UMTS Modems

Supported AT Command Reference

Includes:

- AC850
- AC860
- AC875 / AC875U
- AC880 / AC880E / AC880U
- AC881 / AC881E / AC881U
- MC8755 / MC8755V / MC8765
- MC8775 / MC8775V
- MC8780 / MC8781

2130617
Rev 2.4

SIERRA WIRELESS
HEART OF THE WIRELESS MACHINE™

Important Notice

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

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Do not operate the Sierra Wireless modem in areas where blasting is in progress, where explosive atmospheres may be present, near medical equipment, near life support equipment, or any equipment which may be susceptible to any form of radio interference. In such areas, the Sierra Wireless modem **MUST BE POWERED OFF**. The Sierra Wireless modem can transmit signals that could interfere with this equipment.

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6,339,405	6,359,591	6,400,336	6,516,204	6,561,851
6,643,501	6,653,979	6,697,030	6,785,830	6,845,249
6,847,830	6,876,697	6,879,585	6,886,049	6,968,171
6,985,757	7,023,878	7,053,843	7,106,569	7,145,267
7,200,512	D442,170	D459,303		

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5,544,196	5,568,483	5,600,754	5,657,420	5,659,569
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Consult our website for up-to-date product descriptions, documentation, application notes, firmware upgrades, trouble-shooting tips, and press releases:

www.sierrawireless.com

Revision History

Revision number	Release date	Changes
2.3	Jul 2007	• fixed !TIME (page 48) syntax • added +ECIO (page 31), !GSMINFO (page 32), !NVPORTSET (page 35), !SMSSTSEN (page 43) commands • added detail for !SMSRETRY (page 42)
2.4	Jan 2008	• updated !TIME (page 48) syntax

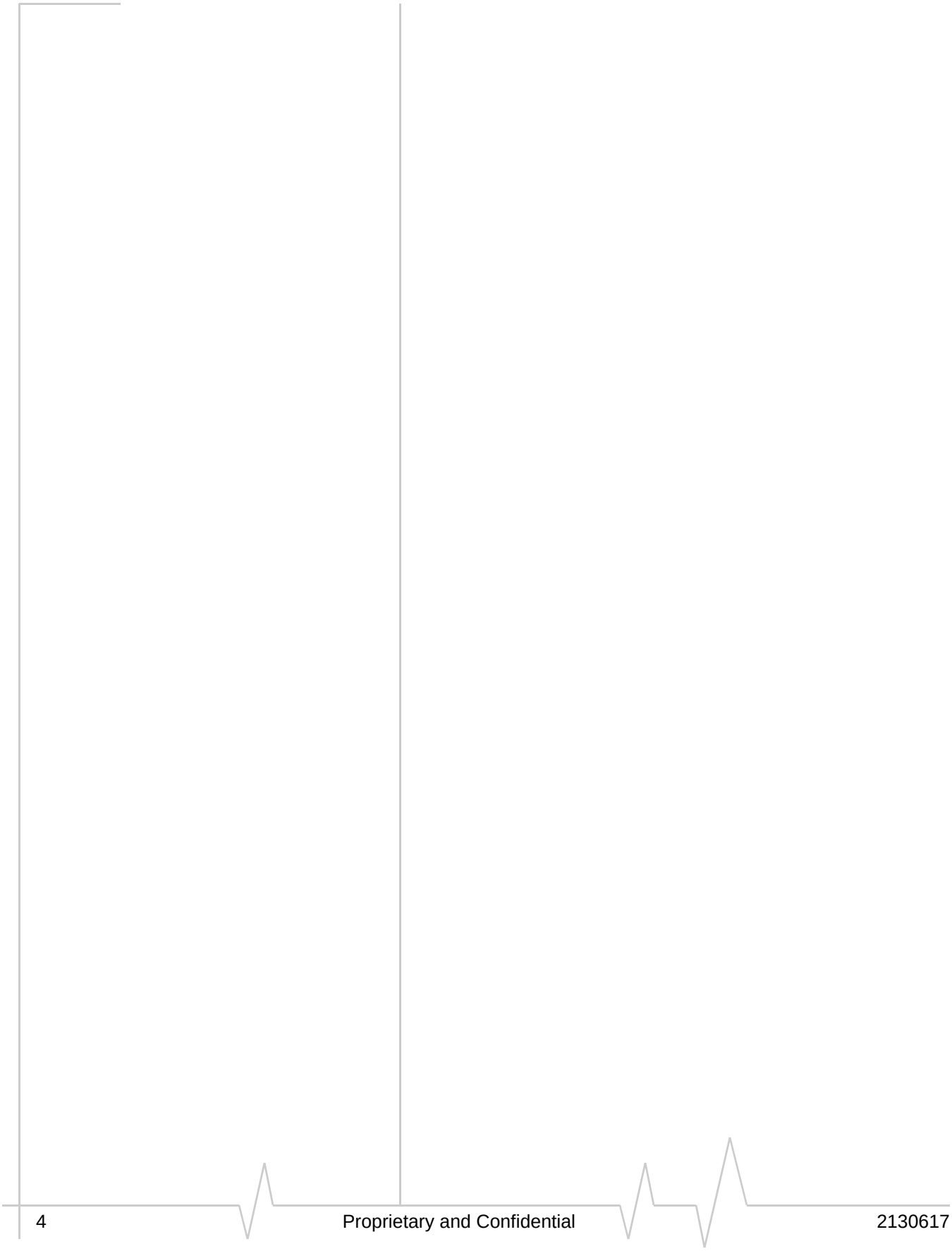


Table of Contents

1: About this Guide

Introduction

This document describes standard and proprietary AT commands that are available for users of UMTS AirCard modems and Mini Card embedded modules.

The standard 3GPP AT commands for UMTS devices are described in two standards documents available from the 3GPP (3rd Generation Partnership Project) web site, www.3gpp.org:

- TS 27.007 *AT command set for User Equipment (UE)*
- TS 27.005 *Use of Data Terminal Equipment -- Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (BSE)*

The proprietary AT commands are supplemental to the standard AT commands.

For normal operation of the modem, consult the *GSM AT Command Reference* (document number 2130213). You may also want to consult the other documents available in the AC8xx/ MC87xx Development Kit or on our Internet site at

www.sierrawireless.com

Note: Some standard 3GPP commands are NOT supported, or are partially supported. These commands are identified in Supported GSM / WCDMA AT Commands, page 15.

Note: When designing applications that use these AT commands, use Watcher® (and other Sierra Wireless applications) as functionality templates to ensure proper use of command groups. For questions or concerns relating to command implementation, please contact your Sierra Wireless account representative.

Result codes

Result codes are not shown in the command tables unless special conditions apply. Generally the result code OK is returned when the command has been executed. ERROR may be returned if parameters are out of range, and will be returned if the command is not recognized or is not permitted in the current state or condition of the modem.

Terminology and acronyms

This document makes use of acronyms that are in common use in data communications and cellular technology. Our Internet site provides a *Glossary of Terms and Acronyms* (document number 2130891) that may be helpful in understanding some acronyms and terminology used in this guide.

Current firmware versions

Versions

Note: Revision codes that include letters, such as 2.1A, are to be considered drafts and are subject to change before final release.

Document This document is revised periodically as new firmware versions are released. This edition is:

Rev 2.4 Jan.08

Applicability of commands to different modules Each command listed in this guide includes a list of supporting AC8xx and MC87xx modules. Unless otherwise noted, the following minimum firmware revisions are required to support the listed commands:

- AC850 / AC860 / MC8755 / MC8765 – Revision U1_2_0 or higher
- AC875 / MC8775 / MC8775V – Revision H1_0_0_0 or higher
- AC880 / MC8780 / MC8781 – Revision D1_0_3_0ap / F1_0_0_0ap or higher

To determine your firmware revision:

- Enter the identification command **AT+GMR**
  The modem responds with version information for software, firmware, and hardware.

  The details following the revision number include Sierra Wireless information on the specific build followed by the date and time of the build.

  +GMR: ... F/W VER: R1_0_0_...

Upgrading

If your modem firmware is an earlier version, you can acquire updated firmware by contacting your account manager.

Document structure

This document assumes you have the 3GPP TS 27.007 AT command documentation (see page 7). This reference includes a chapter covering **Supported 27.007 AT commands**, as well as the proprietary commands listed in the tables below. Each table corresponds to one chapter in this guide.

Note: The 'Supporting modems' column indicates which Mini Card embedded module (MC) and AirCard modem (AC) models support each command. If an entry is marked with an asterisk (''), a firmware upgrade may be required. See the detailed command entry for details.*

Modem Status, Customization, and Reset Commands This chapter describes commands used to determine modem status, adjust customization settings, and reset the modem.

Table 1-1: Modem status and reset commands

Cmnd	Pg	Description	Supporting modems
!BAND	27	Selects a set of frequency bands / queries current selection	All
!BCINF	28	Returns the bootloader version	All
!BOOTHOLD	28	Resets modem and waits in bootloader for firmware download	All
^CARDMODE	28	Returns SIM card mode (card type)	All*
+CLVL	29	Sets / returns internal loudspeaker volume	All*
+CMUT	29	Enables / disables uplink voice muting	All
!CNTI	29	Returns current, available, and supported network technologies	All
+CQI	30	Returns or enables / disables return of averaged CQI (Channel Quality Indicator) value (WCDMA only)	All*
!CSDONSIO2	30	Configures secondary SIO port for circuit-switched data	All*
+ECIO	31	Returns total Energy per chip per power density value (WCDMA only)	All*
!GETBAND	31	Returns the current active band	All

Table 1-1: Modem status and reset commands (Continued)

Cmnd	Pg	Description	Supporting modems
!GETRAT	31	Returns the current active radio access technology (RAT)	All
!GRELIMEI	31	Returns the modem's production IMEI	All*
!GRESET	31	Resets the modem	All
!GSMINFO	32	Displays 2G network information	All
!GSTATUS	34	Returns operational status	All
!GVER	35	Returns the firmware version	All
^HVER	35	Returns the modem hardware version	All*
!NVPORTSET	35	Assigns appropriate USB endpoint AT port	AC880 / 881 MC8780 / 81
!PCTEMP	35	Returns current temperature information	MC (all)
!PCVOLT	36	Returns current power supply voltage information	MC (all)
!POWERDOWN	36	Powers down the system	All
!REL	37	Queries the active protocol / revision	All
!RESET	37	Resets the modem	All
+RSCP	37	Returns Received Signal Code Power (RSCP) (WCDMA only)	All*
!SCACT	38	Activates / deactivates PDP context for FIFO interface	All
!SCDFTPROF	38	Queries / sets the default profile ID	All
!SCDNS	39	Queries / sets profile ID DNS address	All
!SCPROF	40	Queries / sets SWI-specific profile information	All
!SCPADDR	40	Displays IP address for specified PDP context	All
!SELMODE	41	Queries / sets current service domain	All
!SELRAT	41	Queries / sets current radio access technology (RAT)	All
!SMSRETRY	42	Queries / sets SMS retry period and interval	MC8780 / 81 AC880 / 881
!SMSSTSEN	43	Enables / disables SMS status reports	MC8775 / 75V / 80 / 81 AC875 / 880 / 881
!SWICALLPROG	44	Enables / disables Call Progress Notification	All
^SYSCONFIG	46	Queries / sets system configuration information	All*

Table 1-1: Modem status and reset commands (Continued)

Cmnd	Pg	Description	Supporting modems
^SYSINFO	47	Returns service status information	All*
!TIME	48	Queries / sets current time of day	All
!UDINFO	49	Queries / sets current time of day	All*
+UPSC	49	Displays Primary Scrambling Code (WCDMA only)	All
+USET	50	Displays WCDMA set information	All
&V	51	Return operating mode AT configuration parameters	All

* A firmware upgrade may be required, as noted in the detailed listing for this command.

Diagnostic Commands This chapter describes commands used to select frequency bands and diagnose problems.

