



# AirCard<sup>®</sup> 800 Series Wireless Network Cards

## Installation Guide



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Rev 3.6



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# 1: Introducing the AirCard 800 Series Wireless Network Cards

- AirCard 800 Series wireless network cards
- Your account and coverage area
- AirCard modem software
- Before you can begin using the AirCard modem
- Package contents

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*Caution: Do not insert your AirCard modem into your PC Card slot before installing the software.*

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## AirCard 800 Series wireless network cards

The AirCard 800 Series 3G wireless network cards are modems for your PC that allow you to connect to the Internet, send and receive e-mail, connect to a corporate network/VPN, or view streaming video, without the need of a network cable or phone line.

The AirCard modem fits into the standard (Type II) PC Card slot available on most notebook PCs.

## Supported operating systems

The AirCard modem works in notebook PCs running Windows® XP or 2000. Windows Vista will be supported when it is commercially available.

For information on using the AirCard modem with Window NT, 98, or Me, contact Sierra Wireless Technical Support ([support@sierrawireless.com](mailto:support@sierrawireless.com)).

## The AirCard modem as a network card

The AirCard modem can be configured to provide the “always-on” data connection that an Ethernet card or other wired LAN card provides. That is, you can set options in Watcher™ (a program that comes with the AirCard modem) that causes the AirCard modem to establish a network connection whenever you insert it, assuming GSM, GPRS, EDGE, UMTS, or HSDPA service is available. (See “HSDPA,

[UMTS, EDGE, and GPRS service support” on page 8.\)](#)

Otherwise, you can configure Watcher to connect only when you click the Connect button.

The AirCard modem connection provides access to the Internet. Once the connection is established, you can open your browser and connect to any web site available on the Internet, or access other Internet services (such as e-mail).

## HSDPA, UMTS, EDGE, and GPRS service support

GPRS, EDGE, UMTS, and HSDPA are add-on data services to GSM mobile phone networks. The maximum theoretical data speeds when connected on these services are:

- GPRS (General Packet Radio Service)—56 kbps (kilobits per second)
- EDGE (Enhanced Data GSM Environment)—236 kbps for the AirCard 875 modem; 216 kbps for the AirCard 850 and 860 modems
- UMTS (Universal Mobile Telecommunications System)—384 kbps
- HSDPA (High Speed Download Packet Access)—up to 3.6 Mbps (Megabits per second) on the downlink (receive) for the AirCard 875 modem; 1.8 Mbps for the AirCard 850 and 860 modems.

GPRS and EDGE are 2G (second generation) data services. UMTS and HSDPA are 3G (third generation) data services.

When establishing a connection, your AirCard modem uses the fastest available service. If, for example, you are using an AirCard modem in an area that has GPRS and EDGE service but not UMTS or HSDPA service, the AirCard modem connects using EDGE service.

Once the connection is established, you have access to all Internet services.

## Frequency band support

Every GSM network operates on one of these radio frequency bands, in providing 2G (GPRS or EDGE) service:

- **850 MHz band**—(also called the cellular band) used by some North American service providers
- **900 MHz band**—used by some European service providers
- **1800 MHz band**—used by some European and Asian service providers

- **1900 MHz band**—(also called the PCS band) used by many North American service providers

Every network that offers 3G UMTS/HSDPA service does so on one of these bands:

- **WCDMA 850**—used by North American service providers
- **WCDMA 1900**—used by North American service providers
- **WCDMA 2100**—used by European, Asian, and Australian service providers

The AirCard 850 modem and AirCard 860 modem support all of the 2G bands. The AirCard 850 modem supports the WCDMA 2100 3G band (for use outside of North America). The AirCard 860 modem supports the WCDMA 850 and WCDMA 1900 bands (for North American use).

The AirCard 875 modem supports quad-band 850 / 900 / 1800 / 1900 MHz GSM / GPRS / EGPRS, and tri-band 850 / 1900 / 2100 MHz WCDMA / HSDPA frequency bands.

## Your account and coverage area

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*Note: If you purchased the AirCard modem from a GSM service provider, you may already have an account. Otherwise, your retailer should be able to provide you with the names of companies that provide this service.*

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Companies that operate GSM networks and provide access to those networks are called service providers. You must have an account with a GSM service provider that offers HSDPA or UMTS service to use the AirCard modem's 3G capability. (The AirCard modem is backward compatible to 2G service.)

When you obtain your account, you are given a SIM card, also called a "smart card" or "smart chip". (Depending on how you purchased your AirCard modem, you may already have an account, and your SIM card may have been included in your package.) The SIM card contains account information and must be inserted in the AirCard modem anytime you use it.

Before you can use the AirCard modem, you must install the AirCard modem software and ensure that your AirCard modem is configured to use your account. Instructions on completing these steps are provided in the chapters that follow.

Once installed and configured, you can connect to the Internet with the AirCard modem in any area in which you can obtain GPRS, EDGE, UMTS, or HSDPA service.

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

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Your ability to obtain service depends on these factors:

- **Proximity to a GSM network**—You must be within the coverage area of a GSM network in order to use the AirCard modem.
- **Service provider**—If you are within the coverage area of a network that is not operated by your own service provider, you can only obtain service if there is a roaming agreement between your service provider and the network operator.
- **Account provisions**—Your account may restrict your usage to certain networks or limit the amount of time you can use the network.
- **Frequency band**—You cannot connect to networks operating in bands not supported by your AirCard modem, regardless of roaming agreements or account provisions.

Most service providers have coverage maps on their web sites.

## AirCard modem software

The AirCard modem comes with this software (made by Sierra Wireless):

- The Watcher program that you use to manage the AirCard modem and monitor your connections
- The driver software that forms the interface between the network card and your Windows operating system

## Before you can begin using the AirCard modem

Before you can use the AirCard modem for the first time you must:

1. Install the AirCard modem software: Watcher and the AirCard modem driver.
2. If you have an AirCard 850 modem or an AirCard 860 modem, attach the antenna.
3. Insert the SIM into the AirCard modem. When instructed to do so by the install wizard, insert the AirCard modem into your PC Card slot. (Do not insert the AirCard modem before installing the software.)
4. Obtain a GSM account (if this wasn't done when you purchased the AirCard modem).

