



# GSM/GPRS SDK

## AT Command Reference

2130213  
Rev 1.0



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

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Your comments and suggestions on improving this documentation are welcome and appreciated. Please e-mail your feedback to [documentation@sierrawireless.com](mailto:documentation@sierrawireless.com). Thank you.

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

**[www.sierrawireless.com](http://www.sierrawireless.com)**



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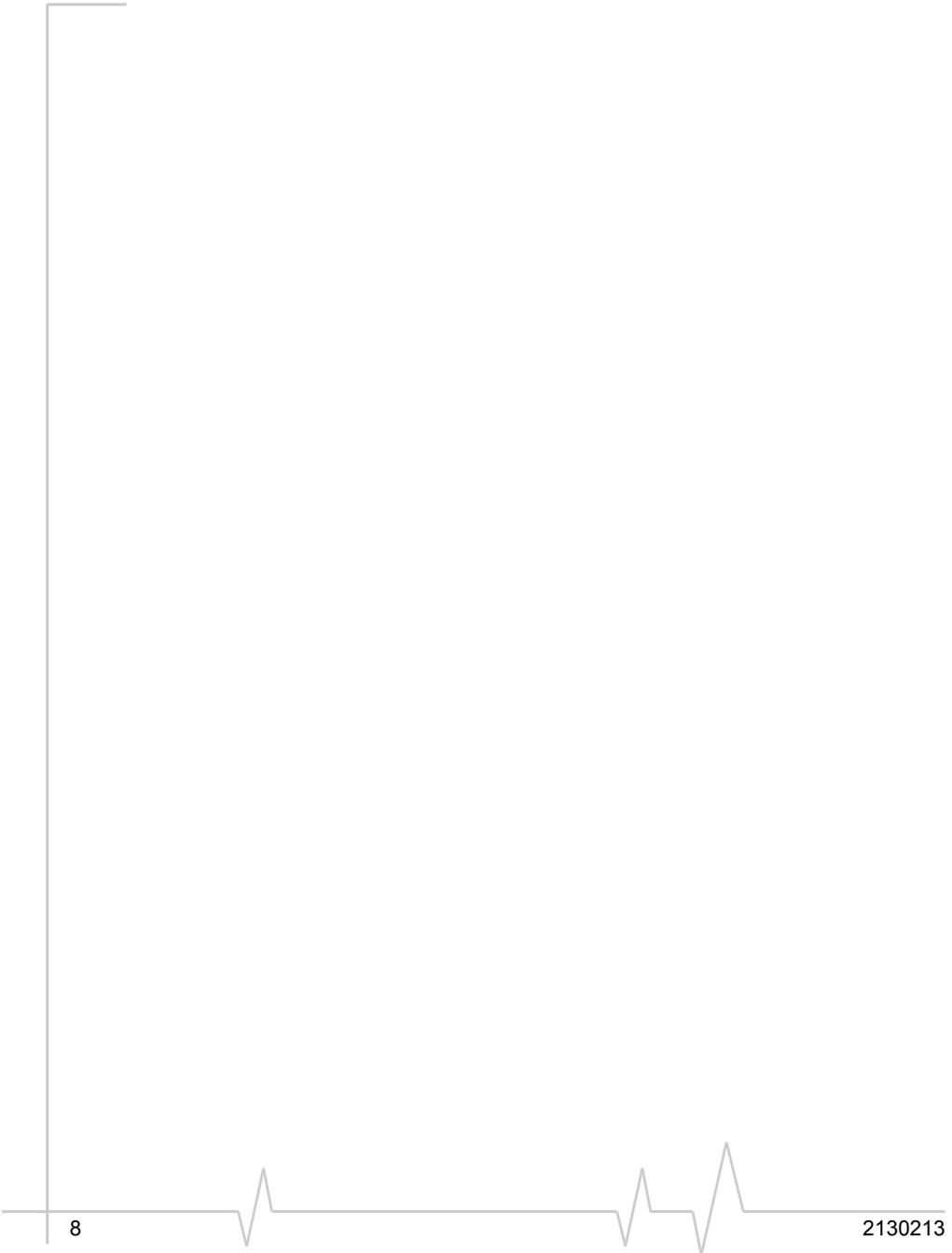
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# GSM/GPRS AT Command Reference



# >> 1: About This Guide

- Introduction
- References
- Currency
- Document Structure
- Conventions

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*Note: For additional background on the use of modems and AT commands generally you may consult the University of Manitoba web site at:*  
[www.umanitoba.ca/campus/acn/remote/faq/at-cmds.html](http://www.umanitoba.ca/campus/acn/remote/faq/at-cmds.html)

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## Introduction

This reference details the Attention (AT) command set supported by the GSM/GPRS products of Sierra Wireless:

- SB750A multi-band wireless modem card
- AirCard<sup>®</sup> 750 multi-band wireless network PC Card
- AirCard<sup>®</sup> 710 single-band wireless network PC Card

A full comprehension of the workings of the AT commands requires understanding the GSM/GPRS data and voice network and the call setup process. This document includes a section on Modem Basics covering these issues and other important connection details.

You should be familiar with the use of AT commands with standard wireline modems to use this document.

The Sierra Wireless GSM/GPRS products present two methods of controlling the modem: AT commands and CnS (Control and Status) language. Some features or capabilities of the modem require the use of CnS. This document presumes that the AT interface is the only interface available to you; features requiring CnS are not discussed.

## References

This guide covers only the command set used by Sierra Wireless GSM/GPRS products and does not deal with operational use. Please consult the individual product manuals for guidance.

Not all commands include detailed descriptions. Commands are implemented to be compliant with industry standards and reference is often made to the following standards:

- IS-131 (Data Transmission Systems and Equipment - Extensions to Serial Asynchronous dialing and Control)
- EIA/TIA-592 (Asynchronous Facsimile DCE Control Standard, Service Class 2)
- EIA/TIA/IS-134 (Amendments to TIA-592 to Support T.30-1993 (Facsimile protocol standard))

Electronic copies of these standards can be purchased at the ANSI Electronic Standards Store at: [webstore.ansi.org](http://webstore.ansi.org). ANSI Customer Service will respond to inquiries about standards information at: [sales@ansi.org](mailto:sales@ansi.org).

Requests for hard copies of standards should be directed to the Global Engineering Documents Division of Information Handling Services:

voice: 800-854-7179 or 303-397-7956

fax: 303-397-2740

e-mail: [global@ihs.com](mailto:global@ihs.com)

web: <http://global.ihs.com>

post: Global Engineering Documents,  
15 Inverness Way East,  
Englewood, CO 80112

Global Engineering operates offices around the world. Consult the web site above for locations.

Other standards referenced in this document are available through the 3rd Generation Partnership Project (3GPP) web site at [www.3gpp.org](http://www.3gpp.org), and the International Telecommunications Union Standards Division (ITU-T) at [www.itu.int](http://www.itu.int). They include:

- ETSI TS 100 916 V7.5.0 (1999-12) (AT Command Set for GSM Mobile Equipment)
- V.25ter (ITU-T recommendation V.250), GSM 07.07, and GSM 07.05 standards

You may also want to consult the other documents available on the Sierra Wireless web site at [www.sierrawireless.com](http://www.sierrawireless.com).

## Terminology and acronyms

This document makes wide use of acronyms that are in common use in data communications and cellular technology. Our Internet site provides a Glossary (document #2110032) that may be helpful in understanding some acronyms and terminology used in this guide.

## Currency

### Versions

**Document** This document is under ongoing revision to expand explanations and enhance detail. This edition is:

**Rev 1.0, 23 August 2002**

This document is current with the following modem firmware revisions:

**SB750A** Revision 2.0 and above. To determine your firmware revision:

- Enter the Identification command **AT+GMR**  
The modem will respond with the firmware revision information:

+GMR: ... R2\_0\_0\_...

**AirCard® 750** Revision 2.0 and above. To determine your firmware revision:

- Enter the Identification command **AT+GMR**  
The modem will respond with the Firmware revision information:

+GMR: ... R2\_0\_0\_...

**AirCard® 710** Revision 2.0 and above. To determine your firmware revision:

- Enter the Identification command **AT+GMR**  
The modem will respond with the Firmware revision information:

+GMR: ... R2\_0\_0\_...

## Upgrading

If your modem firmware is an earlier version, you can acquire updated firmware from our web site or by contacting your wireless carrier.

## Document Structure

Following this introduction is a section on basic elements important to understanding and communicating with the GSM/GPRS products. This includes notes on the connection between

the host (terminal equipment—TE) and the Sierra Wireless modem (terminal adapter and mobile equipment—TA and ME).

The document then presents the commands, registers, result codes, and defaults provided in the command state of the modem.

Commands are often termed *AT commands*. Hayes™ originated the convention of prefixing commands with an “ATtention” string for wireline modems.

In addition to the commands, this document also describes the definitions and use of status registers.

Commands are referenced in strict alphabetical order. This facilitates searches for the syntax, parameters, and operation of specific commands. To help locate whether or not a command exists to perform a desired function, there are tables organizing the commands into these groups:

- Basic modem operation—commands that make the modem execute an immediate action, such as dialing or restoring settings
- Basic modem configuration—settings governing the modem’s behavior when executing basic operations
- Device and service interrogation—commands to determine the services available, information about, and the status of the modem
- Voice operations—related to configuring, making, and controlling voice calls
- Fax commands—configuring and operating in fax mode

Descriptions of the definitions and use of status registers, as well as a table of the factory/reset defaults, follow, along with result codes, both numeric and verbose.

## Conventions

The following format conventions are used in this reference:

- Character codes or keystrokes which 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 (spacebar) 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: **ATD6046649010**.

---

*Note: The AT characters 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. Parameters are enclosed in angle brackets (<i>) to indicate that they should be replaced with a value. Optional parameters are described in the text, and may also be enclosed in square brackets ([<m>]) for clarity.

- Supported parameter values (either set or returned) are described in the text.

---

*Note: The brackets shown with parameters are **not** to be included in the command string.*

---

The 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. The factory defaults are also noted in a section at the end of the Commands chapter, on page 126.

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

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

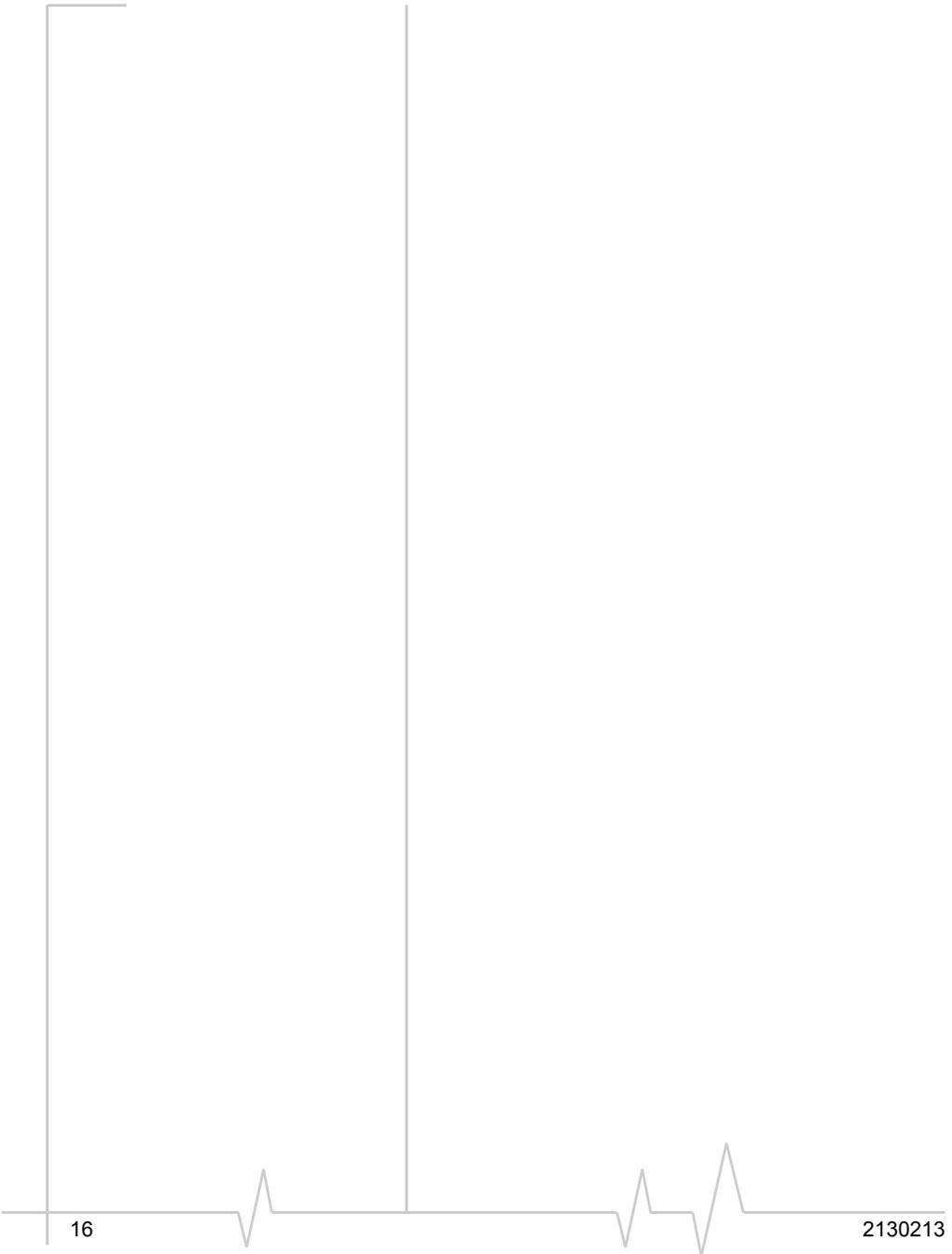
See page 28 for a discussion of how the modem frames these two elements.

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

CONNECT 14400

OK

# GSM/GPRS AT Command Reference



## >> 2: Modem Basics

- GSM and GPRS
- Host Connections
- Modem Modes, States, and Conditions
- State Transitions
- Modem Buffers
- Command Handling
- Responses and Result Codes
- Response and Result Framing

### GSM and GPRS

To help understand the call connection process in GSM/GPRS modems, a basic knowledge of the GSM (Global System for Mobile communication) network helps. There are two primary services available over GSM: circuit switched connections that correspond to the GSM cellular voice network; and GPRS (General Packet Radio Service) packet switched connections.

### Traditional wireline

Before looking at the call setup process in GSM, let's take a moment to review the traditional wireline modem. A call is established by the local modem placing the call over the PSTN (Public Switched Telephone Network).

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*Note: While the Sierra Wireless GSM/GPRS products support a wide range of voice and data services, your carrier may require specific subscriptions or calling plans, your SIM card may support a limited range of services, or particular services may be unavailable in a given GSM coverage area.*

*Please contact your carrier for information about supported services in your area and with your subscription plan.*

---

The local and remote modems are connected and handshake the data protocol to use. The local modem can monitor the call progress by picking up the dial tone, busy, ring, and answer from the PSTN wireline connection.

## **GSM circuit switched (CSD)**

All Sierra Wireless GSM/GPRS products are capable of making circuit switched data connections, also known as Circuit Switched Data (CSD).

## **GPRS packet switched**

In areas where this GPRS service is available over the GSM radio network, the modem can connect much like a local area network card. The connection can be “always on” and only actively used when there is packet data to send or receive.

GPRS offers higher speed data operations than are available with circuit switched service. Circuit switched service is limited to 9.6 kbps or 14.4 kbps. The packet services of GPRS, on the other hand, have a maximum practical bandwidth of 53 kbps.

## **Voice and fax service**

When used with a headset, Sierra Wireless’s GSM/GPRS devices can also serve as mobile telephones over the GSM digital voice network. They can also send and receive fax calls using the same infrastructure. They are *not* compatible with the old AMPS analog voice network.

## Host Connections

When using AT commands, the Sierra Wireless modem emulates a serial port over the PCMCIA (PC Card) connection.

When communicating with a host computer, the communications settings for the modem should be 115 kbps, 8-bit, with no parity and one stop bit (115, 8, N, 1). The airlink data throughput does not affect the 115 kbps data rate setting for the PCMCIA connection.

Hardware flow control is required for PPP and fax connections. It is enabled by default. For information about flow control, see the **+IPR** command on page 110.

## Modem Modes, States, and Conditions

Discussion of the operation of a Sierra Wireless modem requires understanding the settings of the modem and just how it is handling the data being sent to it.

To improve clarity, this document uses the words *mode* (circuit switched data, GPRS data, fax, or voice), *state* (command or data), and *condition* (online or offline) to reflect different elements of the modem's configuration. For AT commands, the modem's state and condition are particularly important.

## Connection Modes

The GSM/GPRS modems operate very much like a landline modem. There are, however, some differences in that the modem supports multiple connection *modes*. Different functions of the modem use different AT commands that determine which *mode* the modem operates in. Commands operate the modem either in *circuit switched data mode*, in *GPRS data mode* (a high-speed data mode), in *fax mode*, or in *voice mode*:

**CSD** One method of operation is to place a data call just like a landline modem would (asynchronous serial). Such a connection is known as a circuit switched call, also known as CSD (Circuit Switched Data). (Fax and voice modes are also circuit switched.)

**GPRS** The second type of connection is GPRS (General Packet Radio Service), which supports higher speeds over the airlink.

As far as the AT command set is concerned, both calling types are simply different methods of placing what amounts to a data call, and use Point-to-Point Protocol (PPP) to emulate a dial-up data connection. In Microsoft® Windows® operating systems, PPP connections are managed using Dial-Up Networking.

**Fax** With appropriate third-party fax software on the host computer, the Sierra Wireless modem can both send and receive facsimiles over the GSM network and the PSTN, using normal circuit switched fax transmission standards used by fax machines and other types of modems.

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*Note: Depending on the product, the exact options available can differ. If a mode or state is not available on the product, commands related to those modes and states will return the ERROR result code.*

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**Voice** Using a standard voice headset and appropriate software on the host computer, users can use the Sierra Wireless modem as a GSM mobile telephone, with an appropriate calling plan from a wireless carrier.

## States

The modem's *state*, in conjunction with its *condition*, govern how the modem handles traffic to and from the host computer (also known as the terminal equipment, TE) and to and from a remote modem.

Data and fax modes can support two states:

**Command** The modem exchanges data with the host computer (also known as Terminal Equipment, or TE) as AT commands and replies. This state handles commands at the modem without the use of the airlink. Voice modes are always in command state.

**Data** Communication is passed between the host and a remote terminal or network as computer or fax data.

---

*Note: Voice modes do not support the data state. Even while off-hook with a voice call active, the modem still communicates over the serial connection in command state. Commands can be issued and executed while a voice call is in progress.*

---

## Conditions

At any time, the modem can be in one of two conditions:

**Online** Actively connected to a remote terminal or network (off-hook). In the online condition, the modem can either be in command state or in data state.

**Offline** Disconnected from any remote terminal or network (on-hook). While in offline condition, the modem can only be in command state (without an airlink).

Accordingly, the modem cannot be in data state while in voice mode, or while offline, as shown in the following tables outlining functional state, mode, and condition combinations:

**Table 2-1: Functional combinations of modem state and mode**

	<b>Command State</b>	<b>Data State</b>
<b>CSD Mode</b>	Yes	Yes
<b>GPRS Mode</b>	Yes	Yes
<b>Fax Mode</b>	Yes	Yes
<b>Voice Mode</b>	Yes	<b>No</b>

**Table 2-2: Functional combinations of modem state and condition**

	<b>Command State</b>	<b>Data State</b>
<b>Online Condition</b>	Yes	Yes
<b>Offline Condition</b>	Yes	<b>No</b>

## State Transitions

On power-up, the modem is in command state.

### Command to data state

The modem changes to data state when a session is opened either by dialing a connection, or by answering a data or fax call. When a session opens, the modem issues the CONNECT message and asserts the DCD control signal.

### Data to command state

When the modem changes to command state, it will issue an OK result. This may be preceded by another result (such as NO CARRIER) to indicate that the session was closed by an event outside the modem. A closed session requires the modem to return to command state.

Several events can cause the modem to transition from data to command state, depending on the current mode:

- DTR is de-asserted, with a configuration to use DTR (&D1 or &D2).
- PPP negotiates command state.
- The modem is reset or power-cycled.

## Modem Buffers

Communication with the modem is buffered to allow the modem to provide a variety of features and speed configurations. This section provides an introduction to the types of buffering performed by the modem.

---

*Note: A transition to command state from data state does not require that the session be closed. This means that DCD will remain asserted while the modem is in command state, online condition.*

---

## Command buffer

When in command state, the modem will buffer the input from the host until a **<CR>** is entered. The buffered data can be edited using the backspace **<BS>**. Depending on the product, the modem (with Echo enabled) may echo the sequence **<BS><space><BS>** for human readability.

There is a limit of 200 characters to one command line, including the **AT** prefix and the **<CR>** termination (i.e. 197 characters of useful command buffer). If the command buffer length is exceeded the modem will continue to echo input (which is not buffered) until the **<CR>** is received. When the **<CR>** is entered, the modem returns the **ERROR** result code without executing any commands in the line. Once over the limit, the **<BS>** will not bring you back under the limit; the **ERROR** code is still returned.

The command buffer is distinct from the data receive and transmit buffers. The command buffer retains the contents of the last issued command until the **AT** command prefix is received for the next command. This allows repeating of the last issued command by entering **A/** instead of **AT**.

## Data buffers

Data being transmitted or received is buffered in several ways depending on the mode and nature of the connection. Some caution must be taken when disconnecting to ensure that any buffered data in the modem has been properly processed prior to breaking the connection.

Specific settings for buffer controls are described in the relevant commands and registers. Normal configuration of the modem will not require you to adjust these settings.

**Data flow control** The modem's CTS and RTS lines control data flow. Where large amounts of data are being exchanged, local hardware flow control must be used to prevent buffer overflows—it is required for PPP and fax connections. Hardware flow control is enabled by default (see page 19 and the **+IPR** command on page 110).

## Command Handling

**AT** can be issued as a command without parameters. It acts like a “ping” to the modem and will always give a result code of OK. If there is no response from the modem, try issuing **ATQ0** (Quiet mode off). If this fails, try the “+++” escape sequence or resetting the modem.

Commands are not case sensitive—they may be entered in upper or lower case, or a combination.

## Concatenation

More than one command can be included in a single line, although some commands or their parameters must be placed at the end of the line. When concatenating commands, a space between basic commands is optional. Where extended commands (those beginning with a non-alphabetic character after the **AT**) are concatenated, they must be separated by a semicolon (;).

Commands are executed in the order entered. If a command results in the ERROR result code the balance of the command line is ignored. Only one result code is returned for the entire command line. The complete concatenated command string must not exceed the 200-character command buffer (see page 24).

## Parameters

Most AT commands support one or more parameters, usually a number. Parameter ranges are specified in this reference.

