



AirCard[®] 800 Series Wireless Network Cards

Installation Guide



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6,199,168	6,339,405	6,359,591	6,400,336	6,643,501
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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 software
- Before you can begin using the AirCard
- Package contents

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

AirCard 800 Series wireless network cards

The AirCard 800 Series 3G wireless network cards are accessories 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 fits into the standard (Type II) PC Card slot available on most notebook PCs.

Supported operating systems

The AirCard wireless network cards work in:

- Notebook PCs running Windows 98 SE, NT 4.0, 2000, Me, and XP. (See [Chapter 3](#) for more details.)

The AirCard as a network card

The AirCard 800 Series network cards 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) that will cause the AirCard 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 6.](#)) Otherwise, you can configure Watcher to connect only when you select a button.

The AirCard 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 data speeds when connected on these services are:

- GPRS (General Packet Radio Service)—56 kbps
- EDGE (Enhanced Data GSM Environment)—216 kbps
- UMTS (Universal Mobile Telecommunications System)—384 kbps
- HSDPA (High Speed Download Packet Access)—up to 1.8 Mbps on the downlink (receive) with 500 to 800 kbps typical

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

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

These data connections are Internet connections. Once the connection is established, you can connect to any web site accessible through the Internet or use Internet services (such as e-mail).

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

Your account and coverage area

Note: If you purchased the AirCard 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.

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's 3G capability. (The AirCard 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, 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 anytime you use it.

Before you can use the AirCard, you must install the AirCard software and ensure that your AirCard 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 in any area in which you can obtain GPRS, EDGE, UMTS, or HSDPA service. 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.
- **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, regardless of roaming agreements or account provisions.

Most service providers have coverage maps on their web sites.

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).

AirCard software

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

- The Watcher program that you use to manage the AirCard and monitor your connections
- The driver software that forms the interface between the network card and your Windows operating system
- The Network Adapter Manager software that allows you to switch between the AirCard and other network cards

Before you can begin using the AirCard

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

1. Install the AirCard software: Watcher, the Network Adapter Manager, and the AirCard driver.
2. Attach the antenna, insert the SIM into the AirCard and insert the AirCard into your PC Card slot. (Do not insert the AirCard before installing the software.)
3. Obtain a GSM account (if this wasn't done when you purchased the AirCard).
4. Configure the AirCard to use your account (unless it was pre-configured.)
5. 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 package contains the following:

- AirCard wireless network card
- Antenna
- Installation CD containing the AirCard software and this installation guide
- Quick start guide

>> 2: The SIM Card and Your Account

- [Inserting a SIM card into your AirCard](#)
- [Removing a SIM card](#)
- [Attaching the antenna to your AirCard](#)

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

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 17.

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

Depending on how you purchased your AirCard, 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)—a number that identifies your device (AirCard model) on the GSM network. This number is printed on the AirCard box and on the AirCard label.

Your AirCard must be configured to use your account. If purchased from a service provider, your AirCard 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

To install your SIM card into the AirCard network card, 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 network card 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 PC Card’s antenna end.

Note: To prevent the SIM from becoming jammed in the AirCard 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.

4. Orient the SIM card, as shown in the diagram on the bottom side of the AirCard.
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 SIM card slot

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

Removing a SIM card

To remove the SIM card, you will need a narrow object, such as a pen or a straightened paper clip, to push into the eject hole.

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

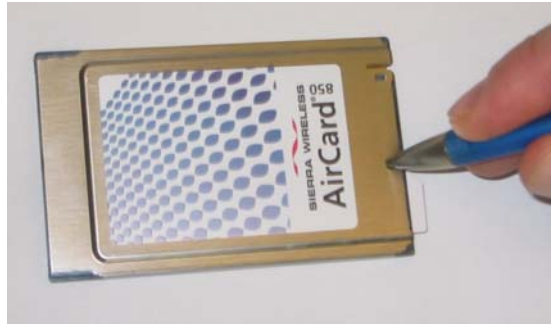


Figure 2-2: Ejecting the SIM card

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

Attaching the antenna to your AirCard

The antenna attaches to the gold-plated connector on the end of the AirCard.