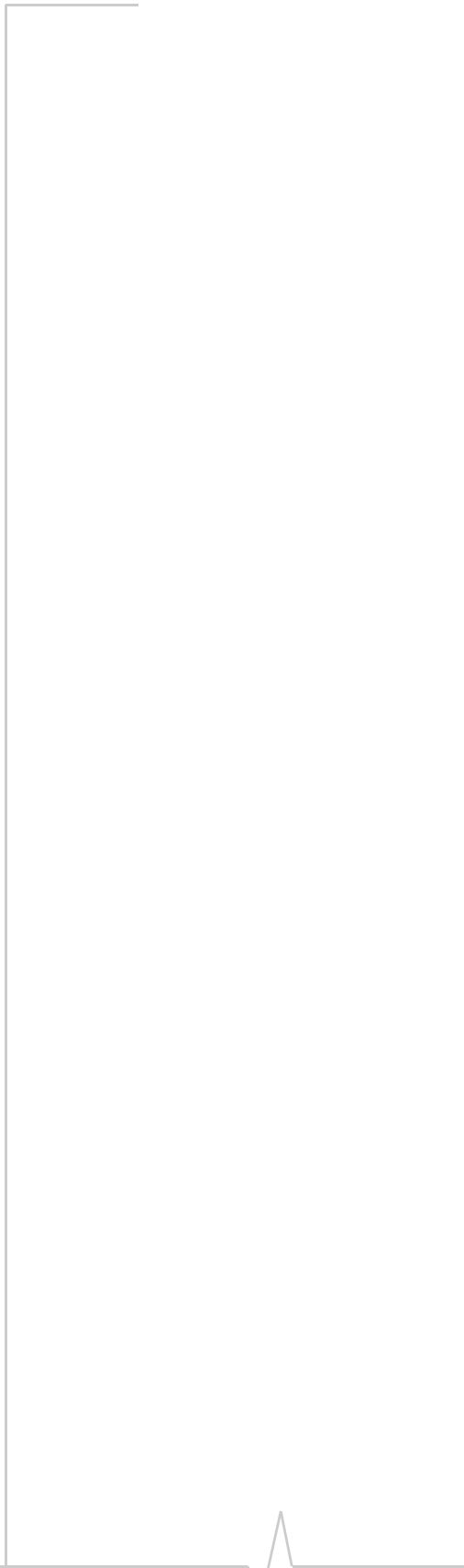
5. Configure the AirCard modem to use your account (unless it was pre-configured.)
6. If your Internet browser is configured to use a dial-up modem, you may need to set it to use a network card.

The next chapters guide you through this process.

## Package contents

Your AirCard modem package contains the following:

- AirCard modem
- Hinged antenna (AirCard 850 modem and AirCard 860 modem only)
- Installation CD containing the AirCard modem software and this installation guide
- Quick start guide



## 2: The SIM Card and Your Account

## 2

- Inserting a SIM card into your AirCard modem
- Removing a SIM card
- Attaching the antenna to your AirCard modem

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*Note: Without a valid SIM card and a valid account, your AirCard modem will not work.*

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*Note: Keep a written record, in a secure place, of the account information that your service provider gives you. Instructions on creating a profile are in the section “Configuring Your Account” on page 23.*

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You require a GSM account and a SIM (Subscriber Identity Module) card to use the AirCard modem. The SIM card is a small chip (about the size of a postage stamp) that you insert into the AirCard modem. The SIM contains account information used by the network to validate your access.

Depending on how you purchased your AirCard modem, you may already have an account. In this case, the SIM should be included in your package. Otherwise, your retailer should direct you to a local company that provides GSM service.

To activate an account, the service provider needs from you:

- Billing information (such as a credit card number) used to collect payment for your network usage
- Possibly the IMEI (International Mobile Equipment Identity), depending on your service provider. This number, printed on the AirCard modem box and on the AirCard modem label, identifies your device (AirCard modem model) on the GSM network.

Your AirCard modem must be configured to use your account. If purchased from a service provider, your AirCard modem may have been pre-configured. Otherwise, you must set up a profile in Watcher. Instructions on setting up a profile are described in [Chapter 4](#).

If you change GSM service providers (such as if you move to a new city), you will need a new SIM card from your new service provider. You will also need to set up a new profile.

### Inserting a SIM card into your AirCard modem

The procedure for inserting the SIM card depends on the model of AirCard modem you have. If you have an AirCard 850 / 860 modem, follow the instructions below. If you have an AirCard 875 modem, see [“AirCard 875 modem”](#) on page 14.

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*Note: To prevent the SIM from becoming jammed in the AirCard modem slot, ensure the edge of the SIM is smooth before inserting it. Do not attach labels to your SIM as this may also cause it to become jammed.*

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## AirCard 850 and AirCard 860 modems

To install your SIM card into the AirCard modem, follow these steps:

1. If your SIM is attached to a card, detach it and remove any fragments of the card stuck to the SIM.
2. Hold the AirCard modem with the label on top and the antenna closest to you.
3. Locate the thin SIM card slot on the left side of the AirCard modem PC Card's antenna end.
4. Orient the SIM card, as shown in the diagram on the bottom side of the AirCard modem.
5. Insert the end of the SIM card into the slot, and gently push it until it is fully inserted.

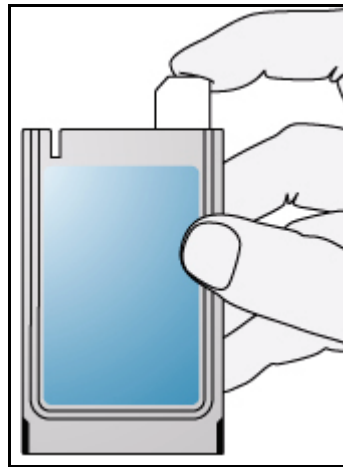


Figure 2-1: Inserting the SIM card into the AirCard modem SIM card slot

Once the SIM card is properly inserted, it should not extend beyond the end of the card.