Commands that normally accept a single numeric option switch (**[<n>]**) and are issued without that parameter will assume a value of zero (**0**).

Defaults shown in the command tables are those for the factory settings of the modem. They are *not* the defaults assumed for a command issued without parameters, which are noted in the text.

## Registers

Some registers are read only. Attempting to write to them yields an ERROR result code.

Some registers store the setting of commands. Changing the register is equivalent to changing the command setting.

The table for S registers indicates the standard default values. The factory defaults are also noted in a separate sub-section.

---

*Note: Entering incorrect syntax or a parameter outside of the specified range may have unexpected results.*

---

## Responses and Result Codes

Most commands return only a result code; however, some commands request information, which is provided by the modem as a response prior to the result code.

### Possible result codes

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

There is a table listing all result codes, giving both the numeric and verbose results.

### Human vs. machine interface

The AT command interface was designed for human interaction. When an intelligent host is managing a modem, the interface may need to be altered (result code words replaced with numbers, for example). Framing characters (line feeds and carriage returns) must be properly understood to ensure the host system properly parses the responses and result codes.

As shipped, the modem is configured with these settings:

- Echo enabled (**E1**) causes the modem to echo characters received from the host back to it

---

*Note: The configuration for most machine-controlled hosts is more likely to set Echo off, and Verbose off or possibly Quiet on.*

---

while in command state. The backspace is echoed as <BS> <space> <BS> in order to erase the last character.

- Quiet off (**Q0**) enables the modem to issue result codes following commands. Quiet on (**Q1**) suppresses result codes entirely; responses remain unaffected.
- Verbose result codes (**V1**) provides results in English text appended with <CR><LF>. Verbose off (**V0**) returns the results as ASCII numeral codes. Numeric codes are much easier to process using software.

With Echo on (**E1** - the default) data received from the local host while in command state is echoed back to the host. This can present problems to machine control, which is not interested in an echo of its own commands to the modem. In some configurations the echo should be turned off (**E0**).

## Response and Result Framing

The framing of the response and result elements by <CR><LF> will depend heavily on the settings of the modem. In particular the settings of Verbose (**V**) and Quiet (**Q**) modes will alter the framing of both responses and result codes.

These elements are normally formatted for human reading with a terminal program. Users wishing to have software read and adjust to these responses and result codes must understand how they are framed.

**Framing Characters** The modem will frame replies with carriage return and line feed characters as they are defined in registers **S3** and **S4** respectively. These are normally the ASCII value 13 for carriage return (<CR>) and 10 for line feed (<LF>). For the purposes of the discussion here, they will be referred to simply as <CR> and <LF>.

If there are any problems determining the exact framing of the response and result codes, you should use a protocol analyzer to monitor the exchanges.

## Response framing

Regardless of command settings, responses will be in ASCII text with a trailing <CR><LF>. Where a response has more than one line, each line is terminated with a <CR><LF>.

- The setting of Verbose on (**ATV1**, see page 119) will trigger a leading <CR><LF> prior to the first line of the response. If Verbose is off (**ATV0**), there are no leading characters prior to the first line of response.
- The setting of Quiet (**ATQ**, see page 118) has no impact on responses.
- The programmer must know the number of lines expected in the response.

## Result code framing

Every command will return a result code unless the Quiet command is enabled. If Quiet is on (**ATQ1**, see page 118) then neither framing characters nor result code is returned; the modem is truly silent with respect to result codes.

A leading <CR><LF> is inserted ahead of the result code if Verbose is on (**ATV1**, see page 119). Otherwise there are no leading characters prior to the ASCII numeral result. The result code is always followed by a <CR>. There is a trailing <LF> only if Verbose is on. For example:

```
ATV1 <CR><LF>OK<CR><LF>
ATV0           0<CR>
```

In other words, when **ATV1** is set successfully, <CR><LF>OK<CR><LF> is sent from the modem (TA) to the computer (TE). If **ATV0** is set, result code 0<CR> is sent instead.

When **ATV1** is set and there is an error, <CR><LF>ERROR<CR><LF> is sent to the TE and no subsequent commands in the command line are processed. If **ATV0** is set, result code 4<CR> is sent instead.

The ERROR (or 4) response may be replaced by +CME ERROR: <err> when the command is not processed because of a GSM radio connection (mobile equipment—ME) error.

# 3: Command Reference

- Introduction
- Command Types
- Command Reference Table
- Result Codes
- Factory Default Settings

## Introduction

As described in the previous section, AT commands are available with Sierra Wireless GSM/GPRS products for users of the COM serial interface. The commands allow control of Circuit Switched Data (CSD) calls and data exchange, similar to dial-up modems, but without wires, and with additional commands available specific to GSM and GPRS.

The AT command set has grown from the original set used with Hayes™ wireline modems to support wireless connections and is now standardized by the Third Generation Partnership Project (3GPP). The commands are defined in the standards known as V.25ter (for standard modem commands), GSM 07.07 (for GSM and GPRS) and GSM 07.05 (for text messaging, also known as short message service—SMS). The following sections describe those commands.

AT commands conform by default to the Phase 2 specifications for GSM 07.07 and GSM 07.05. Some AT commands have been implemented according to Phase 2+ in order to support extended features, such as 14.4 kbps CSD connections.

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*Note: Not every GSM/GPRS product supports all commands.*

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*Note: The AT prefix does not appear in the reference tables. It is, however, required and assumed for all commands unless specifically noted otherwise.*

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The AT commands provide the following features for Sierra Wireless GSM/GPRS devices:

- Voice service
- Fax service
- Short Message Service (SMS)
- Circuit switched data service (CSD), including V.42bis data compression
- GPRS packet data service
- Phone book functionality
- Profiles

## Command Types

The command reference table (beginning on page 41) details the available AT commands in strict ASCII alphabetic order (including character prefixes such as **!**, **&** and **+**, which in ASCII fall before the letters of the alphabet). Sections preceding those tables outline how the commands are organized into functional groups, including:

- Standard modem commands, beginning on page 33.
- GSM voice, circuit-switched data, and fax, from page 36.
- SMS commands, page 38.
- GPRS packet data commands, page 39.

Within each functional section, commands also appear in ASCII alphabetic order, with a cross-reference to the full description in the reference table. This format allows quick lookup of each command to verify syntax, parameters, and behaviors.

## Standard Modem Commands (V.25ter)

Sierra Wireless GSM/GPRS devices support most of the standard AT commands used by telecommunications software for over twenty years.

The following commands are derived from the original 1981 Hayes AT wireline modem command set, with some additional commands specific to wireless devices.

These commands have been standardized by the International Telecommunications Union (ITU) as ITU-T recommendation V.250 (also known as V.25ter). You can find more information on the standard at [www.itu.int](http://www.itu.int).

**Table 3-1: Standard modem commands**

Command	Description	p.
<b>&amp;C</b>	<b>Data carrier detect (DCD) options</b>	43
<b>&amp;D</b>	<b>Data terminal ready (DTR) options</b>	43
<b>&amp;F</b>	<b>Reset modem to factory default</b>	43
<b>&amp;V</b>	<b>Display current modem configuration</b>	44
<b>&amp;W</b>	<b>Store user-defined profile</b>	44
<b>+++</b>	<b>Return (escape) from data state to command state</b>	44
<b>+DR</b>	<b>V.42bis compression reporting</b>	104
<b>+DS</b>	<b>V.42bis compression control</b>	105
<b>+GCAP</b>	<b>Modem capabilities</b>	106
<b>+GMI</b>	<b>Modem manufacturer</b>	107

**Table 3-1: Standard modem commands (cont.)**

Command	Description	p.
<b>+GMM</b>	Modem model	107
<b>+GMR</b>	Current modem firmware version	107
<b>+GOI</b>	Global object identification	107
<b>+GSN</b>	Modem serial number (IMEI)	107
<b>+ICF</b>	Local character framing	108
<b>+IFC</b>	Local flow control	109
<b>+ILRR</b>	Local data rate reporting	110
<b>+IPR</b>	Fixed local data rate	110
<b>A/</b>	Reissue last AT command	113
<b>A</b>	Answer incoming call (or GPRS network request)	113
<i>GSM modes:</i> <b>D&lt;string&gt;&lt;gsm mod&gt;;</b>	Dial outgoing call	114
<i>GPRS mode:</i> <b>D*&lt;GPRSSC&gt; *&lt;address&gt; *&lt;L2P&gt; *&lt;cid&gt;#</b>	Make GPRS connection	115
<b>DL</b>	Redial last outgoing number	116
<b>E&lt;n&gt;</b>	Command echo mode	116
<b>H[0]</b>	Hang up (disconnect)	117
<b>I&lt;n&gt;</b>	Display product identification	117
<b>L (ignored)</b>	Set speaker loudness	117

Table 3-1: Standard modem commands (cont.)

Command	Description	p.
<b>M</b> (ignored)	Set speaker mode	117
<b>O</b> <n>	Switch from command state to data state	118
<b>P</b> (ignored)	Pulse dialing	118
<b>Q</b> <n>	Quiet—suppress result codes	118
<b>S0</b> =<n>=<x> <b>S</b> <n>?	Status Register Set/Query	121
<b>T</b> (ignored)	Tone dialing	118
<b>V</b> <n>	Verbose result code format	119
<b>X</b> <n>	Connection code format and call monitoring	120
<b>Z</b>	Reset modem to user-defined profile	120

## GSM Voice, Circuit-Switched Data, and Fax Commands (GSM 07.07)

These commands are specified in the GSM 07.07 standard and control functions related to GSM voice, CSD, and fax—similar to those provided by many GSM mobile phones.

**Table 3-2: GSM commands**

Command	Description	p.
<b>+CACM</b>	<b>Store user-defined profile</b>	45
<b>+CAMM</b>	<b>Call meter maximum value</b>	46
<b>+CAOC</b>	<b>Advice of charge</b>	47
<b>+CBST</b>	<b>Select bearer service type</b>	48
<b>+CCFC</b>	<b>Call forwarding number and conditions</b>	49
<b>+CCUG</b>	<b>Closed user group control</b>	51
<b>+CCWA</b>	<b>Call waiting control</b>	51
<b>+CEER</b>	<b>Extended error report</b>	53
<b>+CGMI</b>	<b>Request manufacturer identification</b>	60
<b>+CGMM</b>	<b>Request model identification</b>	60
<b>+CGMR</b>	<b>Request revision identification</b>	61
<b>+CGSN</b>	<b>Product serial number</b>	65
<b>+CHLD</b>	<b>Call hold and multi-party</b>	66
<b>+CIMI</b>	<b>Request international mobile subscriber identity (IMSI)</b>	66
<b>+CKPD</b>	<b>Keypad control</b>	67

Table 3-2: GSM commands

Command	Description	p.
<b>+CLCC</b>	List current calls	68
<b>+CLCK</b>	Facility lock	69
<b>+CLIP</b>	Calling line identification presentation	70
<b>+CLIR</b>	Calling line identification restriction	71
<b>+CMEE</b>	Report mobile equipment error	72
<b>+COLP</b>	Connected line identification presentation	85
<b>+COPS</b>	Operator selection	86
<b>+CPAS</b>	Modem activity status	88
<b>+CPBF</b>	Find phonebook entries	88
<b>+CPBR</b>	Read phonebook entries	89
<b>+CPBS</b>	Phonebook memory storage	90
<b>+CPBW</b>	Write phonebook entry	91
<b>+CPIN</b>	Enter PIN	92
<b>+CPWD</b>	Change password	93
<b>+CR</b>	Service reporting control	94
<b>+CRC</b>	Cellular result codes for incoming calls	95
<b>+CREG</b>	GSM network registration	96
<b>+CRLP</b>	Radio link protocol	97
<b>+CSCS</b>	Character set	99
<b>+CSTA</b>	Type of address	103
<b>+CSQ</b>	Signal quality report	103

**Table 3-2: GSM commands**

Command	Description	p.
<b>+FCLASS</b>	<b>Fax service class</b>	106
<b>+FMI</b>	<b>Fax manufacturer identification</b>	106
<b>+FMM</b>	<b>Fax model identification</b>	106
<b>+FMR</b>	<b>Fax revision identification</b>	106
<b>+VTD</b>	<b>Tone duration</b>	111
<b>+VTS</b>	<b>DTMF tone generation</b>	112

### **SMS Commands (GSM 07.05)**

The GSM 07.05 standard provides the following commands for controlling text messaging, also known as Short Message Service (SMS).

**Table 3-3: SMS commands**

Command	Description	p.
<b>+CMGC</b>	<b>Send SMS command</b>	73
<b>+CMGD</b>	<b>Delete SMS message</b>	74
<b>+CMGF</b>	<b>Select SMS message format</b>	75
<b>+CMGL</b>	<b>List SMS messages</b>	76
<b>+CMGR</b>	<b>Read SMS message</b>	78
<b>+CMGS</b>	<b>Send SMS message</b>	79
<b>+CMGW</b>	<b>Write SMS message to memory</b>	80
<b>+CMSS</b>	<b>Send SMS message from storage</b>	81
<b>+CNMI</b>	<b>New SMS message indications</b>	82

**Table 3-3: SMS commands**

Command	Description	p.
<b>+CRES</b>	<b>Restore SMS settings</b>	97
<b>+CSAS</b>	<b>Save SMS settings</b>	98
<b>+CSCA</b>	<b>SMS service center address</b>	99
<b>+CSDH</b>	<b>Show SMS text mode parameters</b>	100
<b>+CSMP</b>	<b>Set SMS text mode parameters</b>	101
<b>+CSMS</b>	<b>SMS message service</b>	102

## **GPRS Packet Data Commands (GSM 07.07)**

These commands, specified in the GSM 07.07 standard, control General Packet Radio Service (GPRS) packet switched data services.

**Table 3-4: GPRS commands**

Command	Description	p.
<b>+CGACT</b>	<b>GPRS PDP context activation/deactivation</b>	54
<b>+CGATT</b>	<b>GPRS attach or detach</b>	55
<b>+CGCLASS</b>	<b>GPRS mobile station class</b>	55
<b>+CGDATA</b>	<b>Enter data state</b>	56
<b>+CGDCONT</b>	<b>Define Packet Data Protocol (PDP) context</b>	57
<b>+CGEREP</b>	<b>Unsolicited GPRS event reporting control</b>	59
<b>+CGPADDR</b>	<b>Show PDP address</b>	61
<b>+CGQMIN</b>	<b>Set or query minimum acceptable quality of service</b>	62

**Table 3-4: GPRS commands**

Command	Description	p.
<b>+CGQREQ</b>	<b>Request specified (or query current) quality of service profile</b>	63
<b>+CGREG</b>	<b>GPRS network registration status</b>	64
<b>+CGSMS</b>	<b>Select service for SMS messages</b>	65

## Modem Control Commands

These commands provide monitoring and control of the modem, and are proprietary to Sierra Wireless.

**Table 3-5: Sierra Wireless modem control commands**

Command	Description	p.
<b>!GBAND</b>	<b>Configure band</b>	41
<b>!GTEMP</b>	<b>Read radio temperature</b>	41
<b>!SHUTDOWN</b>	<b>Shut down/start up protocol stack</b>	41
<b>!VD</b>	<b>Headset volume down</b>	41
<b>!VU</b>	<b>Headset volume up</b>	41

## Command Reference Table

Table 3-6 below details the AT commands for Sierra Wireless's GSM/GPRS products in strict ASCII alphabetic order (with **AT+** before **AT&** before **ATA**). For listings by functional group, see the cross-reference tables beginning on page 32. Detailed status register information (for the **ATS** commands) begins on page 121.

