



AirPrime Embedded Module EM73xx/7655/8805

AT Command Reference



SIERRA
WIRELESS®

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Rev. 2

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Consult our website for up-to-date product descriptions, documentation, application notes, firmware upgrades, troubleshooting tips, and press releases:

www.sierrawireless.com

Revision History

| Revision number | Release date | Changes |
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| 1 | Sep 2013 | <ul style="list-style-type: none"> Created document |
| 2 | Nov 2014 | <ul style="list-style-type: none"> Added audio commands chapter Added +CPINR, !GCCLR, ^MODE, !RMARESET, !HOSTDEVINFO, !OSINFO Added/modified customizations for !CUSTOM (IMSIREFRESH, ISVOICEN, NETWORKNAMEFMT, QMIDETACHEN) |

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1: About This Guide

Introduction

This document describes supported standard and proprietary AT commands available for Sierra Wireless AirPrime® products, and provides details where commands vary from the standards. These commands are intended for use by OEMs, and are supplemental to the standard AT commands for GSM devices defined by the 3GPP (3rd Generation Partnership Project) in *TS 27.007 AT command set for User Equipment (UE)* and *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)*.

Note: When designing applications that use these AT commands, use Skylight™ or 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.

Command access

Most commands in this reference are password-protected. To use these commands, you must enter the correct password using **ATIINTERCND** on page 18. Once the password is entered, all commands are available and remain available until the modem is reset or powered off and on.

The password assigned to **ATIINTERCND** is unique to each carrier and is configured onto the modem during manufacture. If you do not know your password, contact your Sierra Wireless Account Manager.

Command timing

Interval timing

Some commands require time to process before additional commands are entered. For example, the modem returns OK when it receives **ATIDAFTMACT**. If **ATIDASBAND** is received too soon after this, the modem returns an error.

When building automated test scripts, ensure that sufficient delays are embedded, where necessary, to avoid these errors.

Escape sequence guard time

The AT escape sequence “+++” requires a guard time of 1.0 seconds before and after it is used.

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 is returned if the command is not recognized or is not permitted in the current state or condition of the modem.

References

This guide covers the command sets used by OEMs, designers and testers of Sierra Wireless AirPrime products, plus general operational use commands.

You may also want to consult the other documents available on our website at www.sierrawireless.com.

Terminology and acronyms

This document makes wide use of acronyms that are in common use in data communications and cellular technology.

Current firmware versions

Version

To determine your firmware revision, enter the identification command **AT+GMR**.

Upgrading

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

Document structure

This document describes the proprietary commands listed in the tables below—each table corresponds to a specific chapter.

[AT Password Commands](#)—Commands used to enable access to password-protected AT commands and to set the AT command password.

Table 1-1: AT password commands

| Command | Description | Page |
|------------------|--|------|
| !ENTERCND | Enable access to password-protected commands | 18 |
| !SETCND | Set AT command password | 18 |

[Modem Status, Customization, and Reset Commands](#)—Commands used to determine modem status, adjust customization settings, and reset the modem.

Table 1-2: Modem status commands

| Command | Description | Page |
|-----------------------|--|------|
| !ANTSEL | Set/query external antenna select configuration | 21 |
| !BAND | Select/return frequency band set | 22 |
| !BOOTHOLD | Reset modem and wait in bootloader for firmware download | 23 |
| !CUSTOM | Set/return customization settings | 24 |
| !DARPEN | Enable/disable DARP for SAIC | 28 |
| !DTMEN | Enable/disable Dual Transfer Mode stack functionality | 29 |
| !EDAEN | Configure protocol stack for EDA | 29 |
| !GCFEN | Enable/disable GCF test mode | 30 |
| !GCFUIMTYPE | Set/return current SIM type | 30 |
| !GETBAND | Return the current active band | 31 |
| !GETRAT | Return the current active radio access technology (RAT) | 31 |
| !GOBIIMPREF | Query/set Gobi Image Management preferences | 32 |
| !GRESET | Reset the modem | 33 |
| !GSTATUS | Return operational status | 33 |
| !LTENAS | Configure LTE NAS settings | 34 |
| ^MODE | Set/report system mode indication state | 35 |
| !NASREL | Set/report system mode indication state | 35 |
| !NVENCRYPTIMEI | Write unencrypted IMEI to modem | 36 |
| !NVNSCODE | Return Network Subset codes | 37 |
| !NVPLMN | Provision PLMN list for Network Personalization locking | 38 |
| !NVSPCODE | Provision Network Service Provider code list | 38 |
| !PACKAGE | Return package version string | 39 |
| !PCINFO | Return power control status information | 39 |

Table 1-2: Modem status commands (Continued)

| Command | Description | Page |
|----------------------|--|------|
| !PCOFFEN | Set/return Power Off Enable state | 40 |
| !PCTEMP | Return current temperature information | 40 |
| !PCTEMPLIMITS | Set/report temperature state limit values | 41 |
| !PCVOLT | Return current power supply voltage information | 42 |
| !PCVOLTLIMITS | Set/report power supply voltage state limit values | 43 |
| !POWERDOWN | Power down system | 44 |
| !PRIID | Set/report module PRI part number and revision | 44 |
| !REL | Set/report active protocol/revision | 45 |
| !RESET | Reset modem | 45 |
| !SELACQ | Select RAT acquisition order | 46 |
| !SELMODE | Set/return current service domain | 47 |
| !SIMRSTC | Set/report SIM refresh reset notification state | 47 |
| !UDINFO | Return information from active USB descriptor | 48 |
| !UDPID | Set/report product ID in USB descriptor | 49 |
| !UDUSBCOMP | Set/report USB interface configuration | 50 |
| &V | Return operating mode AT configuration parameters | 51 |

Diagnostic Commands—Commands used to select frequency bands and diagnose problems.

Table 1-3: Diagnostic commands

| Command | Description | Page |
|--------------------------|--|------|
| !BCFWUPDATESTATUS | Report status of most recent firmware update attempt | 54 |
| !ERR | Display diagnostic information | 55 |
| !GCCLR | Clear crash dump data | 55 |
| !GCDUMP | Display crash dump data | 55 |
| !RXDEN | Enable/disable WCDMA/LTE receive diversity | 56 |

Test Commands—Commands required to place the modem in particular modes of operation, test host connectivity, and to configure the transmitters and receivers for test measurements.

Table 1-4: Test commands

| Command | Description | Page |
|----------------------|---|------|
| !DAFTMACT | Put modem into Factory Test Mode | 60 |
| !DAFTMDEACT | Put modem into online mode from Factory Test Mode | 60 |
| !DAGGAVGRSSI | Return averaged RSSI value in dBm (GSM only) | 61 |
| !DAGGRSSI | Return the RSSI value in dBm (GSM only) | 61 |
| !DAGGRSSIRAW | Return raw RSSI value (GSM only) | 62 |
| !DAGINFO | Return GSM mode RF information (GSM only) | 63 |
| !DAGSLOCK | Return synthesizer lock state (GSM only) | 64 |
| !DAGSRXBURST | Set GSM receiver to burst mode (GSM only) | 64 |
| !DAGSRXCONT | Set GSM receiver continuously on (GSM only) | 65 |
| !DAGSTXBURST | Set GSM transmitter to burst mode (GSM only) | 65 |
| !DAGSTXFRAME | Set GSM Tx frame structure (GSM only) | 66 |
| !DALGAVGAGC | Return averaged Rx AGC value (LTE only) | 67 |
| !DALGRXAGC | Return Rx AGC value (LTE only) | 68 |
| !DALGTXAGC | Return Tx AGC value and transmitter parameters (LTE only) | 69 |
| !DALSPARANGE | Set LTE PA range (LTE only) | 70 |
| !DALSRXBW | Set LTE Rx bandwidth (LTE only) | 71 |
| !DALSTXBW | Set LTE Tx bandwidth (LTE only) | 71 |
| !DALSTXINDEX | Set LTE Tx gain index (LTE only) | 72 |
| !DALSWAVEFORM | Set LTE TX waveform (LTE only) | 72 |
| !DAOFFLINE | Place modem offline | 73 |
| !DASBAND | Set frequency band | 73 |
| !DASCHAN | Set modem channel (frequency) | 74 |
| !DASLNAGAIN | Set LNA gain state | 75 |
| !DASPDM | Set PDM value | 76 |
| !DASTXOFF | Turn Tx PA off | 76 |
| !DASTXON | Turn Tx PA on | 77 |
| !DAWGAVGAGC | Return averaged Rx AGC value (WCDMA only) | 77 |
| !DAWGRXAGC | Return Rx AGC value (WCDMA only) | 78 |
| !DAWINFO | Return WCDMA mode RF information (WCDMA only) | 79 |

Table 1-4: Test commands (Continued)

| Command | Description | Page |
|---------------|---|------|
| !DAWSCONFIGRX | Set WCDMA receiver to factory calibration settings (WCDMA only) | 80 |
| !DAWSPARANGE | Set PA range state machine (WCDMA only) | 81 |
| !DAWSSCHAIN | Enable secondary receive chain (WCDMA only) | 81 |
| !DAWSCHAINTCM | Place receive chain in test call mode (WCDMA only) | 82 |
| !DAWSTXCW | Set waveform used by the transmitter (WCDMA only) | 82 |
| !DAWSTXPWR | Set desired Tx power level (WCDMA mode only) | 83 |

Memory Management Commands—Commands that control the data stored in non-volatile memory of the modem.

Table 1-5: Memory management commands

| Command | Description | Page |
|-----------|-------------------------------------|------|
| !RMARESET | Restore device to original settings | 86 |

GPS Commands—Supported on GPS-enabled modems only.

Table 1-6: GPS commands

| Command | Description | Page |
|------------------|--|------|
| !GPSLBSAPN | Set GPS LBS APNs | 88 |
| !GPSMTLRSETTINGS | Set/report MT location request settings | 89 |
| !GPSNMEA | Enable/disable GPS session autostart when NMEA opens | 90 |

SIM Commands—Commands used to communicate with an installed (U)SIM.

Table 1-7: GPS commands

| Command | Description | Page |
|---------|--|------|
| +CPINR | Display remaining number of SIM unlock retries | 92 |
| !ICCID | Return (U)SIM card's ICCID | 93 |

OMA-DM Commands—Commands used to configure DM (Device Management) accounts, sessions, and host-device-server interactions.

Table 1-8: OMA-DM commands

| Command | Description | Page |
|--------------|---|------|
| !HOSTDEVINFO | Configure host device details | 96 |
| !IDSAUTOFOTA | Configure automatic settings for FOTA updates | 97 |
| !IDSAUTOSDM | Configure Subscriber Device Management response to server request | 98 |

Table 1-8: OMA-DM commands

| Command | Description | Page |
|----------------------|---|------|
| !IDSCONFIGACC | Configure DM account authentication mode and XML format | 99 |
| !IDSCREATEACC | Enter DM account credentials | 100 |
| !IDSDFLTACC | Set DM account to use for device-initiated sessions | 101 |
| !IDSPID | Set profile ID for DM data connection types | 101 |
| !IDSROAM | Configure DM client roaming support | 102 |
| !IDSSUPPORT | Configure DM sessions | 103 |
| !IMSTESTMODE | Enable/disable IMS test mode | 104 |
| !OSINFO | Configure host device operating system information | 105 |

[SAR Backoff and Thermal Control Commands](#)—Commands used to configure SAR options, and thermal mitigation algorithm parameters and limits.

Table 1-9: SAR backoff and thermal control commands

| Command | Description | Page |
|------------------------|--|------|
| !MAXPWR | Set/report maximum Tx power | 108 |
| !SARINTGPIOMODE | Set/report default pull mode for SAR interrupt GPIOs | 109 |

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 leading “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)—text codes are returned if verbose responses are enabled. 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: AT Password Commands

Introduction

AT commands described in this document are password-protected. This chapter describes how to enter and change the password.

Command summary

[Table 2-1](#) on page 17 lists the commands described in this chapter.

Table 2-1: AT password commands

| Command | Description | Page |
|------------------|--|------|
| !ENTERCND | Enable access to password-protected commands | 18 |
| !SETCND | Set AT command password | 18 |

Command reference

Table 2-2: AT command password details

| Command | Description |
|------------------|---|
| !ENTERCND | <p>Enable access to password-protected commands</p> <p>Before you can use any password-protected AT commands, you must enter the password correctly using this command. The initial password is configured onto the modem during manufacture. You can change the password using !SETCND. If you do not know the password, contact your Sierra Wireless account manager.</p> <p>Once the password has been entered correctly, the password-protected AT commands are available until the modem is reset or powered off and on.</p> <p>Password required: Yes—Query format only.</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!ENTERCND=<"key"> Response: OK Purpose: Unlock password-protected commands. Query: AT!ENTERCND? Response: <key> (if unlocked) Purpose: This command is password-protected. After entering the password correctly using the execution operation ("="), you can use this command to display the password as a reminder. <p>Parameters:</p> <p><"key"> (Password stored in NV memory)</p> <ul style="list-style-type: none"> Password must be entered with quotation marks. (For example, AT!ENTERCND="ExamplePW".) Password length: 4–10 characters (0–9, A–Z, upper or lower case) Characters may be entered in ASCII format, or in Hex format. (For example: "myPass3" or "ABCDEF01234".) |
| !SETCND | <p>Set AT command password</p> <p>Change the password used for the !ENTERCND command. (Before you can change the password using !SETCND, you must enable access to this command using !ENTERCND.)</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!SETCND=<"key"> Response: OK Purpose: Sets <"Key"> as the new password for accessing protected commands. <p>Parameters:</p> <p><"key"> (New password)</p> <ul style="list-style-type: none"> Password must be entered with quotation marks (for example, AT!SETCND="NewPW"). Password length: 4–10 characters (0–9, A–Z, upper or lower case) Characters may be entered in ASCII format, or in Hex format. (For example: "myPass3" or "ABCDEF01234".) <hr/> <p>Warning: Do NOT enter a null password (that is, the <"Key"> cannot be "") — you will NOT be able to use password-protected commands, and will have to contact Sierra Wireless for help to reset the password.</p> <hr/> |

3: Modem Status, Customization, and Reset Commands

Introduction

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

Command summary

Table 3-1 lists the commands described in this chapter.

Table 3-1: Modem status commands

| Command | Description | Page |
|-----------------|--|------|
| !ANTSEL | Set/query external antenna select configuration | 21 |
| !BAND | Select/return frequency band set | 22 |
| !BOOTHOLD | Reset modem and wait in bootloader for firmware download | 23 |
| !CUSTOM | Set/return customization settings | 24 |
| !DARPEN | Enable/disable DARP for SAIC | 28 |
| !DTMEN | Enable/disable Dual Transfer Mode stack functionality | 29 |
| !EDAEN | Configure protocol stack for EDA | 29 |
| !GCFEN | Enable/disable GCF test mode | 30 |
| !GCFUIMTYPE | Set/return current SIM type | 30 |
| !GETBAND | Return the current active band | 31 |
| !GETRAT | Return the current active radio access technology (RAT) | 31 |
| !GOBIIMPREF | Query/set Gobi Image Management preferences | 32 |
| !GRESET | Reset the modem | 33 |
| !GSTATUS | Return operational status | 33 |
| !LTENAS | Configure LTE NAS settings | 34 |
| ^MODE | Set/report system mode indication state | 35 |
| !NASREL | Set/report system mode indication state | 35 |
| !INVENCRYPTIMEI | Write unencrypted IMEI to modem | 36 |
| !NVNSCODE | Return Network Subset codes | 37 |
| !NVPLMN | Provision PLMN list for Network Personalization locking | 38 |
| !NVSPCODE | Provision Network Service Provider code list | 38 |

Table 3-1: Modem status commands (Continued)

| Command | Description | Page |
|----------------------|--|------|
| !PACKAGE | Return package version string | 39 |
| !PCINFO | Return power control status information | 39 |
| !PCOFFEN | Set/return Power Off Enable state | 40 |
| !PCTEMP | Return current temperature information | 40 |
| !PCTEMPLIMITS | Set/report temperature state limit values | 41 |
| !PCVOLT | Return current power supply voltage information | 42 |
| !PCVOLTLIMITS | Set/report power supply voltage state limit values | 43 |
| !POWERDOWN | Power down system | 44 |
| !PRIID | Set/report module PRI part number and revision | 44 |
| !REL | Set/report active protocol/revision | 45 |
| !RESET | Reset modem | 45 |
| !SELACQ | Select RAT acquisition order | 46 |
| !SELMODE | Set/return current service domain | 47 |
| !SIMRSTC | Set/report SIM refresh reset notification state | 47 |
| !UDINFO | Return information from active USB descriptor | 48 |
| !UDPID | Set/report product ID in USB descriptor | 49 |
| !UDUSBCOMP | Set/report USB interface configuration | 50 |
| &V | Return operating mode AT configuration parameters | 51 |

Command reference

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

| Command | Description |
|---------|--|
| !ANTSEL | <p>Set/query external antenna select configuration</p> <p>Configure the device to drive (high or low) up to four GPIOs for specific bands. (If a GPIO is not needed for a specific band, it is identified as not required.)</p> <p>When the device switches to a configured band, the GPIOs are driven as specified, and the host uses those GPIOs to tune the external antenna appropriately. Note that this feature is independent of the radio technology being used. For example, Band 5 corresponds to any 850-band technology (CDMA, WCDMA, LTE, GSM).</p> <hr/> <p><i>Note: Any changes to GPIO configurations take effect after the modem is reset.</i></p> <hr/> <p><i>Note: System level testing should be performed to ensure that the antenna switching feature does not introduce any handover issues. The tunable antenna should be designed to ensure that it can retune in < 5 μs (recommended) and < 10 μs (maximum).</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!ANTSEL=<band>, <gpio1>, <gpio2>, <gpio3>[, <gpio4>] Response: OK Purpose: Configure the GPIOs for the specified <band>. • Query: AT!ANTSEL? Response: BAND <band a>: <gpio1>, <gpio2>, <gpio3>[, <gpio4>] BAND <band b>: <gpio1>, <gpio2>, <gpio3>[, <gpio4>] ... OK Purpose: Display the current external antenna select configuration. • Query List: AT!ANTSEL=? Purpose: Display valid execution format and parameter values. <p>Parameters:</p> <p><band> (RF band)</p> <ul style="list-style-type: none"> • 3GPP band number. For a full listing of 3GPP band numbers, see Table 12-2 on page 122. • Valid range: 0–60. Band support is product specific—see the device's Product Specification or Product Technical Specification document for details. <p><gpio1>, <gpio2>, <gpio3>, <gpio4> (GPIO configurations. Note: <gpio4> availability is device-specific—see the appropriate Product Technical Specification for details.)</p> <ul style="list-style-type: none"> • 0=Logic low • 1=Logic high • 2=Not used for antenna selection (Default value for <gpio4>.) |

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

| Command | Description |
|--|--|
| <p>!BAND</p> <hr/> <p><i>Note: The 'Basic' command and response versions are used if you haven't entered the required password. (See Command access on page 9.)</i></p> <hr/> | <p>Select/return frequency band set</p> <p>Configure the modem to operate on a set of frequency bands, look up available sets, create new sets, or return the current selection.</p> <p>Password required: Yes—Execution (Extended) format</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution (Basic): <ul style="list-style-type: none"> AT!BAND=<Index> Response: OK Purpose: Select an existing set of bands. • Execution (Extended): <ul style="list-style-type: none"> AT!BAND=<Index>,"<Name>",<GWmask>[,<Lmask>,<Lmask2>] Response: OK Purpose: Create a new set of bands. • Query: AT!BAND? <ul style="list-style-type: none"> Response: Index, Name[, GW Band Mask [L Band Mask]] <Index>, <Name>[, <GWmask> [, <Lmask>]] OK or (<i>If the current band mask doesn't match a band set</i>) Unknown band mask. Use AT!BAND to set band. <Index> OK Purpose: Report the current band selection. (<GWmask> and <Lmask> may only appear in Extended responses.) • Query List: AT!BAND=? <ul style="list-style-type: none"> Response: Index, Name[, GW Band Mask [L Band Mask]] <Index1>, <Name1>[, <GWmask1> [, <Lmask1>]] ... <IndexN>, <NameN>[, <GWmaskN> [, <LmaskN>]] OK Purpose: Display allowed <Index> values and descriptions of the associated band sets. <p>(Continued on next page)</p> |

