



**AirCard 402 Modem with**



# **User Guide (Windows)**



2131145  
Rev 1.0

## Important Notice

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

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- Where explosive atmospheres may be present
- Near medical equipment
- Near life support equipment, or any equipment that may be susceptible to any form of radio interference. In such areas, the Sierra Wireless modem **MUST BE POWERED OFF**. The Sierra Wireless modem can transmit signals that could interfere with this equipment.

Do not operate the Sierra Wireless modem in any aircraft, whether the aircraft is on the ground or in flight. In aircraft, the Sierra Wireless modem **MUST BE POWERED OFF**. When operating, the Sierra Wireless modem can transmit signals that could interfere with various onboard systems.

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

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5,515,013	5,629,960	5,845,216	5,847,553	5,878,234
5,890,057	5,929,815	6,169,884	6,191,741	6,199,168
6,339,405	6,359,591	6,400,336	6,516,204	6,561,851
6,643,501	6,653,979	6,697,030	6,785,830	6,845,249
6,847,830	6,876,697	6,879,585	6,886,049	6,968,171
6,985,757	7,023,878,	7,053,843	7,106,569	7,145,267
7,200,512	7,287,162	7,295,171	D442,170	D459,303
D559,256	D560,911			

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Web:	<a href="http://www.sierrawireless.com">www.sierrawireless.com</a>	

## Additional information and updates

For up-to-date product descriptions, documentation, application notes, [firmware](#) upgrades, troubleshooting tips, and press releases, visit [www.sierrawireless.com](http://www.sierrawireless.com).

# >> Table of Contents

<b>Introducing the AirCard 402 modem</b> .....	<b>9</b>
Welcome .....	9
Feature summary .....	10
Wireless modem .....	10
TRU-Install .....	10
TRU-Locate .....	10
CDMA 3G services .....	11
Additional features of the modem .....	12
Package contents .....	12
System components .....	12
Your host computing device .....	13
The ExpressCard/PC Card modem .....	13
The modem drivers and enabling software .....	13
CDMA service provider account .....	14
The CDMA wireless network .....	14
Care and maintenance of your modem .....	15
<b>Getting Started</b> .....	<b>17</b>
The AirCard 402 software .....	17
Account activation and configuration .....	17
<b>Installation</b> .....	<b>19</b>
System requirements .....	19
Installing the modem and software .....	19
Removing the modem .....	23
Attaching an external antenna .....	23

<b>Activation</b> .....	<b>25</b>
Account configuration procedures.....	25
Activation Wizard .....	25
Manual activation .....	26
<b>Watcher Basics</b> .....	<b>27</b>
Starting and closing Watcher .....	27
Components of the Watcher window.....	28
Window controls .....	29
Docking .....	29
Always On Top .....	29
Interpreting icons .....	30
Connection Status Area .....	30
Call Status Area .....	31
Indicator area .....	32
Minimized icons .....	32
GPS Monitor window .....	33
Online Help .....	34
Warranty.....	34
Troubleshooting .....	35
<b>Technical Specifications</b> .....	<b>37</b>
LED operation .....	37
Radio frequency and electrical specifications .....	38
Environmental specifications .....	39
<b>Regulatory Information</b> .....	<b>41</b>
Important safety/compliance information .....	41
Information pertaining to OEM customers .....	43
<b>Glossary</b> .....	<b>45</b>

**Index .....49**





# 1: Introducing the AirCard 402 modem

- [Welcome](#)
- [Feature summary](#)
- [Package contents](#)
- [System components](#)
- [Care and maintenance of your modem](#)

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*Note: This document applies to you, only if your wireless card is the AirCard 402 modem from Sierra Wireless.*

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## Welcome

The Sierra Wireless AirCard 402 modem is a dual-band wireless ExpressCard/PC Card modem for cellular and [PCS](#) networks, and the [GPS](#) frequency band. The modem enhances the functionality of your mobile computing device by adding 2-way messaging and high-speed mobile data in extended areas, compared to wireless local area networks.

This modem allows you to do the following (subject to feature availability), without using a wireline phone or network:

- Connect to the Internet, [VPN](#) and corporate networks
- Send and receive large e-mail messages
- Send and receive [SMS](#) messages
- Use location-based services
- Conduct video-conferencing
- Access streaming, real-time media
- Play games online

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*Note: You can view this guide online or print it to keep on hand. If you're viewing it online, simply click a topic in the Table of Contents, or a page number in the Index, or any page reference or section reference. (Most text that is blue is a clickable link.) The PDF automatically displays the appropriate page.*

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*Note: For step-by-step instructions to access features of the modem, consult the [online help](#) available with the Watcher<sup>®</sup> software (page 34).*

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## Feature summary

The ExpressCard/PC Card is designed to provide a wide range of capabilities using [CDMA](#) network technology. Implementation of these features depends on the particular service provider and account features you have chosen.

Some features described in this manual may not be supported by your service provider or may not be available with your network account. For details of the services and accounts available, contact your service provider.

### Wireless modem

Once installed and configured, the modem can connect to the [CDMA](#) network automatically. You just insert the modem, allow Watcher to autolaunch and authenticate your account on the network, then launch your Internet browser (which you can also configure in Watcher to launch automatically)—you're online!

Alternatively, you can make a high-speed data connection without running Watcher—simply by launching whatever application you want to use (such as your web browser or e-mail application). For details, see the [online help](#) topic "Autoconnect behaviour".

The modem also allows you to dial up a modem (such as a corporate server).

### TRU-Install

TRU-Install™ is a Sierra Wireless feature that installs the necessary software and drivers the first time you insert the modem into your computer. An installation CD is not required.

### TRU-Locate

With TRU-Locate™, you can use location-based services (GPS) to query, for example, the network for information on points of interest (POI) that are near your current location, or display driving instructions.

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*Note: TRU-Locate is subject to feature availability.*

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Your modem requires an unobstructed view of GPS satellites (in the sky), and, like any other GPS device, might not perform well within forested areas or near tall buildings.

Depending on your account, you may be charged for each position fix or after you have performed a certain number of fixes. For details, contact your service provider.

Depending on the mechanism that the network and your modem use to obtain location information, GPS may not be supported:

- If Network Mode is set to "EVDO Only"
- If you're roaming
- If you do not have network coverage
- Due to other reasons.

If you're having problems using GPS, contact your service provider.

## CDMA 3G services

The modem operates over a type of wireless network called **CDMA** (Code Division Multiple Access).

CDMA 3G technology provides a variety of connectivity features, depending on your service provider and account:

- **1x-EVDO Rev. A** supports Internet connections with data rates up to 3.1 **Mbps** (downlink from the network) and 1.8 **Mbps** (uplink to the network). Average data rates are 450-800 **Kbps** (downlink from the network) and 300-400 **Kbps** (uplink to the network). Actual speed depends on the network conditions.
- **1x-EVDO Rev. 0** supports Internet connections with data rates up to 2.4 **Mbps** (downlink from the network) and 153 **Kbps** (uplink to the network). Average data rates are 400-700 **Kbps** (downlink from the network) and 40-80 **Kbps** (uplink to the network). Actual speed depends on the network conditions.
- **1X** supports Internet connections with data rates up to 153 **Kbps**. Actual speed depends on the network conditions.

Once the connection is established, you can open your browser and connect to any web site that is accessible through the Internet, or access other Internet services (such as e-mail).

The connection is "active" when data transmission is occurring. If data transmission stops for a period of time (determined by the network), the connection becomes dormant.

- Circuit switched (dial-up) data, using the earlier [CDMA IS-95](#) specification, supports data connections to any dial-in service at rates up to 14.4 [Kbps](#).
- QNC (Quick Net Connect) provides a simplified way to dial into an Internet connection (using circuit switched data) where 3G (1xEV-DO or 1X) high-speed [packet](#) service is not available.
- [SMS](#) (Short Message Service) allows you to send and receive short text messages using the modem.

## Additional features of the modem

Beyond the features of the [CDMA](#) network, the modem provides additional software features:

- PIN security code to protect your modem and account from unauthorized use.
- A wizard to assist with activating your CDMA account.
- Sound options to customize ringtones for SMS messages.
- A Call Log to track outgoing calls and determine the amount of data transferred.

## Package contents

Your package contains the following items:

- AirCard 402 modem
- Quick Start Guide

To install the modem drivers and software, you do not need an installation CD. Your modem uses the Sierra Wireless TRU-Install feature. The drivers and software are installed when you insert the modem into your computer and go through the software installation; an installation CD is not required.

## System components

Your modem is just one part of a system designed to provide you with a wide range of communication features. Every component of the system is needed to enable these capabilities.

## Your host computing device

Your notebook or desktop computer hosts the modem hardware and runs the communication software: your web browser or e-mail application, and Watcher—the enabling software for the modem.

You may also have other software on your computer that can be used wirelessly with the modem, such as: file transfer applications (FTP), chat or instant messaging, a [VPN](#) (Virtual Private Network) client, client software for a corporate server application.

## The ExpressCard/PC Card modem

The modem provides your computer with a connection to the CDMA wireless network.