Table 1-2: Diagnostic commands

Cmnd	Pg	Description	Supporting modems
!AUTH	53	!AUTH = <randNumber>	All*
!GCIPHER	54	Enables / disables ciphering and integrity settings	All
!MXSTATS	55	Displays / clears 27.010 statistics	All

* A firmware upgrade may be required, as noted in the detailed listing for this command.

Test commands This chapter describes commands required to place the modem in particular modes of operation, test host connectivity, and configure the transmitters and receivers for test measurements.

Table 1-3: Test commands

Cmnd	Pg	Description	Supporting modems
!ERR	57	Displays diagnostic information	All
!GCCLR	57	Clears crash dump data	All
!GCDUMP	57	Displays the crash dump data	All

Memory Management Commands This chapter describes commands that control the data stored in non-volatile memory of the modem.

Table 1-4: Memory management commands

Cmnd	Pg	Description	Supporting modems
!NVBACKUP	59	Backs up items stored in non-volatile memory	All

SIM Commands This chapter describes commands that communicate with an installed (U)SIM.

Table 1-5: SIM commands

Cmnd	Pg	Description	Supporting modems
!ICCID	61	Returns (U)SIM card's ICCID	All

Conventions

The following format conventions are used in this reference:

Character codes or keystrokes that are described with words or standard abbreviations are shown within angle brackets using a different font, such as <CR> for Carriage Return and <space> for a blank space character.

Numeric values are decimal unless prefixed as noted below.

Hexadecimal values are shown with a prefix of 0x, i.e. in the form 0x3D.

Binary values are shown with a prefix of 0b, i.e. in the form 0b00111101.

Command and register syntax is noted using an alternate font: **!CHAN=<c>[,b]**. The "**AT**" characters are not shown but must be included before all commands except as noted in the reference tables.

Characters that are required are shown in uppercase; parameters are noted in lowercase. Required parameters are enclosed in angle brackets (**<n>**) while optional parameters are enclosed within square brackets (**[x]**). The brackets are not to be included in the command string.

Commands are presented in table format. Each chapter covers the commands related to that subject and presents a summary table to help you locate a needed command. Commands are in ASCII alphabetical order in the body of each chapter.

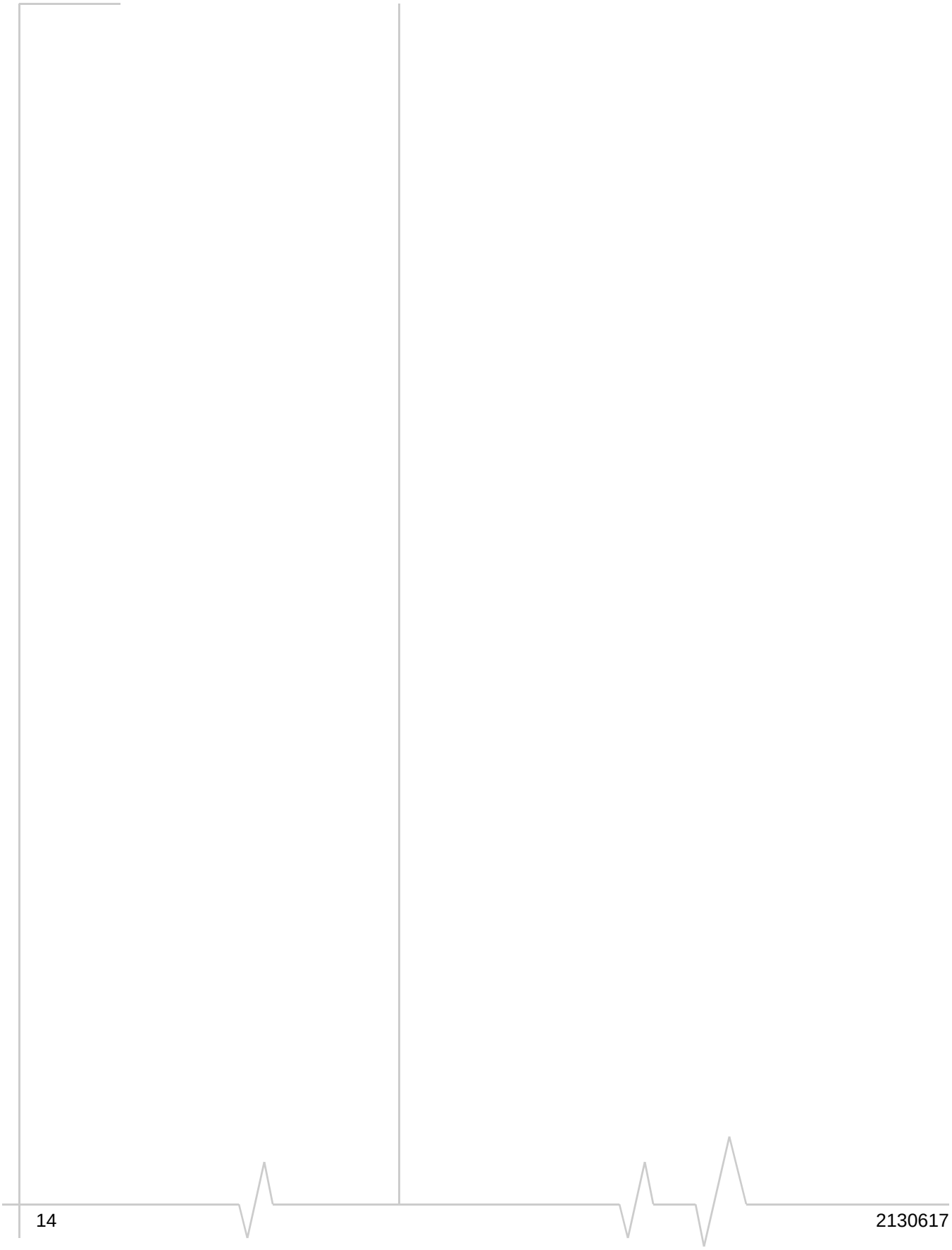
Any default settings are noted in the command tables. Note that these are the factory default settings and *not* the default parameter value assumed if no parameter is specified.

Result Code This is a numeric or text code that is returned after all commands (except resets). Only one result code is returned for a command line regardless of the number of individual commands contained on the line.

Response This term indicates a response from the modem that is issued prior to a result code. Reading registers or issuing commands that report information will provide a response followed by a result code unless the command generates an error.

Responses and result codes from the modem, or host system software prompts, are shown in this font:

```
CONNECT 14400
```



2: Supported GSM / WCDMA AT Commands

This chapter identifies which ITU-T Recommendation V.250, 3GPP TS 27.005, and 3GPP TS 27.007 AT commands are supported on regular and voice-enabled Sierra Wireless AirCard modems (850/860/875/880/881) and Mini Card embedded modules (MC8755/65/75/80/81). These commands are used to:

- Control serial communications over an asynchronous interface (*ITU-T Recommendation V.250*)
- Control SMS functions for devices on GSM/WCDMA networks (*3GPP TS 27.005*)
- Control devices operating on GSM/WCDMA networks (*3GPP TS 27.007*)

The ITU-T specification, *Serial Asynchronous Dialling and Control (Recommendation V.250)*, is available on the International Telecommunication Union web site, www.itu.int, and the 3GPP specification documents, *3GPP TS 27.007 V3.13.0 (2003-03)* and *3GPP TS 27.007 V3.13.0 (2003-03)*, are available on the 3GPP web site, www.3gpp.org.

The tables below identify whether each command is supported on AirCard modems and Mini Card embedded modules. An "N/A" in the Supported column of the table indicates that the command is related to a feature (such as voice) that is not available on the modems.

Some commands are partially supported—the descriptions for these commands identify any limitations on command usage. Also, some commands are described in more detail in later chapters—the descriptions for these commands link to those detailed entries (for example, **&V** in Table 1).

Table 1: Supported ITU-T Recommendation V.250 AT commands

Command	Description	Supported
&C	Set Data Carrier Detected (Received line signal detector) function mode	No
&D	Set Data Terminal Ready function mode	No
&F	Set all current parameters to manufacturer's defaults	No
&S	Set DSR signal	No
&T	Auto tests	No

Table 1: Supported ITU-T Recommendation V.250 AT commands (Continued)

Command	Description	Supported
&V	Return operating mode AT configuration parameters	Yes
&W	Store current parameter to user-defined profile	No
+DR	V42bis data compression report	Yes
+DS	V42bis data compression	No
+GCAP	Request complete TA capabilities list	Yes
+GMI	Request manufacturer identification	Yes
+GMM	Request TA model identification	Yes
+GMR	Request TA revision identification	Yes
+GOI	Request global object identification	No
+GSN	Request TA serial number identification	Yes
+ICF	Set TE-TA control character framing	Yes
+IFC	Set TE-TA local data flow control	Yes
+ILRR	Set TE-TA local rate reporting mode	No
+IPR	Set fixed local rate	Yes
A	Answer incoming call	Yes
A/	Re-issues last AT command given	No
D	Dial	Yes
D><MEM><N>	Originate call to phone number in memory <MEM>	No
D><N>	Originate call to phone number in current memory	Yes
D><STR>	Originate call to phone number in memory which corresponds to alphanumeric field <STR>	No
DL	Redial last telephone number used	No
E	Set command echo mode	Yes
H	Disconnect existing connections	Yes
I	Display product identification information	Yes
L	Set monitor speaker loudness	No
M	Set monitor speaker mode	No
O	Switch from command mode to data mode	No
P	Select pulse dialing	No
Q	Set Result code presentation mode	No

Table 1: Supported ITU-T Recommendation V.250 AT commands (Continued)

Command	Description	Supported
S0	Set number of rings before automatically answering the call	Yes
S10	Set disconnect delay after indicating the absence of data carrier	Yes
S3	Set command line termination character	Yes
S4	Set response formatting character	Yes
S5	Set command line editing character	Yes
S6	Set pause before blind dialing	Yes
S7	Set number of seconds to wait for connection completion	Yes
S8	Set number of seconds to wait when comma dial modifier used	Yes
T	Select tone dialing	Yes
V	Set result code format mode	Yes
X	Set connect result code format and call monitoring	Yes
Z	Set all current parameters to user-defined profile	Yes

Table 2: Supported 27.005 AT commands

Command	Description	Supported
+CMGC	Send command	Yes
+CMGD	Delete message	Yes
+CMGF	Message format	Yes
+CMGL	List messages	Yes
+CMGR	Read message	Yes
+CMGS	Send message	Yes
+CMGW	Write message to memory	Yes
+CMSS	Send message from storage	Yes
+CMNA	New message acknowledgement to ME/TA	Yes
+CNMI	New message indications to TE	Yes
+CPMS	Preferred message storage	Yes
+CRES	Restore settings	No
+CSAS	Save settings	No
+CSCA	Service centre address	Yes
+CSCB	Select cell broadcast message types	Yes

Table 2: Supported 27.005 AT commands (Continued)

Command	Description	Supported
+CSDH	Show text mode parameters	Yes
+CSMP	Set text mode parameters	Yes
+CSMS	Select message service	Yes
+CBM	Cell broadcast message directly displayed	Yes
+CMT	Incoming message directly displayed	Yes
+CDS	SMS status report after sending a SMS	Yes
+CBMI	Cell broadcast message stored in memory at specified <index> location	No
+CMTI	Incoming message stored in <mem> (“SM” - (U)SIM message storage) at location <index>	Yes
+CDSI	Incoming SMS status report	Yes
+CMS ERROR: <err>	SMS error (mobile or network error)	Yes