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

| Command | Description |
|--------------------------|--|
| !BAND (continued) | <p>Select/return frequency band set (continued)</p> <p>Parameters:</p> <p><Index> (Index of a band set. Use the Query List command to display all supported sets)</p> <ul style="list-style-type: none"> Valid range: 0–13 (Hexadecimal. There are 20 possible values.) <p><Name> (Name of the band set)</p> <ul style="list-style-type: none"> ASCII string—Up to 30 characters <p><GWmask> (GSM/WCDMA bands included in the set)</p> <ul style="list-style-type: none"> Format: 32-bit bitmask Valid values: <ul style="list-style-type: none"> 0000000000000001—BC0-A 0000000000000002—BC0-B 0000000000000003—BC0 (BC0-A and BC0-B) 0000000000000004—BC1 0000000000000080—G1800 0000000000000300—G900 (EGSM/GSM) 0000000000000400—BC6 0000000000004000—BC10 (800) 0000000000080000—G850 0000000000200000—G1900 0000000000400000—W2100 0000000000800000—W1900 0000000002000000—W1700 0000000004000000—W850 0000000008000000—W800 0000000080000000—BC15 0002000000000000—W900 1000000000000000—B19 (850) <p><Lmask> (LTE bands included in the set)</p> <ul style="list-style-type: none"> Format: 32-bit bitmask Valid values: <ul style="list-style-type: none"> 0000000000000001—Band 1 0000000000000002—Band 2 ... 0000080000000000—Band 40 0000100000000000—Band 41 |
| !BOOTHOLD | <p>Reset modem and wait in bootloader for firmware download</p> <p>Prepare for a firmware download by resetting the modem and waiting in 'boot and hold' mode.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!BOOTHOLD Response: OK Purpose: Force the modem to backup user NV options, reset, and then wait in boot and hold mode for a firmware download. |

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

| Command | Description |
|--|---|
| <p>!CUSTOM</p> <hr/> <p><i>Note: Some customizations may not be available for certain chipsets, firmware revisions, or devices.</i></p> <hr/> | <p>Set/return customization settings</p> <p>Set or return several customization values.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!CUSTOM=<customization>, <value> Response: OK Purpose: Assign <value> to a specific <customization> setting. • Query: AT!CUSTOM? Response: (list of enabled <customization>s) OK Purpose: Display customizations that are currently enabled. • Query list: AT!CUSTOM=? Purpose: Return a list of valid <customization> values. <p>Parameters:</p> <p><value> (Value being assigned to a specific <customization> setting)</p> <ul style="list-style-type: none"> • Descriptions are included in each of the customizations described below. • Numeric value. Valid range depends on the <customization> type. <p><customization> (String identifying customization setting. The default value for all customizations is 0.)</p> <hr/> <p><i>Note: Use quotation marks around the customization string. For example, AT!CUSTOM="CSDOFF",0.</i></p> <hr/> <ul style="list-style-type: none"> • "AUTONETWORKMODE"—Indicate if UE should revert to Automatic Network mode after 60 seconds of Manual Network mode. <value>: <ul style="list-style-type: none"> • 0 = Remain in Manual. (Default) • 1 = Revert to Automatic. • 2 = Remain in Manual if UE is attached to the network, otherwise switch to Automatic. • "CFUNPERSISTEN"—Enable/disable persistence (across power cycles) of AT+CFUN setting. <value>: <ul style="list-style-type: none"> • 0 = Disable (+CFUN setting does not persist across power cycle) • 1 = Enable (+CFUN setting persists across power cycle) • "CMCLIENT"—Assign a default communication manager (CM) client. <value>: <ul style="list-style-type: none"> • 0 = No CM client specified (default) • 1 = Verizon Access Manager • 2 = Cisco CM <p>(Continued on next page)</p> |

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

| Command | Description |
|--------------------------------|--|
| !CUSTOM (continued) | <p>Set—query customization settings (continued)</p> <ul style="list-style-type: none"> • “CSVOICEREJECT”—Enable/disable ability to ignore incoming voice call pages from the network. <value>: <ul style="list-style-type: none"> • 0 = Process pages as per device capabilities (default) • 1 = Ignore paging (type 1 and 2) messages • 2 = Reject call setup (voice and circuit-switched VT), returning cause code 88 (Incompatible destination) • 3 = Process voice pages as per device capabilities, and reject call setup (circuit-switched VT), returning cause code 88 (Incompatible destination) • 4 = Reject voice pages, returning cause code 65 (Bearer service not implemented), and reject call setup (circuit-switched VT), returning cause code 88 (Incompatible destination) • “FASTENUMEN”—Enable/disable fast enumeration for warm/cold boot. <value>: <ul style="list-style-type: none"> • 0 = Disable fast enumeration (Default) • 1 = Enable fast enumeration for cold boot and disable for warm boot • 2 = Enable fast enumeration for warm boot and disable for cold boot • 3 = Enable fast enumeration for warm and cold boot • “GMMCAUSE7REMAP”—Enable/disable remapping of GMM Cause 7 instances to GMM Cause 14. <value>: <ul style="list-style-type: none"> • 0 = Do nothing • 1 = Remap all GMM Cause 7 instances to GMM Cause 14. • “GOBIIMEN”—Enable/disable Gobi Image Management. <value>: <ul style="list-style-type: none"> • 0 = Disable (Default) • 1 = Enable • “GPIOSARENABLE”—Indicate whether SAR backoff is controlled by GPIOs or by AT commands. <value>: <ul style="list-style-type: none"> • 0 = Controlled by AT commands (default) • 1 = Controlled by GPIOs • “GPSENABLE”—Enable/disable the GPS feature. <value>: <ul style="list-style-type: none"> • 0 = GPS disabled • 1 = MO & MT enabled regardless of GPS_DISABLE setting • 2 = MO enabled regardless of GPS_DISABLE setting • 3 = MT enabled regardless of GPS_DISABLE setting • 4 = MO & MT enabled but are gated by GPS_DISABLE setting • 5 = MO enabled but is gated by GPS_DISABLE setting • 6 = MT enabled but is gated by GPS_DISABLE setting • <value> + 80 = Disable GLONASS (For example, 84 = MO & MT narrow-band GPS enabled, but gated by GPS_DISABLE setting.) <p>(Continued on next page)</p> |

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

| Command | Description |
|--------------------------------|--|
| !CUSTOM (continued) | <p>Set/query customization settings (continued)</p> <ul style="list-style-type: none"> • “GPSLPM”—Enable/disable GPS in Low Power Mode. <value>: <ul style="list-style-type: none"> • 0 = Enable—GPS engine remains enabled when modem enters LPM (Default) • 1 = Disable—GPS engine is disabled when modem enters LPM • “GPSREFLOC”—Enable/disable reference GPS location reporting. <value>: <ul style="list-style-type: none"> • 0 = Enable (Default) • 1 = Disable • “GPSSEL”—Select GPS antenna (useful only for devices with both a GPS and a shared GPS/Rx diversity antenna). <value>: <ul style="list-style-type: none"> • 0 = Use dedicated GPS antenna (Default) • 1 = Use shared GPS/Rx diversity antenna • “IMSIREFRESH”—Allow/prohibit IMSI Refresh during active PDP context. <value>: <ul style="list-style-type: none"> • 0 = Do not allow (Default) • 1 = Allow • “ISVOICEN”—Enable/disable voice functionality. <value>: <ul style="list-style-type: none"> • 0 = Disable voice • 1 = Enable voice • “LTEREJDELAY”—Set delay before LTE attach requests are sent after TAU or service request rejection. <value>: <ul style="list-style-type: none"> • 0–255 = Delay in 10 msec units. (e.g. 10=100 msec) • Actual range is 0–2.55 sec • Delay is cancelled if RRC connection is released early. • Suggested value (if delay is being enabled) is 50 (500 msec). Adjust the value as necessary based on testing. • “NETWORKNAMEFMT”—Set MBIM provider name format for vanui (roaming). <value>: <ul style="list-style-type: none"> • 0 = Display one of: SPN, LongName, or ShortName, by order of priority (Default QCT behavior) • 1 = Display one of: LongName or ShortName • 2 = Display [SPN] - [LongName/ShortName] (Note: May be truncated.) • 3 = Display [LongName/ShortName] - [SPN] (Note: May be truncated.) • “NMEAENABLE”—Enable/disable the NMEA port. <value>: <ul style="list-style-type: none"> • 0 = Disable (default) • 1 = Enable • “NOROAM”—Enable/disable roaming indicator display. <value>: <ul style="list-style-type: none"> • 0 = Enable—Display indicator if roaming • 1 = Disable—Never display indicator • 2 = Disable—Never display when on Home MCC <p>(Continued on next page)</p> |

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

| Command | Description |
|--------------------------------|---|
| !CUSTOM (continued) | <p>Set/query customization settings (continued)</p> <ul style="list-style-type: none"> • “PCSCDISABLE”—Determine functionality of PCSC, GSM Algorithm and Authenticate commands, and +CIMI command. <value>: <ul style="list-style-type: none"> • 0–7 (Default value = 0—all functions enabled) <ul style="list-style-type: none"> • Bit 0: PCSC (0=Enable, 1=Disable) • Bit 1: GSM Algorithm and Authenticate commands (0=Enable, 1=Disable) • Bit 2: AT+CIMI outputs IMSI (0=Enable, 1=Disable) • “QMIDETACHEN”—Enable/disable QMI NAS detach. <value>: <ul style="list-style-type: none"> • 0 = Disable—QMI detach request returns NO_EFFECT response, and no action is taken. • 1 = Enable—QMI detach request is acted on, and appropriate response is returned based on the detach result. • “REL8FASTDORMDIS”—Enable/disable the Release 8 fast dormancy feature. <value>: <ul style="list-style-type: none"> • 0 = Enable (default) • 1 = Disable • “RRCREL7CAPDIS”—Configure RRC Release 7 capability <value>: <ul style="list-style-type: none"> • 0 = Enable CPC, enable EF-DPCH (default) • 1 = Disable CPC, enable EF-DPCH • 2 = Disable CPC, disable EF-DPCH • “SIMHOTSWAPDIS”—Configure SIM hotswap feature <value>: <ul style="list-style-type: none"> • 0 = Enable UIM1 and UIM2 (default) • 1 = Disable UIM1, enable UIM2 • 2 = Enable UIM1, disable UIM2 • 3 = Disable UIM1 and UIM2 • “SIMLPM”—Indicate default SIM power state during Low Power Mode. <value>: <ul style="list-style-type: none"> • 0 = QCT default behavior (same as <value>=2) (Default) Note—The default behavior could change in future revisions. Use <value>=2 if you need to guarantee the described behavior. • 1 = SIM remains powered in LPM • 2 = Power down SIM with AT+CFUN=0; Power up SIM with AT+CFUN=1 • “SINGLEAPNSWITCH”—Indicate device behavior when changing APN name, username, or password. <value>: <ul style="list-style-type: none"> • 0 = Do nothing • 1 = Device detaches and re-attaches after changing APN information • 2 = Power-cycle the UE • “STKUIEN”—Enable/disable SIM toolkit UI. <value>: <ul style="list-style-type: none"> • 0 = Enable for QMI interface • 1 = Reserved • 2 = Enable for AT interface <p>(Continued on next page)</p> |

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

| Command | Description |
|--------------------------------|---|
| !CUSTOM (continued) | <p>Set/query customization settings (continued)</p> <ul style="list-style-type: none"> • “UBISTENABLE”—Enable/disable UBIST support. <value>: <ul style="list-style-type: none"> • 0 = Disable (Default) • 1 = Enable • “USBSERIALENABLE”—Use IMEI as serial number in USB descriptor (USBD). <value>: <ul style="list-style-type: none"> • 0 = Same as 1 (Default) • 1 = Use IMEI as USB serial number • 2 = Do not use a serial number in the USBD. • “WAKEHOSTEN”—Enable/disable host wake-up via SMS or incoming data packet. <value>: <ul style="list-style-type: none"> • 0 = Disable—Host will not wake when SMS or incoming data packet is received. (Default) • 1 = Wake host when simple SMS is received. • 2 = Wake host when incoming data packet is received. • 3 = Wake host when simple SMS or incoming data packet is received. • “WIN7MBOPTIONS”—Configure Windows7 MB options. <mask> (Bitmap): <ul style="list-style-type: none"> • Bit 0: Hide profile 0=Default behavior 1=Force OSP to hide all profiles from host • Bit 1: Connect Auth Type Re-map 0='NONE' from host maps to CHAP or PAP if UN and/or PWD present 1='NONE' from host maps only to PAP if UN and/or PWD present |
| !DARPEN | <p>Enable/disable DARP for SAIC</p> <p>Enable or disable Downlink Advanced Receiver Performance (DARP) for Single-Antenna Interference Cancellation (SAIC).</p> <p>Password required: Yes—Execution format only</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DARPEN=<enableFlag> Response: OK Purpose: Enable or disable SAIC-DARP. • Query: AT!DARPEN? Response: !DARPEN: <enableFlag> OK Purpose: Display the current <enableFlag> setting—this shows whether SAIC-DARP is enabled or disabled. If the command returns ERROR, SAIC-DARP is assumed to be enabled. • Query list: AT!DARPEN=? Purpose: Display a list of valid <enableFlag> values. <p>Parameters:</p> <p><enableFlag> (Enable/disable SAIC-DARP mode)</p> <ul style="list-style-type: none"> • 0 = Disable SAIC-DARP • 1 = Enable SAIC-DARP (Default) — This value is used for normal operations. |

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

| Command | Description |
|---------------|---|
| !DTMEN | <p>Enable/disable Dual Transfer Mode stack functionality</p> <p>Enable or disable Dual Transfer Mode (DTM) and Enhanced DTM (EDTM) functionality in the stack.</p> <p>Password required: Yes—Execution format only</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DTMEN=<enableDTM, <enableEDTM> Response: OK Purpose: Enables or disables DTM and EDTM. • Query: AT!DTMEN? Response: !DTMEN: DTM: 01 EDTM: 01 OK Purpose: Indicates the current state (disabled/enabled) of DTM and EDTM support. If the command returns ERROR, DTM and EDTM are assumed to be enabled. • Query list: AT!DTMEN=? Purpose: Returns a list of valid <enableDTM> and <enableEDTM> values. <p>Parameters:</p> <p><enableDTM> (Enable/disable Dual Transfer Mode)</p> <ul style="list-style-type: none"> • 0 = Disable DTM • 1 = Enable DTM (Default) — Value used for normal operations. <p><enableEDTM> (Enable/disable Enhanced Dual Transfer Mode)</p> <ul style="list-style-type: none"> • 0 = Disable EDTM • 1 = Enable EDTM (Default) — Value used for normal operations. |
| !EDAEN | <p>Configure protocol stack for EDA</p> <p>Enable or disable EDA (Extended Dynamic Allocation) functionality in the stack.</p> <p>Password required: Yes—Execution format only</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!EDAEN=<enableFlag> Response: OK Purpose: Enable or disable EDA. • Query: AT!EDAEN? Response: !EDAEN: <enableFlag> OK Purpose: Display the current <enableFlag> setting—this shows whether EDA is enabled or disabled. If ERROR is returned, assume that EDA is enabled. • Query list: AT!EDAEN=? Purpose: Return a list of valid <enableFlag> values. <p>Parameters:</p> <p><enableFlag> (Enable/disable EDA)</p> <ul style="list-style-type: none"> • 0 = Disable • 1 = Enable (Default) — This value is used for normal operations. |

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

| Command | Description |
|--------------------|---|
| !GCFEN | <p>Enable/disable GCF test mode</p> <p>Place the modem in GCF testing mode or normal operating mode.</p> <p>Password required: Yes—Execution format only</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!GCFEN=<enableFlag> Response: OK Purpose: Place the modem in GCF testing mode or normal operating mode. • Query: AT!GCFEN? Response: !GCFEN: <enableFlag> OK Purpose: Display the modem's current mode. • Query List: AT!GCFEN=? Purpose: Return a list of supported <enableFlag> values. <p>Parameters:</p> <p><enableFlag> (Enable/disable GCF testing)</p> <ul style="list-style-type: none"> • 0 = Disable GCF test mode (Default) — This value is used for normal operations. • 1 = Enable GCF test mode. |
| !GCFUIMTYPE | <p>Set/return current SIM type</p> <p>Indicate (for GCF testing) the type of SIM that is installed in the module.</p> <p>Password required: Yes—Execution format only</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!GCFUIMTYPE? Response: !GCFUIMTYPE: <simType> Purpose: Return the type of SIM that is installed in the module (the current <simType> value). • Query list: AT!GCFUIMTYPE=? Purpose: Return a list of supported SIM types. • Execution: AT!GCFUIMTYPE=<simType> Response: OK Purpose: Indicate the type of SIM that is installed. <p>Parameters:</p> <p><simType> (Installed SIM type)</p> <ul style="list-style-type: none"> • 0 = 2G SIM • 1 = 3G USIM • 2 = USB UICC (Default) — This value should be used for normal operations. • 3 = USB UICC RST HIGH |

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

| Command | Description |
|-----------------|--|
| !GETBAND | <p>Return the current active band</p> <p>Return the active band currently being used by the modem.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!GETBAND? Response: !GETBAND: <active band description> OK or Unknown OK or No Service OK <p>Purpose: Return a description of the current active band, or return an error message.</p> <hr/> <p><i>Note: Due to stack implementation requirements, !GETBAND reports W800 for both W800 and W850.</i></p> <hr/> |
| !GETRAT | <p>Return the current active radio access technology (RAT)</p> <p>Return the RAT currently being used by the modem.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!GETRAT? Response: !GETRAT: <active RAT description> OK or Unknown OK or No Service OK <p>Purpose: Return a description of the current RAT, or return an error message.</p> |

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

| Command | Description |
|--------------------|--|
| !GOBIIMPREF | <p>Query/set Gobi Image Management preferences</p> <p>Indicate (set) which firmware image (firmware plus carrier configuration pair) should be downloaded to the module, or list (query) the configuration pairs that are currently downloaded and preferred.</p> <p>Contact your Sierra Wireless representative if you need assistance identifying the correct components of the <pref> parameter.</p> <hr/> <p><i>Note: If Gobi Image Management is disabled, you can use the Execution format to set a new preferred configuration, but the change will not take effect until Gobi Image Management is enabled. Use AT!CUSTOM="GOBIIMEN",1 to enable Gobi Image Management.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!GOBIIMPREF=<pref> Response:OK Purpose:Indicate which firmware plus carrier configuration pair (the preferred pair) should be used. • Query: AT!GOBIIMPREF? Response:! GOBIIMPREF: preferred fw version: <firmware_tag> preferred carrier name: <carrier_name> preferred config name: <carrier_configuration_tag> current fw version: <firmware_tag> current carrier name: <carrier_name> current config name: <carrier_configuration>tag OK Purpose:Query (show) the preferred and current firmware plus carrier carrier configuration pairs. <p>Parameters:</p> <p><pref> (Preferred firmware image)</p> <ul style="list-style-type: none"> • ASCII string in following format (quotation marks are entered as shown) "<firmware_tag>" or "<firmware_tag>","<carrier_name>","<carrier_configuration_tag>" <p><firmware_tag> (Unique firmware version number assigned by Sierra Wireless)</p> <ul style="list-style-type: none"> • ASCII string <p><carrier_name> (Unique code identifying the carrier that the firmware was designed for)</p> <ul style="list-style-type: none"> • ASCII string <p><carrier_configuration_tag> (Unique code identifying the carrier and configuration details)</p> <ul style="list-style-type: none"> • ASCII string <p>Example execution:</p> <ul style="list-style-type: none"> • AT!GOBIIMPREF="01.02.03.04","ABC","ABC_001.123_000" |

