AT Commands Interface Guide

AirPrime HL6528RDx

SIERRA WIRELESS®

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Document History

Version	Date	Updates
1.0	September 01, 2015	Creation
1.1	September 09, 2015	Added: • 3.6 +CMUX Command: Enter Multiplexing Mode • 5.34 +KSLEEP Command: Power Management Control • 11.1 +KPCMCFG Command: Configure PCM/Digital Audio • 12.2 +WMRXPOWER Command: Test RF Rx • 13 SIM Application Toolkit Commands
		Updated: • 5.25 +KADC Command: Analog to Digital Converter • 12.1 +WMAUDIOLOOP Command: Audio Test
1.2	September 11, 2015	Added: • 2.27 X Command: Result Code Selection and Call Progress Monitoring Control • 6.4 +CHLD Command: Call Hold and Multiparty
		Updated: • 2.12 +IPR Command: Set Fixed Local/DTE Rate • 4.5 D Command: Mobile Originated Call to Dial a Number
1.3	October 06, 2015	Updated section 3.14 I Command: Request Identification Information
2.0	November 02, 2015	Added: • 2.1 &C Command: Set Data Carrier Detect (DCD) Function Mode • 2.2 &D Command: Set Data Terminal Ready (DTR) Function Mode • 2.3 &F Command: Restore Factory Settings • 2.4 &K Command: Flow Control Option • 2.6 &S Command: DSR Option • 2.8 &W Command: Save Stored Profile • 2.9 +++ Command: Switch from Data Mode to Command Mode • 2.13 A/ Command: Repeat Previous Command Line • 2.15 O Command: Switch from Command Mode to Data Mode • 2.18 S2 Command: Set Character for the Escape Sequence (Data to Command Mode) • 2.19 S3 Command: Command Line Termination Character • 2.20 S4 Command: Set Response Formatting Character • 2.21 S5 Command: Write Command Line Editing Character • 2.22 S6 Command: Pause before Blind Dialing • 2.24 S8 Command: Comma Dial Modifier Time • 2.25 S10 Command: Automatic Disconnect Delay • 2.28 Z Command: Reset to Default Configuration • 5.13 +CMER Command: Mobile Equipment Event Reporting • 5.22 +CSQ Command: Signal Quality • 6.5 +CLCC Command: List Current Calls • 9.3 +CGCLASS Command: GPRS Mobile Station Class

Version	Date	Updates
2.0	November 02, 2015	Updated: • 2.12 +IPR Command: Set Fixed Local/DTE Rate • 5.7 +CFUN Command: Set Phone Functionality • 5.25 +KADC Command: Analog to Digital Converter • 6.3 +CCWA Command: Call Waiting • 6.4 +CHLD Command: Call Hold and Multiparty • 6.10 +COLP Command: Connected Line Identification Presentation • 6.12 +COPS Command: Operator • 12.1 +WMAUDIOLOOP Command: Audio Test
	November 09, 2015	Added: • 2.11 +IFC Command: DTE-DCE Local Flow Control • 5.10 +CLAN Command: Set Language • 5.19 +CPWC Command: Power Class • 5.31 +KRIC Command: Ring Indicator Control • 14 NV Related Commands • 15 AVMS Commands • 17.1 Error Codes
		Updated: • 2.6 &S Command: DSR Option • 5.8 +CIND Command: Indicator Control • 5.37 +WEXTCLK Command: External Clocks Setting • 6.12 +COPS Command: Operator • 9.3 +CGCLASS Command: GPRS Mobile Station Class • 12.3 +WMTXPOWER Command: Test RF Tx
	November 13, 2015	Added: • 5.15 +CPAS Command: Phone Activity Status • 5.33 +KSIMSEL Command: SIM Selection • 5.35 +KSREP Command: Mobile Start-Up Reporting • 8 Data Commands • 9.4 +CGDCONT Command: Define PDP Context
		Updated: • 2.28 Z Command: Reset to Default Configuration • 5.34 +KSLEEP Command: Power Management Control • 9.6 +CGPADDR Command: Show PDP Address
	November 20, 2015	Added: • 2.7 &V Command: Display Current Configuration • 7.3 +CMGD Command: Delete SMS Message • 7.11 +CNMI Command: New SMS Message Indication • 7.14 +CSCB Command: Select Cell Broadcast Message Types • 9.4 +CGDCONT Command: Define PDP Context
	November 26, 2015	Added 5.32 +KSIMDET Command: SIM Detection
		Updated: • 2.12 +IPR Command: Set Fixed Local/DTE Rate • 2.19 S3 Command: Command Line Termination Character • 2.6 &S Command: DSR Option • 5.15 +CPAS Command: Phone Activity Status • 5.33 +KSIMSEL Command: SIM Selection

Version	Date	Updates
2.0	December 08, 2015	Added: • 6.9 +CNUM Command: Subscriber Number • 6.11 +COPN Command: Read Operator Name • 6.13 +CPLS Command: Select Preferred PLMN List • 6.15 +CPWD Command: Change Password
		Updated: • 2.8 &W Command: Save Stored Profile • 17.1 Error Codes
3.0	December 21, 2015	Added: • 3.8 +CSCS Command: Select TE Character Set • 5.2 +CACM Command: Accumulated Meter (ACM) Reset or Query • 5.3 +CAMM Command: Accumulated Call Meter Maximum (ACM Max) • 5.6 +CCWE Command: Call Meter Maximum Event • 5.11 +CMEC Command: Mobile Equipment Control Mode • 6.6 +CLCK Command: Facility Lock • 16 Protocol Specific Commands • 17.2 How to Use UDP Specific Commands
		Updated: • 2.3 &F Command: Restore Factory Settings • 2.28 Z Command: Reset to Default Configuration • 5.19 +CPWC Command: Power Class • 5.32 +KSIMDET Command: SIM Detection • 6.16 +CREG Command: Network Registration • 9.9 +CGREG Command: GPRS Network Registration Status • 9.10 +CGSMS Command: Select Service for MO SMS Messages • 9.11 +WPPP Command: Configure PDP Context Authentication (also moved this command from section 15 to section 9) • 12.2 +WMRXPOWER Command: Test RF Rx • 14 NV Related Commands • 15.9 +WDSS Command: Device Services Session
		Deleted 5.29 +KPWM Command: PWM Control
	December 30, 2015	Added: • 3.7 +CSNS Command: Single Numbering Scheme • 11.3 +VTS Command: DTMF and Tone Generation
		Updated: • 2.10 +GCAP Command: Request Complete TA Capability List • 6.12 +COPS Command: Operator Selection • 10.1 +KSIOCFG Command: Serial IO Configuration • 16 Protocol Specific Commands
	January 07, 2016	Added: • 5.17 +CPIN2 Command: Send Password to MT • 5.21 +CSIM Command: Generic SIM Access • 11.2 +VIP Command: Initialize Voice Parameters

Version	Date	Updates
3.0	January 07, 2016	Updated: • 16 Protocol Specific Commands • 2.11 +IFC Command: DTE-DCE Local Flow Control • 2.7 &V Command: Display Current Configuration • 2.8 &W Command: Save Stored Profile • 2.10 +GCAP Command: Request Complete TA Capability List • 5.26 +KBCAP Command: Retrieve Bitmap Capabilities • 13 SIM Application Toolkit Commands
	January 14, 2016	Added 2.5 &R Command: RTS/CTS Option
		Updated: • 2.4 &K Command: Flow Control Option • 2.7 &V Command: Display Current Configuration • 2.12 +IPR Command: Set Fixed Local/DTE Rate • 6.9 +CNUM Command: Subscriber Number
	January 26, 2016	Updated: • 4.5 D Command: Mobile Originated Call to Dial a Number • Table 2 CME Error Codes
3.1	February 04, 2016	Added 17.1.5 CEER Error Codes
		Updated: • 4.1 +CEER Command: Extended Error Report • 7.4 +CMGF Command: Select SMS Message Format • 16.7.4 +KCGPADDR Command: Display PDP Address • 16.7.6 +KCNXUP Command: Bring the PDP Connection Up • 16.9.1 +KUDPCFG Command: UDP Connection Configuration
	February 11, 2016	Added 17.3 Sleep Mode Management
		Updated: • 5.34 +KSLEEP Command: Power Management Control • 5.37 +WEXTCLK Command: External Clocks Setting • 14.4 +NVBU: NV Backup Status and Control
	February 19, 2016	Moved +WMAUDIOLOOP from section 11 to section 12.1
		Updated: • 5.31 +KRIC Command: Ring Indicator Control • 13.2 *PSSTKI Command: SIM Toolkit Interface Configuration • 16.2 IP Address Format in AT Commands

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1. Overview

This manual provides information about the AT command set used with the AirPrime HL6528RDx. The HL6528RDx series consists of:

- HL6528RD
- HL6528RD-G
- HL6528RD-2.8V
- HL6528RD-G2.8V

Each AT command is described in the subsequent sections and when necessary, the standard reference is noted (e.g.: [27.007] §7.5).

1.1. Reference Documents

[04.08]	GSM 04.08 (6.7.1) – Mobile radio interface layer 3 specification (Release 1997)
[22.022]	3GPP 22.022 (3.1.0) – Personalization of Mobile Equipment (ME); Mobile functionality specification (Release 1999)
[27.005]	3GPP 27.005 (5.0.0) – Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
[27.007]	3GPP 27.007 (6.0.0) – AT command set for User Equipment (UE) (Release 6)
[V25ter]	ITU-T Recommendation V.25 ter – Serial asynchronous automatic dialing and control
[SIM]	Specification of the Subscriber Identity Module – Mobile Equipment (SIM – ME) interface. (GSM 11.11 version 8.3.0 Release 1999)
[21.905]	3GPP 21.905 (9.4.0) Vocabulary for 3GPP Specifications (Release 9)
[26.267]	3GPP 26.267 (10.0.0) – eCall Data Transfer - In-band modem solution

1.2. Reference Configuration

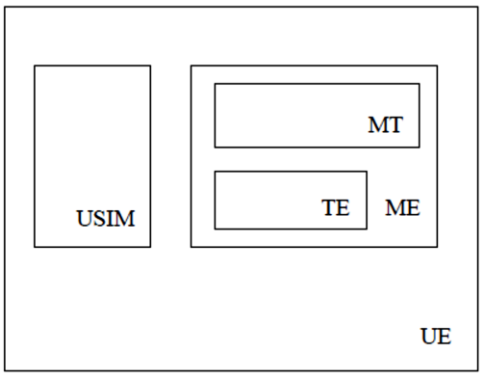


Figure 1. Reference Configuration

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.

1.3. AT Command Principles

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

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

Four kinds of extended AT commands are implemented:

Command Type	Syntax	Definition
Test Command	AT+CXXX=?	The equipment returns the list of parameters and range of value 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

1.3.1. Parameters

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.

1.3.2. Command Responses

There is always a response sent by the TA to an AT Command line (except for when setting up TA for no answer).

The response is always terminated by an indication of success or failure; however, the returned response may vary.

Classical messages: **OK** or **ERROR**

Extended error message (see **AT+CMEE**): **+CME ERROR: <n>**

Numeric Mode (see **ATV**): **<n>** with: **<n> = 0** ↔ **OK** or **<n>** is an error code

1.3.3. Multiple AT Commands on the Same Command Line

Several AT commands may be entered on the same line to eliminate the need to type the "AT" or "at" prefix before each command and to wait for the answer for each command. The main advantage of using multiple AT commands per line is avoiding losing bandwidth on the link between the 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 the TA will return **ERROR**.

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

Example:

```
ATZ&K3+CLAN="en";+CLAN?
+CLAN: "en"
OK
```

1.3.4. AT Commands on Separate Lines

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

1.4. Unsolicited Result Codes (URCs)

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

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

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

1.5. Document Modification

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

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

1.6. Abbreviations

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

Abbreviation	Definition
BER	Bit Err Rate
BM	Broadcast Message Storage
CBM	Cell Broadcast Message
CB	Cell Broadcast
CCK	Corporate Control Key
CCM	Current Call Meter
CHV	Card Holder Verification
CHAP	Challenge handshake Authentication Protocol
CI	Cell Identifier
CLI	Client Line Identification
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
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
DTR	Data Terminal Ready
DCS	Digital Cellular System
DCE	Data Circuit Equipment
DCD	Data Carrier Detect
DLC	Data Link Connection
DLCI	Data Link Connection Identifier
DM	Device Management
DNS	Domain Name System
DSR	Data Set Ready
DTE	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

Abbreviation	Definition
ENS	Enhanced Network Selection
E-ONS	Enhanced Operator Name Service
ERMES	European Radio Messaging System
ETSI	European Telecommunications Standards Institute
FD	FIFO depth
FDN	Fixed Dialing Number (Phonebook)
FR	Full Rate (full rate speech version 1)
GERAN	GSM EDGE Radio Access Network
GPIO	General Purpose Input Output
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
HDLC	High-level Data Link Control
HFR	High Frequency Regeneration
HLR	Home Location Register
HR	Half Rate (half rate speech version 1)
ID	Identifier
IETF	Internet Engineering Task Force
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
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

Abbreviation	Definition
NTC	Negative Temperature Coefficient
O	Optional
OA	Outgoing Access
OPL	Operator PLMN List
OS	Operating System
OTA	Over the Air
PAD	Portable Application Description
PAP	Password Authentication Protocol
PC	Personal Computer
PCCP	PC character set code page
PCK	Personalization Control Key
PCL	Power Control Level
PCM	Protection Circuit Module
PCN	Personal Communication Network
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

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

2. V25ter Commands

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

HL6528RDx	
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	Note Configuration is saved using AT&W.

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

HL6528RDx	
Execute command Syntax **AT&D<value>**	Response **OK** Parameter **<value>** 0 TA ignores status on DTR 1 DTR drop from active to inactive. Change to command mode while retaining the connected data call 2 DTR drop from active to inactive. Disconnect data call, change to command mode. During state DTR inactive auto-answer is off.
Reference V.25Ter	Notes • The command AT&D only applies to data calls. Thus, a DTR drop from active to inactive in AT&D2 mode will not hang up a voice call. • See also the appendix about the DTR +++ ATO behaviors matrix.

2.3. &F Command: Restore Factory Settings

HL6528RDx	
Execute command Syntax **AT&F[<value>]**	 Response **OK** Parameter **<value>** 0 or Omitted Restore parameters to factory settings
Reference V.25Ter	Notes • Also see AT&V. • Restore factory settings to the active profile. • AT&F also restores the settings of AVMS services indication +WDSI (if the AVMS feature is applicable), +CREG, +CGREG, +CRC, +CR, +CMEE, +CLIP, +COLP, +CMGF, +CSMS.
Examples	**AT&F** **OK** **AT&F0** **OK** **AT&F1** **ERROR**

2.4. &K Command: Flow Control Option

HL6528RDx	
Execute command Syntax **AT&K<mode>**	 Response **OK** Parameter **<mode>** 0 Disable all flow control 3 Enable bi-directional hardware flow control 4 Enable XON/XOFF flow control
Reference V.25Ter	Notes • Use AT&V0 to display the current flow control setting. • The use of hardware flow control is recommended. • Software flow control is supported if the data to be transmitted is coded in ASCII (in this case XON/XOFF controls and data are differentiated), or the customer manages the data encapsulation and does not include XON/XOFF with the data.

2.5. &R Command: RTS/CTS Option

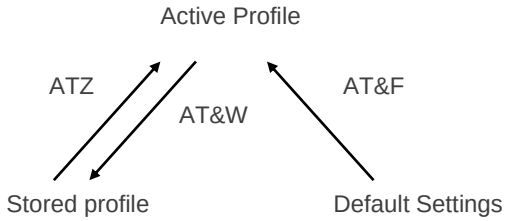
HL6528RDx	
Execute command Syntax **AT&R <option>**	 Response **OK** Parameter **<option>** 1 In sync mode, CTS is always ON (RTS transitions are ignored). In async mode, CTS will only drop if required by the flow control.
Notes	This selects how the modem controls CTS. CTS operation is modified if hardware flow control is selected (see **&K** command).

2.6. &S Command: DSR Option

HL6528RDx	
Execute command Syntax **AT&S <override>**	 Response **OK** Parameter **<override>** 0 or 1 DSR signal is always ON (0 is the default value)

2.7. &V Command: Display Current Configuration

HL6528RDx	
Execute command Syntax **AT&V[<value>]**	 Response **ACTIVE PROFILE: <current configuration>** **STORED PROFILE 0: <user default configuration>** **STORED PROFILE 1: <manufactory configuration>** **OK** Parameter **<value>** 0 Profile number
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 manufacture, the product and the user setup. • AT&V lists +IFC and S01 parameters which are directly editable. The +IFC answer reflects the flow control parameters set by AT&K.

HL6528RDx	
Examples	**E1 Q0 V1 X4 &C1 &D1 &R1 &S0 +IFC= 0,0 &K0** **S00:0 S03:13 S04:10 S05:8 S07:50 S08:2 S10:14** This command indicates the result of certain actions as shown below: 

2.8. &W Command: Save Stored Profile

HL6528RDx	
Execute command Syntax **AT&W[<value>]**	Response **OK** Parameter <value> 0 or Omitted Save in STORED PROFILE 0 1 Save in STORED PROFILE 1
Reference Sierra Wireless Proprietary	Notes • Also see AT&V. • This command saves the current configuration in a non-erasable place. • The default stored profile may be adapted for customer needs. • Configurations saved are: ▪ &C DCD control ▪ &D DTR behavior ▪ &K Flow control ▪ &R RTS control ▪ &S DSR control ▪ E Echo ▪ Q Set result code presentation mode ▪ S0 Set number of rings before automatically answering the call ▪ S3 Write command line termination character ▪ S4 Set response formatting character ▪ S5 Write command line editing character ▪ S7 Set number of seconds to wait for connection completion ▪ S8 Comma dial modifier time ▪ S10 Automatic disconnect delay ▪ V Verbose ▪ X Extended result code

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

HL6528RDx	
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 a terminating character). • The "+" character may be changed with the ATS2 command. (Refer to S2 Command for details.) • The +++ characters are not transmitted in the data flow.

2.10. +GCAP Command: Request Complete TA Capability List

HL6528RDx	
Execute command Syntax **AT+GCAP**	 Response **+GCAP:** list of **<name>**s **OK** Parameter **<name>** +CGSM
Reference V.25ter	Example **+GCAP: +CGSM** **OK**

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

HL6528RDx	
Test command Syntax **AT+IFC=?**	 Response **+IFC:** (list of supported **<DCE_by_DTE>**s), (list of supported **<DTE_by_DCE>**s) **OK**

HL6528RDx	
Read command Syntax **AT+IFC?**	 Response **+IFC: <DCE_by_DTE>,<DTE_by_DCE>** **OK**
Write command Syntax **AT+IFC=** **[<DCE_by_DTE>** **[,<DTE_by_DCE>** **]]**	 Response **OK** Parameters **<DCE_by_DTE>** 0 Disable all flow control 1 Enable XON/XOFF flow control 2 Enable bi-directional hardware flow control **<DTE_by_DCE>** 0 Disable all flow control 1 Enable XON/XOFF flow control 2 Enable bi-directional hardware flow control
Reference V.25Ter	Notes • <DCE_by_DTE> and <DTE_by_DCE> must have the same value. • Flow control is not supported via the USB AT command port. <DCE_by_DTE> and <DTE_by_DCE> must be set to 0 when using USB; using another value will have no effect on the USB port.
Examples	**AT+IFC=?** **+IFC: (0-2),(0-2)** **OK** **AT+IFC?** **+IFC: 0,0** **OK** **AT+IFC=1,1** **OK** **AT+IFC?** **+IFC: 1,1** **OK** **AT+IFC=** **OK** **AT+IFC?** **+IFC: 0,0** **OK** **AT+IFC=1,1** // On a USB command port **ERROR**

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

HL6528RDx	
Test command Syntax **AT+IPR=?**	 Response **+IPR: (**list of supported **<rate>**s**)**
Read command Syntax **AT+IPR?**	 Response **+IPR: <rate>**
Write command Syntax **AT+IPR=[<rate>]**	 Response **OK** Parameter **<rate>** Bit rate per second 0, 300, 600, 1200, 2400, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 57600, 115200, 230400, 460800, 921600
Reference V.25Ter	Notes • Because the autobaud rate is still under development, not specifying a <rate>, or setting to it 0 has no effect on the baud rate setting. • Supported auto-detectable <rate> values and fixed-only <rate> values are the same.

2.13. A/ Command: Repeat Previous Command Line

HL6528RDx	
Execute command Syntax **A/**	 Response Depends on the previous command
Reference V.25Ter	Notes Line does not need to end with a terminating character.

2.14. E Command: Enable Echo

HL6528RDx	
Execute command Syntax **ATE[<value>]**	 Response **OK** Parameter **<value>** 0 Echo mode off 1 Echo mode on
Reference V.25Ter	Notes This setting determines whether or not the TA echoes characters received from TE during the command state.

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

HL6528RDx	
Execute command Syntax **ATO[<n>]**	 Response TA returns to data mode from command mode: **CONNECT <text>** If connection is not successfully resumed: **NO CARRIER** Parameter **<n>** 0 Switch from command mode to data mode
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.

2.16. Q Command: Set Result Code Presentation Mode

HL6528RDx	
Execute command Syntax **ATQ[<n>]**	 Response **OK** (if <n> = 0) Nothing (if <n> = 1) Parameter **<n>** 0 Result codes are transmitted by TA 1 No result codes are transmitted by TA
Reference V.25Ter	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.

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

HL6528RDx	
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
Reference V.25Ter	Notes In data mode (after any CONNECT), automatic call answering does not work. This means that incoming calls are not automatically answered during data mode.

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

HL6528RDx	
Execute command Syntax **ATS2?**	 Response **<n>** **OK**
Write command Syntax **ATS2=<n>**	 Response **OK** Parameter **<n>** Only 43 ("+") is supported
Reference V.25Ter	Notes The default character is "+" (043) and cannot be changed.

