

User Guide for the

ORiNOCO 802.11a/b ComboCard



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ORiNOCO ComboCard User's Guide

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Introduction

In This Chapter

- [Introducing the ORiNOCO 802.11a/b ComboCard](#)
- [The Product Package](#)
- [System Requirements](#)
- [The IEEE 802.11 Specifications](#)

Introducing the ORiNOCO 802.11a/b ComboCard

Congratulations on your purchase of an ORiNOCO 802.11a/b ComboCard, a high performance wireless LAN adapter card that complies with the IEEE 802.11a and 802.11b wireless standards. This means that the card is interoperable with IEEE 802.11a and 802.11b equipment from any manufacturer. The card cannot use both standards simultaneously but it can automatically switch between the two. In addition, the card supports 802.11a 2X mode*, which provides data rates of up to 108 Mbps.

The ORiNOCO ComboCard supports Windows XP, Windows 2000, Windows Millennium Edition (ME), and Windows 98 Second Edition (SE). Computers with an ORiNOCO ComboCard installed “look” like standard network nodes to the operating system.

The ORiNOCO ComboCard can be used with other 802.11a or 802.11b devices to form a stand-alone wireless Peer-to-Peer Group* or used in conjunction with an Access Point infrastructure to provide mobile clients with wireless access to an Ethernet network.

Proxim is a leading manufacturer of wireless networking equipment. Proxim’s unmatched expertise in radio networking technology, combined with the company’s extensive experience serving the communication needs of the mobile computing user, have kept Proxim at the forefront of the wireless Local Area Networking (LAN) market.

*Available features vary by region/country.

The Product Package

Each ORiNOCO 802.11a/b ComboCard comes with the following:

- One **Gold Model 8460** or **Silver Model 8461** ORiNOCO ComboCard
 - The Gold card provides the following features that are not included with the Silver card:
 - Supports Harmony Key Management (also known as the Harmony Security Protocol)
 - Includes Boingo Wireless Software
 - Both models include two integral antennas (antennas are inside the casing and not visible to the user)
- One ORiNOCO Installation CD-ROM containing software and utilities and this user’s guide in Portable Document Format (PDF)
- One *ORiNOCO 802.11a/b ComboCard Quick Start Guide*

If any of these items are missing or damaged, please contact your reseller or ORiNOCO Technical Support (see “Technical Support” on page 58 for contact information).

System Requirements

To begin using an ORiNOCO 802.11a/b ComboCard, you must have the following minimum requirements:

- A computer that meets the following specifications:
 - Windows XP, Windows 2000, Windows Millennium Edition (ME), or Windows 98 Second Edition (SE) installed
 - PC Card expansion slot (32-bit CardBus)
 - At least 64 MB of memory
 - A 300 MHz processor or higher
- At least one other IEEE 802.11a-compliant or 802.11b-compliant device
 - Customers in Europe who want to use the card in 802.11a mode need an 802.11a-compliant Access Point (Peer-to-Peer Groups are not available in Europe)

The IEEE 802.11 Specifications

In 1997, the Institute of Electrical and Electronics Engineers (IEEE) adopted the 802.11 standard for wireless devices operating in the 2.4 GHz frequency band. This standard includes provisions for three radio technologies: direct sequence spread spectrum, frequency hopping spread spectrum, and infrared. Devices that comply with the 802.11 standard operate at a data rate of either 1 or 2 Mbps.

In 1999, the IEEE modified the 802.11 standard to support direct sequence devices that can operate at speeds of up to 11 Mbps. The IEEE ratified this standard as **802.11b**. 802.11b devices are backwards compatible with 2.4 GHz 802.11 direct sequence devices (that operate at 1 or 2 Mbps).

Also in 1999, the IEEE modified the 802.11 standard to support devices operating in the 5 GHz frequency band. This standard is referred to as **802.11a**. 802.11a devices are not backwards compatible with 2.4 GHz 802.11 or 802.11b devices. 802.11a radios use a radio technology called Orthogonal Frequency Division Multiplexing (OFDM) to achieve data rates of up to 54 Mbps.

Since both 802.11a and 802.11b are based on the same common standard (IEEE 802.11), 802.11a and 802.11b devices have many of the same parameters. This user's guide uses the generic term **802.11** to refer to parameters that apply to both 802.11a and 802.11b devices.

In addition to supporting 802.11a and 802.11b mode, the ORiNOCO ComboCard supports a third operating mode: **2X™** mode. 2X mode is an extension of the 802.11a standard that allows data rates of up to 108 Mbps; the ORiNOCO Utility refers to this mode as **802.11a 2X**; other products, such as the ORiNOCO AP-2000, refer to this mode as **Turbo** mode. Note that 2X mode is not part of the 802.11a standard (so devices using this mode from different vendors may not necessarily be interoperable with each other), and 2X mode is not available in all countries.

NOTE

An 802.11a device and an 802.11b device cannot communicate with each other. Also, a device in 802.11a 2X mode and a device operating in 802.11a mode (2X mode disabled) cannot communicate.

Installation

In This Chapter

This chapter describes how to install an ORiNOCO 802.11a/b ComboCard and software in a computer running Windows XP, Windows 2000, Windows Millennium Edition (ME), or Windows 98 Second Edition (SE).

- [Pre-installation Considerations](#)
- [Installation Instructions](#)



NOTE

Run the ORiNOCO Installation program before installing the ORiNOCO ComboCard in the computer.

Pre-installation Considerations

Review the following pre-installation considerations before installing an ORiNOCO ComboCard.

U.S. Regulatory Warnings

FCC Guidelines

This device has been tested for compliance with FCC RF Exposure (SAR) limits in a typical laptop configuration with a PCMCIA slot on either the right or left side of the laptop.

In order to comply with the SAR limit established in the ANSI C95.1 standard, it is recommended when using a PC card adapter that the integrated antenna is positioned more than 2.5 centimeters from nearby persons during extended periods of operation. If the antenna is positioned less than 2.5 centimeters from nearby persons, it is recommended that the user limit exposure time.

This device and its antenna must not be co-located or operated in conjunction with any other antenna or transmitter.