Table 3: Supported 27.007 AT commands

Command	Description	Support
C	ITU T V.24 circuit 109 carrier detect signal behavior command Format • C<value> Limitations • Default <value> = 2 • <value> = 2 causes the AT/Data carrier detect pin to ‘wink’ (briefly switch off and on) when data calls end. • <value> = 0 or 1 performs as defined in the standard	Partial
+CACM	Accumulated call meter	No
+CACSP	Voice Group or Voice Broadcast Call State Attribute Presentation	N/A
+CAEMLPP	eMLPP Priority Registration and Interrogation	No
+CAHLD	Leave an ongoing Voice Group or Voice Broadcast Call	N/A
+CAJOIN	Accept an incoming Voice Group or Voice Broadcast Call	N/A
+CALA	Alarm	N/A
+CALCC	List current Voice Group and Voice Broadcast Calls	N/A
+CALD	Delete alarm	N/A
+CALM	Alert sound mode	No

Table 3: Supported 27.007 AT commands (Continued)

Command	Description	Support
+CAMM	Accumulated call meter maximum	No
+CANCHEV	NCH Support Indication	No
+CAOC	Advice of Charge	No
+CAPD	Postpone or dismiss an alarm	N/A
+CAPTT	Talker Access for Voice Group Call	N/A
+CAREJ	Reject an incoming Voice Group or Voice Broadcast Call	N/A
+CAULEV	Voice Group Call Uplink Status Presentation	N/A
+CBC	Battery charge	Yes
+CBST	Select bearer service type	Yes
+CCCM	Current call meter value	No
+CCFC	Call forwarding number and conditions	Yes
+CCLK	Clock	N/A
+CCUG	Closed user group	Yes
+CCWA	Call waiting	Yes
+CCWE	Call Meter maximum event	No
+CDIP	Called line identification presentation	No
+CDIS	Display control	No
+CEER	Extended error report	No
+CFUN	Set phone functionality Format • +CFUN = [<fun> [, <rst>]] Limitations • Valid <fun> values: ◦ 0 (minimum functionality, low power draw) ◦ 1 (full functionality, high power draw)	Partial
+CGACT	PDP context activate or deactivate	Yes
+CGANS	Manual response to a network request for PDP context activation	No
+CGATT	PS attach or detach	Yes
+CGAUTO	Automatic response to a network request for PDP context activation	No
+CGCLASS	GPRS mobile station class	Yes

Table 3: Supported 27.007 AT commands (Continued)

Command	Description	Support
+CGCLOSP	Configure local octet stream PAD parameters	No
+CGCMOD	PDP Context Modify	No
+CGDATA	Enter data state	No
+CGDCONT	Define PDP Context	Yes
+CGDSCONT	Define Secondary PDP Context	Yes
+CGEQMIN	3G Quality of Service Profile (Minimum acceptable)	Yes
+CGEQNEG	3G Quality of Service Profile (Negotiated)	Yes
+CGEQREQ	3G Quality of Service Profile (Requested)	Yes
+CGEREP	Packet Domain event reporting	Yes
+CGEV	GPRS network event indication	Yes
+CGMI	Request manufacturer identification	Yes
+CGMM	Request model identification	Yes
+CGMR	Request revision identification	Yes
+CGPADDR	Show PDP address	Yes
+CGQMIN	Quality of Service Profile (Minimum acceptable)	Yes
+CGQREQ	Quality of Service Profile (Requested)	Yes
+CGREG	GPRS network registration status	Yes
+CGSMS	Select service for MO SMS messages	Yes
+CGSN	Request product serial number identification	Yes
+CGTFT	Traffic Flow Template	Yes
+CHLD	Call related supplementary services	Yes
+CHSA	HSCSD non-transparent asymmetry configuration	N/A
+CHSC	HSCSD current call parameters	N/A
+CHSD	HSCSD device parameters	N/A
+CHSR	HSCSD parameters report	N/A
+CHST	HSCSD transparent call configuration	N/A
+CHSU	HSCSD automatic user initiated upgrading	N/A
+CHUP	Hangup call	Yes
+CIEV	Indicator event	No

Table 3: Supported 27.007 AT commands (Continued)

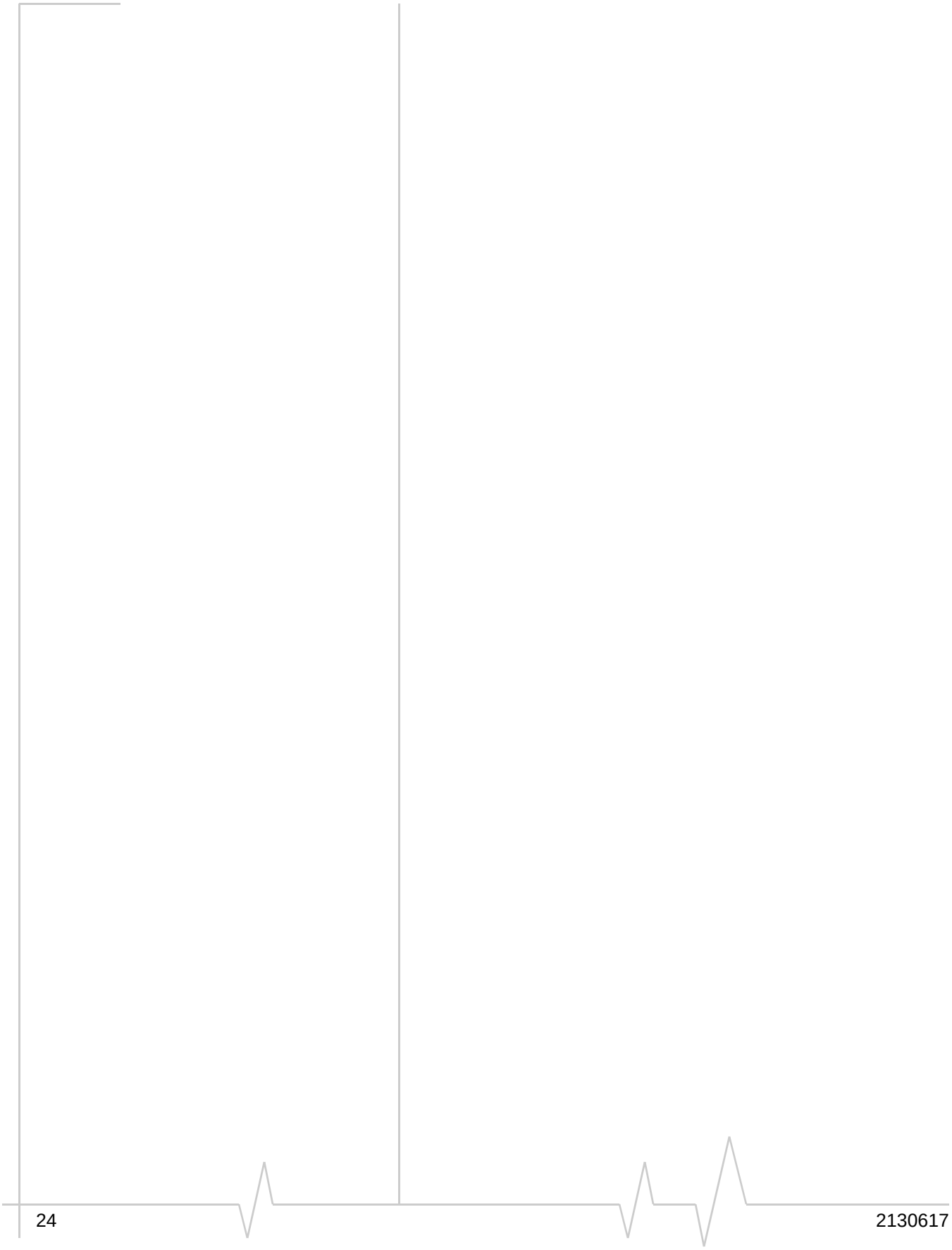
Command	Description	Support
+CIMI	Request international mobile subscriber identity	Yes
+CIND	Indicator control	No
+CKEV	Key press or release event	No
+CKPD	Keypad control	No
+CLAC	List all available AT commands	No
+CLAE	Language Event	No
+CLAN	Set Language	No
+CLCC	List current calls	No
+CLCK	Facility lock	Yes
+CLIP	Calling line identification presentation	Yes
+CLIR	Calling line identification restriction	Yes
+CLVL	Sets / returns internal loudspeaker volume	Yes
+CMAR	Master Reset	No
+CME ERROR: <err>	Mobile Termination error result code	Yes
+CMEC	Mobile Termination control mode	No
+CMEE	Report Mobile Termination error	Yes
+CMER	Mobile Termination event reporting	No
+CMOD	Call mode	Yes
+CMUT	Enables / disables uplink voice muting	Yes
+CMUX	Multiplexing mode	Yes
+CNUM	Subscriber number	Yes
+COLP	Connected line identification presentation	Yes
+COPN	Read operator names	Yes
+COPS	Operator selection	Yes
+CPAS	Phone activity status	Yes
+CPBF	Find phonebook entries	Yes
+CPBR	Read phonebook entries	Yes
+CPBS	Select phonebook memory storage	Yes
+CPBW	Write phonebook entry	Yes

Table 3: Supported 27.007 AT commands (Continued)

Command	Description	Support
+CPIN	Enter PIN	Yes
+CPOL	Preferred operator list	No
+CPROT	Enter protocol mode	No
+CPUC	Price per unit and currency table	No
+CPWC	Power class	No
+CPWD	Change password	Yes
+CR	Service reporting control	Yes
+CRC	Cellular result codes	Yes
+CREG	Network registration	Yes
+CRING	Incoming call type	Yes
+CRLP	Radio link protocol	Yes
+CRMP	Ring Melody Playback	N/A
+CRSL	Ringer sound level	N/A
+CRSM	Restricted SIM access	Yes
+CSCC	Secure control command	No
+CSCS	Select TE character set	Yes
+CSDF	Settings date format	N/A
+CSGT	Set Greeting Text	N/A
+CSIL	Silence Command	N/A
+CSIM	Generic SIM access	Yes
+CSNS	Single numbering scheme	No
+CSQ	Signal quality	Yes
+CSSN	Supplementary service notifications	Yes
+CSTA	Select type of address	Yes
+CSTF	Settings time format	Yes
+CSVM	Set Voice Mail Number	No
+CTFR	Call deflection	No
+CTZR	Time Zone Reporting	N/A
+CTZU	Automatic Time Zone Update	No

Table 3: Supported 27.007 AT commands (Continued)

Command	Description	Support
+CUSD	Unstructured supplementary service data	Yes
+CV120	V.120 rate adaption protocol	No
+CVHU	Voice Hangup Control	No
+CVIB	Vibrator mode	N/A
D	ITU T V.25ter [14] dial command	Yes
D*99#	Sets up a packet data call (PDP context) based on profile ID #1	Yes
D*99*<n>#**	Sets up a packet data call (PDP context) based on profile ID #<n> (<n> is the <cid> in the +CGDCONT command)	Yes
+WS46	PCCA STD 101 [17] select wireless network	No



3: Modem Status, Customization, and Reset Commands

Introduction

This chapter describes commands used to reset the modem, adjust customization settings, retrieve the firmware version, and monitor the temperature, voltage, and modem status.

Command summary

The table below lists the commands described in this chapter.