## AirCard 875 modem

To install your SIM/USIM card into the AirCard modem, follow these steps:

1. If your SIM is attached to a card, detach it and remove any fragments of the card stuck to the SIM.
2. Hold the AirCard modem face down.
3. Locate the thin SIM card slot on the side of the AirCard modem.
4. Insert the SIM card into the slot as shown in the following illustration, and gently push it until it is fully inserted.

*Note: To prevent the SIM from becoming jammed in the AirCard modem slot, ensure the edge of the SIM is smooth before inserting it. Do not attach labels to your SIM as this may also cause it to become jammed.*

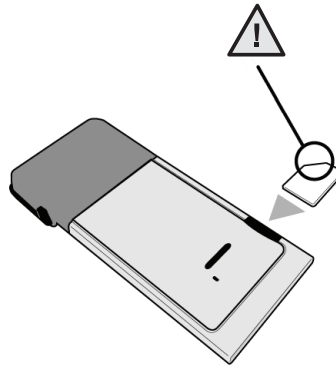


Figure 2-2: Inserting the SIM card into the AirCard modem

## Removing a SIM card

The procedure for removing the SIM card depends on the model of AirCard modem you have. If you have an AirCard 850 / 860 modem, follow the instructions below. If you have an AirCard 875 modem, see [“AirCard 875 modem”](#) on page 14.

### AirCard 850 and AirCard 860 modems

To remove the SIM card, you need a pen.

1. Place the AirCard modem on a smooth, hard surface such as a tabletop.
2. Position the pen above the eject hole, which is on the top surface of the AirCard modem housing, just to the right of the SIM card slot. (See [Figure 2-3](#).)
3. Press down gently (without excessive force) on the eject hole. The SIM card should pop out of its slot.



Figure 2-3: Ejecting the SIM card

4. Gently pull the SIM card from the slot until it slides free.

### AirCard 875 modem

To remove the SIM/USIM card, you need a pen.

1. Place the AirCard modem on a smooth, hard surface such as a tabletop, or hold it face down.
2. Gently insert the pen into the end of the eject slot farthest from the SIM slot. Slide the pen towards the SIM slot. The SIM card pops out of its slot.

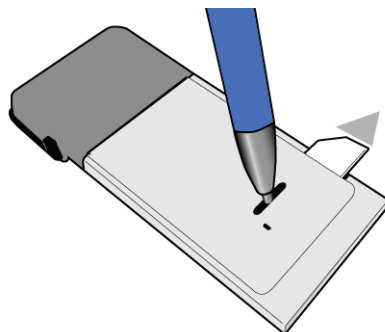


Figure 2-4: Ejecting the SIM card

3. Gently pull the SIM card from the slot until it slides free.

## Attaching the antenna to your AirCard modem

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*Note: This section applies only to the AirCard 850 modem and AirCard 860 modem.*

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If your AirCard modem has an external antenna, the antenna attaches to the gold-plated connector on the end of the AirCard modem.

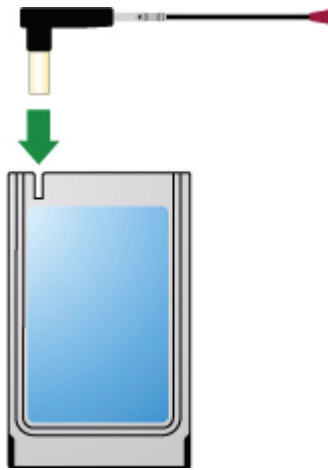
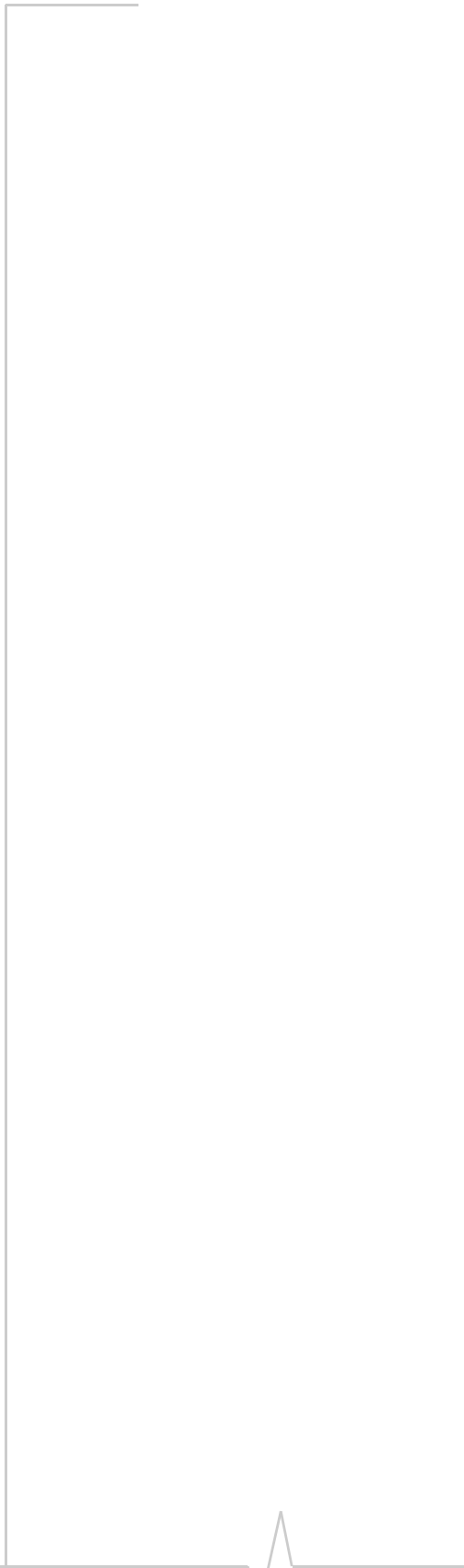


Figure 2-5: Attaching the antenna to the AirCard modem



## 3: Software and Driver Installation

- System requirements
- Installation on Windows XP and 2000
- Setting Internet Explorer to use the AirCard modem

### System requirements

The AirCard modem is supported on:

- Windows XP (Home and Professional versions)
- Windows 2000
- Windows Vista (when commercially available)

For information on using the AirCard modem with Windows NT, 98, or Me, contact Sierra Wireless Technical Support ([support@sierrawireless.com](mailto:support@sierrawireless.com)).

