFCN>** DL UARFCN of serving cell in decimal format. The range can be found at 3GPP TS 25.101

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<UMTS_CI> Cell ID, 8 hexadecimal digits, 32 bits **<scrambling code>** 0 – 511 Downlink scrambling code in decimal format **<rscp>** 0 – 91 Received Signal Code Power. The power level in one chip 255 Invalid/default value **<ecno>** 0 – 24 Ratio of energy per modulating bit to the noise spectral density. This is the cell quality and is equal to RSCP/RSSI Energy per chip/noise 255 Invalid/default value **<pathloss>** 46 dB to 158 dB Path loss in decimal format 255 Not available **<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) **<LTE_TA>** 0 – 1282 Timing advance (as per [3GPP 36.321]) **<Earfcn>** 0 – 0xFFFF The carrier frequency of the neighbor cell designated by the EUTRA Absolute Radio Frequency Channel Number (EARFCN) (Ref: 3GPP TS 36.101, 5.7.3) **<PhyCellInd>** 0 – 503 Physical Cell ID (Ref: 3GPP TS 36.331, 6.3.4, PhysCellId IE)
Reference Sierra Wireless Proprietary	Notes • This command provides information related to the network environment and can be used, for example, for localization calculation. • This command can only be used with a SIM. The cell information can only be retrieved when the UE stays in attached mode.

5.18. +KGPIO Command: Hardware IO Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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**
Write command Syntax **AT+KGPIO=<IO>, <cde>**	Response If <cde> = 2: **+KGPIO: <IO>, <current_value>** **OK** Else **OK** Parameters **<IO>** 1 – 8, 10, 11, 13 – 15 Selected IO **<cde>** 0 Reset the selected IO 1 Set the selected IO 2 Request the current value of the IO **<current_value>** 0 GPIO is Low 1 GPIO is High
Reference Sierra Wireless Proprietary	Notes • The current configuration is saved in non-volatile memory over module reboot. • Check the configuration of +KGPIOCFG when +CME ERROR: 3 is issued. • GPIO 3 is used for SIM detection by default; it cannot be reconfigured. • The test command AT+KGPIO=? returns a dynamic list of supported GPIOs. GPIOs assigned to a specific purpose are not listed. • This command can be used without a SIM.
Examples	Make GPIO1 output high/low level **AT+KGPIOCFG=1,0,2** // Configure GPIO1 as output mode; <pull mode> must // be "no pull" **OK** **AT+KGPIO=1,1** // Set GPIO1 **OK** **AT+KGPIO=1,0** // Reset GPIO1 **OK** Define input/output mode for GPIO1 **AT+KGPIOCFG=1,1,0** // Configure GPIO1 as input mode;<pull mode> is "pull // down" **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	AT+KGPIO=1,2 // Request the current value of GPIO1 **+KGPIO: 1,1** // Value is HIGH for GPIO1 **OK** **at+kgpio=?** **+KGPIO: (1,2,4,5,6,7,8,10,11,13,14,15),(0-2)** **OK** **at+kgpio=9,1** // Set GPIO9, and it should return ERROR **+CME ERROR: 3**

5.19. +KGPIOCFG Command: GPIO Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KGPIOCFG=?**	Response **+KGPIOCFG:** (list of supported **<n>**s),(list of supported **<dir>**s), (list of supported **<pull mode>**s) **OK**
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 – 8, 10, 11, 13 –15 GPIO number **<dir>** Direction 0 Output 1 Input **<pull mode>** 0 Pull down. Internal pull down resistor available. Only used in input mode 1 Pull up. Internal pull up resistor available. Only used in input mode 2 No pull. Internal pull up/down resistor NOT available. Only used in output mode

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference Sierra Wireless Proprietary	Notes • This command provides configuration for +KGPIO command. • The current configuration is saved in non-volatile memory before a reset. • By default, GPIO 3 is used by SIM detection; it cannot be reconfigured. • Pull down/up mode provides a stable input level. • Commands AT+KGPIOCFG=? and AT+KGPIOCFG? return a dynamic list of supported GPIOs. GPIOs assigned to a specific purpose are not listed. • This command can be used without a SIM.
Examples	**at+kgpiocfg=1,0,0** // When setting GPIO1 as Output, with incorrect <pull mode> **ERROR** **at+kgpiocfg=1,0,1** // When setting GPIO1 as Output, with incorrect <pull mode> **ERROR** **at+kgpiocfg=1,0,2** // When setting GPIO1 as Output, with correct <pull mode> **OK** **at+kgpiocfg=1,1,0** // When setting GPIO1 as Input, with pull down **OK** **at+kgpiocfg=1,1,1** // When setting GPIO1 as Input, with pull up **OK** **at+kgpiocfg=1,1,2** // When setting GPIO1 as Input, with incorrect <pull mode> **ERROR** **at+kgpiocfg=?** **+KGPIOCFG: (1,2,4,5,6,7,8,10,11,13,14,15),(0-1),(0-2)** **OK** **at+kgpiocfg?** // GPIO 9 is not available for use **+KGPIOCFG: 1,0,2** **+KGPIOCFG: 2,0,2** **+KGPIOCFG: 4,0,2** **+KGPIOCFG: 5,0,2** **+KGPIOCFG: 6,0,2** **+KGPIOCFG: 7,0,2** **+KGPIOCFG: 8,0,2** **+KGPIOCFG: 10,0,2** **+KGPIOCFG: 11,0,2** **+KGPIOCFG: 13,0,2** **+KGPIOCFG: 14,0,2** **+KGPIOCFG: 15,0,2** **OK** **at+kgpiocfg=9,1,0** // When setting GPIO9, it returns ERROR **+CME ERROR: 3**

5.20. +KADC Command: Analog Digital Converter

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KADC=?**	Response **+KADC:** (list of supported **<Meas id>**s),(list of supported **<Meas time>**s) **OK**
Read command Syntax **AT+KADC= <Meas id>, <Meas time>**	Response **+KADC: <Meas result>,<Meas id>,<Meas time>[,<Temperature>]** Parameters **<Meas id>** Measurement ID 0 VBATT – “VBATT” voltage 1 VCOIN – “BAT_RTC” backup battery voltage 2 THERM – Connected to RT400 (the thermistor on board which is located close to the 26MHz VCTCXO) 3 Reserved 4 Reserved 5 Reserved 6 Reserved 7 ADC1 **<Meas time>** Measurement time 1 During TX 2 Far from TX 3 No constraint **<Meas result>** Measurement result is in µV **<Temperature>** Temperature in degrees Celsius
Reference Sierra Wireless Proprietary	Notes • 10 bits converter • VBATT does not support no constraint measurement time • This command can be used without a SIM. • Available range for voltage input are as follows: **<Meas id>** — **Range (V)** VBATT — 3.2 - 4.5 VCOIN — 0 - 1.8 THERM — 0 - 1.2 ADC1 — 0 - 1.2

5.21. +CSIM Command: Generic SIM Access

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CSIM=?**	Response **OK**
Write command Syntax **AT+CSIM= <length>, <command>**	Response **+CSIM: <length>,<response>** **OK** or **+CME ERROR: <err>** Parameters **<length>** Integer type; length of the characters that are sent to TE in <command> or <response> **<command>** Command passed on by MT to the SIM in hexadecimal format **<response>** Response to the command passed on by the SIM to the MT in hexadecimal format

5.22. +KSIMDET Command: SIM Detection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KSIMDET=?**	Response **+KSIMDET:** (list of supported **<mod>**s) **OK**
Read command Syntax **AT+KSIMDET?**	Response **+KSIMDET: <mod>** **OK**
Write command Syntax **AT+KSIMDET= <mod>**	Response **OK** Parameter **<mod>** 0 Disable SIM detection 1 Enable SIM detection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Notes	• If a change in the SIM status is detected, the module is notified by URC **+SIM: <status>**, where <status> = 0 means the SIM is extracted and <status> = 1 means the SIM is inserted. • This command can be used without a SIM. • <mod> setting is kept even after the module reboots.
Examples	<A SIM card is inserted> **AT+KSIMDET?** // read current setting **+KSIMDET: 1** **OK** **+SIM: 0** // Active SIM card is removed **+SIM: 1** // Active SIM card is inserted **AT+KSIMDET=?** // check supported setting **+KSIMDET: (0-1)** **OK** **AT+KSIMDET=0** // disable SIM detection **OK** <No URC indication when SIM card is removed or inserted> **AT+KSIMDET?** // read current setting **+KSIMDET: 0** **OK** <Reboot module> **AT+KSIMDET?** // read current setting **+KSIMDET: 0** **OK**

5.23. +CLAN Command: Read Language

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

5.24. +CCHO Command: Open Logical Channel

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CCHO=?**	Response **OK**
Write command Syntax **AT+CCHO= <dfname>**	Response **<session_id>** **OK** or **+CME ERROR: <err>** Parameters **<dfname>** DF name coded on 1 to 16 bytes that references to all selectable application in the UICC **<session_id>** Session ID to be used in order to target a specific application on the smart card using logical channels mechanism (string without double quotes that represents a decimal value).
Notes	The +CCHO execute command gives the <session_id> when it receives SIM application response status words as shown below: • '90' '00' – normal ending of the command • '91' 'XX' – normal ending of the command with extra information from the proactive UICC containing a command for the terminal.length 'XX' of the response data • '92' 'XX' – normal ending of the command with extra information concerning an ongoing data transfer session

5.25. +CCHC Command: Close Logical Channel

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CCHC=?**	Response **OK**
Write command Syntax **AT+CCHC= <session_id>**	Response **OK** or **+CME ERROR: <err>** Parameter **<session_id>** Session ID to be used in order to target a specific application on the smart card using logical channels mechanism (string without double quotes that represents a decimal value).

5.26. +CGLA Command: Generic UICC Logical Channel Access

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+CGLA=<sessionid>,<length>,<command>**	Response **+CGLA: <length>,<response>** **OK** or **+CME ERROR: <err>** Parameters **<sessionid>** Integer type; used as the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0"). **<length>** Integer type; length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response). **<command>** Command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 in hexadecimal format (refer to +CSCS). **<response>** Response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101 in hexadecimal format (refer to +CSCS).

5.27. +CRLA Command: Restricted UICC Logical Channel Access

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+CRLA=<sessionid>,<command>[,<file id>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]>**	Response **+CRLA: <sw1>,<sw2>[,<response>]** **OK** or **+CME ERROR: <err>** Parameters **<sessionid>** Integer typewhich identifies the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0"). **<command>** 176 READ BINARY 178 READ RECORD 192 GET RESPONSE

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS 219 SET DATA All other values are reserved **<fileid>** Integer type that identifies the elementary datafile on SIM. Mandatory for every <command> except STATUS. **<P1>, <P2>, <P3>** Integer type; parameters passed on by the MT to the UICC. These parameters are mandatory for every command, except GET RESPONSE and STATUS. **<data>** Information which shall be written to the SIM in hexadecimal format **<pathid>** String type containing the path of an elementary file on the UICC in hexadecimal format . **<sw1>, <sw2>** Integer type; information from the UICC about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command **<response>** Response of a successful completion of the command previously issued in hexadecimal format. STATUS and GET RESPONSE returns data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer to 3GPP TS 31.101). After READ BINARY, READ RECORD or RETRIEVE DATA command the requested data will be returned.
Notes	By using this command instead of generic UICC access command, +CGLA, the TE application has an easier but more limited access to the UICC database.

5.28. +CUAD Command: UICC Application Discovery

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CUAD=?**	Response **OK**
Execute command Syntax **AT+CUAD**	Response **<response>** **OK** or **+CME ERROR: <err>** Parameter **<response>** Content of the EFDIR. String type in hexadecimal format.

5.29. +CRSM Command: Restricted SIM Access

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 **<fileid>** Integer type; this is the identifier of an elementary data file on the SIM. Mandatory for every command except STATUS. 28423 IMSI file (6F07) 28473 ACM file (6F39) 28481 PUKT file (6F41) 28482 SMS file (6F42) **<P1>, <P2>, <P3>** Integer type defining the request. These parameters are mandatory for every command, except GET RESPONE and STATUS. The values are described in GSM 51.011 **<data>** Information which shall be written to the SIM (hexadecimal character format; refer +CSCS) **<sw1>, <sw2>** Integer type containing SIM information 0x90 0x00 Normal entry of the command 0x9F 0xXX Length XX of the response data 0x92 0x0X Update successful but after using an internal retry routine X times 0x92 0x40 Memory problem 0x94 0x00 No EF selected 0x94 0x02 Out of range (invalid address) 0x94 0x04 File ID not found; pattern not found 0x94 0x08 File is inconsistent with the command 0x98 0x02 No CHV initialized 0x98 0x04 Access cond. Not fullfiled / unsuccessful CHV verify / authentication failed 0x98 0x08 In contradiction with CHV status 0x98 0x10 In contradiction with invalidation status 0x98 0x40 Unsucc. CHV-verif. Or UNBLOCK CHF / CHV blocked /UNBL.blocked 0x98 0x50 Increase can not be performed. Maximum value reached

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692		
	0x61 0xXX	SW2 indicates the number of response bytes still available. Use Get Response to access this data.
	0x62 0xXX	Warning - state unchanged
	0x62 0x00	Warning - no information provided
	0x62 0x81	Warning - part of returned data may be corrupt
	0x62 0x82	Warning - end of file/record reached (bad cmd)
	0x62 0x83	Warning - selected file invalidated
	0x62 0x84	Warning - bad file control information format
	0x63 0xXX	Warning - state unchanged
	0x63 0x00	Warning - no information provided
	0x63 0x81	Warning - file filled up with last write
	0x63 0xCx	Warning - counter value is x
	0x64 0xXX	Error - state unchanged
	0x65 0xXX	Error - state changed
	0x65 0x00	Error - no information provided
	0x65 0x81	Error - memory failure 66 xx Security Error
	0x66 0xXX	Security Error
	0x67 0xXX	Incorrect parameter P3
	0x68 0xXX	Check Error - CLA function not supported
	0x68 0x00	Check Error - no information provided
	0x68 0x81	Check Error - logical channel not supported
	0x68 0x82	Check Error - secure messaging not supported
	0x69 0xXX	Check Error - command not allowed
	0x69 0x00	Check Error - no information provided
	0x69 0x81	Check Error - command incompatible with file structure
	0x69 0x82	Check Error - security status not satisfied
	0x69 0x83	Check Error - authentication method blocked
	0x69 0x84	Check Error - referenced data invalidated
	0x69 0x85	Check Error - conditions of use not satisfied
	0x69 0x86	Check Error - command not allowed (no current EF)
	0x69 0x87	Check Error - expected SM data objects missing
	0x69 0x88	Check Error - SM data objects incorrect
	0x6A 0xXX	Check Error - wrong parameters
	0x6A 0x00	Check Error - no information provided
	0x6A 0x80	Check Error - incorrect parameters in data field
	0x6A 0x81	Check Error - function not supported
	0x6A 0x82	Check Error - file not found
	0x6A 0x83	Check Error - record not found
	0x6A 0x84	Check Error - not enough memory space in the file
	0x6A 0x85	Check Error - Lc vailable on with TLV structure
	0x6A 0x86	Check Error - vailable on parameters P1-P2
	0x6A 0x87	Check Error - Lc vailable on with P1-P2
	0x6A 0x88	Check Error - referenced data not found
	0x6B 0xXX	Incorrect parameter P1 or P2
	0x6C 0xXX	Check Error - wrong length - xx is the correct length
	0x6D 0xXX	Unknown instruction code given in the command
	0x6E 0xXX	Wrong instruction class given in the command
	0x6F 0xXX	Technical problem with no diagnostic given
	<response> Response of successful completion of the command previously issued in hexadecimal character format; refer to +CSCS. STATUS and GET RESPONSE returns data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer to GSM 51.011 [28]). After READ BINARY or READ RECORD commands, the requested data will be returned. <response> is not returned after a successful UPDATE BINARY or UPDATE RECORD command.	

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<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).
Notes	By using this command instead of generic SIM access command, +CSIM, the DTE application has an easier but more limited accessto the SIM database.

5.30. +CEAP Command: EAP Authentication

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+CEAP= <dfname>, <EAPMethod>, <EAP packet data>[,<DFeap>]**	Response **+CEAP: <EAPsessionid>,<EAP packet response>** **OK** or **+CME ERROR: <err>** Parameters **<dfname>** String type in hexadecimal format. All selectable applications are represented in the UICC by an AID coded on 1 to 16 bytes. **<EAPMethod>** String type in hexadecimal format.The value range for 1 byte format and for 8 bytes expanded format is defined in RFC 3748. **<EAP packet data>** String type in hexadecimal format **<DFeap>** String type in hexadecimal format **<EAPsessionid>** 1 – 4294967295 Identifier of the EAP session to be used in order to retrieve the EAP parameters with +CERP command. **<EAP packet response>** String type in hexadecimal format

5.31. +CERP Command: EAP Retrieve Parameters

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT+CERP= <EAPsessionid>, <EAPparameter>**	Response **+CERP: <EAP parameter response>** **OK** or **+CME ERROR: <err>**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	Parameters **<EAPparameter>** 1 Keys 2 Status 3 Identity 4 Pseudonym **<EAPsessionid>** 1 – 4294967295 Identifier of the EAP session to be used in order to retrieve the EAP parameters corresponding to an active EAP session. **<EAP parameter response>** String type in hexadecimal format

5.32. +KTEMPMON Command: Temperature Monitor

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KTEMPMON=?**	Response **+KTEMPMON:** (list of supported **<mod>**s),(list of supported **<temperature>**s),(list of supported **<urcMode>**s),(list of supported **<action>**s),(list of supported **<hystTime>**s),(list of supported **<repGPIO>**s) **OK**
Read command Syntax **AT+KTEMPMON?**	Response **+KTEMPMON: <mod>,<temperature>,<urcMode>,<action>,<hystTime>,<repGPIO>** **OK**
Write command Syntax **AT+KTEMPMON=<mod>,[<temperature>[,<urcMode>[,<action>[,<hystTime>[,<repGPIO>]]]]]**	Response **+KTEMPMON: <level>,<value>** **OK** Parameters **<mod>** 0 Disable the module's internal temperature monitor 1 Enable the module's internal temperature monitor **<temperature>** Temperature limit before the module acts as defined by <action>. Default value: 0 **<urcMode>** 0 Disables the presentation of the temperature monitor URC 1 Enables the presentation of the temperature monitor URC **<action>** 0 No action 1 Automatic shut-down when the temperature is beyond <temperature> 2 The output pin <repGPIO> is tied HIGH when <temperature> is reached; when the temperature is normal the output pin <repGPIO> is tied LOW. Note that if this parameter is required, it is mandatory to set the <repGPIO> parameter.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<hyst_time> 0 – 255 Hysteresis time in seconds. Action will only happen if <temperature> is maintained for at least as long as this period. This parameter is mandatory if <action> is not zero. Default value: 30. **<repGPIO>** 1 – 8, 10, 11, 13 – 15 Defines which GPIO is used as output pin. This parameter is mandatory only if <action>=2 is required. Default value: 6.
Notes	• When the module's internal temperature reaches either operating or extreme levels; the unsolicited message is in the format: **+KTEMPMEAS: <level>,<value>** where: <level> is the threshold level: -2 Extreme temperature lower bound (-40°C) -1 Operating temperature lower bound (-20°C) 0 Normal temperature 1 Operating temperature upper bound (+55°C) 2 Extreme temperature upper bound (+85°C) <value> is the actual temperature expressed in degrees Celsius • Due to temperature measurement uncertainty there is a tolerance of ± 2°C. • Check available GPIOs with +KGPIOCFG when using this command.

5.33. +CTZU Command: Automatic Time Zone Update

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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
Notes	• <onoff> is saved in non-volatile memory over module reboot. • CTZU (onoff=1) is enabled by default for proper Verizon Administration (SIM provision, OMADM, etc.)

5.34. +CTZR Command: Time Zone Reporting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CTZR=?**	Response **+CTZR:** (list of supported **<onoff>**s) **OK**
Read command Syntax **AT+CTZR?**	Response **+CTZR: <onoff>** **OK**
Write command Syntax **AT+CTZR =<onoff>**	Response **OK** or **+CME ERROR: <err>** Parameter **<onoff>** 0 Disable time zone change event reporting 1 Enable time zone change event reporting
Unsolicited Notification	Response **+CTZV: <tz>,<time>** **XNITZINFO: <timzone_variance>,<time>** **+CTZDST: <dst>** Parameters **<tz>** Integer value indicating the time zone **<time>** String type value in format “YY/MM/dd,hh:mm:ss” wherein the characters indicate year, month, date, hour, minutes and seconds. **<dst>** Daylight sabings time value 0 Disable time zone change event reporting and URC +XNITZINFO, +CTZDST 1 Enable time zone change event reporting and URC +XNITZINFO, +CTZDST **<timzone_variance>** String of format “GMT+HH:MM” or “GMT-HH:MM” (for example, GMT+5:30)
Reference [27.007] §8.41	Notes • The Time Zone reporting is not affected by the Automatic Time Zone setting command +CTZU • If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed • <onoff> is saved in non-volatile memory per AT port over module reboot

5.35. +XDATACHANNEL Command: Configure Data Channel

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+ XDATACHANNEL =?**	Response **+XDATACHANNEL:** (list of **<mode>**s),(list of **<csd_gprs_flag>**s),(list of **<connect_flag>**s),(list of supported **<cid>**s) **OK**
Write command Syntax **AT+ XDATACHANNEL =<mode>, <csd_gprs_flag>, <ctrl_tid_path>, <tid_path> [,<connect_flag> [,<cid>]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<mode>** 0 Disable routing 1 Enable routing 2 Query current setting for the channel where the command is executed (other parameters will be ignored) **<csd_gprs_flag>** 0 Configure channel for a CSD connection 1 Configure channel for a GPRS connection **<ctrl_tid_path>** Terminal for which the data routing mechanism shall be enabled in string format (e.g.: “/mux/5”) **<tid_path>** Terminal to which a data call shall be routed in string format (e.g.: “/mux/5”) **<connect_flag>** 0 No reporting on the data channel (neither CONNECT nor NO CARRIER) 1 Reporting on the data channel enabled (CONNECT and NO CARRIER) 2 Reporting on the control channel enabled (CONNECT and NO CARRIER) **<cid>** Numeric parameter which specifies a particular PDP contect definition (see the +CGDCONT and +CGDSCONT commands)
Notes	• The control channel must be in OPEN state when the +XDATACHANNEL command is sent. • +XDATACHANNEL settings will only apply while control channel DLC is OPEN and will be reset as soon as DLC is closed. • When this command is sent with <cid> parameter, then the data channel (<tid_path>) must be in OPEN state and the given <cid> should already be defined. • If the <cid> is deleted or undefined, the XDATACHANNEL settings pertaining to the <cid> are not retained. • Connection must be established (start and stop) through <ctrl_tid_path> for data to be properly routed. • +XDATACHANNEL query (mode=2) does not return the <cid> associated with the control channel, as the data routing of a control channel can be configured for multiple <cid>s. • CSD is not allowed on the HL7650.

5.36. +XCELLINFO Command: Provide Cell Information

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+XCELLINFO =?**	Response **+XCELLINFO:** (range of **<mode>**s) **OK**
Read command Syntax **AT+XCELLINFO?**	Response **+XCELLINFO: <mode>,<type>,<MCC>,<MNC>,<LAC>,<CI>,<RxLev> [,<t_advance>]** **OK** or **+XCELLINFO: <mode>,<type>,<MCC>,<MNC>,<LAC>,<CI>,<scrambling_code>, <dl_frequency>,<rscp>,<ecn0>,<pathloss>** **OK** or **+XCELLINFO: <mode>,<type>,[[<Earfcn>,[<PhyCellID>,[<RSRPResult>, [<RSRQResult>]]]]]** **OK** or **+XCELLINFO:<mode><type><MCC>,<MNC>,<CI>,<PhyCellInd>,<TrackingAreaCode>, <RSRPResult>,<RSRQResult>,<TA>** **OK**
Write command Syntax **AT+XCELLINFO= <mode>**	Response **OK** or **+CME ERROR: <err>** Parameters **<mode>** 0 Disable periodic reporting 1 Enable reporting 2 Currently not used (for backward compatibility) **<type>** 2 UMTS sercing cell 3 UMTS neighbor cell 4 UMTS detected cell 5 LTE serving cell 6 LTE neighbor cell **<RxLev>** See command +CGED **<t_advance>** Signal strength; only valid for the serving cell **<MCC>** 0 – 999 Mobile country code

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<MNC> 0 – 999 Mobile network code **<CI>** Cell identity, 28-bit integer type **<PhysCellId>** 0 – 503 Physical cell ID **<TrackingAreaCode>** Tracking area code, 16-bits integer type **<RSRPResult>** 0 – 97 Reference signal received power **<RSRQPResult>** 0 – 34 Reference signal reference quality **<TA>** 0 – 1282 Timing advance **<Earfcn>** Carrier frequency of the neighbor cell designated by the EUTRA absolute radio frequency **<PhyCellID>** 0 – 503 Physical cell ID of the neighbor cell **<RSRPResult>** 0 – 97 Average RSRP of the neighbor cell **<RSRQResult>** 0 – 34 Average RSRQ of the neighbor cell
Unsolicited Notification	Response for UMTS cells: **+XCELLINFO:<type>,<MCC>,<MNC>,<LAC>,<CI>,<scrambling_code>, <dl_frequency>,<rscp>,<ecn0>,<pathloss>** Response for LTE serving cell: **+XCELLINFO:<type><MCC>,<MNC>,<CI>,<PhyCellInd>,<TrackingAreaCode>, <RSRPResult>,<RSRQResult>,<TA>** Response for LTE neighbor cell: **+XCELLINFO: <type>,[[<Earfcn>,[<PhyCellID>,[< RSRPResult>,[<RSRQResult>]]]]]**

5.37. +KSLEEP Command: Power Management Control for UART

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+KSLEEP= <mngt>**	Response **OK** Parameters **<mngt>** 0 The UART doesn't go to sleep mode as long as the DTR is active (low level). The DTR has to be active to send AT commands. 1 The UART decides by itself (internal timing) when it will go to sleep mode, and it will be woken up with a character 2 The UART never goes in sleep mode regardless of the DTR state
Reference Sierra Wireless Proprietary	Notes • The current configuration is kept in non-volatile memory over module reboot. • This command only controls UART power management, and does not affect the USB AT command port. • This command can be used without a SIM. • When AT+KSLEEP=1 and the module is in sleep mode, the user needs to input a character to wake the module up. After which, AT commands can be input normally.
Example	**AT+KSLEEP=?** **+KSLEEP: (0-2)** **OK** **AT+KSLEEP?** **+KSLEEP: 2** **OK** **AT+KSLEEP=0** // Change settings to mode 0 **OK** **AT+KSLEEP?** **+KSLEEP: 0** **OK** **AT+KSLEEP=2** // Change settings to mode 2 **OK** **AT+KSLEEP?** **+KSLEEP: 2** **OK**

5.38. +HBHV Command: Configure General System Behavior

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+HBHV=?**	Response **+HBHV: (0,2,3),(0,1)** **+HBHV: 1,(0-2)** **…** **OK**
Read command Syntax **AT+HBHV?**	Response **+HBHV: 0,<ppp_dun_mode>** **+HBHV: 1,<omadm_reg_mode>,<omadm_reg_state>** **+HBHV: 2,<pdp_unlock_mode>** **+HBHV: 3,<show_orig_apn>** **OK**
Write command Syntax **AT+HBHV=0, <ppp_dun_ mode>** **AT+HBHV=1, <omadm_reg_ mode>** **AT+HBHV=2, <pdp_unlock_ mode>** **AT+HBHV=3, <show_orig_ apn>**	Response **OK** Parameters **<ppp_dun_mode>** PPP dial-up networking behavior 0 PDP context is brought up after LCP negotiation 1 PDP context is brought up before LCP negotiation **<omadm_reg_mode>** OMADM client boostrapping behavior 0 Disables boostrapping initiated by the client 1 Enables boostrappining initiated by the client on the next successful registration if the module's IMEI is used for the first time and no server initatiated session has happened before 2 Enables boostrapping initiates by the client on the next successful registration regardless of the above mentioned criteria. **<omadm_reg_state>** Boostrap registration state 0 The client hasn't been boostrapped yet (no server initiated session has happened before) 1 The client has been boostrapped before with a successful server initiated session **<pdp_unlock_mode>** PDP unlock mode For HL7618 Verizon and HL7618RD modules: 0 Protects the reserved PDP contexts (1, 2, 11-20) from being modified accidentally 1 Unlocks the protection on the reserved PDP contexts For HL7690 and HL7692 modules: 0 Protects the reserved PDP context (1) from being modified accidentally 1 Unlocks the protection on the reserved PDP context

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<show_orig_apn> Enables showing the original APN saved in non-volatile memory (updated by AT+CGDCONT=…); this is effective for PDP context 1 (LTE default bearer) with PDP context reading (AT+CGDCONT?) 0 Disabled. Shows APN given by the network (e.g. "ltemobile.apn.mnc720.mcc302.gprs", "vzwims.mnc480.mcc311.gprs") 1 Enabled. Shows the original APN saved in non-volatile memory
Notes	• <omadm_reg_mode> only affects HL7618 Verizon and HL7618RD modules. • <omadm_reg_mode> will automatically be changed from “2” to “1” after the server initialized session was successfully processed. • The HL7618 and HL7618RD’s OMADM client uses customized bootstrapping defined in the OMADM specification, i.e. with Verizon OMADM server connection configurations preloaded. However, the module still needs to be bootstrapped before the OMADM client can work with the Verizon OMADM server. There are two mechanism to complete this bootstrapping: 1. Boostrapping initiated by the server – the IMEI/IMSI are pre-registered to Verizon’s OMADM databse and boostrapping is initiated automatically by the OMADM server through a DM session. 2. Boostrapping initiated by the client – the module initiates a DM session to the Verizon OMADM server that performs the bootstrapping. The default option <omadm_reg_mode>=1 enables the module to perform boostrapping automatically via mechanism 2.

5.39. +CIREP Command: IMS Network Reporting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CIREP=?**	Response **+CIREP:** (list of supported **<reporting>**s) **OK**
Read command Syntax **AT+CIREP?**	Response **+CIREP: <reporting>,<nwimsvops>** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+CIREP= <reporting>**	Response **OK** or **+CME ERROR: <err>** Parameters **<reporting>** 0 Disable reporting 1 Enable reporting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<nwimsvops> Gives the last IMS Voice over PS session (IMSVOPS) supported indication received from network 0 IMSVOPS support indication is not received from network, or is negative 1 IMSVOPS support indication as received from network is possible **<srvcch>** SRVCC handover information 0 PS to CS SRVCC handover has started in the CS domain ("Handover Command" indicating SRVCC received) 1 PS to CS SRVCC handover successful ("Handover Complete" sent) 2 PS to CS SRVCC handover cancelled ("Handover Failure" sent) 3 PS to CS SRVCC handover, general non-specific failure
Unsolicited Notification	Response **+CIREPI: <nwimsvops>** **+CIREPH: <srvcch>**
Notes	• <reporting> is saved in non-volatile memory per AT port over module reboot. • <srvcch>=3, general non-specific failure, may be used, for example in the case of handover cancellation as specified in 3GPP TS 24.301 subclause 6.6.2.

5.40. +CIREG Command: Registration Information

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CIREG=?**	Response **+CIREG:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CIREG?**	Response **+CIREP: <n>,<reg_info>[,<ext_info>]** **OK**
Write command Syntax **AT+CIREG=<n>**	Response **OK** or **+CME ERROR: <err>** Parameters **<n>** Enables or disables reporting of changes in the MT's IMS registration information 0 Disable reporting 1 Enable reporting (parameter <reg_info>) 2 Enable extended reporting (parameter <reg_info> and <ext_info>) **<reg_info>** Indicates IMS registration status 0 Not registered 1 Registered

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<ext_info> Numeric value in hexadecimal format. It is the sum of hexadecimals values, each respresenting a particular IMS capability of the MT. This parameter is not present if the IMS registration status is “not registered” 1 RTP-based transfer of voice 2 SMS using IMS functionality 5 Both RTP-based transfer of voice according to MMTEL and SMS using IMS functionality can be used
Unsolicited Notification	Response **+CIREGU: <reg_info>[,<ext_info>]**
Notes	<n> is saved in non-volatile memory per AT port over module reboot

5.41. +GST Command: General System Status Information

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+GST=?**	Response **+GST:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+GST?**	Response … (display all responses of **<mode>**s) **OK**
Write command Syntax **AT+GST=<mode>**	Response For <mode>=0: … (display all responses of **<mode>**s) **OK** For <mode>=1: **+GST: <rtc_time>,<up_time>** **OK** For <mode>=2: **+GST: <port device string>** **OK** Parameters **<mode>** 0 Display all status information 1 Display the RTC time in seconds since 1970 Jan 1, and system boot up time in seconds 2 Display module port device string (e.g. /USBCDC/0) **<rtc_time>** RTC time in seconds since 1970 Jan 1

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<up_time> System boot up time in seconds **<port device string>** String type; unique AT port device string e.g. “/USBCDC/0” /USBCDC/0 → ACM0 AT port /USBCDC/2 → ACM2 AT port

5.42. +CESQ Command: Extended Signal Quality

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CESQ=?**	Response **+CESQ: (**list of supported **<rxlev>**s**),(**list of supported **<ber>**s**),(**list of supported **<rscp>**s**),(**list of supported **<ecno>**s**),(**list of supported **<rsrq>**s**),(**list of supported **<rsrp>**s**)** **OK**
Execute command Syntax **AT+CESQ**	Response **+CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>** **OK** Parameters **<rxlev>** Integer type; received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4) 0 rssi < -110 dBm 1 -110 dBm ≤ rssi < -109 dBm 2 -109 dBm ≤ rssi < -108 dBm … 61 -50 dBm ≤ rssi < -49 dBm 62 -49 dBm ≤ rssi < -48 dBm 63 -48 dBm ≤ rssi 99 not known or not detectable **<ber>** Integer type; channel bit error rate (in percent) 0 – 7 As RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4 99 Not known or not detectable **<rscp>** Integer type; received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3) 0 rscp < -120 dBm 1 -120 dBm ≤ rscp < -119 dBm 2 -119 dBm ≤ rscp < -118 dBm … 94 -27 dBm ≤ rscp < -26 dBm 95 -26 dBm ≤ rscp < -25 dBm 96 -25 dBm ≤ rscp 255 Not known or not detectable

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<ecno> Integer type; ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause) 0 Ec/Io < -24 dB 1 -24 dB ≤ Ec/Io < -23.5 dB 2 -23.5 dB ≤ Ec/Io < -23 dB … 47 -1 dB ≤ Ec/Io < -0.5 dB 48 -0.5 dB ≤ Ec/Io < 0 dB 49 0 dB ≤ Ec/Io 255 Not known or not detectable **<rsrq>** Integer type; reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7) 0 rsrq < -19.5 dB 1 -19.5 dB ≤ rsrq < -19 dB 2 -19 dB ≤ rsrq < -18.5 dB … 32 -4 dB ≤ rsrq < -3.5 dB 33 -3.5 dB ≤ rsrq < -3 dB 34 -3 dB ≤ rsrq 255 Not known or not detectable **<rsrp>** Integer type; reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4) 0 rsrp < -140 dBm 1 -140 dBm ≤ rsrp < -139 dBm 2 -139 dBm ≤ rsrp < -138 dBm … 95 -46 dBm ≤ rsrp < -45 dBm 96 -45 dBm ≤ rsrp < -44 dBm 97 -44 dBm ≤ rsrp 255 Not known or not detectable
Notes	• If the current serving cell is not a GERAN cell, <rxlev> and <ber> are set to value 99. • If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rscp> is set to 255. • If the current serving cell is not a UTRA FDD cell, <ecno> is set to 255. • If the current serving cell is not an E-UTRA cell, <rsrq> and <rsrp> are set to 255.

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+XCSQ?**	Response **+XCSQ: <n>,<rssi>,<ber>** **OK**
Write command Syntax **AT+XCSQ=<n>**	Response **OK** or **+CME ERROR: <err>** Parameters **<n>** 0 Disable radio signal strength and quality indication URC 1 Enable radio signal strength and quality indication URC **<rssi>** Radio signal strength indication 0 -113 dBm or less 1 – 30 -111 to -53 dBm 31 -51 dBm or greater 99 Not known or not detectable **<ber>** Received signal quality. Range of values = 0 – 34 accoding to specification 3GPP 36.133 section 9.1.7
Unsolicited Notification	Response **+XCSQ: <rssi>,<ber>**

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+XCESQ=?**	Response **+XCESQ: (**list of supported **<n>**s**),(**list of supported **<rxlev>**s**),(**list of supported **<ber>**s**),(**list of supported **<rscp>**s**),(**list of supported **<ecno>**s**),(**list of supported **<rsrq>**s**),(**list of supported **<rsrp>**s**),(**list of supported **<rssnr>**s**)** **OK**
Read command Syntax **AT+XCESQ?**	Response **+XCESQ: <n>,<rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<rssnr>** **OK**
Write command Syntax **AT+XCESQ= [<n>]**	Response **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	or **+CME ERROR: <err>** Parameters **<rxlev>** Integer type; received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4) 0 rssi < -110 dBm 1 -110 dBm ≤ rssi < -109 dBm 2 -109 dBm ≤ rssi < -108 dBm … 61 -50 dBm ≤ rssi < -49 dBm 62 -49 dBm ≤ rssi < -48 dBm 63 -48 dBm ≤ rssi 99 Not known or not detectable **<ber>** Integer type; channel bit error rate (in percent) 0 – 7 As RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4 99 Not known or not detectable **<rscp>** Integer type; received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3) 0 rscp < -120 dBm 1 -120 dBm ≤ rscp < -119 dBm 2 -119 dBm ≤ rscp < -118 dBm … 94 -27 dBm ≤ rscp < -26 dBm 95 -26 dBm ≤ rscp < -25 dBm 96 -25 dBm ≤ rscp 255 Not known or not detectable **<ecno>** Integer type; ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause) 0 Ec/Io < -24 dB 1 -24 dB ≤ Ec/Io < -23.5 dB 2 -23.5 dB ≤ Ec/Io < -23 dB … 47 -1 dB ≤ Ec/Io < -0.5 dB 48 -0.5 dB ≤ Ec/Io < 0 dB 49 0 dB ≤ Ec/Io 255 Not known or not detectable **<rsrq>** Integer type; reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7) 0 rsrq < -19.5 dB 1 -19.5 dB ≤ rsrq < -19 dB 2 -19 dB ≤ rsrq < -18.5 dB … 32 -4 dB ≤ rsrq < -3.5 dB 33 -3.5 dB ≤ rsrq < -3 dB 34 -3 dB ≤ rsrq 255 Not known or not detectable

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<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 **<rssnr>** Integer type; radio signal strength noise ration value -100 RSSNR ≤ -50 dB -99 -50 dB < RSSNR ≤ -49.5 dB -98 -49.5 dB < RSSNR ≤ -49 dB … -1 -1 dB < RSSNR ≤ -0.5 dB 0 -0.5 dB < RSSNR ≤ 0 dB 1 0 dB < RSSNR ≤ 0.5 dB … 98 49 dB ≤ RSSNR < 49.5 dB 99 49.5 dB ≤ RSSNR < 50 dB 100 50 dB ≤ RSSNR 255 Not known or not detectable
Unsolicited Notification	Response **+XCESQI: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<rssnr>**
Notes	• If the current serving cell is not a GERAN cell, <rxlev> and <ber> are set to value 99. • If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rscp> and <ecno> are set to 255. • If the current serving cell is not an E-UTRA cell, <rsrq>, <rsrp> and <rssnr> are set to 255.

5.45. +WEXTCLK Command: External Clocks Setting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+WEXTCLK=?**	Response **+WEXTCLK: (**list of supported **<output>**s**),(**list of supported **<status>e**s**)** **OK**
Read command Syntax **AT+WEXTCLK?**	Response **+WEXTCLK: <output>,<status>** **+WEXTCLK: <output>,<status>** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+WEXTCLK= <output>, <status>**	Response **+WEXTCLK: <output>,<status>** **OK** Parameters **<output>** 0 32kHz output (32K_CLKOUT) 1 26MHz output (26M_CLKOUT) **<status>** 0 Disabled 1 Enabled
Notes	• This command allows generating 32 kHz and 26 MHz on the output clock pins of the module. • Parameters are saved in non-volatile memory. • This command is available when the module has finished its initialization. • This command can be used without a SIM.

5.46. +KRIC Command: Ring Indicator Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KRIC=?**	Response **+KRIC: (**list of supported **<masks>**es**),(**list of supported **<shape>**s**)** **OK**
Read command Syntax **AT+KRIC?**	Response **+WEXTCLK: <masks>,<shape>** **OK**
Write command Syntax **AT+KRIC= <masks> [,<shape>]**	Response **OK** Parameters **<masks>** Use of RI signal 0x00 RI is not used 0x01 RI is activated on incoming calls (+CRING, RING) 0x02 RI is activated on SMS (+CMT, +CMTI) 0x04 RI is activated on SMS-CB (+CBM, +CBMI) 0x08 RI is activated on USSD (+CUSD) 0x10 RI is activated on network state (+CIEV) **<shape>** Signal shape (only available for incoming calls) 0 Repeat pulses. The total length of the pulse is equivalent to the transfer of the RING or CRING notification 1 Always active. The signal is set to be active during the whole incoming call notification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference Sierra Wireless Proprietary	Notes • The current configuration is kept in non-volatile memory after a reset. • For SMS and other unsolicited messages, only one pulse is set regardless of <shape>. • The width of the pulse is 1s. For repeated pulse on incoming calls, pulse width is 1s, and then rest for 4 seconds, and then repeated. • This command should not be used during an incoming call, SMS, SMSCB, USSD, etc. • This command can be used without a SIM. • If <shape> is omitted, the previously saved value will be used.
Examples	**AT+KRIC=?** **+KRIC: (0-31),(0-1)** **OK** **AT+KRIC?** **+KRIC: 15,0** **OK** **AT+KRIC=1,1** //RI is always activated on incoming calls **OK** **AT+KRIC?** **+KRIC: 1,1** **OK** **AT+KRIC=2** //RI is activated on SMS **OK** **AT+KRIC?** **+KRIC: 2,1** **OK**

5.47. +CPWROFF Command: Switch MS Off

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CPWROFF=?**	 Response **OK**
Execute command Syntax **AT+CPWROFF [=<mode>]**	 Response **OK** or **+CME ERROR: <error>** Parameter **<mode>** Power down mode 1 Fast power down mode

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 (~100 to 300 ms) without an IMSI detach request being sent to the network.