Radio Frequency Interference Requirements

The ORiNOCO 802.11a/b ComboCard, Models 8460 and 8461, operates in multiple frequency ranges including the 5.15 to 5.35 GHz band (when in 802.11a or 802.11a 2X mode); the device is restricted to indoor use due to their operation in the 5.15 to 5.25 GHz frequency range. FCC 15.407(e) requires that these devices be used indoors in the frequency range of 5.15 to 5.25 GHz to reduce the potential or harmful interference to co-channel Mobile Satellite systems. Therefore the devices should be used indoor only for channel 36, 40, 44, and 48 and when in 802.11a 2X mode, channel 42 and 50.

High power radars are allocated as primary users of the 5.25 to 5.35 GHz and 5.725 to 5.850 GHz band. These radar stations can cause interference with and/or damage the ORiNOCO 802.11a/b ComboCard.

DECLARATION OF CONFORMITY

We, Proxim Corporation,
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declare under our sole responsibility that the ORiNOCO 802.11a/b ComboCard, Models 8460 and 8461, complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Windows ME and Windows 98 SE Installation CD Requirement

Before beginning the installation of an ORiNOCO ComboCard, confirm that you have a Windows 98 SE or Windows ME installation CD available (depending on the computer's operating system). Windows 98/ME users may be prompted to insert a Windows CD during the installation. You should not need a Windows CD when installing the card in a Windows XP or Windows 2000 computer.

If you do not have a Windows 98/ME CD, it is possible that you already have the Windows installation files on your hard drive. These Windows installation files are known as Windows Cabinet or CAB files. The Cabinet files are commonly located in *C:\WINDOWS\OPTIONS\INSTALL* or *C:\WINDOWS\OPTIONS\CABS*.

➤ NOTE

Windows 98/ME users may need the Windows CD or Cabinet files to complete the installation of an ORiNOCO ComboCard. Proxim recommends that you do not proceed with the installation until you have confirmed that you have one of these Windows installation media available.

Note to Customers Using a Laptop Without a CD-ROM Drive

If you are installing the ORiNOCO ComboCard in a laptop that does not have a CD-ROM drive or if your CD-ROM drive is an external device that shares a single CardBus slot with network adapter cards, you should follow the steps below prior to installing the card:

1. Windows 98/ME users: Confirm that the Windows cabinet (CAB) files are installed on the computer. The CAB files are typically located in *C:\WINDOWS\OPTIONS\INSTALL* or *C:\WINDOWS\OPTIONS\CABS*.
2. Windows 98/ME users: If the computer does not have the CAB files installed, copy the *Win98* or *Win9x* folder found on the Windows CD-ROM to a temporary folder on the computer.
3. Copy the contents of the ORiNOCO Installation CD-ROM to a temporary folder on the computer. Alternatively, you may download the software at <http://www.proxim.com> or <http://www.orinocowireless.com>.
4. Follow the installation instructions contained in this chapter. When the instructions call for either the Windows CD or the ORiNOCO Installation CD, search the CAB files or the temporary folders you created in Steps #2 and 3.
5. When the installation is complete, remove the temporary folders you created in Steps #2 and 3 from the computer's hard drive.

Note to Customers Who Already Have Harmony 802.11a Software Installed

The ORiNOCO 802.11a/b ComboCard's software and utility cannot be installed on a computer that is already running the Harmony 802.11a Utility. If your computer already has the Harmony 802.11a Utility installed, the ORiNOCO 802.11 Setup program will detect the Harmony 802.11a software during installation and prompt you to authorize the removal of the Harmony 802.11a software, as shown in Figure 2-1.

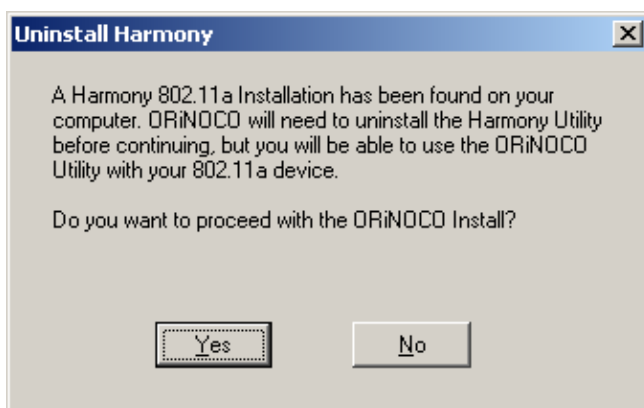


Figure 2-1 Harmony 802.11a Software Detected

If you click **Yes** to proceed with ORiNOCO installation, the ORiNOCO Setup program will automatically remove the Harmony 802.11a Utility. If you select **No**, the ORiNOCO Setup program will close, and the ORiNOCO ComboCard will not be installed.

After installing the ORiNOCO software, the Harmony 802.11a card will continue to function in the computer but you will use the ORiNOCO Utility rather than the Harmony 802.11a Utility to configure it.

If you later want to return to the Harmony 802.11a Utility, you will need to uninstall the ORiNOCO software and reinstall the Harmony 802.11a software.

Installation Instructions

The instructions below describe how to install an ORiNOCO ComboCard by running the ORiNOCO Installation program before inserting the card into the computer. If you inserted the card before running the ORiNOCO Installation program, see “Card Inserted Before Running the Installation Program” on page 50 for instructions.

Follow these steps to install an ORiNOCO ComboCard in a Windows 98 SE, Windows ME, Windows 2000, or Windows XP computer.

1. Turn on the computer and logon to Windows, if applicable.
2. Insert the ORiNOCO Installation CD into the computer's CD-ROM drive.
3. If the ORiNOCO Installation program does not launch automatically, run *SETUP.EXE* from the ORiNOCO Installation CD to launch the program, which is shown in Figure 2-2.