To install the AirCard modem, you require these system resources:

**Table 3-1: System resource requirements**

Card slots	1 Type II PCMCIA (PC Card) slot
Disk drive	CD-ROM
I/O resources	1 IRQ, 40 bytes I/O space
Memory	32 MB

### Installation on Windows XP and 2000

*Note: Users of Windows 2000 must be logged in with administrative privileges. Users of Windows XP may require administrative privileges.*

*Note: If you are running Windows 2000, Windows Installer Redistributable 2.0 must be installed. This is available on the Microsoft web site, [www.microsoft.com](http://www.microsoft.com).*

*Note: You may require your Windows CD. Ensure you have the CD before proceeding.*

1. If the AirCard modem CD is not already in your CD-ROM drive, insert it. The CD should autostart and display a menu.  
If the CD does not autostart, select **Start > Run** and enter **d:\setup.exe** where **d** is the drive letter of your CD-ROM drive.

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*Note: Do not forcefully insert the AirCard modem. This may damage connector pins. If you have more than one PC Card slot, you may obtain better signal strength using the top slot.*

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2. From the CD start-up menu, select your language, then **notebook installation**, and then the link under **notebook software installation** to launch the installer.
3. Use the **Next** and **Back** buttons to navigate through the installer.
4. If the SIM is not already inserted in your AirCard modem, insert it. (See [page 13](#).)
5. For the AirCard 850 modem / AirCard 860 modem:  
If the antenna is not yet attached, attach it. (See [page 17](#).)
6. With the label facing up, insert the AirCard modem into your PC Card slot.

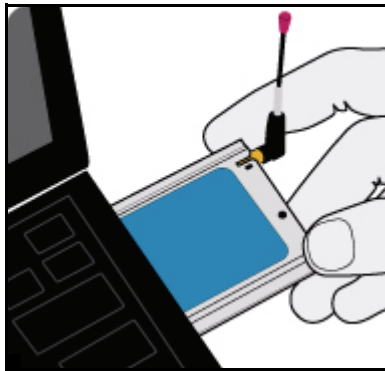


Figure 3-1: Inserting the AirCard modem

To close the CD start-up menu, click the **exit** option in the lower right corner of the window.

Watcher should launch automatically when the AirCard modem is inserted. If your AirCard modem has not yet been configured to use your account, you are prompted to do so. See [“Setting up a profile” on page 24](#).

## Setting Internet Explorer to use the AirCard modem

If you are using Internet Explorer as your browser, and it is set to connect to the Internet through a dial-up modem, you must set it to use a LAN (local area network) card.

To set Internet Explorer version 5 or 6 to use a LAN, follow these steps:

1. In Internet Explorer, select **Tools > Internet Options**.
2. Click the **Connections** tab.
3. Click **Setup** to run the Internet Connection wizard.

4. Select the option “**I want to set up my Internet connection manually, or I want to connect through a local area network (LAN).**” Click **Next**.
5. Select “**I connect through a local area network (LAN)**”. Click **Next**.
6. Ensure no check boxes are selected in the “Local area network Internet configuration” window and click **Next**.
7. Select **No** when prompted to set up an Internet mail account and click **Next**.

Click **Finish** to exit the wizard.



## 4: Configuring Your Account

- *Setting up a profile*

Profiles contain account information used by the AirCard modem to establish connections. At least one profile must be set up on the AirCard modem before you can use it. The profile(s) may have been stored on the AirCard modem before you purchased it. Otherwise, your service provider should give you all the information you need to set up the profile(s) you require.

Depending on your service provider, some or all of this information must be entered into your profile:

- User Name
- Password
- APN (Access Point Name)
- IP (Internet Protocol) Address (if the address is not automatically assigned by the network)
- Use of IP header compression
- DNS (Domain Name Server) address or addresses

Your service provider may give you only one APN in which case you require only one profile. Some service providers assign separate APNs for separate purposes. For example, some service providers supply one APN to use for Internet browsing and a different APN to use with a VPN. In this case you must set up multiple profiles. The AirCard modem allows for up to sixteen profiles.


Most service providers have one or two standard profiles that all or most of their subscribers are expected to use. Most of these standard profiles have been pre-defined in Watcher, allowing you to select a standard profile, rather than creating it manually.

One of your profiles must be set as the “default” profile. This is the one that is used if you select the **Connect** button without selecting a profile. The default profile is also used if you set the AirCard modem to autoconnect. If you are using the AirCard modem to access a network that requires you to provide a password each time you connect, you must set the connection mode for your profile to prompt for password (in which case you must connect manually).

*Note: You cannot set up a profile before installing the software. (See page 19.)*

## Setting up a profile


To determine whether you have a profile:

1. Insert the SIM into the AirCard modem if it is not already inserted. (See [page 13](#).)
2. Insert the AirCard modem into the PC Card slot if it is not already inserted. (See [page 20](#).)
3. If Watcher is not running, start Watcher by selecting **Start > Programs > Sierra Wireless > 3G Watcher > 3G Watcher** or double-clicking the desktop shortcut .


If Watcher detects that no profile has been set up, you are prompted, "Would you like to configure a profile now?" Select **Yes**.

If this prompt does not appear, your AirCard modem may have been preconfigured. You can verify that you have a profile by selecting **Tools > Connections** to access the AirCard modem tab of the Connections window, which lists all profiles.