5.48. +KUSBCOMP Command: Set USB Composition

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KUSBCOMP=?**	Response **+KUSBCOMP:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+KUSBCOMP?**	Response **+KUSBCOMP: <mode>** **OK**
Write command Syntax **AT+KUSBCOMP= <mode>**	Response **OK** Parameter **<mode>** 0 3 CDC-ACM and 4 NCM, (VID: 0x0807 PID: 0x0443) NCM0 – NCM Network interface NCM1 – NCM Network interface NCM2 – NCM Network interface NCM3 – NCM Network interface USB0 – AT / modem port USB1 – Traces port USB2 – AT / modem port 1 7 CDC-ACM, (VID: 0x1519 PID: 0x0020) USB0 – AT / modem port USB1 – Traces port USB2 – AT / modem port USB3 – AT / modem port USB4 – AT / modem port USB5 – reserved port USB6 – reserved port 2 1 MBIM and 1 CDC-ACM, (VID: 0x0807 PID: 0x0911) MBIM0 – MBIM Network interface USB2 – AT / modem port
Notes	• The current configuration is kept in non-volatile memory. • New configuration will only be activated after the module reboots. • The factory preset value of <mode> is 0. • This command can be used without a SIM.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Examples	**AT+KUSBCOMP=0** **OK** **AT+KUSBCOMP=3** **ERROR** **AT+KUSBCOMP?** **+KUSBCOMP: 0** **OK** **AT+KUSBCOMP=1** **OK** **AT+CFUN=1,1** // Reboot the module to take effect. The new mode is effective // with the USB bus re-enumerated. **OK** **<<<< module reboots >>>>**

5.49. +WMUSBVCC Command: USB VCC Detection Setting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+WMUSBVCC=?**	Response **+WMUSBVCC:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+WMUSBVCC?**	Response **+WMUSBVCC: <mode>** **OK**
Write command Syntax **AT+WMUSBVCC=<mode>**	Response **OK** Parameter **<mode>** 0 USB detection if Vbus > 4.75V 1 USB detection if Vbus > 2.5V (e.g., for PC mini-card applications)
Reference Sierra Wireless Proprietary	Notes • <mode> is saved to non-volatile memory over module reset. • This command can be used without a SIM.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Examples	**AT+WMUSBVCC=?** **+WMUSBVCC: (0-1)** **OK** **AT+WMUSBVCC?** **+WMUSBVCC: 0** **OK** **AT+WMUSBVCC=0** // Change setting to mode 0 **OK** **AT+WMUSBVCC?** **+WMUSBVCC: 0** **OK** **AT+WMUSBVCC=1** // Change setting to mode 1 **OK** **AT+WMUSBVCC?** **+WMUSBVCC: 1** **OK**

5.50. +KLTEMUTE Command: Mute LTE TX

Note: For HL7650, HL7690 and HL7692 only.

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

HL7650, HL7690 and HL7692	
Write command Syntax **AT+KLTEMUTE=<mode>[,<duration>[,<ind>]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<mode>** Enable or Disable LTE TX mute 0 The feature is deactivated, the LTE transmit power emission is unmuted 1 The feature is activated and the LTE transmit power emission is currently muted **<duration>** Mute duration (only used when <mode>=1) Range: 5s – 120s; default value = 30 **<ind>** Unsolicited result code mode 0 Disable LTE TX mute unsolicited result code 1 Disable LTE TX mute unsolicited result code **+KLTEMUTE: <mode>**
Unsolicited Notification	Response **+KLTEMUTE: <state>,<duration> 1** // start LTE mute with duration **<state> 0** // stop LTE mute
Reference Sierra Wireless Proprietary	Notes • If AT+KLTEMUTE=1 is resent within <duration> after it has already been sent, then it will not take any effect. The <duration> timer will not be reactivated and will continue to run as expected. • If AT+KLTEMUTE=0 is sent within <duration> after AT+KLTEMUTE=1 is sent, then the <duration> timer will be killed and mute will be deactivated. • If AT+KLTEMUTE=0 is sent while mute is not activated, then the AT command does not take any effect. • When the feature is activated, the <mode> parameter will be automatically reset to 0 after the <duration> mute timer expires. • At module power up, by default, <mode> is always 0. • This command can only be used with a SIM.
Examples	**AT+KLTEMUTE=?** **+KLTEMUTE: (0-1),(5-120),(0-1)** **OK** **AT+KLTEMUTE?** // Read the current settings **+KLTEMUTE: 0,30,0** **OK** **AT+KLTEMUTE=1,40,1** // Activate LTE TX mute during 40s **OK** **+KLTEMUTE: 1** // LTE TX mute is started **AT+KLTEMUTE?** **+KLTEMUTE: 1, 40,1** **OK**

5.51. +KSYNC Command: Application Synchronization Signal

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KSYNC=?**	Response **+KSYNC:** (list of supported **<mode>**s),(list of supported **<IO>**s),(range of **<Duty Cycle>**),(range of **<Pulse Duration>**) **OK**
Read command Syntax **AT+KSYNC?**	Response **+KSYNC: <mode>,<IO>,<Duty Cycle>,<Pulse Duration>** **OK**
Write command Syntax **AT+KSYNC=<mode>[,<IO>[,<Duty Cycle>[,<Pulse Duration>]]]**	Response **OK** Parameters **<mode>** Operation mode 0 Disable the generation of synchronization signal 1 Manage the generation of signal according to **<Duty Cycle>** and **<Pulse Duration>**. The waveform of the signal is controlled only by these two parameters; Network status would not affect the waveform 2 Manage the generation of signal according to CS network registration status; **PERMANENTLY OFF** Not register/Initialization/Register denied/no SIM card **600 ms ON / 600ms OFF** Not registered but searching **75 ms ON / 3s OFF** Right connected to the network <Duty Cycle> and <Pulse Duration> are not used in mode 2 For backward compatibility, HL7618/90 does not support CS network registration. 3 Manage the generation of signal according to PS network registration status; **OFF** Not registered/Initialzation/Registered denied/no SIM card **ON** Registered to the network **<IO>** 1 – 8, 10, 11, 13 – 15 GPIO used as output **<Duty Cycle>** 1 – 100 In percent; only effective when <mode>=1 Default value = 50 **<Pulse Duration>** 10 – 65535 In milliseconds; only effective when <mode>=1 Default value = 1000
Notes	• Parameter settings are automatically saved in non-volatile memory. • <Duty Cycle> and <Pulse Duration> can be configured regardless of <mode>. • Refer to +KGPIOCFG for multiplexed functions of GPIOs. • GPIOs may be already used by SIM detection, temperature monitoring, etc. Check with other related commands such as +KSIMDET, +KTEMPMON, etc. prior to using this command. • This command can be used without a SIM. • This command will force the GPIO pins as output, regardless of AT+KGPIOCFG configuration.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	• Only 1 GPIO signal can be generated at any time. • The minimum LED ON/OFF cycle is 5ms due to the precision of the timer; this feature cannot be used if either the LED ON/OFF cycle is less than 5ms. “LED ON cycle” is <Pulse Duration>*<Duty Cycle> while “LED OFF cycle” is <Pulse Duration> - “LED ON cycle”. • <mode>=2 is kept for compatibility with other HL series LTE-only products which do not support CS, e.g. HL7618, HL7618RD and HL7690.
Examples	**AT+KSYNC=1,1,50,2000** // Generate signal with 50% duty cycle and 2000 ms pulse // duration on GPIO1 **OK** **AT+KSYNC=1,2,50,2000** // Generate signal with 50% duty cycle and 2000 ms pulse // duration on GPIO2 **OK** // Previous signal on GPIO1 will be stopped **AT+KSYNC=0,2** // Disable signal generation **OK** **AT+KSYNC=2,1** // Generate signal on GPIO1 according to the CS network // registration status **OK** **AT+KSYNC=3,1** // Generate signal on GPIO1 according to the PS network // registration status **OK**

5.52. +KLTEPARAM Command: LTE Parameters

Note: For HL7650, HL7690 and HL7692 only.

HL7650, HL7690 and HL7692	
Test command Syntax **AT+KLTEPARAM =?**	Response **+KLTEPARAM**: (list of supported <**mode**>s) **OK** or **+CME ERROR: <err>**
Read command Syntax **AT+KLTEPARAM ?**	Response **+KLTEPARAM: <mode>,<qrxlevmin>,<T3402-dur>,<T3402-stat>,<T3412-dur>, <T3412-stat>** **OK** or **+CME ERROR: <err>**

HL7650, HL7690 and HL7692	
Write command Syntax **AT+KLTEPARAM =<mode>**	Response **OK** or **+CME ERROR: <err>** Parameters **<mode>** URC reporting mode 0 Disable URC reporting 1 Enable URC reporting **<qrxlevmin>** -70 to 22 qRxLevMin in dBm. Default value = 32767 This parameter is omitted if it is not available **<T3402-dur>** T3402 duration in ms. Default value = 720000 (12 min) This parameter is omitted if it is not available **<T3402-stat>** T3402 timer status. This parameter is omitted if it is not available 0 Stopped 1 Running **<T3412-dur>** T3412 duration in ms. Default value = 3240000 (54 min) This parameter is omitted if it is not available **<T3412-stat>** T3412 timer status. This parameter is omitted if it is not available 0 Stopped 1 Running
Unsolicited Notification	Response **+KLTEPARAM: <qrxlevmin>,<T3402-dur>,<T3402-stat>,<T3412-dur>,<T3412-stat>**
Reference Sierra Wireless Proprietary	Notes • The qrxlevmin is defined according to 3GPP specification TS 36.304 section 5.2.4.7. • The EMM timer T3402 and T3412 are defined according to 3GPP specification TS 24.301 section 5.3.5 – 5.3.6. • <mode> is reset to 0 automatically after reboot. • The command can only be used with a SIM. • Parameter values are only available after the module is registered to the network. • URC is presented when the value is updated by the network.
Examples	**AT+KLTEPARAM=?** **+KLTEPARAM: (0-1)** **OK** **AT+KLTEPARAM?** // Read the current settings when the // module is registered to the network **+KLTEPARAM: 0,-60,720000,0,3240000,1** **OK** **AT+KLTEPARAM=1** // Enable URC message **OK** **+KLTEPARAM: -60,720000,0,3240000,1** // URC message

HL7650, HL7690 and HL7692	
	AT+KLTEPARAM? // Read command when the module is not // registered to the network **+KLTEPARAM: 0,,,,,** **OK**

5.53. +KBND Command: Current Networks Band Indicator

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KBND=?**	Response **+KBND:** (list of supported **<bnd>**s) **OK**
Read command Syntax **AT+KBND?**	Response **+KBND: <bnd>** **OK** Parameter **<bnd>** Band in hexadecimal format 0x00000000 Not available 0x00000002 GSM 900 MHz (HL7692 only) 0x00000004 DCS 1800 MHz (HL7692 only) 0x00000010 UMTS Band I (2100 MHz) (HL7650 only) 0x00000020 UMTS Band II (1900 MHz) (HL7688 only) 0x00000040 UMTS Band V (850 MHz) (HL7650 and HL7688) 0x00000100 UMTS Band VIII (900 MHz) (HL7650 only) 0x00000800 LTE Band 2 (1900 MHz) (HL7648 and HL7688) 0x00001000 LTE Band 3 (1800 MHz) (HL7650, HL7690 and HL7692) 0x00002000 LTE Band 4 (1700 MHz) (HL7618, HL7618RD, HL7648 and HL7688) 0x00004000 LTE Band 5 (850 MHz) (HL7650 and HL7688) 0x00010000 LTE Band 13 (700 MHz) (HL7618, HL7618RD and HL7688) 0x00020000 LTE Band 17 (700MHz) (HL7688 only) 0x00040000 LTE Band 28 (700 MHz) (HL7650 only) 0x00800000 LTE Band 8 (900MHz) (HL7650, HL7690 and HL7692) 0x01000000 LTE Band 20 (800MHz) (HL7690 and HL7692) 0x02000000 LTE Band 12 (700 MHz) (HL7648 only)
Reference Sierra Wireless Proprietary	Notes • This command returns the GSM, UMTS or LTE band that the module is currently using. • This command cannot be used without a SIM.

5.54. +KSRAT Command: Set Radio Access Technology

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KSRAT=?**	Response **+KSRAT:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+KSRAT?**	Get current band Response **+KSRAT: <mode>** **OK**
Write command Syntax **AT+KSRAT= <mode>**	Set current mode Response **OK** Parameter **<mode>** 1 GSM only 2 UMTS only 5 LTE only 6 Search for UMTS first then LTE 7 Search for LTE first then UMTS 8 Search for GSM first then LTE 9 Search for LTE first then GSM
Reference Sierra Wireless Proprietary	Notes • This command can be used without a SIM. • <mode> is automatically stored in persistent memory. • Settings take effect immediately. • The HL7650 and HL7688 support both UMTS and LTE; the HL7618, HL7618RD, HL7648 and HL7690 only support LTE; and the HL7692 supports both GSM and LTE. • Setting the <mode> of +KSRAT automatically corrects the <band> of *PSRDBS if the two values conflict with each other. For example, when the <band> of *PSRDBS is set to GSM only, changing the <mode> of +KSRAT to LTE only will also correct <band> of *PSRDBS to the original or all LTE bands of *PSRDBS.

5.55. *PSRDBS Command: Change Frequency Band

HL7618, HL7618RD, HI7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT*PSRDBS=?**	Response ***PSRDBS:** (list of supported **<mode>**s), (list of supported **<band>**s) **OK**

HL7618, HL7618RD, HI7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT*PSRDBS?**	Response ***PSRDBS: <band>** **OK**
Write command Syntax **AT*PSRDBS= <mode>,<band>**	Response **OK** Parameters **<mode>** 0 Set <band> at next switch on 1 Set <band> immediately **<band>** Bit field type parameter. To set several bands, sum up the values 2 GSM 900 MHz (HL7692 only) 8 DCS 1800 MHz (HL7692 only) 32 UMTS Band I (2100 MHz) (HL7650 only) 64 UMTS Band II (1900 MHz) (HL7688 only) 128 UMTS Band V (850 MHz) (HL7650 and HL7688) 512 UMTS Band VIII (900 MHz) (HL7650 only) 4096 LTE Band 2 (1900 MHz) (HL7648 and HL7688) 8192 LTE Band 3 (1800 MHz) (HL7650, HL7690 and HL7692) 16384 LTE Band 4 (1700 MHz) (HL7618, HL7618RD, HL7648 and HL7688) 32768 LTE Band 5 (850 MHz) (HL7650 and HL7688) 131072 LTE Band 13 (700 MHz) (HL7618, HL7618RD and HL7688) 262144 LTE Band 17 (700MHz) (HL7688 only) 524288 LTE Band 28 (700 MHz) (HL7650 only) 16777216 LTE Band 8 (900 MHz) (HL7650, HL7690 and HL7692) 33554432 LTE Band 20 (800 MHz) (HL7690 and HL7692) 67108864 LTE Band 12 (700 MHz) (HL7648 only)
Reference Sierra Wireless Proprietary	Notes • Selection can be one or more (up to two) GSM bands, one or more (up to three) UMTS bands, and one or more (up to five) LTE bands. • Setting the <band> of *PSRDBS automatically corrects the <mode> of +KSRAT if the two value conflict with each other. For example, when the <mode> of +KSRAT is GSM only, changing the <band> of *PSRDBS to LTE band only will also correct the <mode> of +KSRAT to LTE only. Likewise, when the <mode> of +KSRAT is GSM only, changing the <band> of *PSRDBS to LTE+GSM bands will also correct <mode> of +KSRAT to dual LTE and GSM mode.

5.56. +CMEC Command: Mobile Equipment Control Mode

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+CMEC=?**	Response **+CMEC: (**list of supported **<keyp>**s**),(**list of supported **<disp>**s**),(**list of supported **<ind>**s**)** **OK**
Read command Syntax **AT+CMEC?**	Response **+CMEC: <keyp>,<disp>,<ind>** **OK**
Write command Syntax **AT+CMEC=[<keyp>[,<disp>[,<ind>]]]**	Response **OK** Parameters **<keyp>** 0 Keypad management, not significant (no keypad) **<disp>** 0 Display management, not significant (no display) **<ind>** 0 Only the ME can set the status of its indicators (command +CIND can only be used to read the indicators)
Notes	This command has no effect and was only implemented for compatibility purposes. Parameters are ignored and are not saved in non-volatile memory.

5.57. +CPOF Command: Power Off

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Execute command Syntax **AT+CPOF**	Response **OK**
Notes	• This command powers the module off. It is equivalent to **AT+CFUN=0**. • “OK” is immediately returned after the power off sequence is started.

5.58. +KGSMAD Command: GSM/LTE Antenna Detection

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KGSMAD=?**	Response **+KGSMAD: (**list of supported **<mod>**s**),(**list of supported **<urcmode>**s**),(**list of supported **<interval>**s**),(**list of supported **<detGPIO>**s**),(**list of supported **<repGPIO>**s**)** **OK**
Read command Syntax **AT+KGSMAD?**	Response **+KGSMAD: <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>** **OK**
Write command Syntax **AT+KGSMAD=<mod>,[<urcmode>[,<interval>[,<detGPIO>[,<repGPIO>]]]]**	Response **OK** Parameters **<mod>** 0 Disable antenna detection 1 Periodic antenna detection 2 Instantaneous antenna detection **<urcmode>** URC presentation mode. This is only applicable if <mod>=1 0 Disable the presentation of antenna detection URC 1 Enable the presentation of antenna detection URC **<interval>** 45 – 3600 Interval between two detections, in seconds. This is only applicable if <mod>=1. Default value = 120 **<detGPIO>** 1 – 8, 10, 11, 13 –15 GPIO to be used as input by the antenna detection algorithm. Default value = 5 **<repGPIO>** 1 – 8, 10, 11, 13 –15 GPIO to be used as output by the antenna detection algorithm to report the antenna's condition. This is only applicable if <mod>=1. Default value = 7
Notes	• <repGPIO> is set to LOW when the antenna is connected, set to HIGH otherwise. • If the antenna detection algorithm detects a change in the antenna status, the module is notified by URC **+KGSMAD: <presence>** where <presence>: 0 - antenna connected 1 - antenna connector short circuited to ground 2 - antenna connector short circuited to power 3 - antenna not detected (open) • GPIOs may be already used by +KSIMDET, +KGNSSAD, +KSYNC, and +KTEMPMON; use +KGPIOCFG to check if a GPIO is already used by another interface/command prior to using this command. • Instantaneous activation doesn't affect a periodic activation that has already been started.

5.59. +KSREP Command: Mobile Start-up Reporting

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KSREP=?**	Response **+KSREP:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+KSREP?**	Response **+KSREP: <mode>,<stat>,<PB ready>** **OK**
Write command Syntax **AT+KSREP= <mode>**	Response **OK** or **+CME ERROR: <err>** Parameters **<mode>** Unsolicited result code mode 0 Disable the start-up URC 1 Enable the start-up URC **<stat>** Module status 0 The module is ready to receive commands for the TE. No access code is required 1 The module is waiting for an access code. Use AT+CPIN? to determine the code 2 The SIM card is not present 3 The module is in “SIM lock” state 4 Unrecoverable error 5 Unknown state **<PB ready>** Phone book status 0 Phone book is not ready 1 Phone book is ready for read and write
Unsolicited Notification	Response **+KSUP: <stat>**
Reference Sierra Wireless Proprietary	Notes • URC **+KSUP: <stat>** will only be displayed once after reboot if <mode>=1. • If <mode>=0, +PBREADY and +SIM URC notifications will not be sent at the start-up process. However, they will still be sent afterwards during normal module operation. • This command can be used without a SIM. • <mode> is saved in non-volatile memory.

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	

Example	// SIM Card is inserted
	AT+KSREP?
	+KSREP: 1,0,1 // <mode>=1. The module and phone book are ready
	OK
	
	AT+KSREP=?
	+KSREP: (0-1)
	OK
	
	AT+KSREP=0 // Set mode to 0
	OK
	
	AT+KSREP?
	+KSREP: 0,0,1 // Mode is changed to 0 and save to non-volatile memory
	OK
	
	// Reboot the module
	AT+KSREP?
	+KSREP: 0,0,1 // Mode=0 which is restored from non-volatile memory
	OK
	
	// SIM card is not inserted
	// Reboot the module
	+SIM: 0 // URC after reboot
	+KSUP: 2 // Start-up report shows that the SIM is not present
	
	AT+KSREP?
	+KSREP: 1,2,0 // SIM is not present and the phone book is not ready
	OK
	
	+SIM: 1 // Insert SIM card
	+PBREADY // Phone Book is ready
	
	AT+KSREP?
	+KSREP: 1,0,1 // Start-up reporting is enabled. Both module and phone book // are ready
	OK

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+WMANTSEL?**	Response **+WMANTSEL: <MODE>** **OK**
Write Command Syntax **AT+WMANTSEL= <MODE>**	Response **OK** Parameter **<MODE>** Mode of operations for main and diversity antennas For LTE-only variants, <MODE> is coded as a single decimal number **<digit-L>**; while for variants that support both LTE and UMTS, <MODE> is coded as a 2-digit BCD number **[<digit-U>]<digit-L>** **<digit-L>** Digit for LTE 0 Use main and diversity antenna on LTE 1 Only use main antenna on LTE 2 Only use diversity antenna on LTE **<digit-U>** Digit for UMTS 0 Use main and diversity antenna on UMTS 1 Only use main antenna on UMTS 2 Only use diversity antenna on UMTS
Reference Sierra Wireless Proprietary	Notes • This command works with or without a SIM. • <MODE> is stored in non-volatile memory using the AT&W command. • This command should be issued when the device is deregistered from the network; settings will be effective the next time the module registers to the network.
Examples	// For variants that only support LTE (e.g. HL7690 and HL7692) **at+wmantsel?** **+WMANTSEL: 0** **OK** **at+cops=2** // Deregister from network **OK** **at+wmantsel=1** // Only select only main antenna **OK** **at+cops=0** // Re-register to network **OK** **at+cops=2** // Deregister from network **OK** **at+wmantsel=2** // Only select diversity antenna **OK** **at+cops=0** // Re-register to network **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	// For variants that support both UMTS and LTE (e.g. HL7650 and HL7688) **at+wmantsel?** // Read command **+WMANTSEL: 00** **OK** **at+wmantsel=?** // Test command **+WMANTSEL: (0-2,00-02,10-12,20-22)** **OK** **at+wmantsel=11** // Write command to enable main antenna only for both UMTS // and LTE **OK** **at+wmantsel?** // Read back the inputted value **+WMANTSEL: 11** **OK**

5.61. +KSIMSEL Command: SIM Selection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KSIMSEL=?**	Response **+KSIMSEL:** (list of supported **<mode>**s),(list of supported **<GPIO>**s) **OK**
Read command Syntax **AT+KSIMSEL?**	Response **+KSIMSEL: <mode>[,<GPIO>[,<sim_used>]]** **OK**
Write command Syntax **AT+KSIMSEL= <mode> [, <GPIO>]**	Response **OK** If <mode> = 4: **+KSIMSEL: <mode>,<sim1_pres>,<sim2_pres>** **OK** Parameters **<mode>** SIM selection mode 0 SIM selection disable 1 Force to select the 1st external SIM. The 2nd external SIM presence will be ignored. 2 Force to select the 2nd external SIM. The 1st external SIM presence will be ignored. 3 Select the 1st external SIM if present, else select the 2nd external SIM if present. 4 Read SIM cards presence status **<GPIO>** 1 – 8, 10, 11, 13 – 15 GPIO to be used for external SIM selection. Default value = 6. If the value is omitted, the previously configured GPIO will be used.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<sim_used> 1 The 1st external SIM currently used 2 The 2nd external SIM currently used **<sim1_pres>** 0 The 1st external SIM is not present 1 The 1st external SIM is present **<sim2_pres>** 0 The 2nd external SIM is not present 1 The 2nd external SIM is present
Notes	• The firmware supports DSSS – Dual SIM Single Standby. This means that only one SIM can be set as active at a time. • <GPIO> would be low leveled for enabling the 1st external SIM, whereas <GPIO> would be high leveled for enabling the 2nd external SIM. • <sim_used> information is only available when <mode> = 3. • Response **[+KSIMSEL: 4,<sim1_pres>,<sim2_pres>]** is only available when <mode> = 4. • This command can be used without a SIM. • Parameters <mode> and <GPIO> are saved in non-volatile memory over module reboot. • When SIM select feature is disabled, only the 1st external SIM interface is available and the dedicated GPIO is free for customer use via +KGPIO. • When <mode>=3, SIM selection is performed immediately after the user enters the AT+KSIMSEL command. No SIM selection is performed for SIM insertion or SIM removal afterwards. • Module reboot is needed when the <mode> setting is changed from enabled (<mode> = 1 or 2 or 3) to disabled (<mode> = 0) and vice versa.

Examples	**AT+KSIMSEL=?** // test command
	+KSIMSEL: (0-4),(1-8,10-11,13-15)
	OK
	
	AT+KSIMSEL? // check current setting
	+KSIMSEL: 1,6 // 1st SIM active and GPIO 6 is used for SIM selection
	OK
	
	AT+KSIMSEL=2,6 // force to select the 2nd external SIM
	OK
	
	AT+KSIMSEL?
	+KSIMSEL:2,6 // 2nd SIM active and GPIO 6 is used for SIM selection
	OK
	
	AT+KSIMSEL=1 // force to select the 1st external SIM
	OK
	
	AT+KSIMSEL?
	+KSIMSEL:1,6 // 1st SIM active and GPIO 6 is used for SIM selection
	OK
	
	AT+KSIMSEL=0 // Disable SIM select functionality
	OK
	
	AT+KSIMSEL=3,6 // Enable SIM select functionality. SIM selection will be
	// performed. SIM slot status = the 1st SIM is present, the 2nd
	// SIM is absent
	OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692		
	AT+KSIMSEL? **+KSIMSEL: 3,6,1** **OK**	// SIM selection performed. GPIO 6 is used as selection pin and // the 1st external SIM is currently activated
	AT+KSIMSEL=0 **OK**	// Disable SIM select functionality

	AT+KSIMSEL=3
	
	OK
		// Re-enable SIM select functionality. SIM selection will be
		// performed. SIM slot status = the 1st SIM is absent, the 2nd
		// SIM is present

	AT+KSIMSEL? **+KSIMSEL: 3,6,2** **OK**	// SIM selection performed. GPIO 6 is used as selection pin and // the 2nd external SIM is currently activated
	AT+KSIMSEL=4 **+KSIMSEL: 4,0,1** **OK**	// 1st external SIM is absent and 2nd external SIM is present

5.62. +BOOTDWLCFG Command: Boot Configuration for Firmware Download

5.62.1. Description

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

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

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

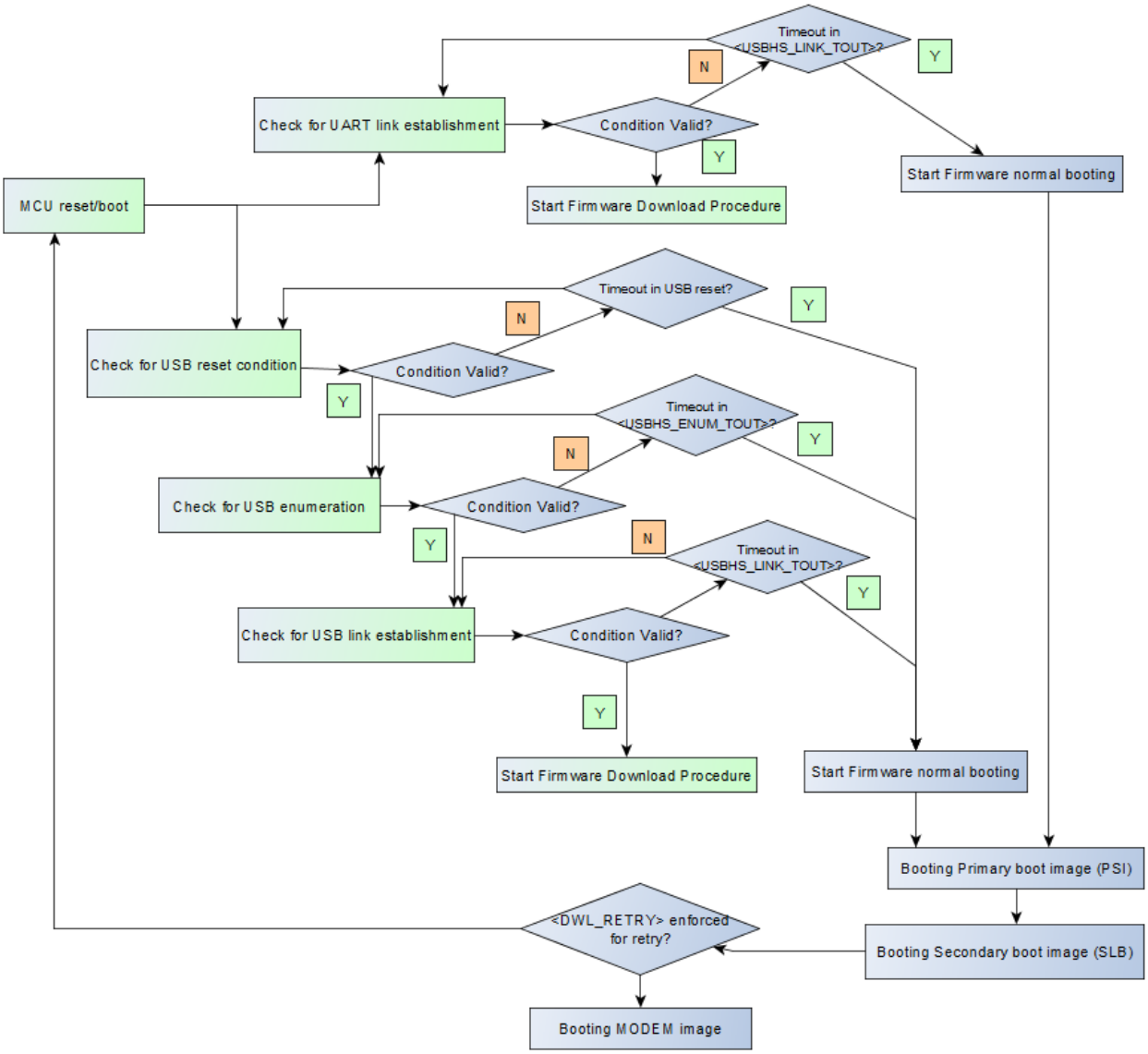


Figure 2. Firmware Download Request Detection Sequence

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

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

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

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

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

Time out values are listed in the following table.

Table 2. Time Out Values

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

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

Table 3. Extended Time Out Values

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

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

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

5.62.2. Syntax

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+ BOOTDWLCFG= ?**	Response **+BOOTDWLCFG:** (list of supported **<USBHS_ENUM_TOUT>**s),(list of supported **<USBHS_LINK_TOUT>**s),(list of supported **<DWL_RETRY>**s),(list of supported **<SYS_REBOOT>**s) **OK**
Read command Syntax **AT+ BOOTDWLCFG?**	Response **+BOOTDWLCFG: <USBHS_ENUM_TOUT>,<USBHS_LINK_TOUT>,<DWL_RETRY>** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+ BOOTDWLCFG= [<USBHS_ENUM_TOUT> [,<USBHS_LINK_TOUT> [,<DWL_RETRY> [,<SYS_REBOOT>]]]**	Response **OK** Parameters **<USBHS_ENUM_TOUT>** USB enumeration time out value 0 3s 1 30s 2 60s 3 90s **<USBHS_LINK_TOUT>** USB link establishment time out value 0 1s 1 30s 2 60s 3 90s **<DWL_RETRY>** Desired firmware download retry count when firmware download conditions are not met (i.e. the download program didn't start) 0 No retry 1 – 10 Number of retries **<SYS_REBOOT>** System reboot options after executing this command 0 Do not reboot 1 Reboot immediately without network deregistration
Notes	• USB time out happens when the USB cable is connected (VBUS level > 0.8V) and USB RESET happens within a 400ms time out. • <USBHS_ENUM_TOUT> and <USBHS_LINK_TOUT> are automatically reset to their default values, 0, in the following conditions: ▪ Cold boot or hardware reset. ▪ Download program received the reset command from the host to reboot the module. ▪ Successfully booted in the module firmware, which means time out values are reset when time out happens in a previous boot. Basically, the conditions above are terminate conditions that time out values are effective only once. • If <DWL_RETRY> is enabled (non-zero value), and firmware download conditions are not met (i.e. download program didn't start), the module reboots itself with the input parameters <USBHS_ENUM_TOUT> and <USBHS_LINK_TOUT> for the next "TRY" of USB enumeration and USB link establishment. One of the following conditions stops this firmware download retry loop: ▪ Cold boot or hardware reset. ▪ Retry count exhausted (if not configured to be 255/continually). ▪ Download program successfully started. • Any failures related to firmware download, that includes the following will have the module reboot itself with <USBHS_ENUM_TOUT>=3 and <USBHS_LINK_TOUT>=3, regardless of the setting <DWL_RETRY>: ▪ 10 seconds inactivity time out in download program. ▪ Boot failures due to corrupted firmware images, either detected by the primary boot image (PSI) or secondary boot image (SLB). ▪ Any exceptional failures in download program or boot-up images. Five (5) extra seconds of delay happens before the reboot for the second and third conditions. A successful firmware download is required to recover the module.

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

Examples	**AT+BOOTDWLCFG=?**
	+BOOTDWLCFG: (0-3),(0-3),(0-10),(0-1)
	OK
	
	//default values after boot-up
	AT+BOOTDWLCFG?
	+BOOTDWLCFG: 0,0,0
	OK
	
	<USB enumeration time-out = 90s, USB link time-out = 90s>
	AT+BOOTDWLCFG=3,3,0,0
	OK
	
	AT+BOOTDWLCFG?
	+BOOTDWLCFG: 3,3
	OK
	
	AT+BOOTDWLCFG=3,3 or AT+CFUN=1,1
	OK
	
	//module reboots for Firmware Download
	
	<USB enumeration time-out = 3s, USB link time-out = 30s, reboot automatically>
	AT+BOOTDWLCFG=0,1
	OK
	
	//module reboots for Firmware Download

5.63. +CALA Command: Set Alarm

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	Parameters **<time>** String type valuewith format "yy/MM/dd,hh:mm:ss", where characters indicate year (last two digits), month, day, hour, minutes and seconds **<n>** Alarm index
Unsolicited Notification	Response **+CALV: <value>** Parameter **<value>** Alarm state 1 Alarm is enabled
Reference Sierra Wireless Proprietary	Notes • When an alarm is timed out, the unsolicited result code is returned. • Only one alarm can be set at a time; <n> must always be 1. • The alarm will wake the module up even if it is already in the off state (e.g., turned off by **AT+CPOF** or **AT+CFUN=0**). The module will then boot up normally, and no unsolicited result code **+CALV: 1** is returned. • This command can be used without a SIM. • The year "yy" of <time> must be set to 2004 or later. • <time> can only be set to later than the current time on the internal clock.
Examples	**AT+CCLK="16/08/26,15:00:00+0"** // Set the date and time **OK** **AT+CALA=?** // Test command **+CALA: ("yy/mm/dd,hh:mm:ss"),(1)** **OK** **AT+CALA?** // Read command **OK** **AT+CALA="16/08/26,15:00:35"** // Set an alarm for the date and time **OK** **+CALV: 1** // An URC is indicated when the alarm is expired.

5.64. +CALD Command: Delete Alarm

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+CALD=?**	Response **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Write command Syntax **AT+CALD=<n>**	Response **OK** or **+CME ERROR: <err>** Parameter **<n>** Alarm index
Reference Sierra Wireless Proprietary	Notes • This command can be used without a SIM. • This write command is only effective when the alarm has already been set by **AT+CALA**.
Examples	**AT+CALD=?** // Test command **OK** **AT+CALD=1** // Delete the alarm **OK**

5.65. +KCCINFO Command: Camped Cell Information

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<RAC> 1-byte routing area code in hexadecimal format. FF will be displayed if routing area identity information is invalid. **<TAC>** 2-byte tracking area code in hexadecimal format (e.g. “00C3” equals 195 in decimal). FFFF will be displayed if tracking area identity information is invalid.
Unsolicited Notification	Response **+KCCINFOI: <CI>,<RAC>,<TAC>**
Reference Sierra Wireless Proprietary	Notes • This command is used to enable or disable the unsolicited response which informs about any change in camped cell parameters. • This command works with a SIM card. • <mode> is automatically stored in persistent memory. • Settings take effect immediately.
Examples	**AT+KCCINFO=1** // Set mode to 1 **OK** **AT+KCCINFO=?** // Test command **+KCCINFO: (0-1)** **OK** **AT+COPS=0** // Attach to network **OK** **+KCCINFOI: "00006773","01","FFFF”** // URC display after attached to network **AT+KCCINFO?** // Read command **+KCCINFO: 1,"00006773","01","FFFF"** **OK**

5.66. +CALM Command: Alert Sound Mode

Note: For HL7648 and HL7688 only.

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

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

5.67. +CRSL Command: Ringer Sound Level

Note: For HL7648 and HL7688 only.

HL7648 and HL7688	
Test command Syntax **AT+CRSL=?**	Response **+CRSL: (**list of supported **<level>**s**)** **OK**
Read command Syntax **AT+CRSL?**	Response **+CRSL: <level>** **OK**
Write command Syntax **AT+CRSL= <level>**	Response **OK** Parameter **<level>** Integer type value with manufacturer specific range (smallest value represents the lowest sound level). Possible values = 0 (default), 1, 2, 3.

HL7648 and HL7688	
Reference [27.007] § 8.21	Examples **AT+CRSL?** **+CRSL: 0** **OK** **AT+CRSL=1** **OK** **AT+CRSL=?** **+CRSL: (0-3)** **OK**

5.68. +CCED Command: Cell Environment Description

Note: For HL7650 only.

HL7650	
Test command Syntax **AT+CCED=?**	Response **+CCED: (**list of supported **<mode>**s**),(**list of supported **<requested dump>**s**)** **OK**
Read command Syntax **AT+CCED?**	Response **OK**
Write command Syntax **AT+CCED= <mode> [,<requested dump>]**	Response **+CCED: [<AcT>,]<Main Cell dump>** **OK** Parameters **<mode>** Requested operation 0 One shot request 1 The requested dump is returned as intermediate response **<requested dump>** Requested cell parameter 1 Main cell only **<AcT>** Access technology of the registered network (for UTRAN and LTE only) 0 GSM 2 UTRAN 7 LTE **<Main Cell dump>** This parameter gathers the following parameters for the Main Cell parameters:

HL7650	
	For <AcT>=0: [<MCC>],[<MNC>],[<LAC>][,<CI>],[<BSIC>],[<BCCH Freq>],[<RxLev>],[<RxLev Full>],[<RxLev Sub>],[<RxQual>],[<RxQual Full>],[<RxQual Sub>],[<Idle TS>] For <AcT>=2: [<MCC>],[<MNC>],[<LAC>][,<CI>],[<RSCP>],[<EcNo>],[<Scrambling Code>],[<UARFCN>],[<R>],[<R2>],[<H>],[<Squal>],[<Srxlev>] For <AcT>=7: [<MCC>],[<MNC>],[<TAC>],[<LTE_CI>],[<PhyCellInd>],[<RSRPResult>],[<RSRQResult>],[<EARFCN>],[<TA>],[<nbLTEcells>] **<MCC>** Mobile Country Code; 3 digits **<MNC>** Mobile Network Code; 2 or 3 digits **<LAC>** Location Area Code. String type – two byte location area code in hexadecimal format (e.g. “00C3” equals 195 in decimal) **<TAC>** Tracking Area Code. String type – two byte tracking area code code in hexadecimal format (e.g. “00C3” equals 195 in decimal) **<CI>** Cell Id. String type. Two bytes in hexadecimal format for 2G, four bytes in hexadecimal format for 3G. If the Cell Id is not available, this parameter is omitted. **<LTE_CI>** LTE Cell Identity. String type – eight bytes in hexadecimal format **<PhyCellInd>** 0 – 503 LTE Physical Cell Id **<BSIC>** Base Station Identity Code **<BCCH Freq>** 0 – 1023 Broadcast Control Channel Frequency **<RxLev>** 0 – 63 RSSI level on BCCH channel in idle mode. This parameter is empty in dedicated mode. The indicated value is an offset which should be added to –110 dBm to get a value in dBm. See the formula specified in TS 05.08 Radio Subsystem Link Control **<RxLev Full>** RSSI level on all TCH channel, in dedicated mode. Currently not supported **<RxLev Sub>** RSSI level on a subset of TCH channel, in dedicated mode. Currently not supported **<RxQual>** Signal quality on the BCCH channel in idle mode **<RxQual Full>** Signal quality on all TCH channels in dedicated mode. Currently not supported **<RxQual Sub>** Signal quality on a subset of TCH channels in dedicated mode. Currently not supported. **<Idle TS>** Time slot **<RSCP>** Received Signal Code Power. The power level in one chip

HL7650	
	<RSRPResult> 0 – 7 Reference Signal Received Power **<RSRQResult>** 0 – 34 Reference Signal Received Quality **<EcNo>** Ratio of energy per modulating bit to the noise spectral density. This is the cell quality and is equal to RSCP/RSSI **<Scrambling code>** 0 – 511 The downlink scrambling code of the serving cell; for 3G networks only. **<UARFCN>** UTRA absolute radio frequency channel number **<EARFCN>** EUTRA absolute radio frequency channel number **<nbLTEcells>** 0 – 33 Number of available LTE base stations **<R>** Ranking criteria for all types of cells (UTRA or GSM, based on RSCP (3G cells) or RSSI (2G cells)). This parameter is only significant when <AcT> = 2. Currently not supported. **<R2>** Ranking criteria for UTRA cells only (based on EcNo). This parameter is only significant when <AcT> = 2. Currently not supported. **<H>** Ranking criteria when HCS is used. This parameter is only significant when <AcT> = 2. Currently not supported. **<Squal>** S criteria – Cell selection quality value (dB). This parameter is only significant when <AcT> = 2 **<Srxlev>** S criteria – Cell selection RX level value (dB). This parameter is only significant when <AcT> = 2
Examples	**AT+CCED=?** **+CCED: (0),(1)** **OK** **AT+CCED?** **OK** **AT+KSRAT=2** // set UTRAN mode (3G) **OK** **AT+CCED=0,1** **+CCED: 2,208,01,0316,007747e2,255,12,91,10787,,,,6,17** **OK** **AT+CCED=0** **+CCED: 2,208,01,0316,00772279,255,12,91,10712,,,,6,17** **OK** **AT+KSRAT=5** **// set LTE mode (4G)** **OK** **AT+CCED=0,1** **+CCED: 7,208,10,b5a6,00093705,101,52,18,1501,0,2** **OK**

HL7650	
Reference Sierra Wireless Proprietary	Notes • The command is available only when a (U)SIM card is present. • The HL7650 supports 4G and 3G, but not 2G so only UTRAN and LTE cell information will be displayed.