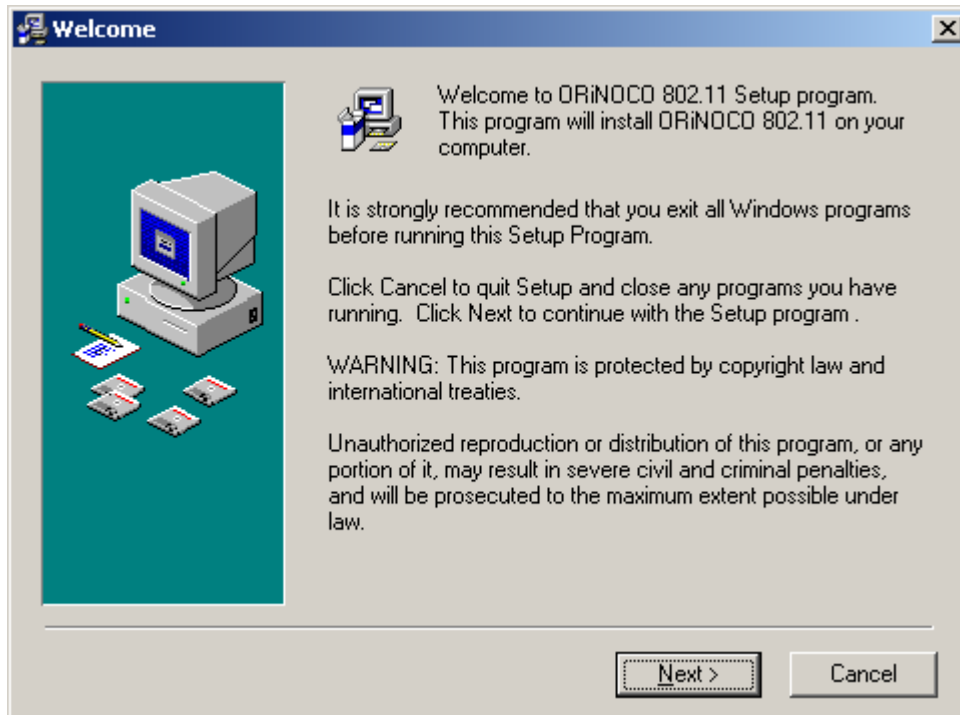


Figure 2-2 ORiNOCO Installation Program – Welcome Screen

4. Click **Next** to continue.
5. Select a destination folder for the ORiNOCO Utility files and click **Next** to continue.

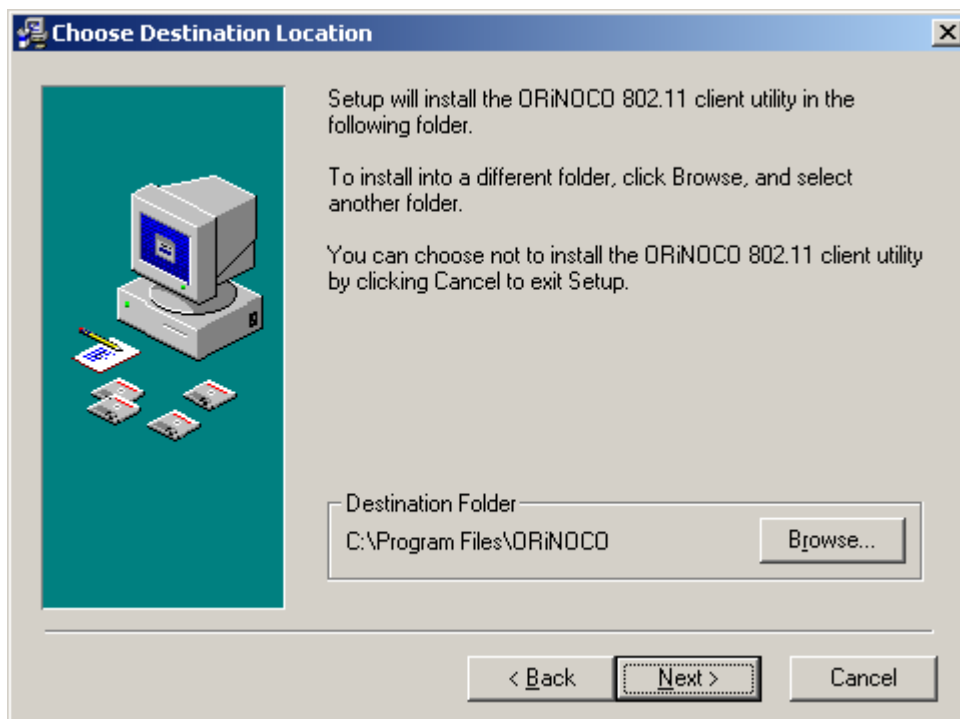


Figure 2-3 ORiNOCO Installation Program – Choose Destination Location Screen

6. Enter a name for the utility's Program Manager group and click **Next**. This is the name that will appear under the Windows Start menu (under Start > Programs).