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

| Command | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---------------|-----------|--------------|--------|--------------|---------|-------|--------|--------------|---------|-----------|-----------|-----------|---------|---------|-------|--------------|----------|--------------|----------|-----------------|------------|---------------|--|----------------|-----------|--------------|--|-------------|--------|------------|--------|-------------|--------|------|-------|------------|--------|----------|-----------|--|----|--|--|
| !GRESET | <p>Reset the modem</p> <p>Perform a modem reset.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> Query: AT!GRESET Response: OK Purpose: Instruct system to perform a reset. <hr/> <p><i>Note: This command is identical in function to !RESET.</i></p> <hr/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| !GSTATUS | <p>Return operational status</p> <p>Return specific details about the current operational status of the modem. The response details vary depending on the current RAT. Contact Sierra Wireless for further details if required.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> Query: AT!GSTATUS? <p>Response (Example shown is for LTE, actual fields may vary)</p> <p>!GSTATUS:</p> <table> <tbody> <tr> <td>Current Time:</td> <td><ctime></td> <td>Temperature:</td> <td><temp></td> </tr> <tr> <td>Bootup Time:</td> <td><btime></td> <td>Mode:</td> <td><mode></td> </tr> <tr> <td>System mode:</td> <td><smode></td> <td>PS state:</td> <td><PSstate></td> </tr> <tr> <td>LTE band:</td> <td><lband></td> <td>LTE bw:</td> <td><lbw></td> </tr> <tr> <td>LTE Rx chan:</td> <td><lrchan></td> <td>LTE Tx chan:</td> <td><ltchan></td> </tr> <tr> <td>GMM (PS) state:</td> <td><gmmstate></td> <td><gmmsubstate></td> <td></td> </tr> <tr> <td>MM (CS) state:</td> <td><mmstate></td> <td><mmsubstate></td> <td></td> </tr> <tr> <td>RSSI (dBm):</td> <td><rssi></td> <td>SINR (dB):</td> <td><sinr></td> </tr> <tr> <td>RSRP (dBm):</td> <td><rsrp></td> <td>TAC:</td> <td><tac></td> </tr> <tr> <td>RSRQ (dB):</td> <td><rsrq></td> <td>Cell ID:</td> <td><Cell ID></td> </tr> <tr> <td></td> <td>OK</td> <td></td> <td></td> </tr> </tbody> </table> | Current Time: | <ctime> | Temperature: | <temp> | Bootup Time: | <btime> | Mode: | <mode> | System mode: | <smode> | PS state: | <PSstate> | LTE band: | <lband> | LTE bw: | <lbw> | LTE Rx chan: | <lrchan> | LTE Tx chan: | <ltchan> | GMM (PS) state: | <gmmstate> | <gmmsubstate> | | MM (CS) state: | <mmstate> | <mmsubstate> | | RSSI (dBm): | <rssi> | SINR (dB): | <sinr> | RSRP (dBm): | <rsrp> | TAC: | <tac> | RSRQ (dB): | <rsrq> | Cell ID: | <Cell ID> | | OK | | |
| Current Time: | <ctime> | Temperature: | <temp> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bootup Time: | <btime> | Mode: | <mode> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| System mode: | <smode> | PS state: | <PSstate> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LTE band: | <lband> | LTE bw: | <lbw> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LTE Rx chan: | <lrchan> | LTE Tx chan: | <ltchan> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GMM (PS) state: | <gmmstate> | <gmmsubstate> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MM (CS) state: | <mmstate> | <mmsubstate> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RSSI (dBm): | <rssi> | SINR (dB): | <sinr> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RSRP (dBm): | <rsrp> | TAC: | <tac> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RSRQ (dB): | <rsrq> | Cell ID: | <Cell ID> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | OK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

| Command | Description |
|---------|--|
| !LTENAS | <p>Configure LTE NAS settings Configure LTE NAS-related settings. Note: To support test equipment that may use the NULL integrity algorithm, turn on (set to '1') <bitmask> Bit0 and Bit3. Password required: No Usage:</p> <ul style="list-style-type: none"> • Execution: AT!LTENAS=<bitmask><FPLMNtime> Response: <bitmask> <FPLMNtime> Purpose: Set LTE NAS-related settings. • Query: AT!LTENAS? Response: LSTI: <lsti> GERAN Cap: <geran> Disable GUTI Security check: <guti> Temp Forbidden PLMN: <FPLMNtime> OK Purpose: Report the current settings. • Query List: AT!LTENAS=? Purpose: Return the command format and the supported parameter values. <p>Parameters:</p> <p><bitmask> (8-bit mask that identifies LTE NAS-related settings)</p> <ul style="list-style-type: none"> • Displayed/entered as hexadecimal value • Bit 0: <lsti> • Bit 1: <geran> • Bit 2: <guti> • Bit 3: <>nullIntegrity> <p><FPLMNtime> (Temporary Forbidden PLMN backoff time)</p> <ul style="list-style-type: none"> • Displayed/entered as hexadecimal value • 0x0=Disable feature (Default) • 0x1–0xFFFFFFFFE=Backoff time (in ms) • 0xFFFFFFFF=Use the user equipment's Timer T3402 time as backoff time <p><lsti> (LSTI (LTE/SAE Trial Initiative))</p> <ul style="list-style-type: none"> • 0=Disabled • 1=Enabled <p><geran> (GERAN Cap)</p> <ul style="list-style-type: none"> • 0=Disabled • 1=Enabled <p><guti> (Disable GUTI and NAS security check)</p> <ul style="list-style-type: none"> • 0=Disabled (This means the security check is *enabled*.) • 1=Enabled (This means the security check is *disabled*.) <p><>nullIntegrity> (NULL Integrity Algorithm)</p> <ul style="list-style-type: none"> • 0=Disabled • 1=Allowed |

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

| Command | Description |
|----------------|--|
| ^MODE | <p>Set/report system mode indication state</p> <p>Enable or disable system mode indications (unsolicited ^MODE messages).</p> <p>Password required: No.</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT^MODE=<mode> Response: OK Purpose: Enable or disable system mode indication support. • Query: AT^MODE? Response: !MODE: <mode> OK Purpose: Report current system mode indication support state (enabled/disabled). • Query List: AT^MODE=? Purpose: Return the execution command format and the supported parameter values. <p>Parameters:</p> <p><mode> (System mode indication support state)</p> <ul style="list-style-type: none"> • 0 = Disabled • 1 = Enabled (Default) |
| !NASREL | <p>Set/report supported NAS release compliance version</p> <p>Configure the modem to support a specific NAS (Non-Access Stratum) release compliance version.</p> <p>Password required: Yes—Execution format only</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!NASREL=<nasrel> Response: OK Purpose: Set the desired version (<nasrel>). • Query: AT!NASREL? Response: !NASREL: NAS Release: Release 5 (or Release 99) OK Purpose: Report the NAS release compliance version currently being used. • Query List: AT!NASREL=? Purpose: Return the command format (for !NASREL =) and the supported parameter values. <p>Parameters:</p> <p><nasrel> (NAS release compliance version)</p> <ul style="list-style-type: none"> • 00 = Release 99 • 01 = Release 5 • 02 = Release 6 (Default) • 03 = Release 7 <hr/> <p><i>Note: If you use IREL, use the default value (1) for that command's <sgsnr> and <mscr> parameters. You must choose the appropriate compliance version using !NASREL.</i></p> <hr/> |

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

| Command | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|---|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|----|---|----|---|---|---|---|---|---|
| !INVENCRYPTIMEI | <p>Write unencrypted IMEI to modem</p> <p>Write an unencrypted IMEI to a modem <i>if</i> the modem does not already have an IMEI—the command can only be used once per modem.</p> <p>The IMEI is a fifteen digit string formed by concatenating the following elements:</p> <ul style="list-style-type: none"> TAC code (8 digits) SN (Serial number) (6 digits) CheckDigit (1 digit calculated from TAC code and SN) <p>The CheckDigit is calculated as follows:</p> <ol style="list-style-type: none"> 1. Label the fourteen digits in the TAC and SN as: TAC: D14..D7 SN: D6..D1 For example: TAC = 12345678 ('1' is D14, '8' is D7) SN = 901234 ('9' is D6, '4' is D1) 2. Double the value of each odd-labeled digit (D13, D11, ..., D1). 3. Add the values of each individual digit from the result of Step 2. 4. Add the even-labeled digits (D14, D12, ..., D2) to the result of Step 3. 5. Check the last digit of the result of Step 4. If it is '0', the CheckDigit is 0; if it is not '0', subtract it from 10 to get the CheckDigit. <p>For example:</p> <p>TAC (12345678) SN (901234)</p> <p>Step 1: Label the digits of the TAC and SN.</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">D14</td><td style="text-align: center;">D13</td><td style="text-align: center;">D12</td><td style="text-align: center;">D11</td><td style="text-align: center;">D10</td><td style="text-align: center;">D9</td><td style="text-align: center;">D8</td><td style="text-align: center;">D7</td><td style="text-align: center;">D6</td><td style="text-align: center;">D5</td><td style="text-align: center;">D4</td><td style="text-align: center;">D3</td><td style="text-align: center;">D2</td><td style="text-align: center;">D1</td> </tr> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">2</td><td style="text-align: center;">3</td><td style="text-align: center;">4</td><td style="text-align: center;">5</td><td style="text-align: center;">6</td><td style="text-align: center;">7</td><td style="text-align: center;">8</td><td style="text-align: center;">9</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">2</td><td style="text-align: center;">3</td><td style="text-align: center;">4</td> </tr> </table> <p>Step 2: Double the odd-labeled values:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">D14</td><td style="text-align: center;">D13</td><td style="text-align: center;">D12</td><td style="text-align: center;">D11</td><td style="text-align: center;">D10</td><td style="text-align: center;">D9</td><td style="text-align: center;">D8</td><td style="text-align: center;">D7</td><td style="text-align: center;">D6</td><td style="text-align: center;">D5</td><td style="text-align: center;">D4</td><td style="text-align: center;">D3</td><td style="text-align: center;">D2</td><td style="text-align: center;">D1</td> </tr> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">4</td><td style="text-align: center;">3</td><td style="text-align: center;">8</td><td style="text-align: center;">5</td><td style="text-align: center;">12</td><td style="text-align: center;">7</td><td style="text-align: center;">16</td><td style="text-align: center;">9</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">4</td><td style="text-align: center;">3</td><td style="text-align: center;">8</td> </tr> </table> <p>Step 3: Add <i>each</i> digit of the odd-labeled values: $4 + 8 + (1 + 2) + (1 + 6) + 0 + 4 + 8 = 34$</p> <p>Step 4: Add each digit of the even-labeled values to the Step 3 total: $1 + 3 + 5 + 7 + 9 + 1 + 3 + 34 = 63$</p> <p>Step 5: Check last digit of Step 4 total. CheckDigit = $10 - 3 = 7$</p> <p>Result: IMEI = TAC:SN:CheckDigit = 123456789012347</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!INVENCRYPTIMEI=<P1>, <P2>, <P3>, <P4>, <P5>, <P6>, <P7>, <P8> <p>Response: OK</p> <p>Purpose: Write the unencrypted IMEI to the modem.</p> <p>(Continued on next page)</p> | D14 | D13 | D12 | D11 | D10 | D9 | D8 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | D14 | D13 | D12 | D11 | D10 | D9 | D8 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | 1 | 4 | 3 | 8 | 5 | 12 | 7 | 16 | 9 | 0 | 1 | 4 | 3 | 8 |
| D14 | D13 | D12 | D11 | D10 | D9 | D8 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D14 | D13 | D12 | D11 | D10 | D9 | D8 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 4 | 3 | 8 | 5 | 12 | 7 | 16 | 9 | 0 | 1 | 4 | 3 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

| Command | Description |
|---------------------------------------|--|
| !NVENCRYPTIMEI (continued) | <p>Write unencrypted IMEI to modem (continued)</p> <p>Parameters:</p> <p><P1> to <P8> (IMEI segments)</p> <ul style="list-style-type: none"> • <P1> = IMEI[0..1]; <P2> = IMEI[2..3]; ...; <P8> = IMEI[14..15] • <P1> to <P4> represent the TAC • <P5> to <P7> represent the SNR • <P8> represents the CheckDigit plus a padding digit ('0') <p>Example:</p> <p>Using the example IMEI shown above: AT!NVENCRYPTIMEI=12,34,56,78,90,12,34,70</p> |
| !NVNSCODE | <p>Return Network Subset codes</p> <p>Return the provisioned list of Network Subset codes used for Network Subset Personalization locking.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!NVNSCODE? Response: (list of <NSCode> items) OK Purpose: Return the list of Network Subset codes used for Network Subset Personalization locking. • Execution: AT!NVNSCODE=<NSCode> Response: OK Purpose: Add a network subset code to the list used for Network Subset Personalization locking. <p>Parameters:</p> <p><NSCode> (Network Subset Code)</p> <ul style="list-style-type: none"> • Format: 99—Two digit numeric code |

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

| Command | Description |
|------------------|---|
| !NVPLMN | <p>Provision PLMN list for Network Personalization locking</p> <p>Provision the list of PLMN (MCC/MNC pairs) used for Network Personalization locking.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!NVPLMN? Response: <MCC> <MNC> ... OK • Purpose: Return a list of NV items that can be read or written. • Execution: AT!NVPLMN=<MCC1>, <MNC1>, ..., <MCCn>, <MNCn> Response: OK • Purpose: Add up to six MCC/MNC pairs to the PLMN list • Note: Execution can be performed one time only (all MCC/MNC pairs must be set at the same time). <p>Parameters:</p> <p><MCC> (Mobile Country Code)</p> <ul style="list-style-type: none"> • 3 digits <p><MNC> (Mobile Network Code)</p> <ul style="list-style-type: none"> • 2 digits |
| !NVSPCODE | <p>Provision Network Service Provider code list</p> <p>Provisions the list of Network Service Provider codes that are used for Network Service Provider Personalization locking.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!NVSPCODE? Response: SP Code: (list of <SP Code> values) OK • Purpose: Provision the list of Network Service Provider codes. • Execution: AT!NVSPCODE=<SP Code> Response: OK • Purpose: Add a Network Service Provider code to the list. <p>Parameters:</p> <p><SP Code> (Service Provider Code)</p> <ul style="list-style-type: none"> • Format: 1–2 digits |

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

| Command | Description |
|-----------------|---|
| !PACKAGE | <p>Return package version string</p> <p>This command returns the FOTA package name loaded in the modem.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!PACKAGE? <p>Response: !PACKAGE:<PackageName> OK or Unset OK</p> <p>Purpose: Return the package name string.</p> <p>Parameters:</p> <p><PackageName></p> <ul style="list-style-type: none"> • Character string, maximum 126 characters • Example: MC7750_01.00.02.03_00_VZW_011.006_000 |
| !PCINFO | <p>Return power control status information</p> <p>Return the modem's power control status information.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!PCINFO? <p>Response: State: <state> LPM force flags: W_DISABLE: <ForceFlag>, User:<ForceFlag>, Temp:<ForceFlag>, Volt:<ForceFlag>, BIOS:<ForceFlag>, GOBIIM:<ForceFlag> BIOS: <description> GOBIIM: <description> OK</p> <p>Purpose: Return power control information.</p> <p>Parameters:</p> <p><state> (The modem's power mode)</p> <ul style="list-style-type: none"> • Low Power Mode (LPM) • Online • Offline • Power off (internal) • Initialization (internal) <p><ForceFlag> (Conditions that caused modem to enter LPM. 0=did not cause, 1 = caused)</p> <ul style="list-style-type: none"> • W_DISABLE: W_DISABLE is asserted • USER: CnS/AT command was issued • TEMP: Temperature is outside operational limits • VOLT: Voltage is outside operational limits <p><description> (Explanation of associated information)</p> <ul style="list-style-type: none"> • ASCII string |

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

| Command | Description |
|-----------------|--|
| !PCOFFEN | <p>Set/return Power Off Enable state</p> <p>The modem can be configured to enter low power mode or power off when W_DISABLE is asserted. (This is called the Power Off Enable feature.)</p> <p>Use this command to indicate or set the Power Off Enable feature state.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!PCOFFEN=<state> Response: OK Purpose: Set the current state. • Query: AT!PCOFFEN? Response: <state> OK Purpose: Report the current <state>. <p>Parameters:</p> <p><state> (Current state of Power Off Enable)</p> <ul style="list-style-type: none"> • 0 = Modem will enter LPM (low power mode) when W_DISABLE is asserted. • 2 = Ignore changes on W_DISABLE. |
| !PCTEMP | <p>Return current temperature information</p> <p>Return the module's temperature state and actual temperature.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!PCTEMP? Response: Temp state: <state> Temperature: <temperature> degC OK Purpose: Return the module's temperature information. <p>Parameters:</p> <p><state> (Temperature state):</p> <ul style="list-style-type: none"> • Valid values: <ul style="list-style-type: none"> • "Normal" • "High Warning" • "High Critical" • "Low Critical" <p><temperature> (Current temperature):</p> <ul style="list-style-type: none"> • Current temperature in degrees Celsius. This is the temperature reported by a thermistor positioned near the power amplifiers. |

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

| Command | Description |
|----------------------|---|
| !PCTEMPLIMITS | <p>Set/report temperature state limit values</p> <p>Certain modem functionality is affected by the modem's temperature state. The possible temperature states are high critical, high warning, high normal, low normal, and low critical.</p> <p>Use this command to report or set the limits that correspond to these temperature states.</p> <p>To display the current temperature and temperature state, see !PCTEMP on page 40.</p> <hr/> <p><i>Note: All temperatures are in Celsius.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!PCTEMPLIMITS=<hc>,<hw>,<hn>,<ln>,<lc> Response: OK Purpose: Set the temperature limits for each state (all five values must be specified). • Query: AT!PCTEMPLIMITS? Response: HI CRIT: <hc> HI WARN: <hw> HI NORM: <hn> LO NORM: <ln> LO CRIT: <lc> Purpose: Return the temperature limits for each state. <p>Parameters:</p> <p><hc> (High Critical)</p> <ul style="list-style-type: none"> • Temperature limit varies by device (see device Product Specification Document or Product Technical Specification). • Default = 108°C. <p><hw> (High Warning)</p> <ul style="list-style-type: none"> • Temperature limit varies by device (see device Product Specification Document or Product Technical Specification). • Default = 95°C. <p><hn>(High Normal)</p> <ul style="list-style-type: none"> • Temperature limit varies by device (see device Product Specification Document or Product Technical Specification). • Default = 85°C. <p><ln> (Low Normal)</p> <ul style="list-style-type: none"> • Temperature limit varies by device (see device Product Specification Document or Product Technical Specification). • Default = -15°C. <p><lc> (Low Critical)</p> <ul style="list-style-type: none"> • Temperature limit varies by device (see device Product Specification Document or Product Technical Specification). • Default = -25°C. |

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

| Command | Description |
|----------------|---|
| !PCVOLT | <p>Return current power supply voltage information</p> <p>Return the module's power supply state and actual voltage.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!PCVOLT? Response: Volt state: Normal Power supply voltage: <voltage> mV (<raw> cnt) OK Purpose: Return the module's voltage information. <p>Parameters:</p> <p><state> (Power supply state):</p> <ul style="list-style-type: none"> • Valid values: <ul style="list-style-type: none"> • "Normal" • "High Critical" • "Low Warning" • "Low Critical" <p><voltage>:</p> <ul style="list-style-type: none"> • Current voltage reading in mV. <p><raw>:</p> <ul style="list-style-type: none"> • ADC (Analog/digital convertor) reading |

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

| Command | Description |
|----------------------|--|
| !PCVOLTLIMITS | <p>Set/report power supply voltage state limit values</p> <p>Certain modem functionality is affected by the modem's power supply voltage state. The possible voltage states are high critical, high normal, low normal, low warning, and low critical.</p> <p>Use this command to report or set the limits that correspond to these voltage states.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!PCVOLTLIMITS=<hc>,<hn>,<ln>,<lw>,<lc> Response: OK Purpose: Set the voltage limits for each state (all five values must be specified). • Query: AT!PCVOLTLIMITS? Response: HI CRIT: <hc> HI NORM: <hn> LO NORM: <ln> LO WARN: <lw> LO CRIT: <lc> Purpose: Return the voltage limits for each state. <p>Parameters:</p> <p><hc> (High Critical)</p> <ul style="list-style-type: none"> • Voltage limit varies by device (see device Product Specification Document or Product Technical Specification) • Default = 4400 mV <p><hw> (High Normal)</p> <ul style="list-style-type: none"> • Voltage limit varies by device (see device Product Specification Document or Product Technical Specification) • Default = 4300 mV <p><ln> (Low Normal)</p> <ul style="list-style-type: none"> • Voltage limit varies by device (see device Product Specification Document or Product Technical Specification) • Default = 3300 mV <p><lw> (Low Warning)</p> <ul style="list-style-type: none"> • Voltage limit varies by device (see device Product Specification Document or Product Technical Specification) • Default = 3200 mV <p><lc> (Low Critical)</p> <ul style="list-style-type: none"> • Voltage limit varies by device (see device Product Specification Document or Product Technical Specification) • Default = 3100 mV |