5.69. +WESHDOWN Command: Emergency Shutdown

Note: For HL7650 only.

HL7650	
Test command Syntax **AT+WESHDOWN =?**	Response **+WESHDOWN:** (list of supported **<mode>**s), (list of supported **<gpio_index>**es) **OK**
Read command Syntax **AT+WESHDOWN ?**	Response **+WESHDOWN: <mode>[,<gpio_index>]** **OK**
Write command Syntax **AT+WESHDOWN =<mode> [,<gpio_index>]**	Response **OK** or **+CME ERROR <err>** Parameters **<mode>** 0 Disable emergency shutdown feature by GPIO 1 Enable emergency shutdown feature by GPIO 2 Trigger emergency shutdown *Note: Due to the quick shutdown of the module, the OK response sent by AT+WESHDOWN=2 might not be received by the application.* **<gpio_index>** 1 – 8 Defines which GPIO will be used as input to trigger the emergency shutdown on the falling edge. Default value = 4
Reference Sierra Wireless Proprietary Command	Notes • <gpio_index> is only used when <mode> = 1. • Parameters are not saved in non-volatile memory. They must be configured each time the module boots up. • GPIOs may already be used by +KSIMDET, +KSYNC, +KTEMPMON, +KGSMAD, +KSIMSLOT, etc. • Only GPIO 4 is available for use in the HL7650. Since this GPIO is also used to detect the insertion/removal of SIM2, this feature is disabled when emergency shutdown is activated. • This command can be used without a SIM.

HL7650	
Examples	**AT+WESHDOWN=?** **+WESHDOWN: (0-2),(1-8)** **OK** **AT+WESHDOWN?** **+WESHDOWN: 0** // Emergency shutdown by GPIO is not active **OK** **AT+WESHDOWN=1,4** // Activate emergency shutdown on GPIO4 **OK** **AT+WESHDOWN?** **+WESHDOWN: 1,4** // A falling edge on GPIO4 will shut the module down **OK** **AT+WESHDOWN=2** **OK** // Module shuts down

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

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

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

HL7618, HL7650, HL7688, HL7690 and HL7692

Write command

Syntax
AT+KMCLASS= <mclass>

Set Multislot Class for GPRS and EGPRS

Response
OK

Parameter
<mclass> Multislot class

Multislot Class	Maximum Number of Slots		
	Rx	Tx	Sum
1	1	1	2
2	2	1	3
3	2	2	3
4	3	1	4
5	2	2	4
6	3	2	4
7	3	3	4
8	4	1	5
9	3	2	5
10	4	2	5
11	4	3	5
12 (default)	4	4	5
30	5	1	6
31	5	2	6
32	5	3	6
33	5	4	6

Reference
Sierra Wireless Proprietary

Notes
- This AT command works with a SIM card inserted in the modem.
- <mclass> changes take effect immediately and is automatically stored in non-volatile memory.

6. Network Service Related Commands

6.1. +CAOC Command: Advice of Charge

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

6.2. +CUSD: Unstructured Supplementary Service Data

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

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

6.3. +CLCK Command: Facility Lock

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+CLCK=<fac>, <mode> [,<passwd> [,<class>]]**	Response If **<mode>** = 2 and command is successful **OK** **+CLCK: <status>[,<class1>[<CR>,<LF>** **+CLCK: <status>,class2…]]** or **+CME ERROR: <err>** Parameters **<fac>** Values reserved by the present document: "PS" PH-SIM (lock Phone to SIM/UICC card installed in the currently selected card slot) (MT asks for the password when other than current SIM/UICC card is inserted; MT may remember certain previously used cards thus not requiring password when they are inserted) "SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) "AO" BAOC (Barr All Outgoing Calls) "OI" BOIC (Barr Outgoing International Calls) "OX" BOIC-exHC (Barr Outgoing International Calls except to Home Country) "AI" BAIC (Barr All Incoming Calls) "IR" BIC-Roam (Barr Incoming Calls when Roaming outside the home country) "AB" All Barring services (applicable only for mode>=0) "AG" All outgoing barring services (applicable only for <mode>=0) "AC" All incoming barring services (applicable only for <mode>=0) "FD" SIM card or active application in the UICC (GSM or USIM) fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>) "PN" Network Personalization "PU" Network subset Personalization "PP" Service Provider Personalization "PC" Corporate Personalization **<mode>** 0 Unlock 1 Lock 2 Query status **<status>** 0 Not active 1 Active **<passwd>** String type; shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD **<classx>** Sum of integers each representing a class of information (default value = 7) 2 Data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128) 4 Fax (facsimile services) 8 Short message service 16 Data circuit sync 32 Data circuit async 64 Dedicated packet access 128 Dedicated PAD access

6.4. +CNUM Command: Subscriber Number

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CNUM=?**	 Response **OK**
Execute command Syntax **AT+CNUM**	 Response **+CNUM: [<alpha1>],<number1>,<type1>[,<speed>,<service>[,<itc>]][<CR><LF>** **+CNUM: [<alpha2>],<number2>,<type2>[,<speed>,<service>[,<itc>]][...]]** **OK** or **+CME ERROR: <err>** Parameters **<alphax>** Optional alphanumeric string associated with <numberx>; used character set should be the one selected with command +CSCS **<numberx>** String type phone number of format specified by <typex> **<typex>** Type of address octet in integer format **<speed>** As defined in 27.007 sub clause 6.7, corresponding to +CBST setting **<service>** Service related to the phone number 0 Asynchronous modem 1 Synchronous modem 2 PAD Access (asynchronous) 3 Packet Access (synchronous) 5 Fax **<itc>** Information transfer capability 0 3.1kHz 1 UDI
Note	MSISDN information should be stored in the SIM card before using +CNUM.

6.5. +COLP Command: Connected Line Identification Presentation

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+COLP?**	Response **+COLP: <n>,<m>** **OK**
Execute command Syntax **AT+COLP=[<n>]**	Response **OK** or **+CME ERROR: <err>** Parameters **<n>** 0 Disable result code presentation status to the TE 1 Enable result code presentation status to the TE **<m>** 0 COLP not provisioned 1 COLP provisioned 2 Unknown (e.g. no network, etc.)
Notes	• If the connected line identity of the called party is enabled, (and called subscriber allows it), the intermediate result code +COLP: <number>, <type> [,<subaddr>, <satype> [, <alpha>]] is returned from TA to TE. • <n> is saved in non-volatile memory per AT port over module reboot.

6.6. +COPN Command: Read Operator Name

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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)
Notes	If the matching PLMN name is not found then the numeric PLMN ID (MCCMNC) will be displayed.

6.7. +COPS Command: Operator Selection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+COPS=?**	Response **+COPS:** [list of supported (**<stat>**, long alphanumeric **<oper>**, short alphanumeric **<oper>**, numeric **<oper>[,< AcT>,<plmn_list>**)s][,,(list of supported **<mode>**s),(list of supported **<format>**s)] **OK** or **+CME ERROR: <err>**
Read command Syntax **AT+COPS?**	Response **+COPS: <mode>[,<format>,<oper>[,<AcT>]]** **OK** or **+CME ERROR: <err>**
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 4 Manual/automatic; if manual selection fails then automatic mode is entered **<format>** 0 Long alphanumeric; if network name is not available it displays a combination of MCC and MNC in string format 1 Short alphanumeric 2 Numeric **<oper>** String type given in format <format>; this field may be up to 16 character long for long alphanumeric format, up to 8 characters for short alphanumeric format and 5 characters long for numeric format (MCC/MNC codes) **<stat>** 0 Unknown networks 1 Network available 2 Current (registered) 3 Forbidden network **<AcT>** 2 UMTS 7 LTE

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<plmn_list> 0 PLMN is present on the EHPLMN list 1 PLMN is present on the user-controlled PLMN list 2 PLMN is present on the operator-controlled PLMN list Note that this parameter only supports R7 Protocol Stack onwards.
Notes	• This command forces an attempt to select and register the GSM, UMTS network. • Set command sets automatic network selection or selects network and a certain access technology AcT. • Read command returns current network. • Test command returns available networks and lists of supported <mode>s and <format>s. • This command is abortable. The port shall be freed for issuing another command. No network abort shall be triggered. • <mode>=0,1,2,4 and <oper> are saved in non-volatile memory over module reboot. • <format> is saved in non-volatile memory per AT port over module reboot.

6.8. +CPOL Command: Preferred PLMN List

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CPOL=?**	Response **+CPOL:** (list of supported **<index>**es),(list of supported **<format>**s) **OK** or **+CME ERROR: <err>**
Read command Syntax **AT+CPOL?**	Response **+CPOL: <index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>, <UTRAN_AcT1>,<EUTRAN_AcT>][<CR><LF>** **+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>, <UTRAN_AcT2>,<EUTRAN_AcT>][...]]** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+CPOL= [<index>] [,<format> [,<oper> [,<GSM_AcT>, <GSM_Compact_ AcT>,<UTRAN_ AcT>,<EUTRAN_ AcT>]]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<index>** Integer type; order number of operator in the SIM/USIM preferred operator list

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<format> 0 Long format alphanumeric <oper> 1 Short format alphanumeric <oper> 2 Numeric <oper> **<opern>** String type; <format> indicates if the format is alphanumeric or numeric **<GSM_AcT>** 0 GSM access technology not selected 1 GSM access technology selected **<GSM_Comp_AcT>** 0 GSM compact access technology not selected 1 GSM compact access technology selected **<UTRA_AcT>** 0 UTRA access technology not selected 1 UTRA access technology selected **<EUTRA_AcT>** 0 EUTRA access technology not selected 1 EUTRA access technology selected
Notes	• The read command can have “n” RAT values. • If matching PLMN name is not found, then numeric PLMN ID (MCCMNC) will be displayed. • <format> is saved in non-volatile memory over module reboot.

6.9. +CPWD Command: Change Password

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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) "SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) "AO" BAOC (Barr All Outgoing Calls) "OI" BOIC (Barr Outgoing International Calls) "OX" BOIC-exHC (Barr Outgoing International Calls except to Home Country)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	"AI" BAIC (Barr All Incoming Calls) "IR" BIC-Roam (Barr Incoming Calls when Roaming outside the home country) "FD" SIM card or active application in the UICC (GSM or USIM) fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>) "PN" Network Personalization "PU" Network subset Personalization "PP" Service Provider Personalization "PC" Corporate Personalization **<oldpwd>** String type containing the old password **<newpwd>** String type containing the new password **<pwdlength>** Length of password

6.10. +CREG Command: Network Registration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>]]** **OK**
Write command Syntax **AT+CREG=[<n>]**	Response **OK** or **+CME ERROR: <err>** 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>]]** **<stat>** 0 Not registered, ME is not currently searching a new operator to register to 1 Registered, home network 2 Not registered, but ME is currently searching a new operator to register to 3 Registration denied 4 Unknown 5 Registered, roaming

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

6.11. +CSSN Command: Supplementary Service Notification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CSSN=?**	Response **+CSSN:** (list of supported **<n>**s), (list of supported **<m>**s) **OK**
Read command Syntax **AT+CSSN?**	Response **+CSSN: <n>,<m>** **OK**
Write command Syntax **AT+CSSN=[<n>[,<m>]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<n>** 0 Disable +CSSI result code presentation status to the TE 1 Enable +CSSI result code presentation status to the TE **<m>** 0 Disable +CSSU result code presentation status to the TE 1 Enable +CSSU result code presentation status to the TE

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Unsolicited Notification	Response **+CSSI : <code1>[,<index>]** **+CSSU: <code2>[<index> [,<number>,<type>]]** Parameters **<code1>** 0 Unconditional call forwarding is active 1 Some of the conditional call forwarding are active 2 Call has been forwarded 3 Call is waiting 4 This is a CUG call (also <index> present) 5 Outgoing calls are barred 6 Incoming calls are barred 7 CLIR suppression rejected 8 Call has been deflected **<index>** 0 – 9 Index 10 No index (prefer to take from subscriber data) **<code2>** 0 This is a forwarded call (MT call setup) 1 This is a CUG call (<index> present) (MT call setup) 6 Forward check SS message received (can be received whenever) 8 Call has been connected with the other remote party in explicit call transfer operation (during an MT call setup) 9 This is a deflected call (MT call setup) 10 Additional incoming call forwarded **<number>** String type phone of format specified by <type> **<type>** Type of address octet in Integer format
Notes	<n> and <m> are saved in non-volatile memory per AT port over module reboot.

6.12. +CPLS Command: Select Preferred PLMN List

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CPLS=?**	Response **+CPLS:** (list of supported **<cpls_list>**s) **OK**
Read command Syntax **AT+CPLS?**	Response **+CPLS: <cpls_list>** **OK**
Write command Syntax **AT+CPLS= [<cpls_list>]**	Response **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	or **+CME ERROR: <err>** Parameter **<cpls_list>** 0 User controlled PLMN selector with access technology EFPLMNwAcT, but iff not found in the SIM/UICC, then the PLMN preferred list is EFPLMNsel 1 Operator controlled PLMN selector with access technology EFOPLMNwAcT 2 HPLMN selector with access technology EFHPLMNwAcT

6.13. +CEREG Command: EPS Network Registration Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CEREG=?**	Response **+CEREG:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CEREG?**	Response **+CEREG: <n>,<stat>[,<tac>,<ci>[,<AcT>]]** **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 unsolicited result code **+CEREG: <stat> [,<tac>,<ci>[,<AcT>]]** **<stat>** 0 Not registered, MT is not currently searching an operator to register to 1 Registered on the home network 2 Not registered, but MT is currently trying to attach or searching for an operator to register to 3 Registration denied 4 Unknown 5 Registered, roaming 8 Attached for emergency bearer services only (note that this is only available when <AcT> = 2,4,5,6 **<tac>** String type; two-byte tracking area code in hexadecimal format (e.g. “00C3” is equals to 195 in decimal)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<ci> String type; four-byte UTRAN/E-UTRAN cell ID in hexadecimal format **<AcT>** 2 UTRAN 4 UTRAN with HSDPA 5 UTRAN with HSUPA 6 UTRAN with HSDPA and HSUPA 7 E-UTRAN
Notes	<n> is saved in non-volatile memory per AT port over module reboot.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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
Notes	<mode> is saved in non-volatile memory over module reboot.

6.15. +KAAT Command: GPRS Automatic Attach

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

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690	
Test command Syntax **AT+KAAT=?**	Response **+KAAT:** (list of supported **<attach mode>**s) **OK**
Read command Syntax **AT+KAAT?**	Get current mode Response **+KAAT: <attach mode>** **OK**
Write command Syntax **AT+KAAT= <attach mode>**	Set attach mode Response **OK** Parameter **<attach mode>** 0 No GPRS automatic attach at switch on 1 GPRS automatic attach at switch on
Reference Sierra Wireless Proprietary	Notes • The write command is used to select the GPRS attach mode at ME switch on. • This AT command works with a SIM card. • <attach mode> is automatically stored in non-volatile memory.
Example	<start up with no SIM card> **AT+KAAT?** **+CME ERROR: 10** <Insert SIM card and reset> <default mode is GPRS automatic attach at switch on> **AT+KAAT?** **+KAAT: 1** **OK** **AT+CGATT?** **+CGATT: 1** **OK** <set no GPRS automatic attach at switch on> **AT+KAAT=0** **OK** **AT+CGATT?** **+CGATT: 1** **OK** <reset> **AT+CGATT?** **+CGATT: 0** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688 and HL7690	
	AT+KAAT? **AT+KAAT: 0** **OK** **AT+CGATT=1** **OK** **AT+CGATT?** **+CGATT: 1** **OK** <reset> **AT+KAAT?** **+KAAT: 0** **OK** **AT+CGATT?** **+CGATT: 0** **OK**

7. Phone Book Management

7.1. +CPBF Command: Find Phonebook Entries

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<glength> Integer type value indicating the maximum length of field <group> **<slength>** Integer type value indicating the maximum length of field <secondtext> **<elength>** Integer type value indicating the maximum length of field <email> **<hidden>** Indicates if the entry is hidden or not 0 Phonebook entry not hidden 1 Phonebook entry hidden
Notes	Execution command returns phonebook entries (from the current phonebook memory storage selected with +CPBS).

7.2. +CPBR Command: Read Current Phonebook Entries

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<adnumber> String type phone number of format <adtype> **<adtype>** Type of address octet in integer format **<secondtext>** String type field of maximum length <slength> **<email>** String type field of maximum length <elength> **<nlength>** Integer type value indicating the maximum length of field <number> **<tlength>** Integer type value indicating the maximum length of field <text> **<glength>** Integer type value indicating the maximum length of field <group> **<alength>** Integer type value indicating the maximum length of field <adnumber> **<slength>** Integer type value indicating the maximum length of field <secondtext> **<elength>** Integer type value indicating the maximum length of field <email>
Notes	• Optional parameters <nlength>, <tlength>, <glength>, <alength>, <slength>, <elength> are only applicable for 3G UICC. • Execution command returns phonebook entries in location number range <index1>...<index2> from the current phonebook memory storage selected with +CPBS.

7.3. +CPBS Command: Select Phonebook Memory Storage

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CPBS=?**	Response **+CPBS:** (list of supported **<storage>**s) **OK**
Read command Syntax **AT+CPBS?**	Response **+CPBS: <storage>[,<used>,<total>]** **OK** or **+CME ERROR:<err>**
Write command Syntax **AT+CPBS= <storage> [,<password>]**	Response **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	or **+CME ERROR:<err>** Parameters **<storage>** "FD" SIM/USIM fixdialing phonebook "LD" SIM/UICC last dialing phonebook (LD phonebook can't be deleted) "ON" SIM (or MT) own numbers (MSISDNs) list (reading of this storage may be available through +CNUM also) "SM" SIM/UICC phonebook (default) "BL" Blacklist phonebook (delete only) "EN" SIM emergency-call-codes phonebook (read only) "AP" Selected application phonebook "BN" SIM barred-dialing-number (EF_BDN) phonebook (only valid with PIN2) "SN" SIM service-dialing-number (EF_SDN) phonebook (read only) **<password>** String type value representing the PIN2-code required when selecting PIN2 code locked <storage>s above **<used>** Integer type value indicating the number of used locations in the selected memory **<total>** Integer type value indicating the total number of locations in the selected memory
Notes	Set command selects phonebook memory storage <storage>, which is used by other phonebook commands.

7.4. +CPBW Command: Write Phonebook Entry

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+CPBW=** **[<index>]** **[,<number>** **[,<type>[,<text>** **[,<group>** **[,<adnumber>** **[,<adtype>** **[,<secondtext>** **[,<email>** **[,<hidden>]]]]]]]]]**	Response **+CPBW: <written_index>** **OK** or **+CME ERROR: <err>** Parameters **<index>** Integer type values in the range of location numbers of phonebook memory **<number>** String type phone number of format <type> **<type>** Type of address octet in integer format; default value is 145 when dialing string includes international access code character "+"; otherwise, default value is 129 **<text>** String type field of maximum length <tlength> **<hidden>** Indicates if the entry is hidden or not – only available if a UICC with an active USIM application is present 0 Phonebook entry not hidden 1 Phonebook entry hidden **<group>** String type field of maximum length <glength> **<adnumber>** String type phone number of format <adtype> **<adtype>** Type of address octet in integer format **<secondtext>** String type field of maximum length <slength> **<email>** String type field of maximum length <elength> **<nlength>** Integer type value indicating the maximum length of field <number> **<tlength>** Integer type value indicating the maximum length of field <text> **<glength>** Integer type value indicating the maximum length of field <group> **<alength>** Integer type value indicating the maximum length of field <adnumber> **<slength>** Integer type value indicating the maximum length of field <secondtext> **<elength>** Integer type value indicating the maximum length of field <email>
Notes	• Optional parameters <nlength>, <tlength>, <glength>, <alength>, <slength>, <elength> are only applicable for 3G UICC. • Execution command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS.

7.5. +PBREADY URC: Phonebook Ready

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

8. SMS Commands

For other information regarding HL7618 and HL7618RD SMS commands, refer to section 1.5 SMS Commands.

8.1. Parameters Definition

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

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

8.1.1. Message Storage Parameters

<index> Integer type; value in the range of location numbers supported by the associated memory

<mem1> String type; memory from which messages are read and.or deleted (by commands +CMGL, +CMGR and +CMGD); defined values are as follows:

"BM"	Broadcast message storage
"ME"	ME message storage
"MT"	Any of the storages associated with ME
"SM"	(U)SIM message storage ; default value
"TA"	TA message storage
"SR"	Status report storage

<mem2> String type; memory to which writing and sending operations are made (commands Send Message from Storage +CMSS and Write Message to Memory +CMGW); refer <mem1> for defined values. Default value is “SM”.

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

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

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

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

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

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

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

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

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

8.1.2. Message Data Parameters

<ackpdu> RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without SC address field and parameter shall be bounded by double quote characters like a normal string type parameter.

<alpha> String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command +CSCS.

<cdata> Command data in text mode responses; ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).

<ct> Command type in integer format (default value = 0).

<da> Address value in string format. BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to command +CSCS). Type of address is given by <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 command +CSCS): ME/TA converts GSM alphabet into current TE character set
  - if TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7-bit default alphabet into two IRA character long hexadecimal number (e.g. character Π (GSM 7-bit default alphabet 23) is presented as 17 (IRA 49 and 55))
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that user data header indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

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

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

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

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

<mid> CBM Message Identifier in integer format

<mn> TP-Message-Number in integer format

<mr> Message reference in integer format

<oa>	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 command +CSCS); type of address given by <tooa>
<page>	CBM Page Parameter bits 4-7 in integer format
<pages>	CBM Page Parameter bits 0-3 in integer format
<pdu>	GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format In the case of CBS, TPDU in hexadecimal format
<pid>	Protocol identifier in integer format. Default value is 0
<ra>	Recipient address address value in string format; BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to command +CSCS); type of address is given by <tora>
<sca>	String value enclosed in quotes indicating the service center address. Note that BCD numbers are converted to characters; type of address is given by <tosca>
<scts>	Service centre time stamp in time-string format (refer to <dt>)
<sn>	CBM Serial Number in integer format
<st>	Status in integer format
<toda>	Type of address octet in integer format. Default value is 145 if the first character of <da> is “+”; otherwise, default value is 129
<tooa>	Originating address type of address octet in integer format (refer to <toda> for the default value)
<tora>	Recipient address type of address octet in integer format (refer to <toda> for the default value)
<tosca>	SC address type of address octet in integer format (refer to <toda> for the default value)
<vp>	Depending on SMS-SUBMIT <fo> setting: TP-Validity-Period either in integer format (default value = 167) or in time-string format (refer to <dt>)
<vp>	Validity period in either integer format (default value = 167) or in time-string format depending on <fo> settings
<dcs>	SMS Data Coding Scheme (default value = 0), or Cell Broadcast Data Coding Scheme in integer format
<dt>	Discharge time in time-string format “yy/MM/dd,hh:mm:ss+zz” where the characters indicate year, month, day, hour, minutes, seconds and time zone. For example, May 6, 1994, 10:10 pm GMT+2 hours is equals to “94/05/06,22:10:00+08”
<fo>	First octet of SMS-DELIVER, SMS-SUBMIT (default value = 17), SMS-STATUS-REPORT, or SMS-COMMAND (default value = 2) in integer format depending on command or result code

8.2. +CMGD Command: Delete Message

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+CMGD= <index> [,<delflag>]**	Response **OK** 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.

8.3. +CMGF Command: Set Message Format

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

8.4. +CMGL Command: List Messages

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 8.1 Parameters Definition.

8.5. +CMGR Command: Read Message

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CMGR=?**	Response **OK**

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

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 8.1 Parameters Definition.

8.6. +CMGS Command: Send Message

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** If PDU mode (+CMGF=0): **AT+CMGS= <length><CR> PDU is given <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>** Parameters For parameter information and values, refer to section 8.1 Parameters Definition.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 command Service Centre Address +CSCA is used; in this case the SMSC Type-of-Address octet shall not be present in the PDU, i.e. TPDU starts right after SMSC length octet. • Sending can be cancelled by giving <ESC> character. • <ctrl-Z> must be used to indicate the ending of PDU. • +CMGS: <mr>[,<scts>] is not available in +CMGS intermediate response as SMS is sent over IMS using 3GPP2 SMS PDU format and protocol.

8.7. +CMGW Command: Write Message to Memory

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 8.1 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 command +CMGS.

8.8. +CMSS Command: Send Message from Storage

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 8.1 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.

8.9. +CNMI Command: New Message Indication

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]**	Response **OK** or **+CMS ERROR: <err>** Parameters **<mode>** 0 Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE. 2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. **<mt>** 0 No indications are routed to the TE. 1 Result code is sent when ME does not have any other display device other than the AT interface 2 Acknowledgement command must be sent when +CSMS <service> = 1 and ME does not have any other display device other than the AT interface 3 Acknowledgement command must be sent when +CSMS <service> = 1 **<bm>** 0 No CBM indications are routed to the TE. 1 If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI: <mem>,<index> 2 New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled); or +CBM: <sn>,<mid>, <dcs>,<page>,<pages><CR><LF><data> (text mode enabled) 3 Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1 **<ds>** 0 No SMS-STATUS-REPORTs are routed to the TE. 1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: +CDS: <length><CR><LF><pdu> (PDU mode enabled) or +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>, <st> (text mode enabled) 2 If SMS-STATUS-REPORT is stored in ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CDSI: <mem>,<index> **<bfr>** 0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> = 1 – 3 is entered 1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> = 1 – 3 is entered
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: (0-2),(0-3),(0-3),(0-2),(0-1)** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	AT+CNMI? // Read command **+CNMI: 1,0,0,0,0** **OK**

8.10. +CSCB Command: Select Cell Broadcast Message Type

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CSCB=?**	Response **+CSCB:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CSCB?**	Response **+CSCB: <mode>,<mids>,<dcss>** **OK**
Write command Syntax **AT+CSCB= [<mode> [,<mids>]]**	Response **OK** or **+CMS ERROR: <err>** Parameters **<mode>** 0 Accepts messages that are defined in <mids> and <dcss> 1 Does not accept messages that are defined in <mids> and <dcss> **<mids>** String type; combinations of CBM message IDs (e.g. "0,1,5,320-478,922"). Default value is an empty string.The number of ranges in <mids> parameter string is limited to 6. Note that intervals are not allowed. **<dcss>** String type; all different possible combinations of CBM data coding schemes. Default value is an empty string.

8.11. +CSCA Command: Service Center Address

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CSCA=?**	Response **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 8.1 Parameters Definition.

8.12. +CSMP Command: Set Text Mode Parameters

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CSMP=?**	Response **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 8.1 Parameters Definition.

8.13. +CSMS Command: Select Message Service

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

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

8.14. +CPMS Command: Preferred Message Storage

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CPMS=?**	Response **+CPMS:** (list of supported **<mem1>**s), (list of supported **<mem2>**s), (list of supported **<mem3>**s) **OK**
Read command Syntax **AT+CPMS?**	Response **+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>** **OK** or **+CMS ERROR: <err>**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 8.1 Parameters Definition.
Notes	<mem1>, <mem2> and <mem3> are saved in non-volatile memory over module reboot.

8.15. +CSDH Command: Show Text Mode Parameters

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

HL7618, HL7618RD, HL7648, HL7688, HL7690 and HL7692	
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>** 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 result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata> 1 Show values in result codes

8.16. +XCMGS3GPP2 Command: Send 3GPP2 SMS Message

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

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+ XCMGS3GPP2=?**	Response **OK**
Write command Syntax **AT+ XCMGS3GPP2= <length> <message_type> <CR> PDU is given <ctrl-Z/ESC>**	Response If sending is successful: **OK** If sending fails: **+CMS ERROR: <err>** Parameters **<length>** Indicates the number of total octets coded in the PDU to be given **<message_type>** 0 Invalid 1 Point to Point 2 Acknowledge 3 Broadcast
Notes	• Entered text should be formatted as follows: ▪ PDU should be in hexadecimal format and given in one continuous line; the ME/TA converts this coding into the actual octets of PDU. ▪ Sending can be called by giving the <ESC> character during input. ▪ <ctrl-Z> must be used to indicate the ending of PDU. • AT+CMGF has no impact on this command. • This command returns error when SMS over IP network option is not set.

8.17. +XCMT3GGP2 Command: Enable or Disable the 3GPP2 MT SMS URC

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

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+XCMT3GPP2 =?**	Response **+XCMT3GPP2: (**list of supported **<n>**s**)** **OK**

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+XCMT3GPP2 =<n>**	Response **OK** or **+CMS ERROR: <err>** Parameters **<length>** Indicates the number of total octets coded in the PDU to be given **<n>** Type of 3GPP2 message 0 Disable URC 1 Enable URC
Unsolicited Notification	Response **+XCMT3GPP2: <length><CR><LF><PDU data>** Parameters **<length>** Indicates the number of total octets coded in the PDU to be given **<PDU data>** PDU data in 3GPP2 format
Notes	If XCMT3GPP2 URC is enabled, then unsolicited result codes are buffered in the TA when the TA-TE link is reserved (e.g. in online data mode) and flushed to the TE after reservation. Otherwise, they are forwarded directly to the TE.

9. Audio Commands

9.1. +KPCMCFG Command: Configure PCM Digital Audio

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KPCMCFG=?**	Response For the HL7618, HL7618RD, HL7688, HL7690 and HL7695: **+KPCMCFG: (**list of supported **<Mode>**s**), (**list of supported **<SamplingCtrl>**s**),** **(**list of **<BitClk>**s**)** **OK** For the HL7648 and HL7650: **+KPCMCFG: (**list of supported **<Mode>**s**), (**list of supported **<SamplingCtrl>**s**),** **(**list of **<BitClk>**s**),(**list of **<SampleRate>**s**)**
Read command Syntax **AT+KPCMCFG?**	Response For the HL7618, HL7618RD, HL7688, HL7690 and HL7695: **+KPCMCFG: <Mode>,<SamplingCtrl>,<BitClk>** **OK** For the HL7648 and HL7650: **+KPCMCFG: <Mode>,<SamplingCtrl>,<BitClk>,<SampleRate>** **OK**
Write command Syntax For the HL7618, HL7618RD, HL7688, HL7690 and HL7695: **AT+KPCMCFG =<Mode> [,<SamplingCtrl> [,<BitClk>]]** For the HL7648 and HL7650: **AT+KPCMCFG =<Mode> [,<SamplingCtrl> [,<BitClk> [,<SampleRate>]]]**	Response **OK** Parameters **<Mode>** PCM mode 0 Master 1 Slave **<SamplingCtrl>** Sampling clock edge control 0 Falling edge 1 Rising edge **<BitClk>** PCM bit clock 0 256 kHz 1 384 kHz 2 512 kHz **<SampleRate>** PCM sample rate 0 8kS/s 1 16kS/s This parameter is only available on the HL7648 and HL7650

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference Sierra Wireless Proprietary	Notes • Settings will take effect immediately; no reset is required. • Parameters are saved and kept after reset. • This command can be used without a SIM. • The sampling rate is fixed at 8 kS/s for the HL7618, HL7618RD, HL7688, HL7690 and HL7692. • Only 16-but linear PCM mode is supported. A-law and μ-law compression modes are not supported. • Only long frame sync is supported. • In slave mode, the acceptable PCM clock is also determined by <BitClk>.

Examples	// Example using an HL7618 module:
	AT+KPCMCFG? //Shows the current configuration
	+KPCMCFG: 0,1,2 //Master mode, rising edge and PCM clock is 512 kHz
	OK
	
	AT+KPCMCFG=1,0
	//Switch to slave mode with falling edge latched. As parameter <BitClk> is omitted, the old
	//<BitClk> value will be used in the new configuration.
	OK
	
	AT+KPCMCFG?
	+KPCMCFG: 1,0,2 //Slave mode, falling edge and PCM clock is 512 kHz
	OK
	
	AT+KPCMCFG=0,1 //Turn back to master mode and rising edge latched
	OK
	
	AT+KPCMCFG?
	+KPCMCFG: 0,1,2
	OK
	
	// Example using an HL7648 module:
	AT+KPCMCFG? //Shows the current configuration
	+KPCMCFG: 0,1,2,0 //Master mode, rising edge, PCM clock is 512 kHz and PCM
	//sample rate is 8kS/s
	OK
	
	AT+KPCMCFG=1,0 //Turn to slave mode and falling edge latched. As
	//parameter <BitClk> and <SampleRate> are omitted, old
	//<BitClk> and <SampleRate> values will be used in the new
	//configuration.
	OK
	
	AT+KPCMCFG?
	+KPCMCFG: 1,0,2,0 //Slave mode, falling edge, PCM clock is 512 kHz and PCM
	//sample rate is 8kS/s
	OK
	
	AT+KPCMCFG=0,1 //Turn back to master mode and rising edge latched.
	OK
	
	AT+KPCMCFG?
	+KPCMCFG: 0,1,2,0
	OK

9.2. +WMAUDIOLOOP Command: Audio Test

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+ WMAUDIOLOOP =?**	Response **+WMAUDIOLOOP: (**list of supported **<ENABLE>**s**),(**list of supported **<TXORGAN>**s**),** (list of supported **<RXORGAN>**s**)** **OK**
Read command Syntax **AT+ WMAUDIOLOOP ?**	Response **+WMAUDIOLOOP: <ENABLE>[,<TXORGAN>,<RXORGAN>]** **OK** Note that parameters <TXORGAN> and <RXORGAN> are only available if <ENABLE>=1.
Write command Syntax **AT+ WMAUDIOLOOP =<ENABLE>, <TXORGAN>, <RXORGAN>**	Response **OK** Error Case **+CME ERROR: 4** (when a non-supported <TXORGAN> or <RXORGAN> is used) Parameters **<ENABLE>** 0 Stop the audio loop test 1 Execute the audio loop **<TXORGAN>** Audio input used as reference for the audio loop 0 PCM in 1 Reserved **<RXORGAN>** Audio output used to loop the audio input 0 PCM out 1 Reserved
Reference Sierra Wireless Proprietary	Notes Audio loop activation involves some restructions on the use of other AT commands: • It must not be enabled when: ▪ Communications is active ▪ A tone is under generation • It must be disabled (if active) before opening up communications. • Tone generation and sidetone modifications are not possible when the audio loop is active.
Examples	**AT+WMAUDIOLOOP=?** **+WMAUDIOLOOP: (0-1),(0-1),(0-1)** **OK** **AT+WMAUDIOLOOP?** **+WMAUDIOLOOP: 0** **OK** **AT+WMAUDIOLOOP=1,0,0** **OK** //Started audio loop

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

9.3. +CLVL Command: Loudspeaker Volume Level

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+CLVL=?**	Response **+CLVL: (**list of supported <**level**>s**)** **OK**
Read command Syntax **AT+CLVL?**	Response **+CLVL: <level>** **OK**
Write command Syntax **AT+CLVL= <level>**	Response **OK** Parameter **<level>** 1 – 10 Loudspeaker level (smallest value represents the lowest sound level)
Reference [27.007] § 8.23	Notes The value of <level> is not saved; it will return to its nominal value after the module is reset.
Examples	**AT+CLVL=?** **+CLVL: (1-10)** **OK** **AT+CLVL?** **+CLVL: 8** **OK** **AT+CLVL=1** //Turn to the lowest volume level **OK** **AT+CLVL=10** //Turn to the loudest volume level **OK**

9.4. +KECHO Command: Echo Cancellation

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

HL7648, HL7650, HL7688 and HL7692	
Test command Syntax **AT+KECHO=?**	Response **+KECHO: (**list of supported <**mode**>s**),(**list of supposted **<param>**s**)** **OK**
Read command Syntax **AT+KECHO?**	Response **+KECHO: <status>,<param_1>,…,<param_n>** **OK**
Write command Syntax **AT+KECHO= <mode> [,<param_1>,…, <param_n>]**	Response **OK** Parameter **<mode>** 0 Deactivate echo cancellation 1 Activate echo cancellation **<status>** Echo cancellation status 0 Deactivated 1 Activated **<param_n>** • NLMSTaps_band_x stands for number of LMS (Least Mean Squares) filter taps in frequency band x. • Parameters should be bounded by the follow constrain. • NLMSTaps_band_0 + 2*(NLMSTaps_band_1+...+ NLMSTaps_band_5) < 2000 **#** **Name** **Range** **Default Handset Profile** 1 <NLMSTaps_band_0> 2-1096 100 2 <NLMSTaps_band_1> 1-548 100 3 <NLMSTaps_band_2> 1-548 100 4 <NLMSTaps_band_3> 1-994 2 5 <NLMSTaps_band_4> 1-994 2 6 <NLMSTaps_band_5> 1-994 2 7 <NLMS_Block_Length> 1, 2, 4, 5, 8 1
Reference Sierra Wireless Proprietary	Notes • Settings will take effect immediately. • Parameters are saved and kept after reset. • This command can be used without a SIM card.
Examples	**AT+KECHO?** //Shows the current configuration **+KECHO: 1,100,100,100,1,1,1,2** **OK** **AT+KECHO=0** //Turn off the echo cancellation **OK**

HL7648, HL7650, HL7688 and HL7692	
	AT+KECHO? **+KECHO: 0,100,100,100,1,1,1,2** //Echo cancellation is deactivated **OK** **AT+KECHO=1,150,100,100,1,1,1,2** //Activate echo cancellation again and modify //param_0 to 150 **+KECHO: 1,150,100,100,1,1,1,2** //The algorithm is activated again with new //parameters **OK** **AT+CFUN=1,1** **OK** **AT+KECHO?** **+KECHO: 1,150,100,100,1,1,1,2** //Parameters are retained after reset **OK**

9.5. +KNOISE Command: Echo Suppression

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+KNOISE=?**	Response **+KNOISE: (**list of supported **<rx_mode>**s**), (**list of supported **<tx_mode>**s**),** **(**list of supported **<rx_param_1>**s**),…,(**list of supported **<rx_param_5>**s**),** **(**list of supported **<tx_param_1>**s**),…,(**list of supported **<tx_param_5>**s**)** **OK**
Read command Syntax **AT+KNOISE?**	Response **+KNOISE: <rx_status>,<tx_status>,<rx_param_1>,...,<rx_param_5>, <tx_param_1>,…,<tx_param_5>** **OK**
Write command Syntax **AT+KNOISE= <rx_mode>, <tx_mode> [,<rx_param_1>, …,<rx_param_5>, <tx_param_1,…, <tx_param_5>]**	Response **OK** Parameters **<rx_mode>** Receive mode 0 Deactivate downlink noise suppression 1 Activate downlink noise suppression **<tx_mode>** Transmit mode 0 Deactivate uplink noise suppression 1 Activate uplink noise suppression

HL7648, HL7688 and HL7692	
	<rx_status> Receive noise suppression status 0 Deactivated 1 Activated **<tx_status>** Transmit noise suppression status 0 Deactivated 1 Activated **<rx_param_1>** 0-65535 Minimum attenuation Default handset profile value = 6000 **<rx_param_2>** 0-65535 Over-estimation factor for band 0 Default handset profile value = 8000 **<rx_param_3>** 0-65535 Over-estimation factor for all other bands Default handset profile value = 8000 **<rx_param_4>** 0-65535 Exponent factor of the NR Default handset profile value = 1000 **<rx_param_5>** 0-65535 Over-estimation factor for all other bands Default handset profile value = 19660 **<tx_param_1>** 0-65535 Minimum attenuation Default handset profilevalue = 6000 **<tx_param_2>** 0-65535 Over-estimation factor for band 0 Default handset profile value = 8000 **<tx_param_3>** 0-65535 Over-estimation factor for all other bands Default handset profile value = 8000 **<tx_param_4>** 0-65535 Exponent factor of the NR Default handset profile value = 1000 **<tx_param_5>** 0-65535 Over-estimation factor for all other bands Default handset profile value = 19660
Reference Sierra Wireless Proprietary	Notes • Settings will take effect immediately • Parameters are saved and kept after reset • This command can be used without a SIM card
Examples	**AT+KNOISE=?** **+KNOISE: (0-1),(0-1),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535)** **OK** **AT+KNOISE?** //Shows the current configuration **+KNOISE: 1,1,6000,8000,8000,1000,19660, 6000,8000,8000,1000,19660** **OK** **AT+KNOISE=0,0** //Disable uplink and downlink noise suppression **OK**

HL7648, HL7688 and HL7692	

	AT+KNOISE=1,1,6500,8000,8000,1000,19660, 6800,8000,8000,1000,19660
	//Enable uplink and downlink noise suppression with new parameters
	OK
	
	AT+CFUN=1,1
	OK
	
	AT+KNOISE?
	+KNOISE: 1,1,6500,8000,8000,1000,19660, 6800,8000,8000,1000,19660
	//Parameters are retained after reset
	OK

9.6. +KPC Command: Peak Compressor

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+KPC=?**	Response **+KPC: (**list of supported **<rx_mode>**s**), (**list of supported **<tx_mode>**s**)** **OK**
Read command Syntax **AT+KPC?**	Response **+KPC: <rx_mode>,<tx_mode>** **OK**
Write command Syntax **AT+KPC=** **<rx_mode>,** **<tx_mode>**	Response **OK** Parameters **<rx_mode>** 0 Disable 1 Enable **<tx_mode>** 0 Disable 1 Enable
Reference Sierra Wireless Proprietary	Notes • Settings will take effect immediately. • Parameters are saved and kept after reset. • This command can be used without a SIM card.
Examples	**AT+VIP?** //Check the current audio profile **+VIP: 0** **OK** **AT+KPC=?** **+KPC: (0-1),(0-1)** **OK**

HL7648, HL7688 and HL7692	
	AT+KPC? //Shows the current value **+KPC: 0,0** **OK** **AT+KPC=1,0** //Activate the rx peak compressor **OK** **AT+KPC?** **+KPC: 1,0** **OK** **AT+VIP=1** //Switch to headset profile **OK** **AT+KPC?** **+KPC: 0,0** //Peak compressor status is different in different audio profiles **OK**

9.7. +KST Command: Side Tone

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+KST=?**	Response **+KST: (**list of supported **<level>**s**)** **OK**
Read command Syntax **AT+KST?**	Response **+KST: <level>** **OK**
Write command Syntax **AT+KST=<level>**	Response **OK** Parameters **<level>** 0 – 16 Side tone value (side tone gain from -14 dB to +18 dB in steps of 2) 20 Disable sidetone
Reference Sierra Wireless Proprietary	Notes • Settings will take effect immediately. • Parameters are saved and kept after reset. • This command can be used without a SIM card.