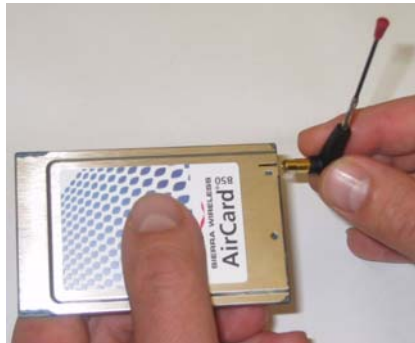


Figure 2-3: Attaching the antenna to the AirCard

>> 3: Software and Driver Installation

- System requirements
- Installation on Windows 98, 2000, Me, and XP
- Setting Internet Explorer to use the AirCard

System requirements

The AirCard wireless network card is supported on:

- Windows 98 SE
- Windows 2000 with Service Pack 4
- Windows NT 4.0 with Service Pack 6a and Networking installed
- Windows Me
- Windows XP (Home and Professional versions) with Service Pack 1

Note: The installation CD and this guide provide the software and instructions for installing on Windows 98 SE, 2000, Me, and XP. For Windows NT 4.0 software and instructions, see the Sierra Wireless web site, www.sierrawireless.com.

To install the AirCard, 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 98, 2000, Me, and XP

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 98 SE, Me, or 2000, Windows Installer Redistributable 2.0 must be installed. This is available on the Microsoft website, www.microsoft.com.

Note: The installer runs twice—once to install Watcher and once to install the Network Adapter Manager.

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

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

1. If the AirCard 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.
2. From the CD start-up menu, select your language, then **notebook installation**, and then **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, insert it. (See [page 9](#).) If the antenna is not yet attached, attach it. (See [page 11](#).) With the label facing up, insert the AirCard into your PC Card slot.

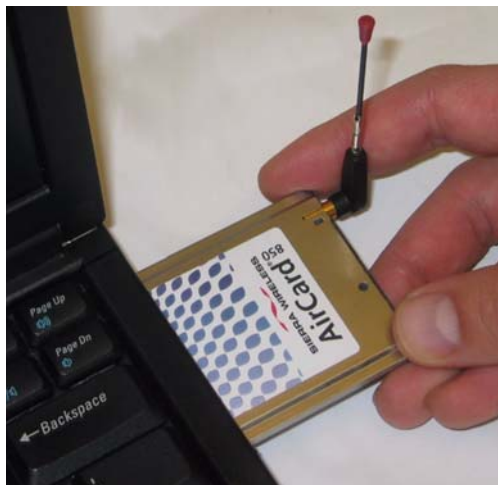


Figure 3-1: Inserting the AirCard

Watcher should launch automatically when the AirCard is inserted. If your AirCard has not yet been configured to use your account, you are prompted to do so. See [“Setting up a profile” on page 18](#).

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

Setting Internet Explorer to use the AirCard

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 to establish connections. At least one profile must be set up on the AirCard before you can use it. The profile(s) may have been stored on the AirCard 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 allows for up to twelve 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 to autoconnect. If you are using the AirCard 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 13.)

Setting up a profile

To determine whether you have a profile:

1. Insert the SIM into the AirCard if it is not already inserted. (See [page 9](#).)
2. Insert the AirCard into the PC Card slot if it is not already inserted. (See [page 14](#).)
3. If Watcher is not running, start Watcher, by selecting **Start > Programs > Sierra Wireless > AirCard Watcher for GSM > AirCard Watcher**



or double-click 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 may have been preconfigured. You can verify that you have a profile by selecting **Tools > Connections** to access the AirCard tab of the Connections window which lists all profiles.

To create a profile:

1. On the Connections window, select the **Add** button.
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 AirCard 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.
 - 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, DNS address(es), or Quality of Service (QoS) parameters, select the **Advanced** button to open the Advanced Profile window. Otherwise, click **OK** and skip to [Step 12](#).