To create a profile:

1. On the Connections window, Click the add button  and click **WWAN profile**.
2. If you want to use a pre-defined profile, in the **Profile Name** field, select the profile from the drop-down list. Then skip to [Step 5](#).
3. Complete the fields in the Profile window by entering a **Profile Name** (any meaningful description of the profile, such as the name of your service provider) and **User Name**, **Password**, and/or **APN**, if applicable.
4. Select whether you want to make connections automatically or manually, or whether you are required to provide a password each time you make a connection:
  - If you select **Autoconnect**, a connection is established automatically whenever you insert the AirCard modem.
  - If you select **Manual**, you must select the **Connect** button on the main Watcher window to make a connection.
  - If you select **Prompt for Password**, you must select **Connect** and enter a password to make a connection. Use this option if you have an external device that provides a time-scheduled secure password for your corporate network.
5. If you want to set Watcher to launch your Internet browser, VPN, or any other program automatically, or if your service provider specified an IP address, or DNS

address(es), select the **Advanced** folder. Otherwise, click **OK** and skip to [Step 10](#).

6. Select the **Launch after connecting** field, and from the drop-down list, select which application, if any, you want **Watcher** to automatically launch when a connection is established with this profile:
  - **None**—No application is autolaunched.
  - **Browser**—**Watcher** autolaunches your default Internet browser.
  - **MS VPN**—**Watcher** autolaunches a Virtual Private Network (VPN) connection.
  - **Application**—**Watcher** autolaunches an installed VPN program, or any other program.
7. Complete the appropriate field, depending on the option you chose in the **Launch after connecting** field:
  - If you selected **Browser** — in the **URL** field, type the URL for the web site you want to view on connection (such as [www.sierrawireless.com](http://www.sierrawireless.com)).
  - If you selected **Microsoft VPN** — in the **Microsoft VPN (PPTP) connection** field, select the VPN connection from the drop-down list.
  - If you selected **Application** — in the **Application** field, enter the path to the program or use the browse button  to locate the .exe file for the software application you want to autolaunch.
8. If your service provider has given you an IP address, in the **Advanced** folder, click **TCP/IP**. Select **Static IP** and enter the address in the field below. Otherwise select **Dynamic IP**. (This is the default because most networks use dynamic IP addressing.) Use the data compression or IP header compression fields if supported by your service provider.

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*Note: The **Use IP header compression** field should NOT be used unless your service provider is using this compression. The AirCard modem cannot maintain a connection if this is enabled but not supported on the network.*

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9. If you have a DNS address or addresses, click **DNS Settings** and enter the address(es). (In most cases, it is not necessary to enter a DNS address.)
10. If you have more than one profile, select **Profiles**, and in the **Default Profile** field, choose the default profile from the drop-down list. (The “default” profile is the one used by the autoconnect feature and is used if you click **Connect** without selecting a profile.)

11. Click **Apply** to save the change without exiting the window, or, click **OK** to save the change and exit the window.

## 5: Care and Maintenance of Your Network Card

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*Note: Do not insert the AirCard modem before installing the software. See “Software and Driver Installation” on page 19.*

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You can ensure reliable operation and long life of your AirCard modem by adhering to these guidelines in storage and use:

- Do not apply adhesive labels to the AirCard modem or SIM. This may cause the AirCard modem or SIM to become jammed inside the slot, or prevent it from being inserted properly.
- When not installed in your computer, store the AirCard modem and SIM in a safe place.
- Protect the card from liquids, dust, and excessive heat (see “Environmental specifications” on page 32 for details).
- The AirCard modem should fit easily into your computer’s PC Card slot. Forcing the AirCard modem into the slot may damage the connector pins.
- For AirCard modems with external antennas, optimal signal strength is usually obtained when the antenna is pointing straight up. The antenna should bend easily at the hinge. Do not forcefully bend the antenna.



*Figure 5-1: Proper positioning of the AirCard modem antenna for AirCard 850 modem / AirCard 860 modem*

When you insert the AirCard modem in a notebook PC, Watcher launches (unless the autolaunch option is disabled).

## Stopping and ejecting the AirCard modem

To remove the AirCard modem:

1. Close Watcher if it is open.
2. Click the PC Card icon in the status area to display the option to stop the card.
3. Click the appropriate option, depending on your operating system and the model of AirCard modem:
  - For the AirCard 850 or AirCard 860 modem:
    - Windows 2000 – “Stop Sierra Wireless AirCard 3G Adapter Parent”
    - Windows XP – “Safely remove Sierra Wireless AirCard 3G Adapter Parent”
  - For the AirCard 875 modem:
    - Windows 2000 or XP – “Safely remove NEC PCI to USB Open Host Controller”
4. If a dialog box appears notifying you that it is safe to remove the card, click **OK**.
5. Push the PC Card eject button beside the PC Card slot on your computer to eject the card.
6. Grasp the AirCard modem and remove it from the slot.

## 6: Technical Specifications

- LED operation
- Radio frequency and electrical specifications
- Environmental specifications
- Sending GSM commands to the network

This chapter describes the operation of the LED and provides technical data for the AirCard modem.

### LED operation

The number and function of the LEDs depends on the type of AirCard modem you have.

If the AirCard modem has a single LED on the antenna end of the card beneath the SIM slot, use the following table to determine the status of the AirCard modem:





**Table 6-1: LEDs for AirCard 850 / 860 modem**

LED state	How to interpret
<b>Solid amber<sup>a</sup></b>	The AirCard modem is powering up, or a firmware download is in progress.
<b>Blinking amber</b>	The AirCard modem is scanning for service.
<b>Blinking green</b>	The AirCard modem is in service and registered on the network.
<b>Solid green</b>	A voice call is in progress.
<b>Solid / blinking red</b>	There is a hardware problem.
<b>Off</b>	The AirCard modem is powered down.

a. The LED is red/green. The amber color occurs when both red and green are lit.