HL7648, HL7688 and HL7692	
Examples	**AT+KST=?** **+KST: (0-16, 20)** **OK** **AT+KST?** //Shows the current value **+KST: 8** **OK** **AT+KST=0** //Set side tone gain to -14dB **OK** **AT+KST=20** //Disable side tone **OK** **AT+CFUN=1,1** **OK** **AT+KST?** **+KST: 20** //Parameters are retained after reset **OK**

9.8. +KVGR Command: Receive Gain Selection

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+KVGR=?**	Response **+KVGR: (**list of supported **<n>**s**)** **OK**
Read command Syntax **AT+KVGR?**	Response **+KVGR: <n>** **OK**
Write command Syntax **AT+KVGR=<n>**	Response **OK** Parameters **<n>** -21 to 6 Digital gain of the downlink path in dB. Default value = 0
Reference Sierra Wireless Proprietary	Notes • The value of <n> is not saved; it will return to its nominal value after the module is reset. • <n> can be specified with or without quotes. • Gain can be changed either during a connection or outside of a connection.

HL7648, HL7688 and HL7692	
Examples	**AT+KVGR="-21"** //Receive gain is set to 21dB less than the nominal gain **OK** **AT+KVGR="-22"** //Input is out of range **ERROR** **AT+KVGR="6"** //Receive gain is set to 6dB more than the nominal gain **OK** **AT+KVGR="7"** //Input is out of range **ERROR** **AT+VGR=87** //Receive gain is set to -20.5dB less than the nominal gain by +VGR **OK** **AT+KVGR?** //+KVGR response truncates the decimal part of the actual gain **+KVGR: -20** **OK**

9.9. +KVGT Command: Transmit Gain Selection

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+KVGT=?**	Response **+KVGT: (**list of supported **<n>**s**)** **OK**
Read command Syntax **AT+KVGT?**	Response **+KVGT: <n>** **OK**
Write command Syntax **AT+KVGT=<n>**	Response **OK** Parameters **<n>** -21 to 6 Digital gain of the uplink path in dB. Default value = 0
Reference Sierra Wireless Proprietary	Notes • The value of <n> is not saved; it will return to its nominal value after the module is reset. • <n> can be specified with or without quotes. • Gain can be changed either during a connection or outside of a connection.

HL7648, HL7688 and HL7692	
Examples	**AT+KVGT="-21"** //Transmit gain is set to 21dB less than the nominal gain **OK** **AT+KVGT="-22"** //Input is out of range **ERROR** **AT+KVGT="6"** //Transmit gain is set to 6dB more than the nominal gain **OK** **AT+KVGT="7"** //Input is out of range **ERROR** **AT+VGT=87** //Transmit gain is set to -20.5dB less than the nominal gain by +VGT **OK** **AT+KVGT?** //+KVGT response truncates the decimal part of the actual gain **+KVGT: -20** **OK**

9.10. +VGR Command: Receive Gain Selection

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+VGR=?**	Response **+VGR: (**list of supported **<n>**s**)** **OK**
Read command Syntax **AT+VGR?**	Response **+VGR: <n>** **OK**
Write command Syntax **AT+VGR=<n>**	Response **OK** Parameters **<n>** 86 ≤ n ≤ 140 < 128 (128 – n)/2 dB less than the normal gain (up to -21 dB) 128 Nominal gain > 128 (n – 128)/2 dB more than the nominal gain (up to 6 dB)
Reference [27.007] § C.2.5	Notes • The value of <n> is not saved; it will return to its nominal value after the module is reset. • Gain can be changed either during a connection or outside of a connection. • This command returns an error when the requested value is out of range (-21 dB to 6 dB).

HL7648, HL7688 and HL7692	
Examples	**AT+VGR=86** //Receive gain is set to 21 dB less than the nominal gain **OK** **AT+VGR=85** //Input is out of range **ERROR** **AT+VGR=140** //Receive gain is set to 6 dB more than the nominal gain **OK** **AT+VGR=141** //Input is out of range **ERROR**

9.11. +VGT Command: Transmit Gain Selection

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+VGT=?**	Response **+VGT: (**list of supported **<n>**s**)** **OK**
Read command Syntax **AT+VGT?**	Response **+VGT: <n>** **OK**
Write command Syntax **AT+VGT=<n>**	Response **OK** Parameters **<n>** 86 ≤ n ≤ 140 < 128 (128 – n)/2 dB less than the normal gain (up to -21 dB) 128 Nominal gain > 128 (n – 128)/2 dB more than the nominal gain (up to 6 dB)
Reference [27.007] § C.2.5	Notes • The value of <n> is not saved; it will return to its nominal value after the module is reset. • Gain can be changed either during a connection or outside of a connection. • This command returns an error when the requested value is out of range (-21 dB to 6 dB).
Examples	**AT+VGT=86** //Transmit gain is set to 21 dB less than the nominal gain **OK** **AT+VGT=85** //Input is out of range **ERROR**

HL7648, HL7688 and HL7692	
	AT+VGT=140 //Transmit gain is set to 6 dB more than the nominal gain **OK** **AT+VGT=141** //Input is out of range **ERROR**

9.12. +VIP Command: Initialize Voice Parameters

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+VIP=?**	Response **+VIP: (**list of **<profile>**s**),(**list of supported **<persistence>**s**)** **OK**
Read command Syntax **AT+VIP?**	Response **+VIP: <profile>,<persistence>** **OK**
Write command Syntax **AT+VIP=<profile> [,<persistence>]**	Response **OK** Parameters **<profile>** Audio profile 0 Handset 1 Headset 2 Handsfree + back speaker 5 TTY 23 Basic (no specific transducer defined) **<persistence>** Persistence of <profile> after a call is disconnected 0 <profile> will be reset to 0 1 <profile> will not be reset to 0
Reference [27.007] § C.2.6	Notes • This command can be used without a SIM card. • <profile> takes effect in the next call. • When <persistence>=0, <profile> is automatically returned to its default value after a call is disconnected. • Parameters are not saved in non-volatile memory.
Examples	**AT+VIP?** //Shows the current configuration **+VIP: 0,0** **OK** **AT+VIP=1** //Turn to headset profile **OK**

HL7648, HL7688 and HL7692	
	AT+VGT=140 //Transmit gain of headset profile is changed to 140 **OK** **AT+VIP=0** //Turn to handset profile **OK** **AT+VGT?** //Transmit gain of handset profile is still 128 **+VGT: 128** **OK**

9.13. +CODECINFO Command: Display Audio Codec Information

Note: For HL7688 and HL7692 only.

HL7688 and HL7692	
Test command Syntax **AT+CODECINFO =?**	Response **+CODECINFO: (**list of supported **<MODE>**s**)** **OK**
Read command Syntax **AT+CODECINFO ?**	Response **+CODECINFO: <MODE>** **OK**
Write command Syntax **AT+CODECINFO =<MODE>**	Response **OK** Parameter **<MODE>** 0 Disable codec info unsolicited message 1 Enable codec info unsolicited message
Reference Sierra Wireless Proprietary	Notes • <MODE> is stored in non-volatile memory immediately when a valid write command is entered, and retained after reset. • <MODE> is effective without a reset. • This command can be used without a SIM card. • If <MODE> = 1, +CODECINFO: x unsolicited message will be displayed in the format below: +CODECINFO: 0 GSM_FR +CODECINFO: 1 GSM_HR +CODECINFO: 2 GSM_EFR +CODECINFO: 3 FR_AMR +CODECINFO: 4 HR_AMR +CODECINFO: 5 UMTS_AMR +CODECINFO: 6 UMTS_AMR2 +CODECINFO: 10 UMTS_AMR_WB

HL7688 and HL7692	
Examples	**AT+CODECINFO=?** // Read available options **+CODECINFO: (0-1)** **OK** **AT+CODECINFO=1** **OK** **AT+CODECINFO?** // Read current setting **+CODECINFO: 1** **OK** **RING** // An incoming call **+CODECINFO: 10** // UMTS_AMR_WB is chosen

9.14. +KSRAP Command: Save or Restore Audio Parameters

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+KSRAP=?**	Response **+KSRAP: (**list of supported **<level>**s**)** **OK**
Write command Syntax **AT+KSRAP= <level>**	Response **OK** Parameter **<level>** 2 Restore audio parameters in non-volatile memory to their default values
Reference Sierra Wireless Proprietary	Notes This command changes the values in the non-volatile memory immediately; settings take effect in the next speech call.
Example	**at+ksrap** **ERROR** **at+ksrap?** **ERROR** **at+ksrap=?** **+KSRAP: (2)** **OK** **at+kecho?** // Current kecho NVM parameters **+KECHO: 0,100,100,100,2,2,2,1** **OK**

HL7648, HL7688 and HL7692	
	at+kecho=1,103,102,101,4,3,2,1 // Change kecho NVM parameters by at+kecho **+KECHO: 1,103,102,101,4,3,2,1** **OK** **at+cfun=1,1** **OK** **at+kecho?** // kecho NVM parameters are modified **+KECHO: 1,103,102,101,4,3,2,1** **OK** **at+ksrap=2** // By ksrap=2, default kecho parameters in NVM // are restored **OK** **at+kecho?** **+KECHO: 0,100,100,100,2,2,2,1** **OK**

9.15. +WVR Command: Voice Codec Selection

Note: For HL7688 and HL7692 only.

HL7688 and HL7692	
Test command Syntax **AT+WVR=?**	Response **+WVR: (**list of supported **<aud_coding_type_2G>**s**),(**list of supported **<aud_coding_type_3G>**s**)** **OK**
Read command Syntax **AT+WVR?**	Response **+WVR: <aud_coding_type_2G>,<aud_coding_type_3G>** **OK**
Write command Syntax **AT+WVR=** **[<aud_coding_type_2G>]** **[,<aud_coding_type_3G>]**	Response **OK** Parameters **<aud_coding_type_2G>** Supported 2G types (not supported) 5 FR, EFR, HR, AMR-FR, AMR-HR **<aud_coding_type_3G>** Supported 3G types 3 UMTS AMR v2 4 UMTS AMR v2, UMTS, AMR-WB

HL7688 and HL7692	
Reference Sierra Wireless Proprietary	Notes • This command allows the configuration of supported 3G voice codecs of the device; although the final codec decision is actually made by the network. No call would be established and no sound would be heard if the list of supported codecs set in the device does not match the network's. (Note that 2G voice codecs are not supported in the HL7588.) • <aud_coding_type_2G> has no effect in the HL7588 as it is not supported. • Parameters are stored in non-volatile memory immediately when a valid write command is entered. • This command can be used without a SIM card.
Example	**AT+WVR=?** // Read the available options **+WVR: (5),(3-4)** **OK** **AT+WVR=,3** // Set 3G codec as UMTS AMR v2, 2G codec is skipped as only 3G // codecs available **OK** **AT+WVR?** // Read the current setting **+WVR: 5,3** **OK**

9.16. +VTD Command: Tone Duration

Note: For HL7688 and HL7692 only.

HL7688 and HL7692	
Test command Syntax **AT+VTD=?**	Response **+VTD:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+VTD?**	Response **+VTD: <n>** **OK**
Write command Syntax **AT+VTD=<n>**	Response **OK** Parameter **<n>** 0 Default setting (default duration of the tone is 7/10 second) 1 – 100 Duration of the tone in 1/10 seconds

HL7688 and HL7692	
Reference [27.007] § C.2.12	Notes The network shall ensure that the minimum length of tone and the minimum gap between two subsequent tones (according to ETR 206) is achieved. (In ETR 206 the minimum duration of a DTMF tone is 70ms ± 5ms, the minimum gap between DTMF tones is 65ms). There is no defined maximum length to the tone; however, the operator may choose to put a pre-defined time limit on the duration of tones sent to line (refer to [23.014]). That means that with n<6, DTMF will be generated with a duration given by the network.

9.17. +VTS Command: DTMF and Tone Generation

Note: For HL7648, HL7688 and HL7692 only.

HL7648, HL7688 and HL7692	
Test command Syntax **AT+VTS=?**	Response **+VTS:** (list of supported **<DTMF>**s) **OK**
Write command Syntax **AT+VTS= "<DTMF>$_1$, <DTMF>$_2$, …, <DTMF>$_n$"** or **AT+VTS= "{<DTMF>$_1$, <DURATION>$_1$}, {<DTMF>$_2$, <DURATION>$_2$}, … {<DTMF>$_n$, <DURATION>$_n$}"**	Response **OK** Parameters **<DTMF>** A single ASCII character in the set 0 – 9, #, *, A – D. This is interpreted as a single ACSII character whose duration is set by the +VTD command. DTMF tones can only be issued during a voice call. **<DURATION>** This is interpreted as a DTMF tone of different duration from that mandated by the +VTD command. In GSM, this only operates in voice mode. Values are in 1/10 second multiples.
Reference [27.007] § C.2.11	Notes The network shall ensure that the minimum length of tone and the minimum gap between two subsequent tones (according to ETR 206) is achieved. (In ETR 206 the minimum duration of a DTMF tone is 70ms ± 5ms, the minimum gap between DTMF tones is 65ms). There is no defined maximum length to the tone, however, the operator may choose to put a pre-defined time limit on the duration of tones sent to line (refer to [23.014]). That means that with n<6, DTMF will be generated with a duration given by the network

10. Packet Domain Commands

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

10.1. +CGATT Command: PS Attach or Detach

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

10.2. +CGACT Command: Activate or Deactivate PDP Context

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

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

10.3. +CGANS Command: PDP Context Activation Manual Response

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Notes	• Commands following the +CGANS command in the AT command line shall not be processed by the MT. • If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.250 online data state. If no <cid> is given or if there is no matching context definition, the MT will attempt to activate the context using the values for PDP type and PDP address provided by the network, together with any other relevant information known to the MT. The other context parameters will be set to their default values. • If the activation is successful, data transfer may proceed. Note that this is not the same as if the MT issues a +CGDATA (or +CGACT) command after receiving a +CRING unsolicited result code. +CGDATA (or +CGACT) does not command the MT to acknowledge the network request but rather to make a new request for context activation. The network request would be ignored.

10.4. +CGCMOD Command: Modify PDP Context

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

10.5. +CGTFT Command: Traffic Flow Template

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	[<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>** **[...]]**
Write 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> [,<flow label (ipv6)>, <direction>]]]]]]]]]]**	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 **<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.’

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<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)
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 of the packet filters in the TFT for context number <cid> to become undefined.

10.6. +CGCLASS Command: GPRS Mobile Station Class

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGCLASS=?**	Response **+CGCLASS:** (list of supported **<class>**es) **OK**
Read command Syntax **AT+CGCLASS?**	Response **+CGCLASS: <class>** **OK**
Write command Syntax **AT+CGCLASS= [<class>]**	Response **OK** or **ERROR** Parameters **<class>** Mode of operation “A” Class A “B” Class B “CG” Class C in GPRS mode “CC” Class C in circuit switched mode
Notes	<class> is saved in non-volatile memory over module reboot.

10.7. +CGDCONT Command: Define PDP Context

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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**
Read command Syntax **AT+CGDCONT?**	Response **[+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp> [,<IPv4AddrAlloc>[,<emergency_indication>[,<PCSCF_discovery> [,<IM_CN_Signalling_Flag_Ind>]]]]]** **[<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp>[,<IPv4AddrAlloc>[,<emergency_indication>[,<PCSCF_discovery> [,<IM_CN_Signalling_Flag_Ind>]]]]]** **[...]]** **OK**
Write command Syntax **AT+CGDCONT= [<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp> [,<IPv4AddrAlloc >[,<emergency_ indication> [,<PCSCF_ discovery> [,<IM_CN_ Signalling_Flag_ Ind>]]]]]]]]]**	Response **OK** or **ERROR** Parameters **<cid>** PDP Context Identifier. A numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of the permitted values (minimum value = 1) is returned by the test command. **<PDP_type>** Packet Data Protocol type "IP" Internet Protocol "IPV6" Internet Protocol, version 6 "IPV4V6" Virtual <PDP_type>introduced to handle dual IP stack UE capability **<APN>** Access Point Name String parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. **<PDP_address>** String parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the command +CGPADDR command.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	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) **<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
Notes	• If the command is used only with the one parameter <cid>, it means that the corresponding PDP context becomes undefined. • The APN Control List (ACL) will only be checked if a USIM is inserted. Before performing context definition it will check if the ACL-service is enabled and activated. If yes, all APNs from ACL of EF-ACL of the USIM will be read out and compared with the requested APN. ▪ If the requested APN is listed in the ACL, the context definition will be performed. ▪ If the requested APN is empty ("") and ACL contains "network provided APN", the context definition will also be requested. ▪ If the APN is not listed in the ACL the command returns error. ▪ If the ACL-service is not enabled or not activated in the USIM or a GSM-SIM is inserted the context definition will be performed without any checks. • Parameters are saved in non-volatile memory over module reboot.

10.8. +CGDSCONT Command: Define Secondary PDP Context

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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**
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**
Write 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)

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<IM_CN_Signalling_Flag_Ind> Numeric parameter used to indicate whether the PDP context is for IM CN subsystem related signaling only or not 0 UE indicates that the PDP context is not for IM CN subsystem-related signaling only 1 UE indicates that the PDP context is for IM CN subsystem-related signaling only

10.9. +CGDATA Command: Enter Data State

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

10.10. +CGED Command: GPRS Cell Environment

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

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

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+CGED?**	Response **+CGED: <mode>** **OK**
Write command Syntax **AT+CGED= [<mode>]**	Response If UMTS is not supported: **+CGED:** **Service-Cell:** **<MCC>,<MNC>,<LAC>,<CI>,<BSIC>,<AcT>** **Equivalent PLMNs :** **<MCC>,<MNC>** **<MCC>,<MNC>** **<arfcn>,<RxLevServ>,<RfChannels>,<Arfcn_ded>,<RxLevFull>,<RxLevSub>, <RxQualFull>,<RxQualSub>,GSM-<ciphering>,** **GPRS Ciphering Algorithm: GEA<gprs_ciphering>,<ms_txpwr>,<rx_acc_min>,<cbq>, <cba>,<c2_valid>,<cr_offset>,<tmp_offset>,<penalty_t>,<c1>,<c2>,<ch_type>, <ch_mode>,<txpwr>,<dtx_used>,<dtr_used>,<t3212>,<acc>,<t_adv>,<bs_pa_mfrms>, <dsc>,<rll>,<amr_acs>,<amr_cod_ul>,<amr_cod_dl>,<amr_c_i>,** **BEP GMSK: <mean_bep_gmsk>,<cv_bep_gmsk>,** **BEP 8PSK: <mean_bep_8psk>,<cv_bep_8psk>,** **Neighbour Cell <n>:** **<MCC>,<MNC>,<LAC>,<CI>,<BSIC>,<arfcn>,<RxLev><C1_nc>,<C2_nc>** *Note: Neighbour cell content may be repeated up to 6 times.* **GPRS Parameters :** **<GPRS_sup>,<RAC>,<Split_Pg_Cycle>,<NCO>,<NOM>,<T3192>,<Acc_Burst_type>, <DRX_Timer_Max>,<PBCCH>,<Ext_Measure_Order>** **<PSI1_r_per>,<si13_location>,<packet_psi_status>,<packet_si_status>,<ext_upl_tbf_ supported>,<ccn_active>,<pfc_feat_supported>** **Coding Scheme:** **dl_sc: <dl_sc>,ul_sc: <ul_sc>** **<Count_LR>,<Count_HR>,<C_R_Hyst>,<C31>,<C32>,<Prior_Acc_Thr>** **OK** If UMTS is supported: **+CGED: RAT:<rat>,URR:<rrc_state>,DC:<urrcdc_state>, BP:<urrcbp_state>, M:<urrcm_state>, ERR:<as_error_code>, RC:<release_cause>,OOS:<out_of_service>, BLER:<meas_bler>,TSIR:<target_sir>,MSIR:<meas_sir>,** **DPUC:<dlpc_power_up_commands_count>,** **DPDC:<dlpc_power_down_commands_count>,** **UPUC:<ulpc_power_up_commands_count>,** **UPDC:<ulpc_power_down_commands_count>, CMOD: <compressed_mode>** **TPCA:<tx_ul_pwr_ctrl_alg>, DCL:<drx_cycle_length>, UPCS: <ul_pwr_ctrl_step_size>,BTRG:<bler_target>,NHSC:<num_hsscch_codes>** **HSC:<hierarchical_cell_structure>,HMD:<high_mobility_detected>, LM:<limited_mode>,RJCZ: <urrc_con_rej_cause>** **CMAX:<UMAC data CQI max value>, CMEAN:<UMAC data CQI mean value>, CMIN:<UMAC data CQI min value>, AFTI:<AMR frame type id>, ATYP:<AMR type>** **CellId:<cell_identity>, DLF:<dl_frequency>, ULF:<ul_frequency>, C:<ciphering>, D:<ps_data_transfered>,PSM:< power_saving_mode>,Cell:<celltype=AS>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>** **Cell:<celltype=VAS>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>, DLF:<dl_ frequency>**

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
	Cell:<celltype=M>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0> **Cell:<celltype=D>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>** **Cell:<celltype=G>, B:<gsm_band>,Arfcn:<arfcn>, RxLev:<rxLev>, Bsic:<bsic>, RV: <ranking_value>** **Cell:<celltype=U>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>, DLF:<dl_ frequency>, RV:<ranking_value>** **Cell:<celltype=NU>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>, DLF:<dl_ frequency>, RS:<ranking_status>** **Cell:<celltype=NG>, B:<gsm band>, Arfcn:<arfcn>, RxLev:<rxLev>, Bsic:<bsic>, RS: <ranking_status>** **RR measurement evaluation:** **MeasId :<meas_id>, EventId :<event_id>, <par 3>,<par 4>, <par 5>, <par 6>,...,<par N>, MeasId :<meas_id>, EventId :,<par 3>,<par 4>,<par 5>,<par 6>,...,<par M>,etc...** **MM:** **Process:CO, MMs:<mm_state>,MMSs:<mm_service_state>,MSC:<ms_class>, T:<active_timer_bitmap>** **Process:CS, MMs:<mm_state>,MMSs:<mm_service_state>,LUS:<location_update_status>, T:<active_timer_bitmap>,L:<limited_service>** **Process:PS, MMs:<mm_state>,MMSs:<mm_service_state>, LUS:<location_update_status>,T:<active_timer_bitmap>,L:<limited_service>, GS:<gprs_supported>,R:<ready_state>** **Cell change counters:** **CRT:<cell_reselecetion_total>,IRCR:<ir_cell_reselecetion>,AIRCR:<attempted_ir_cell _reselecetion>,IRHO:<ir_handover>, AIRHO:<attempted_ir_handover>** **Equivalent PLMNs:** **MCC:<mobile_country_code>, MNC:<mobile_network_code>** **Serving PLMN:** **MCC:<mobile_country_code>,MNC:<mobile_network_code>, LAC:<location_area_code>,RAC:<routing_area_code>** *Note: The maximum total number of cells is 24.* or **CME ERROR: <err>** Parameters **<mode>** 0 One shot dump 1 Periodic refreshed dump 2 Stop periodic dump **<MCC>** 0 – 999 3-digit mobile country code **<MNC>** 0 – 99 2-digit mobile network code **<LAC>** 0h – FFFFh 2-octet location area code **<CI>** 0h – FFFFh 2-octet cell identity **<BSIC>** 0h – 3Fh 6-bit base station identify code **<AcT>** 0 GSM 1 GPRS 2 EGPRS 3 EGPRS_PCR

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
	4 EGPRS_EPCR 5 UMTS (unused) 6 DTM 7 EGPRS_DTM 8 Undefined **<arfcn>** 0 – 1023 Absolute radio frequency channel number **<RfChannels>** Number of frequencies in MA 0 N.A. 0x01 Single RF **<Arfcn_ded>** Single ARFCN of dedicated channel of first ARFCN of MA **<RxLevFull>** 0h – 3Fh Received signal strength on serving cell, measured on all slots **<RxLevSub>** 0h – 3Fh Received signal strength on serving cell, measured on a subset of slots **<RxQualFull>** 0 – 7 Received signal quality on serving cell, measured on all slots **<RxQualSub>** 0 – 7 Received signal quality on serving cell, measured on a subset of slots **<ms_txpwr>** 0 – 31 Maximum TX power level an MS may use when accessing the system until otherwise commanded **<rx_acc_min>** 0 – 63 RXLEV-ACCESS-MIN **<cbq>** 0 – 1 CELL_BAR_QUALIFY **<cba>** 0 – 1 CELL_BAR_ACCESS **<cs_valid>** True if all parameter for calculation of c2 are available **<cr_offset>** 0 – 63 6-bit CELL_RESELECT_OFFSET **<tmp_offset>** 0 – 7 (mapped to 0 – 70) TEMPORARY_OFFSET **<penalty_t>** 0 – 31 Penalty time **<c1>** Value of c1 **<c2>** Value of c2 **<ch_type>** Channel type of the current connection 0 INVALID_CHN_TYPE 1 TCH_F 2 TCH_F 3 SDCCH_4 4 SDCCH_8 5 TCH_H_H 6 TCH_F_M

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
	<ch_mode> Channel mode of the current connection. Value = 0 – 255 (mapped to an internal value as detailed below) 0 MODE_SIG_ONLY 1 MODE_SPEECH_F 2 MODE_SPEECH_H 3 MODE_DATA_96_F 4 MODE_DATA_48_F 5 MODE_DATA_48_H 6 MODE_DATA_24_F 7 MODE_DATA_24_H 8 MODE_SPEECH_F_V2 9 MODE_SPEECH_F_V3 10 MODE_SPEECH_H_V2 11 MODE_SPEECH_H_V3 12 MODE_DATA_144_F **<txpwr>** 0 – 31 5-bit transmit power level of the current connection **<dtx_used>** 0 – 1 DTX used **<dtr_used>** 0 – 1 DTX used **<t3212>** 0 – 255 8-bit T3212 timeout value field coded as the binary representation of the timeout value for periodic updating in decihours **<acc>** 0 – 65535 Access control class (RACH Control Parameters) **<t_adv>** FFh Timing Advance (not used) **<bs_pa_mfrms>** 0 – 7 (mapped to 2 – 9) BS_PA_MFRMS (multiframes period for transmission of PAGING REQUEST) **<amr_acs>** AMR active codec **<amr_cod_dl>** AMR codec used in DL **<amr_cod_ul>** AMR codec used in UL **<amr_ci_i>** AMR C/I in dB/2 **<mean_bep_8psk>** 0 – 31 MEAN_BEP_8PSK **<cv_bep_8psk>** 0 – 7 CV_BEP_8PSK **<mean_bep_gmsk>** 0 – 31 MEAN_BEP_GMSK **<cv_bep_gmsk>** 0 – 7 CV_BEP_GMSK GPRS Parameters: **<GPRS_sup>** 0 – 255 GPRS supported (in serving cell) **<RAC>** 0 – 1 Routing Area Code

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
	<Split_Pg_Cycle> 0 – 1 SPGC_CCH_SUP split pg_cycle on ccch by network **<NCO>** 0 – 3 NETWORK_CONTROL_ORDER (GPRS_Cell_Options) **<NOM>** 0 – 3 NETWORK OPERATION MODE (GPRS_Cell_Options) **<T3192>** 0 – 7 (mapped to 0 – 1500msec) Wait for release time of the TBF after reception of the final block 0 500 msec 1 1000 msec 2 1500 msec 3 0 msec 4 80 msec 5 120 msec 7 200 msec **<Acc_Burst_type>** 0 8 bit access burst 1 11 bit access burst **<DRX_Timer_Max>** 0 – 7 DRX_TIMER_MAX **<PBCCH>** PBCCH present **<Ext_Measure_Order>** 0 – 3 EXT_MEASUREMENT_ORDER **<PSI1_r_per>** 0 – 15 (mapped to 1 – 16) PSI1_REPEAT_PERIOD **<si14_location>** “BCCH_NORM” “BCCH_EXT” “NO_BCCH_TYPE” **<packet_psi_status>** 0 – 1 **<packet_si_status>** 0 – 1 **<ext_upl_tbf_supported>** 0 – 1 **<ccn_active>** 0 – 1 **<pfc_feat_supported>** 0 – 1 **<dl_sc>, <ul_sc>** Current modulation and coding scheme of downlink <dl_sc> or uplink <ul_sc> NB_CS_1 NB_CS_2 NB_CS_3 NB_CS_4 NB_MCS_1 NB_MCS_2 NB_MCS_3 NB_MCS_4 NB_MCS_5 NB_MCS_6

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
	NB_MCS_7 NB_MCS_8 NB_MCS_9 NB_MCS_5_7 NB_MCS_6_9 AB_8 AB_11 AB_11_E **<Count_LR>** 0 – 63 PSI_COUNT_LR **<Count_HR>** 0 – 15 (mapped to 1 – 16) PSI_COUNT_HR **<C_R_Hyst>** 0 – 7 CELL-RESELECT-HYSTERESIS **<C1>** Integer value of c1 **<C2>** Integer value of c2 **<C31>** Integer value of c31 **<C32>** Integer value of c32 **<Prior_Acc_Thr>** 0 – 7 Prioriry_ACCESS_THR **<rrc_state>** "CD" CELL_DCH "CF" CELL_FACH "CP" CELL_PCH "UP" URA_PCH "ID" IDLE "ST" START **<urrcdc_state>** Indicated by three hex digits (octet1, 2:event, 3:state) **<urrcbp_state>** Indicated by four hex digits (1, 2:event, 3, 4:state) **<urrcm_state>** Indicated by three hex digits (1:event, 2:state, 3:number of sent measurements) **<as_error_code>** Indication about error in UAS; integer value with range from 0 – 99 **<release_cause>** Integer value with range from 0 – 99 **<out_of_service>** 0 – 1 **<meas_bler>** Block error rate. Range of values = 1.0×10^{-6} to 9.9×10^{-1} The value '-' is indicated if the parameter is not available, or for all cells except DCH. The internal received value is divided by 2^{23} before displayed. **<target_sir>** Target SIR. Range of value = -10 to 20 (3 digits are always displayed); the value '-' is displayed if the parameter is not available, or for all cells except DCH. The internal received value is divided by 2^{24} before displayed.

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
	<meas_sir> Integer displayed in hexadecimal format with range from -10 to 20; the value '-' is displayed if the parameter is not available, or for all cells except DCH. The internal received value is divided by 2^{24} before displayed. **<hierarchical_cell_structure>** 0 – 1 **<high_mobility_detected>** 0 – 1 **<limited_mode>** 0 – 1 **<dlpc_power_up_commands_count>** L1 related data counter **<dlpc_power_down_commands_count>** L1 related data counter **<ulpc_power_up_commands_count>** L1 related data counter **<ulpc_power_down_commands_count>** L1 related data counter **<compressed_mode>** Flag indicating if Compressed Mode is Active or not **<tx_ul_pwr_ctrl_alg>** Tx Uplink Power Control Algorithm **<drx_cycle_length>** DRX Cycle Length value 2^k **<ciphering>** Indicates whether GSM Ciphering may be ON or OFF **<ps_data_transfered>** 0 – 1 **<power_saving_mode>** 0 – 1 **<cell_type>** "AS" Active set "VAS" Virtual active set "M" Monitored cells "D" Detected cells "G" GSM cells << U >> UMTS cells << NU >> Non-ranked UMTS cells "NG" Non-ranked GSM cells **<scrambling_code>** Integer value with range from 0 – 511 **<rscp>** Received Signal Code Power with range from 0 – 91; 255 for invalid/default value **<ecno>** Energy per chip/noice with range from 0 – 24; 255 for invalid/default value **<gsm_band>** "D" 1800 MHz "P" 1900 MHz "G" 900 MHz **<arfcn>** Absolute radio frequency channel number with range from 0 – 1023 **<ranking_value>** Integer value with range from 0 – 999

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
	<ranking_status> Integer value with range from 0 – 9 Measurement Parameters: **<meas_id>** One hex digit with range from 0 – FH **<event_id>** Two hex digits with range from 1AH – 3DH **<par 3,4,5,...,M,...,N>** Integer value with range from 0 – 99 **<mm_state>** Integer value with range from 0 – 99 **<mm_service_state>** Integer value with range from 0 – 99 **<ms_class>** MS GPRS-class (previously stored in ATC either at reception of message MN_GCLASS_IND or sending the message MN_GCLASS_REQ). Possible values are: class A class B class CG: class C in GPRS only mode classCC: class C in circuit switched only mode (lowest class) **<active_timer_bitmap>** Four hex coded digits **<location_update_status>** Integer value with range from 0 – 9 **<limited_service>** 0 – 1 **<gprs_supported>** 0 – 1 **<ready_state>** 0 – 1 **<cell_reselecetion_total>** Integer value with range from 0 – 999 **<ir_cell_reseelection_counter>** Integer value with range from 0 – 999 **<attempted_ir_cell_reselection>** Integer value with range from 0 – 999 **<ir_handover>** Integer value with range from 0 – 999 **<attempted_ir_handover>** Integer value with range from 0 – 999 **<routing_area_code>** Integer value with range from 0 – 255
Notes	This command returns a dump of the cell environment, either as a one shot dump or as a periodic refreshed dump (5 seconds each), dependent on the command parameter <mode>.

10.11. +CGEREP Command: Packet Domain Event Reporting

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 **<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 **+CGEV: ME DEACT <p_cid>, <cid>, <event_type>** The network has responded to an ME initiated context deactivation request

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	+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
Notes	<mode> is saved in non-volatile memory over module reboot; URC is available on the port that executes the command.

10.12. +CGAUTO Command: Automatic Response

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGAUTO=?**	Response **+CGAUTO:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CGAUTO?**	Response **+CGAUTO: <n>** **OK**
Read command Syntax **AT+CGAUTO= [<n>]**	Response **OK** or **+CME ERROR: <err>** Parameter **<n>** 0 Turn off automatic response for packet domain only 1 Turn on automatic response for packet domain only 2 Modem compatibility mode, packet domain only 3 Modem compatibility mode, packet domain and circuit switched calls 4 Turn on automatic negative response for packet domain only

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Notes	• When the +CGAUTO=1 command is received, the MT shall attempt to perform a PS attach if it is not already attached. • <n> is saved in non-volatile memory over module reboot.

10.13. +CGPADDR Command: Show PDP Address

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). If no <cid> is specified, the addresses for all defined contexts are returned. **<PDP_addr_1>, <PDP_addr_2>** String that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. Both <PDP_addr_1> and <PDP_addr_2> are omitted if none are available. Both <PDP_addr_1> and <PDP_addr_2> are included when both Ipv4 and Ipv6 addresses are assigned, with <PDP_addr_1> containing the IPv4 address and <PDP_addr_2> containing the IPv6 address. The string is given as dot-separated numeric (0 – 255) parameter of the form: a1.a2.a3.a4 for IPv4 and a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6.

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

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

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

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

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

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGEQMIN=?**	Response **+CGEQMIN: <PDP_type>**, (list_of supported **<Traffic_class>**es) ,(list of supported **<Maximum_bitrate_UL>**s) , (list of supported **<Maximum_bitrate_DL>**s), (list of supported **<Guaranteed_bitrate_UL>**s), (list of supported **<Guaranteed_bitrate_DL>**s) ,(list of supported **<Delivery_order>**s) ,(list of supported **<Maximum_SDU_size>**s) ,(list of supported **<SDU_error_ratio>**s) , (list of supported **<Residual_bit_error_ratio>**s) ,(list of supported **<Delivery_of_erroneous_SDUs>**s) , (list of supported **<Transfer_delay>**s) ,(list of supported **<Traffic_handling_priority>**s) [,(list of supported **<Source_statistics_descriptor>**s) ,(list of supported **<Signalling_indication>**s)] **[<CR><LF> +CGEQMIN: <PDP_type>**, (list of supported **<Traffic_class>**es) ,(list of supported **<Maximum_bitrate_UL>**s), (list of supported **<Maximum_bitrate_DL>**s) ,(list of supported **<Guaranteed_bitrate_UL>**s), (list of supported **<Guaranteed_bitrate_DL>**s), (list of supported **<Delivery_order>**s) ,(list of supported **<Maximum_SDU_size>**s) ,(list of supported **<SDU_error_ratio>**s),(list of supported **<Residual_bit_error_ratio>**s) ,(list of supported **<Delivery_of_erroneous_SDUs>**s) ,(list of supported **<Transfer_delay>**s) ,(list of supported **<Traffic_handling_priority>**s) [,(list of supported **<Source_statistics_descriptor>**s) ,(list of supported **<Signalling_indication>**s)**][...]]** **ERROR**
Read command Syntax **AT+CGEQMIN?**	Response **+CGEQMIN: <cid>, <Traffic_class> ,<Maximum_bitrate_UL>, <Maximum_bitrate_DL> , <Guaranteed_bitrate_UL> ,<Guaranteed_bitrate_DL>,<Delivery_order>, <Maximum_SDU_size>,<SDU_error_ratio> ,<Residual_bit_error_ratio>, <Delivery_of_erroneous_SDUs>,<Transfer_delay> ,<Traffic_handling_priority> [,<Source_statistics_descriptor> ,<Signalling_indication>]** **[<CR><LF> +CGEQMIN: <cid>,<Traffic_class> ,<Maximum_bitrate_UL>, <Maximum_bitrate_DL> ,<Guaranteed_bitrate_UL>,<Guaranteed_bitrate_DL>, <Delivery_order>,<Maximum_SDU_size>,<SDU_error_ratio>, <Residual_bit_error_ratio>,<Delivery_of_erroneous_SDUs>,<Transfer_delay>, <Traffic_handling_priority>[,<Source_statistics_descriptor> ,<Signalling_indication>] [...]]** **Error**
Write command Syntax **AT+CGEQMIN= [<cid>[,<Traffic_class> [,<Maximum_bitrate_UL> [,<Maximum_bitrate_DL> [,<Guaranteed_bitrate_UL> [,<Guaranteed_bitrate_DL> [,<Delivery_order> [,<Maximum_SDU_size>**	Response **OK** or **ERROR** Parameter **<cid>** Numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands). **<Traffic_class>** UMTS bearer service application type 0 Conversational 1 Streaming 2 Interactive 3 Background

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
[,<SDU_error_ratio>[,<Residual_bit_error_ratio>[,<Delivery_of_erroneous_SDUs>[,<Transfer_delay>[,<Traffic_handling_priority>[,<Source_statistics_descriptor>,<Signalling_indication>]]]]]]]]]]]]]]	**<Maximum_bitrate_UL>** Numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. **<Maximum_bitrate_DL>** Numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. **<Guaranteed_bitrate_UL>** Numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). **<Guaranteed_bitrate_DL>** Numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). **<Delivery_order>** Numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not 0 No 1 Yes **<Maximum_SDU_size>** Numeric parameter that indicates the maximum allowed SDU size in octets **<SDU_error_ratio>** String parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. **<Residual_bit_error_ratio>** String parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. **<Delivery_of_erroneous_SDUs>** Numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not 0 No 1 Yes 2 No detect **<Transfer_delay>** Numeric parameter that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds **<Traffic_handling_priority>** Numeric parameter that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers **<Source_Statistics_Descriptor>** Supported in R7 P S a numeric parameter that specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as conversational or streaming 0 Characteristics of SDUs is unknown 1 Charactersitics of SDUs correspond to a speech source **<Signalling_Indication>** Supported in R7 P S a numeric parameter used to indicate content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive 0 PDP context is not optimized 1 PDP context is optimized **<PDP_type>** Refer to +CGDCONT and +CGDSCONT commands.
Notes	If a value is omitted for a particular class then the value is considered to be unspecified.

10.16. +CGQREQ Command: Request Quality of Service Profile

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

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGQREQ=?**	Response **+CGQREQ: <PDP_type>**, (list of supported **<precedence>**s), (list of supported **<delay>**s), (list of supported **<reliability>**s),(list of supported **<peak>**s), (list of supported **<mean>**s) **OK**
Read command Syntax **AT+CGQREQ?**	Response **+CGQREQ: <cid>, <precedence>, <delay>, <reliability>, <peak>, <mean>** **OK**
Write command Syntax **AT+CGQREQ = [<cid> [,<precedence> [,<delay> [,<reliability> [,<peak> [,<mean>]]]]]]**	Response **OK** or **ERROR** Parameters **<cid>** Numeric parameter that specifies a particular PDP context definition. **<precedence>** Numeric parameter that specifies the precedence class **<delay>** Numeric parameter that specifies the delay class **<reliability>** Numeric parameter that specifies the reliability class **<peak>** Numeric parameter that specifies the peak throughput class **<mean>** Numeric parameter that specifies the mean throughput class.
Notes	• This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network. • If a value is omitted for a particular class then the value is considered to be unspecified.