Table 3-1: Modem status commands

Command	Description	Page
!BAND	Selects a set of frequency bands / queries current selection	27
!BCINF	Returns the bootloader version	28
!BOOTHOLD	Resets modem and waits in bootloader for firmware download	28
^CARDMODE	Returns SIM card mode (card type)	28
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+CMUT	Enables / disables uplink voice muting	29
!CNTI	Returns current, available, and supported network technologies	29
+CQI	Returns or enables / disables return of averaged CQI (Channel Quality Indicator) value (WCDMA only)	30
+CSDONSIO2	Configures secondary SIO port for circuit-switched data	30
+ECIO	Returns total Energy per chip per power density value (WCDMA only)	31
!GETBAND	Returns the current active band	31
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!GRELIMEI	Returns the modem's production IMEI	31
!GRESET	Resets the modem	31
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^HVER	Returns the modem hardware version	35

Table 3-1: Modem status commands (Continued)

Command	Description	Page
!NVPORTSET	Assigns appropriate USB endpoint AT port	35
!PCTEMP	Returns current temperature information	35
!PCVOLT	Returns current power supply voltage information	36
!POWERDOWN	Powers down the system	36
!REL	Queries the active protocol / revision	37
!RESET	Resets the modem	37
+RSCP	Returns Received Signal Code Power (RSCP) (WCDMA only)	37
!SCACT	Activates / deactivates PDP context for FIFO interface	38
!SCDFTPROF	Queries / sets the default profile ID	38
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!UDINFO	Returns information from active USB descriptor	49
+UPSC	Displays Primary Scrambling Code (WCDMA only)	49
+USET	Displays WCDMA set information	50
&V	Return operating mode AT configuration parameters	51

Command reference

Table 3-2: Modem status, customization, and reset commands

Command	Description
!BAND=<bandsetInd> **!BAND=?** **!BAND?** Supporting modems: • All	**Selects a set of frequency bands / queries current selection** This command is used to configure the modem to operate on a set of frequency bands, to look up the sets available, and to query the current selection. These band sets are preconfigured by your device's manufacturer. **Usage:** • AT!BAND=? reports allowed values for <bandsetInd> and the corresponding frequency bands. • AT!BAND=<bandsetInd> is used to select a set of bands. • AT!BAND? reports the current band selection. **Parameters:** <bandsetInd> (band index value): • 00 = All bands • 01 = WCDMA 2100 • 02 = WCDMA 850/1900 • 03 = GSM 900/1800 • 04 = GSM 850/1900 • 05 = GSM ALL • 06 = WCDMA 2100 GSM 900/1800 • 07 = WCDMA 850/1900 GSM 850/1900 • 08 = WCDMA ALL • 09 = WCDMA 850/2100 • 0A = WCDMA 800/2100 • 0B = WCDMA 850/2100 GSM 900/1800

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!BCINF Supporting modems: • All	**Returns the bootloader version** This command is used to return the module's bootloader version. **Usage:** • AT!BCINF returns several values—the bootloader version is the second parameter returned. **Example:** AT!BCINF returns: BOOT Address: <...> Version: <version> ... **Parameters:** <version> (bootloader version): • ASCII string • Maximum length: 84 characters • Example: H1_0_0_0ACBT G:/WS/FW/H1_0_0_0ACBT/MSM6280/ SRC 2006/09/01 16:33:30
!BOOTHOLD Supporting modems: • All	**Resets modem and waits in bootloader for firmware download** This command is used to prepare for a firmware download by resetting the modem and waiting in 'boot and hold' mode. **Usage:** • AT!BOOTHOLD forces the modem to backup user NV options, reset, and then wait in boot and hold mode for a firmware download.
^CARDMODE Supporting modems: • All	**Returns SIM card mode (card type)** This command is used to identify the type of SIM card being used. **Returned parameters:** <sim_type> (the type of sim card) • 0 = unknown • 1 = SIM • 2 = USIM

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
+CLVL=<level> **+CLVL=?** **+CLVL?** Supporting modems: • All (with exceptions below) • MC8755/55V/65 (minimum FW rev: U1_2_9mcap) • AC850/860 (minimum FW rev:U1_2_7acap)	**Sets / returns internal loudspeaker volume** This command is used to set or report the modem's internal loudspeaker volume. **Usage:** • AT+CLVL=<level> sets the volume within a specified range • AT+CLVL=? reports allowed values for <level> • AT+CLVL? reports the current volume **Parameters:** <level> (Sound level): • Manufacturer-specific volume levels • Valid range: 0(lowest)–7(highest)
+CMUT=<enableFlag> **+CMUT=?** Supporting modems: • All voice-enabled modems	**Enables / disables uplink voice muting** This command is used to enable or disable uplink voice muting during a voice call. **Usage:** • AT+CMUT=<enableFlag> turns muting on or off • AT+CMUT=? returns valid <enableFlag> values **Parameters:** <enableFlag> (Enable / disable muting): • 0 = Mute off • 1 = Mute on
***CNTI=<n>** Supporting modems: • All	**Returns current, available, and supported network technologies** This command is used to report the network technology currently being used, the technologies available for use, or the technologies supported by the modem. **Usage:** • AT*CNTI=<n> returns *CNTI: <n>,<tech>[,<tech>[...]] **Parameters:** <n> (reporting option): • 0 = Network technology currently in use • 1 = Available technologies on current network • 2 = All technologies supported by the modem <tech> (technology type): • ASCII string • Valid values: "GSM", "GPRS", "EDGE", "UMTS", "HSDPA", "HSUPA" (only when <n> = 1)

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
+CQI? **+CQI=<enableFlag>** Supporting modems: • All	**Returns or enables / disables return of averaged CQI (Channel Quality Indicator) value (WCDMA only)** This command returns the averaged CQI from the modem. **Usage:** • AT!CQI? returns the average CQI and the number of samples used to determine the average. For example: +CQI: total valid samples 1600, average cqi 26 • AT!CQI=<enableFlag> enables or disables the query version of the command (+CQI?) **Parameters:** <enableFlag> (enable / disable CQI value retrieval): • 0 = Disable retrieval • 1 = Enable retrieval
CSDONSIO2? **!CSDONSIO2=<port#>** Supporting modems: • All	**Configures secondary SIO port for circuit-switched data** This command configures the secondary serial I/O (SIO) port for circuit-switched data over the main AT port, MUX1/MUX2/MUX3, or a virtual serial port (VSP1/VSP2/VSP3). *Note: The modem must be reset before any change takes effect.* **Usage:** • AT!CSDONSIO2? returns the current port number currently used for the SIO port. For example: +CSDONSIO2: <port#> • AT!CSDONSIO2=<port#> sets the port number to use for the SIO port. **Parameters:** <port#> (Port used for circuit-switched data): • 0 = CSD on main AT port (Default) • 1 = CSD on MUX1 (VSP1 on AirCard modems) • 2 = CSD on MUX2 (VSP2 on AirCard modems) • 3 = CSD on MUX3 (VSP3 on AirCard modems)

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
+ECIO? Supporting modems: • All	**Returns total Energy per chip per power density value (WCDMA only)** This command returns the total energy per chip per power density (Ec/Io) value of the active set's three strongest cells. **Usage:** • AT!ECIO? returns the signed dB value as a range from strongest to weakest cell, based on RSCP. For example: +ECIO: Ec/Io: -3.5 dB -24.5 dB • Valid range = -31.5 dB to 0 dB
!GETBAND? Supporting modems: • All	**Returns the current active band** This command returns the active band currently being used by the modem. **Usage:** • AT!GETBAND? returns a description of the current active band, or returns an error message.
!GETRAT? Supporting modems: • All	**Returns the current active radio access technology (RAT)** This command returns the RAT currently being used by the modem. **Usage:** • AT!GETRAT? returns a description of the current RAT, or returns an error message.
!GRELIMEI? Supporting modems: • All	**Returns the modem's production IMEI** This command returns the modem's 15-character unique IMEI. **Usage:** • AT!GRELIMEI? returns the <imei> assigned to the modem. **Parameters:** <imei> • 15-character IMEI assigned to the modem
!GRESET Supporting modems: • All	**Resets the modem** This command performs a modem reset. *Note: This command is identical in function to !RESET.*

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!GSMINFO? Supporting modems: • MC8775 (minimum FW rev: H1_1_8_13mcap) • MC8780 / 81 • AC875 (minimum FW rev: H1_1_8_13acap) • AC880 / 881	**Displays 2G network information** This command returns 2G network information for the 'serving' cell and up to 6 'neighbor' cells. **Parameters:** (referenced in example below) <mccmnc>: Mobile Country Code and Mobile Network Code (combine to form the PLMN) • 16-bit decimal <lac>: Location Area Code • 16-bit decimal <cellid>: Cell ID • 16-bit decimal <bsic>: Base Station Identity Code • 8-bit decimal <ncc>: Network Color Code • 8-bit decimal <bscc>: Base Station Color Code • 8-bit decimal <rac>: Routing Area Code • 8-bit decimal <minrx>: Minimum Rx level (dBm) needed to register • 16-bit decimal <maxrach>: Reserved for future use • 16-bit decimal <band>: Indicates the 2G network band • Valid values: "E900", "P900", "1900", "1800", "850", "Unknown" <arfcn>: Absolute Radio Frequency Channel Number • 16-bit decimal <rxlvl>: Received BCCH frequency level (dBm) • 16-bit decimal <c1>: C1 cell selection criteria • 16-bit decimal <c2>: C2 cell selection criteria • 16-bit decimal <c31>: C31 cell selection criteria • 16-bit decimal <c32>: C32 cell selection criteria • 16-bit decimalf (Continued on next page)

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!GSMINFO (Continued)	**Displays 2G network information** **Example** AT!GSMINFO? returns: !gsminfo: Serving Cell: PLMN: <mccmnc> LAC: <lac> Cell ID: <cellid> BSIC: <bsic> NCC: <ncc> BSCC: <bscc> RAC: <rac> Min Rx Lvl Rqd: <minrx> Max Rach: <maxrach> Band: <band> ARFCN: <arfcn> RX level (dBm): <rxlvl> C1: <c1> C2: <c2> C31: <c31> C32: <c32> Neighbour Cells: Band: <band> <band> <band> ARFCN: <arfcn> <arfcn> <arfcn> RAC: <rac> <rac> <rac> RX level (dBm): <rxlvl> <rxlvl> <rxlvl> C1: <c1> <c1> <c1> C2: <c2> <c2> <c2> C31: <c31> <c31> <c31> C32: <c32> <c32> <c32>

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!GSTATUS? Supporting modems: • All	**Returns operational status** This command returns specific details about the current operational status of the modem. **Parameters:** <ctime>: Current time (Seconds from bootup) <temperature>: Approximate temperature (±5°C) <btime>: Bootup Time (Seconds from reset) <mode>: Current modem mode • (“POWERING OFF”, “FACTORY TEST”, “OFFLINE”, “ONLINE”, “LOW POWER MODE”, “RESETTING”, “NETWORK TEST”, “OFFLINE REQUEST”, “PSEUDO ONLINE”, “Unknown”) <smode>: System mode acquired by modem • (“No service”, “AMPS”, “CDMA”, “GSM”, “HDR”, “WCDMA”, “GPS”, “WCDMA+GSM”, “Unknown”) <PSstate>: Current PS state • (“Attached”, “Not attached”) <wband>: Current WCDMA band being accessed • (“CDMA cell”, “CDMA PCS”, “IMT2000”, “WCDMA1900”, “WCDMA1800”, “WCDMA800”, “GSM EGSM900”, “GSM DCS1800”, “GSM 850”, “GSM1900”, “GPS”, “No band”) <gband>: Current GSM band, either TCH or BCCH • (“GSM850”, “GSM900”, “DCS1800”, “PCS1900”, “Unknown”) <wchan>: WCDMA channel number <gchan>: GSM channel number <gmmstate>: Current GMM state • (“IDLE”, “DEREGISTERED”, “Registering”, “REGISTERED”, “Deregistering”, “RA updating”, “Requesting srvc”) <gmmsubstate>: Current GMM sub-state • (“NORMAL SERVICE”, “LIMITED SERVICE”, “ATT NEEDED”, “ATTEMPTING ATT”, “NO IMSI”, “NO SERVICE”, “PLMN SEARCH”, “SUSPENDED”, “UPDATE NEEDED”, “UPDATING”, “DEATACHING”, “---”) Note: “---” indicates ‘undefined sub-state’ <mmstate>: Current MM state • (“NULL”, “IDLE”, “LA Rejected”, “LA Start”, “CONNECTED”, Network Command”, “---”) Note: “---” indicates ‘undefined state’ <mmsubstate>: Current MM sub-state • (“NORMAL SERVICE”, “LIMITED SERVICE”, “NO IMSI”, “NO SERVICE”, “PLMN SEARCH”, “UPDATE NEEDED”, “UPDATING”, “---”) Note: “---” indicates ‘undefined sub-state’

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!GVER? Supporting modems: • All	**Returns the firmware version** This command returns the firmware version as a string in the format version yyyy/mm/dd hh:mm:ss.
^HVER Supporting modems: • All	**Returns the modem hardware version** This command returns the modem's hardware version number based on the FSN. The version number is returned as a short string representing the actual version. **Examples:** • "E2" – Eng2 device • "1.0" – Production v1.0 • "1.1" – Production v1.1 • etc.
!NVPORTSET? **!NVPORTSET=<mapping>** Supporting modems: • MC8780 / 81 • AC880 / 881	**Assigns appropriate USB endpoint AT port** This command maps the AT port to either endpoint 5 or endpoint 2 in non-MUX mode, or reports the current mapping. **Usage:** • AT!NVPORTSET? returns the current endpoint <mapping> • AT!NVPORTSET=<mapping> maps the AT port to the appropriate USB endpoint **Parameters:** <mapping> (mapping type): • 0 = endpoint 5 (Default value) • 1 = endpoint 2
!PCTEMP? Supporting modems: • All MC modems	**Returns current temperature information** This command returns the module's temperature state and actual temperature. **Usage:** • AT!PCTEMP? returns the <state> and <temperature>. **Parameters:** <state> (temperature state): • "Normal" • "High Warning" • "High Critical" • "Low Critical" <temperature> (current temperature): • Current temperature in degrees Celsius – this is the highest temperature reported by the two thermistors (one measures the PA (Power Amplifier) used by the WCDMA transceiver, the other measures the temperature of the PA used by the GSM transceiver).