If the AirCard modem has four LEDs on the top of the modem, use the following table to determine the status of the AirCard modem:

**Table 6-2: LEDs for AirCard 875 modem**

Symbol	LED State	AirCard modem status
 <b>Power</b>	<b>Off</b>	Indicates one of the following: <ul style="list-style-type: none"> <li>• The card is not inserted in the computer.</li> <li>• The computer is off or in "suspend and resume" mode.</li> <li>• The AirCard modem radio has been turned off using Watcher (Tools &gt; Turn Radio Off).</li> </ul>
	<b>Blue</b>	The power is on, the AirCard modem is working normally, and the firmware is not being updated.
	<b>Blinking Blue</b>	The firmware is being updated. Do not remove the AirCard modem until the firmware update is complete. (The blue LED stops flashing.)
 <b>2G</b>	<b>Amber</b>	The AirCard modem has detected a 2G network (EDGE / GPRS / GSM) and is ready to connect.
	<b>Blue</b>	The AirCard modem is connected to a 2G network and is able to send and receive data.
 <b>3G</b>	<b>Amber</b>	The AirCard modem has detected a 3G network (UMTS / HSDPA) and is ready to connect.
	<b>Blue</b>	The AirCard modem is connected to a 3G network and is able to send and receive data.
 <b>Roaming</b>		This indicator shows your roaming status. (Depending on your service provider, this indicator may not be activated on your modem.)
	<b>Off</b>	The AirCard modem is connected to the home network (not roaming).
	<b>Blue</b>	The AirCard modem is connected to a network other than that of the local service provider (roaming).
	<b>Amber</b>	Only applies to voice-enabled AirCard modems.  An amber roaming symbol indicates that you can make calls to emergency numbers such as 911, 112, etc. even though 2G / 3G service is not available.
<hr/> <p><i>Note:</i> If you are roaming, the roaming icon also appears in the Watcher main window.</p> <hr/>		

## Radio frequency and electrical specifications

**Table 6-3: Radio frequency and electrical specifications for AirCard 850 / 860 /875 modems**

<b>Compliance</b>	GSM Release 5
<b>Transmit</b>	<i>PCS:</i> 1850 to 1910 MHz <i>DCS1800:</i> 1710 to 1785 MHz <i>EGSM900:</i> 880 to 915 MHz <i>GSM850:</i> 824 to 849 MHz <i>WCDMA2100: (AirCard 850 modem and AirCard 875 modem)</i> 1920 to 1980 MHz <i>WCDMA850: (AirCard 860 modem and AirCard 875 modem)</i> 824 to 849 MHz <i>WCDMA1900: (AirCard 860 modem and AirCard 875 modem)</i> 1850 to 1910 MHz
<b>Receive</b>	<i>PCS:</i> 1930 to 1990 MHz <i>DDCS1800:</i> 1805 to 1880 MHz <i>EGSM900:</i> 925 to 960 MHz <i>GSM850:</i> 869 to 894 MHz <i>WCDMA2100: (AirCard 850 modem and AirCard 875 modem)</i> 2110 to 2170 MHz <i>WCDMA850: (AirCard 860 modem and AirCard 875 modem)</i> 869 to 894 MHz <i>WCDMA1900: (AirCard 860 modem and AirCard 875 modem)</i> 1930 to 1990 MHz
<b>Channel spacing</b>	200 kHz (GSM) 5 MHz (WCDMA)
<b>Channel raster</b>	200 kHz
<b>Frequency stability</b>	0.1 ppm

## Environmental specifications

**Table 6-4: Environmental specifications**

<b>Operating temperature</b>	-20 to +60 °C (ambient, outside PCMCIA enclosure)
<b>Storage temperature</b>	-30 to +85 °C
<b>Humidity</b>	95%, non-condensing
<b>Vibration</b>	15 g peak 10 to 2000 Hz (non-operating)

## Sending GSM commands to the network

GSM commands are used to:

- Access network services
- Display network and device parameters
- Provide account status information (for example, indicate whether a subscribed service is available to you)

If your service provider asks you to enter a specific command:

1. Using your keyboard, type the command.

If the command was valid and accepted by the network, the results are displayed in the Watcher window. Otherwise, the message “Invalid GSM Command” is displayed.

For example, enter `*#06#`. This command displays the IMEI<sup>1</sup>.

You can send GSM commands even when a data transfer is in progress.

---

1. IMEI—International Mobile Equipment Identity—a number that uniquely identifies your device (AirCard modem) on the GSM network

## 7: Watcher Basics

- Launching Watcher
- The Watcher window
- Icons and indicators on the main Watcher window
- View options
- Status icons
- Turning the radio on and off
- Frequency band and network selection

---

*Note: It takes up to 20 seconds for Watcher to become fully functional after launch.*

---


Watcher is the program you use to manage and monitor your AirCard modem connections. Watcher allows you to:

- Create an account profile. (This is explained under “[The SIM Card and Your Account](#)” on page 13.)
- Determine signal strength, roaming status, GPRS/EDGE/UMTS/HSDPA availability, and other network connection parameters
- Monitor the status of the AirCard modem and GSM service
- Initiate data connections
- Enable or disable SIM security that prevents others from using your SIM card if it is lost or stolen
- Set options related to notifications and the Watcher window

If you set your account profile to autoconnect (see [page 24](#)), you do not need to run Watcher when you use the AirCard modem, but Watcher does provide useful status information.

### Launching Watcher

Unless the feature has been disabled, Watcher launches automatically anytime you insert the AirCard modem. You can also launch Watcher by:

- Double-clicking the desktop shortcut,  or
- Selecting **Start > Programs > Sierra Wireless > 3G Watcher > 3G Watcher**

Depending on how your profile is configured, your browser, VPN, or other program may launch automatically anytime you launch Watcher. See [page 25](#).

*Note: To get help in Watcher, select **Help > Help Topics**. You can also display help by pressing <F1> in most windows.*

## The Watcher window

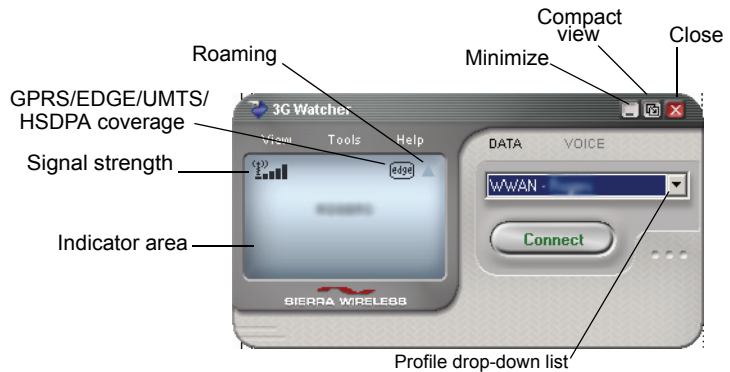





Figure 7-1: The Watcher window.