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

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

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGEQREQ=?**	Response **+CGEQREQ: <PDP_type>**, (list_of supported **<Traffic_class>**es) ,(list of supported **<Maximum_bitrate_UL>**s) ,(list of supported **<Maximum_bitrate_DL>**s), (list of supported **<Guaranteed_bitrate_UL>**s), (list of supported **<Guaranteed_bitrate_DL>**s) ,(list of supported **<Delivery_order>**s) ,(list of supported **<Maximum_SDU_size>**s) ,(list of supported **<SDU_error_ratio>**s) , (list of supported **<Residual_bit_error_ratio>**s) ,(list of supported **<Delivery_of_erroneous_SDUs>**s) ,(list of supported **<Transfer_delay>**s) ,(list of supported **<Traffic_handling_priority>**s) [,(list of supported **<Source_statistics_descriptor>**s) ,(list of supported **<Signalling_indication>**s)] [**<CR><LF>+CGEQREQ: <PDP_type>**, (list of supported **<Traffic_class>**es) ,(list of supported **<Maximum_bitrate_UL>**s), (list of supported **<Maximum_bitrate_DL>**s) ,(list of supported **<Guaranteed_bitrate_UL>**s), (list of supported **<Guaranteed_bitrate_DL>**s), (list of supported **<Delivery_order>**s) ,(list of supported **<Maximum_SDU_size>**s) ,(list of supported **<SDU_error_ratio>**s) ,(list of supported **<Residual_bit_error_ratio>**s) ,(list of supported **<Delivery_of_erroneous_SDUs>**s) ,(list of supported **<Transfer_delay>**s) ,(list of supported **<Traffic_handling_priority>**s) [,(list of supported **<Source_statistics_descriptor>**s),(list of supported **<Signalling_indication>**s)][...]]
Read command Syntax **AT+CGEQREQ?**	Response **+CGEQREQ: <cid>,<Traffic_class>,<Maximum_bitrate_UL>,<Maximum_bitrate_DL>, <Guaranteed_bitrate_UL>,<Guaranteed_bitrate_DL>,<Delivery_order>, <Maximum_SDU_size>,<SDU_error_ratio>,<Residual_bit_error_ratio>, <Delivery_of_erroneous_SDUs>,<Transfer_delay>,<Traffic_handling_priority> [,<Source_statistics_descriptor> ,<Signalling_indication>]** **[<CR><LF>+CGEQREQ: <cid>,<Traffic_class>,<Maximum_bitrate_UL>, <Maximum_bitrate_DL>,<Guaranteed_bitrate_UL>,<Guaranteed_bitrate_DL>, <Delivery_order>,<Maximum_SDU_size>,<SDU_error_ratio>, <Residual_bit_error_ratio>,<Delivery_of_erroneous_SDUs>,<Transfer_delay>, <Traffic_handling_priority>[,<Source_statistics_descriptor>,<Signalling_indication>] [...]]**
Write command Syntax **AT+CGEQREQ= [<cid>[,<Traffic_ class> [,<Maximum_ bitrate _UL> [,<Maximum_ bitrate_DL> [,<Guaranteed_ bitrate_UL> [,<Guaranteed_ bitrate_DL> [,<Delivery_ order> [,<Maximum_ SDU_size> [,<SDU_error_ ratio>[,<Residual**	Response **OK** or **ERROR** Parameters **<cid>** Numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands) **<Traffic_class>** UMTS bearer service application type 0 Conversational 1 Streaming 2 Interactive 3 Background

HL7618, HL7618RD, HL7650, HL7688, HL7690 and HL7692	
_bit_error_ratio> [,<Delivery_of_ erroneous_ SDUs> [,<Transfer_ delay>[,<Traffic_ handling_ priority> [,<Source_ statistics_ descriptor>, <Signalling_ indication>]]]]]]]]]]]]]]]	**<Maximum_bitrate_UL>** Numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. **<Maximum_bitrate_DL>** Numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. **<Guaranteed_bitrate_UL>** Numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). **<Guaranteed_bitrate_DL>** Numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). **<Delivery_order>** Numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not 0 No 1 Yes **<Maximum_SDU_size>** Numeric parameter that indicates the maximum allowed SDU size in octets **<SDU_error_ratio>** String parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. **<Residual_bit_error_ratio>** String parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. **<Delivery_of_erroneous_SDUs>** Numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not 0 No 1 Yes 2 No detect **<Transfer_delay>** Numeric parameter that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds **<Traffic_handling_priority>** Numeric parameter that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers **<Source_Statistics_Descriptor>** Supported in R7 P S a numeric parameter that specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as conversational or streaming 0 Characteristics of SDUs is unknown 1 Charactersitics of SDUs correspond to a speech source **<Signalling_Indication>** Supported in R7 P S a numeric parameter used to indicate content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive 0 PDP context is not optimized 1 PDP context is optimized **<PDP_type>** Refer to +CGDCONT and +CGDSCONT commands.
Notes	If a value is omitted for a particular class then the value is considered to be unspecified.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGEQNEG=?**	Response **+CGEQNEG:** (list of **<cid>**s associated with active contexts)
Write command Syntax **AT+CGEQNEG=[<cid>[,<cid>[,...]]]**	Response **+CGEQNEG: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication>** **[<CR><LF>+CGEQNEG: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication>[....]]** Parameters **<cid>** numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands) **<Traffic_class>** UMTS bearer service application type 0 Conversational 1 Streaming 2 Interactive 3 Background **<Maximum_bitrate_UL>** Numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. **<Maximum_bitrate_DL>** Numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. **<Guaranteed_bitrate_UL>** Numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). **<Guaranteed_bitrate_DL>** Numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). **<Delivery_order>** Numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not 0 No 1 Yes **<Maximum_SDU_size>** Numeric parameter that indicates the maximum allowed SDU size in octets **<SDU_error_ratio>** String parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<Residual_bit_error_ratio> String parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. **<Delivery_of_erroneous_SDUs>** Numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not 0 No 1 Yes 2 No detect **<Transfer_delay>** Numeric parameter that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds **<Traffic_handling_priority>** Numeric parameter that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers **<Source statistics descriptor>** Numeric parameter that specifies the characteristics of the source of submitted SDUs **<Signaling indication>** Numeric parameter that indicates the signalling nature of the submitted SDUs. This parameter is in addition to the other QoS attributes and does not override them; it is only defined for the interactive traffic class. If signalling indication is set to 'Yes', the UE should set the traffic handling priority to '1'.
Notes	• If a value is omitted for a particular class then the value is considered to be unspecified. • Parameter details can be referenced from 3GPP specifications TS24.008 section 10.5.6.5 and TS23.107 section 6.4.3.1.
Examples	**AT+CGDCONT?** **+CGDCONT: 1,"IP","smartone","10.149.7.167",0,0,0,0,0,0** **+CGDCONT: 3,"IP","internet","121.203.230.208",0,0,0,0,0,0** **OK** **AT+CGEQNEG=?** // Test command **+CGEQNEG: (1,3)** **OK** **AT+CGEQNEG=3** // Write command for cid = 3 **+CGEQNEG: 3,4,0,0,0,0,0,0,"0E0","0E0",3,0,0,0,0** **OK**

10.19. +CGREG Command: GPRS Network Registration Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGREG=?**	Response **+CGREG:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CGREG?**	Response **+CGREG: <n>,<stat>[,<lac>,<ci>[,<AcT>,<rac>]]** **OK**
Write command Syntax **AT+CGREG= [<n>]**	Response **OK** or **+CME ERROR: <err>** Parameters **<n>** 0 Disable network registration unsolicited result code 1 Enable network registration unsolicited result code **+CGREG: <stat>** 2 Enable network registration and location information unsolicited result code **+CGREG: <stat>[,<lac>,<ci>[,<AcT>,<rac>]]** **<stat>** 0 Not registered, home network 1 Registered, home network 2 Not registered, but ME is currently searching for a new operator to register to 3 Registration denied 4 Unknown 5 Registered, roaming 8 Attached for emergency bearer services only (only applicable when <AcT>=2, 4, 5, 6) **<lac>** String type; two byte location area code in hexadecimal format. “FFFF” indicates that the location area code is invalid and that the <rac> value should also be ignored. **<ci>** String type; four byte UTRAN/E-UTRAN cell ID in hexadecimal format **<Act>** 0 GSM 1 GSM Compact 2 UTRAN 3 GSM with EGPRS 4 UTRAN with HSDPA 5 UTRAN with HSUPA 6 UTRAN with HSDPA and HSUPA 7 E-UTRAN **<rac>** String type; one byte routing area code in hexadecimal format. “00” indicates that the routing area code is invalid. It has the same meaning as “FF” specified in the +KCCINFO command.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Unsolicited Notification	Response **+CGREG: <stat>** **+CGREG: <stat>[,<lac>,<ci>[,<AcT>,<rac>]]**
Reference Sierra Wireless Proprietary	Notes <n> is saved in non-volatile memory per AT port over module reboot
Examples	**AT+CGREG?** // Read command **+CGREG: 0,0** **OK** **AT+CGREG=?** // Test command **+CGREG: (0-2)** **OK** **AT+CGREG=2** // Set mode to 2 **OK** **AT+COPS=0** **OK** **+CGREG: 1,"008C","6771",0,"01"** // URC displayed after attaching to network

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 2 Packet Domain preferred (use circuit switched if GPRS is not available) 3 Circuit switched preferred (use packet domain if circuit switched is not available)
Note	+CGSMS is ignored for sending SMS over IMS as used in the Verizon network.

10.21. +CRLP Command: Select Radio Link Protocol

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

10.22. +XDNS Command: Dynamic DNS Request

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+XDNS=?**	Response **+XDNS:** (list of supported **<cid>**s),(list of supported **<mode>**s) **OK**
Read command Syntax **AT+XDNS?**	Response **+XDNS: <cid>, <primary DNS>, <secondary DNS>** **[+XDNS: <cid>, <primary DNS>, <secondary DNS>** **[...]]** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+XDNS=<cid>, <mode>**	Response **OK** or **+CME ERROR: <err>** Parameters **<cid>** Context ID **<mode>** 0 Disable dynamic DNS request 1 Enable dynamic DNS request (IPv4) 2 Enable dynamic DNS request (IPv6) 3 Enable dynamic DNS request (IPv4v6) **<primary DNS>, <secondary DNS>** Strings representing the DNS addresses and given as dot-separated numeric (0 – 255) parameters in the form of: a1.a2.a3.a4 for IPv4, a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6, and a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.a17.a18.a19.a20 for IPv4v6 (a1 to a4 here represents IPV4 and a5 to a20 represents IPv6) The DNS address is by default "0.0.0.0" which is not a valid address. Note that IPv6 address obtained on LTE will be prefixed with a constant 8 byte address "FE.80.00.00.00.00.00.00" if the network has not provided any.

10.23. +CGPIAF Command: Printing IP Address Format

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+CGPIAF=?**	Response **+CGPIAF:** (list of supported **<IPv6_AddressFormat>**s),(list of supported **<IPv6_SubnetNotation>**s),(list of supported **<IPv6_LeadingZeros>**s),(list of supported **<IPv6_CompressZeros>**s)
Read command Syntax **AT+CGPIAF?**	Response **+CGPIAF: <IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>, <IPv6_CompressZeros>** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+CGPIAF=[<IPv6_AddressFormat>[,<IPv6_SubnetNotation>[,<IPv6_LeadingZeros>[,<IPv6_CompressZeros>]]]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<IPv6_AddressFormat>** 0 Use IPv4-like dot notation. IP address and subnetwork mask (if applicable) are dot-separated. 1 Use IPv6-like colon notation. IP address and subnetwork mask (if applicable and when given explicitly) are separated by a space. **<IPv6_SubnetNotation>** Specifies the subnet notation for remote address and subnet mask. This parameter setting does not apply if <IPv6_AddressFormat> = 0. 0 Both IP address and subnet mask are stated explicitly, and separated by a space 1 The printout format uses a slash (/) subnet-prefix Classless Inter-Domain Routing (CIDR) notation **<IPv6_LeadingZeros>** Specifies whether leading zeros are omitted or not. This parameter setting does not apply if <IPv6_AddressFormat> = 0. 0 Leading zeros are omitted 1 Leading zeros are inclued **<IPv6_CompressZeros>** Specifies whether 1-n instances of 16-bit zero values are replaced by “::”.This parameter setting does not apply if <IPv6_AddressFormat> = 0. 0 No zero compression 1 Use zero compression If the address is unspecified (all bytes are zeros), “::” will be displayed.
Notes	Parameters are saved in non-volatile memory per AT port over module reboot.

10.24. +WPPP Command: PDP Context Authentication Configuration

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** 1 – 20 PDP context identifier used in +CGDCONT. If omitted, the configuration is set for all PDP contexts. **<username>** Login for the APN. String type, up to 30 characters **<password>** Password for the APN. String type, up to 30 characters
Notes	• +WPPP is available when SIM has been inserted and the pin code is entered. • Parameters are stored in non-volatile memory.
Examples	**AT+WPPP=?** **+WPP: (0-2),(1-20)** **OK** **AT+WPPP=1,1,“myusername”,“mypassword”** **OK** **AT+WPPP?** **+WPPP: 1,1,“myusername”,“mypassword”** **OK**

11. SIM Application Toolkit AT Commands

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+STKPRO=?**	Response **+STKPRO: (01,05,16,17,18,19,20,21,32,33,34,35,36,37,38,40,52,53,64)** **OK**
Unsolicited Notification	Response **+STKPRO: <proactive_cmd>...** Details of which are as follows: • **+STKPRO: 01, <type>** • **+STKPRO: 05, <event_list>** • **+STKPRO: 16, <number>, <subaddr>, <type>, <alpha_1>, <icon_id1>, <alpha_2>,<icon_id2>** • **+STKPRO: 17, <ss_data>, <alpha>, <icon_id>, <ref_number>** • **+STKPRO: 18, <dcs>, <hex_string>, <alpha>, <icon_id>, <ref_number>** • **+STKPRO: 19, <alpha>, <icon_id>, <ref_number>** • **+STKPRO: 20, <alpha>, <icon_id>, <dtmf_string>** • **+STKPRO: 21, <URL>, <alpha>, <icon_id>** • **+STKPRO: 32, <tone>, <unit>, <interval>, <alpha>, <icon_id>** • **+STKPRO: 33, <type>, <dcs>, <hex_string>, <icon_id>** • **+STKPRO: 34, <type>, <dcs>, <hex_string>, <icon_id>** • **+STKPRO: 35, <type>, <dcs>, <hex_string>, <max_rsp_len>, <min_rsp_len>, <defaulttext>, <icon_id>** • **+STKPRO: 36, <type>, <alpha>, <item_id>, <total_items>, <item_text>, <next_action>, <default_item>, <icon_id>, <icon_id_list_element>** • **+STKPRO: 37, <type>, <alpha>, <item_id>, <total_items>, <item_text>, <next_action>, <icon_id>, <icon_id_list_element>** • **+STKPRO: 38, <type>** • **+STKPRO: 40, <dcs>, <hex_string>, <icon_id>** • **+STKPRO: 52, <type>, <alpha>, <icon_id>** • **+STKPRO: 53, <language>** • **+STKPRO: 64, <cmd_qualifier>, <alpha_id>, <icon_refrence>, <dialing_number>, <reconnect_interval>, <reconnect_unit>, <idle_interval>, <idle_unit>, <bearer_type>, <bearer_parameter>, <buffer_size>, <login_dcs>, <login_text>, <password_dcs>, <password_text>, <transaport_level>, <transport_port>, <sub_address>, <destination_address_type>, <destination_address>** Parameters **<alpha>, <alpha_1>, <alpha_2>, <item_text>, <default text>** Text string **<dsc>** Data coding scheme

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<default_item> Default items (s. item_id) **<event_list>** 04 User activity event 05 Idle screen available event 07 Language selection 08 Browser termination event **<hex_string>** String containing data in hexadecimal format **<icon_id>, <icon_id1>, <icon_id2>, <icon_id_list_element>** List containing icon IDs. For example, <icon_id1>, <icon_id2> **<interval>** Time duration in number of units **<item_id>** Item identifier (identifier of item chosen, refer to GSM 11.14) **<language>** 2-byte string indicating the language **<max rsp len>** Maximum response length **<min rsp len>** Minimum response length **<next_action>** Next action **<number>** Called party number **<proactive_cmd>** 01 Refresh 05 Set up event list 16 Set up call 17 Send SS 18 Send USSD 19 Send SMS 20 Send DTMF 21 Launch browser 32 Play tone 33 Display text 34 Get inkey 35 Get input 36 Select item 37 Set up menu 38 Language setting 39 Timer management 40 Set up idle mode text 52 Run AT command info 53 Language notification 64 Open channel 129 End of the proactive session **<ref_number>** Reference number **<subaddr>** Called party subaddress

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<ss_data> Data string **<type>** Integer as command qualifier; possible value “4” means language **<tone>** 01 Dial tone 02 Call subscriber busy 03 Congestion 04 Radio path acknowledge 05 Radio path not available 06 Error/special information 07 Call waiting tone 08 Ringing tone 10 General beep 11 Positive acknowledgement tone 12 Negative acknowledgement or error tone **<total items>** Total items **<unit>** 0 Minutes 1 Seconds 2 Tenth of a second **<URL>** URL to be loaded **<reconnect_interval>** 1 – 255 Duration for reconnect tries. The interval specifies the time interval of the duration in multiples of the time unit used. The value “0” indicated a non-existing duration object. **<reconnect_unit>** Used with <reconnect_interval> 0 Minutes 1 Seconds 2 Tenth of a second **<idle_interval>** 1 – 255 Defines the duration when an idle connection is released automatically. If not present, the terminal never shall releases a connection automatically. A value of “0” indicates a non-existing duration object. **<idle_unit>** Used with <idle_interval> 0 Minutes 1 Seconds 2 Tenth of a second **<bearer_type>** 1 Circuit switched 2 Packet switched 3 Default 255 Invalid **<bearer_parameter>** Hex string that gived detailed information about the bearer type **<buffer_size>** Buffer the terminal shall allocate for channel data. The terminal may allocate less or more than this. **<login_dcs>** Data coding scheme of the text string. Text strings may be coded in 7-bit, 8-bit or UCS2 (16-bit) for user authentication data if requested by the bearer connection.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<login_text> Specfies user authentication data is requested by the bearer connection. Coding based on <login_dcs>. **<password_dcs>** Data coding scheme of the text string. Text strings may be coded in 7-bit, 8-bit or UCS2 (16-bit) for user authentication data if requested by the bearer connection. **<password_text>** Specifies user authentication data if requested by the bearer connection. Coding based on <password_dcs>. **<transport_level>** Transport layer protocol of the UICC/terminal connection 1 UDP 2 TCP 255 Invalid; no transport protocol specified **<transport_port>** Integer that specifies the transport port **<sub_address>** Called party subaddress (for CS bearers only) **<dsc>** Data coding scheme **<destination_address_type>** 33 IPv4 IP address 87 IPv6 IP address 255 Invalid; unknown address type **<destination_address>** Hex string that specifies the destination point of the connection

11.2. +STKTR Command: Enter Response

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+STKTR=?**	Response **+STKTR: (01,05,16,17,18,19,20,21,32,33,34,35,36,37,38,39,40,52,53,64)** **OK**
Write command Syntax **AT+STKTR=1,0**	Response **OK** or **+CME ERROR: <err>**

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

Execute command

Syntax

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

Response

Response depends on the proactive command

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

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

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

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

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

Parameters

<add_result>		Additional result
<dcs>		Data coding scheme
<hex_string>		String in hexadecimal format
<last_cmd>		Last command
<proactive_cmd> +STKPRO)		Decimal code that indicates the proactive command (refer to
<result>	0	Command performed succcessfuly
	1	Command performed with partial comprehension
	2	Command performed with missing information
	3	Refresh performed with additional EFS read
	4	Command performed successfully, but requested icon could not be displayed

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	5 Command performed but modified by call control by SIM 6 Command performed successfully, limited service 7 Command performed with modification 16 Proactive SIM session terminated by the user 17 Backward move in the proactive SIM session requested by the user 18 No response from user 19 Help information required by the user 20 USSD or SS transaction terminated by the user 32 ME currently unable to process command 33 Network currently unable to process the command 34 User did not accept call set-up request 35 User cleared down call before connection or network release 36 Action in contradiction with the current timer state 37 Interaction with call control by SIM, temporary problem 38 Launch browser generic error code 48 Command beyond ME's capabilities 49 Command type not understood by ME 50 Command data not understood by ME 51 Command number not known by ME 52 SS return error 53 SMS RP ERROR 54 Error, required values are missing 55 USSD return error 56 Multiple card command error (if class "a" is supported) 57 Interaction with call control by SIM or MO, short message control by SIM 58 Bearer independent protocol error (if class "e" is supported) **<buffer size>** Size of the allocated buffer **<open_channel_id>** 1 – 7 Channel ID 0 Invalid **<link_status>** Specifies whether link is established or packet data service is activated 1 Enabled 0 Disabled **<channel_status_state>** Link state 00 No further information can be given **<bearer_description_type>** Bearer type which can be used to decode the bearer description value 01 Circuit switched UTA_SIM_TK_BEARER 02 Packet switched UTA_SIM_TK_BEARER (GPRS) 03 Terminal default UTA_SIM_TK_BEARER 255 Invalid bearer value; indicates an unknown bearer type which is not supported by the interface version **<bearer_description_params>** Hexadecimal string; gives detailed information dependent on the bearer type **<address_type>** Type of address 33 IPv4 IP address 87 IPv6 IP address

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<address> Address data dependent on bearer type. IPv4 address representation shall follow the format x.x.x.x where 0<x≤255. IPv6 address representation shall follow the format x.x.x.x.x.x.x.x.x.x.x.x.x.x.x.x where 0<x≤255

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+STKENV=?**	Response **+STKENV:** **OK**
Write command Syntax **AT+STKENV= <envelope_cmd>, <optional_ENV_ data>**	Response **OK** or **+CME ERROR: <err>** Parameters **<cause>** 00 User termination 01 Error termination **<envelope_cmd>** Code 211 (hex: D3) Menu selection (needs) Code 214 (hex: D6) Event download (note that only one event can be included in the <event_list>) **<item_id>** Item identification **<help_requested>** 1 Help is requested 0 Help is not requested **<language>** Currently used language in the DTE (refer to +STKPROF) **<call_id>** Call ID **<call_direction>** 0 MT call 1 MO call **<optional_ENV_data>** D3 <item_identifier> (for code 211) D6 <event_list> (for code 214)

11.4. +STKPROF Command: Terminal Profile Data

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+STKPROF=?**	Response **OK**
Read command Syntax **AT+STKPROF?**	Response **+STKPROF: <length>,<data>** **OK**
Write command Syntax **AT+STKPROF= <length>,<data>**	Response **OK** or **+CME ERROR: <err>** Parameters **<length>** Integer type; length of characters sent to TE in <data>. When set to “0”, forces a reset to the default terminal profile stored in the ME **<data>** Terminal profile data in hexadecimal format

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Unsolicited Notification	Response **+STKCC: <cc_command>...** Details of which are as follows: • **+STKCC: 1,<res_val>,<alpha>,<number>** • **+STKCC: 2,<res_val>,<alpha>,<ss_code>** • **+STKCC: 3,<res_val>,<alpha>,<ussd_code>** • **+STKCC: 4,<res_val>,<alpha>,<ton_npi>,<sc_addr>,<ton_npi>,<dest_addr>** Parameters **<cc_command>** 1 Set up call 2 Send SS 3 Send USSD 4 Send SM **<res_val>** Call control result value **<alpha>** Text string

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<number> Called party number **<ton_npi>** Type of number and numbering plan **<sc_addr>** Service centre address **<dest_addr>** Destination address

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Unsolicited Notification	Response **+STKCNF: <proactive_cmd>,<result>,<add_result>,<sw1>** Parameters **<proactive_cmd>** Decimal code that indicates the command that was finished (refer to +STKPRO) **<result>** General result code **<add_result>** Additional result code **<sw1>** 0 Command to SIM was suppressed because of multiple terminal response or wrong client. For other responses, refer to GSM 11.11

11.7. *PSSTKI Command: SIM Toolkit Configuration

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	Parameter **<mode>** 0 No unsolicited result code will be sent to the TE; the TE will not send proactive commands to the module. 1 Manual mode. Any unsolicited result codes will be sent to the TE. The TE had to acknowledge with a +STKPRO notification. 2 Auto acknowledge mode. The module answers to STK without the TE. Any unsolicited result codes will be sent to the TE. 3 Auto acknowledge mode without sending unsolicited result codes to the TE.
Reference Sierra Wireless Proprietary	Notes • This command cannot be used without a SIM. • <mode> is saved even after the module reboots. • If <mode>=0, the module will automatically restart before the new mode takes effect. • <mode>=2 and <mode>=3 are only possible for a subset of STK proactive commands with user interaction: ▪ Where basic Yes/No responses are expected: ▪ SEND SMS ▪ SEND SS ▪ SEND USSD ▪ SET UP CALL ▪ Where MMI action is need and Yes/No responses are expected when done (for the display part): ▪ SET UP IDLE MODE TEXT ▪ DISPLAY TEXT ▪ PLAY TONE ▪ REFRESH
Examples	<SIM card with STK application is inserted> **AT*PSSTKI?** // read current setting ***PSSTKI: 0** **OK** **AT*PSSTKI=?** // check supported setting ***PSSTKI: (0-3)** **OK** **At*psstki=1** // set STK manual mode **OK** **+STKPRO: 33,0,4,"4D6F62696C65204F4B",0** **at+stktr=33,0** **OK** **At*psstki=0** // deactivate STK **OK** **+SIM: 1** // module resets **+KSUP: 0** **+PBREADY** <Example: Manual Mode - proactive command SET UP MENU> **At*psstki=1** // activate STK manual mode **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	// SET UP MENU **+STKPRO: 37,0,"GemXplore CASE",1,5,"User interaction",33,0,0** **+STKPRO: 37,0,"GemXplore CASE",2,5,"Mobile interaction",33,0,0** **+STKPRO: 37,0,"GemXplore CASE",3,5,"Network interaction",33,0,0** **+STKPRO: 37,0,"GemXplore CASE",4,5,"Card interaction",33,0,0** **+STKPRO: 37,0,"GemXplore CASE",128,5,"Common STK features",33,0,0** **at+stktr=37,0** // Terminal Response for SET UP MENU successful **OK** **+STKCNF: 37,0,255,145** // [ACK] SET UP MENU successful, session on-going **at+stkenv=211,2,0** // Select menu item #2 **+STKCNF: 129, 0, 255, 144** // [ACK] session end **OK** <Example: Manual Mode - proactive command SELECT ITEM> **+STKPRO: 36,0,"Choose an item :",1,5,"Play tone",0,0,0,0** **+STKPRO: 36,0,"Choose an item :",2,5,"Provide local info",0,0,0,0** **+STKPRO: 36,0,"Choose an item :",3,5,"Refresh",0,0,0,0** **+STKPRO: 36,0,"Choose an item :",4,5,"Timer management",0,0,0,0** **+STKPRO: 36,0,"Choose an item :",5,5,"Launch browser",0,0,0,0** **at+stktr=36,0,0,0,0,"03"** // Terminal Response SELECT ITEM #3 **OK** **+STKCNF: 36,0,255,145** // [ACK] SELECT ITEM successful **+STKPRO: 36,0,"Choose an item :",1,2,"Init and file change",0,0,0,0** **+STKPRO: 36,0,"Choose an item :",2,2,"Reset",0,0,0,0** **at+stktr=36,0,0,0,0,"02"** // Terminal Response SELECT ITEM #2 **OK** **+STKCNF: 36,0,255,145** // [ACK] SELECT ITEM successful <Example: Manual Mode - proactive command REFRESH> **+STKPRO: 01,4,,0,,0** // proactive command: REFRESH - SIM reset **at+stktr=01,0** // Terminal Response for REFRESH **OK** **+SIM: 0** // SIM reset **+STKCNF: 144, 0** // [ACK] Reset completed **+SIM: 1** **+STKPRO: 33,0,4,"4D6F62696C65204F4B",0** **+PBREADY** <Example: Automatic Mode - proactive command REFRESH> **at*psstki=2** // set STK automatic mode **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	//Proactive command REFRESH is received **+STKPRO: 01,4,,0,, 0** // proactive command: REFRESH - SIM reset **+SIM: 0** // SIM reset **+STKCNF: 144, 0** // [ACK] Reset completed **+SIM: 1** **+STKPRO: 33,0,4,"4D6F62696C65204F4B",0** **+PBREADY** <Example: Silent Mode - proactive command REFRESH> **At*psstki=3** // set STK silent mode **OK** **+SIM: 0** // SIM reset **+SIM: 1** **+PBREADY** <SIM card is not inserted> **at+cpin?** **+CME ERROR: 10** **AT*PSSTKI?** // read current setting **+CME ERROR: 10** **AT*PSSTKI=?** // check supported setting **+CME ERROR: 10** **AT*PSSTKI=1** // deactivate STK **+CME ERROR: 10**

12. Protocol Specific Commands

12.1. Preliminary Comments

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

- TCP
- UDP
- FTP
- HTTP
- HTTPS

12.2. IP Address Format in AT Commands

Unless specified elsewhere, the following format is used for IP address field in AT commands described in this chapter when using the HL76xx embedded module:

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

12.3. Session ID

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

12.4. Connection of PDP Contexts

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

12.5. Buffer Length of AT Commands

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

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

12.6. Parameter Format of AT Commands

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

If the AT command does not meet the following conditions, the AT parser will regard it as an error and will not go to the corresponding AT command handler. It will immediately return **+CME ERROR: 3**. This means that it will not process any action further or return any specific error code.

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

12.7. Connection Configuration

12.7.1. +KCNXCFG Command: GPRS Connection Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>,<ipv6>,<dns1v6>,<dns2v6>** **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>] [,[<dns1>] [,<dns2>]]]] [,[<ip_v6>] [,[<dns1_v6>] [,<dns2_v6>]]]]]]**	Response **OK** Parameters **<cnx cnf>** 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration **<apn>** (Access Point Name) a string parameter (max size 63 bytes), logical name used to select the GGSN or the external packet data network. **<login>** string type (max size 24 bytes), indicates the user name of the cnx **<password>** string type (max size 24 bytes), indicates the password of the cnx

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<af> Address family used for the connection IPV4 IPv4 only IPV6 IPv6 only IPV4V6 IPv4 and IPv6 **<ip>** String type. If the mobile is supposed to work with a dynamic address, the value should be “0.0.0.0” or an empty string. **<dns1>, <dns2>** String type. If the mobile is supposed to work with dynamic DNS addresses, the value should be “0.0.0.0” or an empty string. **<ip_v6>** IPV6 String type. If the mobile is supposed to work with a dynamic address, the value should be “::” or an empty string. **<dns1_v6>, <dns2_v6>** IPV6 String type. If the mobile is supposed to work with dynamic DNS addresses, the value should be “::” or an empty string. **<state>** Connection state 0 Disconnected 1 Connecting 2 Connected 3 Idle, down counting for disconnection 4 Disconnecting
Reference Sierra Wireless Proprietary	Notes • This AT command is used to configure the bearer to be used for the future IP services. • By default, the IP and DNS address are dynamic (those values would be affected by the network during the PDP connection). • This connection will be used by the module to access to the IP services described in subsequent chapters. The AT+KCNXCFG command is only defined to set the current parameters. The defined connection will be automatically opened when needed by the IP services (e.g. UDP service). • The use of IPV4 and/or IPV6 addresses is configured by PDP context configuration. • <cnx cfg> values 1 to 5 correspond to PDP context ID 1 to 5 respectively, e.g. <cnx cfg>=3 corresponds to CID=3 in +CGDCONT/+CGACT. • When the connection is up, the read command returns the actual values used by the connection interface. • If reuse of existing activated PDP context is required, <apn> can be set as an empty string or as the existing APN string returned by +CGDCONT read command.

12.7.2. +KCNXTIMER Command: Connection Timer Configuration

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** 1 – 5 (PDP context configuration) a 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, UDP, FTP, HTTP and HTTP specific commands (+KTCPCNX, +KTCPSTART, +KUDPCFG, +KFTPCFG, etc.)

12.7.3. +KCNXPROFILE Command: Current Profile Connection Configuration

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+ KCNXPROFILE= <cnx cnf>**	Response **OK** Parameters **<cnx cnf>** 1 – 5 PDP context configuration – a 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, +KUDPCFG, +KFTPCFG, +KHTTPCFG and +KHTTPSCFG, if <cnx cnf> parameter is not given in these commands.

12.7.4. +KCGPADDR Command: Display PDP Address

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** 1 – 5 PDP context configuration – a numeric parameter which specifies a particular PDP context configuration **<PDP_addr>** A string that identifies the MT in the address space applicable to the PDP
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.

12.7.5. +KCNX_IND Notification: Connection Status Notification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration **<status>** PDP connection status 0 Disconnected due to network 1 Connected 2 Failed to connect, <tim1> timer is started if <attempt> is less than <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	

12.7.6. +KCNXUP Command: Bring the PDP Connection Up

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+KCNXUP= <cnx_cnf>**	Response **OK** Parameter **<cnx cnf>** 1 – 5 PDP context configuration – a 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.

12.7.7. +KCNXDOWN Command: Bring the PDP Connection Down

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** 1 – 5 PDP context configuration – a numeric parameter which specifies a particular PDP context configuration **<mode>** 0 Cancels the reservation of the activated PDP connection previously configured by +KCNXUP 1 Similar to 0, but deactivates the PDP connection even if the active session exists
Reference Sierra Wireless Proprietary	

12.8. Common Configuration

12.8.1. +KPATTERN Command: Custom End of Data Pattern

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 "FTP" FTP client session "HTTP" HTTP client session "HTTPS" HTTPS client 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, +KFTP_ERROR, etc.) 0 Disable URC **<indi_act>** 1 Enable URC (like +KTCP_SRVREQ, +KTCP_IND, +KTCP_DATA, +KUDP_DATA, +KUDP_RCV, +KFTP_IND, etc.) 0 Disable URC
Examples	To disable URC: **AT+KURCCFG=“TCP”,0** **OK** Test and read command: **AT+KURCCFG=?** **+KURCCFG: ("TCPC","TCPS","UDPC","UDPS","FTP","HTTP","HTTPS","TCP","UDP"),(0,-1),(0-1)** **OK** **AT+KURCCFG?** **+KURCCFG: "TCPC",1,1** **+KURCCFG: "TCPS",1,1** **+KURCCFG: "UDPC",1,1** **+KURCCFG: "UDPS",1,1** **+KURCCFG: "FTP",1,1**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	+KURCCFG: "HTTP",1,1 **+KURCCFG: "HTTPS",1,1** **OK**
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.

12.8.3. +KIPOPT Command: General Options Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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: 1,(0-1)** **+KIPOPT: 2,(0-255)** **+KIPOPT: 3,(0-1),(0-1)** **+KIPOPT: 4,(0-1)** **OK**
Read command Syntax **AT+KIPOPT?**	Response **+KIPOPT: 0,<proto>,<wait time>,<send size v4>,<send size v6>]** **[...]** **+KIPOPT: 1,<http_chunked>** **+KIPOPT: 2,<http_max_redirect>** **+KIPOPT: 3,<stop_on_error>, <stop_on_peer>** **+KIPOPT: 4,<ssl_ver>** **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>, <http_chunked>**	Response **OK** or **+CME ERROR<err>** Parameters **<option_id>** Option ID 0 Wait time, send size threshold configuration 1 HTTP chunked transfer encoding 2 HTTP maximum redirection 3 PDP connection deactivated behavior 4 SSL version for use in +KHTTPS

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
If <option_id>=2 **AT+KIPOPT= <option_id>, <http_max_ redirect>** If <option_id>=3 **AT+KIPOPT= <option_id>, <stop_on_error>, <stop_on_peer>** If<option_id>=4 **AT+KIPOPT= <option_id>, <ssl_ver>**	**<proto>** Protocol, string type "TCPC" TCP client session "TCPS" TCP server session "UDPC" UDP client session "UDPS" UDP server session "FTP" FTP client session "HTTP" HTTP client session "HTTPS" HTTP server session "TCP" Both client and server TCP sessions "UDP" Both client and server UDP sessions **<wait time>** Timeout for configuring the packet segmentation on the IP network side; it specifies the timeout after which the buffered data will be sent to the peer irrespective of data packet size. Value is in 100 ms units. Range: For UDP: 1 – 100, default value = 2 For TCP: 0 – 100, default value = 1. Note that value = 0 has the same effect as having value = 1 due to the limitation from +KPATTERN detection timing **<send size v4>** Data packet size for IPv4 sessions. This parameter specifies the data packet size that needs to be sent to the peer. Range: For UDP: 8 – 1472, default value = 1020 For TCP: 0, 8 – 1460, default value = 0 (disabled) **<send size v6>** Data packet size for IPv6 sessions. This parameter specifies the data packet size that needs to be sent to the peer. Range: For UDP: 8 – 1452, default value = 1020 For TCP: 0, 8 – 1440, default value = 0 (disabled). Note that value = 0 uses a wait time of 100 ms. **<http_chunked>** "Chunked" transfer encoding for HTTP POST 0 Data sent with HTTP POST are not encoded 1 Data sent with HTTP POST are automatically encoded using "chenked" transfer encoding **<http_max_redirect>** Maximum redirection allowed for HTTP GET. Range: 8 – 255; default value = 0 **<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 **<ssl_ver>** SSL version for use in +KHTTPS 0 TLS version 1.1 1 TLS version 1.0

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference Sierra Wireless Proprietary	Notes • "chunked" transfer encoding for HTTP POST is applicable and effective only for HTTP version 1.1. • The default setting of <option_id>=3 is (<stop_on_error>=0, <stop_on_peer>=0) after module boot-up; this means that a PDP connection is requested to stop only when a session is closed by an Internet AT command (e.g. +KTCPCLOSE). • Thresholds <send size v4> and <send size v6> control the maximum size of data received from the AT terminal to be buffered within timeout <wait time>. When the threshold is reached or after timeout, the buffered data are sent to the socket layer for transmission. For UDP: data are sent as a UDP packet For TCP based protocol: data are copied to socket first-in-first-out buffer for transmission but packet segmentation is not guaranteed to be <send size> • For TCP based protocol, when <send size v4> and <send size v6> are disabled (=0), threshold = 4000 is used internally. • The maximum transmission unit (MTU) is 1500 bytes. • After starting a connection or running SSL Certificate write commands, <ssl_ver> is fixed and cannot be changed until module reboot. • <send size v4> and <send size v6> impacts the detection of <EOF pattern>. Refer to the notes of +KAPTTERN for more information.

12.9. SSL Configuration

12.9.1. +KSSLCRYPTO Command: Cipher Suite Configuration

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+ KSSLCRYPTO=?**	Response **+KSSLCRYPTO: <profile_id>,<mkey_Algo>,<auth_algo>,<enc_algo>,<mac_algo>, <tls_ver>,<auth>,<tls_ver>,<auth>** **OK**
Read command Syntax **AT+ KSSLCRYPTO?**	Response **+ KSSLCRYPTO: <profile_id>,<mkey_algo>,<auth_algo>,<enc_algo>,<mac_algo>, <tls_ver>,<auth>** **[…]]**

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
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 key exchange **<auth_algo>** Authentication algorithm selection 1 RSA authentication **<enc_algo>** Encryption algorithm selection 4 RC4 64 AES 128 128 AES 256 8192 AES128GCM **<mac_algo>** Message authentication code algorithm selection 1 MD5 2 SHA1 64 AEAD **<tls_ver>** Cipher suite version selection. 1 TLS 1.0 4 TLS 1.2 **<auth>** Authentication 0 No authentication 1 Authenticate server 2 Provide client certificate to server 3 Authenticate server and provide client certificate to server
Reference Sierra Wireless Proprietary	

12.9.2. +KSSLCFG Command: SSL Configuration

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KSSLCFG=?**	Response **+KSSLCFG:<option id>,<option>** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Read command Syntax **AT+KSSLCFG?**	Response **+KSSLCFG:0,<TLS Version>** **+KSSLCFG:2,<Session Mode>** **OK**
Write command Syntax **AT+KSSLCFG =<option id>, <option>**	Response If <option_id> = 0: **AT+KSSLCFG=<option_id>,<TLS Version>** **OK** If <option_id> = 1: **AT+KSSLCFG=<option_id>,<Random Seed>** **OK** If <option_id> = 2: **AT+KSSLCFG=<option_id>,<Session Mode>** **OK** Parameters **<option id>** 0 Specify a TLS version to be used for hand shake 1 Setup random seed 2 Specify session mode **<TLS Version>** 0 Highest possible 1 TLS 1.0 3 TLS 1.2 **<Random Seed>** String to be added into the entropy of the random number generator **<Session Mode>** 0 Automatic 1 Always start a new session (not supported)

12.10. TCP Specific Commands

12.10.1. +KTCPCFG Command: TCP Connection Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** **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>** **[…]]**
Write command Syntax **AT+KTCPCFG=** **[<cnx cnf>],** **<mode>,** **[<tcp remote address>],** **<tcp_port>[[,** **[<source_port>]** **[,[<data_mode>],** **[<URC-ENDTCP-enable>]]],<af>]** **[,<cipher_suite>]**	Response **+KTCPCFG: <session_id>** **OK** Parameters **<cnx cnf>** Index of a set of parameters for configuring one TCP session (see +KCNXCFG) **<session_id>** TCP session index **<mode>** 0 Client 1 Server 2 Child (generated by server sockets) 3 Secure client **<tcp remote address>** IP address string or explicit name of the remote server. For server configuration, this parameter is left blank **<tcp_port>** TCP port number; numeric parameter with range 1 – 65535. This parameter is the listening port for a server configuration. **<status>** Connection state of the selected socket 0 Disconnected 1 Connected **<serverID>** Server session ID index. Only for sockets in CHILD mode **<source_port>** Numeric parameter (0-65535). Specifies the local TCP port number. This parameter is left blank for a server configuration.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<data_mode> 0 Do not display <data> in URC (default setting) 1 Display <data> in URC **<URC-ENDTCP-enable>** 0 Do not display URC "+KTCP_ACK" (default setting) 1 Display URC "+KTCP_ACK" **<af>** Address family used for the connection. 0 IPV4 1 IPV6 **<cipher_index>** Cipher suite profile index to use for a secured socket; defined by +KSSLCRYPTO
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 32. • For child session, the property <data_mode> will be kept the same as the server socket's setting. • See section 18.5.6 Use Cases for AT+KTCPACKINFO and <URC-ENDTCP-enable> Option. • This command can be used before setting up +KCNXCFG configuration. Note however that the latter is required to start the connection properly. • The connection timeout for TCP socket is about 9 seconds with 3 retransmissions with 3 seconds delay.

12.10.2. +KTCPCNX Command: Start TCP Connection

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

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KTCPRCV=?**	Response **+KTCPRCV: (**list of possible **<session_id>**s**),(**list of possible **<ndata>**s**)** **OK**
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.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	• It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. • Refer to AT&D for the behavior of DTR drop.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** Parameters **<session_id>** TCP session index **<ndata>** Number of bytes (max value 4294967295) **<tcp_notif>** See command AT+KTCPCNX
Reference Sierra Wireless Proprietary	Notes • User must use <EOF pattern> to finish sending, then module returns to command mode. • 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. • Using "+++" can abort sending data and using ATO[n] to return back to data mode.

12.10.5. +KTCPCLOSE Command: Close Current TCP Operation

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>** 0 Abort. Fast closing of the TCP connection (not supported). 1 The TCP connection is properly closed, which means that data sent to the module by AT+KTCPSND will be sent to the TCP server and acknowledged before the socket is closed. **<tcp_notif>:** See command 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.

12.10.6. +KTCPDEL Command: Delete a Configured TCP Session

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

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

12.10.7. +KTCP_SRVREQ Notification: Incoming Client Connection Request

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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** Start the TCP servers **AT+KTCPCNX=1** //listen on port 179 **OK** **AT+KTCPCNX=2** //listen on port 180 **OK**

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

	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.