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

| Command | Description |
|-------------------|---|
| !POWERDOWN | <p>Power down system</p> <p>Power down the system. After using this command, the modem will not communicate with the host until it has been power cycled.</p> <hr/> <p><i>Note: This command initiates an IMSI_DETACH before the power down.</i></p> <hr/> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!POWERDOWN Response: OK Purpose: Power the system down. <hr/> <p><i>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.</i></p> <hr/> |
| !PRIID | <p>Set/report module PRI part number and revision</p> <p>Report or set the module's customer and carrier PRI part numbers and revisions.</p> <p>Password required: Yes—Execution format only</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!PRIID=<priPN>,<priRev> Response: OK Purpose: Set the module's PRI part number (<priPn>) and revision (<priRev>). • Query: AT!PRIID? Response: PRI Part Number: <priPn> Revision: <priRevDisplay> <p style="margin-left: 40px;">Carrier PRI: None OK</p> <p>Purpose: Return the module's PRI part number (<priPn>) and revision (<priRevDisplay>). (In the example shown above, no Carrier PRI is present. If it were, then the Part Number and Revision would display.)</p> <p>Parameters:</p> <p><priPn> (PRI part number)</p> <ul style="list-style-type: none"> • 7-digit ASCII number • Example: 9991234 <p><priRev> (PRI revision number being written to the module)</p> <ul style="list-style-type: none"> • 4-digit ASCII: XXYY (implied '.' between XX and YY) • Example: 0100 <p><priRevDisplay> (PRI revision number being read from the module)</p> <ul style="list-style-type: none"> • 4-digit ASCII: XX.YY • Example: 01.00 |

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

| Command | Description |
|---|--|
| <p>!REL</p> <hr/> <p><i>Note: The actual parameter values or ranges used in the query (=?) and execution (=) forms of this command may vary slightly from this description depending on the device and firmware revision used.</i></p> <hr/> <p><i>Note: Devices should always use the default value (1) for <sgsnr> and <mscr>, and use AT!NASREL to choose the NAS Release Compliance version (Release 5, 6, 7, or Release 99).</i></p> <hr/> | <p>Set/report active protocol/revision</p> <p>Configure the modem to use specific protocol, SGSN, and MSC revisions, or indicate the current settings.</p> <p>Password required: Yes—Execution format only</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!REL=<wcdmarrc> [<sgsnr>, <mscr>] Response: OK Purpose: Set the desired protocol (<wcdmarrc>), SGSN revision (<sgsnr>), and MSC revision (<mscr>). • Query: AT!REL? Response: !REL: Protocol: Release 5 (from <wcdmarrc>) SGSN Revision: Dynamic (from <sgsnr>) MSC Revision: Dynamic (from <mscr>) OK Purpose: Report the current operating protocol, SGSN revision, and MSC revision. • Query List: AT!REL=? Purpose: Return the command format (for !REL =) and the supported values for each parameter (the supported ranges depend on modem models—see the parameter descriptions for details). <p>Parameters:</p> <p><wcdmarrc> (Protocol)</p> <ul style="list-style-type: none"> • Default value is the highest release supported by the device. • Two-digit number corresponding to 3GPP release (!REL=? shows valid values) • Example: 00 = Release 99 <p><sgsnr> (SGSN revision)</p> <ul style="list-style-type: none"> • Two-digit number corresponding to SGSN revision (!REL=? shows valid values) • Example: 00 = Release 97 • nn = Dynamic—Uses the revision broadcast by the network <p><mscr> (MSC revision)</p> <ul style="list-style-type: none"> • Two-digit number corresponding to MSC revision (!REL=? shows valid values) • Example: 00 = Release 97 • nn = Dynamic—Uses the revision broadcast by the network |
| <p>!RESET</p> | <p>Reset modem</p> <p>Perform a modem reset.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!RESET Response: OK Purpose: Reset the modem. <hr/> <p><i>Note: This command is identical in function to !GRESET.</i></p> <hr/> |

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

| Command | Description |
|-----------------------|--|
| <p>!SELACQ</p> | <p>Select RAT acquisition order Select the acquisition order for RATs (Radio Access Technologies). Password required: Yes Usage:</p> <ul style="list-style-type: none"> • Execution: AT!SELACQ=<mode1>[,<mode2>[,<mode3>[,<mode4>[,<mode5>]]]] Response: OK Purpose: Indicate the acquisition order for up to five RATs. See <mode> parameter description for details. • Query: AT!SELACQ? Response: <mode1> <mode2> <mode3> <mode4> <mode5> Purpose: Show the current acquisition order for the supported RATs. • Query list: AT!SELACQ=? Purpose: Display valid execution format and parameter values. <p>Parameters: <moden> (RAT types)</p> <ul style="list-style-type: none"> • Valid values (shown in default order): <ul style="list-style-type: none"> • “CDMA” • “LTE” • “WCDMA” • “HDR” • “GSM” • If the execution format is issued with fewer than five RATs, the missing entries are appended based on the default order shown above. • Example: If the command is issued as AT!SELACQ=HDR,CDMA,GSM Then AT!SELACQ? will show: HDR CDMA GSM LTE WCDMA <hr/> <p><i>Note: Even if the device does not support a specific RAT (for example, CDMA), the RAT will still appear in the Query response.</i></p> |

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

| Command | Description |
|------------------|---|
| !ISELMODE | <p>Set/return current service domain Configure the modem to use a specific service domain. Password required: No Usage:</p> <ul style="list-style-type: none"> • Execution: ATISELMODE=<sdInd> Response: OK Purpose: Set the desired service domain. • Query: ATISELMODE? Response: <sdInd>, Service Domain description OK or Unknown service domain mask. Use ATISELMODE to set service domain. <sdInd> OK Purpose: Return the current service domain index (<sdInd>) and description. If the <sdInd> is undefined, an error message is returned. • Query List: ATISELMODE=? Purpose: Return a list of supported service domain indexes. <p>Parameters: <sdInd> (Service domain index):</p> <ul style="list-style-type: none"> • 00=CS only • 01=PS only • 02=CS and PS |
| !SIMRSTC | <p>Set/report SIM refresh reset notification state Set or report the state of the unsolicited SIM refresh reset notification (!SIMRSTN). Password required: Yes Usage:</p> <ul style="list-style-type: none"> • Execution: ATISIMRSTC=<n> Response: OK Purpose: Enable/disable the SIM refresh reset notification. • Query: ATISIMRSTC? Response: !SIMRSTC: <n> Purpose: Show the current state of the SIM refresh reset notification. • Query list: ATISIMRSTC=? Purpose: Display valid execution format and parameter values. <p>Parameters: <n> (Notification state)</p> <ul style="list-style-type: none"> • 0=Disable • 1=Enable |

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

| Command | Description |
|----------------|---|
| !UDINFO | <p>Return information from active USB descriptor</p> <p>Return information from the active USB descriptor.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: ATIUDINFO? Response: VID: <vendor_id> APP PID: <app_product_id> BOOT PID: <boot_product_id> Interface: <interfaceType> Manufacturer: <manuString> Product: <prodString> Purpose: Display USB descriptor information. <p>Parameters:</p> <p><vendor_id> (Vendor ID):</p> <ul style="list-style-type: none"> • Valid range: 0000–FFFF <p><app_product_id> (Product ID used when modem is in application mode):</p> <ul style="list-style-type: none"> • Valid range: 0000–FFFF <p><boot_product_id> (Product ID used when modem is in boot loader mode):</p> <ul style="list-style-type: none"> • Valid range: 0000–FFFF <p><interfaceType> (USB interface type):</p> <ul style="list-style-type: none"> • ASCII string: <ul style="list-style-type: none"> • “DIP”—Direct IP interface • “QBI”—QBI interface • “QMI”—QMI interface <p><manuString> (Manufacturer string):</p> <ul style="list-style-type: none"> • ASCII string (32 characters maximum) • Example: “Sierra Wireless, Incorporated” <p><prodString> (Product string):</p> <ul style="list-style-type: none"> • ASCII string (64 characters maximum) • Example: “Mini Card” |

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

| Command | Description |
|---------|---|
| !UDPID | <p>Set/report product ID in USB descriptor</p> <p>Use this command to set the device's product ID in the USB descriptor. (Some devices may support more than one product ID.)</p> <hr/> <p><i>Note: If a custom PID is used for <app product_id>, then the <boot product_id> must be set at the same time.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIUDPID=<app product_id> [,<boot product_id>] Response: OK Purpose: Set the application and boot product IDs in the USB descriptor. • Query: ATIUDPID? Response: !UDPID: APP: <product_id> BOOT: <boot product_id> OK Purpose: Report the product ID that is stored in the USB descriptor. • Query List: ATIUDPID=? Purpose: Display a list of default (non-custom) product IDs for the device. <p>Parameters:</p> <p><app product_id></p> <ul style="list-style-type: none"> • Hexadecimal ASCII value. • Valid range: 0000–FFFF <p>< boot product_id></p> <ul style="list-style-type: none"> • Hexadecimal ASCII value. • Valid range: 0000–FFFF • In the Execution command format, if the <app product_id> is a custom PID, then the <boot product_id> must be set at the same time. (To check if the <app product_id> is a custom PID, use ATIUDPID=? to see a list of all available non-custom PIDs.) |

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

| Command | Description |
|-------------------|---|
| !UDUSBCOMP | <p>Set/report USB interface configuration</p> <p>Use this command with modems that have been configured with multiple USB compositions.</p> <p>By default, devices are typically configured to use a USB composition that presents a minimal set of interfaces. If the device also supports other compositions, this command is used to choose from any of the supported compositions.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIUDUSBCOMP=<device_comp> Response: OK Purpose: Set the current composition. For the change to take effect, you must reset the modem. • Query: ATIUDUSBCOMP? Response: !UDUSBCOMP: <device_comp> OK Purpose: Report the current interface composition. • Query List: ATIUDUSBCOMP=? Response: Example response, details may differ: <pre style="margin-left: 40px;"> 0 - HIP DM NMEA AT MDM1 MDM2 MDM3 MS NOT SUPPORTED 1 - HIP DM NMEA AT MDM1 MS NOT SUPPORTED 2 - HIP DM NMEA AT NIC1 MS NOT SUPPORTED 3 - HIP DM NMEA AT MDM1 NIC1 MS NOT SUPPORTED 4 - HIP DM NMEA AT NIC1 NIC2 NIC3 MS NOT SUPPORTED 5 - HIP DM NMEA AT ECM1 MS NOT SUPPORTED 6 - DM NMEA AT QMI SUPPORTED 7 - DM NMEA AT RMNET1 RMNET2 RMNET3 SUPPORTED 8 - DM NMEA AT MBIM SUPPORTED 9 - MBIM SUPPORTED 10 - NMEA MBIM SUPPORTED 11 - DM MBIM SUPPORTED 12 - DM NMEA MBIM SUPPORTED OK </pre> <p>Purpose: Report the available interface compositions (<device_comp>)—the device can use any compositions that are listed as “SUPPORTED”.</p> <p>Parameters:</p> <p><device_comp> (USB composition)</p> <ul style="list-style-type: none"> • Integer value, 0 or greater • Use ATIUDUSBCOMP=? to view the configurations available for the device. Available configurations are identified as “SUPPORTED”. |

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

| Command | Description |
|----------------------|--|
| <p>&V</p> | <p>Return operating mode AT configuration parameters</p> <p>Return the status of all AT command parameters that apply to the current operating mode.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT&V <p>Response: &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</p> <p>OK</p> <p><i>Note: this is an example only. The supported commands may vary by device/SKU.</i></p> <p>Purpose: Display command parameters.</p> |

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

| Command | Description | Page |
|--------------------------|--|------|
| !BCFWUPDATESTATUS | Report status of most recent firmware update attempt | 54 |
| !ERR | Display diagnostic information | 55 |
| !GCCLR | Clear crash dump data | 55 |
| !GCDUMP | Display crash dump data | 55 |
| !RXDEN | Enable/disable WCDMA/LTE receive diversity | 56 |

Command reference

Table 4-2: Diagnostic command details

| Command | Description |
|--------------------------|---|
| !BCFWUPDATESTATUS | <p>Report status of most recent firmware update attempt</p> <p>Return the status of the most recent firmware update attempt made since the last cold restart.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!BCFWUPDATESTATUS Response: !BCFWUPDATESTATUS: <result> <i>or</i> !BCFWUPDATESTATUS: <result> Failed IMG TYPE <type>, DATA <data>, PART <part> OK <p>Purpose: Return the status of the most recent firmware update attempt. The second response format appears only if <result> = "FAILED".</p> <p>Parameters:</p> <p><result> (Status of last firmware update attempt)</p> <ul style="list-style-type: none"> ASCII string: <ul style="list-style-type: none"> "UNKNOWN"—Status of last attempt is unknown. "SUCCESS"—Last update was successful. "FAILED"—Last update failed. <p><type> (Firmware image type that failed to update)</p> <ul style="list-style-type: none"> ASCII string <p><data> (Reference data for failed image)</p> <ul style="list-style-type: none"> Location of the reference data as an offset in the CWE image Valid range: 0–(2³²-1) <p><part> (Partition associated with the failed image)</p> <ul style="list-style-type: none"> ASCII string Applies only to the CUSTOM_IMG case |

Table 4-2: Diagnostic command details (Continued)

| Command | Description |
|----------------|--|
| !ERR | <p>Display diagnostic information</p> <p>This command is used to display diagnostic information (logged error conditions) that Sierra Wireless uses to assist in resolving technical issues.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIERR=0 Response: OK Purpose: Clear the logged error conditions. Use this command before running tests to make sure that details displayed using AT!ERR are relevant to the tests being performed. • Query: ATIERR Response: 00 [F] <count> <file> <line> ... nn [F] <count> <file> <line> OK Purpose: Return all logged error conditions that are stored in NVRAM. <p>Parameters:</p> <p><count> (Number of occurrences)</p> <ul style="list-style-type: none"> • Valid range: 0x00–0xFF <p><file> (Log file name)</p> <ul style="list-style-type: none"> • Name of log file using ASCII characters <p><line> (Line number in log file)</p> <ul style="list-style-type: none"> • Valid range: 1–99999 |
| !GCCLR | <p>Clear crash dump data</p> <p>Clear crash dump data.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIGCCLR Response: Crash data cleared OK Purpose: Clear crash dump data. <p>Parameters:</p> <p>None</p> |
| !GCDUMP | <p>Display crash dump data</p> <p>Display crash dump data.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIGCDUMP Response: (crash dump data) OK or No crash data available OK Purpose: Display crash dump data. |

Table 4-2: Diagnostic command details (Continued)

| Command | Description |
|---------------|---|
| !RXDEN | <p>Enable/disable WCDMA/LTE receive diversity</p> <p>Enable or disable WCDMA/LTE receive diversity, or establish receive diversity as the primary path. The new state takes effect the next time the modem is reset.</p> <hr/> <p><i>Note: To change from <state=0> to <state=2> (or from <state=2> to <state=0>, you must issue AT!RXDEN=1, reset the modem, and then make the final state change.</i></p> <hr/> <p>Password required: Yes—Execution format only</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!RXDEN=<state> Response: OK Purpose: Set the current receive diversity state. • Query: AT!RXDEN? Response: !RXDEN: <state> OK Purpose: Return the current receive diversity <state>. • Query List: AT!RXDEN=? Purpose: Return a list of available <state> values to use in this command. <p>Parameters:</p> <p><state> (Current/ requested receive diversity state)</p> <ul style="list-style-type: none"> • 0 = Rx diversity disabled • 1 = Rx diversity enabled • 2 = Rx diversity is primary path |

5: Test Commands

Introduction

To obtain regulatory approval and carrier approvals for your product, you may be required to perform tests on the radio component of the embedded modem. This chapter describes AT commands used to perform those tests.

In most cases the modem must be in a particular mode before you can issue the AT commands to perform particular tests. Therefore, the order in which you issue certain commands is important. Three AT commands are important in setting the mode:

- **!DAFTMACT**—puts the modem in factory test mode (a non-signaling mode). You must issue **AT!DAFTMACT** before issuing any other command that starts with “!DA”.
- **!DASBAND**—selects the frequency band.

You must execute **AT!DASBAND** to select an LTE band to run these commands that test the LTE transceiver:

- **!DALGAVGAGC**
- **!DALGRXAGC**
- **!DALGTAGC**

You must execute **AT!DASBAND** to select a WCDMA band to run these commands that test the WCDMA transceiver:

- **!DAWGRXAGC**
- **!DAWGAVGAGC**
- **!DAWSTXCW**
- **!DAWSPARANGE**
- **!DASTXOFF**
- **!DASTXON**
- **!DAWSCONFIGRX**

You must execute **AT!DASBAND** to select a GSM band to run these commands that test the GSM transceiver:

- **!DAGSRXBURST**
- **!DAGSRXCONT**
- **!DAGGRSSI**
- **!DAGGAVGRSSI**
- **!DAGGRSSIRAW**
- **!DAGSTXFRAME**
- **!DASCHAN**—selects the channel. This command must be run after you have selected the band with **!DASBAND**. (If you don't select a channel, the modem uses a default.)

Command summary

The table below lists the commands described in this chapter.

Table 5-1: Test commands

| Command | Description | Page |
|---------------|---|------|
| !DAFTMACT | Put modem into Factory Test Mode | 60 |
| !DAFTMDEACT | Put modem into online mode from Factory Test Mode | 60 |
| !DAGGAVGRSSI | Return averaged RSSI value in dBm (GSM only) | 61 |
| !DAGGRSSI | Return the RSSI value in dBm (GSM only) | 61 |
| !DAGGRSSIRAW | Return raw RSSI value (GSM only) | 62 |
| !DAGINFO | Return GSM mode RF information (GSM only) | 63 |
| !DAGSLOCK | Return synthesizer lock state (GSM only) | 64 |
| !DAGSRXBURST | Set GSM receiver to burst mode (GSM only) | 64 |
| !DAGSRXCONT | Set GSM receiver continuously on (GSM only) | 65 |
| !DAGSTXBURST | Set GSM transmitter to burst mode (GSM only) | 65 |
| !DAGSTXFRAME | Set GSM Tx frame structure (GSM only) | 66 |
| !DALGAVGAGC | Return averaged Rx AGC value (LTE only) | 67 |
| !DALGRXAGC | Return Rx AGC value (LTE only) | 68 |
| !DALGTXAGC | Return Tx AGC value and transmitter parameters (LTE only) | 69 |
| !DALSPARANGE | Set LTE PA range (LTE only) | 70 |
| !DALSRXBW | Set LTE Rx bandwidth (LTE only) | 71 |
| !DALSTXBW | Set LTE Tx bandwidth (LTE only) | 71 |
| !DALSTXINDEX | Set LTE Tx gain index (LTE only) | 72 |
| !DALSWAVEFORM | Set LTE TX waveform (LTE only) | 72 |
| !DAOFFLINE | Place modem offline | 73 |
| !DASBAND | Set frequency band | 73 |
| !DASCHAN | Set modem channel (frequency) | 74 |
| !DASLNAGAIN | Set LNA gain state | 75 |
| !DASPDM | Set PDM value | 76 |
| !DASTXOFF | Turn Tx PA off | 76 |
| !DASTXON | Turn Tx PA on | 77 |
| !DAWGAVGAGC | Return averaged Rx AGC value (WCDMA only) | 77 |
| !DAWGRXAGC | Return Rx AGC value (WCDMA only) | 78 |

Table 5-1: Test commands (Continued)

| Command | Description | Page |
|----------------------|---|------|
| !DAWINFO | Return WCDMA mode RF information (WCDMA only) | 79 |
| !DAWSCONFIGRX | Set WCDMA receiver to factory calibration settings (WCDMA only) | 80 |
| !DAWSPARANGE | Set PA range state machine (WCDMA only) | 81 |
| !DAWSSCHAIN | Enable secondary receive chain (WCDMA only) | 81 |
| !DAWSCHAINTCM | Place receive chain in test call mode (WCDMA only) | 82 |
| !DAWSTXCW | Set waveform used by the transmitter (WCDMA only) | 82 |
| !DAWSTXPWR | Set desired Tx power level (WCDMA mode only) | 83 |