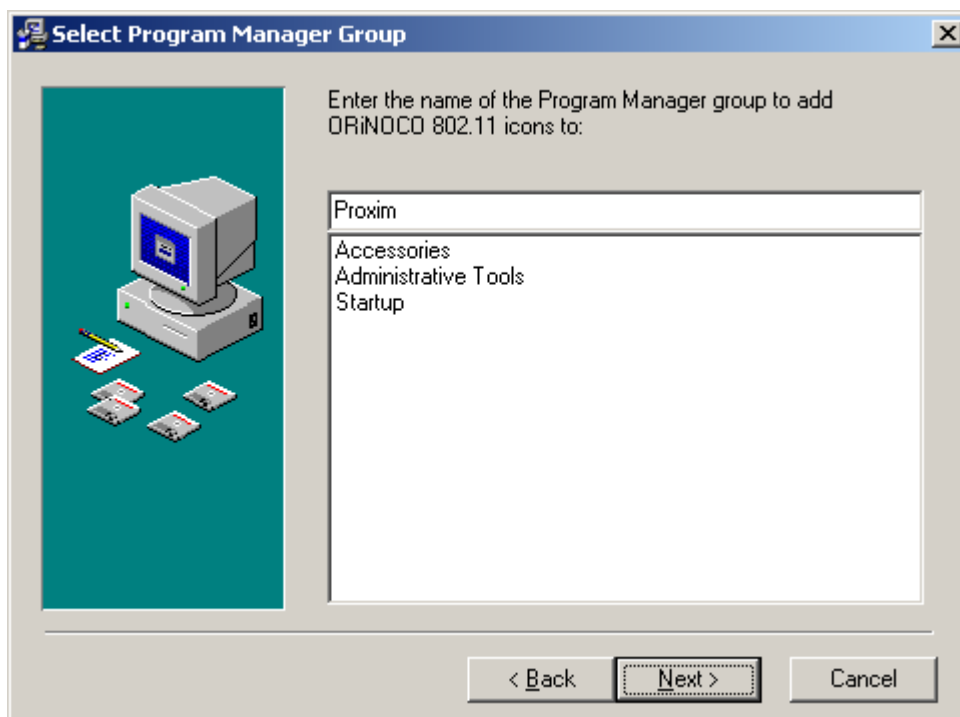


Figure 2-4 ORiNOCO Installation Program – Select Program Manager Group Screen

7. Click **Next** to install the utility.

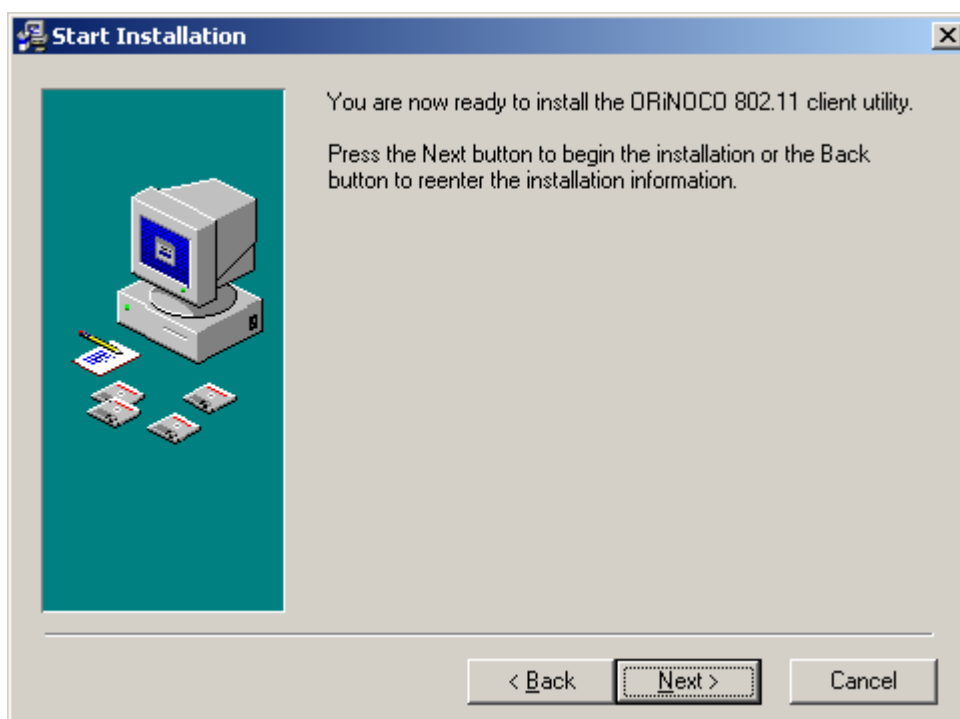


Figure 2-5 ORiNOCO Installation Program – Start Installation Screen

8. If prompted that a Harmony 802.11a Installation has been found on your computer, click **Yes** to uninstall it and continue with the ORiNOCO Installation. After installation, you will be able to use a Harmony 802.11a card with the ORiNOCO Utility. See "Note to Customers Who Already Have Harmony 802.11a Software Installed" on page 8 for more information.
9. When prompted, click **OK** to review the README file.

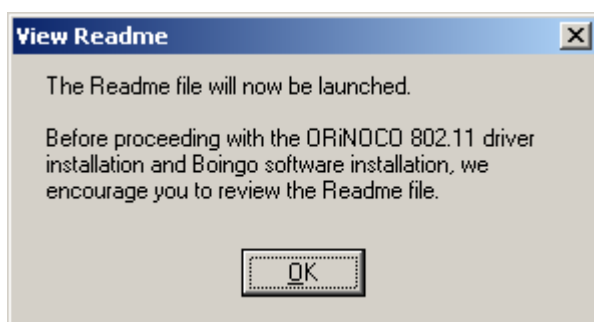


Figure 2-6 ORiNOCO Installation Program – README Prompt

10. Close the README file when finished.
11. Select installation options and click **Finish**. The Boingo software option only appears when installing a Gold card.
- Leave the **Read ORiNOCO configuration instructions** option checked to view information about the ORiNOCO Utility.
 - **Gold Card users:** Leave the **Install Boingo Software** option checked to add Boingo Wireless Software to your computer. Boingo is an easy-to-use service that provides wireless Internet access in hundreds of hot spot locations, such as airports, hotels, convention centers, and cafes. See <http://www.boingo.com> for more information.

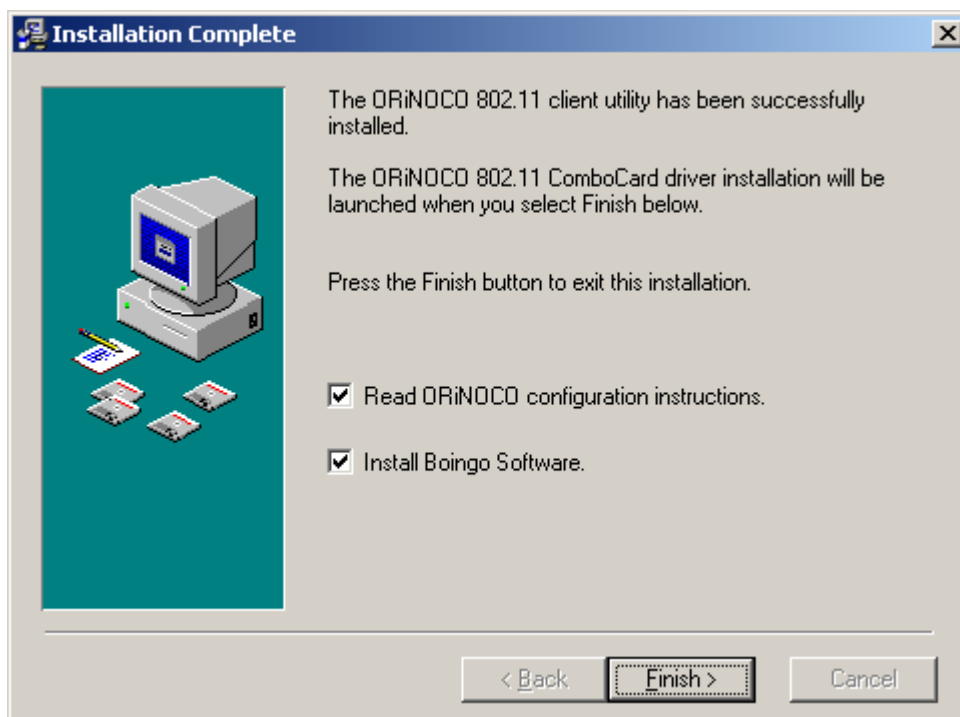


Figure 2-7 ORiNOCO Installation Program – Utility Installation Complete Screen (Gold Card Installation)

12. If you left the **Read ORiNOCO configuration instructions** option checked, review the information that describes the ORiNOCO Status Monitor and click **Finish** to continue.