The modem fits into a standard ExpressCard/34 or ExpressCard/54 slot or, when used in the card adapter, into a PC Card slot available on most notebook and desktop computers.

Every [CDMA](#) network operates on one of three radio frequency bands. As a dual-band product, the modem operates on two of these bands (see [page 38](#)), providing a wide coverage area.

## The modem drivers and enabling software

The modem drivers and enabling software (Watcher) monitor and manage your wireless connections.

Your modem uses the Sierra Wireless TRU-Install feature—the drivers and software are installed when you insert the modem into your computer.

The device driver software enables the modem to work with your computer's operating system.

Using the Watcher software, you can manage the modem and monitor your connections.

For step-by-step instructions to access features of Watcher, use the application's [online help](#).

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*Note: You can use the Lock Modem feature to prevent others from using your account, should your modem be stolen.*

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*Note: More information about [CDMA](#) networks is available on the CDMA Development Group web site, [www.cdg.org](http://www.cdg.org).*

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*Note: Most service providers have coverage maps on their web sites.*

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*Note: The fee for service is usually higher when you are roaming (connecting to a network other than the one belonging to your service provider).*

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## CDMA service provider account

Companies that operate [CDMA](#) networks and provide access to these networks are called *service providers*. To use the modem, you must have an account with a CDMA service provider.

Each service provider has its own pricing options. There may be flat rate accounts, which provide you a maximum number of minutes of network usage for a fixed monthly fee. There may be accounts for which you are charged for network usage by the minute or by the amount of data transmitted.

Your account may include a variety of other services such as SMS messaging or location-based services.

Each modem has been provisioned at the factory for use with a particular service provider. This sets the modem to use particular radio channels and enables services specific for that provider.

The process of setting up your account is called *activation*. Activation involves action by the service provider and configuration of the modem.

The procedure to configure (activate) your modem is covered in "[Activation](#)" on page 25.

## The CDMA wireless network

This is the worldwide infrastructure providing the radio coverage that allows you to stay connected. Made up of radio towers and a variety of network switches, routers, and servers, the network is an interconnection of many service providers.

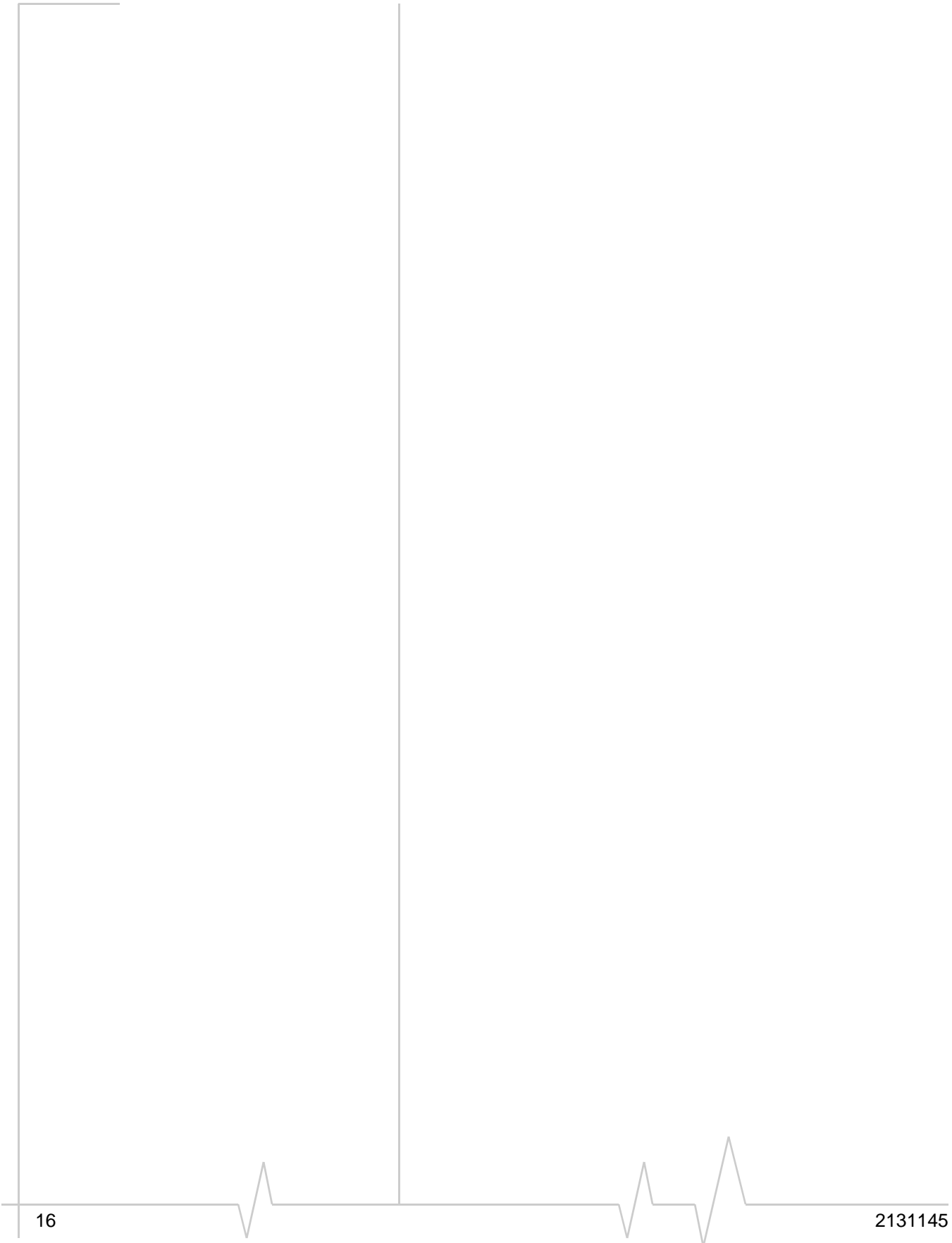
There are [CDMA](#) networks that operate in the frequency bands supported by the modem throughout North America and parts of Latin America, Asia, and New Zealand. However, each service provider operates a network that covers a limited geographical area within the overall CDMA coverage area.

Most service providers have "[roaming](#)" agreements with other service providers, so that they can offer service outside of the coverage area of their own networks. For example, assuming you live in Vancouver (Canada), and travel frequently to Seattle (United States), you can obtain an account with a Vancouver service provider that has a roaming agreement with a service provider in Seattle. You would then have local service in Vancouver, and roaming service in Seattle.

## Care and maintenance of your modem

As with any electronic device, the modem must be handled with care to ensure reliable operation. Follow these guidelines in using and storing the modem:

- Do not apply adhesive labels to the modem or card adapter. This may cause the modem or card adapter to become jammed inside the card slot.
- The modem should fit easily into your ExpressCard/PC Card slot. Forcing the modem into a slot may damage connector pins.
- When inserting or removing the modem, always grip it by the sides rather than the top (see the drawings on [page 23](#)).
- Protect the card from liquids, dust, and excessive heat.
- When not installed in your computer, store the modem in its carry case





## 2: Getting Started

- [The AirCard 402 software](#)
- [Account activation and configuration](#)

Before you can begin using the modem, you must:

1. Insert the modem, to install the enabling software and drivers.
2. Activate an account and configure the modem to use your account (unless the modem has been pre-activated).

This section provides an overview of this process.

### The AirCard 402 software

The modem comes with the following software:

- Watcher application that you use to manage the modem and monitor your connections on your computer
- The driver software that provides the interface between the modem and your Windows operating system

Detailed instructions for installing the modem and its software are provided in [“Installation”](#) on page 19.

### Account activation and configuration

To use the modem, you must have an account with a [CDMA](#) service provider. The process of setting up an account is called *activation*.

If you purchased the modem directly from a service provider, you may already have an account; your modem may be pre-activated.

Otherwise, run the Watcher software and the Activation Wizard, which guides you through the activation and configuration process. (Depending on your configuration, the software and the activation procedure may start automatically.)

Configuring the modem involves setting the phone number assigned by your service provider and may involve entering other network parameters and settings such as a user name and password to access services.

Your service provider may need to know:

- The billing information to use to collect payment for your network usage.
- The **ESN** (Electronic Serial Number) or **MEID** (Mobile Equipment Identifier) assigned to your modem during the manufacturing process. (The ESN or MEID is printed on a label on the modem and can be displayed in the software.) This number is used to help authenticate your account when you connect for service.

You require from your service provider:

- An activation code that gives you access to configure the account.
- A phone number for your modem.
- Additional information specific to your service provider such as:
  - A user ID (username) and password to authenticate your network connection.
  - A SID (System Identifier) that identifies your home network area and is used together with your phone number to determine if you are “home” or “**roaming**”.

## 3: Installation

- System requirements
- Installing the modem and software
- Removing the modem
- Attaching an external antenna

This chapter guides you through the steps necessary to install the modem on a notebook or desktop computer.

The basic steps are:

1. Insert the modem into the ExpressCard/PC Card slot to install the modem drivers and software.
2. If the modem has not been pre-activated, use the Activation Wizard to configure the modem (as described in “Activation” on page 25).