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>!GBAND=</b> <b>&lt;band&gt;</b></p> <p><b>!GBAND?</b></p> <hr/> <p><i>Note: This command does not apply to the AirCard<sup>®</sup> 710 modem, which operates only on the PCS band.</i></p> <hr/>	<p><b>Configure band</b></p> <p>Sets the active radio frequency band, which then remains active until the command is issued again with a different band:</p> <ul style="list-style-type: none"> <li>• <b>&lt;band&gt;=1</b> PGSM</li> <li>• <b>&lt;band&gt;=3</b> EGSM</li> <li>• <b>&lt;band&gt;=4</b> DCS</li> <li>• <b>&lt;band&gt;=5</b> PGSM DCS</li> <li>• <b>&lt;band&gt;=7</b> EGSM DCS</li> <li>• <b>&lt;band&gt;=8</b> PCS (<i>default</i>)</li> <li>• <b>&lt;band&gt;=9</b> PGSM PCS</li> <li>• <b>&lt;band&gt;=11</b> EGSM PCS</li> </ul> <p>Changing the band will reset the single-slot and multi-slot channels for the specified band:</p> <ul style="list-style-type: none"> <li>• Channel 1 for GSM and EGSM</li> <li>• Channel 512 for DCS and PCS</li> </ul> <p><b>!GBAND?</b> returns the current band setting.</p>
<p><b>!GTEMP?</b></p>	<p><b>Read radio temperature</b></p> <p>Returns the temperature of the modem radio as a three-character integer value in degrees Celsius, in the form: <b>!GTEMP: &lt;ddd&gt;</b></p>
<p><b>!SHUTDOWN</b> <b>[=&lt;n&gt;]</b></p> <p><b>!SHUTDOWN?</b></p>	<p><b>Shut down/start up protocol stack</b></p> <p>Shuts down or starts up the protocol stack, as specified by <b>&lt;n&gt;</b> (a single integer value):</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=1</b> Shut down the stack</li> <li>• <b>&lt;n&gt;=0</b> Start up the stack (<i>default</i>)</li> </ul> <p><b>!SHUTDOWN?</b> returns the current state of the protocol stack.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>!VD</b>	<p><b>Headset volume down</b></p> <p>Decreases the headset volume one step.</p>
<b>!VU</b>	<p><b>Headset volume up</b></p> <p>Increases the headset volume one step.</p>
<b>&amp;C&lt;n&gt;</b>	<p><b>Data carrier detect (DCD) options</b></p> <p>Specifies how the modem responds to the behavior of the data carrier detect (DCD) line.</p> <ul style="list-style-type: none"> <li>• <b>0:</b> Sets the modem's DCD control line to ON regardless of the status of the data carrier.</li> <li>• <b>1:</b> DCD specifies the data carrier status of the distant station—ON indicates that a connection exists.</li> </ul>
<b>&amp;D&lt;n&gt;</b>	<p><b>Data terminal ready (DTR) options</b></p> <p>Determines how the modem responds when the data terminal ready (DTR) line switches from ON to OFF. <b>&lt;n&gt;</b> may be one of three values:</p> <ul style="list-style-type: none"> <li>• <b>0:</b> The modem ignores the DTR status.</li> <li>• <b>1:</b> Change to command state while maintaining any connected call.</li> <li>• <b>2:</b> Disconnect any current call, then change to command state. Auto-answer if off while DTR=OFF. (Auto-answer can be reactivated by resetting DTR to ON.)</li> </ul>
<b>&amp;F[0]</b>	<p><b>Reset modem to factory default</b></p> <p>Resets the modem to the default configuration specified at the factory. (See "Factory Default Settings" on page 126.) The command may be issued as either <b>AT&amp;F</b> or <b>AT&amp;F0</b>.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>&amp;V</b>	<p><b>Display current modem configuration</b></p> <p>The modem returns its current configuration settings. On power-up or reset, these settings are either the factory default settings profile (see page 126) or the settings previously stored with the <b>AT&amp;W</b> command.</p>
<b>&amp;W</b>	<p><b>Store user-defined profile</b></p> <p>Saves the current configuration settings into non-volatile memory as a user-defined profile. When the modem is reset or powered off and on, these settings are restored.</p> <p>The settings stored using <b>AT&amp;W</b> can also be restored using the <b>ATZ</b> command (see page 120). The <b>AT&amp;F</b> command (see page 43) returns the modem to the factory default settings (see page 126).</p>
<b>+++</b>	<p><b>Return (escape) from data state to command state</b></p> <p>Used to exit data state and enter command state.</p> <hr/> <p><i>Note: This command is <b>not</b> preceded by <b>AT</b> and does not require <b>&lt;CR&gt;</b> to terminate.</i></p> <hr/> <p>The escape character is fixed as the plus sign (+) (ASCII 0x2B). The guard time between normal transmission of data and the escape sequence is specified as 1 second and cannot be changed, so the modem requires a minimum of 1 second of inactivity on the serial input, then three plus sign characters, then 1 second of inactivity to escape into command state.</p> <hr/> <p><i>Note: If a PPP session is active, then use PPP to escape the data state.</i></p> <hr/>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CACM=&lt;pwd&gt;</b>  <b>+CACM?</b>	<p><b>Reset or query accumulated call meter (ACM)</b></p> <p>The user's SIM card stores a value (ACM) for the accumulated total number of home units used for GSM/GPRS calls with that SIM card. This standard GSM AT command can:</p> <ul style="list-style-type: none"> <li>• Reset the SIM card ACM value with the <b>+CACM=&lt;pwd&gt;</b> command, where <b>&lt;pwd&gt;</b> is the PIN2 password for the SIM card. (If the password is invalid, the modem returns an error.)</li> <li>• Query the SIM card for the current value of the ACM, using the <b>+CACM?</b> command.</li> </ul> <p><b>Supported values</b></p> <p>The returned value is a string, three bytes in hexadecimal format (e.g. 00001E indicates decimal value 30), with a range between 000000 and FFFFFFFF.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CMM=</b> <b>&lt;max&gt;,&lt;pwd&gt;</b></p> <p><b>+CMM?</b></p>	<p><b>Call meter maximum value</b></p> <p>This standard GSM AT command specifies or returns the maximum number of home units permitted in the SIM card accumulated call meter (ACM) before calls are prohibited, allowing Sierra Wireless modems to be used with prepaid or limited-airtime rate plans.</p> <ul style="list-style-type: none"> <li>• The <b>+CCMM=&lt;max&gt;,&lt;pwd&gt;</b> command sets the maximum ACM value <b>&lt;max&gt;</b> as a string value, as long as the SIM PIN2 password <b>&lt;pwd&gt;</b> is supplied. Setting <b>&lt;max&gt;=0</b> specifies no maximum—the ACM can accumulate without limit.</li> <li>• The <b>CCMM?</b> command returns the current specified maximum ACM value.</li> </ul> <p><b>Supported values</b></p> <p><b>&lt;max&gt;</b> is a string, three bytes in hexadecimal format (e.g. <b>&lt;max&gt;=0001E</b> indicates decimal value 30), with a range between <b>00000</b> and <b>FFFFFF</b>. A setting of <b>&lt;max&gt;=00000</b> disables the feature, setting no maximum value.</p>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CAOC=&lt;mode&gt;</b> <b>+CAOC?</b> <b>+CAOC=?</b>	<p><b>Advice of charge</b></p> <p>A standard GSM command enabling the subscriber to get information about the cost of calls by returning the home unit value of the current or most recent call. <b>+CAOC=?</b> returns supported modes and <b>+CAOC?</b> returns the current mode.</p> <p><b>+CAOC=&lt;mode&gt;</b> sets the advice of charge mode:</p> <ul style="list-style-type: none"> <li>• <b>&lt;mode&gt;=0</b> returns the current call meter value. (The command also operates identically as <b>AT+CAOC</b> with no parameter value.)</li> <li>• <b>&lt;mode&gt;=1</b> deactivates unsolicited call meter value reporting.</li> <li>• <b>&lt;mode&gt;=2</b> sets the modem to report the call meter value, no more often than every 10 seconds.</li> </ul> <p><b>Supported values</b></p> <p>The returned value is a string, three bytes in hexadecimal format (e.g. 00001E indicates decimal value 30), with a range between 000000 and FFFFFFFF.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description																																												
<p><b>+CBST=&lt;speed&gt; [<b>],&lt;name&gt;][<b>],&lt;ce&gt;]</b></b></b></p> <p><b>+CBST?</b></p> <p><b>+CBST=?</b></p>	<p><b>Select bearer service type</b></p> <p>Sets the data rate <b>&lt;speed&gt;</b>, bearer service <b>&lt;name&gt;</b>, and connection element <b>&lt;ce&gt;</b> to be used when originating a GSM data call. The query command <b>+CBST?</b> returns current values; <b>+CBST=?</b> returns supported values.</p> <p><b>Supported values</b></p> <p>Available values are:</p> <ul style="list-style-type: none"> <li>• <b>data rate &lt;speed&gt;=</b> <table border="0" style="margin-left: 20px;"> <tr> <td>0</td><td>autobauding (automatic data rate selection)</td> <td>2</td><td>1200 bps (V.22)</td> </tr> <tr> <td>1</td><td>300 bps (V.21)</td> <td>4</td><td>2400 bps (V.22bis)</td> </tr> <tr> <td>3</td><td>1200/75 bps (V.23)</td> <td>6</td><td>4800 bps (V.32)</td> </tr> <tr> <td>5</td><td>2400 bps (V.26ter)</td> <td>7</td><td>9600 bps (V.32)</td> </tr> <tr> <td>7</td><td>9600 bps (V.32)</td> <td>12</td><td>9600 bps (V.34)</td> </tr> <tr> <td>14</td><td>14400 bps (V.34)</td> <td>65</td><td>300 bps (V.110)</td> </tr> <tr> <td>66</td><td>1200 bps (V.110)</td> <td>68</td><td>2400 bps (V.110/X.31)</td> </tr> <tr> <td>70</td><td>4800 bps (V.110/X.31)</td> <td>71</td><td>9600 bps (V.110/X.31)</td> </tr> <tr> <td>75</td><td>14400 bps (V.110/X.31)</td> <td></td><td></td> </tr> </table> </li> <li>• <b>bearer service &lt;name&gt;=</b> <table border="0" style="margin-left: 20px;"> <tr> <td>0</td><td>data circuit asynchronous (UDI or 3.1 kHz modem)</td> </tr> <tr> <td>2</td><td>PAD Access (asynchronous) (UDI)</td> </tr> </table> </li> <li>• <b>connection element &lt;ce&gt;=</b> <table border="0" style="margin-left: 20px;"> <tr> <td>0</td><td>transparent</td> </tr> <tr> <td>1</td><td>non-transparent</td> </tr> </table> </li> </ul>	0	autobauding (automatic data rate selection)	2	1200 bps (V.22)	1	300 bps (V.21)	4	2400 bps (V.22bis)	3	1200/75 bps (V.23)	6	4800 bps (V.32)	5	2400 bps (V.26ter)	7	9600 bps (V.32)	7	9600 bps (V.32)	12	9600 bps (V.34)	14	14400 bps (V.34)	65	300 bps (V.110)	66	1200 bps (V.110)	68	2400 bps (V.110/X.31)	70	4800 bps (V.110/X.31)	71	9600 bps (V.110/X.31)	75	14400 bps (V.110/X.31)			0	data circuit asynchronous (UDI or 3.1 kHz modem)	2	PAD Access (asynchronous) (UDI)	0	transparent	1	non-transparent
0	autobauding (automatic data rate selection)	2	1200 bps (V.22)																																										
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Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CCFC=&lt;reas&gt;, &lt;mode&gt;</b> <b>[,&lt;number&gt;]</b> <b>[,&lt;type&gt;]</b> <b>[,&lt;class&gt;]</b> <b>[,&lt;subaddr&gt;]</b> <b>[,&lt;satype&gt;]</b> <b>[,&lt;time&gt;]</b>  <b>+CCFC=?</b>	<p><b>Call forwarding number and conditions</b></p> <p>Controls the call forwarding features of the modem, if available on the GSM network and supported by the user's carrier and subscription plan. The command supports registration, erasure, activation, deactivation, and status queries for call forwarding.</p> <hr/> <p><i>Note: When &lt;mode&gt;=0, 1, 2, or 4, only &lt;reas&gt; and &lt;mode&gt; parameters are supported.</i></p> <hr/> <p>For all values of &lt;mode&gt; other than 2, the set command returns a simple OK (or an error message). When &lt;mode&gt;=2 and &lt;reas&gt;=0, 1, 2, or 3, for registered call-forward numbers, it returns a status line for each class:  +CCFC: &lt;status&gt;,&lt;class&gt;,&lt;number&gt;,&lt;type&gt;,&lt;time&gt;  +CCFC: &lt;status&gt;,&lt;class&gt;,&lt;number&gt;,&lt;type&gt;,&lt;time&gt;  [etc.]</p> <p>For &lt;mode&gt;=2, if no call-forward numbers are registered (i.e. no classes are active), it returns &lt;status&gt;=0 and &lt;class&gt;=7, which represents inactive status for all classes.  +CCFC: 0,7</p> <p><b>+CCFC=?</b> returns a list of supported values for &lt;reas&gt;.</p> <p><b>Supported values</b></p> <p>&lt;reas&gt; can be one of six values:</p> <ul style="list-style-type: none"> <li>• 0 unconditional</li> <li>• 1 mobile busy</li> <li>• 2 no reply</li> <li>• 3 not reachable</li> <li>• 4 all call forwarding (0-3)</li> <li>• 5 all conditional call forwarding (1-3)</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CCFC</b> (continued)</p>	<p><b>&lt;mode&gt;</b> can be one of five values:</p> <ul style="list-style-type: none"> <li>• 0 disable</li> <li>• 1 enable</li> <li>• 2 query status</li> <li>• 3 registration</li> <li>• 4 erase</li> </ul> <p><b>&lt;number&gt;</b> is the string-type phone number of the forwarding address in the format specified by <b>&lt;type&gt;</b>.</p> <p><b>&lt;type&gt;</b> is the type of address in integer format. The default is <b>&lt;type&gt;=145</b> when the dialing string includes the international access code character +, otherwise it is <b>&lt;type&gt;=129</b>.</p> <p><b>&lt;subaddr&gt;</b> is a string-type subaddress of the format specified by <b>&lt;satype&gt;</b>.</p> <p><b>&lt;satype&gt;</b> is the type of subaddress in integer format. The default is <b>&lt;satype&gt;=128</b>.</p> <p><b>&lt;class&gt;</b> can be one of four values:</p> <ul style="list-style-type: none"> <li>• 1 voice</li> <li>• 2 data</li> <li>• 4 fax</li> <li>• 7 all classes (<i>default</i>)</li> </ul> <p><b>&lt;time&gt;</b> is the time between 1 and 30 seconds, rounded to a multiple of 5 seconds. The default is 20 seconds.</p> <p><b>&lt;status&gt;</b> is only returned, and can be one of two values:</p> <ul style="list-style-type: none"> <li>• 0 inactive</li> <li>• 1 active</li> </ul>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description																
<b>+CCUG[=&lt;n&gt;]</b> <b>[,&lt;index&gt;]</b> <b>[,&lt;info&gt;]</b> <b>+CCUG?</b>	<p><b>Closed user group control</b></p> <p>Sets the behavior of the modem for Closed User Group (CUG) control, restricting some available functions for all subsequent calls. If <b>&lt;n&gt;=0</b>, all other parameters are ignored.</p> <p><b>+CCUG?</b> returns the current setting.</p> <p><b>Supported values</b></p> <table border="0"> <tr> <td><b>&lt;n&gt;=0</b></td> <td>disable CUG (<i>default</i>)</td> </tr> <tr> <td><b>&lt;n&gt;=1</b></td> <td>enable CUG</td> </tr> <tr> <td><b>&lt;index&gt;=0-9</b></td> <td>CUG index (<i>default is 0</i>)</td> </tr> <tr> <td><b>&lt;index&gt;=10</b></td> <td>no index (preferred CUG taken from subscriber data)</td> </tr> <tr> <td><b>&lt;info&gt;=0</b></td> <td>no information (<i>default</i>)</td> </tr> <tr> <td><b>&lt;info&gt;=1</b></td> <td>suppress OA (Outgoing Access)</td> </tr> <tr> <td><b>&lt;info&gt;=2</b></td> <td>suppress preferential CUG</td> </tr> <tr> <td><b>&lt;info&gt;=3</b></td> <td>suppress OA and preferential CUG</td> </tr> </table>	<b>&lt;n&gt;=0</b>	disable CUG ( <i>default</i> )	<b>&lt;n&gt;=1</b>	enable CUG	<b>&lt;index&gt;=0-9</b>	CUG index ( <i>default is 0</i> )	<b>&lt;index&gt;=10</b>	no index (preferred CUG taken from subscriber data)	<b>&lt;info&gt;=0</b>	no information ( <i>default</i> )	<b>&lt;info&gt;=1</b>	suppress OA (Outgoing Access)	<b>&lt;info&gt;=2</b>	suppress preferential CUG	<b>&lt;info&gt;=3</b>	suppress OA and preferential CUG
<b>&lt;n&gt;=0</b>	disable CUG ( <i>default</i> )																
<b>&lt;n&gt;=1</b>	enable CUG																
<b>&lt;index&gt;=0-9</b>	CUG index ( <i>default is 0</i> )																
<b>&lt;index&gt;=10</b>	no index (preferred CUG taken from subscriber data)																
<b>&lt;info&gt;=0</b>	no information ( <i>default</i> )																
<b>&lt;info&gt;=1</b>	suppress OA (Outgoing Access)																
<b>&lt;info&gt;=2</b>	suppress preferential CUG																
<b>&lt;info&gt;=3</b>	suppress OA and preferential CUG																
<b>+CCWA[=&lt;n&gt;]</b> <b>[,&lt;mode&gt;]</b> <b>[,&lt;class&gt;]</b> <b>+CCWA?</b>	<p><b>Call waiting control</b></p> <p>Controls the call waiting features of the modem, if available on the GSM network and supported by the user's carrier and subscription plan. The command can activate, deactivate, and query the call waiting service.</p> <p>For all values of <b>&lt;mode&gt;</b> other than 2, the set command returns a simple OK (or an error message). When <b>&lt;mode&gt;=2</b>, the modem returns a status line for each class:</p> <pre>+CCWA:&lt;status&gt;,&lt;class&gt; +CCWA:&lt;status&gt;,&lt;class&gt; [etc.]</pre> <p><b>+CCWA?</b> returns the current value of <b>&lt;n&gt;</b>.</p>																

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CCWA</b> (continued)</p>	<p><b>Supported values</b></p> <p><b>&lt;n&gt;</b> can be one of two values:</p> <ul style="list-style-type: none"> <li>• <b>0</b> disable presentation of an unsolicited result code (<i>default</i>)</li> <li>• <b>1</b> enable presentation of an unsolicited result code</li> </ul> <p><b>&lt;mode&gt;</b> can be one of three values:</p> <ul style="list-style-type: none"> <li>• <b>0</b> disable</li> <li>• <b>1</b> enable</li> <li>• <b>2</b> query status</li> </ul> <hr/> <p><i>Note: If no &lt;mode&gt; value is provided, the network is not interrogated.</i></p> <hr/> <p><b>&lt;class&gt;</b> is a sum of integers each representing a class of information:</p> <ul style="list-style-type: none"> <li>• <b>1</b> voice</li> <li>• <b>2</b> data</li> <li>• <b>4</b> fax</li> <li>• <b>7</b> all classes (<i>default</i>)</li> </ul> <p><b>&lt;status&gt;</b> is only returned, and can be one of two values:</p> <ul style="list-style-type: none"> <li>• <b>0</b> inactive</li> <li>• <b>1</b> active</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CEER</b>	<b>Extended error report</b>  A standard GSM command that returns a line of text information reporting the reason for: <ul style="list-style-type: none"><li>• the last unsuccessful call setup (originating or answering) or modification.</li><li>• the last call release.</li><li>• the last unsuccessful GPRS attach or unsuccessful PDP context activation.</li><li>• the last GPRS detach or PDP context deactivation.</li></ul> Extended error reports are available for a number of the commands listed in this section, and appear in the form: +CEER: <report>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CGACT=</b> <b>&lt;state&gt;,&lt;cid&gt;</b></p> <p><b>+CGACT?</b></p> <p><b>+CGACT=?</b></p> <hr/> <p><i>Note: The Sierra Wireless modem permits only one PDP context to be active at a time.</i></p> <hr/>	<p><b>GPRS PDP context activation/deactivation</b></p> <p>In GPRS packet data mode, the <b>+CGACT</b> command activates (<b>&lt;state&gt;=1</b>) or deactivates (<b>&lt;state&gt;=0</b>) the specified Packet Data Protocol (PDP) context, then returns the modem to command state.</p> <p><b>&lt;cid&gt;</b> (the PDP Context Identifier) is a numeric parameter which specifies a particular PDP context definition. <b>+CGACT=?</b> returns the permitted values. (See also <b>+CGPADDR</b> on page 61.)</p> <p><b>Details</b></p> <ul style="list-style-type: none"> <li>• If the specified PDP context is already in the requested state, the state for that context remains unchanged.</li> <li>• If the requested state cannot be achieved, the modem returns an error. (Extended error responses are enabled by the <b>+CMEE</b> command, page 72.)</li> <li>• If the modem is not GPRS-attached when instructed to activate, it attempts to perform a GPRS attach first. (See page 55.)</li> <li>• If no <b>&lt;cid&gt;</b> is specified, the command either activates the default PDP context, or deactivates the active one, as appropriate.</li> <li>• <b>+CGACT?</b> returns the current activation state for the PDP context, while <b>+CGACT=?</b> requests information on the supported PDP context activation states.</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CGATT=&lt;state&gt;</b> <b>+CGATT?</b>	<p><b>GPRS attach or detach</b></p> <p>Attaches or detaches the Sierra Wireless modem from the GPRS network:</p> <ul style="list-style-type: none"> <li>• <b>&lt;state&gt;=0</b> detaches from the GPRS network.</li> <li>• <b>&lt;state&gt;=1</b> attaches to the GPRS network.</li> </ul> <p>Any other values return an error.</p> <p><b>Details</b></p> <ul style="list-style-type: none"> <li>• If the modem is already in the requested state, the command is ignored and the modem returns an OK response.</li> <li>• Any active PDP contexts are deactivated before detaching from the GPRS network.</li> <li>• The <b>+CGATT?</b> command returns the current GPRS-attach state of the modem.</li> </ul>
<b>+CGCLASS=&lt;class&gt;</b> <b>+CGCLASS?</b> <b>+CGCLASS=?</b>	<p><b>GPRS mobile station class</b></p> <p>The Sierra Wireless modem operates only as a Class B device. This command exists to query the device and to conform to GSM/GPRS specifications, but only one set value is supported.</p> <p>Any attempt to set any class other than <b>B</b> returns an error. <b>+CGCLASS?</b> returns the current class of the modem, while <b>+CGCLASS=?</b> returns the supported class value.</p> <p><b>Supported values</b></p> <p>The available class setting is:</p> <ul style="list-style-type: none"> <li>• <b>&lt;class&gt;=B</b>      Class B</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CGDATA</b> [=&lt;L2P&gt;],[&lt;cid&gt;]</p> <hr/> <p><i>Note: Since the +CGDATA command enters data state, any other commands in the AT command line are not processed.</i></p> <hr/> <p><i>Note: The Sierra Wireless modem permits only one PDP context to be active at a time.</i></p> <hr/>	<p><b>Enter data state</b></p> <p>Attempts a GPRS attach and PDP context activation. If successful, the modem returns CONNECT and enters the online data state. (The <b>D</b> command can also operate in a similar fashion. See “Make GPRS connection” on page 115.)</p> <p>GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the <b>+CGACT</b> and <b>+CGATT</b> commands (pages 54 and 55). If the activation is successful, data transfer may proceed.</p> <p>After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the modem re-enters command state and returns the final result code OK. If there is an error, the V.25ter command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported.</p> <p><b>+CGDATA=?</b> returns information on the supported layer 2 protocol.</p> <p><b>Supported values</b></p> <ul style="list-style-type: none"> <li>• The Sierra Wireless modem supports only the IP PDP, so the only supported layer 2 protocol value of &lt;L2P&gt; is PPP. Other values will return an error.</li> <li>• If context activation takes place during the PDP startup, a context ID &lt;cid&gt; may be specified in order to provide the information needed for the context activation request (see <b>+CGDCONT</b>, page 57). If no &lt;cid&gt; is given or if there is no matching context definition, the modem will attempt to activate the context with whatever information is available, and set the other context parameters to their default values.</li> </ul>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<p><b>+CGDCONT=</b>  <b>&lt;cid&gt;</b>  <b>[,&lt;PDP_type&gt;]</b>  <b>[,&lt;APN&gt;]</b>  <b>[,&lt;PDP_addr&gt;]</b>  <b>[,&lt;data_comp&gt;]</b>  <b>[,&lt;head_comp&gt;]</b></p> <p><b>+CGDCONT?</b></p> <p><b>+CGDCONT=?</b></p> <hr/> <p><i>Note: The Sierra Wireless modem permits only one PDP context to be active at a time.</i></p> <hr/>	<p><b>Define Packet Data Protocol (PDP) context</b></p> <p>Specifies PDP context parameter values for a PDP context identified by the local context identification parameter, <b>&lt;cid&gt;</b>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by <b>+CGDCONT=?</b>.</p> <hr/> <p><i>Note: A special form of the set command, <b>+CGDCONT=&lt;cid&gt;</b> causes the values for context number <b>&lt;cid&gt;</b> to become undefined.</i></p> <hr/> <p><b>+CGDCONT?</b> returns the current settings for each defined context, while <b>+CGDCONT=?</b> returns values supported as a compound value. (The parameter value ranges for each <b>&lt;PDP_type&gt;</b> are returned on a separate line.)</p> <hr/> <p><i>Note: The Sierra Wireless modem supports only one active PDP context at a time.</i></p> <hr/> <p><b>Supported values</b></p> <p>The set command specifies a number of parameters:</p> <p><b>&lt;cid&gt;</b> (PDP Context Identifier) is a numeric parameter which specifies a particular PDP context definition. The range of permitted values (minimum value = 1) is returned by <b>+CGDCONT=?</b>. (See also <b>+CGPADDR</b> on page 61.)</p> <p><b>&lt;PDP_type&gt;</b> (Packet Data Protocol type) is a string parameter which specifies the type of packet data protocol. Only the IP context is supported:</p> <ul style="list-style-type: none"> <li>• <b>&lt;PDP_type&gt;=IP</b>                    Internet Protocol (IETF STD 5)</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CGDCONT</b> <b>(continued)</b></p>	<p><b>&lt;APN&gt;</b> (Access Point Name) is a string parameter used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.</p> <p><b>&lt;PDP_address&gt;</b> is a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the computer during the PDP startup procedure or, failing that, a dynamic address will be requested. <b>+CGDCONT?</b> returns the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the <b>+CGPADDR</b> command (page 61).</p> <p><b>&lt;data_comp&gt;</b> is a numeric parameter that controls V.42bis PDP data compression, <b>0</b> for off, <b>1</b> for on.</p> <p><b>&lt;head_comp&gt;</b> is a numeric parameter that controls PDP header compression, <b>0</b> for off, <b>1</b> for on.</p>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CGEREP=</b> <b>&lt;mode&gt;</b> <b>[,&lt;buffer&gt;]</b> <b>+CGEREP?</b> <b>+CGEREP=?</b>	<p><b>Unsolicited GPRS event reporting control</b></p> <p>Enables or disables sending of unsolicited result codes, which return as +CGEV: XXX from the modem to the computer in response to modem or network events.</p> <p><b>+CGEREP?</b> returns the current mode and buffer settings, while <b>+CGEREP=?</b> returns the modes and buffer settings supported by the modem as compound values.</p> <p><b>Supported values</b></p> <ul style="list-style-type: none"> <li>• <b>&lt;mode&gt;=0</b> Buffer unsolicited result codes in the modem, discarding the oldest if the buffer is full. No codes are forwarded to the computer.</li> <li>• <b>&lt;mode&gt;=1</b> Discard unsolicited result codes when in online data mode, otherwise forward them directly to the computer.</li> <li>• <b>&lt;mode&gt;=2</b> Buffer unsolicited result codes in the modem when in online data mode and flush them to the computer when the link becomes available, otherwise forward them directly to the computer.</li> <li>• <b>&lt;buffer&gt;=0</b> When mode 1 or 2 above is entered, clear the modem's buffer of unsolicited result codes.</li> <li>• <b>&lt;buffer&gt;=1</b> The modem's buffer of unsolicited result codes defined within this command is flushed to the host computer when <b>&lt;mode&gt;=1</b> or <b>2</b> is entered (OK response is given before flushing the codes).</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CGEREP</b> (continued)</p>	<p><b>Responses</b></p> <p>The following unsolicited result codes and the corresponding events are defined:</p> <ul style="list-style-type: none"> <li>• <b>+CGEV: NW DEACT</b> &lt;PDP_type&gt;, &lt;PDP_addr&gt;, [&lt;cid&gt;] - The network has forced a context deactivation. The &lt;cid&gt; that was used to activate the context is provided if known to the modem.</li> <li>• <b>+CGEV: ME DEACT</b> &lt;PDP_type&gt;, &lt;PDP_addr&gt;, [&lt;cid&gt;] - The mobile equipment has forced a context deactivation. The &lt;cid&gt; that was used to activate the context is provided if known to the modem.</li> <li>• <b>+CGEV: NW DETACH</b> - The network has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.</li> <li>• <b>+CGEV: ME DETACH</b> - The mobile equipment has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.</li> <li>• <b>+CGEV: ME CLASS</b> &lt;class&gt; - The mobile equipment has forced a change of MS class. The highest available class is reported (see +CGCLASS, page 55).</li> </ul>
<p><b>+CGMI</b></p>	<p><b>Request manufacturer identification</b></p> <p>Identifies Sierra Wireless, Inc. as the manufacturer of the modem, returned as a text string. Equivalent to <b>+GMI</b> (page 107) and <b>+FMI</b> (page 106).</p>
<p><b>+CGMM</b></p>	<p><b>Request model identification</b></p> <p>Identifies the model of Sierra Wireless modem being queried, returned as a text string. Equivalent to <b>+GMM</b> (page 107) and <b>+FMM</b> (page 106).</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CGMR</b>	<p><b>Request revision identification</b></p> <p>Returns the current firmware revision of the Sierra Wireless modem being queried, as a text string. Equivalent to <b>+GMR</b> (page 107) and <b>+FMR</b> (page 106).</p>
<p><b>+CGPADDR</b> [=&lt;cid&gt;] <b>+CGPADDR=?</b></p> <hr/> <p><i>Note: The Sierra Wireless modem permits only one PDP context to be active at a time.</i></p> <hr/>	<p><b>Show PDP address</b></p> <p>Returns a list of PDP addresses for the specified context identifier.</p> <p>The command returns the PDP address as a string that identifies the modem in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the <b>+CGDCONT</b> command (page 57) when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation for the specified <b>&lt;cid&gt;</b>. If no address is available, it is omitted.</p> <p><b>&lt;cid&gt;</b> is a numeric parameter which specifies a particular PDP context definition (see the <b>+CGDCONT</b> command, page 57). If no <b>&lt;cid&gt;</b> is specified, the address for the current defined context is returned.</p> <p><b>+CGPADDR=?</b> returns the current defined <b>&lt;cid&gt;</b>.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CGQMIN</b>                      [=&lt;cid&gt;]                      [,&lt;precedence &gt;]                      [,&lt;delay&gt;]                      [,&lt;reliability&gt;]                      [,&lt;peak&gt;]                      [,&lt;mean&gt;]</p> <p><b>+CGQMIN?</b></p> <p><b>+CGQMIN=?</b></p>	<p><b>Set or query minimum acceptable quality of service</b></p> <p>Specifies a minimum acceptable Quality of Service (QoS) profile for the specified local context identification parameter &lt;cid&gt;. (See pages 57 and 61 for more information.) The modem checks the quality of service profile against the negotiated profile returned in the Activate PDP Context Accept message.</p> <p><b>+CGQMIN?</b> returns the current settings for each defined context, in the same order as specified for the set command, while <b>+CGQMIN=?</b> returns values supported as a compound value. The parameter value ranges for each PDP type are returned on a separate line.</p>
<p><i>Note: To specify a particular QoS profile, rather than the minimum, use the +CGQREQ command (page 63).</i></p>	<p><i>Note: A special form of the set command, <b>+CGQMIN=&lt;cid&gt;</b>, causes the minimum acceptable profile for context number &lt;cid&gt; to become undefined. In this case no check is made against the negotiated profile.</i></p>
	<p><b>Supported values</b></p> <p>The <b>+CGQMIN</b> command is effectively an extension to the <b>+CGDCONT</b> command (page 57). The QoS profile consists of a number of parameters, each of which may be set to a separate value. The &lt;cid&gt; value remains as discussed on pages 57 and 61. The remaining parameters are all numeric, and defined in the GSM 03.60 standard:</p> <ul style="list-style-type: none"> <li>• <b>&lt;precedence&gt;</b> specifies the precedence class.</li> <li>• <b>&lt;delay&gt;</b> is a numeric parameter which specifies the delay class.</li> <li>• <b>&lt;reliability&gt;</b> specifies the reliability class.</li> <li>• <b>&lt;peak&gt;</b> specifies the peak throughput class.</li> <li>• <b>&lt;mean&gt;</b> specifies the mean throughput class.</li> </ul> <p>If a value is omitted for a particular class, then that class is not checked.</p>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CGQREQ</b> [=<cid>] [,<precedence >] [,<delay>] [,<reliability>] [,<peak>] [,<mean>]	<b>Request specified (or query current) quality of service profile</b>  Specifies a Quality of Service Profile to be used when the modem sends an Activate PDP Context Request message to the network. If the specified profile is unavailable, the modem returns an error.
<b>+CGQREQ?</b>	All parameters are as outlined in <b>+CGQMIN</b> (page 62).
<b>+CGQREQ=?</b>	<hr/> <i>Note: To specify a minimum acceptable QoS profile, use the <b>+CGQMIN</b> command (page 62).</i> <hr/>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CGREG=&lt;n&gt;</b></p> <p><b>+CGREG?</b></p> <hr/> <p><i>Note: For circuit switched data registration status, see +CREG on page 96</i></p> <hr/>	<p><b>GPRS network registration status</b></p> <p>For GPRS data connections, <b>+CGREG=&lt;n&gt;</b> controls the presentation of an unsolicited result code, which appears in one of several forms depending on the value of <b>&lt;n&gt;</b> (or an error if no status is available):</p> <ul style="list-style-type: none"> <li>• When <b>&lt;n&gt;=0</b>, no network registration unsolicited result codes are returned.</li> <li>• <b>+CGREG: &lt;stat&gt;</b> (registration status only) is returned when <b>&lt;n&gt;=1</b> and there is a change in the modem's GPRS network registration status.</li> <li>• <b>+CGREG: &lt;stat&gt;,&lt;lac&gt;,&lt;ci&gt;</b> (which includes location information) is returned when <b>&lt;n&gt;=2</b> and there is a change of the network cell.</li> </ul> <p><b>+CGREG?</b> returns the status of result code presentation and an integer <b>&lt;stat&gt;</b> showing the current status. (Location information elements <b>&lt;lac&gt;</b> and <b>&lt;ci&gt;</b> are returned only when <b>&lt;n&gt;=2</b> and the modem is registered on the network.)</p> <p><b>Returned values</b></p> <p>The possible returned values of <b>&lt;stat&gt;</b> are:</p> <ul style="list-style-type: none"> <li>• 0: not registered, ME is not currently searching a new operator to register to</li> <li>• 1: registered</li> </ul> <p><b>&lt;lac&gt;</b> is a string specifying a two-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal).</p> <p><b>&lt;ci&gt;</b> is a string specifying a two-byte cell ID in hexadecimal format.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CGSMS[=&lt;n&gt;]</b> <b>+CGSMS?</b> <b>+CGSMS=?</b>	<p><b>Select service for SMS messages</b></p> <p>Specifies which service to use for text messaging (Short Message Service, SMS):</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0</b>: GPRS</li> <li>• <b>&lt;n&gt;=1</b>: circuit switched data (CSD) (<i>default</i>)</li> <li>• <b>&lt;n&gt;=2</b>: GPRS preferred (use CSD if GPRS not available)</li> <li>• <b>&lt;n&gt;=3</b>: circuit switched preferred (use GPRS if CSD not available)</li> </ul> <p><b>+CGSMS?</b> returns the currently selected service or service preference, while <b>+CGSMS=?</b> returns the currently available services and service preferences.</p> <p>See page 38 for more information on SMS commands.</p>
<b>+CGSN</b>	<p><b>Product serial number</b></p> <p>Returns the modem serial number (IMEI) of the Sierra Wireless modem—the same value returned by +GSN (see page 107).</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CHLD=&lt;n&gt;</b></p> <hr/> <p><i>Note: This command applies only to voice mode, not to data or fax transmissions.</i></p> <hr/>	<p><b>Call hold and multi-party</b></p> <p>The Sierra Wireless modem controls the supplementary voice services Call Hold, MultiParty and Explicit Call Transfer.</p> <p><b>+CHLD</b> allows voice calls to be put on hold, recovered, released, added to the conversation, and transferred, if the service is available on the GSM network and supported by the user's carrier and subscription plan.</p> <p>Supported values of <b>&lt;n&gt;</b> are:</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0</b> Terminate all held calls or UDUB (User Determined User Busy) for a waiting call</li> <li>• <b>&lt;n&gt;=1</b> Terminate all active calls (if any) and accept the other call (waiting call or held call)</li> <li>• <b>&lt;n&gt;=1x</b> Terminate the active call number <i>x</i> (<i>x</i>=1–7)</li> <li>• <b>&lt;n&gt;=2</b> Place all active calls on hold (if any) and accept the other call (waiting call or held call) as the active call</li> <li>• <b>&lt;n&gt;=2x</b> Place all active calls except call <i>x</i> (<i>x</i>=1–7) on hold</li> <li>• <b>&lt;n&gt;=3</b> Add the held call to the active calls</li> </ul>
<p><b>+CIMI</b></p>	<p><b>Request international mobile subscriber identity (IMSI)</b></p> <p>Returns the IMSI value that identifies the individual SIM card used in the Sierra Wireless modem.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description																														
<p><b>+CKPD=&lt;keys&gt; [,&lt;time&gt; [,&lt;pause&gt;]</b></p>	<p><b>Keypad control</b></p> <p>Emulates a mobile phone keypad, with values specified for the key pressed, the time it is depressed, and any pause between keypresses.</p> <p><b>&lt;keys&gt;</b> is a string of keypress values (as shown in the following table, derived from the standard PCCA STD-101 Annex table I-3). <b>&lt;time&gt;</b> (1–255, in seconds) and <b>&lt;pause&gt;</b> (0–255, in tenths of a second) can be specified. Unless there is an error, the modem returns OK before sending the keypresses.</p> <p><b>Supported keypad character codes</b></p> <table border="1"> <thead> <tr> <th><u>Char</u></th> <th><u>IRA (dec)</u></th> <th><u>Comment (+ known key symbols)</u></th> </tr> </thead> <tbody> <tr> <td>#</td> <td>35</td> <td>hash (number sign)</td> </tr> <tr> <td>*</td> <td>42</td> <td>star (*)</td> </tr> <tr> <td>0... 9</td> <td>48... 57</td> <td>number keys</td> </tr> <tr> <td>:</td> <td>58</td> <td>custom code escape character</td> </tr> <tr> <td>D/d</td> <td>68/100</td> <td>volume down</td> </tr> <tr> <td>E/e</td> <td>69/101</td> <td>connection end (END)</td> </tr> <tr> <td>R/r</td> <td>82/114</td> <td>recall last number (R/RCL/MR)</td> </tr> <tr> <td>S/s</td> <td>83/115</td> <td>connection start (SEND)</td> </tr> <tr> <td>U/u</td> <td>85/117</td> <td>volume up</td> </tr> </tbody> </table> <p>Characters between semicolons (;) are treated as alphanumeric entries and are not converted to key equivalents. The pause character (IRA 87 or 119) can be used to pause between keypresses for a time specified by <b>&lt;pause&gt;</b>.</p>	<u>Char</u>	<u>IRA (dec)</u>	<u>Comment (+ known key symbols)</u>	#	35	hash (number sign)	*	42	star (*)	0... 9	48... 57	number keys	:	58	custom code escape character	D/d	68/100	volume down	E/e	69/101	connection end (END)	R/r	82/114	recall last number (R/RCL/MR)	S/s	83/115	connection start (SEND)	U/u	85/117	volume up
<u>Char</u>	<u>IRA (dec)</u>	<u>Comment (+ known key symbols)</u>																													
#	35	hash (number sign)																													
*	42	star (*)																													
0... 9	48... 57	number keys																													
:	58	custom code escape character																													
D/d	68/100	volume down																													
E/e	69/101	connection end (END)																													
R/r	82/114	recall last number (R/RCL/MR)																													
S/s	83/115	connection start (SEND)																													
U/u	85/117	volume up																													