Command reference

Table 5-2: Test command details

| Command | Description |
|--------------------|--|
| !DAFTMACT | <p>Put modem into Factory Test Mode</p> <p>Place the modem in FTM (Factory Test Mode). FTM is a non-signaling mode that allows the radio component to be manually configured to conduct certain types of tests. AT commands that start with “!DA” are only available when the modem is in FTM mode.</p> <hr/> <p><i>Note: When this command executes successfully, the modem responds with the value 290300. Any other response indicates an error.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!DAFTMACT Response: 290300 (Success. Any other response indicates an error.) OK Purpose: Place modem in FTM mode. |
| !DAFTMDEACT | <p>Put modem into online mode from Factory Test Mode</p> <p>This command takes the modem out of FTM and puts the modem back into online mode. (The command !DAFTMACT puts the modem into FTM.)</p> <hr/> <p><i>Note: When this command executes successfully, the modem responds with the value 290400. Any other response indicates an error.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!DAFTMDEACT Response: 290400 (Success. Any other response indicates an error.) OK Purpose: Place modem in online mode (from FTM mode). |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|--|
| <p>!DAGGAVGRSSI</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Return averaged RSSI value in dBm (GSM only)</p> <p>Return an averaged RSSI (Received Signal Strength Indicator) value in dBm.</p> <hr/> <p><i>Note: !DASBAND must be used to set the device to a GSM band before you can use !DAGGAVGRSSI.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!DAGGAVGRSSI=<channel>, <LNA Index> Response: OK Purpose: Return the averaged RSSI for the specified channel and LNA offset index. <p>Parameters:</p> <p><channel> (Channel number for the band specified using !DASBAND)</p> <ul style="list-style-type: none"> Valid values depend on the selected band <p><LNA Index> (LNA offset index)</p> <ul style="list-style-type: none"> 0=R0 (highest gain) 1=R1 2=R2 3=R3 (lowest gain) |
| <p>!DAGGRSSI</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Return the RSSI value in dBm (GSM only)</p> <p>Return the RSSI (Received Signal Strength Indicator) value in dBm using the calibration offsets (valid in GSM burst mode only—the command !DAGSRXBURST puts the modem into burst mode).</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAGGRSSI.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!DAGGRSSI Response: Channel:<chan> LNA:<lina> RXPWR:<pwr> dBm OK Purpose: Return the averaged RSSI for the specified channel and LNA offset index. <p>Parameters:</p> <p><chan> (Channel number for the band specified using !DASBAND)</p> <ul style="list-style-type: none"> Valid values depend on the selected band <p><lina> (Current LNA state)</p> <ul style="list-style-type: none"> Valid range: 0–3 <p><pwr> (RSSI converted to dBm)</p> <ul style="list-style-type: none"> Signed value based on Rx power |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|--|
| <p>!DAGGRSSIRAW</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Return raw RSSI value (GSM only)</p> <p>Return a 32-bit raw RSSI value (valid in GSM mode only). The value is an average over multiple bursts.</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAGGRSSIRAW.</i></p> <hr/> <p>UPassword required: Yes</p> <p>sage:</p> <ul style="list-style-type: none"> • Execution: AT!DAGGRSSIRAW Response: <rssi> OK Purpose: Return the raw RSSI value. <p>Parameters</p> <p><rssi> (RSSI, averaged over multiple bursts)</p> <ul style="list-style-type: none"> • 32-bit value |

Table 5-2: Test command details (Continued)

| Command | Description |
|---|--|
| <p>!DAGINFO</p> <hr/> <p><i>Note: The modem must be in online mode (not FTM mode) to use this command.</i></p> <hr/> | <p>Return GSM mode RF information (GSM only)</p> <p>Return RF information for GSM mode.</p> <hr/> <p><i>Note: IDAWINFO provides RF information for WCDMA mode.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DAGINFO <p>Response: Channel: <channel> RSSI:<rssI> LNA:<lna> RXPWR:<rxPwr> dBm SNR:<snr> DC Offset_I:<iOffset> DC Offset Q:<qOffset> Freq. Offset:<freqOffset> Timing Offset:<timingOffset> OK</p> <p>Purpose: Return the RF information. (If the modem is not in GSM mode, the command returns 'OK' with no information.)</p> <p>Parameters</p> <p><channel> (GSM channel)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><rssI> (Receive power)</p> <ul style="list-style-type: none"> • Valid range: 0x00000000–0xFFFFFFFF <p><lna> (LNA gain state)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><rxPwr> (Rx power in dBm (0.25 units))</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><snr> (Signal-to-noise ratio)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><iOffset> (I offset)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><qOffset> (Q offset)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><freqOffset> (Frequency offset)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><timingOffset> (Timing offset)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|---|
| <p>!DAGSLOCK</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Return synthesizer lock state (GSM only)</p> <p>Return a value indicating the lock state of the RF synthesizers.</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAGSLOCK.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!DAGSLOCK Response: <sLockState> OK <p>Purpose: Return the synthesizer lock state.</p> <p>Parameters</p> <p><sLockState> (Synthesizer lock state)</p> <ul style="list-style-type: none"> 0=One or more synthesizers are out of lock 1=All synthesizers locked |
| <p>!DAGSRXBURST</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Set GSM receiver to burst mode (GSM only)</p> <p>Set the receiver to start or stop sending bursts. The receiver must be in burst mode to read the RSSI. (The command !DAGGRSSI returns the RSSI value.)</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAGSRXBURST.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!DAGSRXBURST=<function> Response: <function> OK <p>Purpose: Set the receiver to burst mode</p> <p>Parameters:</p> <p><function></p> <ul style="list-style-type: none"> 0=Get RSSI (Burst mode) 2=Stop continuous Rx |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|--|
| <p>!DAGSRXCONT</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Set GSM receiver continuously on (GSM only)</p> <p>Set the GSM receiver so that it is continuously on and not bursting.</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAGSRXCONT.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!DAGSRXCONT=<function> Response: <function> OK Purpose: Set the receiver to continuously on. <p>Parameters:</p> <p><function></p> <ul style="list-style-type: none"> 3=Receiver continuously on 4=Receiver off |
| <p>!DAGSTXBURST</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Set GSM transmitter to burst mode (GSM only)</p> <p>Set the transmitter to start or stop sending bursts.</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAGSTXBURST.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT!DAGSTXBURST=<source>, <TSCindex>, <burstdur> Response: <source> <TSCindex> <burstdur> OK Purpose: Set the receiver to start/stop sending bursts. <p>Parameters:</p> <p><source></p> <ul style="list-style-type: none"> 0=Random data 1=Tone 2=Buffer data <p><TSCindex> (Training sequence index)</p> <ul style="list-style-type: none"> Valid range: 0–9 <p><burstdur> Burst duration:</p> <ul style="list-style-type: none"> 1=Continuous |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|---|
| <p>!DAGSTXFRAME</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Set GSM Tx frame structure (GSM only)</p> <p>This command configures the Tx slots for GSM operation. It must be issued eight times to set all eight slots.</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAGSTXFRAME.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DAGSTXFRAME=<slotnum>, <onoff>, <pwr>, <mcs> Response: <slotnum> <onoff> <pwr> <mcs> OK Purpose: Set the Tx frame structure. <p>Parameters:</p> <p><slotnum> (Slot number)</p> <ul style="list-style-type: none"> • Valid range: 0–7 (eight available Tx slots) <p><onoff> (Enable/disable the specified slot)</p> <ul style="list-style-type: none"> • 0=Off (disable) • 1=On (enable) <p><pwr> (Slot power level)</p> <ul style="list-style-type: none"> • Measured in dB*100 • Maximum values: <ul style="list-style-type: none"> • GMSK Mode <ul style="list-style-type: none"> 850/900 bands: 3200 (32 dBm) 1800/1900 bands: 2900 (29 dBm) • 8PSK (EDGE) Mode <ul style="list-style-type: none"> 850/900 bands: 2700 (27 dBm) 1800/1900 bands: 2600 (26 dBm) <p><mcs> (Modulation code scheme)</p> <ul style="list-style-type: none"> • Valid range: 0–8 (MCS1 to MCS9) |

Table 5-2: Test command details (Continued)

| Command | Description |
|---|---|
| !DALGAVGAGC <hr/> <i>Note: The modem must be in LTE mode to use this command.</i> <hr/> | Return averaged Rx AGC value (LTE only) Return the averaged AGC (Automatic Gain Control) readings for a specific uplink channel on the main and diversity paths. <hr/> <i>Note: IDASBAND and IDALSRXBW must be issued before you can use !DALGAVGAGC.</i> <hr/> Password required: Yes Usage: <ul style="list-style-type: none"> • Execution: AT!DALGAVGAGC=<channel>, <LNA Index> Response: Paths: <paths> Rx<n>: AGC: <agc> dBm LNA: <lna> Chain: <chain> Rx<n>: AGC: <agc> dBm LNA: <lna> Chain: <chain> OK Purpose: Return the averaged AGC for <channel> on the main and diversity paths. Parameters: <p><channel> (Uplink channel number (UARFCN) for the band specified using IDASBAND)</p> <ul style="list-style-type: none"> • Valid values depend on the selected band <p><LNA Index> (LNA offset index)</p> <ul style="list-style-type: none"> • 0=R0 (Highest gain) • 1=R1 • 2=R2 • 3=R3 (Lowest gain) <p><paths> (Number of receive paths)</p> <ul style="list-style-type: none"> • 2 <p><agc> (AGC value in dBm)</p> <ul style="list-style-type: none"> • Valid values: Dynamic Rx range <p><chain> (Receive paths)</p> <ul style="list-style-type: none"> • 0=Rx Main • 1=Rx Diversity |

Table 5-2: Test command details (Continued)

| Command | Description |
|--------------------------|--|
| <p>!DALGRXAGC</p> | <p>Return Rx AGC value (LTE only)</p> <p>Return the Rx AGC (Automatic Gain Control) value and LNA gain states for each RF path.</p> <p>The AGC value can be converted to RSSI (Received Signal Strength Indicator) in dBm:</p> <pre> if (<AGC_value> < 511) <RX_dBm> = -106 + ((<AGC_value> + 512) / 12) else <RX_dBm> = -106 + ((<AGC_value>-1024) + 512) / 12) </pre> <hr/> <p><i>Note: IDASBAND and IDASCHAN must be issued before you can use !DALGRXAGC.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DALGRXAGC or AT!DALGRXAGC? Response: <AGC value> OK Purpose: Return the <AGC value> for either the main or diversity path. If no <path> is specified, the main path is assumed. <p>Parameters:</p> <p><path> (For modules supporting diversity)</p> <ul style="list-style-type: none"> • 0=Main path • 1=Diversity path <p><AGC value> (Rx AGC value for specified path)</p> <ul style="list-style-type: none"> • Valid range: -512 to +511 |

Table 5-2: Test command details (Continued)

| Command | Description |
|-------------------|---|
| !DALGTXAGC | <p>Return Tx AGC value and transmitter parameters (LTE only) Return the Tx AGC (Automatic Gain Control) value and other transmitter parameters.</p> <hr/> <p><i>Note: This command works only in an active call (for example, when connected to a call box or live network).</i></p> <hr/> <p><i>Note: IDASBAND and IDASCHAN must be issued before you can use !DALGTXAGC.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DALGTXAGC or AT!DALGTXAGC? Response: Paths: <paths> Tx<n>:AGC: <agc> dBm RBi: <rbi> RB: <rbn> PA: <pa> TxGainIdx: <txgi> MTPL: <mtpl> dBm IQgain: <iq> MPR: <mpr> AMPR: <ampr> NS: <ns> SARmpr: <sarmpr> PDet Mode: <mode> PDetAGC: <pagc> PDet: <pdbm> Traw: <traw> Tscaled: <tscaled> Tidx: <tidx> Trem: <trem> <p>OK</p> <p>Purpose: Return transmitter parameters and the transmit <AGC value>.</p> <p>Parameters:</p> <p><paths> (Number of transmit paths)</p> <ul style="list-style-type: none"> • 1 (Tx) <p><agc> (Tx AGC value in dBm)</p> <ul style="list-style-type: none"> • Valid range: -70 to +23 <p><rbi></p> <ul style="list-style-type: none"> • Start resource block index <p><rbn> (Number of resource blocks)</p> <ul style="list-style-type: none"> • Valid range: 0–50 <p><pa> (PA gain state)</p> <ul style="list-style-type: none"> • Valid range: 0–3 <p><txgi></p> <ul style="list-style-type: none"> • Tx gain index <p><mtpl> (Max Tx power limit)</p> <ul style="list-style-type: none"> • Max value: +23 <p><iq></p> <ul style="list-style-type: none"> • Digital IQ gain scaling <p><mpr> (Maximum power reduction)</p> <ul style="list-style-type: none"> • See 3GPP 36.101 for details <p><ampr> (Additional Max power reduction)</p> <ul style="list-style-type: none"> • See 3GPP 36.101 for details <p><ns> (Network Signaled (NS) value)</p> <ul style="list-style-type: none"> • See 3GPP 36.101 for details <p>(Continued on next page)</p> |

Table 5-2: Test command details (Continued)

| Command | Description |
|---|---|
| !DALGTXAGC (continued) | Return Tx AGC value and transmitter parameters (LTE only) (continued) <p><mode> (HDET (power detector) mode)</p> <ul style="list-style-type: none"> • Valid values: <ul style="list-style-type: none"> • L (Lower power) • H (Higher power) <p><padc></p> <ul style="list-style-type: none"> • HDET ADC <p><pdbm></p> <ul style="list-style-type: none"> • HDET dBm <p><traw> (Raw thermistor ADC value)</p> <ul style="list-style-type: none"> • Valid range: 0–4095 <p><tscald> (Scaled thermistor value)</p> <ul style="list-style-type: none"> • Valid range: 0–255 • Value is scaled from <traw> based on calibrated min/max <traw> values for the supported temperature range. <p><tidx> (Temperature compensation bin)</p> <ul style="list-style-type: none"> • Valid range: 0–7 <p><trem></p> <ul style="list-style-type: none"> • Temperature compensation remainder bin |
| !DALSPARANGE | Set LTE PA range (LTE only) Set the LTE PA (Power Amplifier) range. Requirements: <ul style="list-style-type: none"> • Device must be in FTM mode • !DASBAND, !DASCHAN, and !DALSTXBW must be issued before you can use this command. Password required: Yes Usage: <ul style="list-style-type: none"> • Execution: AT!DALSPARANGE=<pa_range> Response: OK Purpose: Set the LTE PA range. Parameters: <p><pa_range> (PA range)</p> <ul style="list-style-type: none"> • 0 • 1 • 2 • 3 |

Table 5-2: Test command details (Continued)

| Command | Description |
|------------------|--|
| !DALSRXBW | <p>Set LTE Rx bandwidth (LTE only)</p> <p>Set the LTE Rx bandwidth.</p> <p>Requirements:</p> <ul style="list-style-type: none"> • IDASBAND must be issued before you can use this command. • This command must be issued before you can use !DALGAVGAGC. <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DALSRXBW=<bw> Response: OK Purpose: Set the LTE Rx bandwidth. <p>Parameters:</p> <p><bw> (LTE bandwidth)</p> <ul style="list-style-type: none"> • 0=1.4 MHz • 1=3 MHz • 2=5 MHz • 3=10 MHz • 4=15 MHz • 5=20 MHz |
| !DALSTXBW | <p>Set LTE Tx bandwidth (LTE only)</p> <p>Set the LTE Tx bandwidth.</p> <p>Requirements:</p> <ul style="list-style-type: none"> • IDASBAND must be issued before you can use this command. <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DALSTXBW=<bw> Response: OK Purpose: Set the LTE Tx bandwidth. <p>Parameters:</p> <p><bw> (LTE bandwidth)</p> <ul style="list-style-type: none"> • 0=1.4 MHz • 1=3 MHz • 2=5 MHz • 3=10 MHz • 4=15 MHz • 5=20 MHz |

Table 5-2: Test command details (Continued)

| Command | Description |
|----------------------|---|
| !DALSTXINDEX | <p>Set LTE Tx gain index (LTE only)</p> <p>Set the LTE Tx gain index.</p> <p>Requirements:</p> <ul style="list-style-type: none"> • Device must be in FTM mode • !DASBAND, !DASCHAN, and !DALSTXBW must be issued before you can use this command. <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DALSTXINDEX=<tx_index> <p>Response: OK</p> <p>Purpose: Set the LTE Tx gain index.</p> <p>Parameters:</p> <p><tx_index> (LTE Tx gain index)</p> <ul style="list-style-type: none"> • Valid range: 0–127 |
| !DALSWAVEFORM | <p>Set LTE TX waveform (LTE only)</p> <p>Set the LTE Tx waveform characteristics.</p> <p>Requirements:</p> <ul style="list-style-type: none"> • Device must be in FTM mode • !DASBAND, !DASCHAN, and !DALSTXBW must be issued before you can use this command. <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DALSWAVEFORM=<waveform>[,<PUSCH_RBs>,<PUCCH_RBs>,<PUSCH_start_RB_index>] <p>Response: OK</p> <p>Purpose: Set the LTE Tx waveform characteristics.</p> <p>Parameters:</p> <p><waveform> (Tx waveform)</p> <ul style="list-style-type: none"> • 0=1 MHz offset CW • 1=LTE PUSCH (Physical Uplink Shared Channel) • 2=LTE PUCCH (Physical Uplink Control Channel) • 3=LTE PRACH (Physical Random Access Channel) • 4=LTE SRS • 5=UpPTS (Uplink Pilot Time Slot) <p><PUSCH_RBs> (Number of PUSCH resource blocks)</p> <ul style="list-style-type: none"> • Valid range: 0–100 <p><PUCCH_RBs> (Number of PUCCH resource blocks)</p> <ul style="list-style-type: none"> • Valid range: 0–12 <p><PUSCH_start_RB_index> (PUSCH starting resource block index)</p> <ul style="list-style-type: none"> • Valid range: 0–255 |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|---|
| !IDAOFFLINE | <p>Place modem offline</p> <p>Put the modem offline.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIDAOFFLINE Response: OK Purpose: Put the modem offline. <p>Parameters:</p> <p>None</p> |
| <p>!DASBAND</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use IDAFCTACT to enter FTM mode.</i></p> <hr/> | <p>Set frequency band</p> <p>Set the modem to use a particular frequency band. You must use this command to select an appropriate band before running LTE, WCDMA, or GSM commands. See page 57.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIDASBAND=<rband> Response: <rband> OK Purpose: Set frequency band. <p>Parameters:</p> <p><rband> (Unique value corresponding to an RF band and technology.)</p> <ul style="list-style-type: none"> • This is a unique value that maps to an RF band and technology. It is not an actual 3GPP band number. For example, '18' is GSM 850, which corresponds to 3GPP band 5 (on a GSM network). • Band support is product specific—see the device's Product Specification or Product Technical Specification document for details. • Examples (for a full listing, see Table 12-1 on page 121): <ul style="list-style-type: none"> • GSM <ul style="list-style-type: none"> • 10=GSM 900 • 11=GSM 1800 • 12=GSM 1900 • 18=GSM 850 • WCDMA <ul style="list-style-type: none"> • 9=WCDMA 2100 • 16=WCDMA 1900B • 22=WCDMA 850 • 29=WCDMA 900 (BC8) • LTE <ul style="list-style-type: none"> • 34=LTE B1 • 35=LTE B7 • 36=LTE B13 • 37=LTE B17 • 42=LTE B4 • 44=LTE B3 • 47=LTE B8 • 56=LTE B20 |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|--|
| <p>!DASCHAN</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Set modem channel (frequency)</p> <p>Set the modem to operate on a particular frequency channel. Before using this command, use the command !DASBAND (described on page 73) to set the band. Once a channel is set, the modem continues to use that channel until the modem is reset or powered off and on.</p> <hr/> <p><i>Note: !DASBAND must be issued before you can use !DASCHAN. In LTE mode, you must also issue !DALSRXBW and !DALSTXBW before you can use !DASCHAN.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DASCHAN=<rfchannel> Response: <rfchannel> OK Purpose: Set modem channel (frequency). <p>Parameters:</p> <p><rfchannel> (Uplink channel number (ARFCN)—depends on frequency band being used)</p> <ul style="list-style-type: none"> • 128–251: GSM 850 MHz • 1–24: GSM 900 MHz • 975–1023: GSM 900 MHz • 512–885: GSM 1800 MHz • 512–810: GSM 1900 MHz • 9612–9888: WCDMA 2100 • 9262–9538: WCDMA 1900 • 4132–4233: WCDMA 850 • 2712–2863: WCDMA 900 • 18000–18599: LTE B1 • 19200–19949: LTE B3 • 19950–20399: LTE B4 • 20750–21449: LTE B7 • 21450–21799: LTE B8 • 23180–23279: LTE B13 • 23730–23849: LTE B17 • 24150–24449: LTE B20 |

Table 5-2: Test command details (Continued)

| Command | Description |
|--------------------|--|
| !DASLNAGAIN | <p>Set LNA gain state</p> <p>Set the LNA (Low Noise Amplifier) range for the main or diversity path (if applicable), in either WCDMA or GSM mode.</p> <hr/> <p><i>Note: IDASBAND and IDASCHAN must be issued before you can use !DASLNAGAIN.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!LNAGAIN=<gain index>[, <path>] Response: <gain index> OK Purpose: Set the LNA gain state for either the main or diversity paths. <p>Parameters:</p> <p><gain index></p> <ul style="list-style-type: none"> • 0=R0 (highest gain) Approximate switch from low to high gain: WCDMA (< -72 dBm); GSM (< -73 dBm) • 1=R1 Approximate switch from low to high gain: WCDMA (< -72 up to -46 dBm); GSM (< -73 up to -58 dBm) • 2=R2 Approximate switch from low to high gain: WCDMA (< -46 up to -36 dBm); GSM (< -58 up to -41 dBm) • 3=R3 (lowest gain) Approximate switch from low to high gain: WCDMA (> -36 dBm); GSM (< -41 dBm) <hr/> <p><i>Note: The LNA gain state is set based on the expected receive power level. The gain state values listed above are provided as a guideline. The values are approximations and subject to change over time. The values are different than those from high to low gain.</i></p> <hr/> <p><path> (For modules supporting diversity)</p> <ul style="list-style-type: none"> • 0=Main path • 1=Secondary (diversity) path |