Before you begin the installation process, ensure your computer meets the requirements described below.

### System requirements

The modem is supported on notebook and desktop computers running:

- Windows Vista
- Windows XP (Home and Professional versions) with Service Pack 2 or later
- Windows 2000 with Service Pack 4 and Update Rollup 1

To install the modem, you require one of the following slots:

- ExpressCard/34
- ExpressCard/54
- Type II PC Card slot.

### Installing the modem and software

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*Note: If you're running Windows XP, you may require administrative privileges, depending on the Windows XP installation. If you're running Windows Vista or Windows 2000, you must be logged in with administrative privileges to install the modem software. If you're running Windows 2000, your computer might be restarted, as part of the installation process; save any open documents.*

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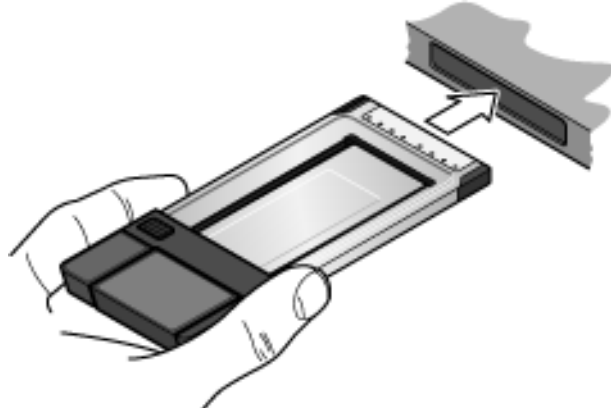
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*Note: Do not forcefully insert the modem. This may damage the connector pins.*

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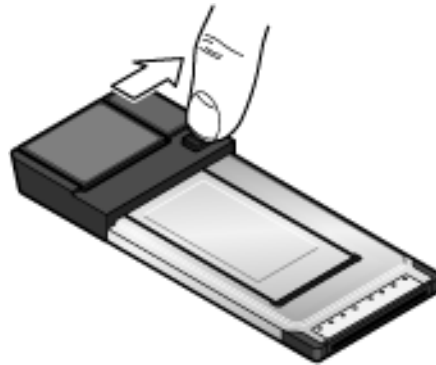
To install Watcher and the modem drivers:

1. If your computer has a WiFi or Bluetooth adapter, turn it off. (For instructions, see the user guide or online Help of your computer).
2. If your computer has a PC Card slot, grip both sides of the card adapter and insert the modem and card adapter into your computer (modem label facing up); proceed to [step 6 on page 21](#).



If your computer has an ExpressCard slot, remove the modem from the card adapter, as described below.

3. Slide and hold the locking tab in the indicated direction.



4. Holding the locking tab, use your other hand to free the modem from the card adapter.

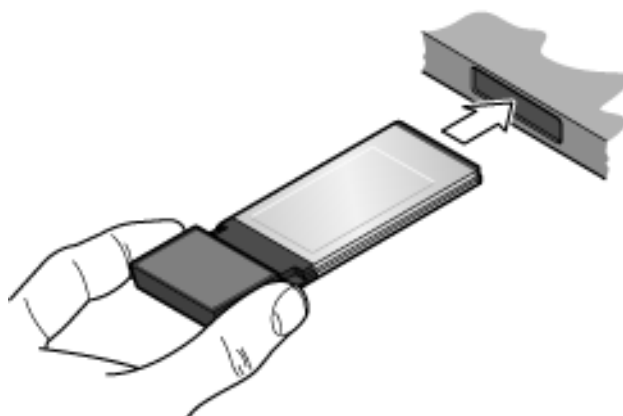



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*Note: Do not forcefully insert the modem. This may damage the connector pins.*

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5. Gripping both sides of the modem, insert it into your computer (modem label facing up).

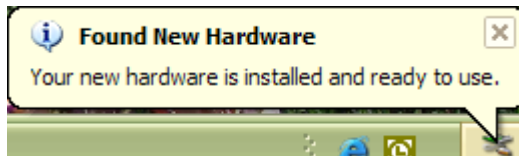



6. If the TRU-Install window is not displayed, in Windows Explorer browse to the  TRU-Install entry (under **My Computer**), then browse to the **Win** folder and run **Setup.exe**; alternatively, if you're running Windows Vista and the AutoPlay window is displayed, click **Run setup.exe**.
7. In the TRU-Install window, click **OK**.
8. In the "Welcome to the InstallShield Wizard" window, select **Install** to launch the InstallShield<sup>®</sup> Wizard.

9. If the Open With... window appears, cancel the installation (your computer is missing some files required for the installation). Search for Instmsiw.exe (if you're running Windows 2000) among the downloads at [www.microsoft.com](http://www.microsoft.com). Install the file on your computer, remove the modem from your computer, then rerun the installation.
10. If the Ikernel Application Error window appears:
  - a) Cancel the installation.
  - b) Download the file:  
<http://support.installshield.com/kb/files/Q108312/ikernelupdate.exe>.
  - c) Install the file on your computer, remove the modem from your computer (see [page 23](#)), then rerun the installation.

11. Use the **Next** and **Back** buttons to navigate through the wizard noting the following:
  - To proceed with the installation, you must click **I accept the terms in the license agreement** to indicate your acceptance of the terms of the license agreement.


Windows detects the modem and installs the drivers for it. This may take a few minutes. Once completed, the [system tray](#) may display the message "Your devices are ready to use" or "Your new hardware is installed and ready to use":

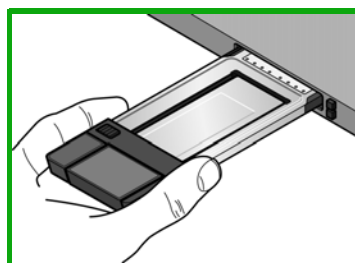


12. If you are prompted to restart your computer:
  - a) Save any open documents.
  - b) Select the option to restart your computer.
  - c) Wait until your computer restarts and Windows is ready.
13. When you are notified that the installation is complete, click **Finish**.
14. If Watcher has not started automatically, start it: double-click the Watcher icon  on your desktop.
15. Proceed to configure the modem to use your account (if it was not pre-activated). See "[Activation](#)" on page 25.

## Removing the modem

To remove the modem:

1. Close Watcher if it is open.
2. If you're running Windows 2000, click the Unplug or Eject Hardware icon  in the [system tray](#), and click the entry for NEC PCI to USB Open Host Controller or Standard Enhanced PCI to USB Host Controller. If a dialog box appears notifying you that it is safe to remove the device, click **OK**.
3. Use the ejector (located on your computer, next to the ExpressCard/PC Card slot) to remove the modem from the slot. Pull the modem out of the slot by gripping both sides of the modem and pulling the modem straight out.



Correct



Incorrect

## Attaching an external antenna

You can improve the signal strength by attaching an external antenna with a TS9 connector (sold separately). The recommended antenna is the 6-band blade antenna with TS9 connector, available from [www.sierrawireless.com](http://www.sierrawireless.com) (part number 6000342).

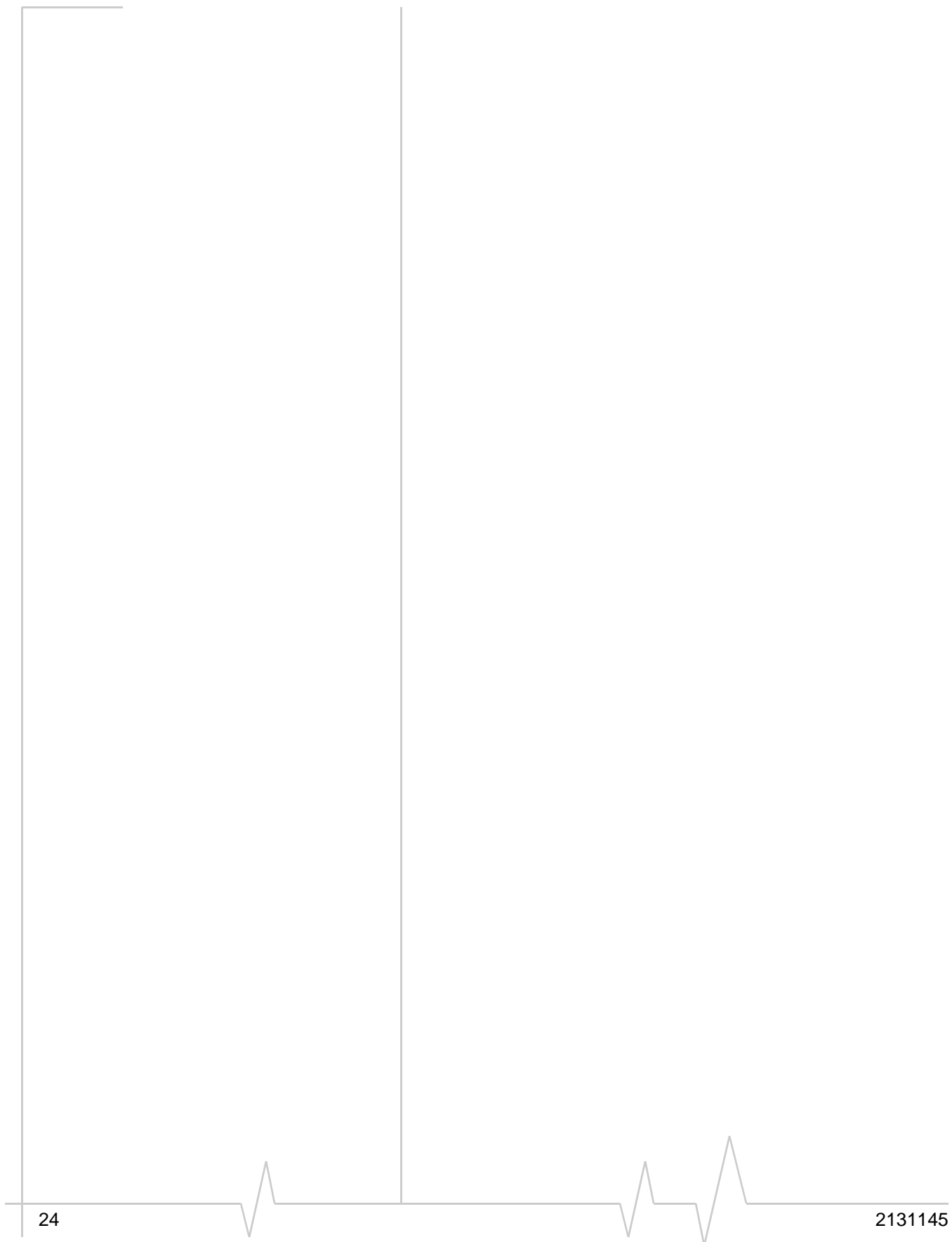
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*Caution: Use of other antennas may violate FCC requirements.*