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CLCC</b></p>	<p><b>List current calls</b></p> <p>Lists the current calls and their type, if any available. Each call reports on a different line in this format:            +CLCC: &lt;id1&gt;,&lt;dir&gt;,&lt;state&gt;,&lt;bst&gt;,&lt;conf&gt;,&lt;number&gt;,&lt;type&gt;,&lt;alpha&gt;</p> <p><b>Returned values</b></p> <p>&lt;idx&gt; is an integer call identification number, as described in GSM 02.30 [19] subclause 4.5.5.1.</p> <p>&lt;dir&gt; describes the call type:</p> <ul style="list-style-type: none"> <li>• &lt;dir&gt;=0: mobile originated (MO) call</li> <li>• &lt;dir&gt;=1: mobile terminated (MT) call</li> </ul> <p>&lt;state&gt; shows the state of the call:</p> <ul style="list-style-type: none"> <li>• &lt;stat&gt;=0: active</li> <li>• &lt;stat&gt;=1: held</li> <li>• &lt;stat&gt;=2: dialing (MO call)</li> <li>• &lt;stat&gt;=3: alerting (MO call)</li> <li>• &lt;stat&gt;=4: incoming (MT call)</li> <li>• &lt;stat&gt;=5: waiting (MT call)</li> </ul> <p>&lt;bst&gt; indicates the bearer service type:</p> <ul style="list-style-type: none"> <li>• &lt;bst&gt;=0: voice</li> <li>• &lt;bst&gt;=1: data</li> <li>• &lt;bst&gt;=2: fax</li> <li>• &lt;bst&gt;=9: unknown</li> </ul> <p>&lt;conf&gt; indicates whether the call is a party in a conference (multi-party) call:</p> <ul style="list-style-type: none"> <li>• &lt;conf&gt;=0: call is not part of a conference call</li> <li>• &lt;conf&gt;=1: call is part of a conference call</li> </ul> <p>&lt;number&gt; is a string specifying the phone number in the format specified by &lt;type&gt;.</p>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CLCC</b> <b>(continued)</b>	<p>&lt;type&gt; is the type of address octet in integer format (refer to GSM 04.08 [8] subclause 10.5.4.7)</p> <p>&lt;alpha&gt; is a string corresponding to the phonebook entry for &lt;number&gt;, using the character set specified in +CSCS (page 99).</p>
<b>+CLCK=&lt;fac&gt;, &lt;mode&gt; [, &lt;passwd&gt;] [, &lt;class&gt;]</b>  <b>+CLCK=?</b>	<p><b>Facility lock</b></p> <p>Locks, unlocks, or interrogates the modem or a network facility specified in &lt;fac&gt;. <b>+CLCK=?</b> returns a list of supported &lt;fac&gt;s.</p> <p><b>Supported values</b></p> <p>&lt;fac&gt; values include:</p> <ul style="list-style-type: none"> <li><b>PS</b> PH-SIM, lock PHone to SIM card. The modem requests a password another SIM card is inserted.</li> <li><b>SC</b> SIM, lock SIM Card. The SIM requests a password when the command is issued or when the modem is powered on.</li> <li><b>AO</b> BAOC, Barr All Outgoing Calls—see GSM 02.88[6] clause 1</li> <li><b>OI</b> BOIC, Barr Outgoing International Calls—see GSM 02.88[6] clause 1</li> <li><b>OX</b> BOIC-exHC, Barr Outgoing International Calls except to Home Country—see GSM 02.88[6] clause 1</li> <li><b>AI</b> BAIC, Barr All Incoming Calls—see GSM 02.88[6] clause 2</li> <li><b>IR</b> BIC-Roam, Barr Incoming Calls when Roaming outside the home country—see GSM 02.88[6] clause 2</li> <li><b>AB</b> All Barring services (see GSM 02.30[19])—applicable only when &lt;mode&gt;=0)</li> <li><b>AG</b> All outGoing barring services (see GSM 02.30[19])—applicable only when &lt;mode&gt;=0)</li> <li><b>AC</b> All inComing barring services (see GSM 02.30[19])—applicable only when &lt;mode&gt;=0)</li> <li><b>PN</b> Network Personalisation (see GSM 02.22[33])</li> <li><b>PU</b> network sUbset Personalisation (see GSM 02.22[33])</li> <li><b>PP</b> service Provider Personalisation (see GSM 02.22[33])</li> <li><b>PC</b> Corporate Personalisation (see GSM 02.22[33])</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CLCK</b> (continued)</p>	<p><b>&lt;mode&gt;</b> specifies whether to unlock, lock, or query:  <b>&lt;mode&gt;=0</b> to unlock, <b>&lt;mode&gt;=1</b> to lock, and <b>&lt;mode&gt;=2</b> to query the lock status.</p> <p>When <b>&lt;mode&gt;=2</b>, a successful query returns each class on its own line:            +CLCK: &lt;status&gt;,&lt;class&gt;            where &lt;status&gt; is either 0 (not active) or 1 (active).</p> <p><b>&lt;passwd&gt;</b> is a string password, either specified for the facility or set using the +CPWD command (see page 93).</p> <p><b>&lt;class&gt;</b> is a sum of integers each representing a class of information as follows (default 7):</p> <ul style="list-style-type: none"> <li>• <b>1</b> voice (telephony)</li> <li>• <b>2</b> data (refers to all bearer services)</li> <li>• <b>4</b> fax (facsimile services)</li> <li>• <b>7</b> all classes (<i>default</i>)</li> </ul>
<p><b>+CLIP=&lt;n&gt;</b> <b>+CLIP?</b></p>	<p><b>Calling line identification presentation</b></p> <p>Sets whether the modem user can receive the Calling Line Identity (CLI, similar to Caller ID for landline phones) for incoming calls, using one of two values:</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0</b>: CLI disabled</li> <li>• <b>&lt;n&gt;=1</b>: CLI enabled</li> </ul> <p>If enabled (<b>&lt;n&gt;=1</b>), a RING or +CRING returns the following information. (See “Result Codes” on page 125.)            +CLIP: &lt;number&gt;,&lt;type&gt;</p>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CLIP</b> <b>(continued)</b>	<p><b>Returned values</b></p> <p>Returned values when <b>&lt;n&gt;=1</b> and an incoming call is detected appear as <b>+CLIP: &lt;number&gt;,&lt;type&gt;</b> and are:</p> <ul style="list-style-type: none"> <li>• <b>&lt;number&gt;</b>: a string-type phone number of format specified by <b>&lt;type&gt;</b></li> <li>• <b>&lt;type&gt;</b>: the type of address octet in integer format (see GSM 04.08[8] subclause 10.5.4.7)—<b>&lt;type&gt;=145</b> when the dialing string includes the international access code character <b>+</b>, otherwise it is <b>129</b>.</li> </ul> <p><b>+CLIP?</b> returns whether CLI is enabled or disabled locally, and whether it is available to the user on the network:</p> <p>+CLIP:0,0 CLI disabled, CLIP not provisioned on network            +CLIP:0,1 CLI disabled, CLIP provisioned            +CLIP:0,2 CLI disabled, CLIP network status unknown            +CLIP:1,0 CLI disabled, CLIP not provisioned on network            +CLIP:1,1 CLI disabled, CLIP provisioned            +CLIP:1,2 CLI disabled, CLIP network status unknown</p>
<b>+CLIR=&lt;n&gt;</b> <b>+CLIR?</b>	<p><b>Calling line identification restriction</b></p> <p>Sets whether the Sierra Wireless modem respects the remote caller's restriction of CLI (Calling Line Identity) information, and queries the status of CLIR service on the network.</p> <p><b>Supported values</b></p> <p>To set the CLIR status, the following values are supported:</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0 (default)</b> presents CLI information according to the CLIR subscription setting on the network.</li> <li>• <b>&lt;n&gt;=1</b> invokes CLIR (i.e. blocks incoming CLI information)</li> <li>• <b>&lt;n&gt;=2</b> suppresses CLIR (i.e. always displays incoming CLI information if available)</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CLIR</b> <b>(continued)</b></p>	<p><b>+CLIR?</b> returns the current setting and CLIR network status:</p> <ul style="list-style-type: none"> <li>+CLIR:0,0 CLIR default, CLIR not provisioned on network</li> <li>+CLIR:0,1 CLIR default, CLIR provisioned (permanent mode)</li> <li>+CLIR:0,2 CLIR default, CLIR network status unknown</li> <li>+CLIR:0,3 CLIR default, CLIR presentation restricted (temporary)</li> <li>+CLIR:0,4 CLIR default, CLIR presentation allowed (temporary)</li> <li>+CLIR:1,0 CLIR invoked, CLIR not provisioned on network</li> <li>+CLIR:1,1 CLIR invoked, CLIR provisioned (permanent mode)</li> <li>+CLIR:1,2 CLIR invoked, CLIR network status unknown</li> <li>+CLIR:1,3 CLIR invoked, CLIR presentation restricted (temp)</li> <li>+CLIR:1,4 CLIR invoked, CLIR presentation allowed (temp)</li> <li>+CLIR:2,0 CLIR suppressed, CLIR not provisioned on network</li> <li>+CLIR:2,1 CLIR suppressed, CLIR provisioned (permanent)</li> <li>+CLIR:2,2 CLIR suppressed, CLIR network status unknown</li> <li>+CLIR:2,3 CLIR suppressed, CLIR presentation restricted (temp)</li> <li>+CLIR:2,4 CLIR suppressed, CLIR presentation allowed (temp)</li> </ul>
<p><b>+CMEE=&lt;n&gt;</b> <b>+CMEE?</b></p>	<p><b>Report mobile equipment error</b></p> <p>Sets whether the modem reports errors as simply ERROR, or with details in the form +CME ERROR: &lt;err&gt; (either numeric or verbose).</p> <hr/> <p><i>Note: A plain ERROR message still returns for syntax, invalid parameter, or non-modem-related problems.</i></p> <hr/> <p><b>+CMEE?</b> returns the current setting.</p> <p><b>Supported values</b></p> <p>&lt;n&gt; can be set to one of three values:</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0:</b> do not report detailed errors, simply return ERROR.</li> <li>• <b>&lt;n&gt;=1:</b> enable +CME ERROR: &lt;err&gt; result codes and use numeric values for &lt;err&gt;.</li> <li>• <b>&lt;n&gt;=2:</b> enable +CME ERROR: &lt;err&gt; result codes and use verbose (English) values for &lt;err&gt;.</li> </ul> <p>Numeric and verbose values for &lt;err&gt; appear on page 125.</p>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<p><i>PDU mode:</i> <b>+CMGC= &lt;length&gt;</b></p> <p>or</p> <p><i>Text mode:</i> <b>+CMGC=&lt;fo&gt;, &lt;ct&gt;[,&lt;pid&gt;] [,&lt;mn&gt;][,&lt;da&gt;] [,&lt;toda&gt;]</b></p> <hr/> <p><i>Note: Also see the +CMGS command on page 79.</i></p> <hr/>	<p><b>Send SMS command</b></p> <p>Sends an SMS Command message from the host computer to the network (SMS-COMMAND). The message reference value &lt;mr&gt; is returned (as +CMGC: &lt;mr&gt;) to the host computer if the message is successfully delivered, and can be used to identify the message if an unsolicited delivery status code is received.</p> <p>How the command is used depends on the SMS message format specified in <b>+CMGF</b> (page 75):</p> <ul style="list-style-type: none"> <li>In PDU mode (<b>+CMGF=0</b>), messages are sent as follows: <ul style="list-style-type: none"> <li><b>+CMGC=&lt;length&gt;&lt;CR&gt; &lt;PDU data&gt;&lt;CTRL+Z&gt;</b></li> </ul> </li> <li>In text mode (<b>+CMGF=1</b>), messages are sent in this form: <ul style="list-style-type: none"> <li><b>+CMGC=&lt;fo&gt;,&lt;ct&gt;,&lt;pid&gt;,&lt;mn&gt;,&lt;da&gt;,&lt;toda&gt;&lt;CR&gt; &lt;message text&gt;&lt;CTRL+Z&gt;</b></li> </ul> </li> </ul> <hr/> <p><i>Note: In both modes, sending &lt;ESC&gt; instead of &lt;CTRL+Z&gt; quits without sending the message.</i></p> <hr/> <p><b>Supported values</b></p> <p>Parameters for the text-mode send command are:</p> <ul style="list-style-type: none"> <li><b>&lt;fo&gt;</b> first octet of GSM 03.40 SMS-COMMAND in integer format (<i>default 2</i>)</li> <li><b>&lt;ct&gt;</b> GSM 03.40 TP-Command-Type in integer format (<i>default 0</i>)</li> <li><b>&lt;pid&gt;</b> GSM 03.40 TP-Protocol-Identifier in integer format (<i>default 0</i>)</li> <li><b>&lt;mn&gt;</b> GSM 03.40 TP-Message-Number in integer format</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CMGC</b> (continued)</p>	<ul style="list-style-type: none"> <li>• <b>&lt;da&gt;</b> GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <b>&lt;toda&gt;</b></li> <li>• <b>&lt;toda&gt;</b> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <b>&lt;da&gt;</b> is + (IRA 43) default is 145, otherwise default is 129)</li> </ul> <p>For PDU mode:</p> <ul style="list-style-type: none"> <li>• <b>&lt;length&gt;</b> integer type value indicating the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)</li> </ul>
<p><b>+CMGD=&lt;index&gt;</b></p>	<p><b>Delete SMS message</b></p> <p>Deletes the <b>&lt;index&gt;</b>-numbered message from the currently selected memory store (see <b>+CMGS</b>, page 79).</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CMGF=&lt;n&gt;</b></p> <p><b>+CMGF?</b></p>	<p><b>Select SMS message format</b></p> <p>Specifies the input and output format of messages to use. <b>&lt;n&gt;</b> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages.</p> <p>There are two available formats for text messages:</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0</b> specifies PDU (Protocol Description Unit) mode, in which the complete SMS message, including all header information, is passed as a binary string..</li> <li>• <b>&lt;n&gt;=1</b> specifies text mode, where the headers and body of the messages are given as separate parameters.</li> </ul> <p>Text mode is an encoding of the bit stream represented by PDU mode. See <b>+CMGC</b> (page 73) for information on sending messages.</p> <p><b>+CMGF?</b> returns the current setting.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description																		
<p><b>+CMGL</b> [=&lt;status&gt;]</p>	<p><b>List SMS messages</b></p> <p>Lists messages of the specified &lt;status&gt; from the message store. If &lt;status&gt; is omitted, the command lists all messages (same as &lt;status&gt;=4).</p> <p>The format of the returned messages depends on whether the modem has been set to PDU or text mode (see <b>+CMGF</b>, page 75):</p> <ul style="list-style-type: none"> <li>In PDU mode, returned messages appear in the form:                      +CMGL: &lt;index&gt;,&lt;status&gt;,&lt;alpha&gt;,&lt;br&gt;&lt;length&gt;&lt;CR&gt;&lt;LF&gt;                      &lt;pdu data&gt;                      +CMGL: &lt;index&gt;,&lt;status&gt;,&lt;alpha&gt;,&lt;br&gt;&lt;length&gt;&lt;CR&gt;&lt;LF&gt;                      &lt;pdu data&gt;                      etc.</li> <li>In text mode, returned messages appear in the form:                      +CMGL: &lt;index&gt;,&lt;stat&gt;,&lt;oa/da&gt;,&lt;alpha&gt;,&lt;br&gt;&lt;scts&gt;,&lt;tooa/toda&gt;,&lt;length&gt;&lt;CR&gt;&lt;LF&gt;                      &lt;message text&gt;                      +CMGL: &lt;index&gt;,&lt;stat&gt;,&lt;oa/da&gt;,&lt;alpha&gt;,&lt;br&gt;&lt;scts&gt;,&lt;tooa/toda&gt;,&lt;length&gt;&lt;CR&gt;&lt;LF&gt;                      &lt;message text&gt;                      [etc.]</li> </ul> <p><b>Supported values</b></p> <p>The format of &lt;status&gt; depends on whether the modem is in PDU or text mode. In PDU mode, it is an integer; in text mode, a string:</p> <table border="1" data-bbox="418 1098 1028 1241"> <thead> <tr> <th>PDU Mode</th> <th>Text Mode</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>REC UNREAD</td> <td>Received unread (i.e. new message)</td> </tr> <tr> <td>1</td> <td>REC READ</td> <td>Received read</td> </tr> <tr> <td>2</td> <td>STO UNSENT</td> <td>Stored unsent</td> </tr> <tr> <td>3</td> <td>STO SENT</td> <td>Stored sent</td> </tr> <tr> <td>4</td> <td>ALL</td> <td>All messages (default if &lt;status&gt; omitted)</td> </tr> </tbody> </table>	PDU Mode	Text Mode	Meaning	0	REC UNREAD	Received unread (i.e. new message)	1	REC READ	Received read	2	STO UNSENT	Stored unsent	3	STO SENT	Stored sent	4	ALL	All messages (default if <status> omitted)
PDU Mode	Text Mode	Meaning																	
0	REC UNREAD	Received unread (i.e. new message)																	
1	REC READ	Received read																	
2	STO UNSENT	Stored unsent																	
3	STO SENT	Stored sent																	
4	ALL	All messages (default if <status> omitted)																	