6. On the Autolaunch tab, select which application, if any, you want Watcher to automatically launch when a connection is established with this profile:
 - **None**—Select this if you do not want any application to be autolaunched.
 - **Browser**—Select this if you want Watcher to autolaunch your Internet browser (such as Internet Explorer or Netscape Communicator) when a connection is established with this profile. In the URL field, specify the web site (such as <http://www.sierrawireless.com>) you want to view on connection.
 - **Microsoft VPN (PPTP) Connection**—Select this if you want Watcher to autolaunch a VPN connection that you have set up in Windows when a GPRS, EDGE, or UMTS connection is established with this profile. From the drop-down list, select the VPN connection.
 - **Application (VPN Client, etc...)**—Select this if you want Watcher to autolaunch an installed VPN program, or any other program, when a GPRS, EDGE, or UMTS connection is established with this profile. In the field below, enter the path to the program, or use the **Browse** button to locate the program.
7. If your service provider has given you an IP address, on the TCP/IP tab, select **Use static IP address** and enter the address in the field below. Otherwise select **Use dynamic IP address**. (This is the default because most networks use dynamic IP addressing.) Use the check boxes to enable data compression or IP header compression if supported by your service provider.

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

8. If you have a DNS address or addresses, select the DNS tab and enter the address(es). (In most cases, it is not necessary to enter a DNS address.)
9. If your service provider specifies values for Quality of Service (QoS) parameters, enter those settings on the appropriate tabs (**Minimum QoS** and **Requested QoS**). (In most cases it is not necessary to adjust Quality of Service parameters and the tabs do not appear.) Do NOT change

any Quality of Service parameters unless advised to do so by your service provider.

10. Select **OK** to close the Advanced Profile window.
11. Select **OK** to close the GPRS Profile window.
12. If you have more than one profile, use the **Default Profile** radio button to select which is the default. (The “default” profile is the one used by the autoconnect feature and is used if you select **Connect** without selecting a profile.)

5: Care and Maintenance of Your Network Card

- [Stopping and ejecting the AirCard](#)

Note: Do not insert the AirCard before installing the software. See "Software and Driver Installation" on page 13.

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

- Do not apply adhesive labels to the AirCard or SIM. This may cause the AirCard or SIM to become jammed inside the slot, or prevent it from being inserted properly.
- When not installed in your computer, store the AirCard and SIM in a safe place.
- Protect the card from liquids, dust, and excessive heat (see ["Environmental specifications" on page 31](#) for details).
- The AirCard should fit easily into your computer's PC Card slot. Forcing the AirCard into the slot may damage the connector pins.
- 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 antenna



When you insert the AirCard in a notebook PC, the following should happen:

- The PC beeps (unless the effect is disabled).
- The PC Card icon appears in the status area (usually located in the lower right corner of the screen) unless the feature is disabled.
- The Network Adapter Manager icon  for the AirCard also appears in the status area.
- Watcher launches (unless the autolaunch option is disabled).

Stopping and ejecting the AirCard

To remove the AirCard:

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 “Stop Sierra Wireless AirCard 3G Adapter Parent” (Windows 98,2000, or Me) or “Safely remove Sierra Wireless AirCard 3G Adapter Parent” (Windows XP).
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 on your computer to eject the card.



Figure 5-2: Ejecting the AirCard from its slot

6. Grasp the AirCard and remove it from the slot.

6: Watcher™ Basics

- [Launching Watcher](#)
- [The Watcher window](#)
- [Icons and indicators on the main Watcher window](#)
- [View options](#)
- [Status icons](#)
- [Power Down and Up](#)
- [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 connections. Watcher allows you to:

- Create an account profile. (This is explained under [“The SIM Card and Your Account”](#) on page 9.)
- Determine signal strength, roaming status, GPRS/EDGE/UMTS/HSDPA availability, and other network connection parameters
- Monitor the status of the AirCard 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 18](#)), you do not need to run Watcher when you use the AirCard, but Watcher does provide useful status information.

Launching Watcher

On notebook PCs, unless the feature has been disabled, Watcher launches automatically anytime you insert the AirCard. You can also launch Watcher by:

- Double clicking the desktop shortcut,  or
- Selecting **Start > Programs > Sierra Wireless > AirCard 800 Series > Watcher for AirCard 800 Series**

Depending on how your profile is configured, your browser, VPN, or other program may launch automatically anytime you launch Watcher. See [page 19](#).