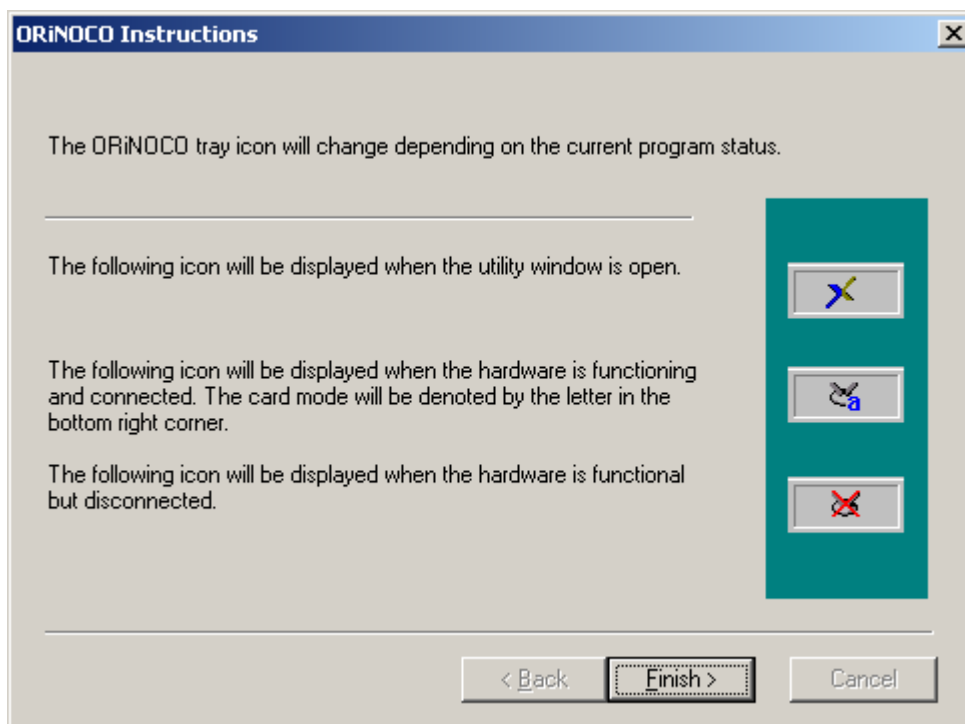


Figure 2-8 ORiNOCO Installation Program – Instructions Screen

13. Click **OK** to begin the ORiNOCO ComboCard's driver installation.

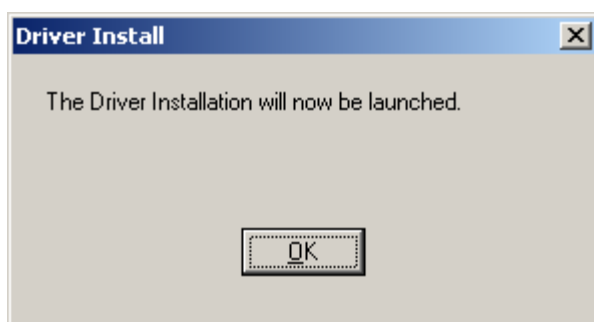


Figure 2-9 ORiNOCO Installation Program – Driver Install Screen

⇒ NOTE

Windows 2000/XP users: If prompted that the software is not Microsoft-certified, click **Yes** or **Continue Anyway** to continue the installation. The software is fully compatible with Windows 2000 and Windows XP.

14. Insert the card into the computer's CardBus slot when prompted by the ORiNOCO Device Setup screen, shown in Figure 2-10.



Figure 2-10 ORiNOCO Installation Program – Device Setup Screen

15. Follow the on-screen instructions to install the card. Note the following:

- If prompted to identify the location of the file *Prox11ab.sys* or *Ntpr11ab.cat*, direct the installation wizard to search the ORiNOCO Installation CD.
- Windows XP users: If prompted, select **Install the software automatically (Recommended)** and click **Next**.
- Windows 2000/XP users: If prompted that the software is not Microsoft-certified, click **Yes** or **Continue Anyway** to continue the installation. The software is fully compatible with Windows 2000 and Windows XP.
- Windows 98/ME users: Insert the Windows installation CD if prompted. If you do not have a Windows installation CD, see "Windows ME and Windows 98 SE Installation CD Requirement" on page 8.

16. Click **Close** when prompted that the ORiNOCO ComboCard has been successfully installed.



Figure 2-11 ORiNOCO Installation Program – Card Successfully Installed

⇒ NOTE

If the ORiNOCO Device Setup program or Windows Networking reports that the card has not been properly configured, follow the on-screen instructions and refer to “Troubleshooting” beginning on page 50 for suggestions.

17. **Gold Card users:** If you left the **Install Boingo Software** option checked, the Boingo installer will launch automatically. Follow the on-screen instructions to install the software.

⇒ NOTE

If you are a Boingo customer and are having problems using the Boingo software, contact Boingo Technical Support for assistance at 1-800-880-4117 or support@boingo.com. See <http://www.boingo.com> for more information.

18. The ORiNOCO Utility's Status Monitor icon will appear in Windows Taskbar, as shown in Figure 2-12.



Figure 2-12 Status Monitor Icon: Associated with an 802.11b Network

19. The ORiNOCO ComboCard is now ready for use. The card will automatically search for an 802.11a or 802.11b network to communicate with. Use the ORiNOCO Utility (described in “Configuration Utility” beginning on page 20) to configure the card.

- Windows XP users: You may need to enable the ORiNOCO Utility's configuration parameters before you can use the utility to change the card's settings. See “Note to Windows XP Users” on page 23 for details.

If you have one or more 802.11a and/or 802.11b Access Points, configure the card's **Network Type** to **Access Point**. If your network consists of only 802.11a client adapters or 802.11b client adapters, set **Network Type** to **Peer-to-Peer Group**.