Table 5-2: Test command details (Continued)

| Command | Description |
|---|--|
| <p>!DASPDM</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Set PDM value</p> <p>Adjust the PDM (Pulse Duration Modulation), allowing you to apply frequency offset to the LO (Local Oscillator) or Tx AGC.</p> <p>When you adjust the Tx AGC (<PDM ID> = 2), the modem does not use a calibrated result but uses the raw AGC value. The resulting change in Tx power will vary from modem to modem, so it is usually necessary to tune this value by executing the command repeatedly with different settings for the <PDMvalue> until you obtain the desired Tx power.</p> <p>When adjusting the tracking LO, you also need to execute the command repeatedly with different settings for the <PDMvalue> until you obtain the desired frequency offset.</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DASPDM.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: !DASPDM=<PDM ID>, <PDMvalue> Response: <PDM ID> <PDMvalue> OK Purpose: Set the tracking LO and Tx AGC PDM. <p>Parameters:</p> <p><PDM ID> (LO (Local Oscillator) or Tx AGC (Automatic Gain Control) to adjust)</p> <ul style="list-style-type: none"> • 0=Tracking LO adjust (GSM only) • 2=Tx AGC adjust (WCDMA only) • 4=Tracking LO adjust (WCDMA only) <p><PDMvalue> (Frequency offset value)</p> <ul style="list-style-type: none"> • If <PDM ID>=0: 0–511 • If <PDM ID>=2: 0–511 • If <PDM ID>=5: 0–65536 |
| <p>!DASTXOFF</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Turn Tx PA off</p> <p>Turn the transceiver PA off, after it has been turned on with !DASTXON.</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DASTXOFF.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: !DASTXOFF Response: OK Purpose: Turn the Tx PA off. <p>Parameters:</p> <p>None</p> |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|--|
| !DASTXON <hr/> <i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i> <hr/> | Turn Tx PA on Turn on the transceiver PA (either the WCDMA PA or the GSM PA, depending on the mode set with !DASBAND). The PA then remains on until you turn it off using the !DASTXOFF command, or until you reset or power the modem down and up. <hr/> <i>Note: !DASBAND and !DASCHAN must be issued before you can use !DASTXON.</i> <hr/> Password required: Yes Usage: <ul style="list-style-type: none"> • Execution: AT!DASTXON Response: OK Purpose: Turn the Tx PA on. Parameters: None |
| !DAWGAVGAGC | Return averaged Rx AGC value (WCDMA only) Return the averaged AGC (Automatic Gain Control) reading for a specific band for either the main path or diversity path (if applicable). <hr/> <i>Note: !DASBAND must be issued before you can use !DAWGAVGAGC.</i> <hr/> Password required: Yes Usage: <ul style="list-style-type: none"> • Execution: AT!DAWGAVGAGC=<channel>, <LNA Index>[, <path>] Response: <agc> OK Purpose: Return the averaged AGC for <channel> on the main path or diversity path. Parameters: <channel> (Uplink channel number (UARFCN) for the band specified using !DASBAND) <ul style="list-style-type: none"> • Valid values depend on the selected band <LNA Index> (LNA offset index) <ul style="list-style-type: none"> • 0=R0 (Highest gain) • 1=R1 • 2=R2 • 3=R3 (Lowest gain) <path> (For modules supporting diversity) <ul style="list-style-type: none"> • 0=Main path • 1=Diversity path <agc> (Averaged Rx AGC in dBm) <ul style="list-style-type: none"> • Example: -78.9 |

Table 5-2: Test command details (Continued)

| Command | Description |
|-------------------|--|
| !DAWGRXAGC | <p>Return Rx AGC value (WCDMA only)</p> <p>Return the Rx AGC (Automatic Gain Control) value of the main path or diversity path (if applicable).</p> <p>This value can be converted to RSSI (Received Signal Strength Indicator) in dBm:</p> <pre> if (<AGC_value> < 511) <RX_dBm> = -106 + ((<AGC_value> + 512) / 12) else <RX_dBm> = -106 + (((<AGC_value>-1024) + 512) / 12) </pre> <hr/> <p><i>Note: IDASBAND and IDASCHAN must be issued before you can use !DAWGRXAGC.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DAWGRXAGC?[<path>] Response: <AGC value> OK Purpose: Return the <AGC value> for either the main or diversity paths. If no <path> is specified, the main path is assumed. <p>Parameters:</p> <p><path> (For modules supporting diversity)</p> <ul style="list-style-type: none"> • 0=Main path • 1=Diversity path <p><AGC value> (Rx AGC value for specified path)</p> <ul style="list-style-type: none"> • Valid range: -512 to +511 |

Table 5-2: Test command details (Continued)

| Command | Description |
|---|--|
| <p>!DAWINFO</p> <hr/> <p><i>Note: The modem must be in online mode (not FTM mode) to use this command.</i></p> <hr/> | <p>Return WCDMA mode RF information (WCDMA only)</p> <p>Return RF information for WCDMA mode when the modem is in CELL_DCH (Designated Channel) state.</p> <hr/> <p><i>Note: IDAGINFO provides RF information for GSM mode.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DAWINFO Response: RXAGC:<rxAGC> TXAGC:<txAGC> TXADJ:<txAdj> TXLIM:<txLim> LNA:<lnaRange> PA ON:<paOn> TX ON:<txOn> PA Range:<paRange> RxD RXAGC:<RXDrxAGC> RxD LNA:<RXDlnaRange> HDET:<hdet> OK Purpose: Return the RF information. <p>Parameters:</p> <p><rxAGC> (Rx AGC value)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><txAGC> (Tx AGC value)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><txAdj> (Tx AGC value after linearization (adjustment))</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><txLim> (Tx AGC limit)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><lnaRange> (State of the LNA)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><paOn> (State of PA_ON0)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><txOn> (State of TX_ON)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><paRange> (State of PA_R1: PA_R0)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><RXDrxAGC> (RxD Rx AGC value)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><RXDlnaRange> (State of the RxD LNA)</p> <ul style="list-style-type: none"> • Valid range: 0–65535 <p><hdet> (Raw HDET (High Power Detector) data)</p> <ul style="list-style-type: none"> • Valid range: 0–255 |

Table 5-2: Test command details (Continued)

| Command | Description |
|---|--|
| <p>!DAWSCONFIGRX</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Set WCDMA receiver to factory calibration settings (WCDMA only)</p> <p>Configure the WCDMA receiver according to factory calibration settings stored in the modem's NV (Non-Volatile memory). This allows for accurate measurement of Rx AGC levels.</p> <p>The command performs these steps:</p> <ol style="list-style-type: none"> 1. Sets the channel. 2. Selects and sets LNA range (or LNA gain). 3. Sets the VGA gain offset based on the channel. 4. Sets the LNA range offset. <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAWSCONFIGRX.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DAWSCONFIGRX=<channel>,<Rx_Level_dBm> Response: <LNA Index>, <LNA Value> OK Purpose: Configure the receiver. <p>Parameters (Input):</p> <p><channel> (Uplink channel number (ARFCN))</p> <ul style="list-style-type: none"> • Value based on the selected band <p><Rx_Level_dBm> (Approximate signal level (in dBm) being applied to the modem receiver)</p> <ul style="list-style-type: none"> • Valid range: -113 to 20 <p>Parameters (Output):</p> <p><LNA Index> (LNA offset index)</p> <ul style="list-style-type: none"> • 0=R0 (highest gain) • 1=R1 • 2=R2 • 3=R3 (lowest gain) <p><LNA Value></p> <ul style="list-style-type: none"> • Internal use only |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|---|
| !DAWSPARANGE <i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i> | Set PA range state machine (WCDMA only) Set the PA range state machine in WCDMA operation. <i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAWSPARANGE.</i> Password required: Yes Usage: <ul style="list-style-type: none"> Execution: AT!DAWSPARANGE=<PA range> Response: <PA range> OK Purpose: Set the PA range state machine. Parameters: <PA range> <ul style="list-style-type: none"> 0=Low gain state of the PA — Limited to about 16 dBm output power (R0=0, R1=0) 3=High gain state of the PA — Up to the maximum output power of the modem (R0=1, R1=1) |
| !DAWSSCHAIN | Enable secondary receive chain (WCDMA only) Enable or disable the secondary receive chain. <i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAWSSCHAIN.</i> Password required: Yes Usage: <ul style="list-style-type: none"> Execution: AT!DAWSSCHAIN=<state> Response: OK Purpose: Enable or disable the secondary receive chain. Parameters: <state> (Requested state for secondary receive chain) <ul style="list-style-type: none"> 0=Off (Disable) 1=On (Enable) |

Table 5-2: Test command details (Continued)

| Command | Description |
|---------------------|---|
| !DAWSCHAITCM | <p>Place receive chain in test call mode (WCDMA only) Place one or both of the primary and secondary receive chains in test call mode.</p> <hr/> <p><i>Note: IDASBAND and IDASCHAN must be issued before you can use !DAWSCHAITCM.</i></p> <hr/> <p>Password required: Yes Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DAWSCHAITCM=<chain> Response: OK Purpose: Place requested receive chain(s) in test call mode. <p>Parameters: <chain> (Receive chain to place in test call mode)</p> <ul style="list-style-type: none"> • 0=Main • 1=Secondary • 2=Both |
| !DAWSTXCW | <p>Set waveform used by the transmitter (WCDMA only) Set the waveform used by the transmitter—the modem can transmit either in carrier wave or WCDMA modulated.</p> <hr/> <p><i>Note: IDASBAND and IDASCHAN must be issued before you can use !DAWSTXCW.</i></p> <hr/> <p>Password required: Yes Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DAWSTXCW=<waveform> Response: OK Purpose: Set the transmitter waveform. <p>Parameters: <waveform> (Waveform used by the transmitter)</p> <ul style="list-style-type: none"> • 0=WCDMA • 1=Carrier wave (no modulating signal applied) |

Table 5-2: Test command details (Continued)

| Command | Description |
|--|---|
| <p>!DAWSTXPWR</p> <hr/> <p><i>Note: The modem must be in FTM mode to use this command—use !DAFTMACT to enter FTM mode.</i></p> <hr/> | <p>Set desired Tx power level (WCDMA mode only)</p> <p>Set the desired Tx power level in dBm. When this occurs, the PA range and PDM are automatically updated as well. (When this command is used, you do not need to use !DAWSPARANGE and !DASPDM.)</p> <hr/> <p><i>Note: !DASBAND and !DASCHAN must be issued before you can use !DAWSTXPWR.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!DAWSTXPWR=<dBm>[,<use_temp_comp>] Response: <pa_range>, <pdm> OK Purpose: Set the Tx power level to the requested <dBm> level, and automatically set the PA range and PDM. <p>Parameters:</p> <p><dBm> (Desired Tx power in dBm)</p> <ul style="list-style-type: none"> • Valid range: -57 to 28 <p><use_temp_comp> (Apply temperature compensation to set desired Tx power.)</p> <ul style="list-style-type: none"> • Frequency compensation is always applied. • 0=No (default) • 1=Yes <p><pa_range> (PA range set as a result of the command)</p> <ul style="list-style-type: none"> • Valid range: 0–3 <p><pdm> (PDM set as a result of the command)</p> <ul style="list-style-type: none"> • Valid range: 0–255 |

6: Memory Management Commands

Introduction

The modem uses non-volatile memory to store:

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

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 commands

| Command | Description | Page |
|------------------|---|--------------------|
| !RMARESET | Restore device to original settings | 86 |

Command reference

Table 6-2: Memory management command details

| Command | Description |
|-----------|--|
| !RMARESET | <p>Restore device to original settings</p> <p>Restore the device to the original provisioned (OEM default) state.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!RMARESET=<category> <p>Response: !RMARESET: <category> RESET OK</p> <p>Purpose: Restore device to original provisioned (OEM default) state.</p> <p>Parameters:</p> <p><category> (Type of restoration)</p> <ul style="list-style-type: none"> • OEM=Default OEM provisioned state • RTN=OEM provisioned state plus activation and Sprint-related settings |

7: GPS Commands

Introduction

This chapter describes commands used to access GPS functionality in supporting modules.

When using these commands, the following considerations apply:

- GPS is typically enabled by default; however, it may be disabled by default for some SKUs. If so, enable GPS using `ATICUSTOM="GPSENABLE"`
- If supported by the modem, gpsOneXTRA is enabled (over the NDIS interface) by default when GPS is enabled, and it generates data traffic.

Command summary

The table below lists the commands described in this chapter.

Table 7-1: GPS commands

| Command | Description | Page |
|-------------------------|--|--------------------|
| !GPSLBSAPN | Set GPS LBS APNs | 88 |
| !GPSMTLRSETTINGS | Set/report MT location request settings | 89 |
| !GPSNMEA | Enable/disable GPS session autostart when NMEA opens | 90 |

Command reference

Table 7-2: GPS command details

| Command | Description |
|-------------------|--|
| !GPSLBSAPN | <p>Set GPS LBS APNs</p> <p>Set the GPS LBS APNs to be used for various RATs (Radio Access Technologies). Password required: Yes Usage:</p> <ul style="list-style-type: none"> Execution (Add): AT!GPSLBSAPN=<operation>,<ratmask>,<IType>,<APN> Execution (Delete one): AT!GPSLBSAPN=<operation>,<ratmask> Execution (Delete all): AT!GPSLBSAPN=<operation> Response: OK or ERROR Purpose: Set the APN to be used for the specified <ratmask>, or delete the APN for a single <ratmask> or all RATs. Query: AT!GPSLBSAPN? Response: <ratmask>, <IType>, <APN> <ratmask>, <IType>, <APN> ... OK or OK (if no ID has been set) Purpose: Display the APNs currently assigned for each RAT. Query List: AT!GPSLBSAPN=? Purpose: Display valid parameter options. <p>Parameters:</p> <p><operation> (Add or delete APNs)</p> <ul style="list-style-type: none"> 1=Add an APN for a specific <ratmask> and <IType>. Note: All parameters are required. <hr/> <p><i>Note: To change an APN that has been set for a RAT, you must first delete the current APN, then add the new APN.</i></p> <hr/> <ul style="list-style-type: none"> 2=Delete the APN for a specific <ratmask> Note: Only <ratmask> is required. 3=Delete all APNs Note: No other parameters are required. <p><ratmask> (Radio access technology)</p> <ul style="list-style-type: none"> Valid values (values shown are in hexadecimal format): <ul style="list-style-type: none"> 01=CDMA 02=HDR 04=GSM 08=WCDMA 10=LTE <p>(Continued on next page)</p> |

Table 7-2: GPS command details (Continued)

| Command | Description |
|-------------------------------|--|
| !GPSLBSAPN (continued) | <p>Set GPS LBS APNs (continued)</p> <p><IPtype> (Internet Protocol version)</p> <ul style="list-style-type: none"> • Character string, entered without quotation marks • Valid values: <ul style="list-style-type: none"> • IPV4 • IPV6 • IPV4V6 <p><APN> (Access Point Name)</p> <ul style="list-style-type: none"> • Character string, entered with quotation marks • Examples: "mycompany.mnc987.mcc123.gprs", "ourinternet" |
| !GPSMTLRSETTINGS | <p>Set/report MT location request settings</p> <p>Set or report the current MT (mobile-terminated) Location Request settings, which control how the UE responds to network-initiated notifications.</p> <hr/> <p><i>Note: !RESET must be issued after this command is used.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!GPSMTLRSETTINGS=<notifResp> Response: OK or ERROR Purpose: Indicate how MT location request will be handled. • Query: AT!GPSMTLRSETTINGS? Response: Notification Response Setting: <notifResp> OK Purpose: Return the current <notifResp> setting. • Query List: AT!GPSMTLRSETTINGS=? Purpose: Return valid <notifResp> values. <p>Parameters:</p> <p><notifResp> (Notification response setting)</p> <ul style="list-style-type: none"> • 0=Default setting as defined in <i>3GPP specification 29.002</i>, 'NotificationToM-User' enumeration. • 1=Accept all MT location requests. • 2=Reject all MT location requests. • 3=Verify all—User will be asked to accept or reject every MT location request. |

Table 7-2: GPS command details (Continued)

| Command | Description |
|-----------------|--|
| !GPSNMEA | <p>Enable/disable GPS session autostart when NMEA opens Enable or disable the automatic start of a GPS session when NMEA opens. Password required: No Usage:</p> <ul style="list-style-type: none"> • Execution: AT!GPSNMEA=<enable> Response: OK Purpose: Enable or disable automatic start of GPS session when NMEA opens. • Query: AT!GPSNMEA? Response: Enabled: <enable> OK Purpose: Return the enable/disable state. <p>Parameters: <enable> (Enable/disable GPS autostart)</p> <ul style="list-style-type: none"> • 0=Disable • 1=Enable (Default) |

8: SIM Commands

- [Introduction](#)
- [Command summary](#)
- [Command reference](#)

Introduction

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

Command summary

[Table 8-1](#) lists the commands described in this chapter:

Table 8-1: SIM command passwords

| Command | Description | Page |
|---------|--|--------------------|
| +CPINR | Display remaining number of SIM unlock retries | 92 |
| !ICCID | Return (U)SIM card's ICCID | 93 |

Command reference

Table 8-2: SIM command details

| Command | Description |
|---------|--|
| +CPINR | <p>Display remaining number of SIM unlock retries</p> <p>Display the number of remaining SIM unlock retries.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution: AT+CPINR=<CPIN TYPE> Response: +CPINR: <CPIN TYPE>,<remaining> OK Purpose: Display the number of remaining retries for the specified PIN/PUK type. Execution: AT+CPINR Response: +CPINR: SIM PIN,<remaining> +CPINR: SIM PUK,<remaining> +CPINR: SIM PIN2,<remaining> +CPINR: SIM PUK2,<remaining> +CPINR: PH-FSIM PIN,<remaining> +CPINR: PH-NET PIN,<remaining> +CPINR: PH-NETSUB PIN,<remaining> +CPINR: PH-SP PIN,<remaining> +CPINR: PH-CORP PIN,<remaining> +CPINR: PH-FSIM PUK,<remaining> +CPINR: PH-NET PUK,<remaining> +CPINR: PH-NETSUB PUK,<remaining> +CPINR: PH-SP PUK,<remaining> +CPINR: PH-CORP PUK,<remaining> OK Purpose: Display the number of remaining retries for all PIN/PUK types. <p>Parameters:</p> <p><CPIN TYPE> (PIN/PUK type):</p> <ul style="list-style-type: none"> ASCII string enclosed within quotes. <p>(Continued on next page)</p> |

Table 8-2: SIM command details (Continued)

| Command | Description |
|--------------------|--|
| +CPINR (continued) | <p>Display remaining number of SIM unlock retries (continued)</p> <ul style="list-style-type: none"> • Valid values: (Note: If there are any errors in this list, use AT+CPINR to display the full list of available types.) <ul style="list-style-type: none"> • “SIM PIN” • “SIM PUK” • “SIM PIN2” • “SIM PUK2” • “PH-FSIM PIN” • “PH-NET PIN” • “PH-NETSUB PIN” • “PH-SP PIN” • “PH-CORP PIN” • “PH-FSIM PUK” • “PH-NET PUK” • “PH-NETSUB PUK” • “PH-SP PUK” • “PH-CORP PUK” <p><remaining> (Number of retries remaining for specified PIN/PUK type)</p> <ul style="list-style-type: none"> • 0–255 (maximum value is type-dependent) |
| !ICCID | <p>Return (U)SIM card’s ICCID</p> <p>Return a (U)SIM’s ICCID (Integrated Circuit Card ID).</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Query: AT!ICCID? Response: !ICCID: <iccid> OK Purpose: Display the ICCID. <p>Parameters:</p> <p><iccid> (ICCID of the (U)SIM currently being tested):</p> <ul style="list-style-type: none"> • 20 digit decimal number—This number is often printed on the (U)SIM card. |

9: OMA-DM Commands

Introduction

This chapter describes commands used to configure DM (Device Management) accounts, sessions, and host-device-server interactions.

Command summary

The table below lists the commands described in this chapter.