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!PCVOLT? Supporting modems: • All MC modems	**Returns current power supply voltage information** This command returns the module's power supply state and actual voltage. **Usage:** • AT!PCVOLT? returns the <state>, <voltage>, and <raw> (Analog/ Digital Convertor reading). **Parameters:** <state> (power supply state): • "Normal" • "High Critical" • "Low Warning" • "Low Critical" <voltage>: • Current voltage reading in mV. <raw>: • Analog/Digital Convertor reading
!POWERDOWN Supporting modems: • All	**Powers down the system** This command powers down the system. After using this command, the modem will not communicate with the host until it has been power cycled. **Usage:** • AT!POWERDOWN returns "OK" and powers the system down. *Note: This command should only be used when testing using an appropriate testing jig—do not use it when the modem is installed in a computer.*

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!REL? Supporting modems: • All	**Queries the active protocol / revision** This command is used to indicate the modem's current protocol, SGSN, and MSC revision settings. **Usage:** • AT!REL? reports the current operating protocol, SGSN revision, and MSC revision in the format <wcdmarrc> <sgsnr> <mscr> (each value appears on a separate line). **Parameters:** <wcdmarrc>: WCDMA RRC Revision (Protocol) • 00 = Release 99 • 01 = Release 5 (Default) <sgsnr>: SGSN Revision • 00 = Release 97 • 01 = Release 99 • 02 = Release 5 • 03 = Dynamic (Default)—uses whichever protocol is broadcast by the network <mscr>: MSC Revision • 00 = Release 97 • 01 = Release 99 • 02 = Release 5 • 03 = Dynamic (Default)—uses whichever protocol is broadcast by the network
!RESET Supporting modems: • All	**Resets the modem** This command performs a modem reset. *Note: This command is identical in function to !GRESET.*
+RSCP? Supporting modems: • All	**Returns Received Signal Code Power (RSCP) (WCDMA only)** This command returns the RSCP of the active set's three strongest cells. **Usage:** • AT!RSCP? returns the signed dBm value, from weakest to strongest cell. For example: +RSCP: RSCP: -73 dBm -84 dBm • Valid return values: -120 dBm to -20 dBm

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!SCACT? [<pid>] **!SCACT=<state>[, <pid>]** Supporting modems: • All	**Activates / deactivates PDP context for FIFO interface** This command is used to activate or deactivate the specified PDP context for FIFO interface. **Usage:** • AT!SCACT?[<pid>] reports the status of the identified profile (<pid>). If no <pid> is specified, the status of all profiles is returned. • AT!SCACT=<state>[,<pid>] is used to set the state of the identified profile (<pid>). If no <pid> is specified, profile 1 is updated. **Parameters:** <state> (PDP context activation state): • 0 = Deactivated • 1 = Activated • During assignment, any <state> other than 1 or 2 will return an ERROR response. <pid> (PDP context definition): • Valid range: 1–16
!SCDFTPROF? **!SCDFTPROF=<pid>** Supporting modems: • All	**Queries / sets the default profile ID** This command is used to query / set the default profile ID. **Usage:** • AT!SCDFTPROF? returns the default profile ID (<pid>). • AT!SCDFTPROF=<pid> sets the default profile ID to <pid>. **Parameters:** <pid> (Profile ID): • Valid range: 1–16 — a valid profile ID that will be used as the default

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!SCDNS?<pid> **!SCDNS=<pid>, <pri_dns>,<sec_dns>** Supporting modems: • All	**Queries / sets profile ID DNS address** This command is used to query / set the primary and secondary DNS addresses of a profile. **Usage:** • AT!SCDNS?<pid> returns the primary (<pri_dns>) and secondary (<sec_dns>) DNS addresses for the specified profile (<pid>). • AT!SCDNS=<pid>,<pri_dns>,<sec_dns> sets the default primary and secondary IP addresses for domain name services. **Parameters:** <pid> (PDP context definition) • Valid range: 1–16 — a valid profile ID that will be used as the default <pri_dns> (Default primary IP address for DNS lookup): • 'Dot format' IP address. For example, 10.10.10.1 • Used by modem when no DNS server address is received over the air during PDP context activation <sec_dns>: Default secondary IP address for DNS lookup • 'Dot format' IP address. For example, 10.10.10.1 • Used by modem when no DNS server address is received over the air during PDP context activation

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!SCPROF?<pid> **!SCPROF=<pid>,<label>, <autoconnect>, <promptforpassword>, <autolaunchapp>, <rffu>** Supporting modems: • All	**Queries / sets SWI-specific profile information** This command is used to query / set the SWI specific information for a profile. **Usage:** • !SCPROF?<pid> reports current SWI-specific information for the specified profile (<pid>) in the format <pid> <label> <autoconnect> <promptforpassword> <autolaunchapp> <pdplingertimer>. • !SCPROF=<pid>...<rffu> sets the SWI-specific information for the specified profile (<pid>). **Parameters:** <pid>: PDP context definition • Valid range: 1–16 — a valid profile ID that will be used as the default <label>: Configuration buffer label • 30-character string surrounded by quotation marks <autoconnect>: Automatic context activation mode • 0 = manual activation • 1 = auto activation <promptforpassword>: Flag value (prompt for password) • 0 = do not prompt for password • 1 = prompt for password <autolaunchapp>: Flag value (auto launch application) • 0 = do not auto launch the application • 1 = auto launch the application <rffu>: Reserved for future use • 0–32767 = Reserved for future use
!SCPADDR=<pid> Supporting modems: • All	**Displays IP address for specified PDP context** This command is used to display the IP address of the specified PDP context (profile), or for all profiles. **Usage:** • AT!SCPADDR=<pid> returns the IP address for the specified <pid> in the format <pid>, <addr>. • AT!SCPADDR= returns the IP addresses for all defined profiles. **Parameters:** <pid> (profile ID (PDP context)) • Valid range: 1–16 <addr> (IP address of <pid>) • 'Dot' format IP address (for exampel, 255.255.255.0)

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!SELMODE? **!SELMODE=?** **!SELMODE=<sdInd>** Supporting modems: • All	**Queries / sets current service domain** This command is used to configure the modem to use a specific service domain. **Usage:** • AT!SELMODE? returns the current service domain index (<sdInd>) and description. If the <sdInd> is undefined, an error message is returned. • AT!SELMODE=? returns a list of supported service domain indexes in the format <sdInd>, <description>. • AT!SELMODE=<sdInd> sets the desired service domain. **Parameters:** <sdInd> (service domain index): • 00 = CS only • 01 = PS only • 02 = CS and PS
!SELRAT? **!SELRAT=?** **!SELRAT=<ratInd>** Supporting modems: • All	**Queries / sets current radio access technology (RAT)** This command is used to configure the modem to use a specific (or preferred) RAT. **Usage:** • AT!SELRAT? returns the current RAT configuration index (<ratInd>) and description. If the <ratInd> is undefined, an error message is returned. • AT!SELRAT=? returns a list of supported RAT configurations in the format <ratInd>, <description>. • AT!SELRAT=<ratInd> sets the desired RAT configuration. **Parameters:** <ratInd> (RAT configuration index): • 00 = Automatic • 01 = UMTS 3G only • 02 = GSM 2G only • 03 = UMTS 3G preferred • 04 = GSM 2G preferred

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!SMSRETRY? **!SMSRETRY=?** **!SMSRETRY=<period>, <interval>** Supporting modems: • MC8780 / 81 • AC880 / 881	**Queries / sets SMS retry period and interval** This command is used to configure the SMS retry period and interval for MO-SMS. **Usage:** • AT!SMSRETRY? returns the current <period> and <interval> settings. • AT!SMSRETRY=? reports the format used for AT!SMSRETRY. • AT!SMSRETRY=<period>, <interval> sets the retry period and retry interval **Parameters:** <period> (Number of seconds allowed for MO-SMS retry attempts): • 0–255 <interval> (Number of seconds to wait between MO-SMS retry attempts): • 0–255 *Note: If <interval> is greater than <period>, a single retry attempt is made.* *Note: <interval> ignores the time spent actually performing a retry attempt. If <interval> = 5, attempts are made at elapsedTime = 0, 5, 10, etc. until an attempt is successful or <period> - elapsedTime < <interval>.* **Example 1:** Assume a retry attempt takes 2 seconds. If <period> = 1 and <interval> = 8, and no attempts are successful: • time = 0: Retry attempt fails at time = 2. No more attempts are made because <period> has expired. **Example 2:** Assume a retry attempt takes 2 seconds. If <period> = 3 and <interval> = 5, and no attempts are successful: • time = 0: Retry attempt fails at time = 2. No more attempts are made because <period> will expire before the <interval> passes. **Example 3:** Assume a retry attempt takes 2 seconds. If <period> = 14 and <interval> = 5, and no attempts are successful: • time = 0: Retry attempt fails at time = 2; next attempt will begin at time=5 (the <interval> counts from the beginning of the previous attempt) • time = 5: Retry attempt fails at time = 7; next attempt will begin at time=10 • time = 10: retry attempt fails at time = 12; No more attempts will be made because the <period> will expire before another <interval> of 5 seconds can pass.