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To attach the external antenna:

1. If the modem is inserted in your computer, remove it.
2. Gently flip open the tab on the side of the modem.
3. Hold the antenna cable by the connector (end) part, and carefully insert the connector part of the cable into the corresponding connector on the modem.
4. Reinsert the modem into your computer.





## 4: Activation

- Account configuration procedures

### Account configuration procedures

The final step to making the modem operational is configuring it to use your [CDMA](#) service provider account. The process of activation configures your modem with the required account parameters (phone number, username, password, and so on).

If you purchased a pre-activated modem, this step is not necessary. Once the application software and drivers are installed, the modem is ready for use. Proceed to [“Watcher Basics”](#) on page 27.


Otherwise, you must either allow use the Activation Wizard to activate and configure your account.

### Activation Wizard

The Activation Wizard walks you through the process of configuring an account. The process and options vary based on the service provider.

This section is a guide only. Consult the Quick Start Guide, and follow the directions on screen and instructions given by your service provider representative.

If your modem does not have an activated account, and Watcher has started automatically, then the Activation Wizard should start automatically. If this does not happen:

1. Ensure Watcher is running. If it is not, double-click the Watcher icon  on your desktop.
2. Start the Activation Wizard: select **Tools > Activation Wizard**.
3. If the **Automated Activation** option is not available, select **Manual Activation** and go to [“Manual activation”](#) on page 26.
4. Select the **Automated Activation** option.

The activation progress is displayed in the Activation Wizard window. If the process is successful, the window displays “Activation successful”.

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*Note: If the window does not display “Activation successful”, retry the process. If the process continues to fail, use manual activation (below) or contact your service provider.*

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At this point your modem is ready to use.

Proceed to [“Watcher Basics”](#) on page 27.

### **Manual activation**

Manual activation involves phoning your service provider, exchanging information, and entering your account information into the appropriate fields in the wizard. (To use this method, you require a phone.)

Use the **Next** and **Back** buttons to navigate through the wizard, noting the following:

- Prepare your billing information, before you phone the service provider or proceed to the next window.
- Contact your service provider. Inform your service provider that you are activating a Sierra Wireless wireless device. The representative will request your [ESN](#) (Electronic Serial Number) or [MEID](#). This is displayed in the Activation Wizard (and is printed on the modem box and on the label on the back of the modem).
- As prompted by the wizard, enter the information provided by the service representative.
- Select **Finish** in the final window of the wizard.

On completion of the Activation Wizard, the modem is ready for use. Proceed to [“Watcher Basics”](#) on page 27.

## >> 5: Watcher Basics

- Starting and closing Watcher
- Components of the Watcher Window
- Interpreting icons
- GPS Monitor window
- Online Help
- Warranty
- Troubleshooting


Watcher is the application that allows you to manage and monitor the connection between the modem and the [CDMA](#) network. You use Watcher to:

- Determine your signal strength, [roaming](#) status, 3G high-speed data availability, and other network connection parameters
- Initiate and end data calls
- Use location-based services (subject to feature availability)
- View call statistics
- Receive and send SMS messages
- Customize features and options

Depending on Watcher settings, you may be able to connect to the CDMA network without starting Watcher—simply by launching whatever application you want to use (such as your web browser or e-mail application); for details, see the [online help](#) topic “Autoconnect behaviour”. However, Watcher and its icon in the system tray won’t be available for you to monitor the status of the connection. Location-based services also won’t be available.

### Starting and closing Watcher

Depending on your settings in the Options window, Watcher may launch automatically anytime you insert the modem. You can also launch Watcher by:

- Double-clicking the Watcher icon  on your desktop
- Selecting:
  - In Windows Vista or Windows XP: **Start > All Programs > Sierra Wireless > Watcher > Watcher**;
  - In Windows 2000: **Start > Programs > Sierra Wireless > Watcher > Watcher**.

The standard Windows control buttons in the upper right corner of the window are used to minimize or close Watcher. When minimized, Watcher does not appear as a taskbar button. Instead, an icon is shown in the [system tray](#), usually at the right end of the taskbar. (See [“Minimized icons”](#) on page 32.)

## Components of the Watcher window

The window has three areas that display messages and icons: the Connection Status Area ([page 30](#)), Call Status Area ([page 31](#)), and Indicator Area ([page 32](#)). These areas are shown in [Figure 5-1](#) that follows.

A menu bar is located on the upper left side of the window.

Windows control buttons are in the top right corner.

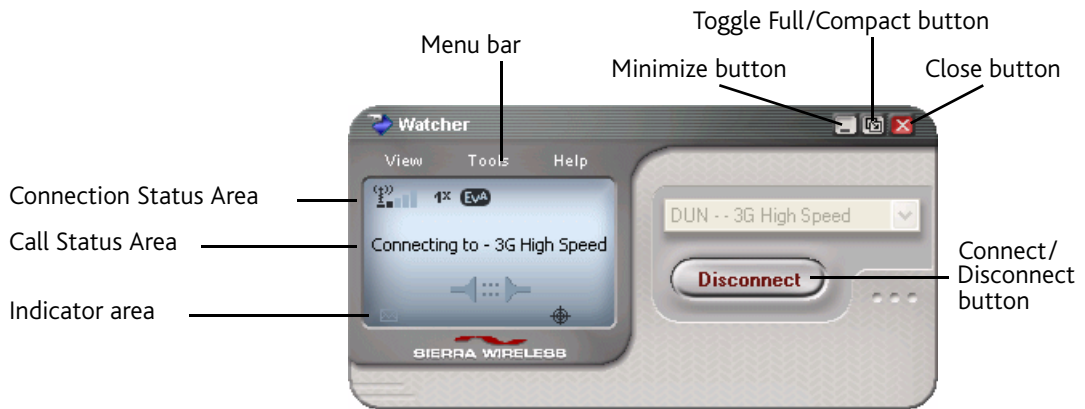



Figure 5-1: Watcher window

For a detailed description of each option in the menus, see the [online help](#).

## Window controls

- The **Minimize** button closes the Watcher window but leaves the application running. When Watcher is minimized, you can use the Watcher icon in the [system tray](#) to determine the modem status. (See “[Minimized icons](#)” on page 32.) This icon replaces a taskbar button for Watcher.


Once minimized, you can redisplay the Watcher window by doing one of the following:

- Clicking the Watcher icon in the system tray
- Double-clicking the Watcher desktop shortcut
- Launching Watcher from the Start menu.
- The **Toggle Full/Compact** button  is used to switch between the full Watcher window and the compact view:



The compact view allows you to see connection status and indicators while using less space on the desktop. If you right-click the compact view, a menu is displayed. From this menu you can open some of the other Watcher windows or establish/end a data connection.

To return to full view, click the view toggle button in the top right.

- The **Close** button  is used to exit Watcher.

## Docking

You can set the Watcher window to “jump” to the edge of your screen when you move the window close to an edge. This lets you easily position Watcher in a corner of the screen.

- Select **View > Docking**

## Always On Top

You can set Watcher to always display in front of other windows. This allows you to monitor connection status while using another maximized application, such as your web browser.

- Select **View > Always On Top**

## Interpreting icons

Watcher makes extensive use of icons to indicate status and events. The various icons are described in the following sections on the display areas of Watcher.