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CMGL (continued)</b>	<p><b>Returned values</b></p> <p>&lt;index&gt; An integer uniquely identifying a message in the message store. The value lies in the range of location numbers supported by the message memory.</p> <p>&lt;status&gt; The message status, as listed on page 76.</p> <p>&lt;alpha&gt; An alphanumeric phone number representing the destination address &lt;da&gt; or originating address &lt;oa&gt; in the modem phonebook.</p> <p>&lt;length&gt; The length of the message body in characters.</p> <p>&lt;pdu&gt; In PDU mode, the SMS message, in the form of the GSM 04.11 SC address followed by the GSM 03.40 TPDU in hexadecimal format. The modem converts each octet of TP data unit into two IRA character long hexadecimal numbers (e.g. an octet with integer value 42 is presented to the computer as two characters 2A—IRA 50 and 65.)</p> <p>&lt;oa/da&gt; The Originating-Address-Value &lt;oa&gt; field in string format; type of address given by &lt;tooa&gt;, or the Destination-Address field &lt;da&gt; in string format; type of address given by &lt;toda&gt;.</p> <p>&lt;scts&gt; Service-Centre-Time-Stamp in time-string format: "yy/MM/dd, hh:mm:ss±zz".</p> <p>&lt;tooa/toda&gt; The Type-of-Originating Address octet &lt;tooa&gt; in integer format, or the Type-of-Destination Address octet &lt;toda&gt; in integer format. In both cases, when the first character of the phone number is "+" (IRA 43), the default is 145; otherwise the default is 129.</p> <p>&lt;data&gt; Message body data for text mode messages.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CMGR=&lt;index&gt;</b></p>	<p><b>Read SMS message</b></p> <p>Returns the message with the location value <b>&lt;index&gt;</b> from the message store. If the <b>&lt;status&gt;</b> of the message is “received unread” (<b>&lt;status&gt;</b>=0 in PDU mode, or <b>&lt;status&gt;</b>=REC UNREAD in text mode), then its status changes to “received read” (1 or REC READ).</p> <p>The format of the returned message depends on whether the modem is in PDU or text mode (see <b>+CMGF</b>, page 75):</p> <ul style="list-style-type: none"> <li>• In PDU mode, the returned message appears in the form: +CMGR: &lt;status&gt;,&lt;alpha&gt;,&lt;length&gt; &lt;pdu&gt;</li> <li>• In text mode, the returned message appears in the form: +CMGR:&lt;status&gt;,&lt;oa&gt;,&lt;alpha&gt;,&lt;scts&gt;,&lt;tooa&gt;,&lt;fo&gt;,&lt;pid&gt;,&lt;dcs&gt;,&lt;sca&gt;,&lt;tosca&gt;,&lt;length&gt; &lt;data&gt;</li> </ul> <p><b>Returned values</b></p> <p>Returned parameters are as described in <b>+CMGL</b> (page 77), with the addition of:</p> <p>&lt;fo&gt;           The first octet of the SMS message according to the ETSI recommendation 03.40.</p> <p>&lt;pid&gt;           The Protocol-Identifier in integer format (<i>default 0</i>).</p> <p>&lt;dcs&gt;           Depending on the command or result code: GSM 03.38 SMS Data Coding Scheme (<i>default 0</i>), or Cell Broadcast Data Coding Scheme in integer format</p> <p>&lt;sca&gt;           A string representing the Service Center address field; the type of address is given by &lt;tosca&gt;.</p> <p>&lt;tosca&gt;        Type-of-Service Center Address octet in integer format. As with &lt;tooa&gt; and &lt;toda&gt;, when the first character of the phone number is “+” (IRA 43), the default is 145; otherwise the default is 129.</p>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<p><i>PDU mode:</i>  <b>+CMGS=</b>  <b>&lt;length&gt;</b></p> <p>or</p> <p><i>Text mode:</i>  <b>+CMGS=&lt;da&gt;</b>  <b>[,&lt;toda&gt;]</b></p>	<p><b>Send SMS message</b></p> <p>Sends an SMS message to the network (SMS-SUBMIT) directly, without requiring that it be stored in memory. A message reference value &lt;mr&gt; is returned if the message has been successfully delivered, in the form +CMGS: &lt;mr&gt;. It can be used to identify the message if an unsolicited delivery status report result code is returned.</p> <p><b>PDU mode</b> The PDU-mode send command is:  <b>+CMGS=&lt;length&gt;&lt;CR&gt;</b>  <b>&lt;PDU data&gt;&lt;CTRL+Z&gt;</b></p> <p><b>&lt;length&gt;</b> must indicate the number of octets coded in the TP layer data unit to be given (i.e. SMSC address octets are excluded). The <b>&lt;pdu data&gt;</b> must be in hexadecimal format (as specified for &lt;pdu&gt; on page 77) and given in one line. The Sierra Wireless modem converts this coding into the actual octets of the PDU. When the length octet of the SMSC address (given in the <b>&lt;pdu data&gt;</b>) equals zero, the SMSC address set with command Service Centre Address <b>+CSCA</b> (see page 99) is used.</p> <p><b>Text mode</b> In text mode, the command is in the form:  <b>+CMGS=&lt;da&gt;,&lt;toda&gt;&lt;CR&gt;</b>  <b>&lt;message text&gt;&lt;CTRL+Z&gt;</b></p> <p>The text in <b>&lt;message text&gt;</b> is sent to the address <b>&lt;da&gt;</b>. <b>&lt;toda&gt;</b> is optional—when the first character of the phone number is “+” (IRA 43), it will default to 145; otherwise the default is 129.</p> <hr/> <p><i>Note: In both modes, &lt;CTRL+Z&gt; (IRA 26) sends the message. &lt;ESC&gt; (IRA 27) quits without sending.</i></p> <hr/> <p><b>Supported values</b></p> <p>See <b>+CMGL</b> (page 76–77) and <b>+CMGC</b> (page 73) for details on the listed parameters.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CMGW=</b>  <b>&lt;length&gt;</b>,  <b>&lt;status&gt;&lt;CR&gt;</b>  <b>&lt;pdu&gt;</b> (PDU mode)</p> <p>or</p> <p><b>+CMGW</b>  <b>[=&lt;oa/da&gt;]</b>  <b>[,&lt;tooa/toda&gt;]</b>  <b>[,&lt;status&gt;]&lt;CR&gt;</b>  <b>&lt;data&gt;</b> (text mode)</p>	<p><b>Write SMS message to memory</b></p> <p>Saves the SMS message (either SMS-DELIVER or SMS-SUBMIT) to the message store. If successful, the memory location &lt;index&gt; of the stored message is returned in the form +CMGW: &lt;index&gt;.</p> <p>By default, message status will be set to “stored unsent” (&lt;status&gt;=2 or <b>STO UNSENT</b>), but another &lt;status&gt; may be assigned, as described on page 76.</p> <p>The ending of the message body (in text mode) or PDU (in PDU mode) must be indicated by &lt;ctrl-Z&gt; (IRA 26). Saving can be cancelled by passing the &lt;ESC&gt; character (IRA 27).</p> <p><b>Supported values</b></p> <p>See <b>+CMGL</b> (page 76–77) for details on the listed parameters.</p> <hr/> <p><i>Note: When storing an SMS-DELIVER to the message store in text mode, &lt;vp&gt; can be substituted for &lt;scts&gt; (see <b>+CSMP</b>, page 101).</i></p> <hr/>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CMSS=&lt;index&gt;[,&lt;da&gt;][,&lt;toda&gt;]</b>	<p><b>Send SMS message from storage</b></p> <p>Sends the message with location value <b>&lt;index&gt;</b> from the message store to the network (SMS-SUBMIT). <b>&lt;da&gt;</b> and <b>&lt;toda&gt;</b> are optional—if new values are provided, they will be used instead of the <b>&lt;da&gt;</b> stored with the message and the default <b>&lt;toda&gt;</b>.</p> <p>A message reference value <b>&lt;reference&gt;</b> is returned if the message has been successfully delivered, in the form <b>+CMSS: &lt;reference&gt;</b>. It can be used to identify the message if an unsolicited delivery status report result code is returned.</p> <p><b>Supported values</b></p> <p>See <b>+CMGL</b> (page 76–77) for details on the listed parameters.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CNMI=&lt;mode&gt;</b> <b>[,&lt;mt&gt;][,&lt;bm&gt;]</b> <b>[,&lt;ds&gt;][,&lt;bfr&gt;]</b> <b>+CNMI?</b>	<p><b>New SMS message indications</b></p> <p>Sets or queries how new messages are indicated to the computer when the modem is active. <b>&lt;mode&gt;</b> controls the processing of unsolicited result codes, <b>&lt;mt&gt;</b> sets the result code indication routing for SMS-DELIVERs, <b>&lt;bm&gt;</b> for CBMs and <b>&lt;ds&gt;</b> for SMS-STATUS-REPORTs. <b>&lt;bfr&gt;</b> defines the handling method for buffered result codes when <b>&lt;mode&gt;=1</b>.</p> <p><b>+CNMI?</b> returns the current settings. The default is <b>+CNMI=1,0,0,0</b>.</p> <p><b>Supported values</b></p> <p><b>&lt;mode&gt;</b> may be one of four integer values:</p> <ul style="list-style-type: none"> <li>• <b>&lt;mode&gt;=0:</b> Buffer unsolicited result codes in the modem. If the buffer is full, the oldest codes are replaced with the new received codes.</li> <li>• <b>&lt;mode&gt;=1:</b> Discard indication and reject new received message unsolicited result codes when the modem-computer link is reserved (e.g. in online data mode); otherwise forward them directly to the computer.</li> <li>• <b>&lt;mode&gt;=2:</b> Buffer unsolicited result codes in the modem when in online data mode, and flush them to the host computer after reservation. Otherwise forward them directly to the modem.</li> <li>• <b>&lt;mode&gt;=3:</b> Forward unsolicited result codes directly to the host computer.</li> </ul> <p><b>&lt;mt&gt;</b> may be one of four values:</p> <ul style="list-style-type: none"> <li>• <b>&lt;mt&gt;=0:</b> No SMS-DELIVER indications.</li> <li>• <b>&lt;mt&gt;=1:</b> If SMS-DELIVER is stored in the modem, indication of the memory location is routed to the host computer using the unsolicited result code:  <b>+CMTI: &lt;mem&gt;,&lt;index&gt;</b></li> </ul>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CNMI (continued)</b>	<ul style="list-style-type: none"> <li>• <b>&lt;mt&gt;=2:</b> Indication of SMS-DELIVER is returned using unsolicited result codes:  + CMT: &lt;alpha&gt;,&lt;length&gt;&lt;CR&gt;  &lt;pdu&gt; (in PDU mode)   or   + CMT: &lt;oa&gt;,&lt;alpha&gt;,&lt;scts&gt;,&lt;toa&gt;,&lt;fo&gt;,&lt;pid&gt;,&lt;dcsc&gt;,&lt;sca&gt;,&lt;tosca&gt;,&lt;length&gt;&lt;CR&gt;  &lt;data&gt; (in text mode)</li> <li>• <b>&lt;mt&gt;=3:</b> Class 3 SMS-DELIVERs are routed directly to the most computer using unsolicited result codes defined in <b>&lt;mt&gt;=2</b>. Messages of other classes result in the indication as defined in <b>&lt;mt&gt;=1</b>.</li> </ul> <p><b>&lt;bm&gt;</b> may be one of two values:</p> <ul style="list-style-type: none"> <li>• <b>&lt;bm&gt;=0:</b> No CBM indications are routed to the host.</li> <li>• <b>&lt;bm&gt;=1:</b> New CBMs are routed directly to the host using unsolicited result code:  + CBM: &lt;length&gt;&lt;CR&gt;&lt;LF&gt;  &lt;pdu data&gt; (PDU mode enabled)  or  + CBM: &lt;sn&gt;,&lt;mid&gt;,&lt;dcsc&gt;,&lt;page&gt;,&lt;pages&gt;&lt;CR&gt;&lt;LF&gt;  &lt;message text&gt; (text mode enabled)</li> </ul> <p><b>&lt;ds&gt;</b> may be one of two values:</p> <ul style="list-style-type: none"> <li>• <b>&lt;ds&gt;=0:</b> No SMS-STATUS-REPORTs returned</li> <li>• <b>&lt;ds&gt;=1:</b> SMS-STATUS-REPORTs returned:  + CDS: &lt;length&gt;&lt;CR&gt;&lt;LF&gt;  &lt;pdu data&gt; (PDU mode enabled)  or  + CDS: &lt;fo&gt;,&lt;mr&gt;,&lt;ra&gt;,&lt;tora&gt;,&lt;scts&gt;,&lt;dt&gt;,&lt;st&gt;  (text mode enabled)</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CNMI</b> <b>(continued)</b></p>	<p><b>&lt;bfr&gt;</b> may be one of two values:</p> <ul style="list-style-type: none"> <li>• <b>&lt;bfr&gt;=0</b>: The modem's buffer of unsolicited result codes is flushed to the computer when <b>&lt;mode&gt;=1, 2, or 3</b> is entered. (OK is returned before flushing the codes.)</li> <li>• <b>&lt;bfr&gt;=1</b>: The modem's buffer of unsolicited result codes is cleared when <b>&lt;mode&gt;=1, 2, or 3</b> is entered.</li> </ul> <hr/> <p><i>Note: See <b>+CMGL</b> (page 76–77) and <b>+CMGR</b> (page 78) for details on the listed parameters.</i></p> <hr/>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+COLP[=&lt;n&gt;]</b> <b>+COLP?</b>	<p><b>Connected line identification presentation</b></p> <p>The GSM supports a supplementary service known as COLP (Connected Line Identification Presentation), which enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. It is similar to landline Caller ID, and to the CLI value for incoming GSM calls discussed on page 70.</p> <p><b>+COLP=&lt;n&gt;</b> sets whether the COL value is displayed to the end user. When enabled (and the called subscriber permits it), the modem returns the following values when a call is connected:</p> <p style="padding-left: 40px;"><b>+COLP:</b> &lt;number&gt;,&lt;type&gt;,&lt;subaddr&gt;,&lt;satype&gt;,&lt;alpha&gt;,&lt;validity&gt;</p> <p>The parameter meanings and values are explained in <b>+CLIP</b> on page 70.</p> <p><b>+COLP?</b> returns the current setting in the form:</p> <p style="padding-left: 40px;"><b>+COLP:</b> &lt;n&gt;,&lt;m&gt;</p> <p><b>Supported values</b></p> <p>Set values are either <b>&lt;n&gt;=0</b> to disable presentation of the COL value (the default), or <b>&lt;n&gt;=1</b> to enable it.</p> <p>The returned values from <b>+COLP?</b> include the setting of <b>&lt;n&gt;</b> as well as one of three values for <b>&lt;m&gt;</b>, which is the subscriber COLP service status in the network:</p> <ul style="list-style-type: none"> <li>• <b>&lt;m&gt;=0:</b> COLP not provisioned.</li> <li>• <b>&lt;m&gt;=1:</b> COLP provisioned.</li> <li>• <b>&lt;m&gt;=2:</b> unknown (no network etc.)</li> </ul> <p>As noted above, the returned COL values are explained in <b>+CLIP</b> on page 70.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+COPS=&lt;mode&gt;</b>  <b>[,&lt;format&gt;]</b>  <b>[,&lt;operator&gt;]</b></p> <p><b>+COPS?</b></p> <p><b>+COPS=?</b></p>	<p><b>Operator selection</b></p> <p><b>+COPS=&lt;mode&gt;,&lt;format&gt;,&lt;operator&gt;</b> attempts a forced selection and registration on the GSM network using a particular operator (i.e. GSM service carrier).</p> <p><b>&lt;mode&gt;</b> determines whether the selection is performed automatically by the modem or is forced to the specific operator given in <b>&lt;operator&gt;</b> (using the format specified in <b>&lt;format&gt;</b>, which also applies to further <b>+COPS?</b> commands). The selected <b>&lt;mode&gt;</b> applies to all further network registrations (e.g. after <b>&lt;mode&gt;=2</b>, the modem is unregistered until <b>&lt;mode&gt;=0</b> or <b>1</b> is selected).</p> <hr/> <p><i>Note: Unless <b>&lt;mode&gt;=4</b>, if the selected operator is not available, no other operator is selected.</i></p> <hr/> <p><b>+COPS?</b> returns the current mode and the currently selected operator. If no operator is selected, <b>&lt;format&gt;</b> and <b>&lt;operator&gt;</b> are omitted.</p> <p><b>+COPS=?</b> returns a list of quadruplets, each representing an operator present on the GSM network, follows by a list of supported <b>&lt;modes&gt;</b> and <b>&lt;format&gt;</b>s:</p> <p style="padding-left: 40px;"><b>+COPS: &lt;status&gt;,&lt;loperator&gt;,&lt;soperator&gt;,&lt;noperator&gt;</b>  supported <b>&lt;mode&gt;</b>s,supported <b>&lt;format&gt;</b>s</p> <p>Each quadruplet consists of a <b>&lt;status&gt;</b> integer indicating the availability of the operator, the long <b>&lt;loperator&gt;</b> and short <b>&lt;soperator&gt;</b> alphanumeric names of the operator, and the <b>&lt;noperator&gt;</b> numeric code for the operator. If any of the formats is unavailable, its field is empty (<i>not</i> omitted).</p> <hr/> <p><i>Note: Operators are listed in this order: home network, networks listed in the SIM card, and other networks.</i></p> <hr/>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+COPS</b> (continued)	<p><b>Supported values</b></p> <p><b>&lt;mode&gt;</b> sets how the modem should determine the GSM operator. It can be one of four values:</p> <ul style="list-style-type: none"> <li>• <b>&lt;mode&gt;=0</b>: Automatically (<b>&lt;operator&gt;</b> field is ignored)</li> <li>• <b>&lt;mode&gt;=1</b>: Manually (<b>&lt;operator&gt;</b> field required, no operator selected if not available)</li> <li>• <b>&lt;mode&gt;=2</b>: Deregister from the network.</li> <li>• <b>&lt;mode&gt;=3</b>: Only set the <b>&lt;format&gt;</b> (for the read command <b>+COPS?</b>)—do not attempt registration/deregistration. The <b>&lt;operator&gt;</b> field is ignored.</li> <li>• <b>&lt;mode&gt;=4</b>: Manually if possible (<b>&lt;operator&gt;</b> field is required). If manual selection fails, the modem switches to automatic (<b>&lt;mode&gt;=0</b>).</li> </ul> <p><b>&lt;format&gt;</b> selects which format to use for the <b>&lt;operator&gt;</b> parameter. It can be one of three values:</p> <ul style="list-style-type: none"> <li>• <b>&lt;format&gt;=0</b>: Long format alphanumeric (equivalent to <b>&lt;operator&gt;</b> from <b>+COPS=?</b>).</li> <li>• <b>&lt;format&gt;=1</b>: Short format alphanumeric (equivalent to <b>&lt;soperator&gt;</b>).</li> <li>• <b>&lt;format&gt;=2</b>: numeric (equivalent to <b>&lt;noperator&gt;</b>).</li> </ul> <p><b>&lt;operator&gt;</b> is a string, whose type is determined by the <b>&lt;format&gt;</b> parameter. The long alphanumeric format can be upto 16 characters long, and the short up to 8 characters. The numeric format is the GSM Location Area Identification number (see the standard GSM 04.08[8] subclause 10.5.1.3), in the format:</p> <pre>&lt;country code digit 3&gt;&lt;country code digit 2&gt; &lt;country code digit 1&gt;&lt;network code digit 2&gt; &lt;network code digit 1&gt;</pre> <p><b>&lt;status&gt;</b> returns the status of an operator:</p> <ul style="list-style-type: none"> <li>• <b>&lt;status&gt;=0</b>: Unknown</li> <li>• <b>&lt;status&gt;=1</b>: Available</li> <li>• <b>&lt;status&gt;=2</b>: Current</li> <li>• <b>&lt;status&gt;=3</b>: Forbidden</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CPAS</b></p>	<p><b>Modem activity status</b></p> <p>Returns the activity status of the Sierra Wireless modem in the form: +CPAS: &lt;n&gt;. The command can be used to interrogate the modem before requesting action from the it.</p> <p><b>Supported values</b></p> <p>&lt;n&gt; can have one of six values:</p> <ul style="list-style-type: none"> <li>• &lt;n&gt;=0: Ready to accept commands.</li> <li>• &lt;n&gt;=2: Unknown—may not respond to commands.</li> <li>• &lt;n&gt;=3: Ringing—the modem is ready for commands, but the ringer is active.</li> <li>• &lt;n&gt;=4: Call in progress—the modem is ready for commands, but a call is in progress.</li> </ul>
<p><b>+CPBF=&lt;string&gt;</b></p> <p><b>+CPBF=?</b></p>	<p><b>Find phonebook entries</b></p> <p>Searches the phonebook memory (as selected in <b>+CPBS</b>, see page 90) for the text specified in <b>&lt;string&gt;</b>. Returns all results matching or beginning with <b>&lt;string&gt;</b>, in the following form:</p> <p style="padding-left: 20px;">+CPBF: &lt;index&gt;,&lt;number&gt;,&lt;type&gt;,&lt;text&gt;</p> <p>If more than one entry returns, each one appears on a separate line.</p> <p>The <b>+CPBF=?</b> command returns the maximum lengths of the &lt;number&gt; and &lt;text&gt; parameters, both as integers:</p> <p style="padding-left: 20px;">+CPBF: &lt;nlength&gt;,&lt;tlength&gt;</p> <hr style="border: 1px solid red;"/> <p><i>Note: If +CPBS has set the phonebook memory to use the SIM card, parameter lengths may not be available.</i></p> <hr style="border: 1px solid red;"/>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CPBF</b> <b>(continued)</b>	<p><b>Supported values</b></p> <p><b>&lt;string&gt;</b> is alphanumeric, with a maximum length of <b>&lt;length&gt;</b> as noted above. Returned parameters from searches are:</p> <ul style="list-style-type: none"> <li>• <b>&lt;index&gt;</b>: Integer values indicating the phonebook location of the returned entry.</li> <li>• <b>&lt;number&gt;</b>: A string of type specified in <b>&lt;type&gt;</b>, showing the phone number of the entry.</li> <li>• <b>&lt;type&gt;</b>: The type of address octet in integer format (see GSM 04.08 [8] subclause 10.5.4.7).</li> <li>• <b>&lt;text&gt;</b>: A string of maximum length <b>&lt;length&gt;</b>, with a character set as specified in <b>+CSCS</b> (page 99), indicating the name of the entry.</li> </ul>
<b>+CPBR=&lt;index&gt;</b> <b>[,&lt;index&gt; (etc.)]</b>  <b>+CPBR=?</b>	<p><b>Read phonebook entries</b></p> <p>Similar to <b>+CBPF</b> (page 88), but instead of searching by alphanumeric string, returns phonebook entries from the preferred memory (see <b>+CPBS</b>, page 90) using the specified <b>&lt;index&gt;</b> numbers.</p> <p>All returned values are as discussed in <b>+CPBF</b> on page 88.</p> <p><b>+CPBR=?</b> returns the index location range supported by the current storage as a compound value, and the maximum lengths of the <b>&lt;number&gt;</b> and <b>&lt;text&gt;</b> fields (i.e. <b>&lt;nlength&gt;</b>,<b>&lt;tlength&gt;</b>):</p> <p style="padding-left: 40px;"><b>+CPBF:</b> <b>&lt;indexrange&gt;</b>,<b>&lt;nlength&gt;</b>,<b>&lt;tlength&gt;</b></p> <hr style="border: 1px solid red;"/> <p><i>Note: If <b>+CPBS</b> has set the phonebook memory to use the SIM card, parameter lengths may not be available.</i></p> <hr style="border: 1px solid red;"/>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CPBS=&lt;type&gt;</b></p> <p><b>+CPBS?</b></p>	<p><b>Phonebook memory storage</b></p> <p>Sets which memory type to use for phonebook commands. <b>+CPBS?</b> returns the current storage type in use (a string value), as well as the number of used locations and the total number of locations in the memory (both integers):                      +CPBF: &lt;type&gt;,&lt;used&gt;,&lt;total&gt;</p> <p><b>Supported values</b></p> <p>The following memory types may be set for <b>&lt;type&gt;</b>:</p> <ul style="list-style-type: none"> <li>• <b>&lt;type&gt;=DC:</b> The Sierra Wireless modem’s dialled calls list (<b>+CPBW</b> not applicable—page 91)</li> <li>• <b>&lt;type&gt;=FD:</b> The SIM fixed dialing phonebook</li> <li>• <b>&lt;type&gt;=LD:</b> The SIM last dialing phonebook</li> <li>• <b>&lt;type&gt;=ON:</b> The SIM’s or modem’s “own numbers” (MSISDNs) list</li> <li>• <b>&lt;type&gt;=SM:</b> The SIM phonebook</li> </ul> <hr/> <p><i>Note: If the phonebook memory is set to use the SIM card, parameter lengths may not be available (see <b>+CPBF</b>, <b>+CPBR</b>, and <b>+CPBW</b> commands, pages 88, 89, and 91).</i></p> <hr/>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description																				
<b>+CPBW</b> =[<index>], [<number>] [,<format>] [,<text>]  <b>+CPBW=?</b>	<p><b>Write phonebook entry</b></p> <p>Creates, overwrites, or erases a phonebook entry in the memory specified by <b>+CPBS</b> (see page 90). The parameters are the same as defined in <b>+CPBF</b> (page 88), specifying the phonebook entry number (&lt;index&gt;), the phone number (&lt;number&gt;), the phone number format (&lt;format&gt;), and the text name for the entry (&lt;text&gt;).</p> <p>If &lt;number&gt; and &lt;text&gt; are omitted, the phonebook entry is deleted. If &lt;index&gt; is left out but &lt;number&gt; is provided, a new entry is created in the first free location in the phonebook.</p> <hr/> <p><i>Note: The following characters in &lt;text&gt; must be entered via the escape sequence:</i></p> <table border="1"> <thead> <tr> <th>GSM char.</th> <th>Seq.</th> <th>Seq.(hex)</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>\</td> <td>\5C</td> <td>5C 35 43</td> <td>backslash</td> </tr> <tr> <td>"</td> <td>\22</td> <td>5C 32 32</td> <td>string delimiter</td> </tr> <tr> <td><b>BSP</b></td> <td>\08</td> <td>5C 30 38</td> <td>backspace</td> </tr> <tr> <td><b>NULL</b></td> <td>\00</td> <td>5C 30 30</td> <td>GSM null</td> </tr> </tbody> </table> <p><i>0 (GSM null) may cause problems for application layer software when reading string lengths.</i></p> <hr/> <p><b>+CPBW=?</b> returns the location range supported by the current storage as a compound value, the maximum length of the &lt;number&gt; field, supported number formats of the storage, and the maximum length of &lt;text&gt; field:            +CPBF: &lt;indexrange&gt;,&lt;nlength&gt;,            &lt;typerange&gt;,&lt;tlength&gt;</p> <hr/> <p><i>Note: If +CPBS has set the phonebook memory to use the SIM card, parameter lengths may not be available.</i></p>	GSM char.	Seq.	Seq.(hex)	Note	\	\5C	5C 35 43	backslash	"	\22	5C 32 32	string delimiter	<b>BSP</b>	\08	5C 30 38	backspace	<b>NULL</b>	\00	5C 30 30	GSM null
GSM char.	Seq.	Seq.(hex)	Note																		
\	\5C	5C 35 43	backslash																		
"	\22	5C 32 32	string delimiter																		
<b>BSP</b>	\08	5C 30 38	backspace																		
<b>NULL</b>	\00	5C 30 30	GSM null																		