⇒ NOTE

ORiNOCO ComboCards sold in Europe do not support Peer-to-Peer Group when in 802.11a mode.

For more information on Peer-to-Peer Groups and Access Point networks, see “Wireless Topologies” beginning on page 16 and “Network Type” on page 24.

Related Topics

- Refer to “Configuration Utility” beginning on page 20 for information on the card's configuration parameters and for information on how to use the ORiNOCO Utility.
- See “Configuring Networking Clients and Protocols” on page 51 for information on how to configure networking protocols like TCP/IP (so you can configure the card's IP settings).

Wireless Topologies

In This Chapter

ORiNOCO wireless products look and operate similar to Ethernet products. The only difference is that a radio replaces the wire between communicating devices. This means that all of your existing applications that operate over Ethernet will work with the ORiNOCO ComboCard without any special wireless networking software.

The ORiNOCO 802.11a/b ComboCard supports several network topologies, which are described in this chapter.

- [Peer-to-Peer Group](#)
- [Access Point Infrastructure](#)

Peer-to-Peer Group

Two or more computers easily establish a peer-to-peer group (also known as an **Ad Hoc** network) when the units are in range of each other. Each computer can dynamically connect and reconnect to the others with no additional configuration, using off-the-shelf peer-to-peer network operating systems, as illustrated in Figure 3-1.

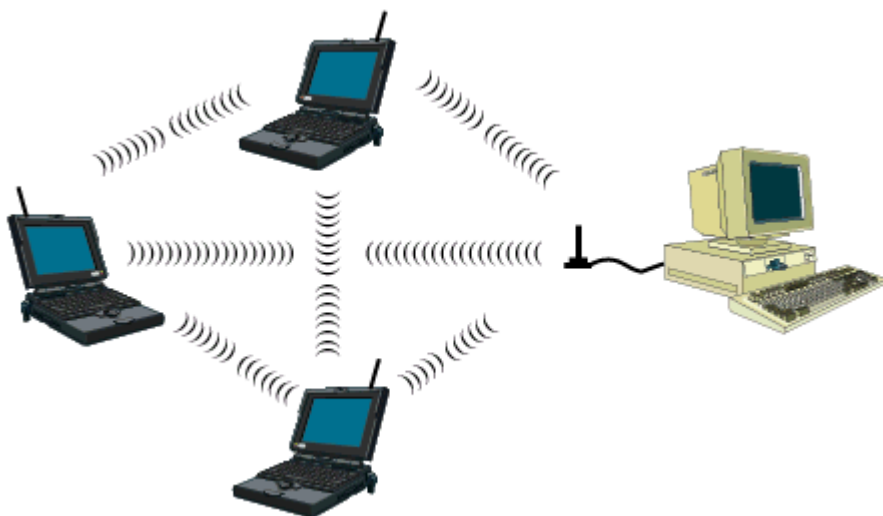


Figure 3-1 Peer-to-Peer Group

The ORiNOCO ComboCard can communicate with either an 802.11a or an 802.11b Peer-to-Peer Group (but it can not dynamically switch between the two). Therefore, you must manually configure the card to use one radio mode or the other. Follow these steps to configure the card as a member of a Peer-to-Peer Group:

1. Launch the ORiNOCO Utility and select the **Configuration** tab.



NOTE

You may want to create a new Profile before continuing. Profiles let you easily switch between pre-configured network so you can change the card's settings with a single mouse click. See "Profiles" on page 39 for more information.

2. Select the **Basic** tab on the left-hand side of the screen (if necessary).
3. Set **Network Type** to **Peer-to-Peer Group**.

4. Select a **Mode**. The card does not support the **Auto** option when Network Type is set to Peer-to-Peer Group.
 - If you want the card to join an 802.11a Peer-to-Peer Group, select **802.11a**.
 - If you want the card to join an 802.11b Peer-to-Peer Group, select **802.11b**.
 - If you want the card to join an 802.11a 2X Peer-to-Peer Group, select **802.11a 2X Mode**.

**NOTE**

ORiNOCO ComboCards sold in Europe do not support Peer-to-Peer Groups when in 802.11a or 802.11a 2X mode.

5. Set the card's **Network Name** to match the Network Name used by the Peer-to-Peer Group (or assign it a new Network Name if this is the first member of a Peer-to-Peer Group).
6. Select the **Advanced** tab.
7. Select the **Channel** used by the Peer-to-Peer Group or set **Channel** to **Automatic** to let the card search for available groups that use the same Network Name.
8. Click **Save** and **Yes** (when prompted) to save these settings to your current profile.
9. Click the **Security** tab and configure the Security settings, if necessary (see "Security" on page 27 for details).
10. Click **OK** to close the utility.

**NOTE**

See "Configuration Utility" on page 20 for additional information on these parameters.

Access Point Infrastructure

Many companies have an existing Ethernet or wired LAN infrastructure and want to be able to extend that capability to wireless nodes. This is accomplished by installing one or more Access Points on the Ethernet network. Access Points are devices that communicate with both the Ethernet network and the wireless network.

You can use the ORiNOCO ComboCard to communicate with 802.11a Access Points, 802.11b Access Points, or a combination of both. The card is compatible with 802.11a or 802.11b Access Points from any vendor, including Proxim's ORiNOCO and Harmony Access Point products.

Connecting to a Single AP

Figure 3-2 depicts an ORiNOCO network that uses a single Access Point (AP); in this example, the Access Point is an ORiNOCO AP-2000 (with an ORiNOCO Gold 802.11b PC Card installed).