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!SMSSTSEN? **!SMSSTSEN=?** **!SMSSTSEN=<enable>, <mode>** Supporting modems: • MC8775 / 75V (minimum FW rev: H1_1_8_14mcap) • MC8780 / 81 • AC875 (minimum FW rev: H1_1_8_14Acap) • AC880 / 881	**Enables / disables SMS status reports** This command is used to enable / disable SMS status reports for MO-SMS messages, and to indicate if the user should be able to enable / disable the reports. The status report indicates when a message is delivered to its intended recipient (in addition to the report that is sent when the network first receives the message). **Usage:** • AT!SMSSTSEN? returns the current <enable> and <mode> settings. • AT!SMSSTSEN=? reports the format used for AT!SMSSTSEN. • AT!SMSSTSEN=<enable>, <mode> enables / disables status reports, and indicates if the user can enable / disable the feature. **Parameters:** <enable> (Enable / Disable SMS status reports): • 0 = Disable • 1 = Enable <mode> (User access to reporting feature): • 0 = Read / Write (User can enable / disable the feature) • 1 = Read only (User cannot enable / disable the feature—the feature status is preset by the device provider)

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!SWICALLPROG? **!SWICALLPROG =<cpnStatus>** Supporting modems: • All	**Enables / disables Call Progress Notification** This command is used to enable or disable call progress notification. This allows the host to receive call status updates such as type of call, answered, on hold, etc. **Usage:** • AT!SWICALLPROG? returns the current <cpnStatus>. • AT!SWICALLPROG=<cpnStatus> Information on current calls is returned, when the call status changes, in the format: !SWICALLPROG:<idx$_1$>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha> !SWICALLPROG:<idx$_2$>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha> ... *Note: When call progress notification is enabled, the standard AT command +CLCC (List Current Calls) is disabled.* **Parameters:** <cpnStatus> (Call progress notification status): • 0 = Disabled • 1 = Output on AT channel if AT is not blocked • 2 = Output on AT channel even if AT is blocked • Any other value will return an ERROR response <idx> (Call identification number): • Integer value as described in GSM 02.30 Section 4.5.5.1 • Can be used in +CHLD command <dir> (Call direction): • 0 = Mobile-originated (MO) • 1 = Mobile-terminated (MT) <state> (Call state): • 0 = Active • 1 = Held • 2 = Dialing (MO calls) • 3 = Alerting (MO calls) • 4 = Incoming (MT calls) • 5 = Waiting (MT calls) • 6 = Disconnected <mode> (Bearer / teleservice): • 0 = Voice • 1 = Data • 2 = Fax (Continued on next page)

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!SWICALLPROG (Continued)	**Enables / disables Call Progress Notification (Continued)** <mpty> (Multiparty status): • 0 = Not part of a multiparty (conference) call • 1 = Part of a multiparty (conference) call <number> (Telephone number of other end of connection): • format specified by next parameter (<type>) <type> (Address octet type): • Two bitfields identifying the type of telephone number and numbering plan type (national / international). • Format specified in *3GPP TS 24.008 Section 10.5.4.7* <alpha> (Tag associated with <number> in the phonebook): • Example: “John Doe”

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
^SYSCONFIG? **^SYSCONFIG=<mode>, <acqorder>, <roam>, <srvDomain>** Supporting modems: • All	**Queries / sets system configuration information** This command is used to set and retrieve the modem's configuration. **Usage:** • AT^SYSCONFIG= sets the various configuration parameters. You must specify all of the parameters. • AT^SYSCONFIG? returns the current modem configuration information in the format <mode> <netAccessOrder> <roaming> <srvDomain>. **Parameters:** <mode> (Supported system mode): • 2 = Auto-select • 13 = GSM only • 14 = WCDMA only • 16 = No change—use this value with AT^SYSCONFIG= if you do not want to change the current setting. <acqOrder> (Network acquisition order) • 0 = Automatic • 1 = GSM, then WCDMA • 2 = WCDMA, then GSM • 3 = No change—use this value with AT^SYSCONFIG= if you do not want to change the current setting. <roam> (Roaming support) • 0 = Not supported • 1 = Supported • 2 = No change—use this value with AT^SYSCONFIG= if you do not want to change the current setting. <srvDomain> (Service domain support) • 0 = Circuit-switched only • 1 = Packet-switched only • 2 = Circuit- and packet-switched • 3 = Any • 4 = No change—use this value with AT^SYSCONFIG= if you do not want to change the current setting. <simStatus> (SIM status) • 0 = SIM is not available • 1 = SIM is available • 255 = No SIM, or the SIM has been PIN-locked (invalid PIN was entered and must be reset)

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
^SYSINFO Supporting modems: • All	**Returns service status information** This command returns current service type and availability information, and the current status of the module's SIM in the format <srvStatus> <srvDomain> <roamStatus> <sysMode> <simState>. **Parameters:** <srvStatus> – Service availability • 0 = No service • 1 = Limited service • 2 = Service • 3 = Limited regional service • 4 = Power save mode or deep sleep mode <srvDomain> – Service domain • 0 = No service • 1 = Circuit-switched service only • 2 = Packet-switched service only • 3 = Circuit- and packet-switched service <roamStatus> – Roaming status indicator • 0 = Not roaming • 1 = Roaming <sysMode> – System mode • 0 = No service • 3 = GSM / GPRS mode • 5 = WCDMA mode <simStatus> – SIM status • 0 = SIM is not available • 1 = SIM is available • 255 = No SIM, or the SIM has been PIN-locked (invalid PIN was entered and must be reset)

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
!TIME=<YYYY>, <MM>, <DD>, <hh>, <mm>, <ss> [, <TZ>, <DST>] **!TIME?** **!TIME=?** Supporting modems: • All	**Queries / sets current time of day** This command is used to set and retrieve the current time of day—the time of day can be set using this command, or could be set by the network. If the time has not been set, the command returns ERROR. **Usage:** • AT!TIME= <YYYY>,<MM>,<DD>,<hh>,<mm>,<ss> [, <TZ>, <DST>] sets the current time. • AT!TIME? returns four lines of data. Lines 1-2 show local date and time, lines 3-4 show UTC date and time. Date format is YYYY/MM/DD; time format is hh:mm:ss. Example response: !TIME: 2007/10/21 10:23:38 (local) 2007/10/21 17:23:38 (UTC) OK Note: In this example, <tz> is -32 (-8 hours) and DST is 1 (+1 hour). • AT!TIME=? reports the format used for AT!TIME **Parameters:** <YYYY> – year • 4 digits required <MM> – month • Valid values: 01–12 <DD> – day • Valid values: 01–31 <hh> – hour • Valid values: 00-23 <mm> – minute • Valid values: 00–59 <ss> – second • Valid values: 00–59 <TZ> – time zone offset from UTC in 15-minute increments • Valid values: -48 to 48 • <DST> must also be set if <TZ> is used <DST> – Daylight Saving Time offset in 1-hour increments • Valid values: 0 to 2 • <TZ> must also be set if <DST> is used

Table 3-2: Modem status, customization, and reset commands (Continued)

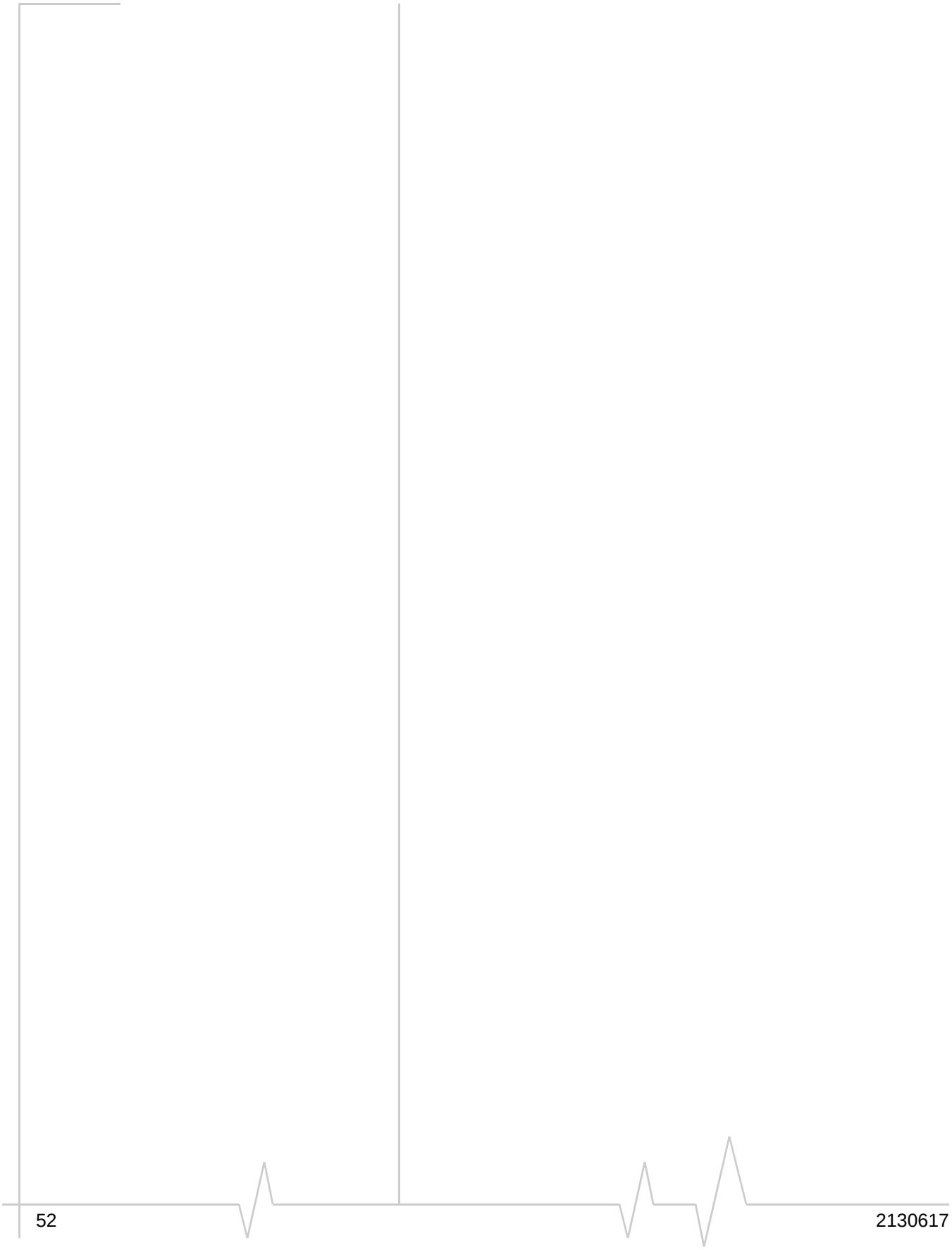
Command	Description
!UDINFO? Supporting modems: • All	**Returns information from active USB descriptor** This command returns information from the active USB descriptor in the format <vid> <pid> <manuf string> <product string> (each parameter on a separate line). **Parameters:** <vid> – Vendor ID • Valid range: 0000–FFFF <pid> – Product ID • Valid range: 0000–FFFF <manuf string> – Manufacturer string • ASCII string (29 characters maximum) • Example: “Sierra Wireless, Incorporated” <product string> – Product string • ASCII string (64 characters maximum) • Example: “Mini Card”
+UPSC Supporting modems: • All	**Displays Primary Scrambling Code (WCDMA only)** This command displays the Primary Scrambling Code (PSC) of the reference WCDMA cell. **Example:** AT!UPSC returns: +UPSC: <psc> **Parameters:** <psc> – Primary Scrambling Code of reference WCDMA cell • Valid range: 0-255 • 255 = No valid cell

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
+USET?<set> **+USET=?** Supporting modems: • All	**Displays WCDMA set information** This command displays WCDMA set information (Active Set, Candidate Set, etc.). **Usage:** • AT+USET?<set> returns detailed information about each item in the <set>. • AT+USET=? returns the list of valid <set> values **Example:** AT+USET?<set> returns: +USET: <setName> Count: <count> PSC: <psc> <ref> SSC: <ssc> STTD: <sttd> Tot Ec/Io: <totEcIo> Ec/Io: <EcIo> RSCP: <rscp> Window Size: <winSize> ... (repeats for <count> items) **Parameters:** <set> – Set for which details are requested • Valid range: 0–11 (see <setName> for descriptions) <setName> – Description of <set> value • ASCII string • Valid values: 0-Active Set 1-Sync Neighbour Set 2-Async Neighbour Set 3-Unlisted Set 4-Add-Candidate Set 5-Drop-Candidate Set 6-After failed W2G Set 7-DCH-Only Set 8-HHO Active Set 9-HHO Active No PN Set 10-Candidate to Unlisted Set 11-Saved Set <count> – Number of items in <set> • Valid range: 0-255 <psc> – Primary Scrambling Code • Valid range: 0–FFFF (Continued on next page)