2.19. S3 Command: Command Line Termination Character

HL6528RDx	
Execute command Syntax **ATS3?**	 Response **<n>** **OK**
Write command Syntax **ATS3=<n>**	 Response **OK** Parameter **<n>** 13 Command line termination character <CR>: carriage return
Reference V.25Ter	Notes • This parameter determines the character recognized by the TA to terminate an incoming command line (13 = <CR> by default). The value cannot be changed. • See data stored by AT&W for the default value.

2.20. S4 Command: Set Response Formatting Character

HL6528RDx	
Execute command Syntax **ATS4?**	 Response **<n>** **OK**
Write command Syntax **ATS4=<n>**	 Response **OK** Parameter **<n>** 0 – 127 Response formatting character
Reference V.25Ter	Notes • This parameter determines the character recognized by the TA to terminate the answer line (10 = <LF> by default). • See data stored by AT&W for the default value.

2.21. S5 Command: Write Command Line Editing Character

HL6528RDx	
Execute command Syntax **ATS5?**	 Response **<n>** **OK**
Write command Syntax **ATS5=<n>**	 Response **OK** Parameter **<n>** 0 – 127 Command line editing character
Reference V.25Ter	Notes • This parameter determines the character recognized by the TA to delete the immediately preceding character from the command line (8 = <backspace> by default). • See data stored by AT&W for the default value

2.22. S6 Command: Pause before Blind Dialing

HL6528RDx	
Execute command Syntax **ATS6?**	 Response **<time>** **OK**
Write command Syntax **ATS6=<time>**	 Response **OK** Parameters **<time>** 2 – 10
Reference ITU-T V.250 § 6.3.9	Notes The responses of this command are compliant with command recommendations, but this command has no effect.

2.23. S7 Command: Set Delay for Connection Completion

HL6528RDx	
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
Reference V.25Ter	Notes In data mode (after any CONNECT), automatic call answering does not work. This means that incoming calls are not automatically answered during data mode.

2.24. S8 Command: Comma Dial Modifier Time

HL6528RDx	
Execute command Syntax **ATS8?**	 Response **<time>** **OK**
Write command Syntax **ATS8=<time>**	 Response **OK** Parameter **<time>** 0 – 255 See data stored by AT&W for the default value
Reference ITU-T V.250 § 6.3.11	Notes Since commas are ignored in the D command, this command has no effect.

2.25. S10 Command: Automatic Disconnect Delay

HL6528RDx	
Execute command Syntax **ATS10?**	 Response **<time>** **OK**
Write command Syntax **ATS10=<time>**	 Response **OK** Parameters **<time>** 1 – 254 See data stored by AT&W for the default value
Reference ITU-T V.250 § 6.3.12	Notes The responses of this command are compliant with command recommendations, but this command has no effect.

2.26. V Command: TA Response Format

HL6528RDx	
Execute command Syntax **ATV[<value>]**	 Response **0** (When numeric mode is activated) **OK** (When verbose mode is activated) Parameter **<value>** 0 Short result code format: <numeric code> 1 Long result code format: <verbose code>
Reference V.25Ter	

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

HL6528RDx	
Execute command Syntax **ATX[<value>]**	 Response **OK** Parameter **<value>** 0 CONNECT result code only returned, dial tone and busy detection are both disabled 1 CONNECT<text> result code only returned, dial tone and busy detection are both disabled 2 CONNECT<text> result code returned, dial tone detection is enabled, busy detection is disabled 3 CONNECT<text> result code returned, dial tone detection is disabled, busy detection is enabled 4 CONNECT<text> result code returned, dial tone and busy detection are both enabled
Reference V.25Ter	Notes This command defines the result code to be returned, as well as sets the dial tone or busy detection features.
Examples	**ATX0** **OK** **ATX4** **OK** **ATX5** **ERROR** **ATX10** **ERROR**

2.28. Z Command: Reset to Default Configuration

HL6528RDx	
Execute command Syntax **ATZ[<value>]**	Response **OK** Parameter **<value>** 0 Reset and restore user configuration with profile 0 1 Reset and restore user configuration with profile 1
Reference V.25Ter	Notes Also see AT&V.

3. General Commands

3.1. +CGMI Command: Request Manufacturer Identification

HL6528RDx	
Test command Syntax **AT+CGMI=?**	 Response **OK**
Execute command Syntax **AT+CGMI**	 Response **(manufacturer identification text)** **OK**
Reference [27.007] § 5.1	Example **AT+CGMI** **Sierra Wireless** **OK**

3.2. +CGMM Command: Request Model Identification

HL6528RDx	
Test command Syntax **AT+CGMM=?**	 Response **OK**
Execute command Syntax **AT+CGMM**	 Response **(manufacturer identification text)** **OK**
Reference [27.007] § 5.2	

3.3. +CGMR Command: Request Revision Identification

HL6528RDx	
Test command Syntax **AT+CGMR=?**	 Response **OK**
Execute command Syntax **AT+CGMR**	 Response **(model revision identification text)** **OK**
Reference [27.007] § 5.3	

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

HL6528RDx	
Test command Syntax **AT+CGSN=?**	 Response **OK**
Execute command Syntax **AT+CGSN**	 Response **<sn>** **OK** Parameter **<sn>** Identification text for determination of the individual ME
Reference [27.007] § 5.4	

3.5. +CIMI Command: Request International Subscriber Identity

HL6528RDx	
Test command Syntax **AT+CIMI=?**	 Response **OK**

HL6528RDx	
Execute command Syntax **AT+CIMI**	 Response **<IMSI>** **OK** Parameter **<IMSI>** International Mobile Subscriber Identity
Reference [27.007] § 5.6	

3.6. +CMUX Command: Enter Multiplexing Mode

HL6528RDx	
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>**
Write command Syntax **AT+CMUX=** **<mode>** **[,<subset>** **[,<port_speed>** **[,<N1>[,<T1>** **[,<N2>[,<T2>** **[,<T3>[,<k>]]]]]]]]**	 Response **OK** Parameters **<mode>** Multiplexer Transparency Mechanism 0 Basic option **<subset>** Multiplexer control channel setup 0 UIH frames used only **<port_speed>** Transmission rate (1-8) 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 7 406 800 bit/s 8 921 600 bit/s

HL6528RDx	
	<N1> Maximum frame size (Payload size) (16 - 1510) default Value : 512 **<T1>** Acknowledgement timer in units of ten milliseconds 1 - 254, where 10 is default (100 ms) **<N2>** Maximum number of re-transmissions 0 Not supported **<T2>** Response timer for the multiplexer control channel in units of ten milliseconds 2 - 255, where 30 is default (300 ms) **<T3>** Wake up response timer in seconds 0 Not supported **<k>** Window size, for advanced operation with Error Recovery options 0 Not supported
Reference [27.007] § 5.7	

3.7. +CSNS Command: Single Numbering Scheme

HL6528RDx	
Test command Syntax **AT+CSNS=?**	Response **+CSNS:** (list of supported **<mode>**) **OK** or **+CME ERROR: <error>**
Read command Syntax **AT+CSNS?**	Response **+CSNS: <mode>** **OK** or **+CME ERROR: <error>**
Write command Syntax **AT+CSNS=** **[<mode>]**	Response **OK** or **+CME ERROR: <error>**

HL6528RDx	
	Parameter **<mode>** 0 Voice
Reference [27.007] § 6.19	

3.8. +CSCS Command: Select TE Character Set

HL6528RDx	
Test command Syntax **AT+CSCS=?**	 Response **+CSCS:** (list of supported **<chset>**) **OK**
Read command Syntax **AT+CSCS?**	 Response **+CSCS: <chset>** **OK**
Write command Syntax **AT+CSCS= <chset>**	 Response **OK** Parameter **<chset>** "GSM" GSM 7 bit default alphabet (GSM 03.38 sub clause 6.2.1) "UCS2" 16 bit universal multiple-octet coded character set (ISO/IEC 10646) "IRA" International Reference Alphabet
Reference [27.007] §5.5	Note This command selects the character set used for all string types (phonebook entries, SMS data, etc.)

3.9. +GMI Command: Request Manufacturer Identification

HL6528RDx	
Test command Syntax **AT+GMI=?**	 Response **OK**

HL6528RDx	
Execute command Syntax **AT+GMI**	 Response **(manufacturer identification text)** **OK**
Reference V.25ter	Notes See also **AT+CGMI**.
Example	**AT+GMI** **Sierra Wireless** **OK**

3.10. +GMM Command: Request Model Identification

HL6528RDx	
Test command Syntax **AT+GMM=?**	 Response **OK**
Execute command Syntax **AT+GMM**	 Response **(manufacturer identification text)** **OK**
Reference V.25ter	Notes See also **AT+CGMM**.

3.11. +GMR Command: Request Revision Identification

HL6528RDx	
Test command Syntax **AT+GMR=?**	 Response **OK**
Execute command Syntax **AT+GMR**	 Response **(model identification text)** **OK**
Reference V.25ter	Notes See also **AT+CGMR**.

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

*Note: This command is identical to **+CGSN**.*

HL6528RDx	
Test command Syntax **AT+GSN=?**	 Response **OK**
Execute command Syntax **AT+GSN**	 Response **<sn>** **OK** Parameter **<sn>** Identification text for determination of the individual ME
Reference V.25ter	Notes See also **AT+CGSN**.

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

HL6528RDx	
Test command Syntax **AT+KGSN=?**	 Response **+KGSN:** (list of supported **<number type>**s) **OK**
Execute command Syntax **AT+KGSN=<number type>**	 Response If **<number type>** = 0: **+KGSN: <IMEI>** **OK** If **<number type>** = 1: **+KGSN: <IMEISV>** **OK** If **<number type>** = 2: **+KGSN: <IMEISV_STR>** **OK** If **<number type>** = 3: **+KGSN: <SN>** **OK**

HL6528RDx	
	If **<number type>** = 4: **+KGSN: <SN-BB>** **OK** Parameters **<IMEI>** 15-digit IMEI <8 digits for TAC + 6 digits for SNR>-<1 check digit> **<IMEISV>** 16-digit IMEISV <8 digits for TAC + 6 digits for SNR> <2 SVN digits> **<IMEISV_STR>** Formatted string: <8 digits for TAC + 6 digits for SNR>-<1 check digit> <2 SVN digits> **<SN>** 14-digit Serial Number **<SN-BB>** 16-digit 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.
Examples	**AT+KGSN=0** **+KGSN: 351578000023006** **OK** **AT+KGSN=1** **+KGSN: 3515780000230001** **OK**

3.14. I Command: Request Identification Information

HL6528RDx	
Execute command Syntax **ATI[<value>]**	Response If <value> = 0 or omitted: **<model>** **OK** If <value> = 3: **<model identification text>** **OK** Parameters **<model>** Model identifier **<model identification text>** Model and software version
Reference V.25ter	Notes See also **AT+GMR**, **AT+CGMR**.

4. Call Control Commands

4.1. +CEER Command: Extended Error Report

HL6528RDx	
Test command Syntax **AT+CEER=?**	 Response **OK**
Execute command Syntax **AT+CEER**	 Response **+CEER: <cause>,<report>** **OK** Parameter **<cause>** Contains a number representing the error cause sent internally or by the network. Refer to section 17.1.5 CEER Error Codes for more information. **<report>** Verbose string containing the textual representation of <cause>. Refer to section 17.1.5 CEER Error Codes for more information.
Reference [27.007] § 6.10	

4.2. +CHUP Command: Hang Up a Call

HL6528RDx	
Test command Syntax **AT+CHUP=?**	 Response **OK**
Execute command Syntax **AT+CHUP**	 Response **OK**
Reference [27.007] § 6.5	Notes This command hangs up waiting or active MT and MO calls.

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

HL6528RDx	
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** Parameters **<mode>** 0 Disable extended format 1 Enable extended format
Reference [27.007] § 6.11	Notes When enabled, an incoming call is indicated with **+CRING: <type>.** For the list of available <type>s, refer to document [27.007] 3GPP 27.007 (6.0.0) – AT command set for User Equipment (UE) (Release 6).

4.4. A Command: Answer a Call

HL6528RDx	
Execute command Syntax **ATA**	 Response **CONNECT[<text>]** Data connection established **OK** Voice connection established, or if cancellation of the command **ERROR** Response if no connection
Reference V.25Ter	

4.5. D Command: Mobile Originated Call to Dial a Number

HL6528RDx	
Test command Syntax **ATD=?**	 Response **1 2 3 4 5 6 7 8 9 0 * # + A B C D T W ,** **OK**
Read command Syntax **ATD?**	 Response **1 2 3 4 5 6 7 8 9 0 * # + A B C D T W ,** **OK**
Execute command Syntax **ATD[<n>][;]**	 Response **BUSY** **CONNECT [<text>]** Data connection successfully connected **NO CARRIER** The connection cannot be established **OK** If successfully connected and voice call **ERROR** Parameters **<n>** String of dialing digits, and optionally, V.25ter modifiers (dialing digits): 0-9, *, #, +, ,, A, B, C, D, T, W (maximum length = 20 characters) **<;>** Only required to set up voice calls. TA remains in command mode
Reference V.25Ter	Notes • The command may be aborted generally when receiving an ATH command during execution • OK answer may arrive just after the ATD command or after the call is actually active (see AT+COLP) • <n>: “,” or “W” are ignored

4.6. H Command: Disconnect Existing Connection

HL6528RDx	
Execute command Syntax **ATH**	 Response **NO CARRIER** **OK**

5. Mobile Equipment Control and Status Commands

5.1. *PSRDBS Command: Change Frequency Band

HL6528RDx	
Test command Syntax **AT*PSRDBS=?**	 Response ***PSRDBS:** (list of supported **<mode>**s), (list of supported **<GSM band>**s) **OK**
Read command Syntax **AT*PSRDBS?**	 Response ***PSRDBS: <GSM band>** **OK**
Write command Syntax **AT*PSRDBS= <mode>, <GSMband>**	 Response **OK** Parameter **<Mode>** 0 Set <Band> at next switch on 1 Set <Band> immediately by restarting stack **<GSM Band>** Bit field type parameter; to set several bands, sum up the values 1 GSM 850 2 GSM 900 4 E-GSM 8 DCS 1800 16 PCS 1900
Reference Sierra Wireless Proprietary	Notes GSM 900 is included into E-GSM band so the module answers 29 to **AT*PSRDBS?**

5.2. +CACM Command: Accumulated Meter (ACM) Reset or Query

HL6528RDx	
Test command Syntax **AT+CACM=?**	 Response **OK**

HL6528RDx	
Read command Syntax **AT+CACM?**	 Response **+CACM: <acm>** (current acm value) **OK** or **+CME ERROR: <error>**
Write command Syntax **AT+CACM= <password>**	 Response **OK** or **+CME ERROR: <error>** Parameters **<password>** SIM PIN2
Reference [27.007] §8.25	Notes • The write command resets the password value. • This AT command needs SIM and a network where AOC is allowed.

5.3. +CAMM Command: Accumulated Call Meter Maximum (ACM Max)

HL6528RDx	
Test command Syntax **AT+CAMM=?**	 Response **OK**
Read command Syntax **AT+CAMM?**	 Response **+CACM: <acmmax>** **OK** or **+CME ERROR: <error>**
Write command Syntax **AT+CAMM= [<acmmax> [,<passwd>]]**	 Response **+CAMM: <acmmax>** **OK** or **+CME ERROR: <error>**

HL6528RDx	
	Parameters **<acmmax>** String type; three bytes of the max ACM value in hexadecimal format 0 Disables ACMmax feature **<passwd>** SIM PIN2
Reference [27.007] § 8.26	Notes This AT command needs SIM and a network where AOC is allowed.

5.4. +CCID Command: Request SIM Card Identification

HL6528RDx	
Test command Syntax **AT+CCID=?**	 Response **OK**
Read command Syntax **AT+CCID?**	 Response **+CCID: <ICCID>** **OK** or **+CME ERROR: <error>**
Execute command Syntax **AT+CCID**	 Response **+CCID: <ICCID>** **OK** or **+CME ERROR: <error>** Parameter **<ICCID>** Integrated Circuit Card ID of the SIM card

5.5. +CCLK Command: Real Time Clock

HL6528RDx	
Test command Syntax **AT+CCLK=?**	 Response **OK**

HL6528RDx	
Read command Syntax **AT+CCLK?**	 Response **+CCLK: <time>** **OK**
Write command Syntax **AT+CCLK= <time>**	 Response **OK** Parameter **<time>** String type value; format is "yy/MM/dd,hh:mm:ss+/-Timezone", where characters indicate year (last two digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -96...+96). E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"
Reference [27.007] § 8.15	Notes NITZ information is taken into account when available

5.6. +CCWE Command: Call Meter Maximum Event

HL6528RDx	
Test command Syntax **AT+CCWE=?**	 Response **+CCWE:** (list of supported **<mode>**s) **OK** or **+CME ERROR: <error>**
Read command Syntax **AT+CCWE?**	 Response **+CCWE: <mode>** **OK** or **+CME ERROR: <error>**
Write command Syntax **AT+CCWE= <mode>**	 Response **OK** or **+CME ERROR: <error>** Parameter **<mode>** 0 Disable the call meter warning event 1 Enable the call meter warning event

HL6528RDx	
Reference [27.007] §8.28	Notes • When enabled, a notification (+CCWV) is sent shortly (approx. 30s) before the ACM max is reached. • This AT command needs SIM and a network where AOC is allowed.

5.7. +CFUN Command: Set Phone Functionality

HL6528RDx	
Test command Syntax **AT+CFUN=?**	 Response **+CFUN: (**list of supported **<fun>**s**), (**list of supported **<rst>**s**)** **OK** or **+CME ERROR: <err>**
Read command Syntax **AT+CFUN?**	 Response **+CFUN: <fun>** **OK**
Write command Syntax **AT+CFUN=[<fun>[,<rst>]]**	 Response **OK** or **+CME ERROR: <err>** Parameters **<fun>** 0 Minimal functionality; turn off radio and SIM power 1 Full functionality 4 Disable phone (both transmit and receive RF circuits) **<rst>** Reset setting. This parameter is only used when <fun> = 1 or 4 0 Do not reset the module before setting it to the <fun> power level 1 Reset the module before setting it to the <fun> power level
Reference [27.007] § 8.2	Notes If <rst>=1, open CMUX channels will not be closed before the module resets and the "OK" result code is returned before reset.

5.8. +CIND Command: Indicator Control

HL6528RDx	
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>,<message>,<call>,<roam>,<smsfull>** **OK** Parameters **<battchg>** 0 – 5 Battery charge level 0 Low level 5 High level **<signal>** 0 – 5 Signal quality 0 Low level signal 5 High level signal **<service>** 0 – 1 Service availability **<message>** 0 – 1 Message received **<call>** 0 – 1 Call in progress **<roam>** Roaming indicator 0 Home network 1 Roaming **<smsfull>** SMS memory storage 0 Memory available 1 Memory full
Reference [27.007] § 8.9	

5.9. +CLAC Command: List Available AT Commands

HL6528RDx	
Execute command Syntax **AT+CLAC**	 Response List of all supported AT Commands **+CLAC: <CR> <LF>** **<AT Command1><CR> <LF>** **<AT Command2><CR> <LF> […]]** **OK**
Reference [27.007] § 8.37	Notes This command provides the AT Command list available for the user.

5.10. +CLAN Command: Set Language

HL6528RDx	
Test command Syntax **AT+CLAN=?**	 Response **+CLAN:** (list of supported **<code>**s) **OK**
Read command Syntax **AT+CLAN?**	 Response **+CLAN: <code>** **OK**
Write command Syntax **AT+CLAN= <code>**	 Response **OK** Parameter **<code>** Two letter abbreviation of the language. The language codes, as defined in ISO 639, consists of two characters, e.g. "sv", "en", etc. “auto” Automatic “en” English
Reference [27.007] § 8.30	

5.11. +CMEC Command: Mobile Equipment Control Mode

HL6528RDx	
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 ME can set the status of its indicators (command +CIND can only be used to read the indicators)
Notes	The set command selects the equipment which operates the ME keypad, writes to ME display and sets ME indicators.

5.12. +CMEE Command: Report Mobile Termination Error

HL6528RDx	
Test command Syntax **AT+CMEE=?**	 Response **+CMEE:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CMEE?**	 Response **+CMEE: <n>** **OK**

HL6528RDx	
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
Reference [27.007] § 9.1	Notes See data impacted by AT&F for default values.

5.13. +CMER Command: Mobile Equipment Event Reporting

HL6528RDx	
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**
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** 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 TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE 2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE 3 Forward unsolicited result codes directly to the TE; TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode **<keyp>** 0 No keypad event reporting **<disp>** 0 No display event reporting

HL6528RDx	
	<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 those indicator events, which are not caused by +CIND shall be indicated by the TA to the TE 2 Indicator event reporting using result code +CIEV: <ind>,<value>. All indicator events shall be directed from TA to TE **<bfr>** 0 TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1..3 is entered 1 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1 to 3 is entered (OK response shall be given before flushing the codes)
Reference [27.007] § 8.10	Notes This command can work with or without a SIM card.

5.14. +CMUT Command: Mute Control

HL6528RDx	
Test command Syntax **AT+CMUT=?**	 Response **+CMUT:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CMUT?**	 Response **+CMUT: <n>** **OK**
Write command Syntax **AT+CMUT=<n>**	 Response **OK** Parameter **<n>** 0 Mute off 1 Mute on
Reference [27.007] § 8.24	Notes This command can only be used during voice calls.