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description														
<p><b>+CPIN=&lt;pin&gt; [,&lt;newpin&gt;]</b></p> <p><b>+CPIN?</b></p> <hr/> <p><i>Note: When the modem is waiting for a SIM PIN, SIM PUK, or PH-SIM password, it will still accept the +CGMI, +CGMM, +CGMR, +CGSN, emergency call, +CPAS, and +CPIN commands.</i></p> <hr/>	<p><b>Enter PIN</b></p> <p>Sends a PIN (Personal Identification Number) password <b>&lt;pin&gt;</b> to the modem in order to authenticate a command. There are several types of PINs, described below. If no PIN request is pending from the modem, the command returns an error.</p> <p>Certain types of password requests (SIM PUK or SIM PUK2) require a second password <b>&lt;newpin&gt;</b>, which replaces the old PIN in the SIM card.</p> <p>The <b>+CPIN?</b> command returns <b>+CPIN: &lt;code&gt;</b>, indicating which password is required, if any:</p> <table border="0"> <tr> <td><code>&lt;code&gt;=READY</code></td> <td>Modem is not waiting for a PIN.</td> </tr> <tr> <td><code>&lt;code&gt;=SIM PIN</code></td> <td>SIM password.</td> </tr> <tr> <td><code>&lt;code&gt;=SIM PUK</code></td> <td>SIM unblocking.</td> </tr> <tr> <td><code>&lt;code&gt;=PH-SIM PIN</code></td> <td>Password between modem and SIM card (anti-theft).</td> </tr> <tr> <td><code>&lt;code&gt;=PH-SIM PUK</code></td> <td>Unblocking password between modem SIM card (anti-theft).</td> </tr> <tr> <td><code>&lt;code&gt;=SIM PIN2</code></td> <td>SIM password 2. (Only if preceding command was acknowledged with +CME ERROR:17.)</td> </tr> <tr> <td><code>&lt;code&gt;=SIM PUK2</code></td> <td>SIM unblocking password 2. (Only if preceding command was acknowledged with +CME ERROR:18.)</td> </tr> </table>	<code>&lt;code&gt;=READY</code>	Modem is not waiting for a PIN.	<code>&lt;code&gt;=SIM PIN</code>	SIM password.	<code>&lt;code&gt;=SIM PUK</code>	SIM unblocking.	<code>&lt;code&gt;=PH-SIM PIN</code>	Password between modem and SIM card (anti-theft).	<code>&lt;code&gt;=PH-SIM PUK</code>	Unblocking password between modem SIM card (anti-theft).	<code>&lt;code&gt;=SIM PIN2</code>	SIM password 2. (Only if preceding command was acknowledged with +CME ERROR:17.)	<code>&lt;code&gt;=SIM PUK2</code>	SIM unblocking password 2. (Only if preceding command was acknowledged with +CME ERROR:18.)
<code>&lt;code&gt;=READY</code>	Modem is not waiting for a PIN.														
<code>&lt;code&gt;=SIM PIN</code>	SIM password.														
<code>&lt;code&gt;=SIM PUK</code>	SIM unblocking.														
<code>&lt;code&gt;=PH-SIM PIN</code>	Password between modem and SIM card (anti-theft).														
<code>&lt;code&gt;=PH-SIM PUK</code>	Unblocking password between modem SIM card (anti-theft).														
<code>&lt;code&gt;=SIM PIN2</code>	SIM password 2. (Only if preceding command was acknowledged with +CME ERROR:17.)														
<code>&lt;code&gt;=SIM PUK2</code>	SIM unblocking password 2. (Only if preceding command was acknowledged with +CME ERROR:18.)														

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<p><b>+CPWD=&lt;fac&gt;, [&lt;oldpassword&gt;], &lt;newpassword&gt;</b></p> <p><b>+CPWD=?</b></p>	<p><b>Change password</b></p> <p>Sets a new password for the facility lock function defined by the Facility Lock <b>+CLCK</b> command (see page 69).</p> <p><b>+CPWD=?</b> returns a list of pairs which show the available facilities and the maximum length of their passwords:</p> <p style="padding-left: 40px;">+CPWD: &lt;fac&gt;, &lt;passlength&gt;                    &lt;fac&gt;, &lt;passlength&gt;                    etc.</p> <p><b>Supported values</b></p> <p>The <b>+CPWD</b> command generally supports the same values of <b>&lt;fac&gt;</b> shown for the <b>+CLCK</b> command (page 69). However, <b>+CPWD</b> also supports the additional value <b>&lt;fac&gt;=P2</b> for the SIM PIN2, and does <b>not</b> support <b>&lt;fac&gt;=PS, PN, PU, PP, or PC</b>.</p> <p><b>&lt;oldpassword&gt;</b> and <b>&lt;newpassword&gt;</b> are both strings, defining the old password and the new one which is to replace it.</p> <p><b>&lt;passlength&gt;</b> is an integer showing the maximum number of characters permitted for a password for the <b>&lt;fac&gt;</b> shown.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CR=&lt;n&gt;</b></p> <p><b>+CR?</b></p> <hr/> <p><i>Note: This command replaces the V.25ter command Modulation Reporting Control +MR, which is not appropriate for use on the GSM network.</i></p> <hr/>	<p><b>Service reporting control</b></p> <p>Sets whether service type is returned (using the result code +CR: &lt;service&gt;) when the modem has determined which speed and quality of service will be used, but before any error control or data compression reports are transmitted, and before CONNECT is returned.</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0</b> sets the modem not to report the service type.</li> <li>• <b>&lt;n&gt;=1</b> reports service type.</li> </ul> <p><b>+CR?</b> returns the current setting.</p> <p>The &lt;service&gt; parameter in result codes reports:</p> <ul style="list-style-type: none"> <li>• <b>ASYNC</b> asynchronous transparent</li> <li>• <b>SYNC</b> synchronous transparent</li> <li>• <b>REL ASYNC</b> asynchronous non-transparent</li> <li>• <b>REL SYNC</b> synchronous non-transparent</li> </ul> <p>Data compression reporting can be enabled with the +DR command (page 104).</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description												
<p><b>+CRC=&lt;n&gt;</b></p> <p><b>+CRC?</b></p>	<p><b>Cellular result codes for incoming calls</b></p> <p>Sets whether incoming calls or GPRS network requests for PDP context activation indicate a simple RING or a detailed, extended-format result code in the form +CRING: &lt;type&gt;:</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0</b> disables the extended format, returning only RING.</li> <li>• <b>&lt;n&gt;=1</b> enables the extended format in the form +CRING: &lt;type&gt;.</li> </ul> <p><b>+CRC?</b> returns the current setting.</p> <p><b>Supported values</b></p> <p>Incoming calls or PDP context activation requests report the following values for +CRING: &lt;type&gt;:</p> <table border="0"> <tr> <td>&lt;type&gt;=ASYNC</td> <td>asynchronous transparent</td> </tr> <tr> <td>&lt;type&gt;=SYNC</td> <td>synchronous transparent</td> </tr> <tr> <td>&lt;type&gt;=REL ASYNC</td> <td>asynchronous non-transparent</td> </tr> <tr> <td>&lt;type&gt;=REL SYNC</td> <td>synchronous non-transparent</td> </tr> <tr> <td>&lt;type&gt;=FAX</td> <td>facsimile</td> </tr> <tr> <td>&lt;type&gt;=VOICE</td> <td>normal voice</td> </tr> </table> <p>For GPRS context activation, &lt;PDP_type&gt; and &lt;PDP_addr&gt; are as defined in the Define PDP Context (<b>+CGDCONT</b>) command (see page 57).</p>	<type>=ASYNC	asynchronous transparent	<type>=SYNC	synchronous transparent	<type>=REL ASYNC	asynchronous non-transparent	<type>=REL SYNC	synchronous non-transparent	<type>=FAX	facsimile	<type>=VOICE	normal voice
<type>=ASYNC	asynchronous transparent												
<type>=SYNC	synchronous transparent												
<type>=REL ASYNC	asynchronous non-transparent												
<type>=REL SYNC	synchronous non-transparent												
<type>=FAX	facsimile												
<type>=VOICE	normal voice												

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CREG[=&lt;n&gt;]</b></p> <p><b>+CREG?</b></p> <hr/> <p><i>Note: For GPRS data registration status, see +CGREG on page 64.</i></p> <hr/>	<p><b>GSM network registration</b></p> <p>For GSM CSD or voice connections, <b>+CREG=&lt;n&gt;</b> controls the presentation of an unsolicited result code, which appears in one of several forms depending on the value of <b>&lt;n&gt;</b> (or an error if no status is available):</p> <ul style="list-style-type: none"> <li>• When <b>&lt;n&gt;=0</b>, no network registration unsolicited result codes are returned (the default).</li> <li>• <b>+CREG: &lt;stat&gt;</b> (registration status only) is returned when <b>&lt;n&gt;=1</b> and there is a change in the modem's GPRS network registration status.</li> <li>• <b>+CREG: &lt;stat&gt;,&lt;lac&gt;,&lt;ci&gt;</b> (which includes location information) is returned when <b>&lt;n&gt;=2</b> and there is a change of the network cell.</li> </ul> <p><b>+CREG?</b> returns the status of result code presentation and an integer <b>&lt;stat&gt;</b> showing the current status. (Location information elements <b>&lt;lac&gt;</b> and <b>&lt;ci&gt;</b> are returned only when <b>&lt;n&gt;=2</b> and the modem is registered on the network.)</p> <p><b>Returned values</b></p> <p>The possible returned values of <b>&lt;stat&gt;</b> are:</p> <ul style="list-style-type: none"> <li>• 0: not registered; not seeking a new operator</li> <li>• 1: registered, home network</li> <li>• 2: not registered; currently seeking a new operator</li> <li>• 3: registration denied</li> <li>• 4: unknown</li> <li>• 5: registered, roaming</li> </ul> <p><b>&lt;lac&gt;</b> is a string specifying a two-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal).</p> <p><b>&lt;ci&gt;</b> is a string specifying a two-byte cell ID in hexadecimal format.</p>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CRES</b>	<p><b>Restore SMS settings</b></p> <p>Restores the SMS settings of the Sierra Wireless modem for <b>+CMGF</b> (page 75), <b>+CNMI</b> (page 82), and <b>+CSDH</b> (page 100) from settings stored in non-volatile memory.</p> <hr/> <p><i>Note: For information on saving these settings to non-volatile memory, see <b>+CSAS</b> on page 98.</i></p> <hr/>
<b>+CRLP[=&lt;iws&gt;] [,&lt;mws&gt;][,&lt;T1&gt; [,&lt;N2&gt; [,&lt;version&gt;]</b>  <b>+CRLP?</b>  <b>+CRLP=?</b>	<p><b>Radio link protocol</b></p> <p>When originating non-transparent data calls, the <b>+CLRP</b> command sets the Radio Link Protocol (RLP) parameters.</p> <p><b>+CRLP?</b> returns current settings for each supported RLP &lt;version&gt;, each on a separate line, with only RLP parameters applicable to the corresponding &lt;version&gt; on each line returned:</p> <p style="padding-left: 2em;">+CRLP: &lt;iws&gt;,&lt;mws&gt;,&lt;T1&gt;,&lt;N2&gt;,&lt;version&gt;,&lt;T4&gt; +CRLP: &lt;iws&gt;,&lt;mws&gt;,&lt;T1&gt;,&lt;N2&gt;,&lt;version&gt;,&lt;T4&gt; etc.</p> <p><b>+CRLP=?</b> command returns values supported by the modem as a compound value. The RLP parameter value ranges for each &lt;version&gt; are returned on a separate line:</p> <p style="padding-left: 2em;">+CRLP: supported &lt;iws&gt;s, supported &lt;mws&gt;s, supported &lt;T1&gt;s, supported &lt;N2&gt;s, &lt;version&gt;, supported &lt;T4&gt;s +CRLP: supported &lt;iws&gt;s, supported &lt;mws&gt;s, supported &lt;T1&gt;s, supported &lt;N2&gt;s, &lt;version&gt;, supported &lt;T4&gt;s etc.</p> <hr/> <p><i>Note: See also <b>+DS</b> (page 105).</i></p> <hr/>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description																				
<p><b>+CRLP</b> (continued)</p>	<p><b>Supported values</b></p> <p><b>&lt;version&gt;</b> is the RLP version number in integer format, either <b>0</b> or <b>1</b>. If it is not present, <b>&lt;version&gt;=0</b> is the default.</p> <hr/> <p><i>Note: Versions 0 and 1 share the same parameter set. <b>+CRLP?</b> and <b>+CRLP=?</b> return only one line for this set (where <b>&lt;version&gt;</b> is not present).</i></p> <hr/> <p><b>&lt;iws&gt;</b>, <b>&lt;mws&gt;</b>, <b>&lt;T1&gt;</b>, and <b>&lt;N2&gt;</b> are the IWF-to-MS window size, MS-to-IWF window size, acknowledgement timer, and retransmission attempts, respectively. All are integers, and their default values and value ranges depend on the RLP version—see the standard GSM 04.22[18]). However, versions 0 and 1, supported here, share the same parameter values:</p> <table border="1" data-bbox="394 730 1027 895"> <thead> <tr> <th>Param</th> <th>Range</th> <th>Default</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>&lt;iws&gt;</b></td> <td>0–255</td> <td>61</td> <td>interworking window size</td> </tr> <tr> <td><b>&lt;mws&gt;</b></td> <td>0–255</td> <td>61</td> <td>mobile window size</td> </tr> <tr> <td><b>&lt;T1&gt;</b></td> <td>0–255</td> <td>48</td> <td>acknowledgment timer (10 ms increments)</td> </tr> <tr> <td><b>&lt;N2&gt;</b></td> <td>0–255</td> <td>6</td> <td>retransmission attempts</td> </tr> </tbody> </table>	Param	Range	Default	Description	<b>&lt;iws&gt;</b>	0–255	61	interworking window size	<b>&lt;mws&gt;</b>	0–255	61	mobile window size	<b>&lt;T1&gt;</b>	0–255	48	acknowledgment timer (10 ms increments)	<b>&lt;N2&gt;</b>	0–255	6	retransmission attempts
Param	Range	Default	Description																		
<b>&lt;iws&gt;</b>	0–255	61	interworking window size																		
<b>&lt;mws&gt;</b>	0–255	61	mobile window size																		
<b>&lt;T1&gt;</b>	0–255	48	acknowledgment timer (10 ms increments)																		
<b>&lt;N2&gt;</b>	0–255	6	retransmission attempts																		
<p><b>+CSAS</b></p>	<p><b>Save SMS settings</b></p> <p>Saves the current SMS settings for <b>+CMGF</b> (page 75), <b>+CNMI</b> (page 82), and <b>+CSDH</b> (page 100) to non-volatile memory.</p> <hr/> <p><i>Note: For information on restoring these settings to active memory, see <b>+CRES</b> on page 97.</i></p> <hr/>																				