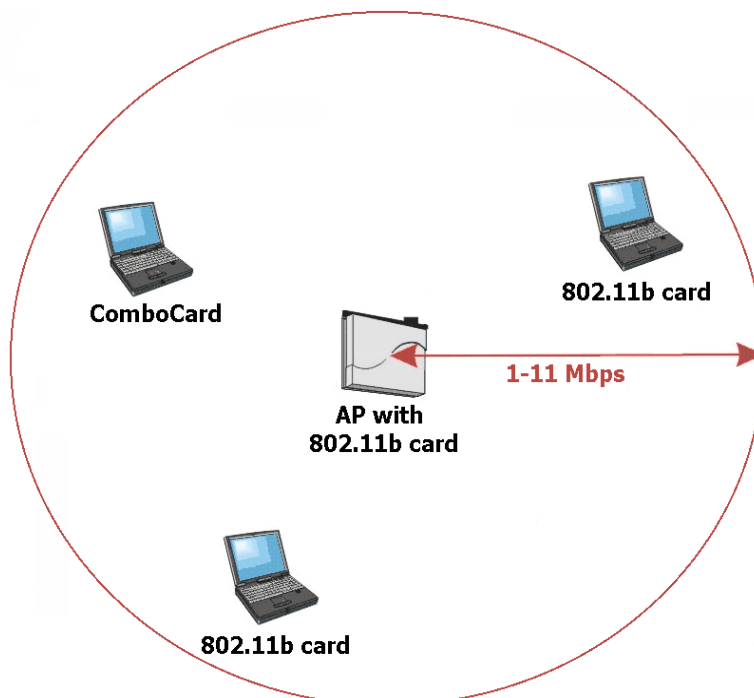


Figure 3-2 Communicating with a Single 802.11b Access Point

Roaming Between Multiple APs

For larger environments, the ORiNOCO ComboCard may roam from one Access Point to another while maintaining the same network connection. The Access Points establish coverage areas or cells similar in concept to those of a cellular phone network. The card will connect to any Access Point that is within range.

The ORiNOCO ComboCard supports roaming between APs of the same type (for example, from one 802.11a AP to another) or roaming between APs of different types (from an 802.11a AP to an 802.11b AP). Figure 3-3 illustrates roaming between APs of the same radio type (in this case, AP-2000s with 802.11a 5 GHz upgrade kits installed).

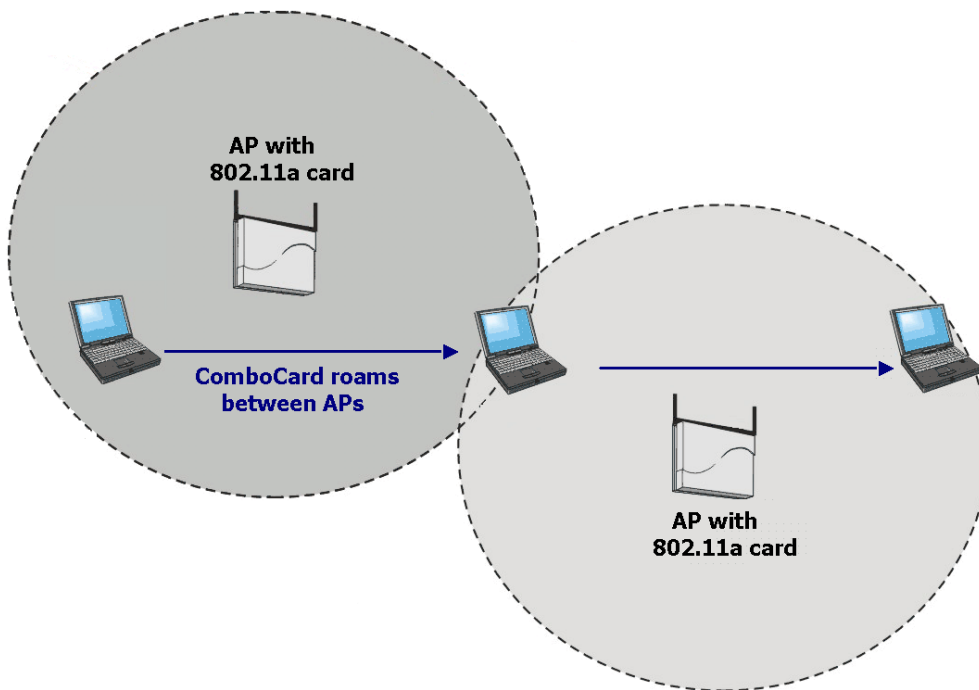


Figure 3-3 Roaming Between APs of the Same Radio Type

Figure 3-4 illustrates roaming between APs of different radio types:

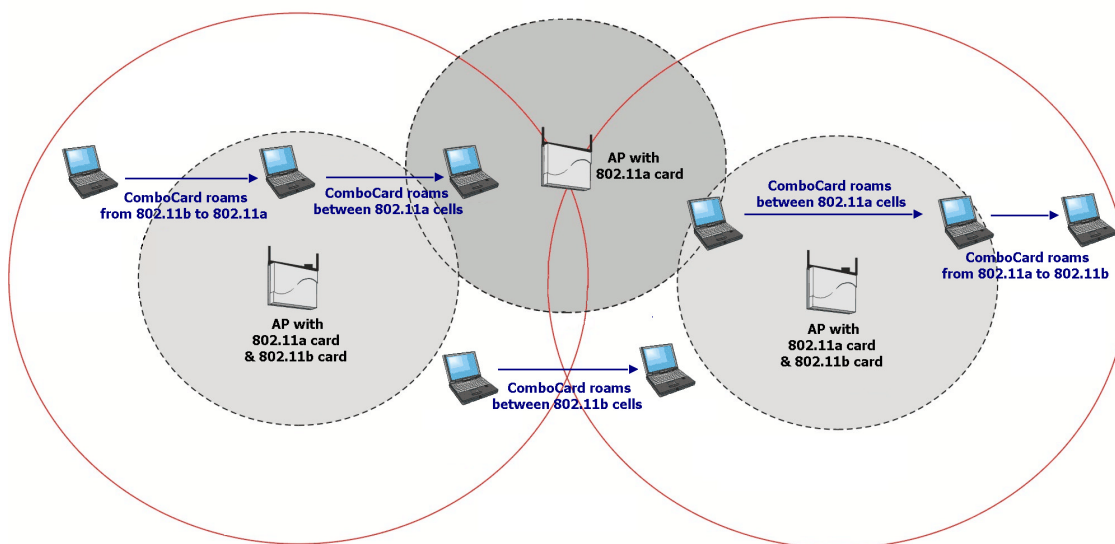


Figure 3-4 Roaming Between APs of Different Radio Types

In either case, each Access Point within a roaming network must have a unique, independent Channel, but all must have the same Network Name and security settings.

Mobile clients equipped with an ORiNOCO ComboCard have Network Type set to Access Point and have the same Network Name and security settings as the Access Points. Alternatively, the mobile client's Network Name may be "any"; this setting lets the client associate with any available Access Point, regardless of the Access Point's Network Name (this assumes that the AP is not a closed system; see "Network Name" on page 26 for more information).