5.15. +CPAS Command: Phone Activity Status

HL6528RDx	
Test command Syntax **AT+CPAS=?**	 Response **+CPAS:** (list of supported **<pas>**s) **OK**
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) 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)
Reference [27.007] § 8.1	

5.16. +CPIN Command: Enter PIN

HL6528RDx	
Test command Syntax **AT+CPIN=?**	 Response **OK**
Read command Syntax **AT+CPIN?**	 Response **+CPIN: <code>** **OK**
Write command Syntax **AT+CPIN=<pin> [,<newpin>]**	 Response **OK** Parameters **<code>** Values reserved by this TS READY ME is not pending for any password SIM PIN ME is waiting for SIM PIN to be given

HL6528RDx	
	SIM PUK — ME is waiting for SIM PUK to be given. A second pin, <newpin>, is used to replace the old pin in the SIM and should thus be supplied SIM PIN2 — ME 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 ME does not block its operation) SIM PUK2 — ME 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). Also, a second pin, <newpin>, is used to replace the old pin in the SIM and should thus be supplied PH-NET PIN — ME is waiting personalization password to be given **<pin>, <newpin>** String type value (8 characters max.)
Reference [27.007] § 8.3	Notes • Parameter <newpin> can only be used if SIM is PIN blocked. <pin> must be PUK. Otherwise, the command is rejected. • If the SIM card is extracted, **AT+CPIN?** will answer within a maximum of 30 seconds. • SIM PIN and SIM PIN2 are between 4 and 8 digits long. • SIM PUK and SIM PUK2 are 8 digits long.

5.17. +CPIN2 Command: Send Password to MT

HL6528RDx	
Test command Syntax **AT+CPIN2=?**	 Response **OK**
Read command Syntax **AT+CPIN2?**	 Response **+CPIN: <code>** **OK** or **+CME ERROR: <err>** Parameter **<code>** READY — PIN2 is allowed to verified SIM PUK2 — PIN2 is blocked SIM BLOCKED — PIN2 and PUK2 are blocked

HL6528RDx	
Write command Syntax **AT+CPIN2=<pin2>** or **AT+CPIN2=<puk2>,<newpin2>**	Response **OK** or **+CME ERROR: <err>** Parameter **<puk2>**, **<newpin2>, <pin2>** String type values
Notes	• To verify PIN2, enter **AT+CPIN2=<pin2>**. • To unblock PIN2, enter **AT+CPIN2=<puk2>,<newpin2>**.

5.18. +CPUC Command: Price per Unit and Currency

HL6528RDx	
Test command Syntax **AT+CPUC=?**	Response **OK**
Read command Syntax **AT+CPUC?**	Response **+CPUC: <currency>,<ppu>** **OK**
Write command Syntax **AT+CPUC=<currency>,<ppu>[,<passwd>]**	Response **OK** Parameters **<currency>** String type; three-character currency code (e.g. .GBP., .DEM.) **<ppu>** String type; price per unit; dot is used as a decimal separator (e.g. 2.66). The length is limited to 20 characters. If the string length is exceeded, the command is terminated with an error. This string may only contain digits and a dot. Leading zeros are removed from the string **<passwd>** String type; SIM PIN2. String parameter which can contain any combination of characters. The maximum string length is limited to 8 characters
Reference [27.007] § 8.27	Notes This AT command needs SIM and network where AOC are allowed.

5.19. +CPWC Command: Power Class

HL6528RDx	
Test command Syntax **AT+CPWC=?**	Response **+CPWC:** list of supported (**<band>**,(list of **<class>**)) pairs **OK**
Read command Syntax **AT+CPWC?**	Response **+CPWC: <curr_class1>,<def_class1>,<band1>[,<curr_class2>,<def_class2>,<band2>[...]]** **OK**
Write command Syntax **AT+CPWC= [<class> [,<band>]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<class>, <curr_classn>, <def_classn>** 0 Default value (not applicable to <curr_class>s or <def_classn>s) 1 MS output power class as in 3GPP TS 45.005 [38] **<band>, <bandn>** 0 GSM900 1 GSM1800 2 GSM1900
Reference [27.007] § 8.29	Notes The module must be rebooted for the selection to be effective.

5.20. +CRSM Command: Restricted SIM Access

HL6528RDx	
Test command Syntax **AT+CRSM=?**	Response **OK**
Write command Syntax **AT+CRSM= <command> [,<fileid>[,<P1>, <P2>,<P3> [,<data>]]]**	Response **+CRSM: <sw1>,<sw2>[,<response>]** **OK**

HL6528RDx	
	Parameters **<command>** Command passed on by the MT to the SIM; refer to GSM 51.011 [28] 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS All other values are reserved **<fileid>** Integer type; this is the identifier of an elementary data file on SIM. Mandatory for every command except STATUS. **<Pi>** Integer type; parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 51.011 [28]. **<data>** Information which shall be written to the SIM **<swi>** Integer type; information from the SIM 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 (hexadecimal character format; refer to **+CSCS**). STATUS and GET RESPONSE return data, which gives information about the current elementary data field. This information includes the type of file and its size (refer GSM 51.011 [28]). After READ BINARY or READ RECORD command the requested data will be returned. <response> is not returned after a successful UPDATE BINAR or UPDATE RECORD command.
Reference [27.007] § 8.18	Notes • For command READ_BINARY, no transparent file greater than 256 bytes exists. So <P1> parameter is always 0 in SAP. (If <P1> != 0, AT+CRSM will return ERROR to TE). <P1> is not interesting (error if <P1> > 256), <P2> is an offset in the range 0-256, <P3> has a maximum value depending of <P2>. SAP returns always 256 bytes (maximum). If we can use <P2> and <P3>, ATP reads the zones it wants, else ERROR. • For command READ_RECORD, only mode <P2>="04" (absolute) is supported in SAP. (Other modes don't seem to be useful.) • For command UPDATE_BINARY, only <P1>="00" and <P2>="00" is possible in SAP. (Other modes don't seem to be useful.) • For command UPDATE_RECORD, as mentioned in the GSM 11.11 recommendation, only PREVIOUS mode (<P2>="03") is allowed for updates on cyclic file. For linear files, SAP only supports mode <P2>="04" (absolute). • For commands STATUS and GET_RESPONSE, If <FileId> is not given, the command must be done on the last selected file: ATP must memorize <FileId> of the last command (3F00 at the initialization of ATP, by default) Moreover, v_LengthPattern = 0.
Example	Read EF_{ICCID} (ICC Identification, unique identification number of the SIM): **AT+CRSM=176,12258,0,0,10** **+CRSM: 144,0,"89330126239181282150"** So ICC number is 98331062321918821205.

5.21. +CSIM Command: Generic SIM Access

HL6528RDx	
Test command Syntax **AT+CSIM =?**	 Response **OK**
Write command Syntax **AT+CSIM= <length>, <command>**	 Response **+CSIM: <length>,<response>** **OK** or **+CME ERROR: <error>** Parameters **<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 ME to the SIM in the format described in GSM 11.11 (hexadecimal character format; refer to **+CSCS**) **<response>** Response to the command passed on by the SIM to the ME in the format described in GSM 11.11 (hexadecimal character format; refer **+CSCS**)
Reference [27.007] § 8.17	Notes Compared to Restricted SIM Access command **+CRSM**, the definition of **+CSIM** allows TE to take more control over the SIM-ME interface. The locking and unlocking of the interface may be done by a special <command> value or automatically by TE/ME (by interpreting the <command> parameter). In case the TE application does not use the unlock command (or does not send a <command> causing automatic unlock) in a certain timeout value, ME may release the locking.

5.22. +CSQ Command: Signal Quality

HL6528RDx	
Test command Syntax **AT+CSQ=?**	 Response **+CSQ:** (list of supported **<rssi>**s),(list of supported **<ber>**s) **OK**
Execute command Syntax **AT+CSQ**	 Response **+CSQ: <rssi>,<ber>** **OK**

HL6528RDx	
	Parameters **<rssi>** 0 -113 dBm or less 1 -111 dBm 2 to 30 -109 to -53 dBm 31 -51 dBm or greater 99 not known or not detectable **<ber>** (in percent) 0 – 7 As RXQUAL values in the table in GSM 05.08 [20] sub clause 8.2.4 99 Not known or not detectable
Reference [27.007] § 8.5	

5.23. +CTZR Command: Time Zone Reporting

HL6528RDx	
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** Parameter **<onoff>** Integer type 0 Disable time zone change event reporting 1 Enable time zone change event reporting
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.

5.24. +CTZU Command: Automatic Time Zone Update

HL6528RDx	
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** Parameter **<onoff>** Integer type 0 Disable automatic time zone update via NITZ 1 Enable automatic time zone update via NITZ
Reference [27.007] §8.40	

5.25. +KADC Command: Analog to Digital Converter

HL6528RDx	
Test command Syntax **AT+KADC=?**	 Response **+KADC: (**list of supported **<Meas id>**s**), (**list of supported **<Meas time>**s**)** **OK**
Write 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 Reserved 2 THERM – connected to NTC200 (the thermistor on board which is located close to the 26MHz DCXO) 3 Reserved 4 ADC0

HL6528RDx	
	5 Reserved 6 Reserved 7 ADC1 **<Meas time>** Measurement time 3 No constraint **<Meas result>** Measurement result is in µV **<Temperature>** Temperature for THERM in degrees Celsius
Reference Sierra Wireless Proprietary	Notes • The ADC is a 10-bit converter • Available voltage input range are as follows: **<Meas id>** / **Range (V)** VBATT / 3.35 – 4.3 THERM / 0 – 2.8 ADC0 and ADC1 / 0 – 2.8 • This command does not require a SIM card to function. • A space is added between each parameter for the read response.

5.26. +KBCAP Command: Retrieve Bitmap Capabilities

HL6528RDx	
Execute command Syntax **AT+KBCAP**	Response **+KBCAP: 0xWXYZ** (where WXYZ is the Bitmap Capabilities value in Hexa) **AVMS: <status>** **ECALL: <status>** **GNSS: <status>** **TLS: <status>** **TTS: <status>** **DSSS: <status>** **DBV: <pinout_config>** **PARAM: <FDPname>** **UBOOT:<microboot_version>** **OK** Parameters **<status>** 0 Deactivated 1 Activated **<pinout_config>** 0 Not supported 1 GPIO pinout configured for demo board design version 1 2 GPIO pinout configured for demo board design version 2

HL6528RDx	
	<FDPname> Product definition file number **<microboot_version>** Microboot version (if AVMS status is 0, this field will be empty)
Reference Sierra Wireless Proprietary	

5.27. +KBND Command: Current Networks Band Indicator

HL6528RDx	
Test command Syntax **AT+KBND=?**	 Response **+KBND: (**list of supported **<bnd>**s**)** **OK**
Read command Syntax **AT+KBND?**	 Response **+KBND: <bnd>** **OK** Parameter **<bnd>** In Hexadecimal 0x00 Not available 0x01 850 MHz 0x02 900 MHz 0x04 1800 MHz 0x08 1900 MHz

5.28. +KCELL Command: Cell Environment Information

HL6528RDx	
Test command Syntax **AT+KCELL=?**	 Response **+KCELL: (**list of supported **<revision>**s**)** **OK**
Read command Syntax **AT+KCELL?**	 Response **OK**

HL6528RDx	
Write command Syntax **AT+KCELL=<revision>**	Response **+KCELL: <nbcells>** **[,<ARFCN$_i$>,<BSIC$_i$>,<PLMN$_i$>,<LAC$_i$>,<CI$_i$>,<RSSI$_i$>,<TA>]** **[,<ARFCN$_i$>,<BSIC$_i$>,<PLMN$_i$>,<LAC$_i$>,<CI$_i$>,<RSSI$_i$>] […]]** **OK** Parameters **<revision>** Reserved for future development (only 0 for the moment) **<nbcells>** Number of base stations available. The first base station is the serving cell ($0 \leq i \leq 7$) **<ARFCN>** Absolute Radio Frequency Channel Number in decimal format. **<BSIC>** Base Station Identify Code in 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 **<CI>** Cell ID, 4 hexadecimal digits, e.g. ABCD **<RSSI>** Received signal level of the BCCH carrier, decimal value from 0 to 63. 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 **<TA>** Timing Advance. 0 – 63 in decimal format; available only during a communication (equals to 255 at any other time). Only available on serving cell during communication
Reference Sierra Wireless Proprietary	Notes • This command provides information related to the network environment and can be used for example for localization calculation • Values in italic are not available during some times; i.e. CI is not available during a communication phase. By default, all values will be initialized to 0xFF; thus when a value is returned equal to 0xFF, this means it was not possible to decode it.
Example	**AT+KCELL=0** **+KCELL: 5,46,51,64f000,2791,f78,46,1,78,255,ff,ff,2e73,26,60,51,ff,ff,e2f,24,80,60,ff,ff,fca,21,16,29,ff,ff,111c,19** **OK**

5.29. +KGPIO Command: Hardware IO Control

HL6528RDx	
Test command Syntax **AT+KGPIO=?**	Response **+KGPIO: (**list of supported **<IO>**s**),(**list of supported **<cde>**s**)** **OK**

HL6528RDx	
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 Selected IO **<cde>** 0 Reset the selected IO, LOW 1 Set the selected IO, HIGH 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 kept in non-volatile memory after reset. • Check the configuration of +KGPIOCFG when +CME ERROR: 3 issued. • GPIO 3 is used by SIM detection and cannot be reconfigured. • GPIOs assigned to a specific purpose are not listed. • This command can be used without SIM.

Examples	// Change GPIO1's output 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
	
	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),(0-2)
	OK
	
	at+kgpio=9,1 // Set GPIO9; it should return ERROR
	+CME ERROR: 3

5.30. +KGPIOCFG Command: GPIO Configuration

HL6528RDx	
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 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
Reference Sierra Wireless Proprietary	Notes • This command provides configuration for the +KGPIO command. • The current configuration is saved in non-volatile memory before reset. • GPIO 3 is used by SIM detection and cannot be reconfigured • GPIOs assigned to a specific purpose are not listed. • This command can be used without 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**

HL6528RDx	
	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),(0-1),(0-2)** **OK** **at+kgpiocfg?** **//** GPIO 9 is not available to be used **+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** **OK** **at+kgpiocfg=9,1,0** **//** When setting GPIO9, it returns ERROR **+CME ERROR: 3** **at+kgpiocfg?** **+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** **OK**

5.31. +KRIC Command: Ring Indicator Control

HL6528RDx	
Test command Syntax **AT+KRIC=?**	 Response **+KRIC:** (list of supported **<mask>**s),(list of supported **<shape>**s) **OK**
Read command Syntax **AT+KRIC?**	 Response **+KRIC: <mask>,<shape>** **OK**
Write command Syntax **AT+KRIC=<mask>[,<shape>]**	 Response **OK**

HL6528RDx	
	Parameters **<mask>** Use of RI signal 0x00 RI not used 0x01 RI activated on incoming calls (+CRING, RING) 0x02 RI activated on SMS (+CMT, +CMTI) 0x04 RI activated on SMS-CB (+CBM, +CBMI) 0x08 RI activated on USSD (+CUSD) 0x10 RI 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 active during the whole incoming call notification
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 second, and then repeated. • Do not use this command during an incoming call, SMS, SMSCB, USSD, etc. • This command can be used without 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 activated on incoming calls only; always active **OK** **AT+KRIC?** **+KRIC: 1,1** **OK** **AT+KRIC=2** // RI is activated on SMS only **OK** **AT+KRIC?** **+KRIC: 2,1** **OK**

5.32. +KSIMDET Command: SIM Detection

HL6528RDx	
Test command Syntax **AT+KSIMDET=?**	 Response **+KSIMDET:** (list of supported **<mod>**s), (list of supported **<selected_sim>**s) **OK**
Read command Syntax **AT+KSIMDET?**	 Response **+KSIMDET: <mod>,<gpio>,<sim slot>** **OK**
Write command Syntax **AT+KSIMDET= <mod>, <selected_sim>**	 Response **OK** Parameters **<mod>** 0 Disable SIM detection 1 Enable SIM detection **<gpio>** 3 GPIO 3 **<sim slot>, <selected_sim>** 1 First external SIM
Notes	• If the module detects a change in the SIM status, the module is notified by **URC: +SIM: <status>,<selected_sim>**. where <status> 0 - EXTRACTED 1 - INSERTED • If UIM1_DET is enabled, the HOT Plug feature is automatically enabled. • UIM1_DET (GPIO 3) is used for SIM1 detection. When SIM detection is disabled, GPIO 3 will be free for customer use via the +KGPIO command (configured to output, no pull). • GPIOs may already be used by other commands such as +KSIMSEL and +KSYNC. • This command can be supported even without a SIM card. • The setting of <mod> will be kept after the module reboots.
Examples	<A SIM card is inserted on slot 1> **AT+KSIMDET?** // read current setting **+KSIMDET: 0,3,1** **OK** **AT+KSIMDET=?** // check supported setting **+KSIMDET: (0-1),(1)** **OK** **AT+KSIMDET=1,1** // enable SIM detection on slot 1 **OK** **+SIM: 0,1** // SIM card is removed **+SIM: 1,1** // SIM card is inserted

HL6528RDx	
	AT+KSIMDET=0,1 // disable SIM detection on slot 1 **OK** <No URC indication when SIM card is removed or inserted in slot 1> **AT+KSIMDET?** // read current setting **+KSIMDET: 0,3,1** **OK** <Reboot module> **AT+KSIMDET?** // read current setting **+KSIMDET: 0,3,1** **OK**

5.33. +KSIMSEL Command: SIM Selection

HL6528RDx	
Test command Syntax **AT+KSIMSEL=?**	Response **+KSIMSEL:** (list of supported **<sim_used>**),(list of supported **<GPIO_polarity>**s) **OK**
Read command Syntax **AT+KSIMSEL?**	Response **+KSIMSEL: <sim_used>,<GPIO_polarity>** **OK**
Write command Syntax **AT+KSIMSEL= <sim_used> [,<GPIO_ polarity>]**	Response **OK** Parameters **<sim_used>** 1 First external SIM is currently used 2 Second external SIM is currently used **<GPIO_polarity>** 0 SIM switching by toggling GPIO6 from 0 to 1 1 SIM switching by toggling GPIO6 from 1 to 0
Notes	• This command is available when the DSSS feature is embedded (feature presence is indicated via +KBCAP). • The GPIO used for SIM switching is GPIO6. • Only one SIM is active at a time (DSSS: Dual SIM Single Standby)

5.34. +KSLEEP Command: Power Management Control

HL6528RDx	
Test command Syntax **AT+KSLEEP=?**	Response **+KSLEEP: (**list of supported **<mngt>**s**)** **OK**
Read command Syntax **AT+KSLEEP?**	Response **+KSLEEP: <mngt>** **OK**
Write command Syntax **AT+KSLEEP= <mngt>**	Response **OK** Parameter **<mngt>** 0 The UART doesn't go in sleep mode as long as the DTR is active (low level). The DTR has to be active to send AT commands. 1 The module decides by itself (via internal timing) when it goes in sleep mode, and will be woken up by a character. 2 The module never goes in sleep mode regardless of the DTR state.
Reference Sierra Wireless Proprietary	Notes • The current configuration is kept in non-volatile memory after reset. • This command can be used without SIM. • When the module is in sleep mode, CTS will stay ON if flow control is disabled (AT+IFC=0,0). Conversely, CTS will toggle ON and OFF if flow control is set to hardware flow control (AT+IFC=2,2) when the module is in sleep mode.
Examples	**AT+KSLEEP=?** **+KSLEEP: (0-2)** **OK** **AT+KSLEEP?** **+KSLEEP: 2** **OK** **AT+KSLEEP=1** // Change settings to mode 1 **OK** **AT+KSLEEP?** **+KSLEEP: 1** **OK** **AT+KSLEEP=2** // Change settings to mode 2 **OK** **AT+KSLEEP?** **+KSLEEP: 2** **OK**

5.35. +KSREP Command: Mobile Start-Up Reporting

HL6528RDx	
Test command Syntax **AT+KSREP=?**	 Response **+KSREP:** (list of supported **<act>**s) **OK**
Read command Syntax **AT+KSREP?**	 Response **+KSREP: <act>,<stat>** **OK**
Write command Syntax **AT+KSREP= <act>**	 Response **OK** Parameters **<act>** Indicates if the module must send a unsolicited code during startup 0 The module will not send an unsolicited code 1 The module will send an unsolicited code **<stat>** This code indicates the status of the module 0 The module is ready to receive commands for the TE. No access code is required 1 The module is waiting for an access code (the AT+CPIN? command can be used to determine the access code) 2 The SIM card is not present 3 The module is in “SIMlock” state 5 Unknown state
Reference Sierra Wireless Proprietary	Notes The module uses unsolicited code **+KSUP: <stat>** once after the boot process.

Examples	**AT+KSREP=?** // insert SIM (PIN disabled)
	+KSREP: (0-1)
	OK
	
	AT+KSREP=1
	OK
	
	AT+KSREP?
	+KSREP: 1,0
	OK
	
	// reboot the module
	
	+KSUP: 0 // indicates that the module is ready to receive commands
	// and that no access code is required
	
	AT+KSREP?
	+KSREP: 1,0
	OK

5.36. +KSYNC Command: Application Synchronization Signal

HL6528RDx	
Test command Syntax **AT+KSYNC=?**	Response **+KSYNC: (**list of supported **<mod>**s**),(**list of supported **<IO>**s**),(**range of **<Duty Cycle>**s**),(**range of **<Pulse Duration>**s**)** **OK**
Read command Syntax **AT+KSYNC?**	Response **+KSYNC: <mod>,<IO>,<Duty Cycle>,<Pulse Duration>** **OK**
Write command Syntax **AT+KSYNC=<mod>[,<IO>[,<Duty Cycle>[,<Pulse Duration>]]]**	Response **OK** Parameters **<mod>** 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 network 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 **<IO>** 1 – 8 Defines which GPIO is used as output **<Duty Cycle>** 1 – 100 Duty cycle; only used when <mod> = 1 50 Default value **<Pulse Duration>** 1 – 65535 Pulse duration in milliseconds; only used when <mod> = 1 1000 Default value
Notes	• Parameter values are automatically saved in the module. • Check with +KGPIOCFG when using +KSYNC command to configuration settings per GPIO. • This command will return ERROR if the selected GPIO is already used by another feature. Check GPIO availability using other related commands. • This command can be used without SIM. • This command will force the GPIO pins as output, regardless of the AT+KGPIOCFG configuration. • Only 1 GPIO signal can be generated at a time.