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<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. • See section 18.6.3 Use Cases for KTCP_DATA and KUDP_DATA.

12.10.9. +KTCP_IND Notification: TCP Status

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

12.10.10. +KTCPSTAT Command: Get TCP Socket Status

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
or **AT+KTCPSTAT= <session_id>**	Parameters **<session_id>** TCP session index **<status>** TCP socket state 0 Socket not defined, use +KTCPCFG to create a TCP socket 1 Socket is only defined but not used 2 Socket is opening and connecting to the server, cannot be used 3 Connection is up, socket can be used to send/receive data 4 Connection is closing, it cannot be used, wait for status 5 5 Socket is closed **<tcp_notif>** -1 if socket/connection is OK, <tcp_notif> if an error has happened **<rem_data>** Remaining bytes in the socket buffer, waiting to be sent **<rcv_data>** Received bytes, can be read with +KTCPRCV command
Reference Sierra Wireless Proprietary	Notes • The socket buffer's size for sending is 17520 bytes. • This command returns +CME ERROR: 910 (Bad Session ID) for undefined <session_id>s.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KTCPSTART=?**	Response **OK**
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 command AT+KTCPCNX

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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. • +++ can be used to switch in command mode. • ATO<session_id> can be used to switch back in .data mode. • Only 1 KTCPSTART session can be used. • Can be used in 07.10 multiplexer. • If the session is successfully connected by +KTCPCNX, this command does not restart the connection and the module directly enters direct data flow.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Unsolicited Notification	Response **+KTCP_ACK: <session_id>,<result> <CR><LF>** Parameters **<session_id>** TCP session index **<result>** 0 Data sent failure: not all data has been received by remote side 1 Data sent success: all the data has already been received by the remote side
Reference Sierra Wireless Proprietary	Notes • This URC is enabled or disabled by parameter <URC-ENDTCP-enable> of command +KTCPCFG. The URC is disabled by default. • See section 18.5.6 Use Cases for AT+KTCPACKINFO and <URC-ENDTCP-enable> Option.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+ KTCPACKINFO =?**	Response **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+ KTCPACKINFO?**	Response **OK**
Write command Syntax For all TCP session IDs with <URC-ENDTCP-enable>=1: **AT+ KTCPACKINFO** or **AT+ KTCPACKINFO= <session_id>**	Response **+KTCPACKINFO: <session_id>,<result>** **[…]** **OK** or **+KTCPACKINFO: <session_id>,<result>** **OK** or **+CME ERROR: <err>** Parameters **<session_id>** TCP session index **<result>** 0 Data sent failure: not all data has been received by remote side. 1 Data sent success: all the data has already been received by the remote side; or no data transfer has happened yet 2 The status is unknown yet
Reference Sierra Wireless Proprietary	Notes • The command will return ERROR if <URC-ENDTCP-enable> of command +KTCPCFG is 0. • After the TCP session is connected and before any data transfer, +KTCPACKINFO returns 1.

12.11. UDP Specific Commands

12.11.1. +KUDPCFG Command: UDP Connection Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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**)** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+KUDPCFG?**	Response **+KUDPCFG: <session_id>,<cnx cnf>,<mode>,<port>,<data_mode>,<udp remote address>,<udp_port>,<af>** **[…]** **OK**
Write command Syntax **AT+KUDPCFG=** **[<cnx cnf>],** **<mode>[,[<port>]** **[,<data_mode>],** **[<udp remote address>] ,** **<udp_port>,<af>]**	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>** 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see section 12.7.1 +KCNXCFG Command: GPRS Connection Configuration). **<udp_notif>** Integer type. Indicates the cause of the UDP connection failure. 0 Network error 1 No more sockets available; max number already reached 2 Memory problem 3 DNS error 5 UDP connection error(Host unreachable) 6 Generic error 8 Data sending is OK but KUDPSND was waiting 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 **<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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 in order to start the connection properly.

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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>,<ndata available>** 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 **<ndata available>** Number of bytes to be read in first received packet **<udp_notif>** See command AT+KUDPCFG **<ndata missed>** Number of bytes left in the UDP socket

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 command AT+KUDPCFG

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference Sierra Wireless Proprietary	Notes • User must use <EOF pattern> to finish sending, then module returns to command mode. • 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. • Using "+++" can abort sending data and using ATO[n] to return back to data mode. • 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.

12.11.4. +KUDPCLOSE Command: Close Current UDP Operation

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

12.11.5. +KUDPDEL Command: Delete a Configured UDP Session

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

12.11.6. +KUDP_IND Notification: UDP Status

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

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Unsolicited Notification	Response **+KUDP_DATA: <session_id>,<ndata available>[,<udp remote address>,<udp remote port>,<data>]**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	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 in order to activate the notification again. • When <data_mode> was set to 1, <ndata_available> will range from 1 – 1500 in the URC. If the user application sends over 1500 bytes of data to the module, the module will display those data with several URCs. It is possible for other applications (e.g. from Windows) to send more than 1472 bytes UDP packets to the module but the packet will be segmented and reassembled by the network stack. • When <data_mode> is set to 1, URC +KUDP_RCV will not be displayed after +KUDP_DATA. • When <data_mode> was set to 1, the fields <udp remote address> and <udp remote port> will be displayed in URC +KUDP_DATA. When <data_mode> was set to 0, they will be displayed in URC +KUDP_RCV. • See section 18.6.3 Use Cases for KTCP_DATA and KUDP_DATA.

12.12. FTP Client Specific Commands

12.12.1. +KFTPCFG Command: FTP Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KFTPCFG=?**	Response **+KFTPCFG: (**list of possible **<cnx cnf>**s**),<server-name/ip>,(**range of possible length of **<login>),(**range of possible length of **<password>),(**list of possible **<port_number>**s**),(**list of possible **<mode>**s**),(**list of possible **<start>**s**),(**list of possible **<af>**s**)** **OK**
Read command Syntax **AT+KFTPCFG?**	Response **+KFTPCFG: <session_id>,<cnx cnf>,<server_name>,<login>,<password>, <port_number>,<mode>,<started>,<af>**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+KFTPCFG=** **[<cnx cnf>],** **<server_name>** **[,<login>** **[,<password>** **[,<port_number>** **[,<mode>]** **[,<start>]** **[,<af>]]]]**	Response **+KFTPCFG:<session_id>** **OK** or **+KFTP_ERROR: <session_id>,<ftp cause>** Parameters **<cnx cnf>** 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration **<session_id>** FTP session index **<server_name>** IP address string of the ftp server or domain name of the server **<login>** String type, indicates the user name to be used during the FTP connection **<password>** String type, indicates the password to be used during the FTP connection **<port_number>** 1 – 65535 Indicates the remote command port (21 by default) **<mode>** Indicates the initiator of the FTP connection 0 Active. The server is initiator of the FTP data connection 1 Passive. The client is initiator of the FTP data connection in order to avoid the proxy filtrate. The passive data transfer process “listens” on the data port for a connection from the active transfer process in order to open the data connection **<start>** Specifies whether to start the FTP connection immediately. 0 Start the FTP connection later by +KFTPCNX 1 Start the FTP connection immediately **<started>** Specifies whether to the FTP connection is started 0 FTP connection is not started yet 1 FTP connection is started **<af>** Address family used for the connection. 0 IPV4 1 IPV6 **<ftp_cause>** Integer type that indicates the cause of the FTP connection failure. 0 The sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to download a file due to connection troubles 3 Download was impossible due to connection timeout 4 No network available 5 Flash access trouble 6 Flash memory full 7 Network error XXX Three-digit reply code from the FTP server. See section 18.2.5 FTP Reply Codes

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference Sierra Wireless Proprietary	Notes • The write command sets the server name, login, password, port number and mode for FTP operations. • This command (with <start> = 0) can be used before setting up +KCNXCFG. Note however that the latter is required to start the connection properly. • The result of the FTP connection is notified using unsolicited response.
Example	**AT+KFTPCFG=1,"ftp.connect.com","username","password",21,0**

12.12.2. +KFTPCNX Command: Start FTP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KFTPCNX=?**	Response **+KFTPCNX: (**list of possible **<session_id>**s**)** **OK**
Write command Syntax **AT+KFTPCNX= <session_id>**	Response **OK** or **NO CARRIER** **+CME ERROR: <err>** **+KFTP_ERROR: <session_id>,<ftp cause>** Parameters **<session_id>** FTP session index **<ftp_cause>** Integer type that indicates the cause of the FTP connection failure. 0 Sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to download a file due to connection troubles 3 Download was impossible due to connection timeout 4 No network available 5 Flash access trouble 6 Flash memory full 7 Network error XXX Three-digit reply code from the FTP server. See section 18.2.5 FTP Reply Codes
Reference Sierra Wireless Proprietary	Notes • This command is used to start the FTP connection created by +KFTPCFG with <start>=0. • +KFTPRCV, +KFTPSND, +KFTPDEL automatically starts the connection if it has not been started using AT+KFTPCNX. • The result of the FTP connection is notified using unsolicited response.

12.12.3. +KFTPRCV Command: Receive FTP Files

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KFTPRCV=?**	Response **+KFTPRCV: (**list of possible **<session_id>**s**),<local_uri>,<server_path>,<file_name>,** **(**list of possible **<type_of_file>**s**),(**list of possible **<offset>**s**)** **OK**
Write command Syntax **AT+KFTPRCV= <session_id>, [<local_uri>,] [<server_path>,] <file_name> [,<type_of_file> [,<offset>]]**	Response **CONNECT** **<EOF_pattern>** **OK** or **+CME ERROR<err>** **NO CARRIER** **+KFTP_ERROR: <session_id>,<ftp cause>** Parameters **<session_id>** FTP session index **<local_uri>** This argument must be empty. It is reserved for compatibility of command syntax. **<server_path>** String type. Indicates the path of the file to be downloaded. An empty string or no string indicates the downloading is done from the path given by the FTP server **<file_name>** string type. Indicates the name of the file to download **<type_of_file>** Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 Binary (default value) 1 ASCII **<offset>** 0 – 4294967295 Integer type indicating the offset to “resume transfer”. See section 18.7.2 "FTP Resume" Use Case. When downloading file and transmitting to serial link, module will use the <offset> value and “resume transfer” from this position. **<EOF_pattern>** End of file notification. See +KPATTERN for value **<ftp_cause>** Integer type that indicates the cause of the FTP connection failure 0 Sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to download a file due to connection troubles. 3 Download was impossible due to connection timeout 4 No network available 5 Flash access trouble 6 Flash memory full 7 Network error XXX Three-digit reply code from the FTP server. See section 18.2.5 FTP Reply Codes

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference Sierra Wireless Proprietary	Notes • An FTP connection must have been achieved using AT+KFTPCFG before using this command. • The user will receive the entire data stream after sending the +KFTPRCV command. • The user can abort the download by sending the “End of Data pattern” from the host. In this case, the module will end the transfer by transmitting the EOF followed by NO CARRIER. • Download can also be aborted (disconnected) by +++ or DTR as specified in section 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. • If AT&C1 is set, DCD will be ON after CONNECT and DCD will be OFF after download is done. • “Resume transfer” feature should be supported by the FTP server to be used. • See section 18.7.2 "FTP Resume" Use Case. • If the FTP server does not support the resume feature, the module will output +KFTP_ERROR. The <ftp_cause> will be in the sets {500, 501, 502, 421, 530}. See section 18.2.5 FTP Reply Codes for error codes.

12.12.4. +KFTPSND Command: Send FTP Files

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KFTPSND=?**	Response **+KFTPSND: (**list of possible **<session_id>**s**),<local_uri>,<server_path>,<file_name>, (**list of possible **<type of file>**s**),(**list of possible **<append>**s**)** **OK**
Write command Syntax **AT+KFTPSND= <session_id>, [<local_uri>,] [<server_path>,] <file_name> [,<type of file>] [,<append>]**	Response **CONNECT** **data…** **<EOF pattern>** **OK** or **+CME ERROR <err>** **NO CARRIER** **+KFTP_ERROR: <session_id>,<ftp cause>** Parameters **<session_id>** FTP session index **<local_uri>** This argument must be empty. It is reserved for compatibility of command syntax. **<server_path>** String type. Indicates the path of the file to be uploaded. An empty string or no string indicates the uploading is done from the path given by the FTP server **<file_name>** String type. Indicates the name of the file to upload

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<type of file> Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 Binary 1 ASCII **<append>** Numeric type. Indicates using "append" or not when uploading. 0 Do not use "append". If the file already exists then the file will be overridden 1 Use "append". If the file already exists then the data will be appended at the end of the file; otherwise the file will be created **<EOF pattern>** End of file notification. See +KPATTERN for values **<ftp_cause>** Integer type that indicates the cause of the FTP connection failure. 0 Sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to download a file due to connection troubles. 3 Download was impossible due to connection timeout 4 No network available 5 Flash access trouble 6 Flash memory full 7 Network error XXX Three-digit reply codes from the FTP server. See section 18.2.5 FTP Reply Codes
Reference Sierra Wireless Proprietary	Notes • An FTP connection must have been achieved using AT+KFTPCFG before using this command. • After sending the +KFTPSND command, the host must send the entire data stream of the file. • Upload can also be ended (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. • ATO is not available for this command. • If AT&C1 is set, DCD will be ON after CONNECT, and it will be OFF after the upload done.

12.12.5. +KFTPDEL Command: Delete FTP Files

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	Parameters **<session_id>** FTP session index **<server_path>** String type. Indicates the path of the file to be deleted. An empty string or no string indicates the deleting is done from the path given by the <server_name> parameter **<file_name>** String type. Indicates the name of the file to delete **<type>** Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 Binary 1 ASCII **<ftp_cause>** Integer type that indicates the cause of the FTP connection failure 0 Sending or the retrieving was impossible due to request timeout 1 Impossible to connect to the server due to DNS resolution failure 2 Impossible to delete a file due to connection troubles 3 Deleting was impossible due to connection timeout 4 No network available XXX Three-digit reply codes from the FTP server. See section 18.2.5 FTP Reply Codes
Reference Sierra Wireless Proprietary	Notes • An FTP connection must have been achieved using AT+KFTPCFG before using this command. • The result of the delete operation is notified using unsolicited response.

12.12.6. +KFTP_IND Notification: FTP Status

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

12.12.7. +KFTPCLOSE Command: Close Current FTP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+KFTPCLOSE =?**	Response **+KFTPCLOSE: (**list of possible **<session_id>**s**),(**list of possible **<keep_cfg>**s**)** **OK**
Write command Syntax **AT+KFTPCLOSE =<session_id> [,<keep_cfg>]**	Response **OK** Parameters **<session_id>** FTP session index **<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 command will close the connection to the FTP server.

12.12.8. +KFTPCFGDEL Command: Delete a Configured FTP Session

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

12.13. HTTP Client Specific Commands

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

12.13.1. +KHTTPCFG Command: HTTP Connection Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KHTTPCFG =?**	Response **+KHTTPCFG: (**list of possible **<cnx_cnf>**s)**,<server-name/ip>,(**list of possible **<http_port>**s)**,(**list of possible **<http_version>**s)**,(**range of possible length of **<login>)**, **(**range of possible length of **<password>)**,(**list of possible **<started>**s)**,** (**list of possible **<af>**s)**,<cipher_index>** **OK**
Read command Syntax **AT+KHTTPCFG?**	Response **+KHTTPCFG: <session_id>,<cnx cnf>,<http_server>,<http_port>,<http_version>, <login>,<password>,<started>,<af>,<cipher_index>** **OK**
Write command Syntax **AT+KHTTPCFG= [<cnx cnf>], <http_server> [,<http_port> [,<http_version> [,<login> [,<password>] [,<start>] [,<af>]]] [,<cipher_index>]]**	Response **+KHTTPCFG: <session_id>** **OK** or **+CME ERROR: <err>** Parameters **<cnx cnf>** 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see KCNXCFG) **<session_id>** HTTP session index **<http_server>** IP address string or explicit name of the remote server **<http_port>** Numeric parameter (1-65535), 80 by default **<http_version>** 0 HTTP 1.1(by default) 1 HTTP 1.0 2 HTTP 1.1 over TLS (HTTPS) 3 HTTP 1.0 over TLS (HTTPS) **<login>** String type, indicates the user name to be used during the HTTP connection **<password>** String type, indicates the password to be used during the HTTP connection

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<start> Specifies whether to start the HTTP connection immediately or not 0 Start the HTTP connection later using +KTTPCNX 1 Start the HTTP connection immediately **<started>** Specifies whether the HTTP connection has been started 0 The HTTP connection has not been started yet 1 The HTTP connection has already been started **<af>** Address family used for the connection. Default is IPV4. 0 IPV4 1 IPV6 **<cipher_index>** Cipher suite profile index to use for a secured socket; defined by +KSSLCRYPTO
Reference Sierra Wireless Proprietary	Notes • <http_port> and <http_server> define the port and the IP address of the remote server one wants to connect. • The connection timeout for TCP socket is about 9 seconds with 3 retransmissions with 3 seconds delay. • This command can be used before setting up +KCNXCFG configuration. Note however that the latter is required to start the connection properly. • For <af>=1 (IPV6), server address (<http_server>) in IP address string format can be optionally quoted with square brackets "[]", e.g. [FEDC:BA98:7654:3210:FEDC:BA98:7654:3210]

12.13.2. +KHTTPCNX Command: Start the HTTP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KHTTPCNX=?**	Response **+KHTTPCNX: (**list of possible **<session_id>**s**)** **OK**
Write command Syntax **AT+KHTTPCNX=<session_id>**	Response **OK** or **+CME ERROR: <err>** **+KHTTP_ERROR: <session_id>, <http_notif>** Parameters **<session_id>** HTTP session index **<http_notif>** Integer type. Indicates the cause of the HTTP connection failure 4 DNS error 5 HTTP connection error due to internal trouble 6 HTTP connection timeout

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP has partial data
Reference Sierra Wireless Proprietary	Notes • This command is used to start the HTTP connection created by +KHTTPCFG with <start>=0. • +KHTTPGET, +KHTTPHEAD, +KHTTPPOST automatically starts the connection if it has not been started before using AT+KHTTPCNX.

12.13.3. +KHTTPHEADER Command: Set the HTTP Request Header

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+ KHTTPHEADER =?**	Response **+KHTTPHEADER: (**list of possible **<session_id>**s**),<local_uri>** **OK**
Read command Syntax **AT+ KHTTPHEADER?**	Response **+KHTTPHEADER: <session_id>,<count>** **[…]**
Write command Syntax **AT+ KHTTPHEADER= <session_id> [,<local_uri>]**	Response **OK** or **+CME ERROR: <err>** Parameters **<session_id>** HTTP session index **<local_uri>** This argument must be empty. It is reserved for compatibility of command syntax. **<count>** Count of HTTP headers
Reference Sierra Wireless Proprietary	Notes • <session_id> is always 0. • File (local_uri) should be put into the directory "/ftp". • User must use <EOF pattern> to finish sending; then the module will return to command mode.

12.13.4. +KHTTPGET Command: Get HTTP Server Information

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KHTTPGET =?**	Response **+KHTTPGET: (**list of possible **<session_id>**s)**,<request_uri >,** **(**list of possible **<show_resp>**s**)** **OK**
Write command Syntax **AT+KHTTPGET= <session_id>, <request_uri> [,<show_resp>]**	Response **CONNECT** **…<EOF pattern>** **OK** or **NO CARRIER** **+CME ERROR: <err>** **+KHTTP_ERROR: <session_id>, <http_notif>** Parameters **<session_id>** HTTP session index **<request_uri>** string type, indicates the information url to get during the HTTP connection **<http_notif>** Integer type. Indicates the cause of the HTTP connection failure 4 DNS error 5 HTTP connection error due to internal trouble 6 HTTP connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP has partial data **<show_resp>** Whether to show HTTP response and HTTP headers 0 Do not show response and headers 1 Show response and headers (default)
Reference Sierra Wireless Proprietary	Notes • <session_id> is always 0. • The user can abort the download by sending the “End of Data pattern” from the host. In this case, the module will end the transfer by transmitting the EOF followed by NO CARRIER. • Download can also be aborted (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. • HTTP does not support DTR1.

12.13.5. +KHTTPHEAD Command: Get HTTP Headers

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KHTTPHEAD =?**	Response **+KHTTPHEAD: (**list of possible **<session_id>**s**),<request_uri>** **OK**
Write command Syntax **AT+KHTTPHEAD =<session_id>, <request_uri>**	Response **CONNECT** **…<EOF pattern>** **OK** or **NO CARRIER** **+CME ERROR: <err>** **+KHTTP_ERROR: <session_id>, <http_notif>** Parameters **<session_id>** HTTP session index **<request_uri>** String type, indicates the information URL to get during HTTP connection **<http_notif>** Integer type. Indicates the cause of the HTTP connection failure 4 DNS error 5 HTTP connection error due to internal trouble 6 HTTP connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP has partial data
Reference Sierra Wireless Proprietary	Notes • HTTP does not support DTR1 • This method is identical to GET except that the server MUST NOT return a message-body in the response. The meta-information contained in the HTTP headers in response to a HEAD request SHOULD be identical to the information sent in response to a GET request

12.13.6. +KHTTPPOST Command: Perform HTTP Post

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

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Write command Syntax **AT+KHTTPPOST = <session_id>, <local_uri>, <request_uri> [,<show_resp>]**	Response **CONNECT** **…<EOF pattern>** **OK** or **NO CARRIER** **+CME ERROR: <err>** **+KHTTP_ERROR: <session_id>, <http_notif>** Parameters **<session_id>** HTTP session index **<local_uri>** This argument must be empty. It is reserved for compatibility of command syntax. **<request_uri>** string type, the request data of the HTTP connection **<http_notif>** Refer to +KHTTPGET **<show_resp>** Whether to show HTTP response and HTTP headers 0 Do not show HTTP response and headers 1 Show HTTP response and headers (default)
Reference Sierra Wireless Proprietary	Notes • <session_id> is always 0. • It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. • Upload can also be ended (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. • ATO is not available for this command.

12.13.7. +KHTTPCLOSE Command: Close an HTTP Connection

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+ KHTTPCLOSE=?**	Response **+KHTTPCLOSE: (**list of possible **<session_id>**s**), (**list of possible **<keep_cfg>**s**)** **OK**
Write command Syntax **AT+ KHTTPCLOSE= <session_id> [,<keep_cfg>]**	Response **OK** or **+CME ERROR: <err>**

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	Parameters **<session_id>** HTTP session index **<keep_cfg>** Specifies whether to delete the session configuration after closing it 0 Delete the session configuration 1 Keep the session configuration
Reference Sierra Wireless Proprietary	

12.13.8. +KHTTPDEL Command: Delete a Configured HTTP Session

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

12.13.9. +KHTTP_IND Notification: HTTP Status

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Unsolicited Notification	Response **+KHTTP_IND: <session_id>,<status>[,<data_len>,<st_code>,<st_reason>]** Parameters **<session_id>** HTTP session index **<status>** HTTP session status 1 Session is set up and ready for operation 3 The last HTTP command is executed successfully

HL7618, HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<data_len> Byte length of data downloaded/uploaded to/from the terminal (using +KHTTPHEAD, +KHTTPGET, or +KHTTPPOST) **<st_code>** HTTP response status code **<st_reason>** HTTP response status reason string
Reference Sierra Wireless Proprietary	

12.14. HTTPS Client Specific Commands

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

12.14.1. +KHTTPSCFG Command: HTTPS Connection Configuration

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KHTTPSCFG =?**	Response **+KHTTPSCFG: (**list of possible **<cnx_cnf>**s)**,<server-name/ip>,(**list of possible **<https_port>**s)**,(**list of possible **<http_version>**s)**,(**list of possible **<cipher_suite>**s) ,(**list of possible **<sec_level>**s) ,(**range of possible length of **<login>),(**range of possible length of **<password>),(**list of possible **<started>**s), (**list of possible **<af>**s) **OK**
Read command Syntax **AT+KHTTPSCFG ?**	Response **+KHTTPSCFG: <session_id>,<cnx cnf>,<http_server>,<https_port>,<http_version>, <cipher suite>,<sec_level>,<login>,<password>,<started>,<af>** **OK**
Write command Syntax **AT+KHTTPSCFG =[<cnx cnf>], <http_server> [,<https_port> [,<http_version> [,<cipher_suite> [,<sec_level> [,<login> [,<password>] [,<start>] [,<af>]]]]]]**	Response **+KHTTPSCFG: <session_id>** **OK** or **+CME ERROR: <err>** Parameters **<cnx cnf>** 1 – 5 (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see +KCNXCFG). **<session_id>** HTTPS session index

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<http_server> IP address string or explicit name of the remote server **<https_port>** Numeric parameter (1-65535), 443 by default. **<http_version>** 0 HTTP 1.1 1 HTTP 1.0 **<cipher_suite>** 0 TLS_RSA_CHOOSE_BY_SERVER 1 TLS_RSA_WITH_RC4_128_MD5 2 TLS_RSA_WITH_RC4_128_SHA 3 TLS_RSA_WITH_DES_CBC_SHA (not supported) 4 TLS_RSA_WITH_3DES_EDE_CBC_SHA (not supported) 5 TLS_RSA_EXPORT1024_WITH_DES_CBC_SHA (not supported) 6 TLS_RSA_WITH_AES_128_CBC_SHA 7 TLS_RSA_WITH_AES_256_CBC_SHA 8 TLS_RSA_WITH_AES_128_GCM_SHA256 **<sec_level>** 1 No authentication 2 Manage server authentication (renegotiation of client certificate is not supported) 3 Manage server and client authentication if requested by remote server (renegotiation of client certificate is not supported) **<login>** String type, indicates the user name to be used during the HTTPS connection. **<password>** String type, indicates the password to be used during the HTTPS connection. **<start>** Specifies whether to start the HTTPS connection immediately or not 0 Start the HTTPS connection later using +KTTPSCNX 1 Start the HTTPS connection immediately **<started>** Specifies whether the HTTPS connection has been started 0 The HTTPS connection has not been started yet 1 The HTTPS connection has already been started **<af>** Address family used for the connection 0 IPV4 1 IPV6
Reference Sierra Wireless Proprietary	Notes • <https_port> and <http_server> define the port and the IP address of the remote server one wants to connect. • The connection timeout for TCP socket is about 9 seconds with 3 retransmissions with 3 seconds delay. • For <sec_level>:2 and 3, certificates or private key must be loaded from internal storage. See SSL Certificate Management for more information. • Any certificates referenced in HTTPS feature should be DER encoded. • Any private key referenced in HTTPS feature should be DER- PKCS#8 encoded. • This command can be used before setting up +KCNXCFG configuration. Note however that the latter is required to start the connection properly.

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	• For <af>=1 (IPV6), server address (<http_server>) in IP address string format can be optionally quoted with square brackets "[]", e.g. [FEDC:BA98:7654:3210:FEDC:BA98:7654:3210] • SSL version is TLS 1.1 by default; refer to <ssl_ver> of +KIPOPT for configuration.

12.14.2. +KHTTPSCNX Command: Start HTTPS Connection

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KHTTPSCNX =?**	Response **+KHTTPSCNX: (**list of possible **<session_id>**s**)** **OK**
Write command Syntax **AT+KHTTPSCNX =<session_id>**	Response **OK** or **+CME ERROR: <err>** **+KHTTPS_ERROR: <session_id>, <http_notif>** Parameters **<session_id>** HTTPS session index **<http_notif>** Integer type. Indicates the cause of the HTTPS connection failure 4 DNS error 5 HTTPS connection error due to internal trouble 6 HTTPS connection timeout 9 Triple plus (+++) error (switch to command mode) 10 HTTPS got no data 11 HTTPS got partial data
Reference Sierra Wireless Proprietary	Notes • This command is used to start the HTTPS connection created by +KHTTPSCFG with <start>=0. • +KHTTPSGET, +KHTTPSHEAD, +KHTTPSPOST automatically starts the connection if it has not been started using AT+KHTTPSCNX.

12.14.3. +KHTTPSHEADER Command: Set the HTTPS Request Header

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+ KHTTPSHEADER =?**	Response **+KHTTPSHEADER: (**list of possible **<session_id>**s**), <local_uri>** **OK**
Read command Syntax **AT+ KHTTPSHEADER ?**	Response **+KHTTPSHEADER: <session_id>,<count>** **[…]**
Write command Syntax **AT+ KHTTPSHEADER =<session_id> [,<local_uri>]**	Response **OK** or **+CME ERROR: <err>** Parameters **<session_id>** HTTPS session index **<local_uri>** This argument must be empty. It is reserved for compatibility of command syntax. **<count>** HTTPS header count
Reference Sierra Wireless Proprietary	Notes User must use <EOF pattern> to finish sending, then module returns to command mode.

12.14.4. +KHTTPSGET Command: Get Information from HTTPS Server

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

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Write command Syntax **AT+KHTTPSGET =<session_id>, <request_uri> [,<show_resp>]**	Response **CONNECT** **…<EOF pattern>** **OK** or **NO CARRIER** **+CME ERROR: <err>** **+KHTTPS_ERROR: <session_id>, <http_notif>** Parameters **<session_id>** HTTPS session index **<request_uri>** String type, indicates the information URL to get during HTTPS connection **<http_notif>** Integer type. Indicates the cause of the HTTPS connection failure 4 DNS error 5 HTTP connection error due to internal trouble 6 HTTP connection timeout 7 Flash access trouble 8 Flash memory full 9 Triple plus (+++) error (switch to command mode) 10 HTTP has no data 11 HTTP has partial data 12 Validate server's certificate error 13 Initialize SSL error **<show_resp>** Defines whether HTTPS response and HTTPS headers are shown 0 Do not show HTTPS response and headers 1 Show HTTPS response and headers
Reference Sierra Wireless Proprietary	Notes • The user can abort the download by sending the "End of Data pattern" from the host. In this case, the module will end the transfer by transmitting the EOF followed by NO CARRIER. • Download can also be aborted (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table.

12.14.5. +KHTTPSHEAD Command: Retrieve HTTP Headers

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

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Write command Syntax **AT+ KHTTPSHEAD= <session_id>, <request_uri>**	Response **CONNECT** **…<EOF pattern>** **OK** or **NO CARRIER** **+CME ERROR: <err>** **+KHTTPS_ERROR: <session_id>, <http_notif>** Parameters **<session_id>** HTTPS session index **<request_uri>** String type, indicates the information URL to get during HTTPS connection
Reference Sierra Wireless Proprietary	Notes • HTTPS does not support DTR1 • This method is identical to GET except that the server MUST NOT return a message-body in the response. The meta-information contained in the HTTP headers in response to a HEAD request SHOULD be identical to the information sent in response to a GET request.

12.14.6. +KHTTPSPOST Command: Send Data to HTTPS Server

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

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
	<request_uri> String type, indicates the request data of the HTTPS connection **<http_notif>** Refer to +KHTTPSGET **<show_resp>** Defines whether HTTPS response and HTTPS headers are shown 0 Do not show HTTPS response and headers 1 Show HTTPS response and headers
Reference Sierra Wireless Proprietary	Notes • It is highly recommended to configure the module for hardware flow control using AT&K3 before using this command. • Upload can also be ended (disconnected) by +++ or DTR as specified in 18.9 Switch Data/Command Mode DTR +++ ATO Behavior Table. • ATO is not available for this command.

12.14.7. +KHTTPSCLOSE Command: Close an HTTPS Connection

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

12.14.8. +KHTTPSDEL Command: Close an HTTPS Connection

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+KHTTPSDEL =?**	Response **+KHTTPSDEL: (**list of possible **<session_id>**s**)** **OK**
Write command Syntax **AT+KHTTPSDEL =<session_id>**	Response **OK** or **+CME ERROR: <err>** Parameter **<session_id>** HTTPS session index
Reference Sierra Wireless Proprietary	Notes The session must be closed (using +KHTTPSCLOSE) before using this command.

12.14.9. +KHTTPS_IND Notification: HTTPS Status

HL7618RD, HL7648, HL7650, HL7690 and HL7692	
Unsolicited Notification	Response **+KHTTPS_IND: <session_id>,<status>[,<data_len>]** Parameters **<session_id>** HTTPS session index **<status>** HTTPS session status 1 Session is set up and ready for operation 2 The last HTTPS command is executed successfully **<data_len>** Byte length of data downloaded/uploaded to/from the terminal (using +KHTTPSHEAD, +KHTTPSGET, or +KHTTPSPOST)
Reference Sierra Wireless Proprietary	

12.15. SSL Certificate Manager

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

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

HL7648, HL7650, HL7690 and HL7692	
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**
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>** Number of bytes to read/write. Value range: 1-3000. **<index>** Stored root/local certificate index. If a root/local certificate is already stored at the index, it will be overloaded. 0 by default. Value range: 0 If <data_type> = 0 0 – 2 If <data_type> = 1 **<File_data>** File data in bytes

HL7648, HL7650, HL7690 and HL7692	
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). • If <NbData> is not given, the input should be terminated by +++ or DTR signal

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

HL7648, HL7650, HL7690 and HL7692	
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>** Index of the stored local certificate associated to this private key. Value range: 0 – 2 **<NbData>** Number of bytes to read/write (mandatory for both reading and writing). Value range: 1-3000. **<File_data>** File data in bytes
Reference Sierra Wireless Proprietary	Notes If <NbData> is not given, the input should be terminated by +++ or DTR signal.

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

HL7648, HL7650, HL7690 and HL7692	
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. Default value = 0. Value range: 0 If <data_type> = 0 0 – 2 If <data_type> = 1
Reference Sierra Wireless Proprietary	

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

HL7648, HL7650, HL7690 and HL7692	
Test command Syntax **AT+ KPRIVKDELETE =?**	Response **+KPRIVKDELETE: (**list of possible **<index>**es**)** **OK**

HL7648, HL7650, HL7690 and HL7692	
Write command Syntax **AT+ KPRIVKDELETE= <index>**	Response **OK** or **+CME ERROR: <err>** Parameter **<index>** Stored private key index. Value range: 0 – 2
Reference Sierra Wireless Proprietary	

13. AVMS Commands

13.1. +WDSC Command: Device Services Configuration

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+WDSC=?**	Response **+WDSC:** (0-2), (list of supported **<State>**s) **+WDSC:** 3, (list of supported **<State>**s) **+WDSC:** 4, (list of supported **<Timer_n>**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]]** **OK**
Write command Syntax For <Mode>= 0, 1, 2 or 3 **AT+WDSC= <Mode>,<State>** For <Mode>= 4 **AT+WDSC= <Mode>, <timer_1> [[,<Timer_2>]… [,<Timer_n>]]**	Response **OK** or **+CME ERROR <err>** Parameters **<Mode>** Integer type 0 User agreement for connection When this mode is activated and when a notification SMS is received by the embedded module, an indication (see +WDSI indication for more information) is returned by the embedded module to request for an agreement before connecting to the AirPrime Management Services server 1 User agreement for package download When this mode is activated, an indication (see +WDSI indication for more information) is returned by the embedded module to request for an agreement before downloading any package 2 User agreement for package install When this mode is activated, an indication (see +WDSI indication for more information) is returned by the embedded module to request for an agreement before installing any package 3 Polling mode The embedded module will initiate a connection to the Device Services server according to the defined timer 4 Retry mode If an error occurs during a connection to the Device Services server (GPRS establishment failed, etc.), the embedded module will initiate a new connection according to the defined timers. This mechanism is persistent to the reset.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<State> Integer type; mode status For <Mode> = 0, 1 or 2 0 Disabled (default value) 1 Enabled For <Mode> = 3 Value in range 0 – 525600 (units = min) 0 The polling mode is deactivated **<Timer_1>** Timer between the first failed connection and the next attempt. Value in range 0 – 20160 (units = min). 0 The retry mode is deactivated 15 Default value **<Timer_n>** Timer between the nth failed attempt connection and the $(n+1)^{th}$ connection (n<=8). Value in range 1 – 20160 (units = min) Default values: <Timer_2> = 60 <Timer_3> = 240 <Timer_4> = 960 <Timer_5> = 2880 <Timer_6> = 10080 <Timer_7> = 10080
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. The &F command has no impact on these values. • The network registration is considered as “failed” when all connections configured by the retry mode have failed. This registration is forbidden while the APN is not set by the +WDSS command.
Examples	**AT+WDSC=?** **+WDSC:(0-2),(0-1)** **+WDSC:3,(0-525600)** **+WDSC:4,(0-20160),(1-20160),(1-20160),(1-20160),(1-20160),(1-20160),(1-20160),(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** **OK** **AT+WDSC=0,1** **OK** **AT+WDSC?** **+WDSC: 0,1** **+WDSC: 1,0** **+WDSC: 2,0** **+WDSC: 3,0** **+WDSC: 4,15,60,240,960,2880,10080,10080** **OK**

13.2. +WDSD Command: Device Services Local Download

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
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 – 24643584 Package size in bytes
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 commands)
Reference Sierra Wireless Proprietary Command	Notes • This command is available when the embedded module has finished its initialization. • The response to the AT+WDSD=<Size> command is the <NACK> character when the device is ready to receive data using the 1K-Xmodem protocol • The flow control of the TE has to be set to 'Hardware' • This command will automatically activate the user agreement for install (see +WDSC command description). • No reset is made during the package download. • A timeout will happen (and a +CME ERROR: 3 is returned) if no data is sent to the device in 5 minutes.

13.3. +WDSE Command: Device Services Error

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Execute command Syntax **AT+WDSE**	Response **[+WDSE:<HTTP_Status>]** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	or **+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 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.
Notes	This command is available when the embedded module has finished the Device Services initialization (see +WDSI) and when AVMS services is activated (see +WDSG).
Examples	**AT+WDSS=1,1** //A session was made with the server **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	AT+WDSE **+WDSE: 200** //The last HTTP response received is “OK” **OK**

13.4. +WDSF Command: Device Services Fallback

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+WDSF=?**	Response **+WDSF:** (list of supported **<Mode>**s) **OK**
Read command Syntax **AT+WDSF?**	Response **+WDSF: 1,<FallbackInfo>** **+WDSF: 2,<EraseInfo>** **OK**
Write command Syntax **AT+WDSF= <Mode>**	Response **OK** or **+CME ERROR <err>** Parameters **<Mode>** Integer type 1 Downgrade to a previous installation 2 Delete the downloaded package which contains the reverse patch **<FallbackInfo>** Integer type – Indicates the presence of the previous package 0 Previous package is not present 1 Previous package is present **<EraseInfo>** Integer type – Indicate if a package can be deleted. Be careful, erasing the package will disable the possibility to make any recovery or manual fallback 0 The package cannot be deleted 1 The package can be deleted
Notes	This command is available when the embedded module has finished the Device Services initialization (see +WDSI).
Examples	**AT+WDSF?** *//a reverse package is present, deletion impossible* **+WDSF: 1,1** **+WDSF: 2,0** **OK** **AT+WDSF=1** *//downgrade to the previous installation* **OK** **+WDSI: 17,1** *//downgrade the package successfully done, displayed only if +WDSI //indication is activated*

13.5. +WDSG Command: Device Services General Status

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+WDSG=?**	 Response **OK**
Execute command Syntax **AT+WDSG**	 Response **+WDSG: <Indication>,<State>** **[+WDSG: <Indication>,<State>[…]]** **OK** or **+CME ERROR <err>** 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 have to be provisioned. 2 Device services have to be provisioned. NAP parameters have to be provisioned. 3 Device services are activated. If a device has never been activated (first use of device services on this device), <State> is set to 1. The connection parameters are automatically provisioned, no action is needed from the user. For <Indication>=1 0 No session or package 1 A session is under treatment 2 A package is available on the server. 3 A package was downloaded and ready to install When a package was installed or a recovery was made, <State> is set to 0.
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**

13.6. +WDSI Command: Device Services Indication

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+WDSI=?**	Response **+WDSI:** (list of supported **<Level>**s) **OK**
Read command Syntax **AT+WDSI?**	Response **[+WDSI: <Level>]** **OK**
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 and 3) 4 Activate the authentication indications (<Event> = 4 and 5) 8 Activate the session start indication (<Event> = 6, 7 and 8) 16 Activate the package download indications (<Event> = 9,10 and 11) 32 Activate the certified downloaded package indication (<Event> = 12 and13) 64 Activate the update indications (<Event> = 14,15 and 16) 128 Activate the fallback indication (<Event> = 17) 256 Activate download progress indication (<Event> = 18) 512 Reserved 1024 Reserved 2048 Activate provisioning indication (<Event> = 21) 4096 Reserved **<Event>** 0 Device services are initialized and can be used. Devices services are initialized when the SIM PIN code is entered and a dedicated NAP is configured (see +WDSS command) 1 The Device Services server requests the device to make a connection. The device requests a user agreement to allow the embedded module to make the connection. The response can be sent using +WDSR command and this indication can be returned by the device if the user has activated the user agreement for connection (see +WDSC command for more information) 2 The Device Services server requests the device to make a package download. The device requests a user agreement to allow the embedded module to make the download. The response can be sent using +WDSR command and this indication can be returned by the device if the user has activated the user agreement for download (see +WDSC command for more information).