Table 9-1: OMA-DM commands

| Command | Description | Page |
|----------------------|---|------|
| !HOSTDEVINFO | Configure host device details | 96 |
| !IDSAUTOFOTA | Configure automatic settings for FOTA updates | 97 |
| !IDSAUTOSDM | Configure Subscriber Device Management response to server request | 98 |
| !IDSCONFIGACC | Configure DM account authentication mode and XML format | 99 |
| !IDSCREATEACC | Enter DM account credentials | 100 |
| !IDSDFLTACC | Set DM account to use for device-initiated sessions | 101 |
| !IDSPID | Set profile ID for DM data connection types | 101 |
| !IDSROAM | Configure DM client roaming support | 102 |
| !IDSSUPPORT | Configure DM sessions | 103 |
| !IMSTESTMODE | Enable/disable IMS test mode | 104 |
| !OSINFO | Configure host device operating system information | 105 |

Command reference

Table 9-2: OMA-DM command details

| Command | Description |
|--------------|---|
| IHOSTDEVINFO | <p>Configure host device details</p> <p>Configure the host device details that will be reported by OMA DM for AT&T devices, to comply with AT&T <CDR-DVM-4532> requirement.</p> <p>To configure host device operating system information, see IOSINFO on page 105.</p> <hr/> <p><i>Note: In the Execution format, if a parameter is not entered then the value on the device does not change.</i></p> <hr/> <p>Password required: Yes (Execution format only)</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIHOSTDEVINFO="<hostman>","<hostmod>","<hostswv>","<hostplasmaid>"]] Response: OK or ERROR Purpose: Set some or all host device detail parameters. • Query: ATIHOSTDEVINFO? Response: HostMan: <hostman> HostMod: <hostmod> HostSwV: <hostswv> HostPlasmaID: <hostplasmaid> OK Purpose: Display current host device details. • Query List: ATIHOSTDEVINFO=? Purpose: Display the execution command format and parameter values. <p>Parameters:</p> <p><hostman> (Host device manufacturer's name)</p> <ul style="list-style-type: none"> • 256 characters maximum <p><hostmod> (Host device model name)</p> <ul style="list-style-type: none"> • 256 characters maximum <p><hostswv> (Host software version)</p> <ul style="list-style-type: none"> • 256 characters maximum <p><hostplasmaid> (Host Plasma ID)</p> <ul style="list-style-type: none"> • 256 characters maximum <p>Examples:</p> <ul style="list-style-type: none"> • ATIHOSTDEVINFO="Manufacturer",,"1.0", This sets the <hostman> and <hostswv> values. The values for <hostmod> and <hostplasmaid> do not change. • ATIHOSTDEVINFO="Manufacturer" This sets the <hostman> value. The values for all other parameters do not change. |

Table 9-2: OMA-DM command details (Continued)

| Command | Description |
|---------------------|---|
| !IDSAUTOFOTA | <p>Configure automatic settings for FOTA updates</p> <p>Configure the automatic download, automatic update, and automatic check flags for over-the-air firmware updates:</p> <ul style="list-style-type: none"> • Automatic check—If enabled, the device initiates a FOTA session on every startup to check if the server has a firmware update available. • Automatic download/Automatic upload—If enabled, the device does not request user permission before proceeding with the download or update. <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIIDSAUTOFOTA=<autodownload>, <autoupdate>, <autocheck> Response: OK or ERROR Purpose: Set 'automatic' options. • Query: ATIIDSAUTOFOTA? Response: !IDSAUTOFOTA:<autodownload>, <autoupdate>, <autocheck> OK Purpose: Display current 'automatic' options. • Query List: ATIIDSAUTOFOTA=? Purpose: Display the execution command format and parameter values. <p>Parameters:</p> <p><autodownload> (Check for user permission before downloading firmware update)</p> <ul style="list-style-type: none"> • 0=Permission required • 1=Permission not required <p><autoupdate> (Check for user permission before updating firmware)</p> <ul style="list-style-type: none"> • 0=Permission required • 1=Permission not required. Auto update when download finishes. • 2=Auto update only on power up. • Note: The device will reboot when the update completes. <p><autocheck> (Check for firmware update on startup)</p> <ul style="list-style-type: none"> • 0=Disabled. Do not check for firmware updates on startup. • 1=Enabled. Check for firmware updates on startup. |

Table 9-2: OMA-DM command details (Continued)

| Command | Description |
|--------------------|---|
| !IDSAUTOSDM | <p>Configure Subscriber Device Management response to server request</p> <p>Configure the Subscriber Device Management (SDM) response to DM server requests. DM requests can be always accepted, always rejected, or presented to the host (user) application for a decision.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIIDSAUTOSDM=<autosdm> Response: OK or ERROR Purpose: Set the response behavior. • Query: ATIIDSAUTOSDM? Response: !IDSAUTOSDM:<autosdm> OK Purpose: Display the current response behavior setting. • Query List: ATIIDSAUTOSDM=? Purpose: Display the execution command format and parameter values. <p>Parameters:</p> <p><autosdm> (How to proceed with DM session)</p> <ul style="list-style-type: none"> • 0=Permission required from host application before proceeding with session. (The user must choose whether to accept or reject requests as appropriate.) • 1=Always accept (proceed with) the DM session. Do not notify the host application. (Choose this behavior for standalone devices that do not present a GUI.) • 2=Always reject (do not proceed with) the DM session. Do not notify the host application. |

Table 9-2: OMA-DM command details (Continued)

| Command | Description |
|----------------------|--|
| !IDSCONFIGACC | <p>Configure DM account authentication mode and XML format Configure the preferred authentication mode and XML format for a DM account. Password required: No Usage:</p> <ul style="list-style-type: none"> • Execution: ATIIDSCONFIGACC=<AccountIndex>, <authentication>, <xml_mode> Response: OK or ERROR Purpose: Set the authentication mode and XML format for a specific DM account. • Query: ATIIDSCONFIGACC? Response: !IDSCONFIGACC:<AccountIndex>, <authentication>, <xml_mode> OK Purpose: Show the authentication mode and XML format for a specific DM account. • Query List: ATIIDSCONFIGACC=? Purpose: Display the execution command format and parameter values. <p>Parameters:</p> <p><AccountIndex> (DM account number)</p> <ul style="list-style-type: none"> • Valid values: 1–2 <p><authentication> (Account authentication mode)</p> <ul style="list-style-type: none"> • Valid values <ul style="list-style-type: none"> • “NONE”—No authentication • “BASIC”—Basic authentication • “DIGEST”—MD5 authentication • “HMAC”—HMAC authentication <p><xml_mode> (XML format)</p> <ul style="list-style-type: none"> • Valid values: <ul style="list-style-type: none"> • “XML”—XML format • “WBXML”—WBXML format |

Table 9-2: OMA-DM command details (Continued)

| Command | Description |
|----------------------|---|
| !IDSCREATEACC | <p>Enter DM account credentials</p> <p>Enter the credentials for a DM account.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!IDSCREATEACC=<AccountIndex>, <ServerAddress>, <ServerID>, <ServerPassword>, <ClientUsername>, <ClientPassword> <p>Response: OK or ERROR</p> <p>Purpose: Set the account credentials for a specific DM account.</p> <ul style="list-style-type: none"> • Query: AT!IDSCREATEACC? <p>Response: !IDSCREATEACC:<AccountIndex>, <ServerAddress>, <ServerID>, <ServerPassword>, <ClientUsername>, <ClientPassword> OK</p> <p>Purpose: Show the account credentials for a specific DM account.</p> <ul style="list-style-type: none"> • Query List: AT!IDSCREATEACC=? <p>Purpose: Display the execution command format.</p> <p>Parameters:</p> <p><AccountIndex> (DM account number)</p> <ul style="list-style-type: none"> • Valid values: 1–2 <p><ServerAddress> (URL of DM server)</p> <ul style="list-style-type: none"> • Maximum length—121 characters • This parameter configures the following DM tree node: <ul style="list-style-type: none"> • ./DMAcc/AppAddr/1/Addr <p><ServerID> (DM Server ID and Username)</p> <ul style="list-style-type: none"> • Maximum length—32 characters • This parameter configures the following DM tree nodes: <ul style="list-style-type: none"> • ./DMAcc/ServerID • ./DMAcc/AppAuth/Server/AAuthName <p><ServerPassword> (DM Server Password)</p> <ul style="list-style-type: none"> • Maximum length—32 characters • This parameter configures the following DM tree node: <ul style="list-style-type: none"> • ./DMAcc/AppAuth/Server/AAuthSecret <p><ClientUsername> (DM Client Username)</p> <ul style="list-style-type: none"> • Maximum length—32 characters • This parameter configures the following DM tree node: <ul style="list-style-type: none"> • ./DMAcc/AppAuth/Client/AAuthName <p><ClientPassword> (DM Client Password)</p> <ul style="list-style-type: none"> • Maximum length—32 characters • This parameter configures the following DM tree node: <ul style="list-style-type: none"> • ./DMAcc/AppAuth/Client/AAuthSecret |

Table 9-2: OMA-DM command details (Continued)

| Command | Description |
|--------------------|---|
| !IDSDFLTACC | <p>Set DM account to use for device-initiated sessions</p> <p>Indicate which DM account to use for device-initiated sessions.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIIDSDFLTACC=<AccountIndex> Response: OK or ERROR Purpose: Indicate the DM account to use for device-initiated sessions. • Query: ATIIDSDFLTACC? Response: !IDSDFLTACC:<AccountIndex> OK Purpose: Show which DM account is currently used for device-initiated sessions. • Query List: ATIIDSDFLTACC=? Purpose: Display the execution command format and parameter values. <p>Parameters:</p> <p><AccountIndex> (DM account number)</p> <ul style="list-style-type: none"> • Valid values: 1–2 |
| !IDSPID | <p>Set profile ID for DM data connection types</p> <p>Set the connection profile ID that OMA-DM will use for its data connection.</p> <p>Password required: No</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIIDSPID=<lte_profile>,<3GPP_legacy_profile>,<eHRPD profile> Response: OK or ERROR Purpose: Set the profile ID for each data connection type. • Query: ATIIDSPID? Response: !IDSPID:<lte_profile>, <3GPP_legacy_profile>, <eHRPD profile> OK Purpose: Show the current profile IDs used for each data connection type. • Query List: ATIIDSPID=? Purpose: Display the execution command format and parameter values. <p>Parameters:</p> <p><lte_profile> (Profile ID to use for LTE data connections)</p> <ul style="list-style-type: none"> • Valid values: <ul style="list-style-type: none"> • 0=Use connected or default profile ID. (Default) • 1–16=Profile ID <p><3GPP_legacy_profile> (Profile ID to use for non-LTE 3GPP data connections)</p> <ul style="list-style-type: none"> • Valid values: <ul style="list-style-type: none"> • 0=Use connected or default profile ID. (Default) • 1–16=Profile ID <p><eHRPD profile> (Profile ID to use for eHRPD data connections)</p> <ul style="list-style-type: none"> • Valid values: <ul style="list-style-type: none"> • 0=Use connected or default profile ID. (Default) • 101–150=Profile ID |

Table 9-2: OMA-DM command details (Continued)

| Command | Description |
|-----------------|--|
| !IDSROAM | <p>Configure DM client roaming support Configure the OMA DM client roaming option. Password required: Yes Usage:</p> <ul style="list-style-type: none"> • Execution: AT!IDSROAM=<enable> Response: OK or ERROR Purpose: Enable/disable DM roaming support. • Query: AT!IDSROAM? Response: !IDSROAM:<enable> OK Purpose: Show current DM roaming support state. • Query List: AT!IDSROAM=? Purpose: Display the execution command format and parameter values. <p>Parameters: <enable> (Roaming support state)</p> <ul style="list-style-type: none"> • Valid values: <ul style="list-style-type: none"> • 0=Disabled. The DM client will not attempt to connect to a DM server when roaming. • 1=Enabled. (Default) The DM client will attempt to connect to a DM server when roaming. |

Table 9-2: OMA-DM command details (Continued)

| Command | Description |
|--------------------|---|
| !IDSSUPPORT | <p>Configure DM sessions Enable/disable client-initiated and network-initiated DM device configuration and FOTA sessions.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIIDSSUPPORT=<CI Config session>, <NI Config session>, <CI FOTA session>, <NI FOTA session> Response: OK or ERROR Purpose: Enable/disable device configuration sessions and FOTA sessions. • Query: ATIIDSSUPPORT? Response: !IDSSUPPORT:<CI Config session>, <NI Config session>, <CI FOTA session>,<NI FOTA session>“ OK Purpose: Show current state of device configuration sessions and FOTA sessions. • Query List: ATIIDSSUPPORTI=? Purpose: Display the execution command format and allowed parameter values. <p>Parameters:</p> <p><CI Config session> (Client-initiated DM configuration session state)</p> <ul style="list-style-type: none"> • 0=Disabled (Default) • 1=Enabled <p><NI Config session> (Network-initiated DM configuration session state)</p> <ul style="list-style-type: none"> • 0=Disabled (Default) • 1=Enabled <p><CI FOTA session> (Client-initiated DM FOTA session state)</p> <ul style="list-style-type: none"> • 0=Disabled (Default) • 1=Enabled <p><NI Config session> (Network-initiated DM FOTA session state)</p> <ul style="list-style-type: none"> • 0=Disabled (Default) • 1=Enabled |

Table 9-2: OMA-DM command details (Continued)

| Command | Description |
|---------------------|---|
| !IMSTESTMODE | <p>Enable/disable IMS test mode</p> <p>Enable/disable IMS (IP Multimedia Subsystem) test mode.</p> <p>If IMS test mode is enabled:</p> <ul style="list-style-type: none"> • IMS registration attempts will not occur • SMS over IMS is not supported <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: ATIIMSTESTMODE=<mode> Response: OK Purpose: Enable/disable IMS test mode. • Query: ATIIMSTESTMODE? Response: IMS Test Mode Enabled or IMS Test Mode Disabled Purpose: Return the current state of IMS Test Mode. <p>Parameters:</p> <p><mode> (IMS Test Mode state)</p> <ul style="list-style-type: none"> • 0=Disable • 1=Enable |

Table 9-2: OMA-DM command details (Continued)

| Command | Description |
|----------------|--|
| !OSINFO | <p>Configure host device operating system information</p> <p>Configure the host device operating system name and version that will be reported by OMA DM for AT&T devices, to comply with AT&T <CDR-DVM-4533> requirement. To configure host device details, see !HOSTDEVINFO on page 96.</p> <hr/> <p><i>Note: In the Execution format, if a parameter is not entered then the value on the device does not change.</i></p> <hr/> <p>Password required: Yes (Execution format only)</p> <p>Usage:</p> <ul style="list-style-type: none"> • Execution: AT!OSINFO="<osname>","<osversion>"] Response: OK or ERROR Purpose: Set host device operating system information parameters. • Query: AT!OSINFO? Response: OSName: <osname> OSVersion: <osversion> OK Purpose: Display current host device operating system information. • Query List: AT!OSINFO=? Purpose: Display the execution command format and parameter values. <p>Parameters:</p> <p><osname> (Host device operating system name)</p> <ul style="list-style-type: none"> • 256 characters maximum <p><osversion> (Host device operating system version)</p> <ul style="list-style-type: none"> • 256 characters maximum <p>Examples:</p> <ul style="list-style-type: none"> • AT!OSINFO="An OS Name","1.0" This sets both parameters. • AT!OSINFO=,"1.0" This sets the <osversion> value. The value for the <osname> does not change. |

10: SAR Backoff and Thermal Control Commands

Introduction

This chapter describes:

- SAR-related commands (Specific Absorption Rate)—SAR commands are used to meet regulatory requirements for the OEM host device by managing the modem's SAR backoff state. OEMs should carefully evaluate their use of these commands and their impact on device operation.

Note: Operators may require OEMs to disclose SAR settings and theory of operation for applicable certifications.

- Thermal mitigation-related commands—These commands may affect the host device's performance. OEMs should carefully evaluate their use of these commands to ensure that the device meets performance expectations.

Command summary

The table below lists the commands described in this chapter.

Table 10-1: SAR backoff and thermal control commands

| Command | Description | Page |
|------------------------|--|------|
| !MAXPWR | Set/report maximum Tx power | 108 |
| !SARINTGPIOMODE | Set/report default pull mode for SAR interrupt GPIOs | 109 |

Command reference

Table 10-2: Thermal mitigation command details

| Command | Description |
|----------------|--|
| !MAXPWR | <p>Set/report maximum Tx power Set or report the maximum Tx power for a specific band.</p> <hr/> <p>Caution: <i>Any adjustments of Tx power may impact regulatory certification of the module in the host platform. The OEM is responsible for ensuring that the final module configuration in the host platform meets all regulatory requirements.</i></p> <hr/> <p><i>Note: Increasing the Tx power affects the module's current consumption and thermal performance.</i></p> <hr/> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none"> Execution (WCDMA/LTE): AT!MAXPWR=<band>,<tech>,<max_tx_pwr> Response: OK Purpose: Set the maximum Tx power for the specified band/technology combination. Execution (CDMA): AT!MAXPWR=<band>,<tech>,<temperature_bin>,<max_tx_pwr> Response: OK Purpose: Set the maximum Tx power for the specified band/technology/temperature bin combination. Query: AT!MAXPWR?<band>,<tech> Response: <maxpwr> dBm OK Purpose: Indicate the maximum Tx power for the specified band/technology combination. Query list: AT!MAXPWR=? Purpose: Display valid execution format and parameter values. <p>Parameters:</p> <p><band> (RF band)</p> <ul style="list-style-type: none"> 3GPP band number. For a full listing of 3GPP band numbers, see Table 12-2 on page 122. Band support is product specific—see the device's Product Specification or Product Technical Specification document for details. Valid range: 0–71 <p><tech> (Network technology)</p> <ul style="list-style-type: none"> 0=WCDMA 1=CDMA 2=LTE <p><maxpwr> (Maximum Tx power in dB)</p> <ul style="list-style-type: none"> Valid range: 20.0–24.5 |

Table 10-2: Thermal mitigation command details (Continued)

| Command | Description |
|------------------------|--|
| !SARINTGPIOMODE | <p>Set/report default pull mode for SAR interrupt GPIOs</p> <p>Set or report the default pull mode (high/low) for SAR interrupt GPIOs. This setting applies to all SAR interrupt GPIOs.</p> <p>Password required: Yes</p> <p>Usage:</p> <ul style="list-style-type: none">• Execution: ATISARINTGPIOMODE=<mode> Response: OK Purpose: Set the default pull mode for all SAR interrupt GPIOs.• Query: ATISARINTGPIOMODE? Response: <mode> OK Purpose: Indicate the default pull mode.• Query list: ATISARINTGPIOMODE=? Purpose: Display valid execution format and parameter values. <p>Parameters:</p> <p><mode> (SAR GPIO interrupt pull mode default setting)</p> <ul style="list-style-type: none">• 0=Standard mode—Default pull is HIGH/DAL_GPIO_PULL_UP• 1=Inverse mode—Default pull is LOW/DAL_GPIO_PULL_DOWN |

11: Supported GSM/WCDMA AT Commands

This chapter identifies standard AT commands that are supported by most Sierra Wireless AirPrime devices. These commands:

- Control serial communications over an asynchronous interface (*ITU-T Serial Asynchronous Dialling and Control (Recommendation V.250)*), available on the International Telecommunication Union web site, www.itu.int.
See [Table 11-1](#) below.
- Control SMS functions for devices on GSM/WCDMA networks (*3GPP TS 27.005*, available on the 3GPP web site, www.3gpp.org)
See [Table 11-2](#) on page 113.
- Control devices operating on GSM/WCDMA networks (*3GPP TS 27.007*, available on the 3GPP web site, www.3gpp.org)
See [Table 11-3](#) on page 114.

The tables below identify whether each command is supported on Sierra Wireless UMTS devices. 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.

Commands that are partially supported include descriptions identifying any limitations on command usage. Also, some commands are described in more detail in other chapters—the descriptions for these commands link to those detailed entries (for example, **&V** in [Table 11-1](#) on page 111).