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CSCA=&lt;sca&gt; [,&lt;tosca&gt;]</b> <b>+CSCA?</b>	<p><b>SMS service center address</b></p> <p>Updates the SMSC (SMS Service Center) address, through which mobile originated SMS messages are transmitted from the modem. The setting is used in both PDU and text modes.</p> <hr/> <p><i>Note: &lt;sca&gt; must be set before SMS messages can be sent.</i></p> <hr/> <p>&lt;sca&gt; is a string indicating the service center address, as a GSM 04.11 RP SC address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters.</p> <p>The type of address is given by &lt;tosca&gt;, which is optional. if it is not specified, when the first character of the phone number is + (IRA 43), the default is <b>145</b>; otherwise the default is <b>129</b>.</p> <p><b>+CSCA?</b> returns the current setting.</p>
<b>+CSCS [=&lt;string&gt;]</b> <b>+CSCS?</b>	<p><b>Character set</b></p> <p>Tells the modem which character set is used by the connected computer. The modem can then convert character strings correctly between the character sets in use on the two devices.</p> <p>This command is available for querying and to support GSM standards only. The Sierra Wireless modem supports only the GSM standard character set, &lt;string&gt;=<b>GSM</b>, which is the GSM default alphabet (GSM 03.38 subclause 6.2.1).</p> <p><b>+CSCS?</b> returns the current setting.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CSDH=&lt;n&gt;</b> <b>+CSDH?</b>	<b>Show SMS text mode parameters</b> Controls whether detailed header information is shown in SMS text mode result codes. <n> can be one of two values: <ul style="list-style-type: none"><li>• <b>&lt;n&gt;=0</b>: Do not show responses with optional parameters (detailed headers).</li><li>• <b>&lt;n&gt;=1</b>: Show responses with optional parameters.</li></ul> <b>+CSDH?</b> returns the current setting.

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+CSMP[=&lt;fo&gt;] [,&lt;vp&gt;][,&lt;pid&gt;] [,&lt;dc&gt;]</b>  <b>+CSMP?</b>	<p><b>Set SMS text mode parameters</b></p> <p>In SMS text mode, this command selects values for additional parameters needed when an SMS message is sent to the network or stored in memory.</p> <p>It is possible to set the validity period <b>&lt;vp&gt;</b> starting from when the message is received by the SMSC (<b>&lt;vp&gt;</b> as an integer between 0–255, default 167) or define the absolute time of the validity period termination (<b>&lt;vp&gt;</b> as a time string). The format of <b>&lt;vp&gt;</b> is given by <b>&lt;fo&gt;</b>.</p> <hr/> <p><i>Note: When storing an SMS-DELIVER to the message store in text mode (see <b>+CMGW</b>, page 80), <b>&lt;vp&gt;</b> can be substituted for <b>&lt;scts&gt;</b>.</i></p> <hr/> <p><b>+CSMP?</b> returns the current settings.</p> <p><b>Supported values</b></p> <p>The validity period <b>&lt;vp&gt;</b> determines when an SMS message expires. It can be an integer between 0 and 255 (default 167), or a time string of the form “yy/MM/dd,hh:mm:ss±zz”. Its format is determined by the <b>&lt;fo&gt;</b> parameter.</p> <p>Other parameters are as described for <b>+CMGR</b> on page 78.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+CSMS= &lt;service&gt;</b></p> <p><b>+CSMS?</b></p>	<p><b>SMS message service</b></p> <p>Selects the SMS message service to be used by the Sierra Wireless modem, as specified in <b>&lt;service&gt;</b>. It returns the types of messages supported by the service in the form:</p> <p>+CSMS: &lt;mt&gt;,&lt;mo&gt;,&lt;bm&gt;</p> <ul style="list-style-type: none"> <li>• &lt;mt&gt; for mobile terminated messages</li> <li>• &lt;mo&gt; for mobile originated messages</li> <li>• &lt;bm&gt; for broadcast type messages</li> </ul> <p>For each returned parameter, 0 means that the type is not supported, and 1 that it is supported.</p> <p><b>+CSMS?</b> returns the current service and message types supported, in the form:</p> <p>+CSMS: &lt;service&gt;,&lt;mt&gt;,&lt;mo&gt;,&lt;bm&gt;</p> <p><b>Supported values</b></p> <ul style="list-style-type: none"> <li>• <b>&lt;service&gt;=0</b> GSM 03.40 and 03.41—the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2 version 4.7.0. Phase 2+ features which do not require new command syntax may be supported (e.g. correct routing of messages with new Phase 2+ data coding schemes).</li> <li>• <b>&lt;service&gt;=128</b> SMS PDU mode - TPDU only used for sending/receiving SMSs.</li> </ul> <p><b>&lt;mt&gt;</b>: Mobile Terminated Messages:</p> <ul style="list-style-type: none"> <li>• <b>0</b> Type not supported</li> <li>• <b>1</b> Type supported</li> </ul> <p><b>&lt;mo&gt;</b>: Mobile Originated Messages:</p> <ul style="list-style-type: none"> <li>• <b>0</b> Type not supported</li> <li>• <b>1</b> Type supported</li> </ul> <p><b>&lt;bm&gt;</b>: Broadcast Type Messages:</p> <ul style="list-style-type: none"> <li>• <b>0</b> Type not supported</li> <li>• <b>1</b> Type supported</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+CSTA</b> [=<string>]  <b>+CSTA?</b>	<p><b>Type of address</b></p> <p>Selects the type of number to be used for further dialing commands (<b>D</b>—page 114) according to GSM specifications.</p> <p><b>+CSTA?</b> returns the current setting.</p> <p><b>Supported values</b></p> <p><b>&lt;type&gt;</b> is the type-of-address octet in integer format (see the standard GSM 04.08[8], subclause 10.5.4.7)</p> <p>The default value depends on the format of the dialing string</p> <ul style="list-style-type: none"> <li>• When the string includes the international access code character +, <b>&lt;type&gt;=145</b> by default.</li> <li>• Otherwise, <b>&lt;type&gt;=129</b> by default.</li> </ul>
<b>+CSQ</b>	<p><b>Signal quality report</b></p> <p>Returns the Received Signal Strength Indication (RSSI) and channel Bit Error Rate (BER) from the modem:  <b>+CSQ: &lt;rssi&gt;,&lt;ber&gt;</b></p> <p><b>Returned values</b></p> <p><b>&lt;rssi&gt;</b> is an integer representing a range of RSSI values:</p> <ul style="list-style-type: none"> <li>• 0        -113 dBm or less</li> <li>• 1        -111 dBm</li> <li>• 2-30    -109 through -53 dBm</li> <li>• 31       -51 dBm or greater</li> <li>• 99       not known or not detectable</li> </ul> <p><b>&lt;ber&gt;</b> is an integer representing the percentage of bit errors:</p> <ul style="list-style-type: none"> <li>• 0-7      as RXQUAL values in the table in the standard GSM 05.08[20], subclause 8.2.4</li> <li>• 99       not known or not detectable</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+DR=&lt;n&gt;</b></p> <p><b>+DR?</b></p>	<p><b>V.42bis compression reporting</b></p> <p>Sets whether the V.42bis compression status is returned (using the result code +DR: &lt;type&gt;) before going into the online data state, for either originated or answered calls:</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0</b> sets the modem not to report compression status.</li> <li>• <b>&lt;n&gt;=1</b> reports compression status.</li> </ul> <p>&lt;type&gt; can be one of four values:</p> <ul style="list-style-type: none"> <li>• <b>NONE</b> data compression is not in use</li> <li>• <b>V42B</b> Rec. V42bis is in use in both direction</li> <li>• <b>V42B RD</b> Rec. V42bis is in use in receive direction only</li> <li>• <b>V42B TD</b> Rec. V42bis is in use in transmit direction only</li> </ul> <p><b>+DR?</b> returns the current setting for reporting.</p> <p>Service type reporting can be enabled with the <b>+CR</b> command (page 94). V.42bis compression is controlled by <b>+DS</b> (page 105).</p>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+DS</b> [=<direction>] [,<negotiation>] [,<P1>][,<P2>]  <b>+DS?</b>	<p><b>V.42bis compression control</b></p> <p>Controls the functions of V.42bis data compression. See the GSM 04.22[18] specification for more information.</p> <p><b>Supported values</b></p> <hr/> <p><i>Note: This command must be used in conjunction with command +CRLP (page 97) to enable compression.</i></p> <hr/> <p><b>&lt;direction&gt;</b> Specifies the desired direction(s) of operation of data compression:</p> <ul style="list-style-type: none"> <li>• <b>&lt;direction&gt;=0</b>: negotiated; no compression (V.42bis P0=0).</li> <li>• <b>&lt;direction&gt;=1</b>: transmit only.</li> <li>• <b>&lt;direction&gt;=2</b>: receive only.</li> <li>• <b>&lt;direction&gt;=3</b>: default, both directions, accept any direction (V.42bis P0=11)—the default.</li> </ul> <p><b>&lt;negotiation&gt;</b> specifies whether or not the modem should continue to operate if the desired result is not obtained:</p> <ul style="list-style-type: none"> <li>• <b>&lt;negotiation&gt;=0</b>: Do not disconnect if V.42bis is not negotiated by the remote modem as specified in &lt;direction&gt;. (The default.)</li> <li>• <b>&lt;negotiation&gt;=1</b>: Disconnect if V.42bis is not negotiated by the remote modem as specified in &lt;direction&gt;.</li> </ul> <p><b>&lt;P1&gt;</b> Specifies the maximum number of dictionary entries (512–2048 entries, with 512 as the default) which should be negotiated.</p> <p><b>&lt;P2&gt;</b> Specifies the maximum string length (6–255 bytes, default 20) to be negotiated (V.42bis P2).</p> <p><b>+DS?</b> reports the current settings.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+FCLASS=&lt;n&gt;</b>  <b>+FCLASS?</b>	<b>Fax service class</b>  Sets, reads, or tests the service class of the modem. Putting the modem into a particular mode of operation (data, fax, voice etc.) makes it process information in a manner suitable for that type of information (rather than for other types of information).  <b>+FCLASS?</b> returns the current service class mode.  <b>Supported values</b>  The Sierra Wireless modem supports the following service class settings: <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0</b> data (default)</li> <li>• <b>&lt;n&gt;=1</b> fax class 1 (TIA-578-A)</li> </ul>
<b>+FMI</b>	<b>Fax manufacturer identification</b>  Identifies Sierra Wireless as the manufacturer of the modem, returned as a text string. Equivalent to <b>+CGMI</b> (page 60) and <b>+GMI</b> (page 107).
<b>+FMM</b>	<b>Fax model identification</b>  Identifies the model of Sierra Wireless modem, returned as a text string. Equivalent to <b>+CGMM</b> (page 60) and <b>+GMM</b> (page 107).
<b>+FMR</b>	<b>Fax revision identification</b>  Identifies the firmware revision of the Sierra Wireless modem, returned as a text string. Equivalent to <b>+CGMR</b> (page 61) and <b>+GMR</b> (page 107).
<b>+GCAP</b>	<b>Modem capabilities</b>  Returns a list of the capabilities of the Sierra Wireless modem, using the <b>+CCAP: &lt;name&gt;s</b> response code.

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+GMI</b>	<p><b>Modem manufacturer</b></p> <p>Returns a text string listing Sierra Wireless as the manufacturer of the modem. Equivalent to <b>+CGMI</b> (page 60) and <b>+FMI</b> (page 106).</p>
<b>+GMM</b>	<p><b>Modem model</b></p> <p>Returns a text string identifying the model of Sierra Wireless modem in use. Equivalent to <b>+CGMM</b> (page 60) and <b>+FMM</b> (page 106).</p>
<b>+GMR</b>	<p><b>Current modem firmware version</b></p> <p>Returns a text string identifying the current firmware revision of the Sierra Wireless modem. Equivalent to <b>+CGMR</b> (page 61) and <b>+FMR</b> (page 106).</p>
<b>+GOI</b>	<p><b>Global object identification</b></p> <p>Returns the ISO system Global Object Identification (GOI) of the modem. The general format is defined in ITU-T Recommendation X.208, and the encoding rules in ITU-T Recommendation X.209.</p>
<b>+GSN</b>	<p><b>Modem serial number (IMEI)</b></p> <p>Returns the modem serial number (IMEI) of the Sierra Wireless modem—the same value returned by <b>+CGSN</b> (see page 65).</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+ICF[=&lt;format&gt;] [&lt;parity&gt;]</b>                      (ignored for PCMCIA interface)</p> <p><b>+ICF?</b></p>	<p><b>Local character framing</b></p> <p>Sets or queries the current character framing in use by the modem, as applied for command state. The default is <b>+ICF=3,3</b> (eight data bits, no parity, 1 stop bit).</p> <p><b>+ICF?</b> returns the current settings.</p> <hr/> <p><i>Note: When using the PCMCIA interface, the default (8,N,1) setting persists regardless of how this command is used. It is provided for querying and compatibility only; no action is taken by the modem for the set command, and parameters are ignored.</i></p> <hr/> <p><b>Supported values</b></p> <p><b>&lt;format&gt;</b> may be one of seven values:</p> <ul style="list-style-type: none"> <li>• <b>1</b>      8 data 0 parity 2 stop</li> <li>• <b>2</b>      8 data 1 parity 1 stop</li> <li>• <b>3</b>      8 data 0 parity 1 stop (default)</li> <li>• <b>4</b>      7 data 0 parity 2 stop</li> <li>• <b>5</b>      7 data 1 parity 1 stop</li> <li>• <b>6</b>      7 data 0 parity 1 stop</li> </ul> <p><b>&lt;parity&gt;</b> may be one of four values:</p> <ul style="list-style-type: none"> <li>• <b>0</b>      odd</li> <li>• <b>1</b>      even</li> <li>• <b>2</b>      mark (1)</li> <li>• <b>3</b>      space (0) (default)</li> </ul>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>+IFC</b> [=<by_comp>] [,<by_modem>] <b>+IFC?</b>	<p><b>Local flow control</b></p> <p>Sets or queries the local flow control between the computer and the Sierra Wireless modem in data state.</p> <p><b>Supported values</b></p> <p>&lt;by_comp&gt; specifies the method to be used by the computer to control the flow of received data from the modem:</p> <ul style="list-style-type: none"> <li>• &lt;by_comp&gt;=0: None.</li> <li>• &lt;by_comp&gt;=1: XON/XOFF on transmitted data (XON/XOFF on transmit data); do not pass characters to data stack.</li> <li>• &lt;by_comp&gt;=2: Line 133 (Ready for Receiving)—the default.</li> <li>• &lt;by_comp&gt;=2: XON/XOFF on transmitted data (XON/XOFF on transmit data); pass characters to data stack.</li> </ul> <p>&lt;by_modem&gt; specifies the method to be used by the modem to control the flow of transmitted data from the computer:</p> <ul style="list-style-type: none"> <li>• &lt;by_modem&gt;=0: None.</li> <li>• &lt;by_modem&gt;=1: XON/XOFF on received data.</li> <li>• &lt;by_modem&gt;=2: Line 106: Clear to send (CTS). (<i>Default.</i>)</li> </ul> <p><b>+IFC?</b> returns the current settings.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+ILRR=&lt;n&gt;</b></p> <p><b>+ILRR?</b></p>	<p><b>Local data rate reporting</b></p> <p>Sets or queries whether the local data rate (between computer and modem) is returned using the result code +ILRR: &lt;rate&gt; (between 300 and 115200 bps) before going into online data state, for either originated or answered calls.</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=0</b> sets the modem not to report the local data rate.</li> <li>• <b>&lt;n&gt;=1</b> reports the local data rate.</li> </ul> <p><b>+ILRR?</b> returns the current setting.</p> <p>A fixed local rate may be set with the <b>+IPR</b> command (below).</p>
<p><b>+IPR[=&lt;n&gt;]</b></p> <p><b>+IPR?</b></p>	<p><b>Fixed local data rate</b></p> <p>Sets or queries a fixed local data rate for the local connection (between modem and computer):</p> <ul style="list-style-type: none"> <li>• <b>&lt;n&gt;=[bits per second]</b> sets the data rate. Permitted values are <b>300, 1200, 2400, 9600, 19200, 28800, 38400, 57600,</b> and <b>115200</b> (the default).</li> <li>• <b>&lt;n&gt;=0</b> instructs the modem to use the host's data rate automatically (autobauding).</li> </ul> <hr/> <p><i>Note: When using autobauding, issuing a "ping" <b>AT&lt;CR&gt;</b> command (with no other characters) should yield an OK response. If not, send another <b>AT&lt;CR&gt;</b> to permit the modem to adapt to the host data rate.</i></p> <hr/> <p><b>+IPR?</b> returns the current setting.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>+VTD=&lt;n&gt;</b> <b>+VTD?</b>	<b>Tone duration</b>  Defines the length of tones emitted when using the <b>+VTS</b> command (page 112), with <b>&lt;n&gt;</b> in tenths of a second between 1 and 255. It does not affect the <b>D</b> command (page 114).  If <b>&lt;n&gt;=0</b> the value is set to the default. (See “Factory Default Settings” on page 126.)  <b>+VTD?</b> returns the current setting.

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>+VTS=&lt;DTMF&gt;</b></p> <p>or</p> <p><b>+VTS=&lt;tone1&gt;, &lt;tone2&gt;, &lt;duration&gt;</b></p> <p>or</p> <p><b>+VTS=&lt;DTMF&gt;, &lt;duration&gt;</b></p>	<p><b>DTMF tone generation</b></p> <p>This command allows the transmission of DTMF (Dual Tone Multi-Frequency, also known as Touch-Tone™) tones and other arbitrary tones, such as to access voice mail and other tone-controlled remote systems. The command is separate from <b>D</b> (page 114), which is used only for dialing.</p> <p>The command is write-only, and does not operate in data or fax modes of operation (<b>+FCLASS=0,1,2-7</b>, see page 106).</p> <p><b>Supported values</b></p> <p>The string parameter of the command consists of combinations of the following, separated by commas:</p> <ol style="list-style-type: none"> <li><b>1. +VTS=&lt;DTMF&gt;</b> is a single ASCII character in the set <b>0-9, #, *, A-D</b>. This is interpreted as a single ACSII character whose duration is set by the <b>+VTD</b> command (page 111). In GSM, this command type operates only in voice mode.</li> <li><b>2. +VTS=&lt;tone1&gt;, &lt;tone2&gt;, &lt;duration&gt;</b> is interpreted as a simultaneous dual tone of frequencies &lt;tone1&gt; and &lt;tone2&gt;, lasting for a time &lt;duration&gt; (in 10 ms multiples). This does not operate in GSM.</li> <li><b>3. +VTS=&lt;DTMF&gt;, &lt;duration&gt;</b> is interpreted as a DTMF tone of different duration from that mandated by the <b>+VTD</b> command (page 111). In GSM, this operates only in voice mode.</li> </ol>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<b>AT/</b>	<p><b>Reissue last AT command</b></p> <p>Re-executes the last command string entered. The last-executed command remains in the command buffer until <b>AT</b> is entered again or the modem is reset or power-cycled. <b>AT/</b> will reissue that same command. It executes immediately when the slash (<i>/</i>) is entered.</p> <hr/> <p><i>Note: This command is <b>not</b> preceded by <b>AT</b> and does not require &lt;CR&gt; to terminate.</i></p> <hr/>
<b>A</b>	<p><b>Answer incoming call (or GPRS network request)</b></p> <p><b>GSM mode</b> When operating in <i>GSM voice, CSD, or fax mode</i>, <b>ATA</b> instructs the modem to immediately go off-hook and attempt to establish a connection without waiting for a ring. This is used to answer an incoming call if the auto-answer status register (S0—see page 35) is disabled.</p> <p>The command presumes a RING has been received. If the command is issued without a RING, and the modem is in <i>command state</i>, the modem replies with OK and remains in command state.</p> <hr/> <p><i>Note: If the incoming call is a fax call, the modem must be ready for the fax call before receiving the RING. (See listings beginning on page 106 for information on fax AT commands.)</i></p> <hr/> <p>Once the RING arrives, the modem looks for carrier to negotiate the connection, and either issues:</p> <ul style="list-style-type: none"> <li>• CONNECT and enters data state; or</li> <li>• NO CARRIER and remains in command state.</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>A</b> (continued)</p>	<p><b>GPRS mode</b> When operating in <i>GPRS packet mode</i>, the <b>ATA</b> command answers a network request for a PDP context activation announced by the unsolicited result code RING. The modem responds with CONNECT and enters the V.25ter online data state to initiate a GPRS connection.</p>
<p><i>GSM modes:</i> <b>D</b>[&lt;string&gt;] <b>[gsmmod]</b>[;]</p>	<p><b>Dial outgoing call</b></p> <p><b>GSM mode</b> When operating in <i>GSM voice, CSD, or fax mode</i>, <b>ATD</b> dials the specified characters in order to originate a call.</p> <p><b>dialing digits</b></p> <p>The dial string may consist of the following characters:</p> <ul style="list-style-type: none"> <li>• <b>1 2 3 4 5 6 7 8 9 0 * # + A B C</b></li> <li>• <b>D</b> is ignored</li> </ul> <p><b>Modifier characters</b></p> <p>The following characters may modify the string:</p> <ul style="list-style-type: none"> <li>• <b>,</b> (comma) indicates a pause, with its length specified in the <b>S8</b> status register (see page 124).</li> <li>• <b>&gt;</b> permits direct dialing from phone books. The string following the <b>&gt;</b> character may be an alphanumeric string (to search phone book entries—<b>ATD&gt;&lt;string&gt;</b>), or may specify a particular memory location (<b>ATD&gt;mem&lt;n&gt;</b>), or may specify a numeric entry (<b>ATD&gt;&lt;n&gt;</b>). (See “GSM Voice, Circuit-Switched Data, and Fax Commands (GSM 07.07)” on page 36.)</li> <li>• <b>I i</b> override the CLIR supplementary service subscription default value for this call; <b>I</b> = invocation (restrict CLI presentation) and <b>i</b> = suppression (allow CLI presentation). (See “GSM Voice, Circuit-Switched Data, and Fax Commands (GSM 07.07)” on page 36.)</li> <li>• <b>G g T P ! W @</b> are ignored by the modem. <b>!</b> (hook flash) may be useful when accessing services on the PSTN.</li> </ul>