## Icons and indicators on the main Watcher window

These icons are used on the main Watcher window:



Table 7-1: Icons and indicators in Watcher

	<p><b>Device status.</b> If an icon of the AirCard modem with an “X” is displayed, Watcher is unable to detect the AirCard modem. This indicates that the AirCard modem is not fully inserted into the PC Card slot or the device is powered down.</p> <p>You may be able to resolve this problem by restarting Watcher, powering up the AirCard modem, stopping, ejecting, and reinserting the AirCard modem, or restarting your PC.</p>
 	<p><b>Signal strength and service status.</b> The number of bars beside the antenna increases as signal strength increases, to a maximum of five bars. The ToolTip that displays when you position the mouse pointer over this indicator shows the numeric value of the RSSI (Received Signal Strength Indication in dBm).</p> <p>An antenna with a line through it indicates no service is available (Not in Service). You are outside of the coverage area or have insufficient signal strength to maintain a GSM data connection.</p>

**Table 7-1: Icons and indicators in Watcher**

   	<p><b>Coverage.</b> The icon shows the fastest service available:</p> <ul style="list-style-type: none"> <li>• GPRS icon—GPRS is the fastest service available in your current coverage area.</li> <li>• EDGE icon—EDGE is the fastest service available in your current coverage area. (supported on EDGE AirCard modems)</li> <li>• 3G icon—UMTS is the fastest service available in your current coverage area. (supported on UMTS AirCard modems)</li> <li>• HS icon—HSDPA is the fastest service available in your current coverage area. (supported on HSDPA AirCard modems)</li> </ul> <p>When only the letters are displayed, (for example <b>edge</b>), you are within the coverage area, but have not yet acquired the service.</p> <p>When the indicator has an outline (<b>edge</b>), you have acquired service and are able to establish a data connection.</p> <p>When the indicator is filled (<b>edge</b>), you have a data connection on the wireless service.</p>
	<p><b>Roaming.</b> You are connected to a network other than your local service provider's. There may be a surcharge for roaming service. (This service may not be available.)</p>
	<p><b>New SMS message.</b> Click the icon to open the SMS Express window and read your messages. When your SIM becomes full, this icon flashes and turns red. (Supported only on selected devices.)</p>
	<p><b>Headset.</b> If your AirCard modem is voice-enabled and the headset is supported, this indicator is displayed when a headset is attached.</p>
	<p><b>Missed call.</b> If your AirCard modem is voice-enabled, this indicator is displayed when you fail to answer an incoming call. Click the icon to open the call history and view the numbers of the calls you missed (assuming you have caller ID service with your account).</p>
	<p><b>Voice mail.</b> If your AirCard modem is voice-enabled, this indicator is displayed when you have a new voice message. Click the icon to access your voice mail box (assuming you have voice mail service with your account).</p>

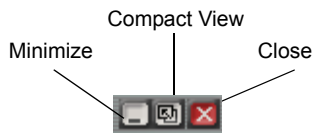
**Table 7-1: Icons and indicators in Watcher**

	<b>Call forwarding.</b> If your AirCard modem is voice-enabled, this indicator is displayed when call forwarding is in use. (This appears only when all calls are forwarded.)
	<b>TTY.</b> If your AirCard modem is voice-enabled, this indicator is displayed if TTY support is enabled. (TTY or TeleTYpe devices allow speech and hearing impaired people to use a phone). (Depending on your AirCard modem configuration, you may not have this indicator.)
	<b>Data transmission.</b> When the modem is connected to the network, the main Watcher window shows you the amount of data received and sent.

## View options

You have these options concerning the Watcher window:



- You can enable/disable always on top from the View menu. When enabled, the Watcher window always appears in front of other application windows.
- You can switch between the full Watcher window and the compact window from the View menu or by using the Compact View button:





- You can use the Minimize button to close the Watcher window but leave the program running.

## Status icons

These icons appear in the system tray (usually in the lower right corner of your screen).

	Watcher cannot detect the AirCard modem. Ensure that the AirCard modem is powered on.
	You do not have an active high-speed connection.

	You have an active high-speed connection.
	You have new (unread) SMS messages.

## Turning the radio on and off

This option allows you to conserve your computer’s battery by turning off the AirCard modem radio transmitter/receiver when you are not using it.

To turn off the radio:

1. Select **Tools > Turn Radio Off**.

When the radio is turned off, the menu option switches to Turn Radio On and the message, “Radio is off” is displayed in the Watcher window.

To turn on the radio:

1. Select **Tools > Turn Radio On**.

## Frequency band and network selection

Watcher has two options that affect your ability to obtain GPRS, EDGE, UMTS, or HSDPA service in any given area. You can select:

- The frequency band you want to use
- The network you want to use, if you are within the coverage area of more than one network

### Frequency band selection

Every GSM network operates on one set of frequency bands. (See “[Frequency band selection](#)” on page 37.) The AirCard modem is designed to change frequency bands automatically as required to obtain network service. You can also change frequency bands manually from the Network tab of the Options window (**Tools > Options... > Network**).

---

*Note: Unless your service provider specifies otherwise, it is recommended that you use the **Auto** setting.*

---

## Network selection

Depending on your location, you may be within the coverage area of several networks. Your ability to obtain service on each network is dependent on your account.

Your options for network selection are:

- **Automatic**—The AirCard modem automatically selects a network based on your account and network availability.
- **Manual**—The AirCard modem scans the area and displays a list of detected GSM networks. You can then choose from a list of available networks.

If you select a network on which you cannot obtain service, the message, “Failed to register with network” appears. You should then choose a different network.