Table 11-1: Supported ITU-T Recommendation V.250 AT commands

| Command | Description | Supported ✓=Yes; ✗=No |
|---------------|---|--------------------------|
| &C | Set Data Carrier Detected (Received line signal detector) function mode | ✗ |
| &D | Set Data Terminal Ready function mode | ✓ |
| &F | Set all current parameters to manufacturer's defaults | ✓ |
| &S | Set DSR signal | ✓ |
| &T | Auto tests | ✗ |
| &V | Return operating mode AT configuration parameters | ✓ |
| &W | Store current parameter to user-defined profile | ✓ |
| +DR | V42bis data compression report | ✓ |
| +DS | V42bis data compression | ✓ |
| +GCAP | Request complete TA capabilities list | ✓ |
| +GMI | Request manufacturer identification | ✓ |

Table 11-1: Supported ITU-T Recommendation V.250 AT commands (Continued)

| Command | Description | Supported ✓=Yes; ✗=No |
|----------------------------------|--|--------------------------|
| +GMM | Request TA model identification | ✓ |
| +GMR | Request TA revision identification | ✓ |
| +GOI | Request global object identification | ✗ |
| +GSN | Request TA serial number identification | ✓ |
| +ICF | Set TE-TA control character framing | ✓ |
| +IFC | Set TE-TA local data flow control | ✓ |
| +ILRR | Set TE-TA local rate reporting mode | ✗ |
| +IPR | Set fixed local rate | ✓ |
| A | Answer incoming call | ✓ |
| A/ | Re-issues last AT command given | ✓ |
| D | Dial | ✓ |
| D><MEM><N> | Originate call to phone number in memory <MEM> | ✗ |
| D><N> | Originate call to phone number in current memory | ✓ |
| D><STR> | Originate call to phone number in memory which corresponds to alphanumeric field <STR> | ✗ |
| DL | Redial last telephone number used | ✗ |
| E | Set command echo mode | ✓ |
| H | Disconnect existing connections | ✓ |
| I | Display product identification information | ✓ |
| L | Set monitor speaker loudness | ✗ |
| M | Set monitor speaker mode | ✗ |
| O | Switch from command mode to data mode | ✓ |
| P | Select pulse dialing | ✗ |
| Q | Set Result code presentation mode | ✓ |
| S0 | Set number of rings before automatically answering the call | ✓ |
| S10 | Set disconnect delay after indicating the absence of data carrier | ✓ |
| S3 | Set command line termination character | ✓ |
| S4 | Set response formatting character | ✓ |
| S5 | Set command line editing character | ✓ |
| S6 | Set pause before blind dialing | ✓ |
| S7 | Set number of seconds to wait for connection completion | ✓ |

Table 11-1: Supported ITU-T Recommendation V.250 AT commands (Continued)

| Command | Description | Supported ✓=Yes; ✗=No |
|-----------|---|--------------------------|
| S8 | Set number of seconds to wait when comma dial modifier used | ✓ |
| T | Select tone dialing | ✓ |
| V | Set result code format mode | ✓ |
| X | Set connect result code format and call monitoring | ✓ |
| Z | Set all current parameters to user-defined profile | ✓ |

Table 11-2: Supported 27.005 AT commands

| Command | Description | Supported ✓=Yes; ✗=No |
|------------------------------------|--|--------------------------|
| +CBM | Cell broadcast message directly displayed | ✓ |
| +CBMI | Cell broadcast message stored in memory at specified <index> location | ✗ |
| +CDS | SMS status report after sending a SMS | ✓ |
| +CDSI | Incoming SMS status report | ✓ |
| +CMGC | Send command | ✓ |
| +CMGD | Delete message | ✓ |
| +CMGF | Message format | ✓ |
| +CMGL | List messages | ✓ |
| +CMGR | Read message | ✓ |
| +CMGS | Send message | ✓ |
| +CMGW | Write message to memory | ✓ |
| +CMMS | More messages to send | ✓ |
| +CMNA | New message acknowledgement to ME/TA | ✓ |
| +CMS ERROR: <err> | SMS error (mobile or network error) | ✓ |
| +CMSS | Send message from storage | ✓ |
| +CMT | Incoming message directly displayed | ✓ |
| +CMTI | Incoming message stored in <mem> ("SM" - (U)SIM message storage) at location <index> | ✓ |
| +CNMA | New message acknowledgement to mobile equipment | ✓ |
| +CNMI | New message indications to TE | ✓ |
| +CPMS | Preferred message storage | ✓ |

Table 11-2: Supported 27.005 AT commands (Continued)

| Command | Description | Supported ✓=Yes; X=No |
|--------------|-------------------------------------|--------------------------|
| +CRES | Restore settings | X |
| +CSAS | Save settings | X |
| +CSCA | Service center address | ✓ |
| +CSCB | Select cell broadcast message types | ✓ |
| +CSDH | Show text mode parameters | ✓ |
| +CSMP | Set text mode parameters | ✓ |
| +CSMS | Select message service | ✓ |

Table 11-3: Supported 27.007 AT commands

| Command | Description | Supported ✓=Yes; X=No |
|-----------------|--|--------------------------|
| C | ITU T V.24 circuit 109 carrier detect signal behavior command Format <ul style="list-style-type: none"> C<value> Limitations <ul style="list-style-type: none"> 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 | X |
| +CACSP | Voice Group or Voice Broadcast Call State Attribute Presentation | N/A |
| +CAEMLPP | eMLPP Priority Registration and Interrogation | X |
| +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 | X |
| +CAMM | Accumulated call meter maximum | X |
| +CANCHEV | NCH Support Indication | X |
| +CAOC | Advice of Charge | X |
| +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 |

Table 11-3: Supported 27.007 AT commands (Continued)

| Command | Description | Supported ✓=Yes; ✗=No |
|------------------|---|--------------------------|
| +CAULEV | Voice Group Call Uplink Status Presentation | N/A |
| +CBC | Battery charge | ✓ |
| +CBST | Select bearer service type | ✓ |
| +CCCM | Current call meter value | ✗ |
| +CCFC | Call forwarding number and conditions | ✓ |
| +CCLK | Clock | N/A |
| +CCUG | Closed user group | ✓ |
| +CCWA | Call waiting | ✓ |
| +CCWE | Call Meter maximum event | ✗ |
| +CDIP | Called line identification presentation | ✗ |
| +CDIS | Display control | ✗ |
| +CEER | Extended error report | ✗ |
| +CFUN | Set phone functionality Format <ul style="list-style-type: none"> • +CFUN = [<fun> [, <rst>]] Limitations <ul style="list-style-type: none"> • Valid <fun> values: <ul style="list-style-type: none"> • 0 (minimum functionality, low power draw) • 1 (full functionality, high power draw) | Partial |
| +CGACT | PDP context activate or deactivate | ✓ |
| +CGANS | Manual response to a network request for PDP context activation | ✗ |
| +CGATT | PS attach or detach | ✓ |
| +CGAUTO | Automatic response to a network request for PDP context activation | ✗ |
| +CGCLASS | GPRS mobile station class | ✓ |
| +CGCLOSP | Configure local octet stream PAD parameters | ✗ |
| +CGCMOD | PDP Context Modify | ✗ |
| +CGDATA | Enter data state | ✓ |
| +CGDCONT | Define PDP Context | ✓ |
| +CGDSCONT | Define Secondary PDP Context | ✓ |
| +CGEQMIN | 3G Quality of Service Profile (Minimum acceptable) | ✓ |
| +CGEQNEG | 3G Quality of Service Profile (Negotiated) | ✓ |

Table 11-3: Supported 27.007 AT commands (Continued)

| Command | Description | Supported ✓=Yes; ✗=No |
|-----------------|--|--------------------------|
| +CGEQREQ | 3G Quality of Service Profile (Requested) | ✓ |
| +CGEREP | Packet Domain event reporting | ✓ |
| +CGEV | GPRS network event indication | ✓ |
| +CGMI | Request manufacturer identification | ✓ |
| +CGMM | Request model identification | ✓ |
| +CGMR | Request revision identification | ✓ |
| +CGPADDR | Show PDP address | ✓ |
| +CGQMIN | Quality of Service Profile (Minimum acceptable) | ✓ |
| +CGQREQ | Quality of Service Profile (Requested) | ✓ |
| +CGREG | GPRS network registration status | ✓ |
| +CGSMS | Select service for MO SMS messages | ✓ |
| +CGSN | Request product serial number identification | ✓ |
| +CGTFT | Traffic Flow Template | ✓ |
| +CHLD | Call related supplementary services | ✓ |
| +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 | ✓ |
| +CIEV | Indicator event | ✓ |
| +CIMI | Request international mobile subscriber identity | ✓ |
| +CIND | Indicator control | ✓ |
| +CKEV | Key press or release event | ✗ |
| +CKPD | Keypad control | ✗ |
| +CLAC | List all available AT commands | ✗ |
| +CLAE | Language Event | ✗ |
| +CLAN | Set Language | ✗ |
| +CLCC | List current calls | ✓ |

Table 11-3: Supported 27.007 AT commands (Continued)

| Command | Description | Supported ✓=Yes; ✗=No |
|------------------------------------|---|---|
| +CLCK | Facility lock | ✓ |
| +CLIP | Calling line identification presentation | ✓ |
| +CLIR | Calling line identification restriction | ✓ |
| +CLVL | Set/return internal loudspeaker volume | ✓ |
| +CMAR | Master Reset | ✗ |
| +CME ERROR: <err> | Mobile Termination error result code | ✓ |
| +CMEC | Mobile Termination control mode | ✗ |
| +CMEE | Report Mobile Termination error | ✓ |
| +CMER | Mobile Termination event reporting | ✓ |
| +CMOD | Call mode | ✓ |
| +CMUT | Enable/disable uplink voice muting | ✓ |
| +CMUX | Multiplexing mode | ✓ (When MUX mode configured on USB interface.) |
| +CNUM | Subscriber number | ✓ |
| +COLP | Connected line identification presentation | ✓ |
| +COPN | Read operator names | ✓ |
| +COPS | Operator selection | ✓ |
| +CPAS | <ul style="list-style-type: none"> Phone activity status | ✓ |
| +CPBF | Find phonebook entries | ✓ |
| +CPBR | Read phonebook entries | ✓ |
| +CPBS | Select phonebook memory storage | ✓ |
| +CPBW | Write phonebook entry | ✓ |
| +CPIN | Enter PIN | ✓ |
| +CPLS | Preferred PLMN list selection | ✓ |
| +CPOL | Preferred operator list | ✓ |
| +CPROT | Enter protocol mode | ✗ |
| +CPUC | Price per unit and currency table | ✓ |
| +CPWC | Power class | ✗ |
| +CPWD | Change password | ✓ |

Table 11-3: Supported 27.007 AT commands (Continued)

| Command | Description | Supported ✓=Yes; X=No |
|--------------------------|---|--------------------------|
| +CR | Service reporting control | ✓ |
| +CRC | Cellular result codes | ✓ |
| +CREG | Network registration | ✓ |
| +CRING | Incoming call type | ✓ |
| +CRLP | Radio link protocol | ✓ |
| +CRMP | Ring Melody Playback | N/A |
| +CRSL | Ringer sound level | N/A |
| +CRSM | Restricted SIM access | ✓ |
| +CSCC | Secure control command | X |
| +CSCS | Select TE character set | ✓ |
| +CSDF | Settings date format | N/A |
| +CSGT | Set Greeting Text | N/A |
| +CSIL | Silence Command | N/A |
| +CSIM | Generic SIM access | ✓ |
| +CSNS | Single numbering scheme | X |
| +CSQ | Signal quality | ✓ |
| +CSSN | Supplementary service notifications | ✓ |
| +CSTA | Select type of address | ✓ |
| +CSTF | Settings time format | ✓ |
| +CSVM | Set Voice Mail Number | X |
| +CTFR | Call deflection | ✓ |
| +CTZR | Time Zone Reporting | N/A |
| +CTZU | Automatic Time Zone Update | X |
| +CUSD | Unstructured supplementary service data | ✓ |
| +CV120 | V.120 rate adaptation protocol | X |
| +CVHU | Voice Hangup Control | X |
| +CVIB | Vibrator mode | N/A |
| D | ITU T V.25ter [14] dial command | ✓ |
| D*99# | Sets up a packet data call (PDP context) based on profile ID #1 | ✓ |
| D*99***<n># | Sets up a packet data call (PDP context) based on profile ID #<n> (<n> is the <cid> in the +CGDCONT command) | ✓ |

Table 11-3: Supported 27.007 AT commands (Continued)

| Command | Description | Supported ✓=Yes; ✗=No |
|----------------|---|---------------------------------|
| +VTD | Tone duration | ✓ |
| +VTS | DTMF and arbitrary tone generation | ✓ |
| +WS46 | PCCA STD 101 [17] select wireless network | ✗ |

12: Band Definitions

Some commands described in this document include input and/or output 'band' parameters, where the band value is one of the following:

- An enumerated value representing a network technology and band (Table 12-1)
- A 3GPP band number (Table 12-2 on page 122)

Note: Band support is product-specific—see the device's Product Specification Document or Product Technical Specification for details.

Table 12-1: Band/technology enumerations^a

| <band> | Description | <band> | Description | <band> | Description | <band> | Description |
|--------|-------------|--------|-------------|--------|-------------|--------|-------------|
| 0 | CDMA | 22 | WCDMA 800 | 42 | LTE B4 | 60 | LTE B24 |
| 2 | Sleep | 25 | WCDMA BC3 | 43 | LTE B2 | 61 | LTE B25 |
| 5 | CDMA 800 | 26 | CDMA BC14 | 44 | LTE B3 | 62 | LTE B26 |
| 6 | CDMA 1900 | 27 | CDMA BC11 | 45 | LTE B5 | 63 | LTE B27 |
| 7 | HDR | 28 | WCDMA BC4 | 46 | LTE B6 | 64 | LTE B28 |
| 8 | CDMA 1800 | 29 | WCDMA BC8 | 47 | LTE B8 | 65 | LTE B29 |
| 9 | WCDMA IMT | 30 | MF 700 | 48 | LTE B9 | 66 | LTE B30 |
| 10 | GSM 900 | 31 | WCDMA BC9 | 49 | LTE B10 | 67 | LTE B31 |
| 11 | GSM 1800 | 32 | CDMA BC15 | 50 | LTE B12 | 68 | LTE B32 |
| 12 | GSM 1900 | 33 | CDMA BC10 | 51 | LTE B14 | 69 | LTE B33 |
| 14 | JCDMA | 34 | LTE B1 | 52 | LTE B15 | 70 | LTE B34 |
| 15 | WCDMA 1900A | 35 | LTE B7 | 53 | LTE B16 | 71 | LTE B35 |
| 16 | WCDMA 1900B | 36 | LTE B13 | 54 | LTE B18 | 72 | LTE B36 |
| 17 | CDMA 450 | 37 | LTE B17 | 55 | LTE B19 | 73 | LTE B37 |
| 18 | GSM 850 | 38 | LTE B38 | 56 | LTE B20 | 74 | LTE B39 |
| 19 | IMT | 39 | LTE B40 | 57 | LTE B21 | 75 | WCDMA BC19 |
| 20 | HDR 800 | 40 | WCDMA BC11 | 58 | LTE B22 | 76 | LTE B41 |
| 21 | HDR 1900 | 41 | LTE B11 | 59 | LTE B23 | | |

a. Band values not listed (e.g. 1, 3, 4) are reserved.

Table 12-2: 3GPP bands

| Band | Frequency bands (MHz) | | Band | Frequency bands (MHz) | |
|------|-----------------------|---------------|-------|-----------------------|---------------|
| | Rx | Tx | | Rx | Tx |
| 1 | 1920–1980 | 2110–2170 | 20 | 832–862 | 791–821 |
| 2 | 1850–1910 | 1930–1990 | 21 | 1447.9–1462.9 | 1495.9–1510.9 |
| 3 | 1710–1785 | 1805–1880 | 22 | Reserved | Reserved |
| 4 | 1710–1755 | 2110–2155 | 23 | 2000–2020 | 2180–2200 |
| 5 | 824–849 | 869–894 | 24 | 1626.5–1660.5 | 1525–1559 |
| 6 | 830–840 | 875–885 | 25 | 1850–1915 | 1930–1995 |
| 7 | 2500–2570 | 2620–2690 | 26–32 | Reserved | Reserved |
| 8 | 880–915 | 925–960 | 33 | 1900–1920 | 1900–1920 |
| 9 | 1749.9–1784.9 | 1844.9–1879.9 | 34 | 2010–2025 | 2010–2025 |
| 10 | 1710–1770 | 2110–2170 | 35 | 1850–1910 | 1850–1910 |
| 11 | 1427.9–1447.9 | 1475.9–1495.9 | 36 | 1930–1990 | 1930–1990 |
| 12 | 699–716 | 729–746 | 37 | 1910–1930 | 1910–1930 |
| 13 | 777–787 | 746–756 | 38 | 2570–2620 | 2570–2620 |
| 14 | 788–798 | 758–768 | 39 | 1880–1920 | 1880–1920 |
| 15 | Reserved | Reserved | 40 | 2300–2400 | 2300–2400 |
| 16 | Reserved | Reserved | 41 | 2496–2690 | 2496–2690 |
| 17 | 704–716 | 734–746 | 42 | 3400–3600 | 3400–3600 |
| 18 | 815–830 | 860–875 | 43 | 3600–3800 | 3600–3800 |
| 19 | 830–845 | 875–890 | 44–60 | Reserved | Reserved |

13: ASCII Table

Table 13-1: ASCII values

| Char | Dec | Hex | Char | Dec | Hex | Char | Dec | Hex | Char | Dec | Hex |
|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| NUL | 0 | 00 | SP | 32 | 20 | @ | 64 | 40 | ' | 96 | 60 |
| SOH | 1 | 01 | ! | 33 | 21 | A | 65 | 41 | a | 97 | 61 |
| STX | 2 | 02 | " | 34 | 22 | B | 66 | 42 | b | 98 | 62 |
| ETX | 3 | 03 | # | 35 | 23 | C | 67 | 43 | c | 99 | 63 |
| EOT | 4 | 04 | \$ | 36 | 24 | D | 68 | 44 | d | 100 | 64 |
| ENQ | 5 | 05 | % | 37 | 25 | E | 69 | 45 | e | 101 | 65 |
| ACK | 6 | 06 | & | 38 | 26 | F | 70 | 46 | f | 102 | 66 |
| BEL | 7 | 07 | ' | 39 | 27 | G | 71 | 47 | g | 103 | 67 |
| BS | 8 | 08 | (| 40 | 28 | H | 72 | 48 | h | 104 | 68 |
| HT | 9 | 09 |) | 41 | 29 | I | 73 | 49 | i | 105 | 69 |
| LF | 10 | 0A | * | 42 | 2A | J | 74 | 4A | j | 106 | 6A |
| VT | 11 | 0B | + | 43 | 2B | K | 75 | 4B | k | 107 | 6B |
| FF | 12 | 0C | , | 44 | 2C | L | 76 | 4C | l | 108 | 6C |
| CR | 13 | 0D | - | 45 | 2D | M | 77 | 4D | m | 109 | 6D |
| SO | 14 | 0E | . | 46 | 2E | N | 78 | 4E | n | 110 | 6E |
| SI | 15 | 0F | / | 47 | 2F | O | 79 | 4F | o | 111 | 6F |
| DLE | 16 | 10 | 0 | 48 | 30 | P | 80 | 50 | p | 112 | 70 |
| XON | 17 | 11 | 1 | 49 | 31 | Q | 81 | 51 | q | 113 | 71 |
| DC2 | 18 | 12 | 2 | 50 | 32 | R | 82 | 52 | r | 114 | 72 |
| XOFF | 19 | 13 | 3 | 51 | 33 | S | 83 | 53 | s | 115 | 73 |
| DC4 | 20 | 14 | 4 | 52 | 34 | T | 84 | 54 | t | 116 | 74 |
| NAK | 21 | 15 | 5 | 53 | 35 | U | 85 | 55 | u | 117 | 75 |
| SYN | 22 | 16 | 6 | 54 | 36 | V | 86 | 56 | v | 118 | 76 |
| ETB | 23 | 17 | 7 | 55 | 37 | W | 87 | 57 | w | 119 | 77 |
| CAN | 24 | 18 | 8 | 56 | 38 | X | 88 | 58 | x | 120 | 78 |
| EM | 25 | 19 | 9 | 57 | 39 | Y | 89 | 59 | y | 121 | 79 |
| SUB | 26 | 1A | : | 58 | 3A | Z | 90 | 5A | z | 122 | 7A |
| ESC | 27 | 1B | ; | 59 | 3B | [| 91 | 5B | { | 123 | 7B |
| FS | 28 | 1C | < | 60 | 3C | \ | 92 | 5C | | 124 | 7C |
| GS | 29 | 1D | = | 61 | 3D |] | 93 | 5D | } | 125 | 7D |
| RS | 30 | 1E | > | 62 | 3E | ^ | 94 | 5E | ~ | 126 | 7E |
| US | 31 | 1F | ? | 63 | 3F | _ | 95 | 5F | DEL | 127 | 7F |

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