Table 3-6: Command Reference Table (ASCII Alphabetic)

Command	Description
<b>D</b> ( <i>GSM mode</i> ) (continued)	<p><b>GSM modifiers</b></p> <p><b>&lt;gsmmod&gt;</b> values are <b>I</b> (capital i) to override the current <b>+CLIR</b> setting for the call (see page 71), and <b>G</b> or <b>g</b> for CUG info set with <b>+CCUG</b> (page 51).</p> <p><b>Semicolon for voice origination</b></p> <p>At the end of a dial string, a semicolon (;) originates a voice call to the given address, and the modem immediately returns to command state. For example, <b>ATD&gt;mem3;</b> would make a voice call to phone book memory location 3.</p>
<p><i>GPRS mode:</i>  <b>D</b>*[&lt;<b>GPRSSC</b>&gt;]            *[&lt;<b>address</b>&gt;]            *[&lt;<b>L2P</b>&gt;]            *[&lt;<b>cid</b>&gt;]#</p> <hr/> <p><i>Note: After issuing ATD in GPRS mode, no further AT commands may follow on the command line until the GPRS connection is terminated.</i></p> <hr/>	<p><b>Make GPRS connection</b></p> <p><b>GPRS mode</b> When operating in <i>GPRS packet mode</i>, the <b>ATD</b> command attempts to make a GPRS packet data connection to the Public Data Network (PDN). The <b>+CGDATA</b> command (page 56) performs a similar function.</p> <p>In GPRS mode, <b>D</b> uses the following parameters:</p> <ul style="list-style-type: none"> <li>• <b>&lt;GPRSSC&gt;</b> (GPRS Service Code) is a digit string specifying which kind of GPRS service to use. For example, code <b>98</b> (known as GPRCSC_IP) requests the network to use GPRS with Internet Protocol (PDP types IP and PPP).</li> <li>• <b>&lt;address&gt;</b> enables the modem to automatically set up a virtual call to the specified address after the PDP context has been activated. The format depends on the protocol in use—for IP, it would be a standard IP address of the form xxx.xxx.xxx.xxx, for instance.</li> <li>• <b>&lt;L2P&gt;</b> is a digit string specifying the Layer 2 Protocol to be used—only <b>PPP</b> is supported (see <b>+CGDATA</b> on page 56).</li> <li>• <b>&lt;cid&gt;</b> is a digit string which specifies a particular PDP context definition (see <b>+CGDCONT</b> command on page 57).</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>D (GPRS mode) (continued)</b></p>	<p>If successful, <b>ATD</b> returns a <b>CONNECT</b> message.</p> <p>When the GPRS data connection is terminated, either as a result of an orderly shutdown or an error, the modem returns to command state with <b>NO CARRIER</b> as its final result code.</p> <hr/> <p><i>Note: Usage for &lt;L2P&gt; and &lt;cid&gt; is the same as in <b>+CGDCONT</b>, <b>+CGQREQ</b>, and other related commands (see page 57 and page 63). They may then be used in the modem initialization AT command string to set values for PDP type, APN, QoS, and so on.</i></p> <hr/>
<p><b>DL[;]</b></p>	<p><b>Redial last outgoing number</b></p> <p>Redials the last number entered into the buffer. The number remains in the buffer until <b>ATD</b> is entered again or the modem is reset or power-cycled.</p> <p><b>Semicolon for voice origination</b></p> <p>As for <b>D</b>, at the end of a dial string, a semicolon (<b>ATDL;</b>) originates a voice call to the redialled address, and the modem immediately returns to command state.</p>
<p><b>E[&lt;n&gt;]</b></p>	<p><b>Command echo mode</b></p> <p>Controls echoing of characters received from the host (TE) back to the host when in command state. This also affects framing of responses. (See “Response and Result Framing” on page 28.)</p> <p><b>n</b> may be one of two values:</p> <ul style="list-style-type: none"> <li>• <b>0</b>: Disable echo</li> <li>• <b>1</b>: Enable echo (Default)</li> </ul>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>H[0]</b></p> <hr/> <p><i>Note: The 0 parameter (ATH0) is the only one permitted. It is optional and has no effect on the command.</i></p> <hr/>	<p><b>Hang up (disconnect)</b></p> <p><b>GSM mode</b> When operating in <i>GSM voice, CSD, or fax mode</i>, <b>ATH</b> or <b>ATH0</b> hangs up the call, disconnecting it. The modem goes from online condition to offline condition.</p> <p><b>GPRS mode</b> When operating in <i>GPRS packet mode</i>, the <b>ATH</b> on-hook command may be used to reject a network request for PDP context activation announced by the unsolicited result code RING.</p> <p>The modem responds with OK. If there is no outstanding connection request, the modem responds with ERROR.</p> <hr/> <p><i>Note: This is an extension to the usage of the H command from the V.25ter standard.</i></p> <hr/>
<p><b>I</b></p>	<p><b>Display product identification</b></p> <p>Displays several lines of text describing the manufacturer (Sierra Wireless, Inc.), the modem model, and firmware revision.</p>
<p><b>L (ignored)</b></p>	<p><b>Set speaker loudness</b></p> <p>This command is provided for compatibility reasons; no action is taken by the modem. Parameters are ignored.</p>
<p><b>M (ignored)</b></p>	<p><b>Set speaker mode</b></p> <p>This command is provided for compatibility reasons; no action is taken by the modem. Parameters are ignored.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
<p><b>O[0]</b></p> <p><i>The 0 parameter (AT00) is the only one permitted. It is optional and has no effect on the command.</i></p>	<p><b>Switch from command state to data state</b></p> <p>Switches modem to from online command state to online data state. The modem responds with the normal CONNECT response codes (if enabled) as if the connection were new.</p> <p>If the connection cannot be established, a NO CARRIER or NO ANSWER response results, as appropriate.</p>
<p><b>P (ignored)</b></p>	<p><b>Pulse dialing</b></p> <p>This command is provided for compatibility reasons; no action is taken by the modem. Parameters are ignored.</p>
<p><b>Q[&lt;n&gt;]</b></p>	<p><b>Quiet—suppress result codes</b></p> <p>Controls the return or suppression of result codes to the host computer (TE). There are two values for &lt;n&gt;:</p> <ul style="list-style-type: none"> <li>• <b>0:</b> Result codes are returned from the modem. Default and recommended.</li> <li>• <b>1:</b> Enable Quiet mode, suppressing result codes..</li> </ul> <p>If &lt;n&gt;=0, the modem returns OK. If &lt;n&gt;=1, result codes are suppressed and there is no response.</p>
<p><b>S&lt;n&gt;[=&lt;x&gt;]</b></p> <p><b>S&lt;n&gt;?</b></p>	<p><b>S-Register Set/Query</b></p> <p>Sets (or queries) the contents of the specified S-register &lt;n&gt; to the new value &lt;x&gt;. Zeros are assumed where parameter values are omitted.</p> <p><b>Var. Range</b></p> <p>&lt;n&gt; Valid S-register number (See Table 3-7 on page 121 for values).</p> <p>&lt;x&gt; as determined by the S-register &lt;n&gt;.</p>
<p><b>T (ignored)</b></p>	<p><b>Tone dialing</b></p> <p>This command is provided for compatibility reasons; no action is taken by the modem. Parameters are ignored.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description
V[<n>]	<p><b>Verbose result code format</b></p> <p>Specifies whether the modem displays the result codes in numeric format (non-verbose) or as words (verbose). See page 125 for a numerical list of the result codes.</p> <hr/> <p><i>Note: Numeric codes are returned as ASCII character numerals.</i></p> <hr/> <p>This command also affects framing of responses (see page 28 for details). Settings for &lt;n&gt; are:</p> <ul style="list-style-type: none"> <li>• <b>0</b>: Numeric result codes</li> <li>• <b>1</b>: Verbose result codes (default)</li> </ul> <p><b>Result codes</b></p> <ul style="list-style-type: none"> <li>• If &lt;n&gt;=0, the result code is 0.</li> <li>• If &lt;n&gt;=1, the result code is OK. (The default.)</li> <li>• ERROR or 4 results otherwise, depending on the current state (verbose or not)</li> </ul>
X[<n>]	<p><b>Connection code format and call monitoring</b></p> <p>Enables tone detection options used in the dialing and handshaking process. As options are chosen, the result codes are also affected. The prime function is to control the modem call response capabilities when the <b>ATD</b> (Dial) command (see page 34) is issued.</p> <p><b>Dial tone detection</b></p> <p>When disabled, the modem waits for the period set in register <b>S6</b> (length of pause, see page 123) and dials "blind," without trying to detect a dial tone. When enabled, the modem allows five seconds to receive at least 1 second of dial tone. If none is detected then the result code is <b>NO DIAL TONE</b>.</p>

**Table 3-6: Command Reference Table (ASCII Alphabetic)**

Command	Description																		
<p><b>X</b> (continued)</p>	<p><b>Busy signal detection</b></p> <p>When disabled, the modem waits for the period set in register <b>S7</b> (wait time for connection, see page 124). If no connection is made then the result code is NO CARRIER. When enabled, the modem can return the result code BUSY if detected. For <b>X0</b>, the modem returns CONNECT only, while for other values of <b>&lt;n&gt;</b>, a more detailed CONNECT&lt;text&gt; is returned.</p> <p>Values enable (<b>Y</b>) or disable (<b>N</b>) tone detection and result codes as indicated in the chart below:</p> <table border="1" data-bbox="394 611 804 770"> <thead> <tr> <th>Value</th> <th>Dial Tone</th> <th>Busy Signal</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>N</td> <td>N</td> </tr> <tr> <td>1</td> <td>N</td> <td>N (default)</td> </tr> <tr> <td>2</td> <td>Y</td> <td>N</td> </tr> <tr> <td>3</td> <td>N</td> <td>Y</td> </tr> <tr> <td>4</td> <td>Y</td> <td>Y</td> </tr> </tbody> </table>	Value	Dial Tone	Busy Signal	0	N	N	1	N	N (default)	2	Y	N	3	N	Y	4	Y	Y
Value	Dial Tone	Busy Signal																	
0	N	N																	
1	N	N (default)																	
2	Y	N																	
3	N	Y																	
4	Y	Y																	
<p><b>Z</b></p> <hr/> <p><i>Note: Additional commands on the same line are ignored.</i></p> <hr/>	<p><b>Reset modem to user-defined profile</b></p> <p>The modem disconnects any active call, and then resets the command and register parameters to the defaults stored in the non-volatile memory's user profile by the <b>AT&amp;W</b> command (see page 33).</p>																		

## Status Registers

Some of these registers relate to the call progress timing at the IWF (the interface between the GSM network and the PSTN) with the PSTN connection. These are noted below using the (Remote) tag.

**Table 3-7: S registers**

Reg.	Description	Range	Default	Units
0	<p><b>Number of rings before answer (or accept/reject PDP context activation request)</b></p> <p><b>GSM mode</b> When operating in <i>GSM voice, CSD, or fax mode</i>, the <b>S0</b> status register is used to set the number of rings before automatically answering a call—<b>&lt;n&gt;</b> is a numeric value between 0 and 255 representing the number of rings before pickup. A value of <b>&lt;n&gt;=0</b> deactivates auto-answering.</p>	0–255	000	rings

**Table 3-7: S registers (cont.)**

Reg.	Description	Range	Default	Units
0 (cont.)	<p><b>GPRS mode</b> When operating in <i>GPRS packet mode</i>, the <b>S0</b> status register can be used to set whether the modem automatically accepts incoming PDP context activation requests from the network.</p> <ul style="list-style-type: none"> <li>• If <b>&lt;n&gt;=0</b>, the modem will not automatically accept a network connection request.</li> <li>• If <b>&lt;n&gt;=1</b> or any other greater value, the modem will automatically accept a connection request.</li> </ul> <hr/> <p><i>Note: AT S0=0 does not perform an automatic GPRS detach.</i></p> <hr/> <p><b>Inquiry</b> <b>ATS0?</b> returns the current setting of the register.</p>	0, 1	0	Boolean
3	<p><b>Command line termination character (usually &lt;CR&gt;)</b></p> <p>Sets the standard end-of-line character used to indicate the end of an AT command. This character is also used as the carriage return character for framing responses and result codes in command state. The default and standard line termination character is the carriage return &lt;CR&gt; (ASCII 13).</p>	0–127	013 (CR)	ASCII

Table 3-7: S registers (cont.)

Reg.	Description	Range	Default	Units
4	<p><b>Response formatting character (usually &lt;LF&gt;)</b></p> <p>Sets the standard character sent by the modem to the host at the end of a response or return code in command state. The default and standard response-end character is the line feed &lt;LF&gt; (ASCII 10).</p>	0–127	010 (LF)	ASCII
5	<p><b>Command line editing character (usually &lt;BS&gt;)</b></p> <p>Sets the standard character used to backspace when editing on the command line. The default and standard response-end character is the backspace &lt;BS&gt; (ASCII 8).</p>	0–127	008 (BS)	ASCII
6	<p><b>Length of pause before dialing (ignore dial tone)</b></p> <p>This register denotes the wait time (between 2 and 10 seconds) before a blind dial, with no dial tone detection. The default value is <b>&lt;n&gt;=2</b> seconds.</p> <p>The value of ATS6 is used when the ATX command is set to 1 or 3. (See “X&lt;n&gt;” on page 35.) ATX settings of 2 and 4 enable dial tone detection and disable blind dialing. Therefore, when X is set to 2 or 4, the value of S6 is ignored.</p>	0–255	002	seconds

**Table 3-7: S registers (cont.)**

Reg.	Description	Range	Default	Units
7	<p><b>Wait time for connection</b></p> <p>This register sets the limit, between 1 and 255 seconds, for how long the modem will wait for a carrier signal from a remote modem before hanging up. The default value is <b>&lt;n&gt;=50</b> seconds.</p>	1–255	060	seconds
8	<p><b>Length of comma pause</b></p> <p>This command is provided for compatibility reasons; no action is taken by the modem. Parameters are ignored.</p>	0–255	002	seconds
10	<p><b>Carrier detection and carrier loss delay</b></p> <p>Specifies how long the carrier from a remote modem can be absent before the modem disconnects (between 0 and 255 seconds). Longer delays allow temporary disruptions to the carrier without disconnecting. Shorter delays detect dropped carriers more efficiently when the connection is good.</p> <p>The default value is <b>&lt;n&gt;=15</b> seconds. A setting of <b>&lt;n&gt;=255</b> causes the modem to disable carrier detection and presume the carrier is always present.</p>	1–255	015	0.1 s

## Result Codes

The Sierra Wireless modem returns result codes when AT commands are entered. These result codes can be numeric or verbose (English language), as described beginning on page 27 of this document. The available codes are described in the following sections.

### Basic Result Codes

This table provides a numerical list of the standard result codes possible.

**Table 3-8: Result codes**

Code	Verbose	Meaning
0	OK	Command executed without errors
1	CONNECT	Connected at any of the supported speeds.
2	RING	Alerting Signal (Ring) signal received from the network.
3	NO CARRIER	Carrier signal lost or not detected. Unable to activate the service.
4	ERROR	Command not recognized or could not be executed. Illegal command. Error in command line. Command line exceeds buffer size. Parameters out of range.
6	NO DIAL TONE	Dial tone not detected within timeout and subsequent commands not processed.
7	BUSY	Reorder (Busy) signal detected and subsequent commands not processed.

**Table 3-8: Result codes**

Code	Verbose	Meaning
8	NO ANSWER	Five seconds of silence not detected after ring back when “@” (quiet answer) dial modifier is used.

## Factory Default Settings

**&F** (Reset modem to factory default) restores these settings, overwriting any that currently differ from the factory defaults.

**Table 3-9: Profile settings**

Command	Description	Factory
<b>&amp;C</b>	Data carrier detect (DCD) options	1
<b>&amp;D</b>	Data terminal ready (DTR) options	2
<b>+CAOC</b>	Advice of charge	1
<b>+CBST</b>	Select bearer service type	7,0,1
<b>+CCUG</b>	Closed user group control	0,0,0
<b>+CCWA</b>	Call waiting control	0
<b>+CLIP</b>	Calling line identification presentation	0
<b>+CLIR</b>	Calling line identification restriction	0
<b>+CMEE</b>	Report mobile equipment error	0
<b>+CMGF</b>	Select SMS message format	0
<b>+CNMI</b>	New SMS message indications	2,1,0,0,0

**Table 3-9: Profile settings (cont.)**

Command	Description	Factory
<b>+COLP</b>	Connected line identification presentation	0
<b>+CR</b>	Service reporting control	0
<b>+CRC</b>	Cellular result codes for incoming calls	0
<b>+CREG</b>	GSM network registration	0
<b>+CRLP</b>	Radio link protocol	61,61,48,6,1,3
<b>+CSDH</b>	Show SMS text mode parameters	0
<b>+CSMS</b>	SMS message service	0
<b>+DR</b>	V.42bis compression reporting	0
<b>+DS</b>	V.42bis compression control	3,0,512,20
<b>+FCLASS</b>	Fax service class	0
<b>+ICF</b>	Local character framing	3,3
<b>+IFC</b>	Local flow control	2,2
<b>+ILRR</b>	Local data rate reporting	0
<b>+IPR</b>	Fixed local data rate	115200
<b>E</b>	Command echo mode	1
<b>L</b>	Set speaker loudness (ignored)	0
<b>M</b>	Set speaker mode (ignored)	0
<b>Q</b>	Quiet—suppress result codes	0
<b>V</b>	Verbose result code format	1

**Table 3-9: Profile settings (cont.)**

Command	Description	Factory
X	Connection code format and call monitoring	4
<b>S registers</b>		
S0	Number of rings before answer (or accept/reject PDP context activation request)	0 (disabled)
S3	Command line termination character (usually <CR>)	013 (CR)
S4	Response formatting character (usually <LF>)	010 (LF)
S5	Command line editing character (usually <BS>)	008 (BS)
S6	Length of pause before dialing (ignore dial tone)	002 (2 seconds)
S7	Wait time for connection	060 (60 seconds)
S8	Length of comma pause	002 (2 seconds)
S10	Carrier detection and carrier loss delay	015 (1.5 seconds)

# Appendix A: ASCII Table **A**

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
<b>NUL</b>	0	00	<b>DC4</b>	20	14	(	40	28
<b>SOH</b>	1	01	<b>NAK</b>	21	15	)	41	29
<b>STX</b>	2	02	<b>SYN</b>	22	16	*	42	2A
<b>ETX</b>	3	03	<b>ETB</b>	23	17	+	43	2B
<b>EOT</b>	4	04	<b>CAN</b>	24	18	,	44	2C
<b>ENQ</b>	5	05	<b>EM</b>	25	19	-	45	2D
<b>ACK</b>	6	06	<b>SUB</b>	26	1A	.	46	2E
<b>BEL</b>	7	07	<b>ESC</b>	27	1B	/	47	2F
<b>BS</b>	8	08	<b>FS</b>	28	1C	<b>0</b>	48	30
<b>HT</b>	9	09	<b>GS</b>	29	1D	<b>1</b>	49	31
<b>LF</b>	10	0A	<b>RS</b>	30	1E	<b>2</b>	50	32
<b>VT</b>	11	0B	<b>US</b>	31	1F	<b>3</b>	51	33
<b>FF</b>	12	0C	<b>SP</b>	32	20	<b>4</b>	52	34
<b>CR</b>	13	0D	<b>!</b>	33	21	<b>5</b>	53	35
<b>SO</b>	14	0E	<b>“</b>	34	22	<b>6</b>	54	36
<b>SI</b>	15	0F	<b>#</b>	35	23	<b>7</b>	55	37
<b>DLE</b>	16	10	<b>\$</b>	36	24	<b>8</b>	56	38
<b>XON</b>	17	11	<b>%</b>	37	25	<b>9</b>	57	39
<b>DC2</b>	18	12	<b>&amp;</b>	38	26	<b>:</b>	58	3A
<b>XOFF</b>	19	13	<b>'</b>	39	27	<b>;</b>	59	3B

# GSM/GPRS AT Command Reference

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
<	60	3C	<b>S</b>	83	53	j	106	6A
=	61	3D	<b>T</b>	84	54	k	107	6B
>	62	3E	<b>U</b>	85	55	l	108	6C
?	63	3F	<b>V</b>	86	56	m	109	6D
@	64	40	<b>W</b>	87	57	n	110	6E
<b>A</b>	65	41	<b>X</b>	88	58	o	111	6F
<b>B</b>	66	42	<b>Y</b>	89	59	p	112	70
<b>C</b>	67	43	<b>Z</b>	90	5A	q	113	71
<b>D</b>	68	44	[	91	5B	r	114	72
<b>E</b>	69	45	\	92	5C	s	115	73
<b>F</b>	70	46	]	93	5D	t	116	74
<b>G</b>	71	47	^	94	5E	u	117	75
<b>H</b>	72	48	_	95	5F	v	118	76
<b>I</b>	73	49	'	96	60	w	119	77
<b>J</b>	74	4A	a	97	61	x	120	78
<b>K</b>	75	4B	b	98	62	y	121	79
<b>L</b>	76	4C	c	99	63	z	122	7A
<b>M</b>	77	4D	d	100	64	{	123	7B
<b>N</b>	78	4E	e	101	65		124	7C
<b>O</b>	79	4F	f	102	66	}	125	7D
<b>P</b>	80	50	g	103	67	~	126	7E
<b>Q</b>	81	51	h	104	68	<b>DEL</b>	127	7F
<b>R</b>	82	52	i	105	69		128	80





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