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	3 The device has downloaded a package. The device requests a user agreement to install the downloaded package. The response can be sent using +WDSR command and this indication can be returned by the device if the user has activated the user agreement for install (see +WDSC command for more information). 4 The embedded module starts sending data to the server 5 Authentication with the server failed 6 Authentication has succeeded, a session with the server started 7 Session with the server failed 8 Session with the server is finished 9 A package is available on the server and can be downloaded by the embedded module. A <Data> parameter is returned indicating the package size in kB 10 A package was successfully downloaded and stored in flash 11 An issue happens during the package download. If the download has not started (+WDSI: 9 indication was not returned), this indication indicates that there is not enough space in the device to download the update package. If the download has started (+WDSI: 9 indication was returned), a flash problem implies that the package has not been saved in the device 12 Downloaded package is certified to be sent by the AirPrime Management Services server 13 Downloaded package is not certified to be sent by the AirPrime Management Services server 14 Update will be launched 15 OTA update client has finished unsuccessfully 16 OTA update client has finished successfully 17 A fallback mechanism was launched 18 Download progress. This event is returned without <Data> parameter to indicate that a download starts. During the download, a percentage progress is indicated in <Data> parameter 19 Reserved 20 Reserved 21 A provision was made by the AirPrime Management Services server 22 Reserved **<Data>** Specific data for some <Event> For<Event>=9, <Data> indicates the package size in bytes, which will be downloaded 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 Reserved 2 Reserved 3 Reserved 4 Reserved 5 Reserved 6 Reserved 7 Reserved 8 Reserved

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	9 Device Service polling mode (see +WDSC command for more information) 10 Reserved 11 Reserved 12 Reserved 13 Reserved
Unsolicited Notification	Response **+WDSI: <Event>[,<Data>]**
Notes	• This command is available when the embedded module has finished its initialization. • To receive +WDSI indications, Device Services should be activated (see +WDSG for more information). • <Level> is stored in non-volatile memory. The default value can be restored using AT&F. • When the AVMS status is updated, the +WDSI unsolicited response will be displayed according to the AVMS status change at the same time. If there is a power loss when the AVMS status is updating but it was updated successfully, the +WDSI unsolicited response may be lost.
Examples	**AT+WDSI=?** **+WDSI: (0-2047)** **OK** **AT+WDSI?** **+WDSI: 0** *// All indications are deactivated* **OK** **AT+WDSI=207** **OK** **+WDSI: 1** *// The devices services server request 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*

13.7. +WDSR Command: Device Services Reply

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+WDSR= <Reply> [,<Timer>]**	Response **OK** or **+CME ERROR <err>** Parameters **<Reply>** Reply to user agreement request 0 Delay or refuse the connection to the server 1 Accept the connection to the server 2 Delay or refuse the download 3 Accept the download 4 Accept the install 5 Delay the install **<timer>** 0 – 1440 Timer (in minutes) until a new user agreement request is returned by the module. This parameter is only available for <Reply>=0, 2 or 5. Default value = 30. Value 0 indicates that the application refuses the user agreement (impossible when <Reply>=5).
Notes	• This command is available when the embedded module has finished the Device Services initialization (see +WDSI) and when AVMS services are activated (see +WDSG) • It is impossible to refuse an install request (AT+WDSR=5,0); this will return +CME ERROR: 3. • After an install delay if the embedded module is powered down until after the delay, it is not powered on and the new user agreement request should be returned at the newt start up.
Examples	**AT+WDSR=?** **+WDSR: (0-5),(0-1440)** **OK** **+WDSI: 1** *//The device Services server requests the device to make a connection // to the server. The user is requested to allow the connection.* **AT+WDSR=1** **OK** **+WDSI: 3** *//A user agreement is requested to install a package* **AT+WDSR=5,10** *//A delay of 10 minutes is requested* **OK** **+WDSI: 3** *//10 minutes later, a new user agreement is requested to install a //package* **AT+WDSR=4** *//The install is requested* **OK**

13.8. +WDSS Command: Device Services Session

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+WDSS=?**	Response **+WDSS: 0,**(Max length for **<Apn>**),(Max length for **<User>**),(Max length for **<Pwd>**),(list of supported **<Cid>**s) **[+WDSS: 1,**(list of supported **<Action>**s for this **<Mode>**)] **OK**
Read command Syntax **AT+WDSS?**	Response **[+WDSS: 0,<Apn>[,<User>],<Cid>]** **[+WDSS: 1,<Action>]** **OK**
Write command Syntax For <Mode>=0: **AT+WDSS= <Mode>[,<Apn> [,<User> [,<Pwd>[,<Cid>]]]]** For <Mode>=1 **AT+WDSS= <Mode>,<Action>**	Response **OK** or **+CME ERROR <err>** Parameters **<Mode>** Integer type 0 PDP context configuration for Device Services 1 User initiated connection to the Device services server **<Apn>** Access Point Name for Devices Services. String type up to 50 characters. For empty string, see <Cid> **<User>** Login for the APN. String type, up to 30 characters **<Pwd>** Password for the APN. String type, up to 30 characters **<Cid>** 1 – 5 Context ID used for AVMS PDP activation For connection to the server: If the PDP of <Cid> has already been activated: • when <Apn> is set as an empty string, AVMS connection will directly reuse the PDP of that <Cid>, or • when <Apn> is set as a non-empty string, it will check if <Apn> matches with +CGDCONT settings to reuse the connection Otherwise, it will activate with APN <Apn>. **<Action>** For <Mode>=1 only 0 Release the current connection to the Device Services Server 1 Establish a connection to the Device Services Server
Notes	• This command is available when the embedded module has finished the Device Services initialization (see +WDSI). • <Apn>, <User>, <Pwd> and <Cid> parameters are automatically stored in non-volatile memory. AT&F has no effect on these parameters. • AT+WDSS? command only returns OK if no APN is defined.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	• When a request is sent to the embedded module to resume a non-existent or unsuspended session, +CME ERROR: 3 is returned. • When a request is sent to the embedded module to release a non-existent session, +CME ERROR: 3 is returned. • Depending on +WDSM configuration, when no dedicated NAP is defined using +WDSS command and a session is asked (by AT command or notify by SMS), the embedded module will use a NAP defined by +CGDCONT command to activate the dedicated PDP context. This NAP will be recorded to configure the NAP Device Services and it will be used to activate the dedicated PDP context for the next sessions. • When the PDP context cannot be activated because of bad AirVantage Management Services NAP configuration, the embedded module will use a NAP defined by +CGDCONT command to activate the dedicated PDP context (but the initial NAP configuration is not erased). • Activation is done if the embedded module is registered on the network. If the embedded module is not registered when the command is performed, activation will be done at the next network registration (even if the embedded module resets). • No GPRS connection to the AirVantage Management Services server is possible when a registration is not completed. • If reuse of existing activated PDP context is required for all internet connections, set the <Cid> accordingly. For example, in LTE, if the internet connection uses PDP of cid1, then <Cid> should be 1. • AT+WDSS=0 will remove all stored information (<Apn>, <User>, <Pwd> and <Cid>). <Apn> will become unprovisioned, but not an empty string.
Examples	**AT+WDSS?** **OK** *//No APN defined* **AT+WDSS=?** **+WDSS: 0, 50,30,30,(1-5)** **+WDSS: 1,(0-1)** **OK** **AT+WDSS=0,“Sierra Wireless”,,,5** *//Define the APN for the Device Services; contect //ID = 5* **OK** **AT+WDSS?** **+WDSS: 0,“Sierra Wireless”,,5** **+WDSS: 1,0** **OK** **AT+WDSS=1,1** *//Initiation of a connection to the Device Services server* **OK** **AT+WDSS=1,0** *//Release connection to the Device Services server* **OK** // Example for LTE with only one PDP context is allowed **at+cgdcont?** **+CGDCONT: 1,"IP","broadband","10.191.8.184",0,0,0,0,0,0** **OK** **at+wdss=0,”broadband”,,,1** **OK**

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	at+wdss? **+WDSS: 0,"broadband",,1** **+WDSS: 1,0** **at+cgact?** **+CGACT: 1,1** **OK** **at+wdss=1,1** **OK** **+WDSI: 4** **+WDSI: 8** **at+cgdcont?** **+CGDCONT: 1,"IP","broadband","10.191.8.184",0,0,0,0,0,0** **OK** //Example for reusing activated PDP **at+cgdcont?** **+CGDCONT: 1,"IP","broadband","10.191.8.184",0,0,0,0,0,0** **OK** **at+wdss=0** //Clear all setting **OK** **at+wdss?** **OK** **at+wdss=0,,,,1** //Define empty string APN **OK** **at+wdss?** **+WDSS: 0,"",,1** **+WDSS: 1,0** **OK** **at+wdss=1,1** //Reuse activated PDP of cid 1 for connection **OK** **+WDSI: 4** **+WDSI: 8**

13.9. +WDSM Command: Manage Device Services

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

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Read command Syntax **AT+WDSM?**	Response **+WDSM: 0,<State>** **+WDSM: 1,<State>** **OK**
Write command Syntax **AT+WDSM= <Mode>,<State>**	Response **OK** or **+CME ERROR <err>** Parameters **<Mode>** APN backup 0 If AVMS APN (filled with +WDSS command) is incorrect, the module will use the APN defined by +CGDCONT command. 1 If AVMS APN has not been filled with +WDSS command, the module will use the APN defined by +CGDCONT command. Each APN will be used until successful session activation. If an AVMS session succeeds, the corresponding APN is copied in the +WDSS command and remains after the AVMS session ends. **<State>** Status of <Mode> 0 Disable (default value) 1 Enable (not supported)
Reference Sierra Wireless Proprietary	Notes <State> is automatically stored in non-volatile memory. AT&F command has no impact on these values.
Examples	**AT+WDSM=?** **+WDSM: (0-1),(0)** **OK** **AT+WDSM?** **+WDSM: 0,0** **+WDSM: 1,0** **OK** // all modes are activated **AT+WDSM=0,0** **OK** **AT+WDSM?** **+WDSM: 0,0** **+WDSM: 1,0** **OK**

14. Test Commands

The following commands are used for testing purposes.

14.1. +WMTXPOWER Command: Test RF Tx

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+ WMTXPOWER=?**	Response **+WMTXPOWER:** (list of supported **<ENABLE>**s),(list of supported 2G **<BAND>**s),(list of supported 2G **<CHANNEL>**s),(list of supported 2G **<POWER_LEVEL>**s),(list of supported **<MULTISLOT>**s) **+WMTXPOWER:** (list of supported **<ENABLE>**s),(list of supported 3G **<BAND>**s),(list of supported 3G **<CHANNEL>**s),(list of supported 3G **<POWER_LEVEL>**s) **+WMTXPOWER:** (list of supported **<ENABLE>**s),(list of supported 4G **<BAND>**s), (list of supported 4G **<CHANNEL>**s), (list of supported 4G **<POWER_LEVEL>**s),(list of supported **<BANDWIDTH>**s) **OK**
Read command Syntax **AT+ WMTXPOWER?**	Response For GSM: **+WMTXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>, <MULTISLOT>]** **OK** For UMTS: **+WMTXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>]** **OK** For LTE: **+WMTXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>, <BANDWIDTH>]** **OK** Note that parameters <BAND>, <CHANNEL>, <POWER_LEVEL>, <MULTISLOT> and <BANDWIDTH> are only available if <ENABLE>=1.
Write command Syntax **AT+ WMTXPOWER= <ENABLE>, [,<BAND>, <CHANNEL>, <POWER_ LEVEL>, [<MULTISLOT>][, <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. For GSM: 900 GSM900 band 1800 DCS band

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	For UMTS: 1 Band I (2100 band) 2 Band II (1900 band) 5 Band V (850 band) 8 Band VIII (700 band) For LTE: 2 PCS 3 DCS 4 AWS 5 CLR 8 E-GSM 12 Lower SMH blocks A/B/C 13 Upper SMH block C 17 Lower SMH blocks B/C 20 EU Digital Dividend 28 APT **<CHANNEL>** Tx burst channel emission. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. For GSM: If <BAND>=900 0 – 124, 975 – 1023 If <BAND>=1800 512 – 885 For UMTS: If <BAND>=1 9612 – 9888 If <BAND>=2 9262 – 9538, 12, 37, 62, 87, 112, 137, 162, 187, 212, 237, 262, 287 If <BAND>=5 4132 – 4233, 782, 787, 807, 812, 837, 862 If <BAND>=8 2712 – 2863 For LTE: If <BAND>=2 18600 – 19199 If <BAND>=3 19200 – 19949 If <BAND>=4 19950 – 20399 If <BAND>=5 20400 – 20649 If <BAND>=8 21450 – 21799 If <BAND>=12 23010 – 23179 If <BAND>=13 23180 – 23279 If <BAND>=17 23730 – 23849 If <BAND>=20 24150 – 24449 If <BAND>=28 27210 – 27659 **<POWER_LEVEL>** Tx burst power. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. Range: 5 (33 dBm) to 19 (5 dBm) for GSM900 bands 0 (30 dBm) to 15 (0 dBm) for GSM1800 bands 0 (0 dBm) to 384 (24 dBm) for all UMTS bands 0 (0 dBm) to 368 (23 dBm) for all LTE bands

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	<MULTISLOT> Defines the slot used in Tx burst emissions. This parameter is not allowed if <ENABLE>=0 and is only applicable with GSM bands. 0 Emit on one time slot (GSM) 1 Emit on two time slots (GPRS compliant) 2 Emit on three time slots 3 Emit on four time slots **<BANDWIDTH>** Defines the bandwidth of Tx burst emissions. This parameter is not allowed if <ENABLE>=0 and is only applicable with LTE bands. 0 1.4MHz 1 3 MHz 2 5 MHz 3 10 MHz 4 15 MHz 5 20 MHz
Reference Sierra Wireless Proprietary	Notes • Burst must be sent on all TDMA frames. • Only one burst can be emitted at a time. • This AT command is not available if AT+WMRXPOWER is enabled. • The module must be restarted after using this command.

Examples	// Using an HL7690 module:
	at+wmtxpower=?
	+WMTXPOWER: (0-1),(3,8,20),(19200-19949,21450-21799,24150-24449),(0-368),(0-5)
	OK
	
	at+wmtxpower=1,3,19575,0,3 // Tx burst is emitted at Uarfcn 19575
	OK
	
	at+wmtxpower=0
	OK
	
	at+wmtxpower=1,8,21799,0,3 // Tx burst is emitted at Uarfcn 21799
	OK
	
	at+wmtxpower=0
	OK
	
	// Using an HL7692 module:
	at+wmtxpower=?
	+WMTXPOWER: (0-1),(900,1800),(0-124,975-1023,512-885),(5-19,0-15),(0-3)
	+WMTXPOWER: (0-1),(3,8,20),(19200-19949,21450-21799,24150-24449),(0-368),(0-5)
	OK
	
	at+wmtxpower=1,900,0,19,0 // A Tx burst is emitted at Earfcn 0
	OK
	
	at+wmtxpower=1,1800,512,15,0 // A Tx burst is emitted at Earfcn 512
	OK
	
	// Using an HL7648 module:
	at+wmtxpower=?
	+WMTXPOWER: (0-1),(2,4,12),(18600-19199,19950-20399,23010-23179),(0-368),(0-5)
	OK

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	at+wmtxpower=1,2,18600,0,0 // A Tx burst is emitted at Earfcn 18600 **OK** **at+wmtxpower=0** **OK** // Using an HL7650 module: **at+wmtxpower=?** **+WMTXPOWER: (0,1),(2,5),(9262-9538,12,37,62,87,112,137,162,187,212,237,262,287,4132-4233,782,787,807,812,837,862),(0-384)** **+WMTXPOWER: (0-1),(2,4,5,13,17),(18600-19199,19950-20399,20400-20649,23180-23279,23730-23849),(0-368),(0-5)** **+WMTXPOWER: (0-1),(2,4,12,17),(18600-19199,19950-20399,23010-23179,23730-23849),(0-368),(0-5)** **OK** **at+wmtxpower=1,2,9262,0** // A Tx burst is emitted at Uarfcn 9262 **OK** **at+wmtxpower=0** **OK** **at+wmtxpower=1,2,18600,0,0** // A Tx burst is emitted at Earfcn 18600 **OK** **at+wmtxpower=0** **OK**

14.2. +WMRXPOWER Command: Test RF Rx

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+ WMRXPOWER=?**	Response **+WMRXPOWER: (**list of supported **<ENABLE>**s),(list of supported 2G **<BAND>**s),(list of supported **2G <CHANNEL>**s) **+WMRXPOWER:** (list of supported **<ENABLE>**s),(list of supported 3G **<BAND>**s), (list of supported 3G **<CHANNEL>**s) **+WMRXPOWER:** (list of supported **<ENABLE>**s),(list of supported 4G **<BAND>**s), (list of supported 4G **<CHANNEL>**s) **OK**
Read command Syntax **AT+ WMRXPOWER?**	Response **+WMRXPOWER: <ENABLE>[,<BAND>,<CHANNEL>,[<EXP_POWER>]]** **OK** Note that parameters <BAND>, <CHANNEL> and <EXP_POWER> are only available if <ENABLE>=1. <EXP_POWER> is only applicable for GSM.

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Write command Syntax **AT+ WMRXPOWER= <ENABLE> [,<BAND>, <CHANNEL>, [<EXP_POWER>]]**	Response For GSM: **+WMRXPOWER: <POWER1>** **OK** For UMTS and LTE: **+WMRXPOWER: <POWER1>,<POWER2>** **OK** Parameters **<ENABLE>** 0 Stop the Rx measurement 1 Start the Rx measurement **<BAND>** Rx band to read. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. For GSM: 900 GSM900 band 1800 DCS band For UMTS: 1 Band I (2100 band) 2 Band II (1900 band) 5 Band V (850 band) 8 Band VIII (700 band) For LTE: 2 PCS 3 DCS 4 AWS 5 CLR 8 E-GSM 12 Lower SMH blocks A/B/C 13 Upper SMH block C 17 Lower SMH blocks B/C 20 EU Digital Dividend 28 APT **<CHANNEL>** Rx channel to read. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. For GSM: If <BAND>=900 0 – 124, 975 – 1023 If <BAND>=1800 512 – 885 For UMTS: If <BAND>=1 10562 – 10838 If <BAND>=2 9662 – 9938 If <BAND>=5 4357 – 4458 If <BAND>=8 2937 – 3088

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
	For LTE: 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>=12 5010 – 5179 If <BAND>=13 5180 – 5279 If <BAND>=17 5730 – 5849 If <BAND>=20 6150 – 6449 If <BAND>=28 9210 – 9659 **<EXP_POWER>** Expected power in dBm. This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. Note that this parameter is only applicable for GSM. **<POWER1>** Received power at primary antenna in dBm **<POWER2>** Received power at secondary antenna in dBm

Reference
Sierra Wireless Proprietary
	Examples
	// Using an HL7690 module:
	at+wmrxpower=?
	+WMRXPOWER: (0-1),(3,8,20),(1200-1949,3450-3799,6150-6449)
	OK
	
	at+wmrxpower=1,3,1575 // Read Uarfcn 1575
	+WMRXPOWER: -80.0,-101.2 // Rx power -80.0 dBm at primary antenna
	// Rx power -101.2 dBm at diversity antenna
	OK
	
	at+wmrxpower=1,8,3625 // Read Uarfcn 3625
	+WMRXPOWER: -88.8,-98.2 // Rx power -88.8 dBm at primary antenna
	// Rx power -98.2 dBm at diversity antenna
	OK
	
	// Using a HL7692 module:
	at+wmrxpower=?
	+WMRXPOWER: (0-1),(900,1800),(0-124,975-1023,512-885)
	+WMRXPOWER: (0-1),(3,8,20),(1200-1949,3450-3799,6150-6449)
	OK
	
	at+wmrxpower=1,900,0,-45 // Read Earfcn 0
	+WMRXPOWER: -46.8 // Rx power -46.8 dBm at primary antenna
	OK
	
	at+wmrxpower=1,1800,512,-45 // Read Earfcn 512
	+WMRXPOWER: -46.4 // Rx power -46.4 dBm at primary antenna
	OK
	
	// Using an HL7648 module:
	at+wmrxpower=?
	+WMRXPOWER: (0-1),(2,4,12),(600-1199,1950-2399,5010-5179)
	OK

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

	at+wmrxpower=1,4,1950 // Read Earfcn 1950
	+WMRXPOWER: -95.0,-108.8 // Rx power -95.0 dBm at primary antenna
	// Rx power -108.8 dBm at secondary antenna
	OK
	
	// Using an HL7650 module:
	at+wmrxpower=?
	+WMRXPOWER: (0,1),(2,5),(9662-9938,4357-4458)
	+WMRXPOWER: (0-1),(2,4,5,13,17),(600-1199,1950-2399,2400-2649,5180-5279,5730-5849)
	+WMRXPOWER: (0-1),(2,4,12,17),(600-1199,1950-2399,5010-5179,5730-5849)
	OK
	
	at+wmrxpower=1,2,9662 // Read Uarfcn 9662
	+WMRXPOWER: -97.9,-103.8 // Rx power -97.9 dBm at primary antenna
	// Rx power -103.8 dBm at secondary antenna
	OK
	
	at+wmrxpower=1,2,600 // Read Earfcn 600
	+WMRXPOWER: -95.0,-108.8 // Rx power -95.0 dBm at primary antenna
	// Rx power -108.8 dBm at secondary antenna
	OK

15. NV Related Commands

15.1. Auto Generation of NV Backup Files

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

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

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

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

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

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

15.2. Auto Recovery from Backup NV Files

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

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

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

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

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

15.3. +NVBU Command: NV Backup Status and Control

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+NVBU=?**	Response **+NVBU: (0-2)** **OK**
Read command Syntax **AT+NVBU?**	Returns list of NV backup with the format: **+NVBU: <file id>,<backup date>,<backup firmware version>** Response **[+NVBU: 0,<backup date>,<backup firmware version>]** **[+NVBU: 1,<backup date>,<backup firmware version>]** **[+NVBU: 2,<backup date>,<backup firmware version>]** **OK** Parameters **<file id>** Backup file ID corresponding to an NV partition in flash **<backup date>** NV backup generation date **<backup firmware version>** Firmware version used to generate the NV backup
Write command Syntax For <mode> = 0 or 1 **AT+NVBU=** **<mode>** **[,<parti_id>]** For <mode> = 2 **AT+NVBU=** **<mode>[,<clear>]**	Response For <mode>=0 or 1 **OK** For <mode>=2 and <clear>=0 **<log data 0>** **[<log data 1>]** **…** **[<log data n>]** **OK** For <mode>=2 and <clear>=1 **OK** Parameters **<mode>** 0 Generate backup of all NV data to NV backup partition 1 Restore all NV data from the NVM backup partition 2 List logs of NV backup operations **<log data>** NV backup operations log data **<parti_id>** 0 Static Calibrated NV 1 Static Fixed NV partition 2 Dynamic NV partition 3 All NV partitions **<clear log>** 0 Read log 1 Clear log

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Reference Sierra Wireless Proprietary	Notes • Status of operations for <mode>=0 and <mode>=1 is notified by +NVBU_IND unsolicited notifications with <status>=0 and <status>=1 respectively on the AT port that executed the write command. • Execution of the write command with <mode>=1 is followed by a modem reboot automatically; NVs are restored to their default values on booting. • The number of lines of <log data> ranges from 1 to 2142 lines. • This command can be used without a SIM. • <mode>=2 is for retrieving log for R&D analysis and not fully documented, generally: ▪ USER=0 for operations triggered by the firmware ▪ USER=1 for manual operations
Example	# automatic backup files generation after FW upgrade, notified by +NVBU_IND **+NVBU_IND: 0,0,"2015/11/16 04:23:33","BHL7618.3.0.154401.201511132200.x7120_2"** **+NVBU_IND: 0,1,"2015/11/16 04:23:33","BHL7618.3.0.154401.201511132200.x7120_2"** **+NVBU_IND: 0,2,"2015/11/16 04:23:33","BHL7618.3.0.154401.201511132200.x7120_2"** # manual generation of backup files from existing NV partitions **AT+NVBU=0,3** **OK** **+NVBU_IND: 0,0,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2"** **+NVBU_IND: 0,1,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2"** **+NVBU_IND: 0,2,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2"** # manual restore of backup files to original NV partitions **AT+NVBU=1,3** **OK** **+NVBU_IND: 1,0,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2"** **+NVBU_IND: 1,1,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2"** **+NVBU_IND: 1,2,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2"** **<module reboots automatically>** # to retrieve the list of NV related operations done by the Firmware **at+nvbu=2** **[2015/11/16 04:02:49] BULO: MDM- BHL7618.3.0.154401.201511132200.x7120_2** **[2015/11/16 04:02:49] BUFL: GENERATE USER=0 FILE=3 LAS=0,0,0** **[2015/11/16 04:02:49] BUFM: ENCODE F=0 REF=0 CNT=15/15 41** **[2015/11/16 04:02:49] BUFM: ENCODE F=1 REF=0 CNT=16/16 31** **[2015/11/16 04:02:49] BUFM: ENCODE F=2 REF=42 CNT=41/41 57** **[2015/11/16 04:23:39] BUFL: GENERATE USER=1 FILE=3 LAS=0,0,0** **[2015/11/16 04:23:39] BUFM: ENCODE F=0 REF=0 CNT=15/15 41** **[2015/11/16 04:23:39] BUFM: ENCODE F=1 REF=0 CNT=16/16 31** **[2015/11/16 04:23:39] BUFM: ENCODE F=2 REF=42 CNT=41/41 57** **[2015/11/16 04:23:43] BUFL: RESTORE USER=1 FILE=3 LAS=0,0,0** **[2015/11/16 04:23:43] BUFM: DECODE-2 F=0 REF=1 CNT=15/15 15,41** **[2015/11/16 04:23:43] BUFM: DECODE-2 F=1 REF=1 CNT=16/16 16,31** **[2015/11/16 04:23:43] BUFM: DECODE-2 F=2 REF=43 CNT=41/41 41,57** **OK**

15.4. +NVBU_IND Notification: NV Backup Status Notification

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Unsolicited Notification	Response **+NVBU_IND: <status>,<file id>,…** For <status>=0 **+NVBU_IND: <status>,<file id>,<backup date>,<backup firmware version>** For <status>=1 **+NVBU_IND: <status>,<file id>,<backup date used for restore>,<backup firmware version used for restore>** For <status>=2 **+NVBU_IND: <status>,<file id>,<backup date used for restore>,<backup firmware version used for restore>,<num NV>** **<NV ID 1>[<NV ID 2>...[<NV ID 16><CR><LF>]]** **…** Parameters **<status>** NV backup status 0 Indicates completion of NV backup generation 1 Indicates completion of NV backup restore 2 Indicates that backup data were restored when the NV corruption was detected during NV initialization **<backup date>** NV backup generation date **<backup firmware version>** Firmware version used to generate the NV backup **<backup date used for restore>** Generation date of the NV backup that was used for the NV restore **<backup firmware version used for restore>** Firmware version used to generate the NV backup that was used for the NV restore **<num NV>** Total number of NV items restored **<NV ID>** List of NV item IDs with data restored, expressed in hexadecimal number delimited by spaces, and delimited by <CR><LF> every 16 numbers.
Reference Sierra Wireless Proprietary	Notes The list of <NV ID> is expressed in 16 hexadecimal numbers per line.
Examples	# recovery in calibrated NV partition after Firmware boot # note that the data is also logged by NV log (i.e. AT+NVBU=2) **+NVBU_IND: 2,0,"2015/11/16 04:23:39","BHL7618.3.0.154401.201511132200.x7120_2",15** **10034900 10034901 10034401 10034402 10034902 10035400 10035401 10035402 10035403 10035500 10035501 10035502 10050000 10310000 10370000**

16. Board Support Commands

16.1. +WCARRIER Command: Show Carrier Name

HL7618, HL7618RD, HL7648, HL7650, HL7688, HL7690 and HL7692	
Test command Syntax **AT+WCARRIER=?**	Response **OK**
Action command Syntax **AT+WCARRIER**	Response **+WCARRIER: <Carrier Name>** **OK** Parameter **<Carrier Name>** Carrier string (maximum of 8 characters, without quotes)
Notes	The carrier name is written in non-volatile memory during the factory customization process.
Example	**at+wcarrier** **+WCARRIER: VZW** // when using a module that's on the Verizon network **OK** **at+wcarrier** **+WCARRIER: AT&T** // when using a module that's on the AT&T network **OK**

17. M2M Service Optimization Commands

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

17.1. +MSOSTATUS Command: Operating Status

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

17.2. +MSORTCSTATUS Command: Display Trust RTC Status

HL7650	
Test command Syntax **AT+ MSORTCSTATUS =?**	Response **OK**
Read command Syntax **AT+ MSORTCSTATUS ?**	Response **+MSORTCSTATUS: <status>** **OK**
Write command Syntax **AT+ MSORTCSTATUS =<status>**	Response **OK** Parameter **<status>** 0 MSO gets local time using RTC, and NITZ time zone if available 1 MSO gets local time from the RTC
Notes	• Local time is required in MSO for ToD rules and rules with fixed window network events. If the local time is not available, then all ToD rules and rules with fixed window network events are ignored. • The MSO RTC status is stored in non-volatile memory.
Examples	**AT+MSORTCSTATUS=1** // MSO uses the RTC for local time **OK** **AT+MSORTCSTATUS=0** // MSO uses NITZ for local time (if available) **OK**

17.3. +MSOPOLICY Command: Update MSO Policies

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

HL7650	
Write command Syntax **AT+MSOPOLICY =<mode>**	Response **<policy data><CTRL-Z>** **OK** Parameter **<mode>** 1 Update MSO policy
Notes	• Previously written policies to the device are erased during this operation. Policies are generated using the MSO Policy Editor Tool (MPET). Additionally, note that MSO is disabled while the policy is being updated. An MSO policy update will enable the MSO module status after the operation completes successfully; else, MSO will clear the policies on the device and disable the MSO module status. The device requires a reset after a new MSO policy is written to it. • The maximum policy size is based on the maximum sizes of all the SCs, rules and schedules. • The MSO policy status is stored in non-volatile memory.
Example	**AT+MSOPOLICY=1** // MSO updates the policy and starts executing **b4f1b8df00020100170200030 10a010a1401141e010103010a030a1401141e010201f30100** **0100012a110001000010401c002000000000001000105000200030005000600080009001** **6001600220022010100000 10401c001000000000001000103000200030006000600080009** **02010001010401c001000000000001000103000700070010001000160016030100020104 0** **1c000000000000001000104000800080001a001b001d002300260026040100010104 01c000** **0000000000001000101001c001c05010002010401c000000000000001000201002700270 60** **1000402010900000401c002000000000001000101000b000b070100060201090000 0401c0** **0100000000000001000102000b000b000e000e0801000402010a00000401c00200000000000** **1000102000c000c000d000d0901000602010a00000401c001000000000001000102000c00** **0c000d000d0a01000402010b00000401c002000000000001000101000f000f0b010006020** **10b00000401c001000000000001000101000f000f0c010007010401c004000000000001000** **10a00080008000a000a00150016001c001e002600260029002a002f002f003200320045004** **5005100510d010007010401c004000000000001000102001100110015001 50e02010401c0** **0000000000000001000101002200220f0101000104019002000000000001000201001100111** **0010101010401900100000000000100020100110011<CTRL-Z>** **OK** **AT+MSOPOLICY?** // MSO returns the current policy data **+MSOPOLICY:** **b4f1b8df00020100170200030 10a010a1401141e010103010a030a1401141e010201f30100** **0100012a110001000010401c002000000000001000105000200030005000600080009001** **6001600220022010100000 10401c001000000000001000103000200030006000600080009** **02010001010401c001000000000001000103000700070010001000160016030100020104 0** **1c000000000000001000104000800080001a001b001d002300260026040100010104 01c000** **0000000000001000101001c001c05010002010401c000000000000001000201002700270 60** **1000402010900000401c002000000000001000101000b000b070100060201090000 0401c0** **0100000000000001000102000b000b000e000e0801000402010a00000401c00200000000000** **1000102000c000c000d000d0901000602010a00000401c001000000000001000102000c00** **0c000d000d0a01000402010b00000401c002000000000001000101000f000f0b010006020** **10b00000401c001000000000001000101000f000f0c010007010401c004000000000001000** **10a00080008000a000a00150016001c001e002600260029002a002f002f003200320045004** **5005100510d010007010401c004000000000001000102001100110015001 50e02010401c0** **0000000000000001000101002200220f0101000104019002000000000001000201001100111** **0010101010401900100000000000100020100110011** **OK**

17.4. +MSORETRYINFO Command: Read Retry Information

HL7650	
Test command Syntax **AT+ MSORETRYINFO =?**	Response **OK**
Read command Syntax **AT+ MSORETRYINFO ?**	Response **+ MSORETRYINFO:** **<rule>,<cid>,<obj>,<time>,<count>,<error>** **<rule>,<cid>,<obj>,<time>,<count>,<error>** **…** **OK**
Write command Syntax **AT+ MSORETRYINFO =<mode>,<rule> [,<cid>]**	Response **OK** Parameters **<mode>** 0 Resets given retry schedule **<obj>** 0 CREG (all) 1 GPRS Attach (all) 2 PDP Activation 3 CREG (manual) 4 CREG (auto) 5 GPRS Attach (manual) 6 GPRS Attach (auto) 7 MO-SMS 8 LTE Attach 9 Socket Connection 10 DNS Query
Notes	• This command shows all of the rules with objects that currently blocked due to a retry schedule. Additionally, this command can also be used to reset any outstanding MSO retry schedules. • The MSO retry schedule states are stored in non-volatile memory.
Examples	**AT+MSORETRYINFO?** // MSO displays all active retry schedules **0,1,2,1,29,17** **OK** **AT+MSORETRYINFO=0,0,1** // MSO uses resets given the retry schedule **OK**

17.5. +MSOMONITOR Command: Monitoring Status Control

HL7650	
Test command Syntax **AT+ MSOMONITOR=?**	Response **OK**
Read command Syntax **AT+ MSOMONITOR?**	Response **+MSOMONITOR: <mode>,<value>,<period>** **OK**
Write command Syntax **AT+ MSOMONITOR= <mode> [,<value>] [,<period>]**	Response **OK** Paremeters **<mode>** 0 MSO monitoring disabled 1 MSO monitoring enabled **<period>** 0 Minutes 1 Hours 2 Days
Notes	• The MSO monitoring period is the time period which upon expiry all monitored values are reset to zero. • The MSO monitoring state is stored in non-volatile memory.
Examples	**AT+MSOMONITOR=1,1,1** // MSO updates the current monitoring configuration **OK** **AT+MSOMONITOR?** **+MSOMONITOR: 1,1,1** // MSO displays the current monitoring configuration **OK**

17.6. +MSOMONITORVALUE Command: Read Monitored Data

HL7650	
Test command Syntax **AT+MSO MONITORVALUE =?**	Response **OK**

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

HL7650	

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

17.7. +MSOEVTLOGSTATUS Command: Event Log Status

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

17.8. +MSOEVTLOGPUSH Command: Event Log Push

HL7650	
Test command Syntax **AT+MSOEVTLOGPUSH=?**	Response **OK**
Read command Syntax **AT+MSOEVTLOGPUSH?**	Response **+MSOEVTLOGPUSH: <cmd>** **OK**
Write command Syntax **AT+MSOEVTLOGPUSH=<cmd>**	Response **OK** or **+CME ERROR: 3** Parameter **<cmd>** 0 Disable MSO event log push to console 1 Enable MSO event log push to console
Note	The MSO event log push to console state is stored in non-volatile memory.
Examples	**AT+MSOEVTLOGPUSH?** **+MSOEVTLOGPUSH: 1** // MSO displays the current event log push to console // configuration **OK** **AT+MSOEVTLOGPUSH=1** // MSO updates the current event log push to console // configuration **OK**

17.9. +MSOEVTLOG Command: Read Event Log

HL7650	
Test command Syntax **AT+MSOEVTLOG=?**	Response **OK**
Read command Syntax **AT+MSOEVTLOG?**	Response **+MSOEVTLOG:** **<data>** **OK**

HL7650	
Note	This command retrieves up to 100 of the oldest MSO event log records since the last event log record read.

Example	**AT+MSOEVTLOG?**
	+MSOEVTLOG:
	Up5LfwAAAAr////+AAAAAQAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAHdtX21zb1 9zb2NrQ3JlYXRlAAAAAAAAAAAAAAAAA
	Up5LgAAAAAr////+AAAAAQAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAHdtX21zb1 9zb2NrQ3JlYXRlAAAAAAAAAAAAAAAAA
	Up5LhgAAAAYAAAABAAAAAAAAAAAQAAAAAAAAAAAAAAAAAAAAAAAAAG1zb1 9wZHBfY3R4X2FjdGl2X3JzcAAAAAAAAAAAAAA
	Up3bBwAAABtSndsHUp3bBwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1zb19 0aW1lX3N5bmNfdXBkYXRlAAAAAAAAAAAAAAA
	Up3bBwAAABEAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1zb 19ncm91cF9hZGRyX3Jlc3RvcmUAAAAAAAAAAAAA
	Up3bBwAAABEAAABAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1zb 19ncm91cF9hZGRyX3Jlc3RvcmUAAAAAAAAAAAAA
	Up3bBwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1zb 19zY19yZXN0b3JlAAAAAAAAAAAAAAAAAAAAAAA
	Up3bBwAAAAAAAAADAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1zb 19zY19yZXN0b3JlAAAAAAAAAAAAAAAAAAAAAAA
	Up3bBwAAAAAAAAAFAAAAAAAAAAHgAAAAAAAAAAAAAAAAAAAAAAAAAAG1zb1 9zY19yZXN0b3JlAAAAAAAAAAAAAAAAAAAAAAA
	Up3bBwAAAAAAAAAGAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1zb 19zY19yZXN0b3JlAAAAAAAAAAAAAAAAAAAAAAA
	Up3bBwAAAAEAAAAAAAAAAAAAAEAAAAAAAAAAQAAAAAAAAABAAAAAG1zb 19uYXJfcmVzdG9yZQAAAAAAAAAAAAAAAAAAAAA
	Up3bBwAAAAQAAAABAAAACwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1zb 19kcGlfcHJvY2Vzc19zb2NrZXRfdG9fc2MAAAAA
	Up3bBwAAAAQAAAAAAAAAACwAAAAAAAAAAAAAAAAAAAAAAAAAAAAG1zb 19kcGlfcHJvY2Vzc19zb2NrZXRfdG9fc2MAAAAA
	OK
	
	// MSO displays up to the latest 100 base64 encoded records to the console. The results
	// above can be saved to a file which can then be parsed using
	// the MSO event log decoding python application to output a text version of the event logs.