HL6528RDx	
Examples	**AT+KSYNC=1,1,50,2000** // Generate the signal, 50% duty cycle, and 2000 ms // pulse duration on GPIO1 **OK** **AT+KSYNC=1,2,50,2000** // Generate the signal, 50% duty cycle, and 2000 ms // pulse duration on GPIO2 **OK** // Note that the 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 // network status **OK**

5.37. +WEXTCLK Command: External Clocks Setting

HL6528RDx	
Test command Syntax **AT+WEXTCLK=?**	 Response **+WEXTCLK: (**list of supported **<output>**s**), (**list of supported **<status>**es**)** **OK**
Read command Syntax **AT+WEXTCLK?**	 Response **+WEXTCLK: <output>,<status>** **+WEXTCLK: <output>,<status>** **OK**
Write command Syntax **AT+WEXTCLK= <output>, <status>**	 Response **+WEXTCLK: <output>,<status>** **OK** Parameters **<output>** 0 32kHz output (32K_CLKOUT) on GPIO18 1 26MHz output (26M_CLKOUT) **<status>** 0 Disabled 1 Enabled
Reference Sierra Wireless Proprietary	Notes • This command allows the generation of 32 kHz and 26 MHz on the output clock pins of the embedded module. • Parameters are saved in non-volatile memory. • This command is available when the module has finished its initialization. • This command works without a SIM card.

6. Network Service Related Commands

6.1. +CAOC Command: Advice of Charge Information

HL6528RDx	
Test command Syntax **AT+CAOC=?**	Response **+CAOC: (**list of supported **<mode>**s**)** **OK**
Read command Syntax **AT+CAOC?**	Response **+CAOC: <mode>** **OK**
Unsolicited Notification	Response **+CCCM: <ccm>**
Write command Syntax **AT+CAOC= [<mode>]**	Response If <mode> = 0 **+CAOC: <ccm>** **OK** else **OK** Parameters **<mode>** 0 Query CCM value 1 Deactivation of the unsolicited notification (**+CCCM**) 2 Activation of the unsolicited notification **<ccm>** String type; three bytes of the current CCM value in hexadecimal format
Execute command Syntax **AT+CAOC**	Response **+CAOC: <ccm>** **OK**
Reference [27.007] §7.16	Notes • When activated this message is sent to the TE every time there is a change in the ccm value with a minimum of 10 seconds between 2 messages • This AT command needs SIM and network where AOC are allowed

6.2. +CCFC Command: Call Forwarding Conditions

HL6528RDx	
Test command Syntax **AT+CCFC=?**	 Response **+CCFC: (**list of supported **<reas>**es**)** **OK**
Write command Syntax **AT+CCFC= <reas>, <mode> [,<number> [,<type>[,<class> [,<subaddr> [,<satype> [,<time>]]]]]]**	 Response If <mode> = 2 and command successful: **+CCFC: <status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]]** **[+CCFC: <status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]]]** **[…]** **OK** Else **OK** Parameters **<reas>** 0 Unconditional 1 Mobile busy 2 No reply 3 Not reachable 4 All call forwarding 5 All conditional call forwarding **<mode>** 0 Disable 1 Enable 2 Query status 3 Registration 4 Erasure **<number>** String type phone number of forwarding address in format specified by <type> **<type>** Type of address octet in integer format **<class>** Sum of integers, each representing a class of information (default = 7) 1 Voice 2 Data **<subaddr>** String type sub address of format specified by <satype> **<satype>** Type of subaddress octet in integer format **<time>** 1 – 30 When "no reply" is enabled, this gives the time in seconds to wait before call is forwarded (default value is 20) **<status>** 0 Not active 1 Active

HL6528RDx	
Reference [27.007] § 7.11	Notes This command allows control of the call forwarding supplementary service according to GSM 02.84

6.3. +CCWA Command: Call Waiting

HL6528RDx	
Test command Syntax **AT+CCWA=?**	 Response **+CCWA:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CCWA?**	 Response **+CCWA: <n>** **OK**
Write command Syntax **AT+CCWA=[<n>[,<mode>[,<class>]]]**	 Response when <mode>=2 and command successful **+CCWA: <status>,<class1>** **[+CCWA: <status>,<class2>[...]]** **OK** Parameters **<n>** Sets/shows the result code presentation status in the TA 0 Disable 1 Enable **<mode>** 0 Disable 1 Enable 2 Query status When this parameter is not given, the network is not interrogated. **<class>** Sum of integers, each representing a class of information (default = 7) 1 Voice (telephony) 2 Data (refers to all bearer services; with <mode>=2 this may refer to some bearer service only if TA does not support values 16, 32, 64 and 128) **<status>** 0 Not active 1 Active **<number>** String type phone number of calling address in format specified by <type> **<type>** Type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7)

HL6528RDx	
Reference [27.007] § 7.12	Notes When enabled (<n>=1), the following unsolicited code is sent to the TE: **+CCWA: <number>,<type>,<class>**

6.4. +CHLD Command: Call Hold and Multiparty

HL6528RDx	
Test command Syntax **AT+CHLD=?**	 Response **+CHLD: (**list of supported **<n>**s**)** **OK**
Write command Syntax **AT+CHLD=[<n>]**	 Response **OK** Parameter **<n>** 0 Terminate all held calls; or set UDUB (User Determined User Busy) for a waiting call, i.e. reject the waiting call. 1 Terminate all active calls (if any) and accept the other call (waiting call or held call) 1X Terminate the active call X (X= 1-7) 2 Place all active calls on hold (if any) and accept the other call (waiting call or held call) as the active call 2X Place all active calls except call X (X= 1-7) on hold 3 Add the held call to the active calls 4 Explicit call transfer 5 Activate the Completion of Calls to Busy Subscriber Request. (CCBS)
Reference [27.007] §7.13	

6.5. +CLCC Command: List Current Calls

HL6528RDx	
Test command Syntax **AT+CLCC=?**	 Response **OK**
Execute command Syntax **AT+CLCC**	 Response **[+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>]]** **[+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>]]** **[…]** **OK**

HL6528RDx	
	Parameters **<id>** Integer type; call identification number as described in GSM 22.030 [19] sub clause 4.5.5.1; this number can be used in +CHLD command operations **<dir>** 0 Mobile originated (MO) call 1 Mobile terminated (MT) call **<stat>** State of the call 0 Active 1 Held 2 Dialing (MO call) 3 Alerting (MO call) 4 Incoming (MT call) 5 Waiting (MT call) **<mode>** Bearer/teleservice 0 Voice 1 Data 3 Voice followed by data, voice mode 4 Alternating voice/data, voice mode 6 Voice followed by data, data mode 7 Alternating voice/data, data mode 9 Unknown **<mpty>** 0 Call is not one of multiparty (conference) call parties 1 Call is one of multiparty (conference) call parties **<number>** String type phone number in format specified by <type> **<type>** Type of address octet in integer format (refer GSM 24.008 [8] sub clause 10.5.4.7)
Reference [27.007] §7.18	Notes This commands returns the current list of ME calls.

6.6. +CLCK Command: Facility Lock

HL6528RDx	
Test command Syntax **AT+CLCK=?**	Response **+CLCK:** (list of supported **<fac>**s) **OK**
Write command Syntax **AT+CLCK=<fac>, <mode> [,<passwd> [,<class>]]**	Response If <mode> <> 2 and command is successful: **OK**

HL6528RDx

If <mode> = 2 and command is successful:
+CLCK:<status>[,<class1>[<CR>,<LF>+CLCK:<status>,class2…]]
OK

or
+CME ERROR: <err>

Parameters
<fac>

"AO"	BAOC (Barr All Outgoing Calls) (refer 3GPP TS 22.088 clause 1)
"OI"	BOIC (Barr Outgoing International Calls) (refer 3GPP TS 22.088 clause 1)
"OX"	BOIC-exHC (Barr Outgoing International Calls except to Home Country) (refer 3GPP TS 22.088clause 1)
"AI"	BAIC (Barr All Incoming Calls) (refer 3GPP TS 22.088 clause 2)
"IR"	BIC-Roam (Barr Incoming Calls when Roaming outside the home country) (refer 3GPP TS 22.088 clause 2)
"AB"	All Barring services (refer 3GPP TS 22.030) (applicable only for mode>=0)
"AG"	All outgoing barring services (refer 3GPP TS 22.030) (applicable only for <mode>=0)
"AC"	All incoming barring services (refer 3GPP TS 22.030) (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>)
"SC"	SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued)
"PN"	Network Personalization (refer 3GPP TS 22.022)
"PU"	Network subset Personalization (refer 3GPP TS 22.022)
"PP"	Service Provider Personalization (refer 3GPP TS 22.022)
"PC"	Corporate Personalization (refer 3GPP TS 22.022)
“PF”	Lock Phone to the very First inserted SIM/UICC card (also referred as PH-FSIM) (MT asks password when other than the first SIM/UICC card is inserted)

<mode>	0	Unlock
	1	Lock
	2	Query status
<status>	0	Not active
	1	Active

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

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

1	Voice (telephony)
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)
8	Short message service
16	Data circuit sync
32	Data circuit async

HL6528RDx	
Reference [27.007] §7.4	Notes • This command may be used by the TE to lock or unlock the ME or network facilities (with password protection) • In case of unlock ME then re-lock again, a reset of the module is mandatory in order to have the ME locked
Example	**AT+CLCK="PN",2** // Query the status of the Network Personalization (commonly // named "SIMLock", "SIM Lock") **+CLCK: 0** // Unlock state **OK**

6.7. +CLIP Command: Calling Line Identification Presentation

HL6528RDx	
Test command Syntax **AT+CLIP=?**	 Response **+CLIP: (**list of supported **<n>**s**)** **OK**
Read command Syntax **AT+CLIP?**	 Response **+CLIP: <n>,<m>** **OK**
Write command Syntax **AT+CLIP=<n>**	 Response **OK** Parameters **<n>** Result code presentation status in the TA 0 Disable 1 Enable **<m>** Subscriber CLIP service status in the network 0 CLIP not provisioned 1 CLIP provisioned 2 Unknown (e.g. no network, etc.) **<number>** String type phone number of format specified by <type> **<type>** Type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7) **<subaddr>** String type subaddress of format specified by <satype> **<satype>** Type of subaddress octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.8)

HL6528RDx	
	<alpha> Optional string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command **+CSCS**. NOT SUPPORTED. **<CLI validity>** 0 CLI valid 1 CLI has been withheld by the originator 2 CLI is not available due to interworking problems or limitations of originating network
Reference [27.007] § 7.6	Notes When the presentation to the CLI at the TE is enabled, the following notification is sent after every ring notification: **+CLIP: <number>,<type>[,<subaddr>,<satype>[,<alpha>, [<CLI validity>]]]**

6.8. +CLIR Command: Calling Line Identification Restriction

HL6528RDx	
Test command Syntax **AT+CLIR=?**	 Response **+CLIR: (**list of supported **<n>**s**)** **OK**
Read command Syntax **AT+CLIR?**	 Response **+CLIR: <n>,<m>** **OK**
Write command Syntax **AT+CLIR=<n>**	 Response **OK** Parameters **<n>** Adjustment for outgoing calls 0 Presentation indicator is used according to the subscription of the CLIR service 1 CLIR invocation 2 CLIR suppression **<m>** Subscriber CLIR service status in the network 0 CLIR not provisioned 1 CLIR provisioned in permanent mode 2 Unknown (e.g. no network, etc.) 3 CLIR temporary mode presentation restricted 4 CLIR temporary mode presentation allowed
Reference [27.007] § 7.7	

6.9. +CNUM Command: Subscriber Number

HL6528RDx	
Test command Syntax **AT+CNUM=?**	 Response **OK**
Execute command Syntax **AT+CNUM**	 Response **+CNUM: [<alpha1>],<number1>,<type1>>[,<speed>,<service>][<CR><LF>** **+CNUM: [<alpha2>],<number2>,<type2>>[,<speed>,<service>][...]]** **OK** Parameters **<alpha>** Optional alphanumeric string associated with <number>; used character set should be the one selected using command **+CSCS** **<number>** String type phone number of format specified by <type> **<type>** Type of address octet in integer format (refer to GSM 04.08 [8] sub clause 10.5.4.7) **<speed>** As defined in 27.007 sub clause 6.7 **<service>** Service related to the phone number 4 Voice All other values below 128 are reserved.
Example	**AT+CNUM** **+CNUM: "TEL","0612345678",129** **+CNUM: "","",255** **+CNUM: "","",255** **+CNUM: "","",255** **OK**
Reference [27.007] § 7.21	Notes • The action command returns the MSISDNs related to the subscriber (this information can be stored in the SIM or in the ME). • The read command (AT+CNUM?) returns an error. • All the numbers are in the “ON” (own number) phonebook. • The response depends on the network provider’s policy.

6.10. +COLP Command: Connected Line Identification Presentation

HL6528RDx	
Test command Syntax **AT+COLP=?**	 Response **+COLP: (**list of supported **<n>**s**)** **OK**
Read command Syntax **AT+COLP?**	 Response **+COLP: <n>,<m>** **OK**
Write command Syntax **AT+COLP=[<n>]**	 Response **OK** Parameters **<n>** Result code presentation status in the TA 0 Disable 1 Enable **<m>** Subscriber COLP service status in the network 0 COLP not provisioned 1 COLP provisioned 2 Unknown (e.g. no network, etc.) **<number>** String type phone number of format specified by <type> **<type>** Type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7) **<subaddr>** String type subaddress of format specified by <satype> **<satype>** Type of subaddress octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.8) **<alpha>** Optional string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command **+CSCS**. NOT SUPPORTED.
Reference [27.007] § 7.8	Notes • This command refers to the GSM supplementary service COLP (Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile-originated call. • When enabled (and called subscriber allows), the following intermediate result code is returned from TA to TE before any +CR or V.25ter [14] responses: **+COLP: <number>,<type>[,<subaddr>,<satype> [,<alpha>]]** • If COLP=1, the **OK** answer to an ATD Command happens only after the call is active (and not just after the command).

6.11. +COPN Command: Read Operator Name

HL6528RDx	
Test command Syntax **AT+COPN=?**	 Response **OK**
Execute command Syntax **AT+COPN**	 Response **+COPN: <numeric1>,<alpha1>[<CR><LF>** **+COPN: <numeric2>,<alpha2>** **[...]]** **OK** Parameters **<numeric>** String type; operator in numeric format (see +COPS) **<alpha>** String type; operator in long alphanumeric format (see +COPS)
Reference [27.007] § 7.21	

6.12. +COPS Command: Operator Selection

HL6528RDx	
Test command Syntax **AT+COPS=?**	 Response **+COPS: [**list of supported **(<stat>,**long alphanumeric **<oper>,**short alphanumeric **<oper>,**numeric **<oper>[,<AcT>][,,(**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>]** **OK** or **+CME ERROR: <err>**

HL6528RDx	
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 the network 3 Only set <format>; do not attempt to register or deregister. In this case <format> becomes a mandatory input 4 Manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered **<format>** 0 Long alphanumeric format for <oper> 1 Short alphanumeric format for <oper> 2 Numeric format for <oper> **<oper>** String type; <format> indicates if the format is alphanumeric or numeric **<stat>** 0 Unknown 1 Available 2 Current 3 Forbidden **<Act>** 0 GSM 2 UTRAN
Reference [27.007] §7.3	

6.13. +CPLS Command: Select Preferred PLMN List

HL6528RDx	
Test command Syntax **AT+CPLS=?**	Response **+CPLS:** (list of supported **<list>**s) **OK** or **+CME ERROR: <err>**

HL6528RDx	
Read command Syntax **AT+CPLS?**	 Response **+CPLS: <list>** **OK**
Write command Syntax **AT+CPLS=<list>**	 Response **OK** or **+CME ERROR: <err>** Parameter **<list>** 0 User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then the PLMN preferred list EFPLMNsel (this file is only available in SIM card or GSM application selected in UICC) 1 Operator controlled PLMN selector with Access Technology EFOPLMNwAcT 2 HPLMN selector with Access Technology EFHPLMNwAcT
Reference [27.007] §7.5	Notes This command appears in 27.007 Release 5, but SIM files EFPLMNwAcT, EFOPLMNwAcT exists in Release 99.

6.14. +CPOL Command: Preferred PLMN List

HL6528RDx	
Test command Syntax **AT+CPOL=?**	 Response **+CPOL: (**list of supported **<index>**es**),(**list of supported **<format>**s**)** **OK**
Read command Syntax **AT+CPOL?**	 Response **+CPOL:** **<index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Comp_AcT1>,<UTRAN_AcT1>]** **[+CPOL:** **<index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Comp_AcT2>,<UTRAN_AcT2>]** **[...]]** **OK**

HL6528RDx	
Write command Syntax **AT+CPOL=** **[<index>]** **[,<format>** **[,<oper>[,<GSM_** **AcT>,<GSM_** **Compact_AcT>,** **<UTRAN_AcT>]]]**	Response **OK** Parameters **<index>** Integer type; the order number of operator in the SIM/USIM preferred operator list **<format>** 0 Long format alphanumeric <oper> 1 Short format alphanumeric <oper> 2 Numeric <oper> **<opern>** String type; <format> indicates if the format is alphanumeric or numeric (see **+COPS**) **<GSM_AcTn>** GSM access technology 0 Access technology not selected 1 Access technology selected **<GSM_Comp_AcTn>** GSM compact access technology 0 Access technology not selected 1 Access technology selected **<UTRA_AcTn>** UTRA access technology 0 Access technology not selected 1 Access technology selected
Reference [27.007] §7.19	Notes The read command returns all used entries from the SIM/USIM list of preferred PLMNs, previously selected by command **+CPLS**, with the Access Technologies for each PLMN in the list.

6.15. +CPWD Command: Change Password

HL6528RDx	
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>**

HL6528RDx	
	Parameters **<fac>** "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 (refer GSM02.30 [19]) (applicable only for <mode>=0) "P2" SIM PIN2<oldpwd> password specified for the facility from the user interface or with command. If an old password has not yet been set, <oldpwd> is not to enter. "SC" SIM (lock SIM card) (SIM asks password in ME power-up and when this lock command issued) “AG" All outgoing barring services (refer GSM02.30 [19]) (applicable only for <mode>=0) “AC” All inComing barring services (refer GSM02.30 [19]) (applicable only for <mode>=0) **<oldpwd>, <newpwd>** String type; <oldpwd> shall be the same as password specified for the facility from the ME user interface or using command this command, and <newpwd> is the new password; maximum length of password can be determined with <pwdlength> **<pwdlength>**Integer type; maximum length of the password for the facility
Reference [27.007] §7.5	Notes • The test command returns a list of pairs which present the available facilities and the maximum length of their password. • The write command sets a new password for the facility lock function.

6.16. +CREG Command: Network Registration

HL6528RDx	
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**

HL6528RDx	
	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 **<lac>** String type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) **<ci>** String type; two byte cell ID in hexadecimal format **<AcT>** 0 GSM 2 UTRAN
Reference [27.007] § 7.2	Notes • This command controls the presentation of an unsolicited result code +CREG and provides the network registration status. • The write command is used to control the unsolicited result code +CREG. The syntax of unsolicited result +CREG is as follows: **+CREG: <stat>** when <n>=1 and there is a change in the ME network registration status code. **+CREG: <stat> [,<lac>,<ci>[,<AcT>]]** when <n>=2 and there is a change of the network cell. • The read command returns the status of the result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac>, <ci> and <AcT> are returned only when <n>=2 and MT is registered in the network. • The test command returns the range of supported modes (i.e. <n>s).

6.17. +CSSN Command: Supplementary Service Notification

HL6528RDx	
Test command Syntax **AT+CSSN=?**	Response **+CSSN: (**list of supported **<n>**s**), (**list of supported **<m>**s**)** **OK**

HL6528RDx	
Read command Syntax **AT+CSSN?**	 Response **+CSSN: <n>,<m>** **OK**
Write command Syntax **AT+CSSN=<n>** **[,<m>]**	 Response **OK** Parameters **<n>** 0 Suppresses +CSSI messages 1 Activates +CSSI messages **<m>** 0 Suppresses +CSSU messages 1 Activates +CSSU messages
Reference [27.007] § 7.17	Notes Currently, the following values are supported: • CSSI: 0 to 6 • CSSU: 0 to 5

6.18. +CTFR Command: Call Deflection

HL6528RDx	
Test command Syntax **AT+CTFR=?**	 Response **OK**
Write command Syntax **AT+CTFR=** **<number>** **[, <type>** **[, <subaddr>** **[, <satype>]]]**	 Response **OK** or **+CME ERROR: <err>** Parameter **<number>** String type phone number of format specified by <type> **<type>** Type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7); default = 145 when dialing string includes international access code character "+", otherwise 129. **<subaddr>** String type subaddress of format specified by <satype> **<satype>** Type of subaddress octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.8); default = 128
Reference [27.007] § 7.14	

6.19. +CUSD Command: Unstructured Supplementary Service Data

HL6528RDx	
Test command Syntax **AT+CUSD=?**	 Response **+CUSD:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CUSD?**	 Response **+CUSD: <n>** **OK**
Unsolicited Notification	Response **+CUSD: <m>[,<str>,<dcs>]**
Write command Syntax **AT+CUSD=[<n>[,<str>[,<dcs>]]]**	 Response **OK** Parameters **<n>** Result code presentation status in the TA 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 this parameter is not given, the network is not interrogated) • If <dcs> indicates that 3GPP TS 23.038 [25] 7 bit default alphabet is used • If TE character set other than "HEX" (refer to command **+cscs**): MT/TA converts GSM alphabet into current TE character set according to rules of 3GPP TS 27.005 [24] Annex A • If TE character set is "HEX": MT/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number (e.g. character Π (GSM 23) is presented as 17 (IRA 49 and 55)) • If <dcs> indicates that 8-bit data coding scheme is used: MT/TA converts each 8-bit octet into two IRA character long hexadecimal numbers (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) **<dcs>** 3GPP TS 23.038 [25] Cell Broadcast Data Coding Scheme in integer format (default = 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

HL6528RDx	
Reference [27.007] §7.15	Notes • When TE sends a USSD to the network, the OK result code is sent before the response of the network. When the network answers, the response will be sent as a URC (as if it were a network initiated operation; in case of error, **+CUSD: 4** will be sent). • This allows the link to not be blocked for a long time (the network can take a long time to answer a USSD request initiated by the TE). • The USSD session can be aborted using command **AT+CUSD=2**.