### Connection Status Area




The Connection Status Area uses the icons shown in the following table.

**Table 5-1: Connection Status Area icons**

Icon	Meaning
	<p>Modem not detected.</p> <p>You may be able to resolve this by doing one of the following:</p> <ul style="list-style-type: none"> <li>- Unlocking the modem (<b>Tools &gt; Unlock Modem</b>)</li> <li>- Powering the modem on (<b>Tools &gt; Turn Radio On</b>)</li> <li>- Ejecting the modem and re-inserting it</li> </ul> <p>If this icon is still displayed, restart your computer.</p>
	<p>The Signal Strength indicator uses bars to show the intensity of the radio signal. The number of bars increases as signal strength increases, to a maximum of five bars.</p>
	<p>When the bars are dimmed and the antenna icon is crossed out, no connection is possible for one of these reasons:</p> <ul style="list-style-type: none"> <li>• You are outside the CDMA network coverage area</li> <li>• The signal strength is too weak</li> <li>• A network or account problem is preventing the modem from obtaining service</li> </ul>
	1xEV-DO <a href="#">Rev. A</a> icon.
	1xEV-DO <a href="#">Rev. 0</a> icon.
	1X icon.
	When only the letters are displayed, you have acquired service, but have not established a data connection.
	When the indicator has a gray background, the network connection is dormant. (You are connected, but there is currently no traffic.)
	When the indicator has a darker background, you have a data connection on the wireless service.

**Table 5-1: Connection Status Area icons (continued)**

Icon	Meaning
	<p>The Roaming Status indicator shows whether you are roaming onto the network of a service provider other than your own.</p> <p>When the indicator is off (gray), you are within the local coverage area of your service provider. When the indicator is on (solid black), you are roaming.</p> <p>Your coverage area and account charges depend upon your service provider and the type of account you have.</p> <p>There may be surcharges for roaming service. If there is no roaming agreement between your service provider and the local carrier, you may be unable to establish data connections and use other features.</p> <p>Location-based services may not be available (depending on the settings of your device, the mechanism that the network and your device use to obtain location information, and other factors).</p>

## Call Status Area

The Call Status Area displays messages related to the status or progress of a connection.



Where a duration timer is shown, timing begins when the call is initiated—not from the time the call is fully connected. This is a measure of the time the modem has been using the radio channel (a wireless network resource).

“Click this display to exit PowerSave mode” indicates that the modem could not find a system within a 15 minute interval. To conserve power, the modem reduces channel scanning to once every three minutes. To force the modem out of PowerSave mode, click in the Call Status Area. The modem performs a channel scan and, if no network is detected, returns to PowerSave mode.

## Indicator area

The Indicator area displays an icon that notifies you when you receive SMS messages, and an icon that reflects the GPS status (subject to feature availability; network operator dependent).

**Table 5-2: Indicator Area icons**





Icon	Meaning
	The SMS message indicator shows whether you have unread messages. A blinking icon indicates that there are one or more urgent or important unread messages.  To display the SMS Express window (in which the messages are displayed), select <b>Tools &gt; SMS Express</b> or double-click the icon.
	If you position the mouse pointer over the GPS icon, the ToolTip shows the GPS status (on or off). Double-click the icon to open the <a href="#">GPS Monitor window (page 33)</a> . (Network operator dependent; this icon may not be displayed.)

## Minimized icons

Watcher displays an icon in the Windows system tray (which is usually located in the lower right corner of your screen). The system tray icon indicates your connection status or notifies you when you have SMS messages.



**Table 5-3: System tray icons**

Icon	Meaning
	Watcher cannot detect the modem. Ensure that the modem is powered on, not locked, and properly connected to your computer.
	You are in service on the network but have no active data connection. The number of red bars indicates the signal strength.
	You have an active data connection. The number of green bars indicates the signal strength.
	You have a new SMS message.



Only one icon can be displayed at a time. The priority of icons, from highest to lowest, is:

- No modem detected
- SMS message(s)
- Active or inactive connection.

For example, if you have unread SMS messages, and then establish a data connection, the icon still displays as an unread SMS message.

## GPS Monitor window

The GPS Monitor window reports GPS data from your modem.




The modem must have a fix on at least four satellites to report latitude, longitude, altitude, velocity and heading. (The status bar at the bottom of the GPS Monitor window indicates how many satellites are being tracked.)

To open the GPS Monitor window:

1. In Watcher, select **Tools > Display GPS**.

- or -

Double-click the GPS icon  in the main Watcher window (network operator dependent; this icon may not be available).

The GPS Monitor window reports:

- Longitude and Latitude — your coordinates in degrees, minutes, and seconds.
- Direction — your direction in degrees from true north (0), increasing clockwise.
- Speed — calculated based on your current latitude and longitude and the last reading (one second previous). This is either in kilometers per hour or miles per hour, depending on your chosen option.
- Altitude — your altitude relative to mean sea level, in either feet or meters, depending on your chosen option.
- HEPE — Horizontal Estimated Position Error. Reflects accuracy (horizontal/vertical precision).

- GPS port — port used for GPS activity.
- Updated — date/time that the GPS values were last acquired. The display format is based on your Control Panel settings in Windows.

From the GPS Monitor window you can:

- Determine the number of satellites being tracked
- Get your current location
- View a map of your current location
- Start/stop a tracking session
- Configure GPS settings

For detailed information on using GPS and configuring the settings, see the online Help of GPS Monitor.

## Online Help

The Watcher and GPS Monitor applications include extensive online help to provide operating hints and step-by-step instructions for getting the most from your modem.

You can access online help in several ways:

- Press <F1> in any window.
- Use Windows Explorer to navigate to **Program Files > Sierra Wireless Inc > Watcher > Help**, and double-click **Watcher\_ENU.chm** (for Watcher help) or **GPS\_ENU.chm** (for GPS Monitor help).

The help files have a table of contents, an index, and search capabilities.

## Warranty

You can access a PDF of the warranty, in:

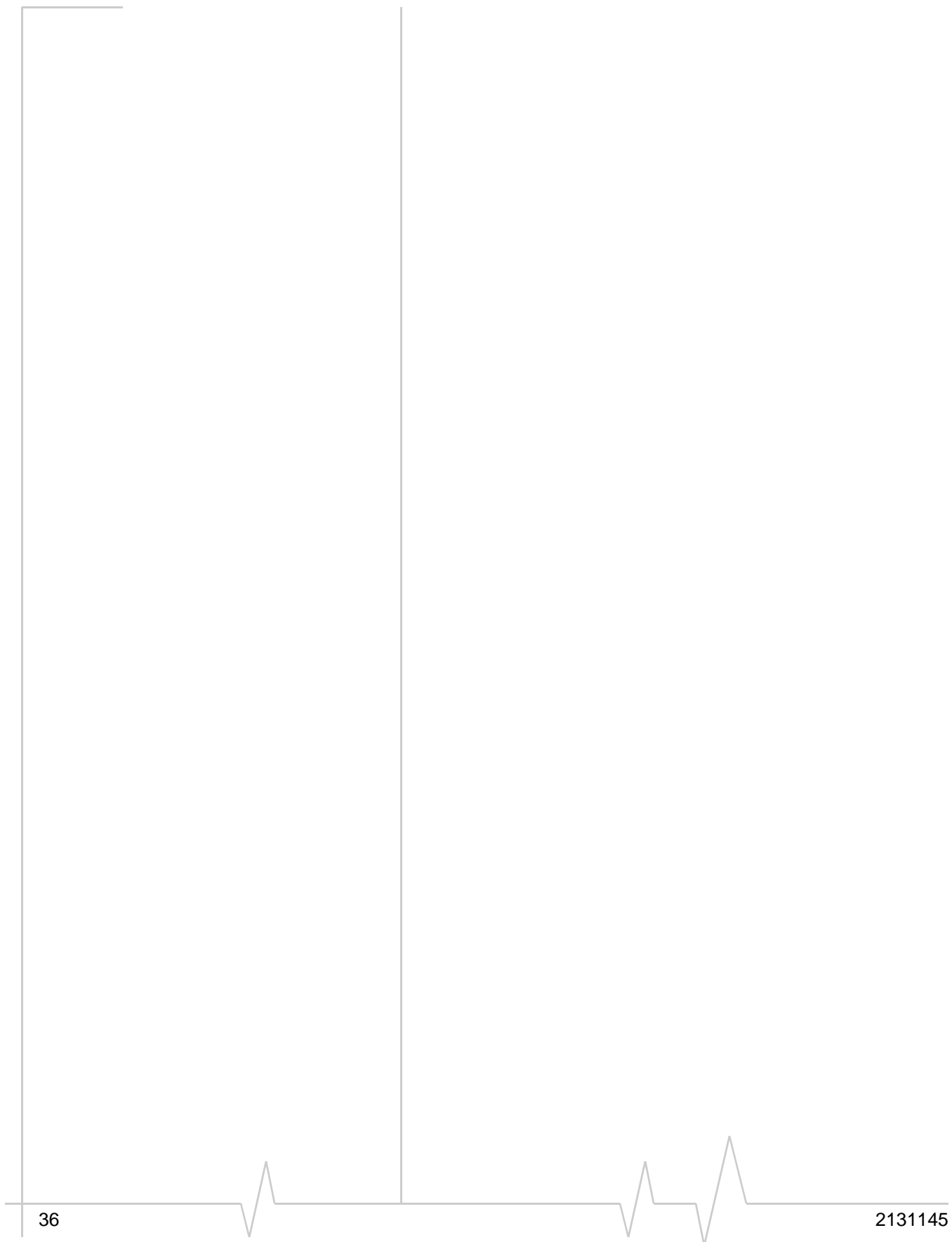
- Windows Vista or Windows XP: **Start > All Programs > Sierra Wireless > Watcher**
- Windows 2000: **Start > Programs > Sierra Wireless > Watcher**

## Troubleshooting

The [online help](#) includes descriptions of most common error messages. Look in the table of contents under Troubleshooting.