This option is set on the Network tab of the Options window (**Tools > Options... > Network**).

## 8: Regulatory and Safety Information

- Important notice
- Important safety/compliance information for North American users
- EU regulatory conformity

### Important notice

Because of the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (that is, have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless network card are used in a normal manner with a well-constructed network, the Sierra Wireless network card 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 and its affiliates accept no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless network card, or for failure of the Sierra Wireless network card to transmit or receive such data.

### Safety and hazards

Do not operate your AirCard modem:

- In areas where blasting is in progress
- Where explosive atmospheres may be present including refuelling points, fuel depots, and chemical plants
- Near medical equipment
- Near life support equipment, or any equipment which may be susceptible to any form of radio interference. In such areas, the AirCard modem **MUST BE POWERED OFF**. Otherwise, the AirCard modem can transmit signals that could interfere with this equipment.

In an aircraft, the AirCard modem **MUST BE POWERED OFF**. Otherwise, the AirCard modem can transmit signals that could interfere with various onboard systems and may be dangerous to the operation of the aircraft or disrupt the cellular network. Use of a cellular phone in an aircraft is illegal in some jurisdi-

cations. Failure to observe this instruction may lead to suspension or denial of cellular telephone services to the offender, or legal action or both.

Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open. The AirCard modem may be used normally at this time.

## Important safety/compliance information for North American users

**CAUTION:** Unauthorized modifications or changes not expressly approved by Sierra Wireless, Inc. could void compliance with regulatory rules, and thereby your authority to use this equipment.

The design of the AirCard 850 / 860 / 875 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)*

These devices are only authorized to be used in laptop computers that are identical or substantially similar to those in its grant application.

These devices comply with Part 15 of the FCC Rules. Operation is subject to the condition that these devices do not cause harmful interference.

Where appropriate, the use of the equipment is subject to the following conditions:

**WARNING (EMI)** – United States FCC Information – This equipment has been tested and found to comply with the limits pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in an appropriate 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 communication. 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

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 850 / 860 / 875 wireless network cards have been granted modular approval for mobile applications. Integrators may use the AirCard 850 / 860 / 875 wireless network cards 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 8 dBi in the Cellular band and 4 dBi in the PCS band.

3. The AirCard 850 / 860 / 875 wireless network cards and their antennas 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 wireless network card is incorporated, with a statement similar to the following:
  - For an end product with an embedded AirCard 850 wireless network card:  
**This device contains FCC ID: N7NAC850.**  
**This equipment contains equipment certified under IC: 2417C-AC850.**
  - For an end product with an embedded AirCard 860 wireless network card:  
**This device contains FCC ID: N7NAC860.**  
**This equipment contains equipment certified under IC: 2417C-AC860.**
  - For an end product with an embedded AirCard 875 wireless network card:  
**This device contains FCC ID: N7NAC875.**  
**This equipment contains equipment certified under IC: 2417C-AC875.**
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.

The end product with an embedded AirCard 850 / 860 / 875 wireless network card must pass the unintentional emission testing and properly authorized per FCC Part 15 requirements.

---

*Note: If these wireless network cards are 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.*

---

## EU regulatory conformity

Sierra Wireless hereby declares that the AirCard 850 / 875 wireless network cards conform to all the essential requirements of Directive 1999/5/EC:

**CE 0682**

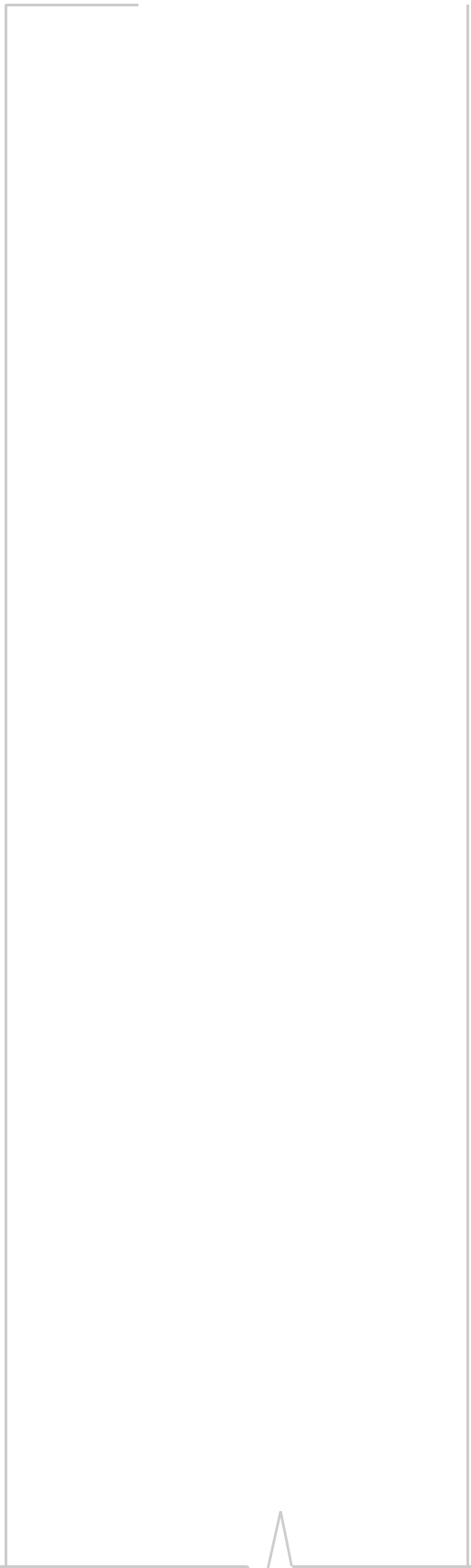
AirCard 875 wireless network card

**CE 0984**

AirCard 850 wireless network card

The Declaration of Conformity made under Directive 1999/5/EC is available for viewing at the following location in the EU community:

Sierra Wireless (UK), Limited  
Lakeside House  
1 Furzeground Way, Stockley Park East  
Uxbridge, Middlesex  
UB11 1BD  
England



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