7. SMS Commands

7.1. Preliminary Comments

The commands supported in both PDU and text modes are only described for PDU mode. For details about text modes, refer to the [27.005].

7.2. 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.

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 deleted (commands List Messages +CMGL, Read Message +CMGR and Delete Message +CMGD); defined values (others are manufacturer specific):

"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> integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values:

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>

Message Data Parameters

<ackpdu> 3G TS 23.040 [3] RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without 3G TS 24.011 [6] 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 (see definition of this command in 3G TS 27.007 [9])

<cdata> 3G TS 23.040 [3] TP-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> 3G TS 23.040 [3] TP-Command-Type in integer format (default 0)

<da> 3G TS 23.040 [3] TP-Destination-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 in3G TS 27.007 [9]); type of address given by <toda>

<data> In the case of SMS: 3G TS 23.040 [3] TP-User-Data in text mode responses; format:

- if <dcs> indicates that 3G TS 23.038 [2] GSM 7 bit default alphabet is used and <fo> indicates that 3G TS 23.040 [3] TP-User-Data-Header-Indication is not set:
- if TE character set other than "HEX" (refer to command +cscs in 3G TS 27.007 [9]): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- 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 3G TS 23.040 [3] TP-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: 3G TS 23.041 [4] CBM Content of Message in text mode responses; format:
- if <dcs> indicates that 3G TS 23.038 [2] GSM 7 bit default alphabet is used:
- if TE character set other than "HEX" (refer to command +cscs in 3G TS 27.007 [9]): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- 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

<dcs> depending on the command or result code: 3G TS 23.038 [2] SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format

<dt> 3G TS 23.040 [3] TP-Discharge-Time in time-string format: “yy/MM/dd,hh:mm:ss±zz”, where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to “94/05/06,22:10:00+08”

<fo>	depending on the command or result code: first octet of 3G TS 23.040 [3] SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format
<length>	integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> > (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)
<mid>	3G TS 23.041 [4] CBM Message Identifier in integer format
<mn>	3G TS 23.040 [3] TP-Message-Number in integer format
<mr>	3G TS 23.040 [3] TP-Message-Reference in integer format
<oa>	3G TS 23.040 [3] TP-Originating-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 in TS 27.07); type of address given by <tooa>
<page>	3G TS 23.041 [4] CBM Page Parameter bits 4-7 in integer format
<pages>	3G TS 23.041 [4] CBM Page Parameter bits 0-3 in integer format
<pdu>	In the case of SMS: 3G TS 24.011 [6] SC address followed by 3G TS 23.040 [3] TPDU in hexadecimal format: ME/TA converts each octet of TP data unit 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: 3G TS 23.041 [4] TPDU in hexadecimal format
<pid>	3G TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0)
<ra>	3G TS 23.040 [3] TP-Recipient-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 in 3G TS 27.007 [9]); type of address given by <tora>
<sca>	3G TS 24.011 [6] RP SC 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 in 3G TS 27.007 [9]); type of address given by <tosca>
<scts>	3G TS 23.040 [3] TP-Service-Centre-Time-Stamp in time-string format (refer <dt>)
<sn>	3G TS 23.041 [4] CBM Serial Number in integer format
<st>	3G TS 23.040 [3] TP-Status in integer format
<toda>	3G TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)
<tooa>	3G TS 24.011 [6] TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)
<tora>	3G TS 24.011 [6] TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<tosca>	3G TS 24.011 [6] RP SC address Type-of-Address octet in integer format (default refer <toda>)
<vp>	depending on SMS-SUBMIT <fo> setting: 3G TS 23.040 [3] TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>)
<vp>	depending on SMS-SUBMIT <fo> setting: 3G TS 23.040 [3] TP-Validity-Period either in integer format (default 167), in time-string format (refer <dt>), or if EVPF is supported, in enhanced format (hexadecimal coded string with double quotes)

7.3. +CMGD Command: Delete SMS Message

HL6528RDx	
Test command Syntax **AT+CMGD=?**	Response **+CMGD:** (list of supported **<index>**s)[,(list of supported **<delflag>**s)] **OK**
Write command Syntax **AT+CMGD= <index> [,<delflag>]**	Response **OK** or **CMS ERROR: <error>** Parameter **<delflag>** Integer indicating multiple message deletion requests 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
Reference [27.005] §3.5.4	Notes The write command deletes messages from the 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 the <delflag> shown.

7.4. +CMGF Command: Select SMS Message Format

HL6528RDx	
Test command Syntax **AT+CMGF=?**	Response **+CMGF: (**list of supported **<mode>**s**)** **OK**
Read command Syntax **AT+CMGF?**	Response **+CMGF: <mode>** **OK**

HL6528RDx	
Write command Syntax **AT+CMGF=[<mode>]**	Response **OK** Parameter **<mode>** 0 PDU mode 1 Text mode
Reference [27.005] §3.2.3	Notes Set command tells the TA which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. <mode> can either be PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters). Text mode uses the value of parameter <chset> specified by command **+CSCS** to inform the character set to be used in the message body in the TA-TE interface.

7.5. +CMGL Command: List SMS Messages from Preferred Storage

HL6528RDx	
Test command Syntax **AT+CMGL=?**	Response **+CMGL: (**list of supported **<stat>**s**)** **OK**
Execute command Syntax **AT+CMGL [=<stat>]**	Response Only if PDU mode (+CMGF=0) and command successful: **+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[<CR><LF>** **+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[...]]** **OK** Parameters See chapter section 7.2 Parameters Definition
Reference [27.005] § 3.4.2 and 4.1	Notes • Execution command returns messages with status value <stat> from preferred message storage <mem1> to the TE. Entire data units <pdu> are returned. • If status of the message is “received unread”, status in the storage changes to “received read”. • <alpha> is optional; it is NOT used in the HL6528RDx.

7.6. +CMGR Command: Read SMS Message

HL6528RDx	
Test command Syntax **AT+CMGR=?**	 Response **OK**
Write command Syntax **AT+CMGR=<index>**	 Response if PDU mode (+CMGF=0) and command successful: **+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>** **OK** Parameters See chapter section 7.2 Parameters Definition
Reference [27.005] §3.4.3 and 4.2	Notes • Execution command returns message with location value <index> from preferred message storage <mem1> to the TE. Status of the message and entire message data unit <pdu> is returned. • If status of the message is “received unread”, status in the storage changes to “received read”. • <alpha> is optional; it is NOT used in the HL6528RDx.

7.7. +CMGS Command: Send SMS Message

HL6528RDx	
Test command Syntax **AT+CMGS=?**	 Response **OK**
Write command Syntax if PDU mode (+CMGF=0): **AT+CMGS=<length><CR>PDU is given <ctrl-Z/ESC>**	 Response if PDU mode (+CMGF=0) and sending successful: **+CMGS: <mr>[,<ackpdu>]** **OK** Parameters See chapter section 7.2 Parameters Definition

HL6528RDx	
Reference [27.005] § 3.5.1 and 4.3	Notes • <length> must indicate the number of octets coded in the TP layer data unit to be given (i.e. SMSC address octets are excluded). • The TA shall send a four character sequence <CR><LF><greater_than><space> (IRA 13, 10, 62, 32) after the command line is terminated with <CR>; after that, the PDU can be given from TE to ME/TA and the DCD signal shall be in ACTIVE state while PDU is given. • The PDU shall be in 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 **+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 the <ESC> character (IRA 27). <ctrl-Z> (IRA 26) must be used to indicate the ending of PDU.

7.8. +CMGW Command: Write SMS Message to Memory

HL6528RDx	
Test command Syntax **AT+CMGW=?**	 Response **OK**
Write command Syntax if PDU mode (+CMGF=0): **AT+CMGW= <length>[,<stat>] <CR>PDU is given <ctrl-Z/ESC>**	 Response **+CMGW: <index>** **OK** Parameters See chapter section 7.2 Parameters Definition
Reference [27.005] § 3.5.3 and 4.4	Notes The execution command stores the message to memory storage <mem2>. Memory location <index> of the stored message is returned. By default, message status will be set to “stored unsent”, but parameter <stat> allows also other status values to be given. (ME/TA manufacturer may choose to use a different default <stat> for different message types.) The entering of PDU is done similarly as specified in command **+CMGS**.

7.9. +CMSS Command: Send SMS Message from Storage

HL6528RDx	
Test command Syntax **AT+CMSS=?**	 Response **OK**
Write command Syntax **AT+CMSS= <index>[,<da> [,<toda>]]**	 Response if PDU mode (+CMGF=0) and sending successful: **+CMSS: <mr>[,<ackpdu>]** **OK** Parameters See chapter section 7.2 Parameters Definition
Reference [27.005] § 3.5.2 and 4.7	Notes • The execution command sends a 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), <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. • Note that none of the messages stored in the module may be forwarded (for instance, carrier messages as SMS replace, etc.)

7.10. +CMT Notification: Received SMSPP Content

HL6528RDx	
Unsolicited Notification	Response **+CMT: [<alpha>], <length><CR><LF><pdu>** **+CMT: <oa> ,[<alpha>], <scts> [, <tooa> , <fo>, <pid> , <dcs> , <sca> , <tosca> , <length>] <CR > <LF> <data>**
Reference [27.005]	Notes • All parameters are extracted from the received message • Detailed header information is shown in text mode result codes according to command **+CSDH**.

7.11. +CNMI Command: New SMS Message Indication

HL6528RDx	
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>**s), (list of supported **<bfr>**s) **OK**
Read command Syntax **AT+CNMI?**	 Response **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>** **OK**
Write command Syntax **+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]**	 Response **OK** or **CMS ERROR: <error>** Parameters **<mode>** Processing of unsolicited result codes 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. 3 Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode. **<mt>** Result code indication routing for SMS-DELIVER indications 0 No SMS-DELIVER indications are routed to the TE 1 If SMS-DELIVER, when an SMS is received there is an unsolicited result code +CMTI:<memory>,<index> 2 Class 2 SMS are stored in SM and notification +CMTI: "SM",<index> is sent to TE. Other SMS are routed directly to TE and notification sent to TE is +CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled) or +CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> (text mode enabled) 3 Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1. **<bm>** Rules for storing the received CBMs (cell Broadcast Message) types 0 No CBM indications are routed to the TE 2 New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled) or +CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled).

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	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>** SMS-STATUS-REPORTs routing 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) **<bfr>** TA buffer of unsolicited result code modes 0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1 – 3 is entered (OK response shall be given before flushing the codes) 1 TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1 – 3 is entered
Reference [27.005] § 3.4.1	

7.12. +CPMS Command: Preferred Message Storage

HL6528RDx	
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**
Write command Syntax **AT+CPMS= <mem1> [,<mem2> [,<mem3>]]**	Response **+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>** **OK** Parameters See chapter section 7.2 Parameters Definition

HL6528RDx	
Examples	**AT+CPMS=?** **+CPMS: ("SM","ME"),("SM","ME"),("SM","ME")** **OK** **AT+CPMS?** **+CPMS: "SM",27,50,"SM",27,50,"SM",27,50** **OK** **AT+CPMS="SM"** **+CPMS: 27,50,27,50,27,50** **OK** **AT+CPMS="SM","SM","SM"** **+CPMS: 27,50,27,50,27,50** **OK**
Reference [27.005] §3.2.2	Notes • Set command selects memory storages <mem1>,<mem2>,<mem3> to be used for reading, writing, etc. • Configuration is set to default values when the module starts.

7.13. +CSCA Command: SMS Service Center Address

HL6528RDx	
Test command Syntax **AT+CSCA=?**	 Response **OK**
Read command Syntax **AT+CSCA?**	 Response **+CSCA: <sca>,<tosca>** **OK**
Write command Syntax **AT+CSCA=<sca>[,<tosca>]**	 Response **OK** Parameters See chapter section 7.2 Parameters Definition
Reference [27.005] § 3.3.1	Notes The set command updates the SMSC address, through which mobile originated SMS is transmitted. In text mode, the setting is used in the send and write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.

7.14. +CSCB Command: Select Cell Broadcast Message Types

HL6528RDx	
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** Parameters **<mode>** 0 Message types specified in <mids> are accepted 1 Message types specified in <mids> are not accepted **<mids>** String type; combinations of CBM message IDs (e.g. "0,1,5,320-478,922"). The number of ranges in the <mids> parameter string is limited to 10. Note that intervals are not allowed. **<dcss>** String type; all different possible combinations of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. "0-3,5"
Reference [27.005] § 3.3.4	Notes • Set command selects which types of CBMs are to be received by the ME. • The module does not manage the SMSCB language, nor the data coding scheme parameter (<dcss> parameter).

7.15. +CSDH Command: Show Text Mode Parameters

HL6528RDx	
Test command Syntax **AT+CSDH=?**	 Response **+CSDH:** (list of supported **<show>**s) **OK**
Read command Syntax **AT+CSDH?**	 Response **+CSDH: <show>** **OK**

HL6528RDx	
Write command Syntax **AT+CSDH=[<show>]**	Response **OK** 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 **+CMT**, **+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 the values in result codes
Reference [27.005] §3.3.3	Notes The set command controls whether detailed header information is shown in text mode result codes.

7.16. +CSMP Command: Set SMS Text Mode Parameters

HL6528RDx	
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 See chapter section 7.2 Parameters Definition
Examples	To activate the SMS-STATUS-REPORT: **AT+CSMP=49,167,0,0** **OK** To use UCS2 data coding scheme: **AT+CSMP=17,167,0,8**

HL6528RDx	
Reference [27.005] § 3.3.2	Notes • The set command is used to select values for additional parameters needed when SM is sent to the network or placed in storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0 to 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>. If TA supports the EVPF, see 3G TS 23.040 [3], it shall be given as a hexadecimal coded string (refer e.g. <pdu>) with double quotes. • When storing an SMS-DELIVER from the TE to the preferred memory storage in text mode (refer to command **+CMGW**), <vp> field can be used for <scts>.

7.17. +CSMS Command: Select Message Service

HL6528RDx	
Test command Syntax **AT+CSMS=?**	 Response **+CSMS:** (list of supported **<service>**s) **OK**
Read command Syntax **AT+CSMS?**	 Response **+CSMS: <service>,<mt>,<mo>,<bm>** **OK**
Write command Syntax **AT+CSMS= <service>**	 Response **+CSMS: <mt>,<mo>,<bm>** **OK** Parameters **<service>** 0 GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with GSM 27.05 Phase 2 version 4.7.0; Phase 2+ features which do not require new command syntax may be supported, e.g. correct routing of messages with new Phase 2+ data coding schemes) 1 Used only on dual OS platforms i.e. when TE is the only SMS client (SMS are only routed to TA in this case) **<mt>** Mobile Terminated Messages 0 Type not supported 1 Type supported **<mo>** Mobile Originated Messages 0 Type not supported 1 Type supported **<bm>** Broadcast Type Messages 0 Type not supported 1 Type supported
Reference [27.005] §3.2.1	Notes The set command selects messaging service <service>. It returns the types of messages supported by the ME: <mt> for mobile terminated messages, <mo> for mobile originated messages and <bm> for broadcast type messages.

8. Data Commands

8.1. +CR Command: Service Reporting Control

HL6528RDx	
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** 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
Reference [27.007] §6.9	Notes • The write command controls whether or not intermediate result code **+CR: <serv>** is returned from the TA to the TE. If enabled, the intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before the intermediate result code CONNECT is transmitted. • This command replaces V.25ter command **+MR**, which is not appropriate for use in the GSM/UMTS network. Possible error control (other than radio link protocol) and data compression reporting can be enabled with V.25ter commands **+ER** and **+DR**.

9. GPRS Commands

These commands are fully supported when the SIM card and the network have GPRS capability.

9.1. +CGACT Command: Activate or Deactivate PDP Context

HL6528RDx	
Test command Syntax **AT+CGACT=?**	Response **+CGACT: (**list of supported **<state>**s**)** **OK**
Read command Syntax **AT+CGACT?**	Response **+CGACT: <cid>, <state>** **OK**
Write command Syntax **AT+CGACT= <state>[, <cid>]**	Response **OK** Parameters **<state>** Indicates the state of PDP context activation 0 Deactivated 1 Activated Other values are reserved and will result in an ERROR response to the execution command **<cid>** PDP Context Identifier is a numeric parameter which specifies a particular PDP context definition.
Reference [27.007] §10.1.10	Notes • It is impossible to use ATD*99… or *98… commands after using this command. • Up to two (2) PDP contexts can be active at once.

9.2. +CGATT Command: Attach or Detach PS

HL6528RDx	
Test command Syntax **AT+CGATT=?**	Response **+CGATT:** (list of supported **<state>**s) **OK**

HL6528RDx	
Read command Syntax **AT+CGATT?**	 Response **+CGATT: <state>** **OK**
Write command Syntax **AT+CGATT= <state>**	 Response **OK** Parameter **<state>** Indicates the state of PS attachment 0 Detached 1 Attached
Reference [27.007] §10.1.9	

9.3. +CGCLASS Command: GPRS Mobile Station Class

HL6528RDx	
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 **+CME ERROR: <err>** Parameter **<class>** A string parameter which indicates the GPRS mobile class (in descending order of functionality) "B" Class B "CG" Class C in GPRS only mode "CC" Class C in circuit switched only mode (lowest)
Reference [27.007] §10.1.17	Notes Class A is not supported.

9.4. +CGDCONT Command: Define PDP Context

HL6528RDx	
Test command Syntax **AT+CGDCONT=?**	Response **+CGDCONT:** (range of supported **<cid>**s), **<PDP_type>**,,,(list of supported **<d_comp>**s), (list of supported **<h_comp>**s)[,(list of supported **<pd1>**s)[,…[,(list of supported **<pdN>**s)]]][...]] **OK**
Read command Syntax **AT+CGDCONT?**	Response **+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp>[,<pd1>[,…[,pdN]]** **OK**
Write command Syntax **AT+CGDCONT=** **[<cid>** **[,<PDP_type>** **[,<APN>** **[,<PDP_addr>** **[,<d_comp>** **[,<h_comp>]]]]]]**	Response **OK** or **+CME ERROR: <err>** Parameters **<cid>** 1 – 2 PDP Context Identifier; a numeric parameter which specifies a particular PDP context definition. **<PDP_type>** Packet Data Protocol type. A string parameter which specifies the type of packet data protocol. Only IP Internet Protocol - IETF STD 5) is supported. **<APN>** Access Point Name A string parameter which is a logical name that is used to select the GGSN or the external packet data network. **<PDP_address>** String parameter that identifies the MT in the address space applicable to the PDP. As only IP is currently supported, it shall be an IP address. If the value is null (“0.0.0.0” or 0), 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 form of the 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 +CGPADDR command. **<d_comp>** Numeric parameter that controls PDP data compression. 0 Off (default and only value supported) **<h_comp>** Numeric parameter that controls PDP header compression 0 Off (default and only value supported) **<pd1>, … <pdN>** Zero to N string parameters whose meanings are specific to <PDP_type>

HL6528RDx	
Reference [27.007] §10.1.1	Notes • The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. • A special form of the write command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined.