For help with other problems:

- Consult the Sierra Wireless web site at [www.sierrawireless.com](http://www.sierrawireless.com), where you will find an extensive knowledge base that can be searched to address most problems.
- Contact your service provider.



36

2131145

## 6: Technical Specifications


- LED operation
- Radio frequency and electrical specifications
- Environmental specifications

This chapter describes the function of the LEDs, and provides technical product data for the modem.

### LED operation

The modem has two LED lights. The LEDs operate as follows:

**Table 6-1: LED operation**

LED	State	Indicates
	Off	The modem has no power, or the LED has been disabled through the software. Check whether any of the following apply: <ul style="list-style-type: none"> <li>• You have powered off the modem.</li> <li>• The modem is not completely inserted into the ExpressCard/PC Card slot.</li> <li>• The computer is in suspend mode, which powers down the modem.</li> <li>• You have set <b>Disable LED</b> (under <b>Tools &gt; Options &gt; General</b>) to "Yes" (subject to feature availability).</li> </ul>
	Blue, not blinking	The modem has power and is working properly.
	Blue, blinking	The modem's <b>firmware</b> is being updated. <b>Do not remove the modem.</b>

**Table 6-1: LED operation (continued)**

LED	State	Indicates
	Amber, blinking	The modem is searching for service. If this LED state persists: <ul style="list-style-type: none"> <li>• Ensure the modem is properly connected to your computer.</li> <li>• If you are inside a building or near a structure that may be blocking the signal, change the position or location of your computer.</li> <li>• You may be able to improve the signal strength by attaching an external antenna (page 23).</li> <li>• Ensure you are within the CDMA network coverage area. For coverage information, contact your service provider.</li> <li>• Check with your service provider—a network or account problem may be preventing the wireless device from obtaining service.</li> </ul>
	Amber, not blinking	An error has occurred. Remove the modem (page 23) and reinsert it.
↔	Off	No service is available. See the suggestions for “Amber, blinking” on page 38.
	Amber, blinking	1X coverage is detected. Ready to connect to the network (click <b>Connect</b> ).
	Amber, not blinking	The modem is connected to the 1X network, and can send or receive data.
	Blue, blinking	1x-EVDO coverage (Rev. 0 or Rev. A) is detected. Ready to connect to the network (click <b>Connect</b> ).
	Blue, not blinking	The modem is connected to the 1x-EVDO network, and can send or receive data.

## Radio frequency and electrical specifications

**Table 6-2: Radio frequency and electrical specifications**

<b>Approvals</b>	Compliant with: IS-2000 Release 1.0 (CDMA 1X) IS-707-A Data, IS-856 (CDMA 1x-EVDO), IS-866, IS-878, IS-890, CDMA Development Group FCC Industry Canada
<b>Voltage</b>	+3.3 Vdc from ExpressCard or PC Card slot

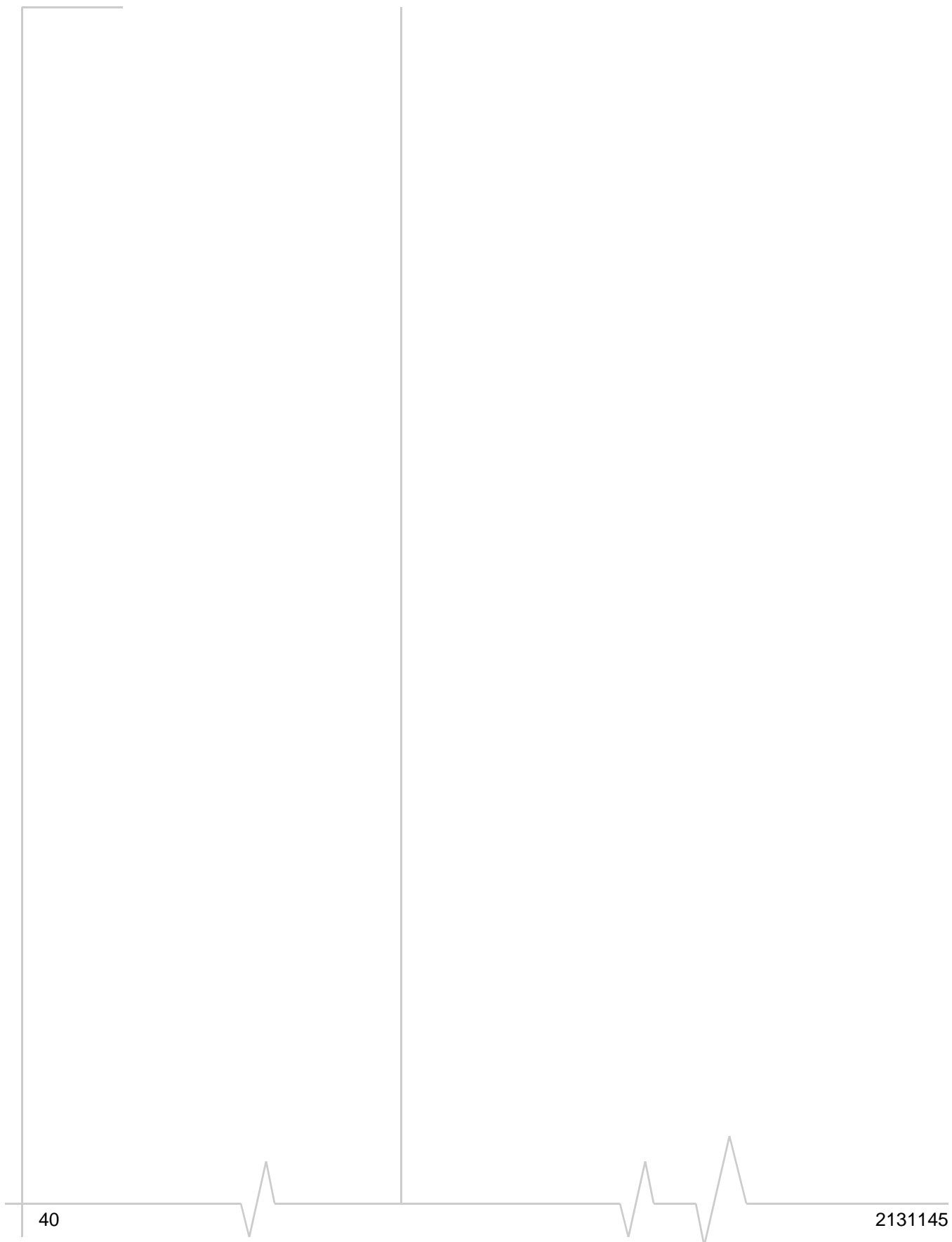
**Table 6-2: Radio frequency and electrical specifications (continued)**

<b>Current</b>	Maximum: 1300 A Typical data call current (talk mode): 350 mA (1X) 430 mA (1xEV-DO) Standby: 100 mA (1xEV-DO/IS2000 hybrid mode)
<b>Transmitter power</b>	250 mW (+24 dBm) average
<b>Transmit</b>	PCS: 1850 to 1909.95 MHz Cellular: 824.04 to 848.97 MHz
<b>Receive</b>	PCS: 1930 to 1989.95 MHz Cellular: 869.04 to 893.97 MHz GPS: 1575.42 MHz
<b>Channel spacing</b>	1.25 MHz
<b>Frequency stability</b>	±150 Hz

## Environmental specifications

**Table 6-3: Environmental specifications**

<b>Operating temperature</b>	-20 to +55°C (ambient, outside PCMCIA enclosure)
<b>Storage temperature</b>	-40 to +85°C
<b>Humidity</b>	95%, non-condensing
<b>Vibration</b>	Random vibration, 10 to 1000 Hz, nominal 6G RMS in each of 3 mutually perpendicular axes. Test duration of 60 minutes for each axis, for a total test time of 3 hours (non-operating).
<b>Drop</b>	1 m on concrete on each of 6 faces, 2 times



40

2131145



## 7: Regulatory Information

- Important safety/compliance information
- Information pertaining to OEM customers

### Important safety/compliance information

The design of the AirCard 402 modem complies with U.S. Federal Communications Commission (FCC) and Industry Canada (IC) guidelines respecting safety levels of radio frequency (RF) exposure for portable devices, which in turn are consistent with the following safety standards previously set by Canadian, U.S. and international standards bodies:

- ANSI / IEEE C95.1-1999, *IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz*
- National Council on Radiation Protection and Measurements (NCRP) Report 86, -1986, *Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields*
- Health Canada, Safety Code 6, 1999, *Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz*
- International Commission on Non-Ionising Radiation Protection (ICNIRP) 1998, *Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)*

**FCC ID:** N7NAC402.

**CAUTION:** The AirCard 402 modem must be 1.2 cm or more from users during operation, to satisfy FCC RF exposure requirements. It is recommended to use the AirCard 402 modem in a PC Card slot whenever possible. If the laptop computer has two slots, it is recommended to use the upper slot for optimum modem performance. When the AirCard 402 modem is inserted into the laptop computer during lap held usage, it is recommended that the antenna portion of the AirCard 402 modem be moved away from the leg to ensure the maximum data rate is available to the user. The AirCard 402 modem has been tested for compliance with FCC / IC RF exposure limits in the laptop computer(s) configurations with the side loading ExpressCard or PC Card slot and can be used in laptop computers with substantially similar physical dimensions, construction, and electrical and RF characteristics. This modem must not be used with any other antenna or trans-

mitter that has not been approved to operate in conjunction with this modem. **Note:** This modem must not be used in any unapproved configurations. For details, contact Sierra Wireless.

Use of this device in any other configuration may exceed the FCC RF Exposure compliance limit. **Note:** If this modem is intended for use in any other portable device, you are responsible for separate approval to satisfy the SAR requirements of Part 2.1093 of FCC rules.

**WARNING (EMI) - United States FCC Information** - This equipment has been tested and found to comply with the limits for a Class B computing device peripheral, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

**CAUTION:** Any changes or modifications not expressly approved by Sierra Wireless could void the user's authority to operate the equipment.

**WARNING (EMI) - Canada** - This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference causing equipment standard entitled "Digital Apparatus", ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le ministre des Communications.

If you have purchased this product under a United States Government contract, it shall be subject to restrictions as set forth in subparagraph (c)(1)(ii) of Defense Federal Acquisitions Regulations (DFARs) Section 252.227-7013 for Department of Defense contracts, and as set forth in Federal Acquisitions Regulations (FARs) Section 52.227-19 for civilian agency contracts or any successor regulations. If further government regulations apply, it is your responsibility to ensure compliance with such regulations.

### Information pertaining to OEM customers

The AirCard 402 modem has been granted modular approval for mobile applications. Integrators may use the AirCard 402 modem in their final products without additional FCC / IC certification if they meet the following conditions. Otherwise, additional FCC / IC approvals must be obtained.

1. At least 20 cm separation distance between the antenna and the user's body must be maintained at all times.
2. To comply with FCC / IC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain must not exceed 5.2 dBi in the Cellular band and 3.75 dBi in the PCS band.
3. The AirCard 402 modem and its antenna must not be colocated with any other transmitter or antenna within a host device.
4. A label must be affixed to the outside of the end product into which the AirCard 402 modem is embedded, with a statement similar to the following:  
This device contains TX FCC ID: **N7NAC402**.  
This equipment contains equipment certified under IC: **2417C-AC402**.
5. A user manual with the end product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC / IC RF exposure guidelines.
6. The end product with an embedded AirCard 402 modem must pass the unintentional emission testing and properly authorized per FCC Part 15 requirements.

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*Note: If this modem is intended for use in a portable device, you are responsible for separate approval to satisfy the SAR requirements of FCC Part 2.1093 and IC RSS-102.*

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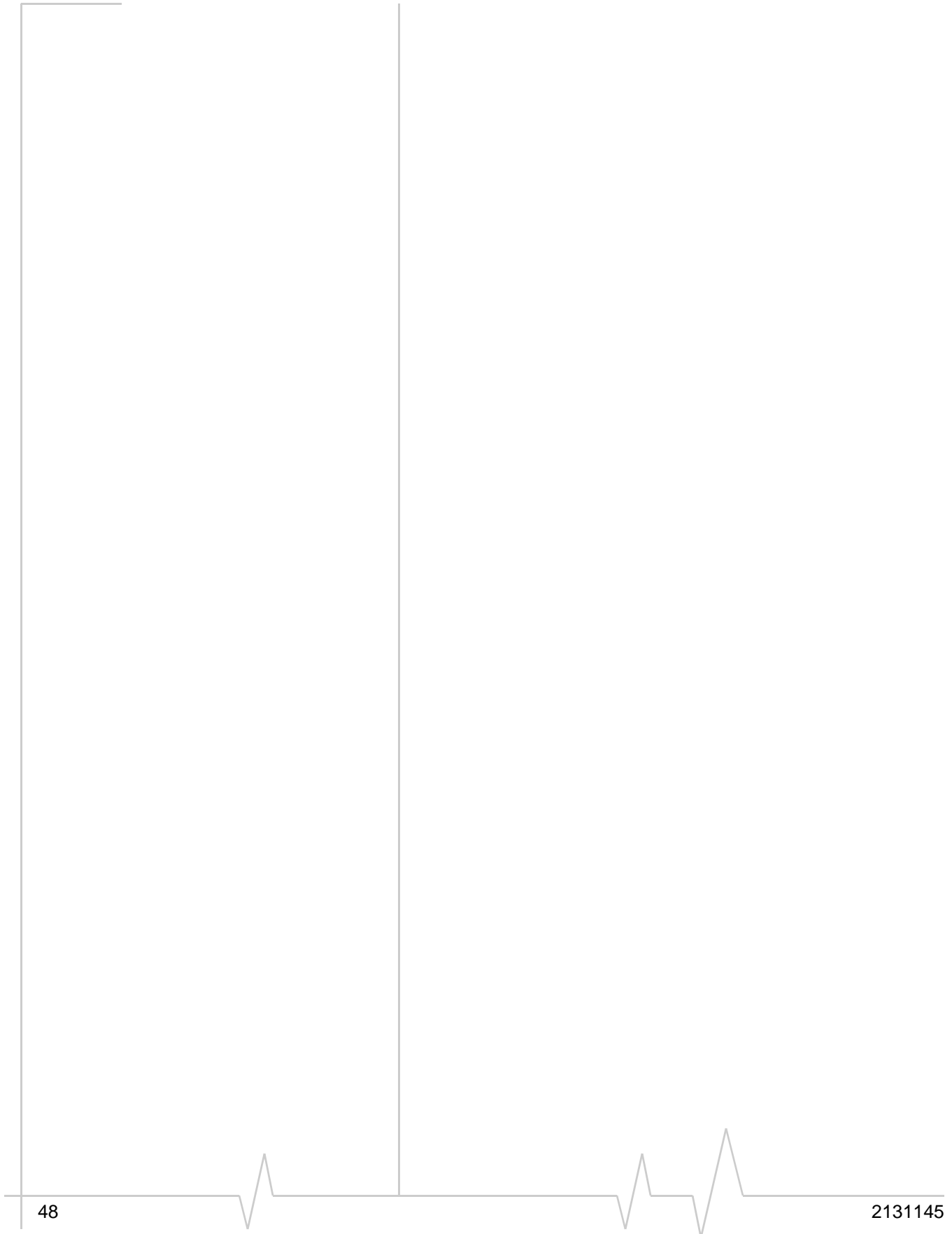
# Appendix A: Glossary

# A

<b>1X</b>	One Times Radio Transmission Technology (the "one times" refers to the frequency spectrum). Supports Internet connections with data rates up to 153 <b>Kbps</b> . Actual speed depends on the network conditions. Compare to <b>1x-EVDO</b> .
<b>1x-EVDO</b>	<p>A high-speed standard for cellular <b>packet</b> data communications.</p> <p>Rev. A supports Internet connections with data rates up to 3.1 <b>Mbps</b> (downlink from the network) and 1.8 Mbps (uplink to the network).</p> <p>Rev. 0 supports Internet connections with data rates up to 2.4 <b>Mbps</b> (downlink from the network) and 153 <b>Kbps</b> (uplink to the network).</p> <p>Average data rates are: for Rev. A: 450–800 Kbps (downlink from the network) and 300–400 Kbps (uplink to the network); for Rev. 0: 400-700 Kbps (downlink from the network) and 40-80 Kbps (uplink to the network).</p> <p>Actual speed depends on the network conditions. Compare to <b>1X</b>.</p>
<b>bps</b>	bits per second—The actual data speed over the transmission medium.
<b>CDMA</b>	Code Division Multiple Access—A wideband spread spectrum technique used in digital cellular, personal communications services, and other wireless networks. Wide channels (1.25 <b>MHz</b> ) are obtained through spread spectrum transmissions, thus allowing many active users to share the same channel. Each user is assigned a unique digital code, which differentiates the individual conversations on the same channel.
<b>CDMA 1X</b>	Also known as <b>1X</b> , this is a high-speed standard for <b>CDMA</b> cellular communications.
<b>dormant</b>	The <b>packet</b> data connection has the logical PPP session left open while the underlying physical link (the radio channel) is released. When traffic is to resume, a radio channel is re-acquired and the original PPP session resumes.
<b>ESN</b>	Electronic Serial Number—The unique first-generation serial number assigned to the modem for cellular network use. Compare to <b>MEID</b> .
<b>ExpressCard™</b>	Add-in memory and communications cards for portable computers. ExpressCard is a trademark of the <b>PCMCIA</b> .