18. Appendix

18.1. Result Codes and Unsolicited Messages

Verbose Result Code	Numeric	Type	Description
+CCCM: <ccm>	like verbose	Unsolicited	
+CME ERROR: <err>	like verbose	Final	
+CMS ERROR: <err>	like verbose	Final or unsolicited	
+CMTI	like verbose	Unsolicited	
+CBM	like verbose	Unsolicited	
+CDS	like verbose	Unsolicited	
+COLP: <number>,<type>[,<subaddr>, <satype>[,<alpha>]]	like verbose	Intermediate	
+CR: <type>	like verbose	Intermediate	
+CREG: <stat>[,<lac>,<ci>]	like verbose	Unsolicited	
+CRING: <type>	like verbose	Unsolicited	
+CSSI: <code1>[,<index>]	like verbose	Intermediate	
+CSSU: <code2>[,<index>[,<number>,<type> [,<subaddr>,<satype>]]]	like verbose	Unsolicited	
+CUSD: <m>[,<str>,<dcs>]	like verbose	Unsolicited	
BUSY	6	Final	
CONNECT	1	Intermediate	connection has been established
CONNECT <text>	manufacturer specific	Intermediate	like CONNECT but manufacturer specific <text> gives additional information (e.g. connection data rate)
ERROR	4	Final	command not accepted
NO ANSWER	7	Final	connection completion timeout
NO CARRIER	3	Final	connection terminated
NO DIALTONE	5	Final	no dial tone detected
OK	0	Final	acknowledges execution of a command line
RING	2	Unsolicited	incoming call signal from network

18.2. Error Codes

18.2.1. CME Error Codes

<err> Code	Meaning
0	Phone failure
1	No connection to phone
2	Phone-adapter link reserved
3	Operation not allowed
4	Operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full
21	Invalid index
22	Not found
23	Memory failure
24	Text string too long
25	Invalid characters in text string
26	Dial string too long
27	Invalid characters in dial string
30	No network service
31	Network timeout
32	Network not allowed - emergency call only
40	Network personalization PIN required
41	Network personalization PUK required
42	Network subset personalization PIN required
43	Network subset personalization PUK required
44	Service provider personalization PIN required
45	Service provider personalization PUK required
46	Corporate personalization PIN required
47	Corporate personalization PUK required
48	Hidden key required
49	EAP method not supported

<err> Code	Meaning
50	Incorrect parameters
99	Resource limitation
100	Unknown
103	Illegal MS
106	Illega IME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
132	Service option not supported
133	Requested service option not subscribed
134	Service option temporarily out of order
148	Unspecified GPRS error
149	PDP authentication failure
150	Invalid mobile class
201	Alternate SIM conflict
500	CTS Handover on Progress
501	Cellular Protocol Stack Out of service state
502	CTS Unspecified Error
650	General AVMS error
651	Communication error
652	Session in progress
654	RDMS services are in “deactivated” state
655	RDMS services are in “prohibited” state
656	RDMS services are in “to be provisioned” state; no available NAP
800	SIM Security unspecified error
902	No more sockets available; the maximum number has been reached
903	Memory problem
904	DNS error
905	TCP disconnection by the server
906	TCP/UDP connection error
907	Generic error
908	Fail to accept client request's
909	Data send by KTCPSND/KUDPSND are incoherent
910	Bad session ID
911	Session is already running
912	No more sessions can be used (maximum session is 32)
913	Socket connection timer timeout
914	Control socket connection timer timeout
915	A parameter is not expected
916	A parameter has an invalid range of values
917	A parameter is missing
918	Feature is not supported

<err> Code	Meaning
919	Feature is not available
920	Protocol is not supported
921	Error due to invalid state of bearer connection
922	Error due to invalid state of session
923	Error due to invalid state of terminate port data mode
924	Error due to session busy, retry later
925	Failed to decode HTTP header's name, missing ':'
926	Failed to decode HTTP header's value, missing 'cr/lf'
927	HTTP header's name is an empty string
928	HTTP header's value is an empty string
929	Format of input data is invalid
930	Content of input data is invalid or not supported
931	The length of a parameter is invalid
932	The format of a parameter is invalid

18.2.2. CEER Error Codes

<cause>	<description>
0	No cause information available
1	Unassigned (unallocated) number
3	No route destination
6	Channel unacceptable
8	Operator determined barring
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Call rejected
22	Number changed
26	Non selected user clearing
27	Destination out of order
28	Invalid number format (incomplete number)
29	Facility rejected
30	Response to STATUS ENQUIIRY
31	Normal, unspecified
34	No circuit / channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit / channel not available
47	Resources unavailable, unspecified

<cause>	<description>
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred with in the CUG
57	Bearer capability not authorized
58	Bearer capability not presently available
63	Service or option not available, unspecified
65	Bearer service not implemented
68	ACM equal to or greater than AC Mmax
69	Requested facility not implemented
70	Only restricted digital information bearer capability is available
79	Service or option not implemented, unspecified
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with protocol state
99	Information element non-existent or not implemented
100	Conditional IE error
101	Message not compatible with protocol state
102	Recovery on timer expiry
103	Illegal MS
106	Illegal ME
107	GPRS service not allowed
111	Protocol error, unspecified
112	Location area not allowed
113	Roaming not allowed in this location area
124	MBMS bearer capabilities insufficient for the service
125	LLC or SNDCP failure
126	Insufficient resources
127	Missing or unknown APN
128	Unknown PDP address or PDP type
129	User authentication failed
130	Activation rejected by GGSN
131	Activation reject,unspecified
132	Service not supported
133	Requested service option not subscribed
134	Service option temporarily out of order
135	NSAPI already used
136	Regular PDP context deactivation
137	QoS not accepted

<cause>	<description>
138	Network failure
139	Reactivation requested
140	Feature not supported
141	Semantic error in the TFT operation
142	Syntactical error in the TFT operation
143	Unknown PDP context
144	Semantic errors in packet filter(s)
145	Syntactical errors in packet filter(s)
146	PDP context without TFT already activated
148	Unspecified GPRS error
149	PDP authentification error
152	Single address bearers only allowed
153	ESM information only allowed
154	ESM information not received
155	PDN connection does not exist
156	Collision with network initiated request
159	Unsupported QCI value
160	Bearer handling not supported
165	Maximum number of EPS bearers reached
166	Requested APN not supported in current RAT and PLMN combination
181	Invalid PTI value
182	APN restriction value incompatible with active EPS bearer context
183	PTI already in use
184	EPS QoS not accepted
185	Invalid EPS bearer identity
186	PTI mismatch
187	Last PDN disconnection not allowed
188	PDN type IPv4 only allowed
189	PDN type IPv6 only allowed
212	APN restriction
256	Internal unspecified
257	Out of memory
258	Invalid parameters
259	Data call active
260	Speech call active
262	Missing ACM information
263	Temporary forbidden
264	Called party is blacklisted
265	Blacklist is full
266	No service
267	Limited service
268	Client conflict
269	Dual Service call active

<cause>	<description>
271	Unknown SIM error
274	Active client is gone
277	SIM status failure
278	Rejected by call control
279	FDN failed
280	BDN failed
283	CCBS possible
284	Invalid alternate service line
285	LND overview
287	MM network failure unspecified
288	MM no service
289	MM access class barred
290	MM RR no resource
291	MM ME busy
292	MM unspecified
301	MMI not registered
303	Rejected by user
304	Rejected due to time out
306	Disconnected due to SIM TK call setup
307	Pending SIM TK call setup
310	SIM reset
340	MM sapi3 release
341	MM lower layer failure
342	MM authentification failure
343	MM PS reject
344	MM service rejected
345	MM abort by network
346	MM timeout
347	MM detach
348	MM RR connection release
349	MM not registered
350	MM reestablishment failure
351	Failure due to handover
352	Link establishment failure
353	Random access failure
354	Radio link aborted
355	Lower layer failure in Layer 1
356	Immediate assignment reject
357	Failure due to paging
358	Abnormal release unspecified
359	Abnormal release channel unacceptable
360	Abnormal release timer expired
361	Abnormal release no act on radio path

<cause>	<description>
362	Preemptive release
363	UTRAN configuration unknown
364	Handover impossible
365	Channel mode unacceptable
366	Frequency not implemented
367	Originator leaving call group area
368	Lower layer failure from network
369	Call already cleared
370	Semantically incorrect message
371	Invalid mandatory info
372	Message type non existing
373	Message type incompatible in state
374	Conditional information element error
375	No cell allocation available
376	Protocol error unspecified
377	Normal event
378	Unspecified
379	Preemptive release
380	Congestion
381	RE establishment reject
382	Directed sig conn establishment
383	User inactivity
384	Lower layer failure downlink
385	Lower layer failure uplink
386	Cell barred due to authentication failure
387	Signalling connection release
388	CS connection release triggered by MM
389	RRC connection establishment failure
390	RRC connection establishment re-ject with redirection
391	Resource conflict
392	Layer 2 sequence error
393	Layer 2 T200 exp N200 plus 1 times
394	Layer 2 unsolicited DM resp MFES
395	Layer 2 contention resolution
396	Layer 2 normal cause
397	RR connection release due to BAND change (2G)
400	MM RR connection error while release
500	User disconnected
510	Remote user / NW disconnected for call status rather than call proceeding
511	Remote user / NW disconnected for call status is call proceeding
512	Request rejected, BCM violation

18.2.2.1. SS Error Codes

18.2.2.1.1. SS Network Error Cause

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

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

18.2.2.1.2. SS Network GSM Cause

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

<cause>	<description>
1	MN_UNASSIGNED_NUMBER
3	MN_NO_ROUTE
6	MN_CHANNEL_UNACCEPTABLE
8	MN_OPERATOR_BARRING
16	MN_NORMAL_CALL_CLEARING
17	MN_USER_BUSY
18	MN_NO_USER_RESPONDING
19	MN_USER_ALERTING_NO_ANSWER
21	MN_CALL_REJECTED
22	MN_NUMBER_CHANGED
26	MN_NON_SELECTED_USER_CLEARING
27	MN_DESTINATION_OUT_OF_ORDER
28	MN_INVALID_NUMBER_FORMAT
29	MN_FACILITY_REJECTED
30	MN_RESPONSE_TO_STATUS_ENQUIRY
31	MN_NORMAL_UNSPECIFIED
34	MN_NO_CIRCUIT_AVAILABLE
38	MN_NETWORK_OUT_OF_ORDER
41	MN_TEMPORARY_FAILURE
42	MN_SWITCH_CONGESTION
43	MN_ACCESS_INFORMATION_DISCARDED
44	MN_REQUESTED_CIRCUIT_NOT_AVAILABLE
47	MN_RESOURCES_UNAVAILABLE
49	MN_QUALITY_UNAVAILABLE
50	MN_FACILITY_NOT_SUBSCRIBED
55	MN_INCOMING_CALLS_BARRED_IN_CUG
57	MN_BEARER_CAPABILITY_NOT_ALLOWED
58	MN_BEARER_CAPABILITY_NOT_AVAILABLE
63	MN_SERVICE_NOT_AVAILABLE
65	MN_BEARER_SERVICE_NOT_IMPLEMENTED
68	MN_ACM_GREATER_OR_EQUAL_TO_ACMMAX
69	MN_FACILITY_NOT_IMPLEMENTED
70	MN_ONLY_RESTRICTED_DIGITAL
79	MN_SERVICE_NOT_IMPLEMENTED
81	MN_INVALID_TI
87	MN_USER_NOT_IN_CUG
88	MN_INCOMPATIBLE_DESTINATION
91	MN_INVALID_TRANSIT_NETWORK
95	MN_SEMANTICS_INCORRECT
96	MN_INVALID_MANATORY_INFORMATION
97	MN_UNKNOWN_MESSAGE_TYPE_1

<cause>	<description>
98	MN_UNEXPECTED_MESSAGE_TYPE
99	MN_UNEXPECTED_IE
100	MN_CONDITIONAL_IE_ERROR
101	MN_UNKNOWN_MESSAGE_TYPE_2
102	MN_RECOVERY_ON_TIMER_EXPIRY
111	MN_PROTOCOL_ERROR
127	MN_INTERWORKING
256	MN_VOID_CAUSE
257	MN_OUT_OF_MEMORY
258	MN_INVALID_PARAM
259	MN_DATA_CALL_ACTIVE
260	MN_SPEECH_CALL_ACTIVE
261	MN_DTMF_REJECTED_DURING_MO_CALL_SETUP
262	MN_MOC_SETUP_REJ_DUE_TO_MISSING_ACM_INFO_IND
263	MN_TEMPORARY_FORBIDDEN_CALL_ATTEMPT
264	MN_CALLED_PARTY_IS_BLACKLISTED
265	MN_BLACKLIST_IS_FULL_NO_AUTO_CALL_ATTEMPTS
266	MN_TEMPORARY_FORBIDDEN_CALL_ATTEMPT_NO_SERVICE
267	MN_TEMPORARY_FORBIDDEN_CALL_ATTEMPT_LIMITED_SERVICE
268	MN_CLIENT_TEMPORARY_BARRED
269	MN_DUAL_SERVICE_CALL_ACTIVE
270	MN_ATC_FCLASS_NOT_SPEECH
271	MN_SI_UNKNOWN_ERROR
272	MN_DTMF_REJECTED_DUE_TO_CALL_HELD_OR_MPARTY
273	MN_CLIENT_NOT_REGISTRATED
274	MN_ACTIVE_CLIENT_GONE
275	MN_DTMF_REJECTED_DUE_TO_DATA_TRANSMISSION
276	MN_NO_APPROPRIATE_DTMF_ENTRY
277	MN_SIM_STATUS_FAILURE
278	MN_REJ_BY_CALL_CONTROL
279	MN_FDN_FAILED
280	MN_BDN_FAILED
281	MN_ONLY_ERROR
282	MN_NOT_IN_SPEECH_CALL
283	MN_CCBS_POSSIBLE
283	MN_INVALID_ALS_LINE
284	MN_INVALID_ALS_LINE
285	MN_LND_OVERFLOW
286	MN_DTMF_REJECTED_NO_TCH_AVAILABLE
287	MN_NW_FAILURE_UNSPECIFIED
288	MN_MS_NO_SERVICE
289	MN_MS_ACCESS_CLASS_BARRED
290	MN_MS_NO_RESOURCE

<cause>	<description>
291	MN_MS_SERVICE_BUSY
292	MN_MS_FAILURE_UNSPECIFIED
293	MN_DTMF_REJECTED_DUE_TO_SUP_TIMER_EXPIRY
300	MN_SIMTK_SETUP_MODE_NOT_SUPPORTED
301	MN_MMI_NOT_REGISTERED
302	MN_SIMTK_SETUP_REJ_DUE_TO_MISSING_ACM_INFO_IND
303	MN_SIMTK_SETUP_REJECTED_BY_THE_USER
304	MN_SIMTK_SETUP_REJECTED_TIME_OUT
305	MN_SIMTK_CALL_CONNECTED
306	MN_DISCONNECT_DUE_TO_SIMTK_SETUP
307	MN_SIMTK_SETUP_REJ_DUE_TO_PENDING_SIMTK_SETUP
308	MN_SIMTK_CALL_CONNECTED_NO_ICON_DISPLAY
309	MN_PENDING_SIMTK_SETUP
310	MN_SIMTK_SIM_RESET
311	MN_SIMTK_DTMF_TRANSMITTED
312	MN_SIMTK_DTMF_TRANSMITTED_NO_ICON_DISPLAY
313	MN_USER_DID_NOT_ACCEPT_CALL_SETUP
314	MN_PROACTIVE_SIM_APPL_TERMINATED_BY_USER
315	MN_SIMTK_ME_UNABLE_SCREEN_BUSY
316	MN_SIMTK_ME_UNABLE_NO_SPECIFIC_CAUSE
317	MN_SIMTK_UNSPECIFIED
318	MN_SETUP_SS_ERR
319	MN_SIMTK_NET_UNABLE_NO_SPECIFIC_CAUSE
320	MN_SIMTK_USSD_TRANSACTION_TERMINATED_BY_USER
330	MN_PHONEBOOK_NOT_AVAILABLE
331	MN_ATC_NO_MATCHING_PHONEBOOK_ENTRY
332	MN_ATC_INVALID_DIALED_NUMBER
333	MN_ATC_SETUP_TEMPORARY_BLOCKED
334	MN_ATC_NO_PERMISSION
335	MN_ATC_INVALID_CALL_SETTINGS
336	MN_ATC_BLOCKING_CALL_PRESENT

18.2.2.1.3. SS Network Reject Cause

According to 3GPP 24.080, 3.6.7, table 3.13.

Table 4. Tag 128 MN_GENERAL_PROBLEM with Causes

From 3GPP 24.008, table 3.14.

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

Table 5. Tag 129 MN_INVOKE_PROBLEM with Causes

From 3GPP 24.008, table 3.15.

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

Table 6. Tag 130 MN_RETURN_RESULT_PROBLEM with Causes

From 3GPP 24.008, table 3.16.

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

Table 7. Tag 131 MN_RETURN_ERROR_PROBLEM with Causes

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

18.2.3. CMS Error Codes

<err> Code	Meaning
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order

<err> Code	Meaning
41	Temporary failure
42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state
99	Information element non-existent or not implemented
111	Protocol error, unspecified
127	Interworking, unspecified
128	Telematic interworking not supported
129	Short message Type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be executed
161	Command unsupported
175	Unspecified TP-Command error
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
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

<err> Code	Meaning
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	no network service
332	Network timeout
340	NO +CNMA ACK EXPECTED
500	Unknown error

18.2.4. GPRS Error Codes

<err> Code	Meaning
Errors related to a failure to Perform an Attach	
103	Illegal MS
106	Illegal ME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
Errors related to a failure to Activate a Context	
132	Service option not supported
133	Requested service option not subscribed
134	Service option temporarily out of order
149	PDP authentication failure
Other GPRS Errors	
148	Unspecified GPRS error
150	Invalid mobile class

Other values in the range 101 - 150 are reserved for use by GPRS.

18.2.5. FTP Reply Codes

FTP Reply Code	Meaning
110	Restart marker reply
120	Service ready in nnn minutes
125	Data connection already open: transfer starting
150	File status okay; about to open data connection
200	Command okay
202	Command not implemented, superfluous at this site
211	System status or system help reply
212	Directory status
213	File status
214	Help message
215	NAME system type
220	Service ready for new user
221	Service closing control connection. Logged out if appropriate. Unassigned (unallocated) number
225	Data connection open; no transfer in progress
226	Closing data connection. Requested file action successful (for example, file transfer or file abort)
227	Entering Passive Mode (h1, h2, h3 ,h4, p1, p2)
22	User logged in, proceed
250	Requested file action okay, completed
257	"PATHNAME" created
331	User name okay, need password
332	Need account for login
350	Requested file action pending further information
421	Service not available, closing control connection. This may be a reply to any command if the service knows it must shut down
425	Can't open data connection
426	Connection closed; transfer aborted
450	Requested file action not taken. File unavailable (e.g., file busy)
451	Requested action aborted: local error in processing
452	Requested action not taken. Insufficient storage space in system
500	Syntax error, command unrecognized. This may include errors such as command line too long
501	Syntax error in parameters or arguments
502	Command not implemented
503	Bad sequence of commands
504	Command not implemented for that parameter
530	Not logged in
532	Need account for storing files
550	Requested action not taken. File unavailable (e.g., file not found, no access)
551	Requested action aborted: page type unknown
552	Requested file action aborted. Exceeded storage allocation (for current directory or dataset)
553	Requested action not taken. File name not allowed

18.2.6. AVMS Error Codes

<err> Code	Meaning
3	Parameter is out of range; Device Services is not in a good state
24	Parameters <APN>, <User> or <Pwd> are too long
650	General error
651	Communication error
652	Session in progress
654	AVMS services are in DEACTIVATED state (see +WDSG)
655	AVMS services are in PROHIBITED state (see +WDSG)
656	AVMS services are in TO BE PROVISIONED state (see +WDSG)

18.2.7. Error Case Examples

AT commands return specific error codes if parameter verification fails. The following tables enumerate some examples to demonstrate specific error cases.

Table 8. Generic Error Case Examples

Error Codes	Corresponding Examples
+CME ERROR: 3 when execute command is not supported	AT+SWITRC AT+COREDUMP AT+LOGLV AT+NVBU AT+KGSN AT+HWREV AT+KBND AT*PSRDBS AT+KSRAT AT+KSREP AT+WMANTSEL AT+KGPIOCFG AT+KGPIO AT+WMIOTEST AT+KTEMPMON AT+WPPP AT+KADC AT+KCELL AT+KCCINFO AT+KSLEEP AT+KRIC AT&C AT+OMADMST AT+GST AT+HBHV AT+KSIMDET AT+KSIMSEL AT*PSSTKI AT+KPCMCFG

Error Codes	Corresponding Examples
+CME ERROR: 3 when action command is not supported	AT+WMAUDIOLOOP AT+VIP AT+VGT AT+KVGT AT+VGR AT+KVGR AT+CLVL AT+KECHO AT+KNOISE AT+KST AT+KPC AT+CALM AT+CRSL AT+KSRAP AT+CODECINFO AT+WIMEI AT+WMUSBVCC AT+KUSBCOMP AT+BOOTDWLCFG AT+KLTEMUTE AT+KSYNC AT+KLTEPARAM AT+KAAT AT+CMEC AT+KGSMAD AT+CALA AT+CALD

Table 9. Non-Generic Error Case Examples

Error Codes	Corresponding Examples
+CME ERROR: 3 instead of ERROR is returned for some cases in some SREG or BASIC AT commands. This is for backward compatibility reason.	ATB100 +CME ERROR: 3 ATB=? ERROR ATB? ERROR ATB=0 ERROR ATB +CME ERROR: 3

Error Codes	Corresponding Examples
+CME ERROR: 16 (incorrect password) instead of +CME ERROR: 18 (PUK2 required) is returned when PIN2 is blocked in AT+CPIN2 write command; while +CME ERROR: 12 (PUK required) is returned when PIN is blocked in AT+CPIN write command.	AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="22222222","5678" OK AT+CPIN="5678" +CME ERROR: 16 AT+CPIN="5678" +CME ERROR: 16 AT+CPIN="5678" +CME ERROR: 12 AT+CPIN? +CPIN: SIM PUK OK AT+CPIN="11111111","1234" OK
+CME ERROR: 18 (SIM PUK2 REQUIRED) instead of +CME ERROR: 50 (INCORRECT PARAMETERS) is returned for +CPIN2 when PUK2 is required while only PIN2 was inputted, +CME ERROR: 12 (SIM PUK REQUIRED) instead of +CME ERROR: 50 (INCORRECT PARAMETERS) is returned for +CPIN when PUK is required while only PIN was inputted,	AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" +CME ERROR: 16 AT+CPIN2="9876" // Incorrect PIN2 – 4th time +CME ERROR: 18 AT+CPIN2="22222222","5678" OK AT+CPIN="5678" +CME ERROR: 16 AT+CPIN="5678" +CME ERROR: 16 AT+CPIN="5678" +CME ERROR: 12 AT+CPIN="5678" // Incorrect PIN1 – 4th time +CME ERROR: 12

Error Codes	Corresponding Examples
	AT+CPIN? +CPIN: SIM PUK OK AT+CPIN="11111111","1234" OK

Table 10. Internet Error Case Examples

Error Codes	Corresponding Examples
+CME ERROR: 907 Generic error/Unsupported read command	AT+KHTTPHEAD? AT+KHTTPGET? AT+KHTTPREAD? AT+KHTTPPOST? AT+KHTTPCLOSE? AT+KHTTPSGET? AT+KHTTPSHEAD? AT+KHTTPSPOST? AT+KHTTPSCLOSE? AT+KFTPCNX? AT+KFTPCLOSE? AT+KFTPCFGDEL? AT+KFTPRCV? AT+KFTPSND? AT+KFTPDEL? AT+KUDPDEL? AT+KUDPCLOSE? AT+KUDPRCV? AT+KUDPSND? AT+KTCPSND? AT+KTCPRCV? AT+KTCPCNX? AT+KTCPCLOSE? AT+KTCPDEL?
+CME ERROR: 912 No more sessions can be used	Create a UDP client session repeatedly until 32 sessions are created: AT+KUDPCFG=1,0,1033,,"10.10.10.10" Then try to create a TCP server session (33rd session) AT+KTCPCFG=1,1,,80
+CME ERROR: 915 A parameter is not expected	AT+KHTTPHEADER=1,0 AT+KHTTPHEADER=1,"file"
	AT+KHTTPPOST=1,0,"/" AT+KHTTPPOST=1,"file","/"
	AT+KHTTPSPOST=1,0,"/" AT+KHTTPSPOST=1,1,"/" AT+KHTTPSPOST=1,"file","/"
	AT+KHTTPSHEADER=1,0 AT+KHTTPSHEADER=1,1 AT+KHTTPSHEADER=1,"file"
	AT+KFTPRCV=1,0,,"/sample.txt" AT+KFTPRCV=1,1,,"/sample.txt" AT+KFTPRCV=1,"file",,"/sample.txt"

Error Codes	Corresponding Examples
+CME ERROR: 916 A parameter has an invalid range of values	AT+KHTTPGET=0,"/" AT+KHTTPGET=1,"/",2
	AT+KHTTPHEADER=0
	AT+KHTTPHEAD=0,"/"
	AT+KHTTPCLOSE=0 AT+KHTTPCLOSE=1,-1
	AT+KHTTPPOST=0,,"/" AT+KHTTPPOST=1,,"/",2
	AT+KHTTPCFG=0,"www.example.com" AT+KHTTPCFG=1,"www.example.com",65536 AT+KHTTPCFG=1,"www.example.com",,,,,2 AT+KHTTPSCFG=0,"www.kernel.org" AT+KHTTPSCFG=-1,"www.kernel.org" AT+KHTTPSCFG=1,"www.kernel.org",65536 AT+KHTTPSCFG=1,"www.kernel.org",-1 AT+KHTTPSCFG=1,"www.kernel.org",,2 AT+KHTTPSCFG=1,"www.kernel.org",,,8 AT+KHTTPSCFG=1,"www.kernel.org",,,-1 AT+KHTTPSCFG=1,"www.kernel.org",,,,4 AT+KHTTPSCFG=1,"www.kernel.org",,,,,,,2 AT+KHTTPSCFG=1,"www.kernel.org",,,,,,,-1
	AT+KHTTPSGET=1,"/",2 AT+KHTTPSGET=1,"/",-1
	AT+KHTTPSHEAD=0,"/" AT+KHTTPSHEAD=-1,"/"
	AT+KHTTPSPOST=0,,"/" AT+KHTTPSPOST=-1,,"/" AT+KHTTPSPOST=1,,"/",2 AT+KHTTPSPOST=1,,"/",-1
	AT+KHTTPSHEADER=0 AT+KHTTPSHEADER=-1
	AT+KHTTPSCLOSE=0 AT+KHTTPSCLOSE=-1 AT+KHTTPSCLOSE=1,2 AT+KHTTPSCLOSE=1,-1
	AT+KFTPCFG=0,"ftp.kernel.org" AT+KFTPCFG=1,"ftp.kernel.org",,,65536 AT+KFTPCFG=1,"ftp.kernel.org",,,-1 AT+KFTPCFG=1,"ftp.kernel.org",,,,2 AT+KFTPCFG=1,"ftp.kernel.org",,,,-1 AT+KFTPCFG=1,"ftp.kernel.org",,,,,2 AT+KFTPCFG=1,"ftp.kernel.org",,,,,10 AT+KFTPCFG=1,"ftp.kernel.org",,,,,,-1 AT+KFTPCFG=1,"ftp.kernel.org",,,,,,?
	AT+KFTPCNX=0 AT+KFTPCNX=99 AT+KFTPCNX=-1
	AT+KFTPCLOSE=0 AT+KFTPCLOSE=1,2 AT+KFTPCLOSE=1,-1
	AT+KFTPCFGDEL=0 AT+KFTPCFGDEL=-1
	AT+KFTPRCV=0,,,"/sample.txt" AT+KFTPRCV=-1,,,"/sample.txt" AT+KFTPRCV=1,,,"/sample.txt",2 AT+KFTPRCV=1,,,"/sample.txt",-1

Error Codes	Corresponding Examples
+CME ERROR: 916 A parameter has an invalid range of values	AT+KFTPSND=0,,,"/sample.txt" AT+KFTPSND=-1,,,"/sample.txt" AT+KFTPSND=1,,,"/sample.txt",2 AT+KFTPSND=1,,,"/sample.txt",,-1
	AT+KFTPDEL=0,,"/sample.txt" AT+KFTPDEL=-1,,"/sample.txt" AT+KFTPDEL=1,,"/sample.txt",2 AT+KFTPDEL=1,,"/sample.txt",-1
	AT+KTCPSND=1,0
	AT+KTCPRCV=1,0
	AT+KUDPSND=1,"116.66.221.43",5043,0
	AT+KUDPRCV=1,0
+CME ERROR: 917 A parameter is missing	AT+KHTTPGET=,"/" AT+KHTTPGET=1, AT+KHTTPGET=,
	AT+KHTTPHEADER=,
	AT+KHTTPHEAD=,"/" AT+KHTTPHEAD=1, AT+KHTTPHEAD=,
	AT+KHTTPCLOSE=,
	AT+KHTTPPOST=,,"/" AT+KHTTPPOST=1,,
	AT+KHTTPCFG=1, AT+KHTTPCFG=,
	AT+KHTTPSCFG=1, AT+KHTTPSCFG=1,www.kernel.org AT+KHTTPSCFG=,
	AT+KHTTPSGET=,"/" AT+KHTTPSGET=1, AT+KHTTPSGET=,
	AT+KHTTPSHEAD=,"/" AT+KHTTPSHEAD=1, AT+KHTTPSHEAD=,
	AT+KHTTPSPOST=,,"/" AT+KHTTPSPOST=1,,
	AT+KHTTPSHEADER=,
	AT+KHTTPSCLOSE=,
	AT+KFTPCFG=1, AT+KFTPCFG=
	AT+KFTPCLOSE=,
	AT+KFTPRCV=1,,,
	AT+KFTPSND=1,,,
	AT+KFTPDEL=1,, AT+KFTPDEL=,,
+CME ERROR: 918 Feature is not supported	AT+KHTTPSCFG=1,"www.kernel.org",,,1 AT+KHTTPSCFG=1,"www.kernel.org",,,3
+CME ERROR: 919 Feature is not available	AT+KTCPACKINFO=1
+CME ERROR: 932 The format of a parameter is invalid	AT+KHTTPGET=a,"/"
	AT+KHTTPHEADER=a

Error Codes	Corresponding Examples
+CME ERROR: 932 The format of a parameter is invalid	AT+KHTTPHEAD=a,"/"
	AT+KHTTPCLOSE=a AT+KHTTPCLOSE=1,?
	AT+KHTTPPOST=a,,"/" AT+KHTTPPOST=1,,"/",?
	AT+KHTTPCFG=a,"www.example.com" AT+KHTTPCFG=1,"www.example.com",,? AT+KHTTPCFG=1,"www.example.com",a AT+KHTTPCFG=1,"www.example.com",,,,,?
	AT+KHTTPSCFG=a,"www.kernel.org" AT+KHTTPSCFG=1,"www.kernel.org",a AT+KHTTPSCFG=1,"www.kernel.org",,? AT+KHTTPSCFG=1,"www.kernel.org",,,,?
	AT+KHTTPSGET=a,"/" AT+KHTTPSGET=1,"/",?
	AT+KHTTPSHEAD=a,"/"
	AT+KHTTPSPOST=a,,"/" AT+KHTTPSPOST=1,,"/",?
	AT+KHTTPSHEADER=a
	AT+KHTTPSCLOSE=a AT+KHTTPSCLOSE=1,?
	AT+KFTPCFG=a,"ftp.kernel.org" AT+KFTPCFG=1,"ftp.kernel.org",,,,,? AT+KFTPCFG=1,"ftp.kernel.org",,,,,,?
	AT+KFTPCNX=a AT+KFTPCNX=#
	AT+KFTPCLOSE=b AT+KFTPCLOSE=1,?
	AT+KFTPCFGDEL=C AT+KFTPCFGDEL=#
	AT+KFTPRCV=D,,,"/sample.txt" AT+KFTPRCV=#,,,"/sample.txt" AT+KFTPRCV=1,,,"/sample.txt",?
	AT+KFTPSND=E,,,"/sample.txt" AT+KFTPSND=#,,,"/sample.txt" AT+KFTPSND=1,,,"/sample.txt",? AT+KFTPSND=1,,,"/sample.txt",,?
	AT+KFTPDEL=f,,"/sample.txt" AT+KFTPDEL=#,,"/sample.txt" AT+KFTPDEL=1,,"/sample.txt",?
	AT+KCGPADDR=a

18.3. Commands without Pin Code Requirement

Most AT commands are rejected (i.e. an error is returned to the DTE) if the valid PIN code has not been entered.

Commands which can be sent without the PIN code include:

- ATD (emergency calls)
- AT+CPIN
- ATI
- AT+CGMI, AT+GMI
- AT+CGMM, AT+GMM
- AT+CGMR, AT+GMR
- AT+CGSN, AT+GSN
- AT+CPAS
- AT+CIND
- AT+CMEE
- AT+IPR
- ATE, ATV, ATS, ATZ
- AT&F
- AT+CBST

This list may be modified in case of special needs from the customer. Contact Sierra Wireless to request modifications. Note that some commands may also require the PIN2 code.

18.4. GSM 27.010 Multiplexing Protocol

Main Options	BASIC	YES
	ADVANCED	YES
	advanced WITH ERROR RECOVERY	NO
Frames	SABM	YES
	UA	YES
	DM	YES
	DISC	YES
	I (ERM)	NO
	RR (ERM)	NO
	RNR (ERM)	NO
	REJ (ERM)	NO
	UI	YES
	UIH	YES
Multiplexer Controls	DLC parameters negotiation (PN) (optional)	YES
	Power Saving Control (PSC)	NO
	Multiplexer Close Down (CLD)	YES
	Test Command (Test)	YES
	Flow control On Command (Fcon)	YES
	Flow control Off Command (Fcoff)	YES
	Modem Status Command (MSC)	YES
	Non Supported Command response (NSC)	YES
	Remote Port Negotiation (RPN). (optional)	NO
	Remote Line Status command (RLS).(optional)	YES
	Service Negotiation Command (SNC)	NO
Convergence Layers	Type 1 - Unstructured Octet Stream	YES
	Type 2 - Unstructured Octet Stream with flow control, break signal handling and transmission of v24 signal states	YES
	Type 3 – Uninterruptible Framed Data	NO
	Type 4 - Interruptible Framed Data	NO
CMUX Parameters	Link speed	9600, 19200, 38400, 57600, 115200
	Maximum frame size	1540
	Acknowledgment timer	100
	Maximum number of retransmissions	100
	Response timer for control channel	30
	Wake up response timer	10 seconds
Others	Wake up procedure (see [RE2] sub clause 5.4.7)	YES
	Priority management	YES
	DLCI number limitation	8

18.5. TCP Commands Examples

18.5.1. Client Mode

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

AT+KTCPCFG? **OK**	No session is available

18.5.2. Server Mode

In this simple example we emulate a daytime server. This server listens to port 13 and for each connection it returns the date.

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

18.5.3. Polling for the Status of a Socket

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

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

18.5.4. End to End TCP Connection

AT&K3 **OK**	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0", "0.0.0.0","0.0.0.0" **OK**	Set GPRS parameters (APN, login, password)
AT+KTCPCFG=1,0,"www.google.com",80 **+KTCPCFG: 1** **OK**	Set the TCP server address and port number Returns session ID 1
AT+KTCPSTART=1 **CONNECT** **…Data sent……Data received……Data sent…** **…Data sent……Data received……Data sent…**	Initiate connection, use session 1 Message CONNECT: connection to server is established, data can be sent
+++ **OK**	Use +++ to enter command mode
ATO1 **CONNECT** **…Data sent……Data received……Data sent…** **…Data sent……Data received……Data sent…** **OK**	Use ATO<session_id> to switch back to data mode
	Toggle DTR (if using AT&D1 or AT&D2 configuration) to enter command mode
AT+KTCPCLOSE=1,1 **OK**	Close the session
AT+KTCPDEL=1 **OK**	Delete the configured session

18.5.5. Error Case for End to End TCP Connection

AT+KTCPSTART=1	Try to initiate connection
NO CARRIER **+KTCP_NOTIF: 1,<tcp_notif>**	Connection failed, see the value of <tcp_notif>
AT+KTCPSTART=1 **CONNECT**	Initiate connection
…Data sent……Data received……Data sent… **…Data sent……Data received……Data sent…**	Exchange some data
NO CARRIER **+KTCP_NOTIF: 1,<tcp_notif>**	An error occurs during connection (network lost, server closed, etc.)

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

This section describes the behavior of AT+KTCPACKINFO when the <URC-ENDTCP> option is used with AT+KTCPCFG.

18.5.6.1. <URC-ENDTCP-enable> is Disabled (default setting)

AT+KCNXCFG=1,"GPRS","CMNET" **OK**	
AT+KTCPCFG=1,0,"202.170.131.76",2000 **+KTCPCFG: 1** **OK**	
AT+KTCPCFG? **+KTCPCFG: 1,0,0,0,,"202.170.131.76",2000,,0,0** **OK**	<URC-ENDTCP-enable> is disabled
AT+KTCPCNX=1 **OK**	Connect to TCP server
AT+KTCPSND=1,10 **CONNECT**	Use command to send 10 bytes
0123456789--EOF--Pattern-- **OK**	Write to serial
	The URC “+KTCP_ACK” is not displayed
AT+KTCPACKINFO=1 **+CME ERROR: operation not allowed**	Error is returned because <URC-ENDTCP-enable> is disabled

18.5.6.2. <URC-ENDTCP-enable> is Enabled

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

18.6. UDP Commands Examples

18.6.1. Client Mode

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

18.6.2. Server Mode

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

18.6.3. Use Cases for KTCP_DATA and KUDP_DATA

18.6.3.1. KTCP_DATA and KUDP_DATA without Data Auto Retrieval – Client Mode

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**	Connect to TCP server 10 bytes have arrived
AT+KTCPRCV=1,10 **CONNECT** **0123456789--EOF--Pattern--** **OK**	Receive the 10 bytes that arrived
AT+KUDPCFG=1,0 **+KUDPCFG: 2** **OK** **+KUDP_DATA: 2,8**	Open a UDP socket 8 bytes have arrived
AT+KUDPRCV=2,8 **CONNECT** **01234567--EOF--Pattern--** **OK** **+KUDP_RCV: "202.170.131.76",2001**	Read the data

18.6.3.2. KTCP_DATA and KUDP_DATA without Data Auto Retrieval – Server Mode

AT+KTCPCFG=1,1,,13 **+KTCPCFG: 1** **OK**	Configure a TCP server socket
AT+KTCPCNX=1 **OK**	Open the listen port
AT+KCGPADDR **+KCGPADDR: 0,“10.35.125.89”** **OK**	

+KTCP_SRVREQ: 1,2	Session 2 is set
+KTCP_SRVREQ: 1,3	Session 3 is set
+KTCP_DATA: 2,10	10 bytes have arrived at session 2
+KTCP_DATA: 3,8	8 bytes have arrived at session 3
AT+KTCPRCV=2,10 **CONNECT** **0123456789--EOF--Pattern--** **OK**	Receive the 10 bytes in session 2
AT+KTCPRCV=3,8 **CONNECT** **01234567--EOF--Pattern--** **OK**	Receive the 8 bytes in session 3
AT+KUDPCFG=1,1,3000 **+KUDPCFG: 4** **OK**	Open a UDP socket in server mode
+KUDP_DATA: 4,8	8 bytes have arrived
AT+KUDPRCV=4,8 **CONNECT** **01234567--EOF--Pattern--** **OK** **+KUDP_RCV: "202.170.131.76",2001**	Receive the 8 bytes

18.6.3.3. KTCP_DATA and KUDP_DATA with Data Auto Retrieval – Client Mode

AT+KCNXCFG=1,"GPRS","CMNET" **OK**	
AT+KTCPCFG=0,0,"202.170.131.76",2000,,1 **+KTCPCFG: 1** **OK**	When <data_mode> = 1, data will be received by the URC “+KTCP_DATA
AT+KTCPCNX=1 **OK**	Connect to TCP server
+KTCP_DATA: 1,10,0123456789	10 bytes have arrived. The data are presented in the URC directly
AT+KUDPCFG=0,0,3000,1 **+KUDPCFG: 2** **OK**	When <data_mode> = 1, data will be received by the URC “+KUDP_DATA
+KUDP_DATA: 2,8,"202.170.131.76",2001,01234567	8 bytes have arrived. The data are presented in the URC directly

18.6.3.4. KTCP_DATA and KUDP_DATA with Data Auto Retrieval – Server Mode

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

18.7. FTP Commands Examples

18.7.1. Client Mode

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

AT+KFTPRCV=0,,"Dir","Testfile.txt",0 **CONNECT** **F6E6E656374696F6E20746573742E--EOF--Pattern--** **OK**	Read the file named "TestFile.txt" from ftp server, data are sent and end by EOF string
AT+KFTPDEL=0,"Dir","TestFile.txt" **OK**	Delete the file called "TestFile.txt" in the FTP server
AT+KFTPCLOSE=0 **OK**	Close the connection

18.7.2. "FTP Resume" Use Case

18.7.2.1. Resume Feature when Transmitting Data to Serial Link

AT+KCNXCFG=1,"GPRS","CMNET" **OK**	
AT+KFTPCFG=1,"202.170.131.76","administrator","8ik,(OL>",21,0 **+KFTPCFG: 1** **OK**	
AT+KFTPRCV=1,,,"111111.txt",0 **CONNECT**	
750aaaaaaaaa….. aaaaa250bbbbbbb--EOF--Pattern--	Total of 760 data from the serial link
+KFTP_ERROR: 1, 421	The result code indicates that the download met with some problems which may be due to control or data connection lost
AT+KFTPRCV=1,,,"111111.txt",0,760	Try to resume transfer by using the offset 760.
bbbbbb……bbbbbbbbend--EOF--Pattern-- **OK**	Total data from the serial link should be 240
	The complete file “111111.txt” can be obtained by combining the data received from the two separate downloads

18.7.2.2. Use Case when FTP Server does not Support the Resume Feature

AT+KCNXCFG=1,"GPRS","CMNET" **OK**	
AT+KFTPCFG=1,"202.170.131.76","administrator","8ik,(OL>",21,0 **+KFTPCFG: 1** **OK**	
AT+KFTPRCV=1,,,"111111.txt",0 **CONNECT**	
750aaaaaaaaa….. aaaaa250bbbbbbb--EOF--Pattern--	Total of 760 data from the serial link
+KFTP_ERROR: 1,421	The result code indicates that the download met with some problems which may be due to control or data connection lost
AT+KFTPRCV=1,,,"111111.txt",0,760 **CONNECT** **--EOF--Pattern--**	
+KFTP_ERROR: 1,502	ERROR 502 means that some commands in the procedure are not supported by the server

18.8. HTTP Commands Examples

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

AT&K3 **OK**	Hardware flow control activation
AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0","0.0.0.0","0.0.0.0" **OK**	Set GPRS parameters (APN, login, password)
AT+KCNXTIMER=1,60,2,70 **OK**	Set Timers
AT+KHTTPCFG=1,"www.google.com",80,1 **+KHTTPCFG: 1** **OK**	Set HTTP address, port number and http version
AT+KHTTPHEADER=1 **CONNECT**	Set the header of the request
Accept : text/html **If-Modified-Since : Saturday, 15-January-2000 14:37:11 GMT** **OK**	Send HTTP data after “CONNECT”. Data should end with the EOF string.
AT+KHTTPGET=1, "/index.html" **CONNECT**	Get the web page

HTTP/1.0 200 OK **Cache-Control: private, max-age=0** **Date: Tue, 24 Jun 2008 02:11:35 GMT** **Expires: -1** **Content-Type: text/html; charset=ISO-8859-1** **Set-Cookie: PREF=ID=ae1c663417e7799e:NW=1:TM=1214273495:LM=1214273495:S=5Uq9kExK4aTEv_cx; expires=Thu, 24-Jun-2010 02:11:35 GMT; path=/; domain=.google.com** **Server: gws** **Connection: Close** **<html><head><meta http-equiv="content-type"** **… a lot of data…** **--EOF--Pattern--** **OK**	HTTP server response
AT+KHTTPHEAD=1, "/index.html" **CONNECT**	Get the headers of the web page
HTTP/1.0 200 OK **Cache-Control: private, max-age=0** **Date: Tue, 24 Jun 2008 02:11:35 GMT** **Expires: -1** **Content-Type: text/html; charset=ISO-8859-1** **Set-Cookie: PREF=ID=ae1c663417e7799e:NW=1:TM=1214273495:LM=1214273495:S=5Uq9kExK4aTEv_cx; expires=Thu, 24-Jun-2010 02:11:35 GMT; path=/; domain=.google.com** **Server: gws** **Connection: Close** **OK**	HTTP server response
AT+KHTTPHEADER=1 **CONNECT** **Accept : text/html** **Context-Length: 64** **OK**	Send data to the HTTP server Length of HTTP 1.0 POST data should be specified by the HTTP header field Context-Length, otherwise the HTTP server may not expect any data to be uploaded and should close the connection.
AT+KHTTPPOST=1,, "/get.cgi" **CONNECT**	
<…Data send…>	Send HTTP data after “CONNECT”
HTTP/1.0 200 **OK** **Content-Type: text/plain** **Context-Length: 37** **Your data have been accepted.** **--EOF--Pattern--** **OK**	HTTP server response

18.9. Switch Data/Command Mode DTR +++ ATO Behavior Table

When the module is in data mode and the connection encounters an error, NO CARRIER terminal response is shown and the module is switched back to command mode.

The following table shows the behavior when trying to switch mode (when connection is running properly):

Case 1: "+++" is used to switch from data mode to command mode, and the service is suspended.

Case 2: If AT&D1 is set, "DTR drop" is used to switch from data mode to command mode, but the service is suspended.

Case 3: If AT&D2 is set, "DTR drop" is used to switch from data mode to command mode, and the service is stopped.

Case 4: If AT&D0 is set, "DTR drop" has no any impact on the mode switch.

Case 5: ATO[n] is used to switch from command mode to data mode.

	Case1/Case5 **+++/ATO[n]**	**Case2/Case5** **DTR1/ATO[n]**	**Case3/Case5** **DTR2/ATO[n]**	**Case4/Case5** **DTR0**
TCP/UDP: +KTCPSND: Send data +KTCPRCV: Receive data +KUDPSND: Send data +KUDPRCV: Receive data +KTCPSTART: Direct data flow	OK/CONNECT	OK/CONNECT	NO CARRIER/NO CARRIER (disconnect)	NO IMPACT
FTP: +KFTPRCV: Download FTP files +KFTPSND: Upload FTP files	OK/NO CARRIER (disconnect)	OK/NO CARRIER (disconnect)	NO CARRIER/NO CARRIER (disconnect)	NO IMPACT
HTTP: +KHTTPGET: Get information +KHTTPHEAD: Get head of information +KHTTPPOST: Send data +KHTTPHEADER: Set the HTTP request header	OK/NO CARRIER (disconnect)	OK/NO CARRIER (disconnect)	NO CARRIER/NO CARRIER (disconnect)	NO IMPACT
HTTPS: +KHTTPSGET: Get information +KHTTPSHEAD: Get head of information +KHTTPSPOST: Send data +KHTTPSHEADER: Set the HTTP request header	OK/NO CARRIER (disconnect)	OK/NO CARRIER (disconnect)	NO CARRIER/NO CARRIER (disconnect)	NO IMPACT
SSL: +KCERTSTORE: Store root CA +KPRIVKSTORE: Store private key	OK/NO CARRIER (abort)	OK/NO CARRIER (abort)	NO CARRIER/NO CARRIER (abort)	NO IMPACT

SIERRA
WIRELESS®