9.5. +CGEREP Command: GPRS Event Reporting

HL6528RDx	
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**
Write command Syntax **AT+CGEREP=** **[<mode>[,<bfr>]]**	Response **OK** 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 **<bfr>** 0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered
Unsolicited Notification	For network attachment: **+CGEV: NW DETACH** **+CGEV: ME DETACH** For PDP context deactivation: **+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]** **+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]** For PDP context activation: **+CGEV: ME PDN ACT <cid>** For other PDP context handling: **+CGEV: REJECT <PDP_type>, <PDP_addr>** **+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]**

HL6528RDx	
Reference [27.007] §10.1.18	

9.6. +CGPADDR Command: Show PDP Address

HL6528RDx	
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>** **[+CGPADDR: <cid>, <PDP_addr>** **[…]]** **OK**
Execute command Syntax **AT+CGPADDR**	Response **[+CGPADDR: <cid>,<PDP_addr>** **[+CGPADDR: <cid>,<PDP_addr>]]** **OK** or **+CME ERROR: <err>** Parameters **<PDP_addr>** 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 command 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>. <PDP_address> is omitted if none is available "<n>.<n>.<n>.<n>" where <n> = 0 – 255 **<cid>** Numeric parameter which specifies a particular PDP context definition
Reference [27.007] §10.1.14	Notes The execution command returns a list of PDP addresses for the specified context identifiers.
Example	Ask for IP address according to cid=1 (identify the PDP context): **AT+CGPADDR=1** **+CGPADDR: 1, "10.20.30.40"**

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

HL6528RDx	
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**)** **[+CGQMIN:...]** **OK**
Read command Syntax **AT+CGQMIN?**	Response **+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>** **[+CGQMIN: ...]** **OK**
Write command Syntax **AT+CGQMIN=** **[<cid>** **[,<precedence>** **[,<delay>** **[,<reliability>** **[,<peak>** **[,<mean>]]]]]]**	Response **OK** Parameters **<precedence>** Numeric parameter for the precedence class 0 Network subscribed value 1 High Priority Service commitments shall be maintained ahead of precedence classes 2 and 3 2 Normal priority Service commitments shall be maintained ahead of precedence class 3 3 Low priority **<delay>** Numeric parameter for the delay class **<reliability>** Numeric parameter for the reliability class 0 Network subscribed value 1 Non real-time traffic, error-sensitive application that cannot cope with data loss 2 Non real-time traffic, error-sensitive application that can cope with infrequent data loss 3 Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS 4 Real-time traffic, error-sensitive application that can cope with data loss 5 Real-time traffic, error non-sensitive application that can cope with data loss **<peak>** Numeric parameter for the peak throughput class 0 Network subscribed value 1 Up to 1 000 (8 kbit/s) 2 Up to 2 000 (16 kbit/s) 3 Up to 4 000 (32 kbit/s) 4 Up to 8 000 (64 kbit/s) 5 Up to 16 000 (128 kbit/s) 6 Up to 32 000 (256 kbit/s) 7 Up to 64 000 (512 kbit/s)

HL6528RDx	
	8 Up to 128 000 (1 024 kbit/s) 9 Up to 256 000 (2 048 kbit/s) **<mean>** Numeric parameter for the mean throughput class 0 Network subscribed value 1 100 (~0.22 bit/s) 2 200 (~0.44 bit/s) 3 500 (~1.11 bit/s) 4 1 000 (~2.2 bit/s) 5 2 000 (~4.4 bit/s) 6 5 000 (~11.1 bit/s) 7 10 000 (~22 bit/s) 8 20 000 (~44 bit/s) 9 50 000 (~111 bit/s) 10 100 000 (~0.22 kbit/s) 11 200 000 (~0.44 kbit/s) 12 500 000 (~1.11 kbit/s) 13 1 000 000 (~2.2 kbit/s) 14 2 000 000 (~4.4 kbit/s) 15 5 000 000 (~11.1 kbit/s) 16 10 000 000 (~22 kbit/s) 17 20 000 000 (~44 kbit/s) 18 50 000 000 (~111 kbit/s) 31 Best effort
Reference [27.007] §10.1.7	

9.8. +CGQREQ Command: Request Quality of Service Profile

HL6528RDx	
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**)** **[+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>** **[+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>** **[…]]** **OK**

HL6528RDx	
Write command Syntax **+CGQREQ= [<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]**	Response **OK** Parameters **<cid>** Numeric parameter which specifies a particular PDP context definition (see the +CGDCONT command). **<precedence>** Numeric parameter which specifies the precedence class **<delay>** Numeric parameter which specifies the delay class **<reliability>** Numeric parameter which specifies the reliability class **<peak>** Numeric parameter which specifies the peak throughput class **<mean>** Numeric parameter which specifies the mean throughput class
Reference [27.007] §10.1.4	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

9.9. +CGREG Command: GPRS Network Registration Status

HL6528RDx	
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>]]** **OK**
Write command Syntax **AT+CGREG= [<n>]**	Response **OK** 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>]]**

HL6528RDx	
	<stat> 0 Not registered, ME is not currently searching an operator to register to. The MS is in GMM state GMM-NULL or GMM-DEREGISTERED-INITIATED. The GPRS service is disabled, the MS is allowed to attach for GPRS if requested by the user. 1 Registered, home network The MS is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED INITIATED on the home PLMN. 2 Not registered, but ME is currently trying to attach or searching an operator to register to. The MS is in GMM state GMM-DEREGISTERED or GMM-REGISTERED-INITIATED. The GPRS service is enabled, but an allowable PLMN is currently not available. The MS will start a GPRS attach as soon as an allowable PLMN is available. 3 Registration denied The MS is in GMM state GMM-NULL. The GPRS service is disabled, the MS is not allowed to attach for GPRS if requested by the user. 4 Unknown 5 Registered, roaming The MS is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED on a visited PLMN. **<lac>** String type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) **<ci>** String type; two byte cell ID in hexadecimal format **<Act>** 0 GSM 2 UTRAN
Reference [27.007] §10.1.19	Notes The set command controls the presentation of unsolicited result code **+CGREG: <stat>** when <n>=1 and there is a change in the MT's GPRS network registration status; or code **+CGREG: <stat>[,<lac>,<ci>[,<Act>]]** when <n>=2 and there is a change of the network cell.

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

HL6528RDx	
Test command Syntax **AT+CGSMS=?**	Response **+CGSMS: (**list of currently available **<service>**s**)** **OK**
Read command Syntax **AT+CGSMS?**	Response **+CGSMS: <service>** **OK**

HL6528RDx	
Write command Syntax **AT+CGSMS=[<service>]**	Response **OK** 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 not available) 3 Circuit switched preferred (use packet domain if circuit switched not available)
Reference [27.007] § 10.1.20	Notes • When <service> value is 2, the SMS is sent on the GPRS network if already attached. Otherwise it is sent on a circuit switched network. If an error occurs on the GPRS network, no further attempts are made. • Parameter is saved in non-volatile memory.

9.11. +WPPP Command: Configure PDP Context Authentication

HL6528RDx	
Test command Syntax **AT+WPPP=?**	Response **+WPPP:** (list of supported **<Auth>**),[<list of supported **<cid>**s] **OK**
Read command Syntax **AT+WPPP?**	Response **+WPPP: <Auth>,<cid>,[<username>],[<password>]** **OK**
Write command Syntax **AT+WPPP=<Auth>,[<cid>],[<username>],[<password>]**	Response **OK** **+CME ERROR <err>** Parameters **<Auth>** Authentication type 0 None 1 PAP 2 CHAP **<cid>** 1 – 2 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

HL6528RDx	
Reference Sierra Wireless Proprietary Command	Notes • Parameters are stored in non-volatile memory. • This command is available after the SIM has been inserted and the pin code has been entered.
Examples	**AT+WPPP=?** **+WPPP: (0-2),(1-2)** **OK** **AT+WPPP=1,1,"myusername","mypassword"** **OK** **AT+WPPP?** **+WPPP: 1,1,"myusername","mypassword"** **+WPPP: 1,2**

10. Board Support Commands

10.1. +KSIOCFG Command: Serial IO Configuration

HL6528RDx	
Test command Syntax **AT+KSIOCFG=?**	Response **+KSIOCFG: (**list of supported **<mode>**s**)** **OK**
Read command Syntax **AT+KSIOCFG?**	Response **+KSIOCFG: <mode>** **OK** or **+CME ERROR: <err>**
Write command Syntax **AT+KSIOCFG= <mode>**	Response **+KSIOCFG: <mode>** **OK** Parameters **<mode>** 0 UART1 for AT/data, UART0 (Debug_UART) for trace 1 USB for AT/data, USB for trace 2 UART1 for AT/data, USB for trace
Notes	• Parameters are saved in non-volatile memory. • Setting is effective after reboot. • This command works without SIM card.

11. Audio Commands

11.1. +KPCMCFG Command: Configure PCM/Digital Audio

HL6528RDx	
Test command Syntax **AT+KPCMCFG=?**	 Response **+KPCMCFG: (**list of supported **<sync_type>**s**),(**list of supported **<bit_clk>**s**)** **OK**
Read command Syntax **AT+KPCMCFG?**	 Response **+KPCMCFG: <sync_type>,<bit_clk>** **OK**
Write command Syntax **AT+KPCMCFG= <sync_type>, <bit_clk>**	 Response **OK** Parameters **<sync_type>** 0 Short sync 1 Long sync **<bit_clk>** 0 256 kHz 1 512 kHz 2 1024 kHz 3 2048 kHz
Notes	Parameter values are automatically saved and kept after reset.

11.2. +VIP Command: Initialize Voice Parameters

HL6528RDx	
Test command Syntax **AT+VIP=?**	 Response **+VIP:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+VIP?**	 Response **+VIP: <n>** **OK**

HL6528RDx	
Write command Syntax **AT+VIP=<n>**	 Response **OK** or **+CME ERROR: <err>** Parameter **<n>** Mode 0 Handset 23 PCM interface
Reference [27.007] § C.2.6	Notes • Settings will take effect in the next call. Values are automatically reset after a call (return to 0). • This command does not require a SIM card to function.

11.3. +VTS Command: DTMF and Tone Generation

HL6528RDx	
Test command Syntax **AT+VTS=?**	 Response **+VTS:** (list of supported **<DTMF>**s) **OK**
Write command Syntax **AT+VTS= "<DTMF>"**	 Response **OK** or **CME ERROR: <error>** Parameter **<DTMF>** A single ASCII character in the set 0 – 9, #, *, A – D. DTMF tones can only be issued during a voice call.
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, and 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.

12. Test Commands

12.1. +WMAUDIOLOOP Command: Audio Test

HL6528RDx	
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>]** **[+WMAUDIOLOOP: <ENABLE>,<TXORGAN>,<RXORGAN>]** **OK**
Write command Syntax **AT+ WMAUDIOLOOP =<ENABLE> [,<TXORGAN>] [,<RXORGAN>]**	Response **OK** or **+CME ERROR: 4** If the AT command tries to control a <TXORGAN> or <RXORGAN> that isn't supported. Parameters **<ENABLE>** Enable or disable audio loop 0 Disable audio loop 1 Enable audio loop **<TXORGAN>** Audio input used as reference for Audio Loop. 0 Main microphone 1 PCM in **<RXORGAN>** Audio output used to loop Audio Input. 0 Main speaker 1 PCM out
Reference Sierra Wireless Proprietary	Notes If <TXORGAN> = 0, <RXORGAN> should also be set to 0; likewise, if <TXORGAN> = 1, <RXORGAN> should also be set to 1.

12.2. +WMRXPOWER Command: Test RF Rx

HL6528RDx	
Test command Syntax **AT+ WMRXPOWER=?**	 Response **+WMRXPOWER=(**list of supported **<BAND>**s**), (**list of supported **<CHANNEL>** ranges**)** **OK**
Read command Syntax **AT+ WMRXPOWER?**	 Response **+WMRXPOWER:<ENABLE>[,<BAND>,<CHANNEL>,<EXP_POWER>]** **OK**
Write command Syntax **AT+ WMRXPOWER= <ENABLE> [,<BAND>, <CHANNEL>, <EXP_POWER>]**	 Response **+WMRXPOWER=<POWER>** **OK** Parameters **<ENABLE>** 0 Stop the Rx measurement 1 Start the Rx measurement **<BAND>** Rx band to read 850 GSM850 band 900 GSM900 band 1800 DCS band 1900 PCS band This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. **<CHANNEL>** Rx channel to read If <BAND>=850 128 – 251 If <BAND>=900 0 – 124 975 – 1023 If <BAND>=1800 512 – 885 If <BAND>=1900 512 – 810 This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. **<EXP_POWER>** Expected power in dBm This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. **<POWER>** Received power in dBm
Reference Sierra Wireless Proprietary	Notes • The module must be set to flight mode before using this command (refer to +CFUN). • This AT command is not available if AT+WMTXPOWER is enabled. • This AT command is available even if AT+WMAUDIOLOOP is enabled

HL6528RDx	
Examples	**at+wmrxpower?** **+WMRXPOWER: 255** **OK** **at+wmrxpower=?** **+WMRXPOWER: (850,900,1800,1900),(128-251,0-124,975-1023,512-885,512-810)** **OK** **at+wmrxpower=1,850,192,"-30"** // read GSM850 uarfcn=192 **+WMRXPOWER: -31.0** // Rx power -31 dBm **OK** **at+wmrxpower?** **+WMRXPOWER: 1,850,192,-30** **OK** **at+wmrxpower=1,1800,711,"-27"** // read GSM1800, urafcn=711 **+WMRXPOWER: -27.0** // Rx power -27 dBm **OK** **at+wmrxpower=1,1900,661,"-40"** // read GSM1900, urafcn=661 **+WMRXPOWER: -41.0** // Rx power -41 dBm **OK**

12.3. +WMTXPOWER Command: Test RF Tx

HL6528RDx	
Test command Syntax **AT+ WMTXPOWER=?**	 Response **+WMTXPOWER=(**list of supported **<BAND>**s**), (**list of supported **<CHANNEL>** ranges**),(**supported **<MULTISLOT>** values**)** **OK**
Read command Syntax **AT+ WMTXPOWER?**	 Response **+WMTXPOWER=<ENABLE>[,<BAND>,<CHANNEL>,<POWER_LEVEL>, <MULTISLOT>]** **OK**
Write command Syntax **AT+ WMTXPOWER= <ENABLE> [,<BAND>, <CHANNEL>, <POWER_ LEVEL> [,<MULTISLOT>]]**	 Response **OK** Parameters **<ENABLE>** 0 Stop the burst emission 1 Start the burst emission

HL6528RDx	
	<BAND> Tx burst band emission 850 GSM850 band 900 GSM900 band 1800 DCS band 1900 PCS band This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. **<CHANNEL>** Tx burst channel emission If <BAND>=850 128 – 251 If <BAND>=900 0 – 124 975 – 1023 If <BAND>=1800 512 – 885 If <BAND>=1900 512 – 810 This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. **<POWER_LEVEL>** Tx burst power If <BAND>=850 or <BAND>=900, 5 (33 dBm) to 19 (5 dBm) If <BAND>=1800 or <BAND>=1900, 0 (30 dBm) to 15 (0 dBm) This is a mandatory parameter if <ENABLE>=1, but is not allowed if <ENABLE>=0. **<MULTISLOT>** Defines which slot is used in Tx burst emissions 0 Emit on one time slot (GSM) 1 Emit on two time slots (GPRS compliant) This parameter is not allowed if <ENABLE>=0.
Reference Sierra Wireless Proprietary	Notes • Before using this command, the module must be set to flight mode. • Burst must be sent on all TDMA frames. • If a burst emission is active, a new AT+WMTXPOWER command just modifies the emission parameters and does not stop the emission; but with a noticeable short interrupt. Only one burst can be emitted at a time. • This AT command is not available if AT+WMRXPOWER is enabled. • This AT command is available even if AT+WMAUDIOLOOP is enabled.
Examples	**at+wmtxpower?** **+WMTXPOWER: 255** // +WMTXPOWER not yet started **OK** **at+wmtxpower=?** **+WMTXPOWER: (850,900,1800,1900),(128-251,0-124,975-1023,512-885,512-810),(0-1)** **OK** **at+wmtxpower=1,850,192,6,1** // emits a Tx burst (31 dBm) on band 850, // uarfcn=192 **OK** **at+wmtxpower?** **+WMTXPOWER: 1,850,192,6,1** **OK**

13. SIM Application Toolkit Commands

13.1. STK Command Usage

Table 1. STK Command Usage

STK Procedure	Command	Involvement	AT Command to Use	Class
Proactive SIM	DISPLAY TEXT	TE	<+STKPCI,0> +STKTR	Class 2
	GET INKEY	TE	<+STKPCI,0> +STKTR	Class 2
	GET INPUT	TE	<+STKPCI,0> +STKTR	Class 2
	MORE TIME	ME	Do Nothing	Class 2
	PLAY TONE	ME	<+STKPCI,1> +STKTR	Class 2
	POLL INTERVAL	ME	Do Nothing	Class 2
	REFRESH	TE / ME	<+STKPCI,1>	Class 2
	SETUP MENU	TE	<+STKPCI,0> +STKTR	Class 2
	SELECT ITEM	TE	<+STKPCI,0> +STKTR	Class 2
	SEND SMS	TE / ME	<+STKPCI,1> +STKSMS	Class 2
	SEND SS	TE / ME	<+STKPCI,1> +STKSS	Class 2
	SEND USSD	TE / ME	<+STKPCI,1> +STKUSSD	Class 2
	SET UP CALL	TE / ME	<+STKPCI,1> +STKCALL	Class 2
	POLLING OFF	ME	Do Nothing	Class 2
	PROVIDE LOCAL INFORMATION	ME	<+STKPCI,1>	Class 2
	SET UP EVENT LIST	ME	<+STKPCI,1>	Class 3
	TIMER MANAGEMENT	ME	Do Nothing	Class 3
	SET UP IDLE MODE TEXT	TE	<+STKPCI,0> +STKTR	Class 3
	RUN AT COMMAND	ME	<+STKPCI,1>	Class B
	SEND DTMF	TE / ME	<+STKPCI,1> +STKDTMF	Class 3
	LANGUAGE NOTIFICATION	TE / ME	<+STKPCI,1>	Class 3
	LAUNCH BROWSER	TE	<+STKPCI,0> +STKTR	Class C
Data Download	SMS-PP data download	ME	Do Nothing	Class 2
	CB data download	ME	Do Nothing	Class 2
Menu Selection		TE	+STKENV	Class 2
Call Control by SIM		ME	Do Nothing	Class 2
MO SMS Control by SIM		ME	Do Nothing	Class 2
Event Download	MT call event	ME	Do Nothing	Class 3
	Call connected event	ME	Do Nothing	Class 3
	Call disconnected event	ME	Do Nothing	Class 3
	Location status event	ME	Do Nothing	Class 3
	User activity event	TE	+STKENV	Class 3
	Idle screen available event	TE	+STKENV	Class 3
	Language selection event	TE	+STKENV	Class 3
	Browser termination event	TE	+STKENV	Class C

13.2. *PSSTKI Command: SIM Toolkit Interface Configuration

HL6528RDx	
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** Parameter **<mode>** 0 No unsolicited result code will be sent to TE. TE won't send proactive command to module. 1 Manual mode. Any unsolicited result code will be sent to TE. TE has to acknowledge with an +STKPRO notification. 2 Auto acknowledge mode. Module answers to STK without TE; any unsolicited result code will be sent to TE. 3 Auto acknowledge mode without sending unsolicited result code to TE.
Reference Sierra Wireless Proprietary	Notes • This AT command configures the AT interface for SIM ToolKit support. • This command is only supported when a SIM card is present. • The setting of <mode> will be kept after the module reboots. • <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 needed and Yes/No responses are expected when done (for the display part): ▪ SET UP IDLE MODE TEXT ▪ DISPLAY TEXT ▪ 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**

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	at*psstki=1 // set STK manual mode
	OK
	
	at*psstki =0 // disable unsolicited result code
	OK
	
	at*psstki=2 // set auto acknowledge mode
	OK
	
	// proactive command SETUP CALL received
	+STKPCI: 1,"D030810301100182028183050B43616C6C696E67202121210606912143658 7F9051043616C6C20696E2070726F6772657373"
	
	// TR is sent automatically here
	+STKPCI: 2
	at+clcc // check connection status
	+CLCC: 1,0,0,0,0,"123456789",145 // active call established (with CMU200)
	OK
	
	at*psstki=3 // set Auto acknowledge mode without sending unsolicited
	// result code to TE
	
	// proactive command SETUP CALL received
	// TR sent automatically
	
	at+clcc // check connection status
	+CLCC: 1,0,0,0,0,"123456789",145 // active call established (with CMU200)
	OK

13.3. +STKCALL Command: STK Call Setup

HL6528RDx	
Test command Syntax **AT+STKCALL=?**	 Response **OK**
Write command Syntax **AT+STKCALL= <TR> [,<add_info>]**	 Response **OK** Parameters **<TR>** Possible terminal response to be responded to by the application 0 Trigger modem to send STK CALLSETUP 4 Trigger modem to send STK CALLSETUP but icon cannot be displayed 16 Proactive session terminated by user 32 ME is currently unable to process this command 33 Network is currently unable to process this command

HL6528RDx	
	34 User rejects setup call 50 Command data is not understood by the ME **<add_info>** Additional information 0 No specific cause can be given 1 Screen is busy 2 ME is currently busy on a call 3 ME is currently busy on an SS transaction 4 No service 5 Access control class bar 6 Radio resource not granted 7 Not in speech call 8 ME is currently busy on a USSD transaction 9 ME is currently busy on a SEND DTMF command 10 No active USIM
Reference Sierra Wireless Proprietary	Notes Refer to Table 1 STK Command Usage.
Example	// SET UP CALL received **+STKPCI: 1,"D030810301100182028183050B43616C6C696E67202121210606912143658 7F9051043616C6C20696E2070726F6772657373"** **at+stkcall=0** // setup STK call **OK** **+STKPCI: 0,"D01A81030121008202810 28D0F0443616C6C20636F6E6E6563746564"** **at+clcc** // check call connection **+CLCC: 1,0,0,0,0,"123456789",145** // active call established (with CMU200) **OK** **Ath** // hang up call **OK** **at+clcc** **OK**

13.4. +STKDTMF Command: STK Sends DTMF

HL6528RDx	
Test command Syntax **AT+STKDTMF=?**	 Response **OK**
Write command Syntax **AT+STKDTMF= <TR> [,<add_info>]**	 Response **OK**

HL6528RDx	
	Parameters **<TR>** Possible terminal response to be responded to by the application 0 Trigger modem to send STK DTMF 4 Trigger modem to send STK DTMF but icon cannot be displayed 32 ME is currently unable to process this command **<add_info>** Additional information 0 No specific cause can be given 1 Screen is busy 2 ME is currently busy on a call 3 ME is currently busy on an SS transaction 4 No service 5 Access control class bar 6 Radio resource not granted 7 Not in speech call 8 ME is currently busy on a USSD transaction 9 ME is currently busy on a SEND DTMF command 10 No active USIM
Reference Sierra Wireless Proprietary	Notes Refer to Table 1 STK Command Usage.
Examples	// SEND DTMF received **+STKPCI: 1,"D00D81030114008202818 32C02C1F2"** **at+stkdtmf=0** **OK** **+STKPCI: 2**

13.5. +STKENV Command: Send STK Envelope

HL6528RDx	
Test command Syntax **AT+STKENV=?**	 Response **OK**
Write command Syntax **AT+STKENV= <stk_command>**	 Response **OK** Parameter **<stk_command>** HEX string of envelope command
Reference Sierra Wireless Proprietary	Notes Refer to Table 1 STK Command Usage.