Table 3-2: Modem status, customization, and reset commands (Continued)

Command	Description
+USET	**Displays WCDMA set information (Continued)** <ref> – Reference PSC designator string • Displays “(REF)” if this is the reference PSC <ssc> – Secondary Scrambling Code • Valid range: 0–FFFF <sttd> – Common Pilot Channel (CPICH) supports Space Time Transit Diversity • 0 = Not supported • 1 = Supported <totEcIo> – Total Ec/Io • Valid range: 00–FF <EcIo> – Best path Ec/Io • Valid range: 00–FF <rscp> – Received Signal Code Power • Valid range: 0-FFFF <winSize> – Search window size • Valid range: 0000–FFFFFFFF
&V Supporting modems: • All	**Return operating mode AT configuration parameters** This command returns the status of all AT command parameters that apply to the current operating mode. **Example:** “AT&V <Enter> &C: 2; &D: 2; &F: 0; E: 1; L: 0; M: 0; Q: 0; V: 1; X: 0; Z: 0; S0: 0; S2: 43; S3: 13; S4: 10; S5: 8; S6: 2; S7: 50; S8: 2; S9: 6; S10: 14; S11: 95; +FCLASS: 0; +ICF: 3,3; +IFC: 2,2; +IPR: 115200; +DR: 0; +DS: 0,0,2048,6;+WS46: 12; +CBST: 0,0,1;+CRLP: (61,61,48,6,0),(61,61,48,6,1),(240,240,52,6,2);+CV120: 1,1,1,0,0,0; +CHSN: 0,0,0,0; +CSSN: 0,0; +CREG: 0; +CGREG: 0;+CFUN:; +CSCS: "IRA"; +CSTA: 129; +CR: 0; +CRC: 0; +CMEE: 2; +CGDCONT: (1,"IP","","",0,0); +CGDSCONT: ; +CGTFT: ; +CGEQREQ: ; +CGEQMIN: ; +CGQREQ: ; +CGQMIN: ;+CGEREP: 0,0; +CGDATA: "PPP"; +CGCLASS: "A"; +CGSMS: 3; +CSMS: 0;+CMGF: 0; +CSCA: "",; +CSMP: ,,0,0; +CSDH: 0; +CSCB: 0,"","; +FDD: 0;+FAR: 0; +FCL: 0; +FIT: 0,0; +ES: ,,; +ESA: 0,,,,0,0,255,; +CMOD: 0;+CVHU: 0; +CPIN: ,; +CMEC: 0,0,0; +CKPD: 1,1; +CGATT: 0; +CGACT: 0;+CPBS: "SM"; +CPMS: "SM","SM","SM"; +CNMI: 0,0,0,0,0; +CMMS: 0; +FTS: 0;+FRS: 0; +FTH: 3; +FRH: 3; +FTM: 96; +FRM: 96; +CCUG: 0,0,0;+COPS: 0,0,""; +CUSD: 0; +CAOC: 1; +CCWA: 0; +CPOL: 0,2,""; +CTZR: 0;+CLIP: 0; +COLP: 0; +CMUX: 0,0,5,31,10,3,30,10,2;!CMUX: 0,0,5,31,10,3,30,10,2 OK”



4: Diagnostic Commands

Introduction

This chapter describes commands used to diagnose modem problems.

Command summary

The table below lists the commands described in this chapter.

Table 4-1: Diagnostic commands

Cmnd	Description	Page
!AUTH	Runs GSM algorithm on SIM	53
!GCIPHER	Enables / disables ciphering and integrity settings	54
!MXSTATS	Displays / clears 27.010 statistics	55

Command reference

Table 4-2: Diagnostic command details

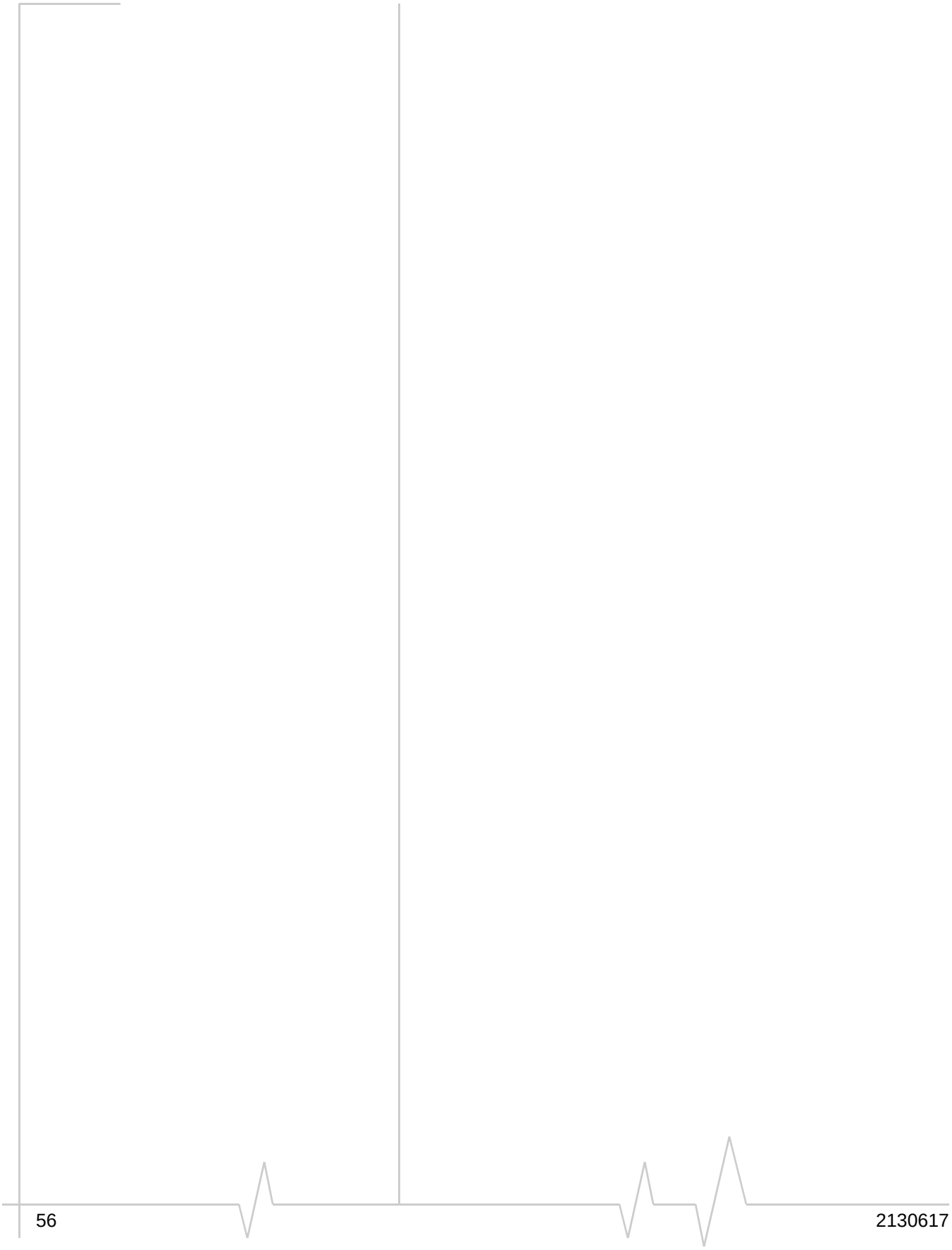
Command	Description
!AUTH = <randNumber> Supporting modems: • All	**Runs GSM algorithm on SIM** This command is used to authenticate the SIM using a random number. The command returns the SIM's response and a 64–bit ciphering key in the format: <key>, <SRES> **Parameters:** <randNumber> • 32 hexadecimal digit random number. Example: 123A567B9012C4567D90123E56789012 <SRES> - SIM response • Example: 500e2879 <key> - Ciphering key • Example: ec793ac5662e7000

Table 4-2: Diagnostic command details (Continued)

Command	Description
!GCIPHER = <setting> **!GCIPHER?** Supporting modems: • All	**Enables / disables ciphering and integrity settings** To register onto a network with WCDMA service, the modem's ciphering and integrity settings must be enabled or disabled to match the network settings. Most carriers enable both ciphering and integrity. When testing the modem, you may be using a SIM that has different codes for ciphering and integrity than those used by the test system. In this case, you may need to disable ciphering and integrity checking to use the test system. **Usage:** • AT!GCIPHER=<setting> sets the ciphering and integrity settings. • AT!GCIPHER? reports the current ciphering and integrity settings (0=disabled, 1=enabled). **Parameters:** <setting> (enable / disable ciphering and integrity): • 0 = ciphering disabled; integrity disabled • 1 = ciphering enabled; integrity disabled • 2 = ciphering enabled; integrity enabled • 3 = ciphering disabled; integrity enabled

Table 4-2: Diagnostic command details (Continued)

Command	Description
!MXSTATS=0 **!MXSTATS?** Supporting modems: • All	**Displays / clears 27.010 statistics** TS 27.010 is a standard that defines a multiplexing protocol between a mobile station and a terminal. This standard is supported on the modem and AT!MXSTATS is used to display statistics related to that protocol for debugging purposes. **Usage:** • AT!MXSTATS=0 clears the statistics. • AT!MXSTATS? reports the statistics. The command AT!MXSTATS? returns these statistics: • Sessions Started • Sessions Ended • SABM (Tx/Rx) • DISC (Tx/Rx) • UA (Tx/Rx) • DM (Tx/Rx) • UIH (Tx/Rx) • T1 expiry • T2 expiry • T3 expiry • N1 count • N2 count • Bad Frame (addr) • Bad Frame (ctl) • Bad Frame (len) • Bad Frame (F9) • Bad Frame (fcs) • Bad Frame (mem) Values are accumulated until cleared (by issuing the command AT!MXSTATS=0).



5: Test commands

Introduction

This chapter describes commands used to display and clear data that is stored if the modem crashes.

Command summary

The table below lists the commands described in this chapter.