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

The Watcher window

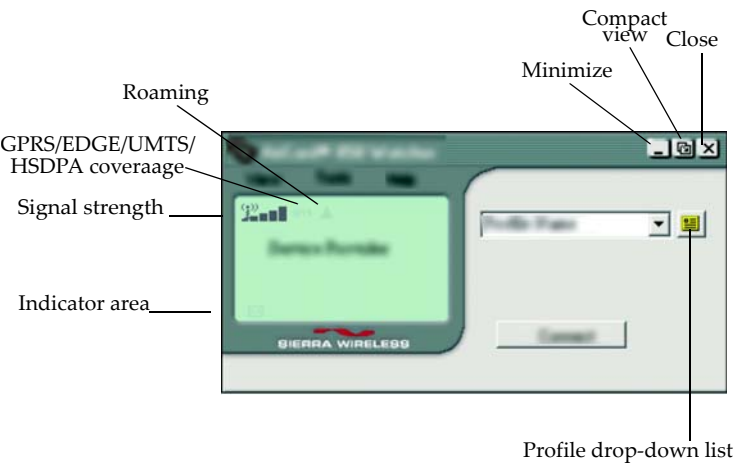


Figure 6-1: The Watcher window.

Icons and indicators on the main Watcher window

These icons are used on the main Watcher window:

Table 6-1: Icons and indicators in Watcher

Icon	Meaning
	Device status. If an AirCard icon with an "X" is displayed, Watcher is unable to detect the AirCard. The ToolTip that displays when you position the mouse pointer over this indicator says, "Device not available". This usually indicates that the AirCard is not fully inserted into the PC Card slot.
	If an AirCard icon with a "?" is displayed, Watcher has detected the AirCard but is unable to communicate with it. The ToolTip that displays when you position the mouse pointer over this indicator says, "Device not responding". You may be able to resolve this problem by restarting Watcher, by stopping, ejecting, and reinserting the AirCard, or by restarting your PC.

Table 6-1: Icons and indicators in Watcher

Icon	Meaning
 Depending on your AirCard configuration, you may have two signal strength indicators. If you have two, the indicator on the right shows the WiFi signal strength (the hotspot with the strongest signal).	Signal strength and service status. 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). Blank bars in the signal strength indicator mean that you are outside of the coverage area or have insufficient signal strength to maintain a GSM data connection. A red thermometer icon indicates overheating. In the unlikely event that this occurs, the AirCard suspends data transmission until the temperature drops, then normal operation is resumed. (This usually takes no more than 10 seconds.) A red flashing antenna icon indicates an antenna problem. If this occurs, try reorienting the antenna and ensure that there is nothing on or near the antenna that could be blocking the signal.
 Depending on your AirCard configuration, you may not have this indicator.	Coverage. The icon shows the best service available where the: - gprs icon—indicates that GPRS is the fastest service available - edge icon—indicates that EDGE is the fastest service available 3G—indicates that UMTS is the fastest service available - HS—indicates that HSDPA is the fastest service available. When only the letters are displayed, you are within coverage but have not yet acquired the service. When the indicator has an outline, you have acquired service and are able to establish a connection. When the indicator is filled, you have a connection on the service.

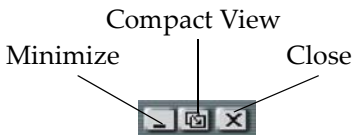
Table 6-1: Icons and indicators in Watcher

Icon	Meaning
 Depending on your AirCard configuration, you may not have this indicator	Roaming. When displayed, you are connected to a network other than your local service provider's. There may be a surcharge for roaming service.
	New SMS message. Select the icon to open the SMS Express window and read your messages. When your SIM becomes full, this icon flashes and turns red.
 	Data transmission. When this indicator is on and neither circle is shaded, you have a connection but no data transmission is occurring. A shaded top circle indicates that data is being sent and a shaded bottom circle that data is being received. These statistics are displayed during GPRS/EDGE/UMTS/HSDPA connections only; no statistics are displayed for dial-up connections.