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Examples	// proactive command SET UP MENU is received
	+STKPCI: 0,"D0818781030125008202818285 0E47656D58706C6F726520434153458F11015573657220696E746572616374696F6E8F13024D6F62696C6520696E746572616374696F6E8F14034E6574776F726B20696E746572616374696F6E8F11044361726420696E746572616374696F6E8F1480436F6D6D6F6E2053544B20666561747572657318052121212121"
	
	// send terminal response (command perform successfully)
	at+stktr="8103012500820282818301 00"
	OK
	
	// select menu item #1
	at+stkenv="d30782028281900101"
	OK
	
	// proactive command SELECT ITEM is received
	+STKPCI: 0,"D0668103012400820281820510436 86F6F736520616E206974656D203A8F0D01446973706C617920746578748F0C0253656C656374206974656D8F0A0347657420696E7075748F0A0447657420696E6B65798F1405536574757020496 46C652053637220546 57874"

13.6. +STKPCI Notification: STK Proactive Command Indication

HL6528RDx	
Unsolicited result code	Response **+STKPCI: <pci_type>[,<proactive_cmd>]** Parameters **<pci_type>** 0 The STK command is handled by TE 1 The STK command is handled by the ME but some commands may need TE involvement, e.g. +STKCALL, +STKSS, etc. 2 No other command (end of session) **<proactive_cmd>** HEX string of STK proactive command sent when <pci_type> = 0 or 1
Reference Sierra Wireless Proprietary	Notes Refer to Table 1 STK Command Usage.

13.7. +STKSMS Command: STK Sends SMS

HL6528RDx	
Test command Syntax **AT+STKSMS=?**	 Response **OK**
Write command Syntax **AT+STKSMS= <TR>**	 Response **OK** Parameters **<TR>** Possible terminal response to be responded to by the application 0 Trigger modem to send STK SMS 4 Trigger modem to send STK SMS but icon cannot be displayed
Reference Sierra Wireless Proprietary	Notes Refer to Table 1 STK Command Usage.
Examples	// SEND SHORT MESSAGE received **+STKPCI: 1,"D022810301130182028183050006059121436587 0B0E01000491341241F205C8329BFD06"** **at+stksms=0** // send STK SMS **OK** **+STKPCI: 2**

13.8. +STKSS Command: STK SS Setup

HL6528RDx	
Test command Syntax **AT+STKSS=?**	 Response **OK**
Write command Syntax **AT+STKSS= <TR> [,<add_info>]**	 Response **OK** Parameters **<TR>** Possible terminal response to be responded to by the application 0 Trigger modem to send STK SS 4 Trigger modem to send STK SS but icon cannot be displayed 50 Command data is not understood by the ME **<add_info>** Additional information 0 No specific cause can be given

HL6528RDx	
Reference Sierra Wireless Proprietary	Notes Refer to Table 1 STK Command Usage.

Examples	// SEND SS received
	// call forward: "**21*01234567890123456789#"
	+STKPCI: 1,"D01D810301110082028183090E91AA120A214365870921436587B91E020101"
	
	at+stkss=0
	OK
	+STKPCI: 2

13.9. +STKTR Command: STK Terminal Response

HL6528RDx	
Test command Syntax **AT+STKTR=?**	 Response **OK**
Write command Syntax **AT+STKTR=<terminal_response>**	 Response **OK** Parameter **<terminal_response>** HEX string of STK response
Reference Sierra Wireless Proprietary	Notes • This command is needed when +STKPCI <pci_type>=0. User uses this command to respond to the proactive command received. • Refer to Table 1 STK Command Usage.

Examples	// proactive command SET UP MENU is received
	+STKPCI: 0,"D0818781030125008202818285 0E47656D58706C6F726520434153458F11015573657220696E746572616374696F6E8F13024D6F62696C6520696E746572616374696F6E8F14034E6574776F726B20696E746572616374696F6E8F11044361726420696E746572616374696F6E8F1480436F6D6D6F6E2053544B20666561747572657318052121212121"
	
	// send terminal response (command perform successfully)
	at+stktr="810301250082028281830100"
	OK
	
	// select menu item #1
	at+stkenv="d30782028281900101"
	OK
	
	// proactive command SELECT ITEM is received
	+STKPCI: 0,"D06681030124008202818205104 3686F6F736520616E206974656D203A8F0D01446973706C617920746578748F0C0253656C65637420697465 6D8F0A0347657420696E7075748F0A0447657420696E6B65798F1405536574757020496 46C652053637220546 57874"

13.10. +STKUSSD Command: STK USSD Setup

HL6528RDx	
Test command Syntax **AT+STKUSSD=?**	 Response **OK**
Write command Syntax **AT+STKUSSD= <TR> [,<add_info>]**	 Response **OK** Parameters **<TR>** Possible terminal response to be responded to by the application 0 Trigger modem to send STK USSD 4 Trigger modem to send STK USSD but icon cannot be displayed 50 Command data is not understood by the ME **<add_info>** Additional information 0 No specific cause can be given
Reference Sierra Wireless Proprietary	Notes Refer to Table 1 STK Command Usage.

Examples	// SEND USSD received
	// specified USSD string ("ABCDEFGHIJKLMNOPQRSTUVWXYZ-
	// abcdefghijklmnopqrstuvwxyz-1234567890")
	+STKPCI: 1,"D04C810301120082028183 0A4144414243444546474849 4A4B4C4D4E4F5051525 35455565758595A2D6162636465666768696A6B6C6D6E6F70717273747576778797 A2D31323334353637383930"
	
	at+stkussd=0
	OK
	+CUSD: 4 // in this case, USSD is not supported
	+STKPCI: 2

14. NV Related Commands

14.1. NV Backup Coverage

NV backup encompasses the following:

- All factory NV, including important and calibrated data.
- All Sierra Wireless NV except NV logs.
- Some user NV for configuration.

14.2. Auto Generation of NV Backup Files

The firmware automatically generates NV backup files from existing NV data after boot if:

- an NV backup of a partition does not exist,
- An NV backup file exists, but the firmware version is different from the records in the NV.

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

14.3. Auto Recovery from Backup NV Files

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

The firmware automatically recovers NV data from available NV backups when one or more NV items are corrupted during NV read. This is notified with +NVBU_IND with <status>=1 on all AT ports.

Manual NV data restores all data from the backup file to the currently used NV.

If all NV has been erased because of FAT formatting, all data in the NV backup file will be used for NV restore. For NV data not in the backup file, default firmware values will be written.

14.4. +NVBU: NV Backup Status and Control

HL6528RDx	
Test command Syntax **AT+NVBU=?**	 Response **+NVBU: (0-2)** **OK**
Read command Syntax **AT+NVBU?**	 Response **ERROR**

HL6528RDx

Write command

Syntax

For <mode> = 0 or 1:
AT+NVBU=<mode>

For <mode>=2:
AT+NVBU=<mode>[,<clear>]

Response

For <mode>=0 or 1:
+NVBU_IND: <status>
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

<status>	0	Indicates completion of NV backup generation
	1	Indicates that backup data has been restored
<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 and restore operations
<log data>	Log data of NV backup or restore operation (maximum of 500 lines)	
<clear>	0	Read log
	1	Clear log

Reference

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Examples

at+nvbu=2

[2004/01/01 01:42:52] LOG: SYS@AHL6528RD.1.9.0.11CV10F23.20151204TEST.m6261a_1

[2004/01/01 01:42:52] GEN: Software version changed. Automatic generating NVRAM backup..

[2004/01/01 01:42:56] GEN: Number of NVRAM backup=48

[2004/01/01 01:42:56] GEN: MT1F MT0Z MT48 SU00 SU01 SU02 SU03 SU04 SU05 SU06

[2004/01/01 01:42:56] GEN: SU07 SU08 SU09 SU0C SUA0 SUA1 SUA2 SUA3 SUA4 SUA5

[2004/01/01 01:42:56] GEN: SUA6 SUA7 MT05 MT06 MT07 MT08 MT09 MT0I MT0J MT0K

[2004/01/01 01:42:56] GEN: MT0L MT0M MT0N MT0O MT0P MT0Q MT0R MT1V MP09 MPA2

[2004/01/01 01:42:56] GEN: MPA8 MP0B ST33 SF00 SF01 SF02 MT00 CA00

[2004/01/01 01:42:56] GEN: NVRAM backup generated successfully

[2004/01/01 01:43:33] RES: User triggered NVRAM restore..

[2004/01/01 01:43:34] RES: Number of NVRAM restored=48

[2004/01/01 01:43:34] RES: MT1F MT0Z MT48 SU00 SU01 SU02 SU03 SU04 SU05 SU06

[2004/01/01 01:43:34] RES: SU07 SU08 SU09 SU0C SUA0 SUA1 SUA2 SUA3 SUA4 SUA5

[2004/01/01 01:43:34] RES: SUA6 SUA7 MT05 MT06 MT07 MT08 MT09 MT0I MT0J MT0K

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	[2004/01/01 01:43:34] RES: MT0L MT0M MT0N MT0O MT0P MT0Q MT0R MT1V MP09 MPA2 **[2004/01/01 01:43:34] RES: MPA8 MP0B ST33 SF00 SF01 SF02 MT00 CA00** **[2004/01/01 01:43:34] RES: All NVRAM restored successfully** **OK**

14.5. +NVBU_IND: NV Backup Status Notification

HL6528RDx	
Unsolicited Notification	Response **+NVBU_IND: <status>[,<nb_restored_nv>]** If <status> = 1 **+NVBU_IND: <status>, <nb_restored_nv>** Parameters **<status>** Status of the NV backup 0 Indicates completion of NV backup generation 1 Indicates that backup data was restored after an NV corruption was detected **<nb_restored_nv>** Number of restored NV
Reference Sierra Wireless Proprietary	

15. AVMS Commands

15.1. +WDSA Command: Change Account for DM Connection

HL6528RDx	
Test command Syntax **AT+WDSA=?**	 Response **+WDSA:** (list of supported **<ServerId>**s) **OK**
Read command Syntax **AT+WDSA?**	 Response **+WDSA: <ServerId>** **OK**
Write command Syntax **AT+WDSA= <serverId>**	 Response **OK** **+CME ERROR <err>** Parameters **<ServerId>** ServerId associated with the account
Reference Sierra Wireless Proprietary Command	Notes This command is available when the embedded module has finished Device Services initialization (see +WDSI command description) and when AVMS services are activated (see +WDSG command).
Examples	**AT+WDSA=?** **+WDSA: (“Cingular”, “Cingularlab”,”WAVECOM-RDMS-SERVER)** **OK** **AT+WDSA=”WAVECOM-RDMS-SERVER”** **OK** **AT+WDSA?** **+WDSA: “WAVECOM-RDMS-SERVER”** **OK**

15.2. +WDSC Command: Device Services Configuration

HL6528RDx	
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** **+CME ERROR <err>** Parameters **<Mode>** 0 User agreement for connection When this mode is activated and when a notification SMS is received by the embedded module, an indication (see +WDSI indication for more information) is returned by the embedded module to request for an agreement before connecting to the AirVantage Management Services server 1 User agreement for package download When this mode is activated, an indication (see +WDSI indication for more information) is returned by the embedded module to request for an agreement before downloading any package 2 User agreement for package install When this mode is activated, an indication (see +WDSI indication for more information) is returned by the embedded module to request for an agreement before installing any package 3 Polling mode The embedded module will initiate a connection to the Device Services server according to the defined timer 4 Retry mode If an error occurs during a connection to the Device Services server (GPRS establishment failed, http error code received), the embedded module will initiate a new connection according to the defined timers. This mechanism is persistent to the reset. **<State>** Mode status For <Mode> = 0, 1 or 2: 0 Disabled 1 Enabled

HL6528RDx	
	For <Mode> = 3, value in the range of 0 – 525600 minutes: 0 Polling mode is deactivated **<Timer_1>** Timer between the first failed connection and the next attempt. Value in range of 0 to 20160 minutes. Default value = 15. 0 Retry mode is deactivated **<Timer_n>** Timer between the n^{th} failed attempt connection and the $(n+1)^{th}$ connection ($n \leq 8$). Value in the range of 1 to 20160 minutes. Default values: <Timer_2> = 60 <Timer_3> = 240 <Timer_4> = 960 <Timer_5> = 2880 <Timer_6> = 10080 <Timer_7> = 10080
Reference Sierra Wireless Proprietary Command	Notes • This command is available when the Wireless CPU has finished the Device Services initialization (see +WDSI command description) and when the AVMS services are in prohibited state (see +WDSG command). • Parameters <State> and <Timer_1> to <Timer_n> are stored in non-volatile memory without sending &W command. &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**

15.3. +WDSE Command: Device Services Error

HL6528RDx	
Execute command Syntax **AT+WDSE**	Response **[+WDSE:<HTTP_Status>]** **OK** **+CME ERROR <err>** Parameters **<HTTP_Status>** 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 returns only OK, without +WDSE: <HTTP_Status> intermediary response.

HL6528RDx	
Reference Sierra Wireless Proprietary Command	Notes This command is available when the embedded module has finished Device Services initialization (see +WDSI command description) and when AVMS services are activated (see +WDSG command).
Examples	**AT+WDSS=1,1** // A session was made with the server **OK** **AT+WDSE** **+WDSE: 200** // The last HTTP response received is “OK” **OK**

15.4. +WDSF Command: Device Services Fallback

HL6528RDx	
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** **+CME ERROR <err>** Parameters **<Mode>** 1 Downgrade to a previous installation 2 Delete the downloaded package which contains the reverse patch **<FallbackInfo>** Indicate the presence of a previous package 0 Previous package is not present 1 Previous package is present **<EraseInfo>** Indicates if a package can be deleted. Note that erasing the package will disable the possibility of making any recovery or manual fallback. 0 The package cannot be deleted 1 The package can be deleted
Reference Sierra Wireless Proprietary Command	Notes This command is available when the embedded module has finished Device Services initialization (see +WDSI command description).

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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
	// Package downgrade is successfully done, displayed only if +WDSI indication is
	// activated.

15.5. +WDSG Command: Device Services General Status

HL6528RDx	
Test command Syntax **AT+WDSG=?**	 Response **OK**
Execute command Syntax **AT+WDSG**	 Response **+WDSG: <Indication>,<State>** **[+WDSG: <Indication>,<State>[…]]** **OK** **+CME ERROR <err>** Parameters **<Indication>** 0 Device services activation state 1 Session and package indication **<State>** Indication status For <Indication>=0: 0 Device services are prohibited. Devices services will never be activated. 1 Device services are deactivated. Connection parameters to a device services have to be provisioned. 2 Device services have to be provisioned. NAP parameters have to be provisioned. 3 Device services are activated If a device has never been activated (first use of device services on this device), <State> is set to 1. The connection parameters are automatically provisioned, and 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 is installed or a recovery was made, <State> is set to 0.

HL6528RDx	
Reference Sierra Wireless Proprietary Command	Notes This command is available when the embedded module has finished Device Services initialization (see +WDSI command description).
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**

15.6. +WDSI Command: Device Services Indications

HL6528RDx	
Read 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** **+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 and 13) 64 Activate the update indications (<Event>=14, 15 and 16) 128 Activate the fallback indication (<Event>=17) 256 Activate download progress indication (<Event>=18) 512 Reversed 1024 Reversed 2048 Activate provisioning indication (<Event>=21) 4096 Reserved

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

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	For<Event>=18, <Data> indicates the download progress in percentage. For<Event>=21, <Data> indicates the provisioned parameters: 9 Device Service Polling mode (see +WDSC command for more information)
Unsolicited Notification	Response **+WDSI: <Event>[,<Data>]**
Reference Sierra Wireless Proprietary Command	Notes • This command is available when the embedded module has finished its initialization. • To receive +WDSI indications, Device Services should be activated (see +WDSG command for more information). • <Level> is stored in non-volatile memory without using AT&W. The default value can be restored using AT&F.
Examples	**AT+WDSI=?** **+WDSI: (0-4096)** **OK** **AT+WDSI?** **+WDSI: 0** // All indications are deactivated **OK** **AT+WDSI=4096** **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 AirVantage // 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

15.7. +WDSM Command: Manage Device Services

HL6528RDx	
Test command Syntax **AT+WDSM=?**	Response **+WDSM:** (list of supported **<Mode>**s),(list of supported **<State>**s) **OK**

HL6528RDx	
Read command Syntax **AT+WDSM?**	 Response **+WDSM: 0,<State>** **+WDSM: 1,<State>** **OK**
Write command Syntax **AT+WDSM=<Mode>,<State>**	 Response **OK** **+CME ERROR <err>** Parameters **<Mode>** APN backup 0 If the AVMS APN (filled using +WDSS command) is incorrect, the module will use the APN defined by +CGDCONT. 1 If the AVMS APN has not been filled using +WDSS, the module will use the APN defined by +CGDCONT. Each APN will be used until successful session activation. If an AVMS session succeeds, the corresponding APN is copied in the +WDSS command and remains after the AVMS session ends. **<State>** <Mode> status 0 Disable 1 Enable
Reference Sierra Wireless Proprietary Command	Notes <State> is stored in non-volatile memory without sending AT&W. AT&F has no impact on this value.
Examples	**AT+WDSM=?** **+WDSM: (0-1),(0-1)** **OK** **AT+WDSM?** **+WDSM: 0,1** **+WDSM: 1,1** **OK** // All modes are activated **AT+WDSM=0,0** **OK** **AT+WDSM?** **+WDSM: 0,0** **+WDSM: 1,1** **OK**

15.8. +WDSR Command: Device Services Reply

HL6528RDx	
Test command Syntax **AT+WDSR=?**	 Response **+WDSR:** (list of supported **<Reply>**s),(list of supported **<Timer>**s) **OK**
Write command Syntax **AT+WDSR= <Reply> [,<Timer>]**	 Response **OK** **+CME ERROR <err>** Parameters **<Reply>** Reply to user agreement request (see +WDSI command description) 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>** Timer in minutes until a new user agreement request is returned by the module. This parameter is only available when <Reply>=0, 2 or 5. Range = 0 to 1440; default value = 30. Value 0 indicates that the application refuses the user agreement (impossible when <reply>=5).
Reference Sierra Wireless Proprietary Command	Notes • This command is available when the embedded module has finished Device Services initialization (see +WDSI command description) and when AVMS services are activated (see +WDSG command). • It is not possible to refuse an install request (AT+WDSR=5,0). Doing so will return +CME ERROR: 3. • If the embedded module is powered down and not powered on until after an install delay, the new user agreement request is returned at the new 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

15.9. +WDSS Command: Device Services Session

HL6528RDx	
Test command Syntax **AT+WDSS=?**	Response **+WDSS: 0,**(Max length for **<Apn>**),(Max length for **<User>**),(Max length for **<Pwd>**) **[+WDSS: 1,** (list of supported **<Action>**s for this **<Mode>**)] **OK**
Read command Syntax **AT+WDSS?**	Response **[+WDSS: 0,<Apn>[,<User>]]** **[+WDSS: 1,<Action>]** **OK**
Write command Syntax For <Mode>=0 **AT+WDSS=<Mode>[,<Apn>[,<User>[,<Pwd>]]]** For <Mode>=1 **AT+WDSS=<Mode>,<Action>**	Response **OK** **+CME ERROR <err>** Parameters **<Mode>** 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 **<User>** Login for the APN. String type, up to 30 characters **<Pwd>** Password for the APN. String type, up to 30 characters **<Action>** Used when <Mode>=1 only 0 Release the current connection to the Device Services server (default value) 1 Establish a connection to the Device Services server
Reference Sierra Wireless Proprietary Command	Notes • This command is available when the embedded module has finished Device Services initialization (see +WDSI command description). • <Apn>, <User> and <Pwd> are stored in non-volatile memory without using AT&W. AT&F has no effect on these parameters. • AT+WDSS? only returns OK if no APN is defined. • When a request is sent to the embedded module to resume an inexistent or unsuspended session, +CME ERROR: 3 is returned. • When a request is sent to the embedded module to release an inexistent session, +CME ERROR: 3 is returned. • Depending on +WDSM configuration, when no dedicated NAP is defined using +WDSS and a session is asked (by an AT command or notified by SMS), the embedded module will use a NAP defined by +CGDCONT 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).

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	• Activation is done if the embedded module is registered on the network. If the embedded module is not registered when the command is performed, the activation will be done at the next network registration (even if the embedded module resets). • No GPRS connection to the AirVantage Management Services server is possible when a registration is not completed.
Examples	**AT+WDSS?** **OK** // No APN defined **AT+WDSS=?** **+WDSS: 0, 50,30,30** **OK** **AT+WDSS=0,"Sierra Wireless"** // Define the APN for the Device Services Sierra Wireless **OK** **AT+WDSS=?** **+WDSS: 0, 50,30,30** **+WDSS: 1,(0-1)** **OK** **AT+WDSS?** **+WDSS: 0,"Sierra Wireless"** **+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**

16. Protocol Specific Commands

16.1. Preliminary Comments

Sierra Wireless has developed a set of proprietary AT Commands to simplify data exchanges using UDP protocol.

16.2. IP Address Format in AT Commands

Unless specified elsewhere, the format used for IP address fields in AT commands described in this chapter consists of dot-separated decimal (0-255) parameters of the form a1.a2.a3.a4.

16.3. Session ID

Protocol specific AT commands share the same range of session IDs. Session ID <session_id> is a unique number and ranges from 1 to 25.

16.4. Connection of PDP Contexts

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

16.5. Buffer Length of AT Command

In AT command mode, the maximum length of an AT command is 1023 characters; any 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 would still be bounded 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.

16.6. 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.

16.7. Connection Configuration

16.7.1. +KCNXCFG Command: GPRS Connection Configuration

HL6528RDx	
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>**),**<ip>**,**<dns1>**,**<dns2>** **OK**
Read command Syntax **AT+KCNXCFG?**	Response **+KCNXCFG: <cnx cnf>, "GPRS", <apn>,<login>,<password>,<ip>,<dns1>,<dns2>, <state>** **[...]>** **OK**
Write command Syntax **AT+KCNXCFG= <cnx cnf>, "GPRS",<apn> [,[<login>] [,[<password>] [,[<ip>] [,[<dns1>] [,<dns2>]]]]]**	Response **OK** Parameters **<cnx cnf>** 1 – 5 PDP context configuration; a numeric parameter which specifies a particular PDP context configuration **<apn>** Access Point Name; string parameter with maximum size = 63 bytes. Logical name used to select the GGSN or the external packet data network. **<login>** Cnx user name. String type with maximum size = 24 bytes **<password>** Cnx password. String type with maximum size = 24 bytes **<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.