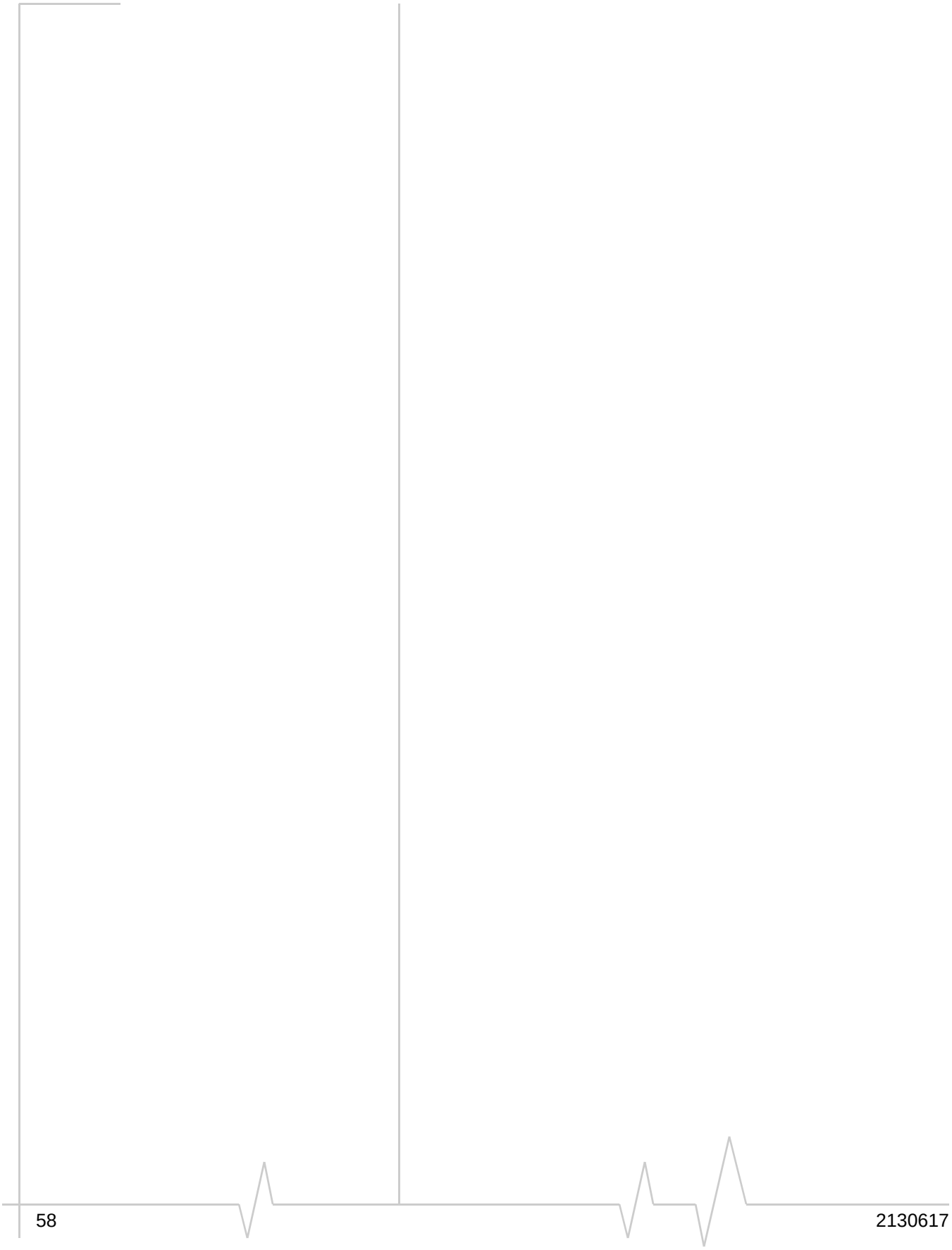
Table 5-1: Test commands

Cmnd	Description	Page
!ERR	Displays diagnostic information	57
!GCCLR	Clears crash dump data	57
!GCDUMP	Displays the crash dump data	57

Command reference

Table 5-2: Test command details

Command	Description
!ERR Supporting modems: • All	**Displays diagnostic information** This command is used to display diagnostic information that Sierra Wireless uses to assist in resolving technical issues.
!GCCLR Supporting modems: • All	**Clears crash dump data** This command clears the crash dump and assert data.
!GCDUMP Supporting modems: • All	**Displays the crash dump data** This command displays crash dump data. If there is no crash dump data, it displays the string “No crash data available”.



6: Memory Management Commands

Introduction

The modem has 2 MB of non-volatile memory that is used to store:

- Factory calibration data
- Settings made in a host application such as Watcher

The commands in this chapter allow you to back up and restore the data in non-volatile memory.

Command summary

The table below lists the commands described in this chapter:

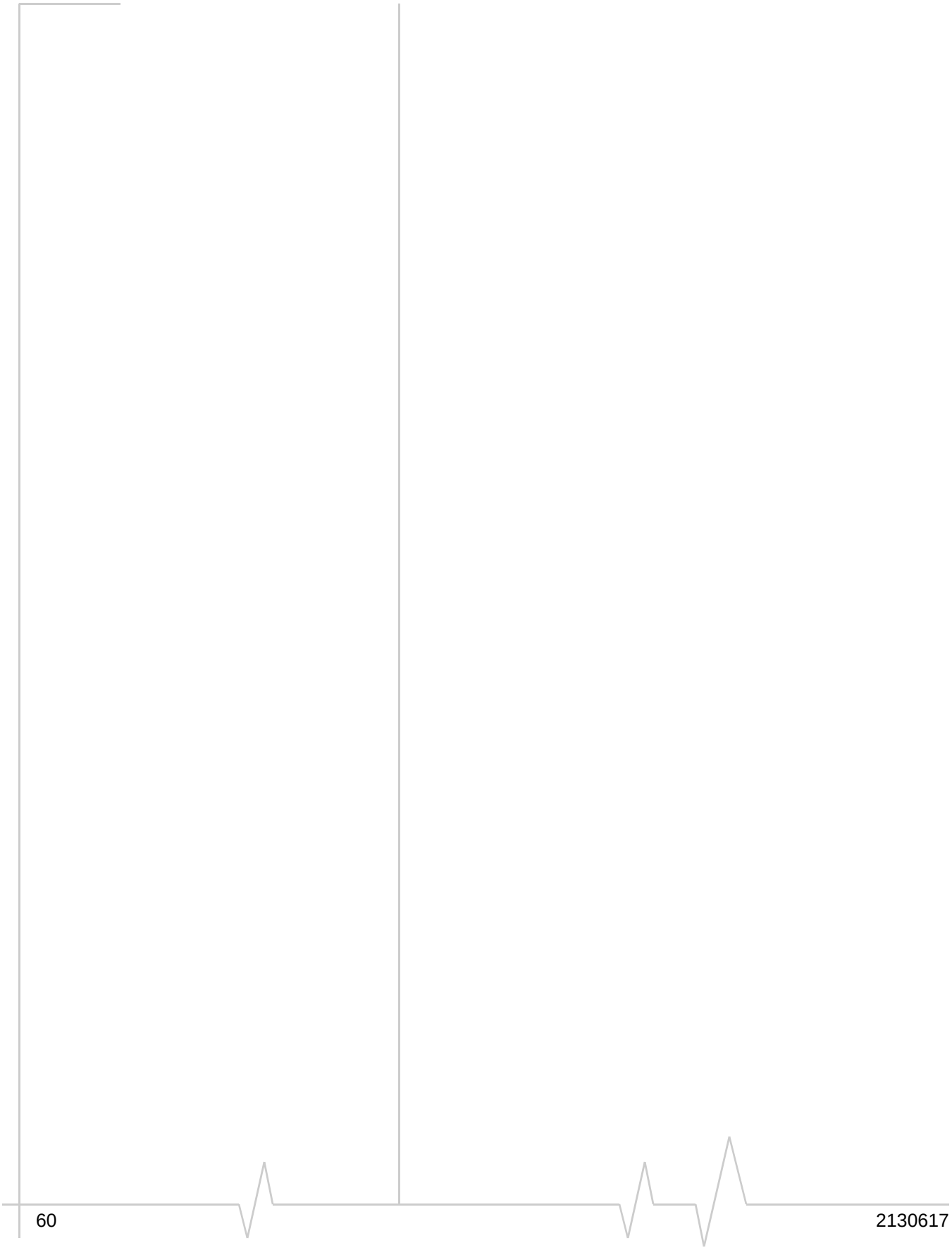
Table 6-1: Memory management command passwords

Command	Description	Page
!NVBACKUP	Backs up items stored in non-volatile memory	59

Command reference

Table 6-2: Memory management command details

Command	Description
!NVBACKUP =<category> Supporting modems: • All	**Backs up items stored in non-volatile memory** This command creates a backup that is stored in the modem's flash memory. **Parameters:** <category> (specify items to back up): • 0 = Factory items (includes calibration data) • 1 = OEM items (includes the PRI file) • 2 = User items (includes settings made in Watcher or another host application) The command returns: • NV Items saved • NV Items skipped The items skipped represent memory to which nothing has been written.



7: SIM Commands

Introduction

This chapter describes commands used to communicate with an installed (U)SIM.

Command summary

The table below lists the commands described in this chapter:

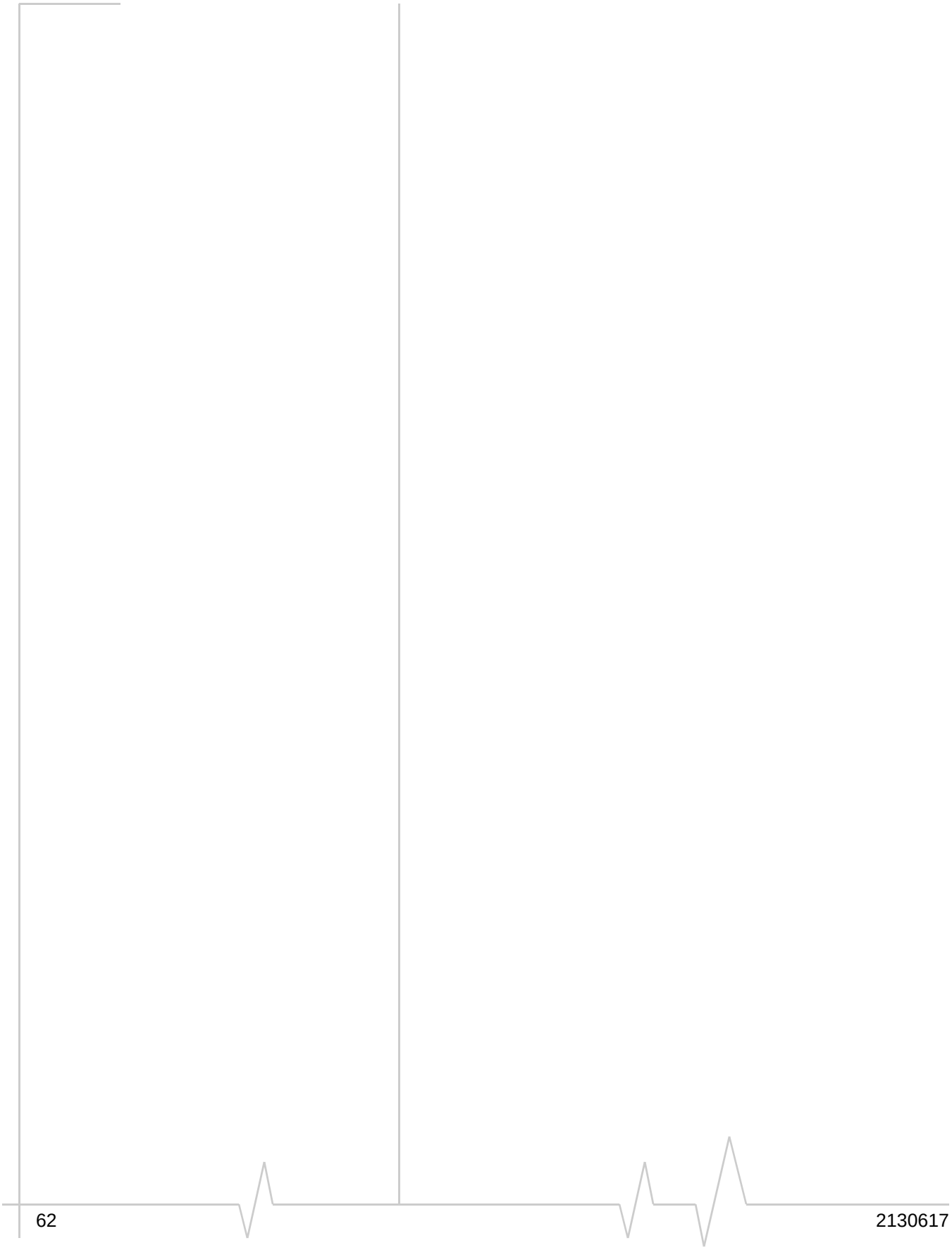
Table 7-1: SIM command passwords

Command	Description	Page
!ICCID	Returns (U)SIM card's ICCID	61

Command reference

Table 7-2: SIM command details

Command	Description
!ICCID Supporting modems: • All	**Returns (U)SIM card's ICCID** (Supporting modems: All; MC8775/75V requires fw revision H0_2_2_0mcap or higher; AC875 requires fw revision H0_2_2_3acap or higher) This command returns a (U)SIM's ICCID (Integrated Circuit Card ID). **Usage:** • AT!ICCID? returns !ICCID: <iccid> **Parameters:** <iccid> (ICCID of the (U)SIM currently being tested): • <tbd> 10-digit hexadecimal number / 19-20 digit regular number

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