View options

On notebook PCs, 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).

Table 6-2: Status icons

Icon	Meaning
	You have a GPRS, EDGE, UMTS, or HSDPA connection.
	You do not have a GPRS, EDGE, UMTS, or HSDPA connection.
	You have one or more unread SMS messages.

Power Down and Up

The power down/power up option allows you to conserve your battery by powering the AirCard down when you are not using it.

To power down the AirCard:

1. Select **Tools > Power Down**

When powered down, the menu option switches to Power Up and the message, "Device powered down" is displayed on the Watcher window.

You cannot maintain a connection when the AirCard is powered down.

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 28](#).) The AirCard 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 automatically selects a network based on your account and network availability.
- **Manual**—The AirCard 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**).

>> 7: 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 800 Series wireless network card.

LED operation

The AirCard has a single LED (Light Emitting Diode) located on the antenna end of the card beneath the SIM slot. The color (red, green or amber) and state (off, on solid, or blinking) of the LED indicate the connection status as follows:

Table 7-1: LED operation

LED state	How to interpret
Solid amber^a	The AirCard is powering up, or a firmware download is in progress.
Blinking amber	The AirCard is scanning for service.
Blinking green	The AirCard is in service and registered on the network.
Blinking red	There is a hardware problem.
Off	The AirCard is powered down.

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

Radio frequency and electrical specifications

Table 7-2: Radio frequency & electrical specifications

Compliance	GSM Release 99
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Table 7-2: Radio frequency & electrical specifications

Multi-slot class	Class 10
Transmit	<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 only)</i> 1920 to 1980 MHz <i>WCDMA850 (AirCard 860 only)</i> 824 to 849 MHz <i>WCDMA1900 (AirCard 860 only)</i> 1850 to 1910 MHz
Receive	<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 only)</i> 2110 to 2170 MHz <i>WCDMA850 (AirCard 860 only)</i> 869 to 894 MHz <i>WCDMA1900 (AirCard 860 only)</i> 1930 to 1990 MHz
Channel spacing	200 kHz (GSM) 5 MHz (WCDMA)
Channel raster	200 kHz
Frequency stability	0.1 ppm

Environmental specifications

Table 7-3: Environmental specifications

Operating temperature	-20 to +65 °C (ambient, outside PCMCIA enclosure)
Storage temperature	-30 to +85 °C
Humidity	95%, non-condensing
Vibration	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 or the keypad on the VOICE tab in the main Watcher window, 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 IMEI¹.

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 wireless network card) on the GSM 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 (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 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 wireless network card:

- 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 **MUST BE POWERED OFF**. Otherwise, the AirCard can transmit signals that could interfere with this equipment.

In an aircraft, the AirCard **MUST BE POWERED OFF**. Otherwise, the AirCard 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 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 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)*

CAUTION: The AirCard 850/860 has been tested for compliance with FCC / IC RF exposure limits in the laptop computer(s) configurations with side PCMCIA slot and can be used in laptop computers with substantially similar physical dimensions, construction, and electrical and RF characteristics. Always place the antenna in the upright position (oriented vertically) when using the AirCard in a notebook computer. Note: If this PC Card 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.

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does 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 wireless network card has been granted modular approval for mobile applications. Integrators may use the AirCard 850/860 card 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 card 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 850/860 is incorporated, with a statement similar to the following:

For an end product with an embedded AirCard 850:

This device contains TX FCC ID: N7NAC850.

This equipment contains equipment certified under IC: 2417C-AC850.

For an end product with an embedded AirCard 860

This device contains TX FCC ID: N7NAC860.

This equipment contains equipment certified under IC: 2417C-AC860.

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 card must pass the unintentional emission testing and properly authorized per FCC Part 15 requirements.

Note: If this PC Card 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.

EU regulatory conformity

Sierra Wireless hereby declares that the AirCard 850 is in conformity to all the essential requirements of Directive 1999/5/EC.:

CE 0984

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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