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	<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. **<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 the IP services described in the following chapters. The **AT+KCNXCFG** command is only defined to set the current parameters. The defined connection will be automatically opened when needed by the IP services (e.g. UDP service). • When the connection is up, the read command returns the actual values used by the connection interface.

16.7.2. +KCNXTIMER Command: Connection Timer Configuration

HL6528RDx	
Test command Syntax **AT+KCNXTIMER=?**	Response **+KCNXTIMER:** (list of supported **<cnx cnf>**s),(list of supported **<tim1>**s),(list of supported **<nbtrial>**s),(list of supported **<tim2>**s) ,(list of supported **<idletime>**s) **OK**
Read command Syntax **AT+KCNXTIMER?**	Response **+KCNXTIMER: <cnx cnf>,<tim1>,<nbtrial>,<tim2>,<idletime>** **[…]** **OK**
Write command Syntax **AT+KCNXTIMER=<cnx cnf>[,[<tim1>][,[<nbrtrial>][,<tim2>][,<idletime>]]]]**	Response **OK** Parameters **<cnx cnf>** 1 – 5 PDP context configuration; a numeric parameter which specifies a particular PDP context configuration **<tim1>** 1 – 120s (default value = 30s) If module fails to activate the PDP context, a timer of <tim1> will be started. When this timer expires, it will try to activate the PDP context again.

HL6528RDx	
	<nbtrial> 1 – 4 (default value = 2) Number of attempt times the module will try to activate the PDP context with max <nbtrial>. **<tim2>** 0 – 300s (default value = 60s) 0 Deactivated (connection will not close by itself) For client sockets, the module will try to connect to the server within <tim2>s; if <tim2> expires, it will give up the connection. **<idletime>** 0 – 1800s (default value = 30s) 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 an impact on **+KUDPCFG**.

16.7.3. +KCNXPROFILE Command: Current Profile Connection Configuration

HL6528RDx	
Test command Syntax **AT+ KCNXPROFILE =?**	Response **+KCNXPROFILE: (**list of possible **<cnx cnf>**s**)** **OK**
Read command Syntax **AT+ KCNXPROFILE?**	Response **+KCNXPROFILE: <cnx cnf>** **OK**
Write command Syntax **AT+ KCNXPROFILE= <cnx cnf>**	Response **OK** Parameter **<cnx cnf>** 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 **+KUDPCFG**, if the <cnx cnf> parameter is not given in this command.

16.7.4. +KCGPADDR Command: Display PDP Address

HL6528RDx	
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 **+KUDPCFG** to display the local IP address of the module. • Only the first two local IP addresses will be displayed.

16.7.5. +KCNX_IND Notification: Connection Status Notification

HL6528RDx	
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 <nbtrial> 3 Closed 4 Connecting 5 Idle time down counting started for disconnection 6 Idle time down counting canceled **<af>** 0 IPV4 **<tim1>** Refer to **+KCNXTIMER** **<attempt>** Current attempt of bringing up of PDP connection

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	<nbtrial> Refer to **+KCNXTIMER** **<idletime>** Refer to **+KCNXTIMER**
Reference Sierra Wireless Proprietary	

16.7.6. +KCNXUP Command: Bring the PDP Connection Up

HL6528RDx	
Test command Syntax **AT+KCNXUP=?**	Response **+KCNXUP:** (list of possible **<cnx_cnf>**s) **OK**
Write command Syntax **AT+KCNXUP=<cnx_cnf>**	Response **OK** Parameter **<cnx cnf>** 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. • Only two PDP contexts (<cnx_cnf>) can be activated simultaneously. The activated <cnx_cnf> can be checked using **+KCGPADDR**.

16.7.7. +KCNXDOWN Command: Bring the PDP Connection Down

HL6528RDx	
Test command Syntax **AT+KCNXDOWN=?**	Response **+KCNXDOWN:** (list of possible **<cnx_cnf>**s),(list of possible **<mode>**s) **OK**

HL6528RDx	
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 an active session exists
Reference Sierra Wireless Proprietary	

16.8. Common Configuration

16.8.1. +KPATTERN Command: Custom End of Data Pattern

HL6528RDx	
Read command Syntax **AT+KPATTERN?**	Response **+KPATTERN: <EOF pattern>** **OK**
Write command Syntax **AT+KPATTERN = <EOF pattern>**	Response **OK** **+CME ERROR <err>** Parameter **<EOF pattern>** String type with maximum 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 with 100ms or higher timeout and without data following. The timeout value is equal to <wait_time> of **+KIPOPT**. • Received data is stored with buffer size <send size v4> 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> is larger than the size of the <EOF pattern>.

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

HL6528RDx	
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 (not supported) "TCPS" TCP server session (not supported) "UDPC" UDP client session "UDPS" UDP server session "FTP" FTP client session (not supported) "HTTP" HTTP client session (not supported) "HTTPS" HTTPS client session (not supported) "TCP" Both TCP client and TCP server sessions (not supported) "UDP" Both UDP client and UDP server sessions **<noti_act>** 1 Enable URC (like **+KUDP_NOTIF**) 0 Disable URC **<indi_act>** 1 Enable URC (like **+KUDP_IND**, **+KUDP_DATA**, **+KUDP_RCV**) 0 Disable URC
Examples	To disable URC: **AT+KURCCFG="UDP",0** **OK** Test and read command: **AT+KURCCFG=?** **+KURCCFG: ("UDPC","UDPS","UDP"),(0-1),(0-1)** **OK** **AT+KURCCFG?** **+KURCCFG: "UDPC",1,1** **+KURCCFG: "UDPS",1,1** **OK**
Reference Sierra Wireless Proprietary	Notes • If disabled, URCs are discarded and not stored. • Can be used in 07.10 multiplexer

16.8.3. +KIPOPT Command: General Options Configuration

HL6528RDx	
Test command Syntax **AT+KIPOPT=?**	 Response **+KIPOPT: 0,<UDP>,(1-100),(8-1472)** **+KIPOPT: 3,(0-1),(0-1)** **OK**
Read command Syntax **AT+KIPOPT?**	 Response **+KIPOPT: 0,<proto>,<wait time>,<send size v4>** **[...]** **+KIPOPT: 3,<stop_on_error>, <stop_on_peer>** **OK**
Write command Syntax If <option_id>=0 **AT+KIPOPT= <option_id>, <proto>,<wait time> [,<send size v4>]** If <option_id>=3 **AT+KIPOPT= <option_id>, <stop_on_error>, <stop_on_peer>**	 Response **OK** **+CME ERROR<err>** Parameters **<option_id>** Option ID 0 Wait time, send size threshold configuration 1 HTTP chunked transfer encoding (not supported) 2 HTTP maximum redirection (not supported) 3 PDP connection deactivated behavior 4 SSL version for use in KHTTPS (not supported) **<proto>** Protocol, string type “TCPC” TCP client session (not supported) “TCPS” TCP server session (not supported) “UDPC” UDP client session “UDPS” UDP server session “FTP” FTP client session (not supported) “HTTP” HTTP client session (not supported) “HTTPS” HTTPS client session (not supported) “TCP” Both TCP client and TCP server sessions (not supported) “UDP” Both UDP client and UDP server sessions **<wait time>** Timeout for sending buffered data to peer; it specifies the timeout after which the buffered data received from the AT terminal will be sent to the peer irrespective of data packet size. Value is in 100 ms units. Range: 1 – 100, default value = 2 **<send size v4>** Data size threshold for IPv4 sessions. When the buffered data received from the AT terminal reaches this threshold, the data is sent to the socket layer. Range: 8 – 1472, default value = 1020

HL6528RDx	
	<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 "chunked" 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
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. **+KUDPCLOSE**) • <send size v4> controls 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. Data is sent as a UDP packet. • 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 the module is rebooted. • <send size v4> impacts the detection of <EOF pattern>; refer to the notes of **+KPATTERN** for more information.

16.9. UDP Specific Commands

16.9.1. +KUDPCFG Command: UDP Connection Configuration

HL6528RDx	
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**)** **OK**
Read command Syntax **AT+KUDPCFG?**	Response **+KUDPCFG: <session_id>,<cnx cnf>,<mode>,<port>,<data_mode>, <udp remote address>,<udp_port>** **[…]** **OK**
Write command Syntax **AT+KUDPCFG= <cnx cnf>, <mode>[,[<port>] [,<data_mode>], [<udp remote address>] , <udp_port>**	Response **+KUDPCFG: <session_id>** **OK** Error case **NO CARRIER** **+CME ERROR: <err>** **+KUDP_NOTIF: <session_id>, <udp_notif>** Parameters **<session_id>** UDP session index **<mode>** 0 Client 1 Server **<port>** 0 – 65535 Numeric parameter; default value = 0 (random) **<cnx cnf>** 1 – 5 PDP context configuration; a numeric parameter which specifies a particular PDP context configuration (see section 16.7.1 +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

HL6528RDx	
	<data_mode> 0 Do not display <data> in URC 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; default value = 0 (given by **+KUDPSND**).
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 25.When more than two different APN are used in **+KCNXCFG**, only one of them can be used in TCP or UDP services. • **+KCNXCFG** configuration should be set up in order to start the connection properly. • When using **+++** to abort sending UDP data, URC **+KUDP_NOTIF: <session_id>,8** could be displayed. • Only two UDP connections with different <cnx_cnf>s can be set up simultaneously. The activated <cnx_cnf> can be checked using **+KCGPADDR**.

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

HL6528RDx	
Unsolicited Notification	Response **+KUDP_DATA: <session_id>,<ndata available>[,<udp remote address>,<udp remote port>,<data>]** 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 Numeric parameter **<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> is 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> is 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. Windows) to send more than 1472 bytes of UDP packet to

HL6528RDx	
	the module but the packet will be segmented and then 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> is set to 1, the fields <udp remote address> and <udp remote port> will be displayed in URC **+KUDP_DATA**. When <data_mode> is set to 0, they will be displayed in URC **+KUDP_RCV**.

16.9.3. +KUDPCLOSE Command: Close Current UDP Operation

HL6528RDx	
Test command Syntax **AT+KUDPCLOSE=?**	Response **+KUDPCLOSE: (**list of possible **<session_id>**s**),(**list of possible **<keep_cfg>**s**)** **OK**
Action command Syntax **AT+KUDPCLOSE=<session_id>[,<keep_cfg>]**	Response **OK** **+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 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 would be released. • This function will delete the session configuration if <keep_cfg> = 0.

16.9.4. +KUDPDEL Command: Delete a Configured UDP Session

HL6528RDx	
Test command Syntax **AT+KUDPDEL=?**	Response **+KUDPDEL: (**list of possible **<session_id>**s**)** **OK**

HL6528RDx	
Write command Syntax **AT+KUDPDEL= <session_id>**	Response **OK** **+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.

16.9.5. +KUDP_IND Notification: UDP Status

HL6528RDx	
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	

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

HL6528RDx	
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** Error case **NO CARRIER** **+CME ERROR: <err>** **+KUDP_NOTIF: <session_id>,< udp_notif>**

HL6528RDx	
	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 (maximum value = 4294967295) **<udp_notif>** See command **AT+KUDPCFG**
Reference Sierra Wireless Proprietary	Notes • User must use <EOF pattern> to finish sending; the module will then return 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>. • Before using this command, it is highly recommended to configure the module for hardware flow control, using the command **AT&K3**. • The behavior of DTR drop meets with **AT&D**. • Using **+++** can abort sending data and using **ATO[n]** to return to data mode. • The maximum transmission unit (MTU) is 1500 bytes. • The <udp remote address> and <udp_port> are saved internally; 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); default value for both parameter is 1020 bytes. • If sending is suspended or aborted using **+++** or by toggling DTR, **+KUDP_NOTIF: <session_id>,8** is displayed. • All URCs are not buffered while AT commands are being entered in an AT port and before entering data mode. Some URCs are not buffered while the AT port is in data mode except for proprietary AT commands (of the form AT+Kxxx), SMS AT commands, GNSS AT commands and Internet AT commands.

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

HL6528RDx	
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>**

HL6528RDx	
	Error case **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>** 0 – 255 Dot-separated numeric parameters of the form a1.a2.a3.a4 **<udp remote port>** 0 – 65535 Numeric parameter **<ndata available>** Number of bytes to be read in the first received packet **<udp_notif>** See command **AT+KUDPCFG** **<ndata missed>** Number of bytes left (and lost) in the UDP socket
Reference Sierra Wireless Proprietary	Notes • This function is used to receive <ndata> data bytes through a previously opened UDP socket. • <ndata> indicates the maximum bytes of data that the terminal wishes to receive. If the UDP socket contains more data than <ndata> bytes then only <ndata> bytes will be received; more data can be read by running this command again. • <EOF pattern> is 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. • Before using this command, it is highly recommended to configure the module for hardware flow control using the command **AT&K3**. • The behavior of DTR drop meets with **AT&D**.

17. Appendix

17.1. Error Codes

17.1.1. CME Error Codes

Table 2. CME Error Codes

<err>	Description
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

<err>	Description
45	Service provider personalization PUK required
46	Corporate personalization PIN required
47	Corporate personalization PUK required
50	Incorrect parameters
99	Resource limitation
100	Unknown
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
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 25)
913	Socket connection timer timeout
914	Control socket connection timer timeout
915	A parameter is not expected
916	A parameter has an invalid range of values
917	A parameter is missing
918	Feature is not supported
919	Feature is not available
920	Protocol is not supported
921	Error due to invalid state of bearer connection
922	Error due to invalid state of session
923	Error due to invalid state of terminal 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

<err>	Description
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

17.1.2. CMS Error Codes

Table 3. CMS Error Codes

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

<err>	Description
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	D0 SIM SMS storage full
209	No SMS storage capability in SIM
210	Error in MS
211	Memory Capacity Exceeded
212	SIM Application Toolkit Busy
213	SIM data download error
255	Unspecified error cause
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	no network service
332	Network timeout
340	NO +CNMA ACK EXPECTED
500	Unknown error

17.1.3. GPRS Error Codes

Table 4. GPRS Error Codes

<err>	Description
Errors related to a failure to perform an Attach	
103	Illegal MS (#3)
106	Illegal ME (#6)
107	GPRS services not allowed (#7)
111	PLMN not allowed (#11)
112	Location area not allowed (#12)
113	Roaming not allowed in this location area (#13)
Errors related to a failure to activate a Context	
132	Service option not supported (#32)
133	Requested service option not subscribed (#33)
134	Service option temporarily out of order (#34)
Other GPRS Errors	
149	PDP authentication failure
148	Unspecified GPRS error
150	Invalid mobile class

Values in parentheses are TS 24.008 cause codes.

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

17.1.4. AVMS Error Codes

AVMS commands return **OK** when the command is correctly executed; and returns **+CME ERROR: 3** when:

- a parameter is out of range (except for APN, user and pwd)
- a requested action is not applicable to the session status

Other error codes used by AVMS commands are listed in the following table.

Table 5. AVMS Error Codes

<err> value	Description
3	A parameter is out of range; Device Services is not in a good state
24	<Apn>, <User> or <Pwd> is too long
650	General error
651	Communication error
652	Session in progress
654	RDMS services are in DEACTIVATED state
655	RDMS services are in PROHIBITED state (see +WDSG)
656	RDMS services are in TO BE PROVISIONED state. No NAP are available (neither in +CGDCONT)

17.1.5. CEER Error Codes

Table 6. CEER Error Codes

<cause>	<report>
0	No cause information available
1	Unassigned (unallocated) number
3	No route destination
6	Channel unacceptable
8	Operator determined barring
10	Call barred
11	Reserved
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Call rejected
22	Number changed
25	Pre-emption
26	Non selected user clearing
27	Destination out of order
28	Invalid number format (incomplete number)
29	Facility rejected
30	Response to STATUS ENQUIRY
31	Normal, unspecified
34	No circuit / channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit / channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred with in the CUG
57	Bearer capability not authorized
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 ACM max
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

<cause>	<report>
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
111	Protocol error, unspecified
112	Location area not allowed
127	Interworking, unspecified
128	Unknown

17.2. How to Use UDP Specific Commands

17.2.1. Client Mode

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

AT+KUDPRCV=1, 16	Same test but try to read 16 bytes from session 1
CONNECT	
This is a simple	
-EOF--Pattern--	
OK	
+KUDP_DATA_MISSED: 1,19	There are 19 unread bytes left and missed in the UDP socket
AT+KUDPCLOSE=1	Definitely close the UDP session and at the same time session is deleted
OK	
AT+KUDPCFG?	No sessions are available now
OK	

17.2.2. Server Mode

AT&K3	Hardware flow control activation
OK	
AT+KCNXCFG=1,"GPRS","APN","log","password","0.0.0.0","0.0.0.0","0.0.0.0"	Set GPRS parameters (APN, login, password)
OK	
AT+KUDPCFG=1,1,3000	Set UDP listener(Port 3000). Initiate the server.
+KUDPCFG: 1	Returns session ID
OK	
AT+KUDPCFG?	Check if the server is initiated
+KUDPCFG: 1,0,1,3000	
OK	
AT+KCGPADDR	Get local IP address and let client know
+KCGPADDR: 0, "192.168.0.71"	
OK	
+KUDP_DATA: 1,9	Data comes in from some client
AT+KUDPRCV=1,9	Receive data and display
CONNECT	
DATA TEST--EOF--Pattern--	
OK	
+KUDP_RCV: "10.10.10.5",1111	This data was from "10.10.10.5"(Port:1111)
AT+KUDPSND=1,”10.10.10.5”,3100,18	Send 18Bytes to a remote server(Port:3100) Some data with "-EOF--Pattern--" in the end
CONNECT	
OK	
AT+KUDPCLOSE=1	Close the UDP server and at the same time session is deleted
OK	
AT+KUDPCFG?	No sessions are available now
OK	

17.3. Sleep Mode Management

Sleep mode allows the module to be placed in a state of low energy consumption. The module cannot receive any AT commands while in this mode.

17.3.1. Determining if the Module is in Sleep Mode

Currently, CTS cannot be used to indicate whether the module is in sleep mode or not. However, when the module is in sleep mode:

- The CTS signal will be toggling ON and OFF when hardware flow control is used (**AT&K3**)
- The CTS signal is always ON when all flow control is disabled (**AT&K0**)

17.3.2. Sleep States

	+KSLEEP=0 (DTR Controls Sleep)		**+KSLEEP=1 (Auto Sleep)**	**+KSLEEP=2 (Sleep is Forbidden)**
	DTR is Active	**DTR is Inactive**		
USB is active (power on)	No sleep	No sleep	No sleep	No sleep
After module starts up	No sleep	Sleep	Sleep after at least 5s	No sleep
No activity on the AT channels (even if a PDP context is opened or a channel is in data mode)	No sleep	Sleep	Sleep after at least 5s	No sleep

Note: In all the sleep cases, the module will not sleep when there are other ongoing activities such as network searching/registering, SIM card reading etc. The module will sleep when there are no other pending activity.

17.3.3. Events that Wake the Module Up

	+KSLEEP=0 (DTR Controls Sleep)		**+KSLEEP=1 (Auto Sleep)**	**+KSLEEP=2 (Sleep is Forbidden)**
	DTR is Active	**DTR is Inactive**		
Any URC is sent (voice call ring, SMS, alarm, network, etc.)	No sleep	Wake up, URC is sent	Wake up, URC is sent	No sleep
Sent 0x00 character on the UART*	No sleep	Sleep	Wake up	No sleep
Data is received on the AT channels (data call, TCP, UDP, etc.)	No sleep	Sleep	Wake up	No sleep
Toggle RTS signal (inactive to active)	No sleep	Sleep	Wake up	No sleep
Toggle DTR inactive to active	Wake up	-	Wake up	No sleep
Toggle DTR active to inactive	-	Sleep	Sleep	No sleep

* After 0x00, wait for 100ms before sending any AT command.

When using auto sleep mode (**AT+KSLEEP=1**) and hardware flow control (**AT&K3**), the only way to wake the module up is to toggle the RTS signal.

The module may not be woken up by sending the character “0x00” on the UART because the CTS signal is toggling ON and OFF so it is blocked by flow control if it is OFF. Due to this limitation, **AT&K3** and **AT+KSLEEP=1** must not be used together.

17.3.4. Signal Behavior during Sleep Mode

17.3.4.1. GPIO Signals

GPIO signals configured with **+KSYNC** are still generated.

17.3.4.2. RI Signal

The RI signal state changes according to the **+KRIC** command.

17.3.4.3. DCD Signal

DCD is active when a data call (CSD call, GPRS/3G, data on MUX, TCP, FTP, UDP, etc.) is in progress even if the module is in sleep mode. After sending **+++**, the DCD becomes INACTIVE, (and become ACTIVE after **ATO** is sent if the data call is still active).

DCD is inactive if there is no data call at all.

17.3.4.4. CTS Signal

The CTS signal is always active when the module is not in sleep mode, and if no flow control is used. It will toggle ON and OFF when the module is in sleep mode if hardware flow control is used.

17.3.4.5. DSR Signal

The DSR signal is always active when the module is powered on.

17.3.4.6. Signals Table

Signal	No Sleep	Sleeping State
CTS	Active	Toggled ON and OFF if HW flow control is used; active if no flow control is used
DSR	Active	Active
DCD	Active or inactive*	Active or inactive*
RI	Active or inactive*	Active or inactive*
GPIO	Active or inactive*	Active or inactive*

* The sleep mode state does not change the status of this signal.

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