<b>FCC</b>	Federal Communications Commission—The U.S. federal agency that is responsible for interstate and foreign communications. The FCC regulates commercial and private radio spectrum management, sets rates for communications services, determines standards for equipment, and controls broadcast licensing. Consult <a href="http://www.fcc.gov">www.fcc.gov</a> .
<b>firmware</b>	Software stored in ROM or EEPROM; essential programs that remain even when the system is turned off. Firmware is easier to change than hardware but more permanent than software stored on disk.
<b>GPS</b>	Global Positioning System—A system that uses a series of 24 geosynchronous satellites to provide navigational data.
<b>host</b>	<ul style="list-style-type: none"> <li>• A computer that uses a modem or a similar device to answer a calling computer.</li> <li>• A source or destination in the communication network.</li> <li>• A computer that contains data or files to be accessed by client computers. Also known as a server.</li> </ul>
<b>IS</b>	Interim Standard—After receiving industry consensus, the TIA forwards the standard to ANSI for approval.
<b>IS-95</b>	The standard for <a href="#">CDMA</a> .
<b>Kbps</b>	Kilobits per second—Actually 1000, not 1024, as used in computer memory size measurements of kilobytes.
<b>LAN</b>	Local Area Network
<b>LED</b>	Light Emitting Diode—A semiconductor diode that emits visible or infrared light.
<b>MEID</b>	Mobile Equipment Identifier—The unique second-generation serial number assigned to the modem for cellular network use. Compare to <a href="#">ESN</a> .
<b>Mbps</b>	Megabits per second
<b>MHz</b>	Mega-Hertz—One million cycles per second.
<b>packet</b>	A short fixed-length block of data, including a header, that is transmitted as a unit in a communications network.
<b>PC Card™</b>	Add-in memory and communications cards for portable computers. PC Card is a trademark of the <a href="#">PCMCIA</a> .
<b>PCMCIA</b>	Personal Computer Memory Card International Association—The organization that standardizes <a href="#">ExpressCards</a> and <a href="#">PC Cards</a> .
<b>PCS</b>	Personal Communications Services—A cellular communication infrastructure that uses a different frequency range than AMPS.

<b>roaming</b>	A cellular subscriber is in an area where service is obtained from a cellular service provider that is not the subscriber's provider.
<b>SMS</b>	Short message services—A feature that allows users of a wireless device on a wireless network to receive or transmit short electronic alphanumeric messages (up to 160 characters, depending on the service provider).
<b>system tray</b>	Usually located in the lower right corner of your screen
<b>TIA</b>	Telecommunications Industry Association—A standards-setting trade organization, whose members provide communications and information technology products, systems, distribution services and professional services in the United States and around the world. Consult <a href="http://www.tiaonline.org">www.tiaonline.org</a> .
<b>VPN</b>	Virtual Private Network





# »» Index

## Numerics

- 1X
  - description, 11
  - icon, 30
  - LED - coverage is detected, 38
- 1x-EVDO
  - description, 11
  - icon, 30
  - LED - coverage is detected, 38
- 3G
  - description, 11

## A

- account
  - configuration, 25
- activation
  - automated, 25
  - manual, 26
- altitude, 33
- always on top, 29
- antenna, external, 23
- approvals, 38
- automated activation, 25

## B

- bands, frequency, 13

## C

- call status area, 31
- care and maintenance, 35
- CDMA 1X
  - description, 11
  - icon, 30
  - LED - coverage is detected, 38
- CDMA 1x-EVDO
  - description, 11
  - icon, 30
  - LED - coverage is detected, 38
- CDMA network
  - 3G services, 11
  - frequency bands, 13
  - service providers, 14
- circuit switched data (CSD)
  - description, 12
- close button, 29
- compact view, 29
- connection status
  - Windows (indicator in system tray), 32

- connection status area, 30
- contact information, 4
- coverage
  - description, 14
- CSD (circuit switched data)
  - description, 12
- current location
  - get, 34
  - map of, 34

## D

- data
  - circuit switched - description, 12
  - dial-up - description, 12
  - high-speed, 11
  - QNC, 12
- dial-up data
  - description, 12
- direction, 33
- docking, 29
- dormant, 30
- drivers
  - description, 13
- driving instructions, 10
- drop test, 39

## E

- electrical specifications, 38
- Electronic Serial Number (ESN)
  - description, 18
- EMI warning, 42
- environmental specifications, 39
- ESN (Electronic Serial Number)
  - description, 18
- EVDO
  - description, 11
  - icon, 30
  - LED - coverage is detected, 38
- expanded (full) view
  - description, 28
  - toggle button, 29
- external antenna, 23

## F

- FCC
  - compliance, 42
  - ID, 41
- firmware upgrades, 4
- frequency bands, CDMA network, 13

- full view
  - description, [28](#)
  - toggle button, [29](#)

## G

- GPS
  - overview, [10](#)
  - GPS Monitor window, [33](#)
  - icon, [32](#)
  - port number, GPS, [34](#)
- GPS Monitor window, [33](#)

## H

- hardware
  - modem, removing, [23](#)
- hazards, [2](#)
- help, online, [34](#)
- help, troubleshooting, [35](#)
- HEPE (Horizontal Estimated Position Error), [33](#)
- high-speed packet data, [11](#)
- Horizontal Estimated Position Error (HEPE), [33](#)
- humidity, [39](#)

## I

- icons
  - connection status, [30](#)
  - coverage, [30](#)
  - GPS, [32](#)
  - indicator area, [32](#)
  - minimized, [32](#)
  - roaming, [31](#)
  - SMS messages, [32](#)
  - system tray, [32](#)
  - See also indicators.
- ID, FCC, [41](#)
- ID, Industry Canada, [38](#)
- indicator area, [32](#)
- indicators
  - connection status, [32](#)
  - GPS, [32](#)
  - LED lights, [37](#)
  - roaming, [31](#)
  - SMS messages, [32](#)
  - See also icons.
- Industry Canada ID, [38](#)
- installation, [19](#)
- interference, [42](#)
- Internet, [11](#)

## K

- knowledge base, [35](#)

## L

- latitude, [33](#)
- LBS (location based services)
  - See GPS.
- LED lights, [37](#)
- liability, limitation of, [3](#)
- limitation of liability, [3](#)
- location based services (LBS)
  - See GPS.
- location, current
  - get, [34](#)
  - map of, [34](#)
- longitude, [33](#)

## M

- map of your current location, [34](#)
- MEID (Mobile Equipment Identifier), [18](#)
- messaging, text
  - See SMS.
- minimize button, [29](#)
- minimized icons, [32](#)
- Mobile Equipment Identifier (MEID), [18](#)

## N

- no service, [38](#)
- notices, regulatory, [41](#)
- number of satellites being tracked, [34](#)

## O

- OEM customers, [43](#)
- online Help, [34](#)
- operating hints, [34](#)
- operating systems supported, [19](#)
- operating temperature, [39](#)

## P

- packet data, high-speed, [11](#)
- POI (points of interest), [10](#)
- points of interest (POI), [10](#)
- port, GPS, [34](#)
- PowerSave mode, [31](#)
- pre-activation, [17](#)

## Q

- QNC, [12](#)
- Quick Net Connect (QNC), [12](#)

## R

- radio frequency specifications, [38](#)

regulatory information, 41  
requirements, system, 19  
roaming  
    definition, 14  
    indicator, 31

## S

safety, 2  
sales desk, 4  
satellites being tracked, number of, 34  
searching for service, 38  
service indicator, 32  
short text messaging  
    See SMS.  
signal strength, CDMA network, 30  
SMS  
    message indicator, 32  
software  
    overview, 13  
    installing, 19  
    using, 27  
specifications  
    electrical, 38  
    environmental, 39  
    radio frequency, 38  
speed of travel, 33  
status area  
    call status area, 31  
    connection status area, 30  
    indicator area, 32  
    Windows system tray, 32  
storage temperature, 39  
support, 35  
suspend mode, 37  
system requirements, 19  
system tray icons, 32

## T

taskbar icons, 32  
temperature, 39  
text messaging  
    See SMS.  
tips, operating, 34  
tracking session, 34  
traveling speed, 33  
troubleshooting, 35  
TRU-Install, 10  
TRU-Locate, 10  
    See also GPS.

## U

upgrades, firmware, 4

## V

vibration, 39  
Virtual Private Network (VPN), 9  
Vista, 19  
VPN (Virtual Private Network), 9

## W

warning  
    EMI, 42  
warranty, 34  
Watcher software  
    overview, 27  
    installing, 19  
    using, 27  
Windows  
    system tray icons, 32  
    versions supported, 19  
Windows Vista, 19