As the mobile client seamlessly switches from cell to cell, its network connectivity is preserved. The user can move freely between the Access Points in the network. When the roaming client leaves the transmission range of one Access Point, the card automatically detects the other Access Point(s) in the same vicinity to continue the network connection. The ORiNOCO ComboCard also includes a Roaming parameter that lets you adjust the speed at which the card roams to new Access Points. See "Roaming" on page 26 for details.

Guidelines for Roaming

- An ORiNOCO 802.11a/b ComboCard can roam between multiple 802.11a Access Points, multiple 802.11b Access Points, or between both 802.11a and 802.11b Access Points.
- To support roaming between 802.11a and 802.11b Access Points, the card's **Mode** must be set to **Auto**.
- Standard 802.11a clients can only roam between 802.11a Access Points.
- Standard 802.11b clients can only roam between 802.11b Access Points.
- All 802.11a and/or 802.11b Access Points that a client will roam between must have the same Network Name.
- All workstations with ORiNOCO ComboCards installed must use either a Network Name of "any" or the same Network Name as the Access Points that they will roam between (this assumes that the AP is not a closed system; see "Network Name" on page 26 for more information).
- All Access Points and ORiNOCO ComboCards must have the same security settings to communicate.
- The Access Points' cells must overlap to ensure that there are no gaps in coverage and to ensure that the roaming client will always have a connection available.
- Access Points of the same type (802.11a or 802.11b) installed in the same vicinity should each use a unique, independent Channel to avoid potential interference.
- Access Points that use the same Channel should be installed as far away from each other as possible to reduce potential interference.

Configuration Utility

In This Chapter

Proxim provides a software utility that simplifies the management and configuration of an ORiNOCO ComboCard. “Installation,” beginning on page 7, describes how to install the utility. This chapter describes how to use the ORiNOCO Utility after it has been installed.

- [Status Monitor Icon](#)
- [Configuration Utility](#)
 - [Association Information](#)
 - [Configuration](#)
 - [Basic](#)
 - [Security](#)
 - [Advanced](#)
 - [Profiles](#)
 - [Statistics](#)
 - [Site Monitor](#)
 - [Snoop Tool](#)
 - [Packet Transmission Success Rate](#)
 - [Version Information](#)

Status Monitor Icon

After you have installed the utility, the Status Monitor icon will appear in the Windows Taskbar. By default, the card's Network Type is set to Access Point, and the icon appears as an Access Point with two antennas.

If the card cannot locate an 802.11a or 802.11b Access Point (AP) (either because the radio settings do not match or the other devices are out of range), the icon will appear as follows:



Figure 4-1 Status Monitor Icon: No Connection

When the card is associated with an 802.11a Access Point, the icon is labeled **a**. When the card is associated with an 802.11a Access Point in 2X mode, the icon is labeled **2X**. When the card is associated with an 802.11b Access Point, the icon is labeled **b**. Each of these icons is shown in Figure 4-2.

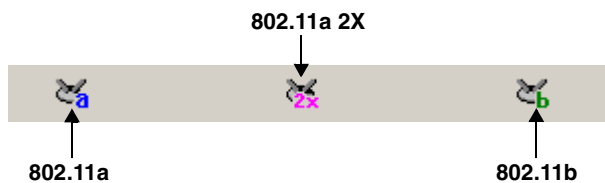


Figure 4-2 Status Monitor Icon: When Associated with an AP

Placing the mouse cursor over the Status Monitor icon provides additional information about the card's wireless connection, as shown in Figure 4-3. The icon displays the physical address of the AP with which the card is associated, the card's Network Type, and its current Security setting.



Figure 4-3 Status Monitor Icon: Association Information

When Network Type is set to Peer-to-Peer Group, the icon appears as a small computer. As shown in Figure 4-4, the icon uses the same lettering convention to denote its Mode (a, b, 2x) as when Network Type is set to Access Point.



Figure 4-4 Status Monitor Icon: When Operating in 802.11a Peer-to-Peer Group Mode

NOTE

When the ORiNOCO Utility is running, the icon appears as a blue and gold "X".

Right-click the icon to view additional Status Monitor options (as shown in Figure 4-5):

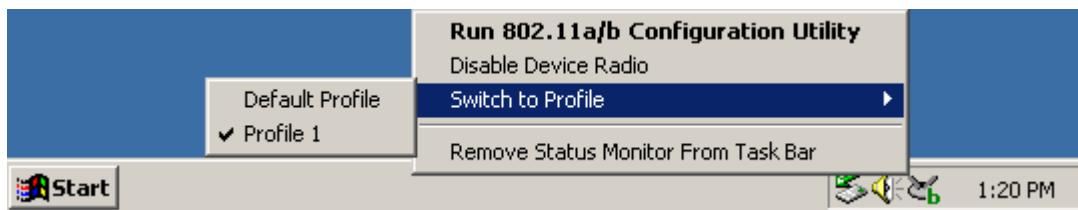


Figure 4-5 Status Monitor Icon: Right-click Menu

- Select **Run 802.11a/b Configuration Utility** from the drop-down menu to launch the ORiNOCO Utility. Double-clicking the icon also launches the utility.
- Select **Disable Device Radio** to turn off the card's radio. You should disable the radio if you intend to use a laptop equipped with the ORiNOCO ComboCard on an airplane. A check mark appears next to this option when the radio is disabled. Select this option again to enable a disabled radio. When the radio is disabled, the ORiNOCO Status Monitor icon is a blue and gold "X" with a red line through it, as shown in Figure 4-6.



Figure 4-6 Status Monitor Icon: Device Radio Disabled

- Select **Switch to Profile** and choose one of the profiles from the drop-down list to change the card's configuration settings. See "Profiles" on page 39 for more information.
- Select **Remove Status Monitor From Task Bar** to close the Status Monitor.

Configuration Utility

The ORiNOCO Utility includes several tools for diagnostic and configuration purposes. This section describes all of the utility's features and configuration options. For additional information about the ORiNOCO Utility, click **Help** on any screen to view on-line Help documentation.

Association Information

The Association Information screen, shown in Figure 4-7, displays information about the card's connection with a wireless network.

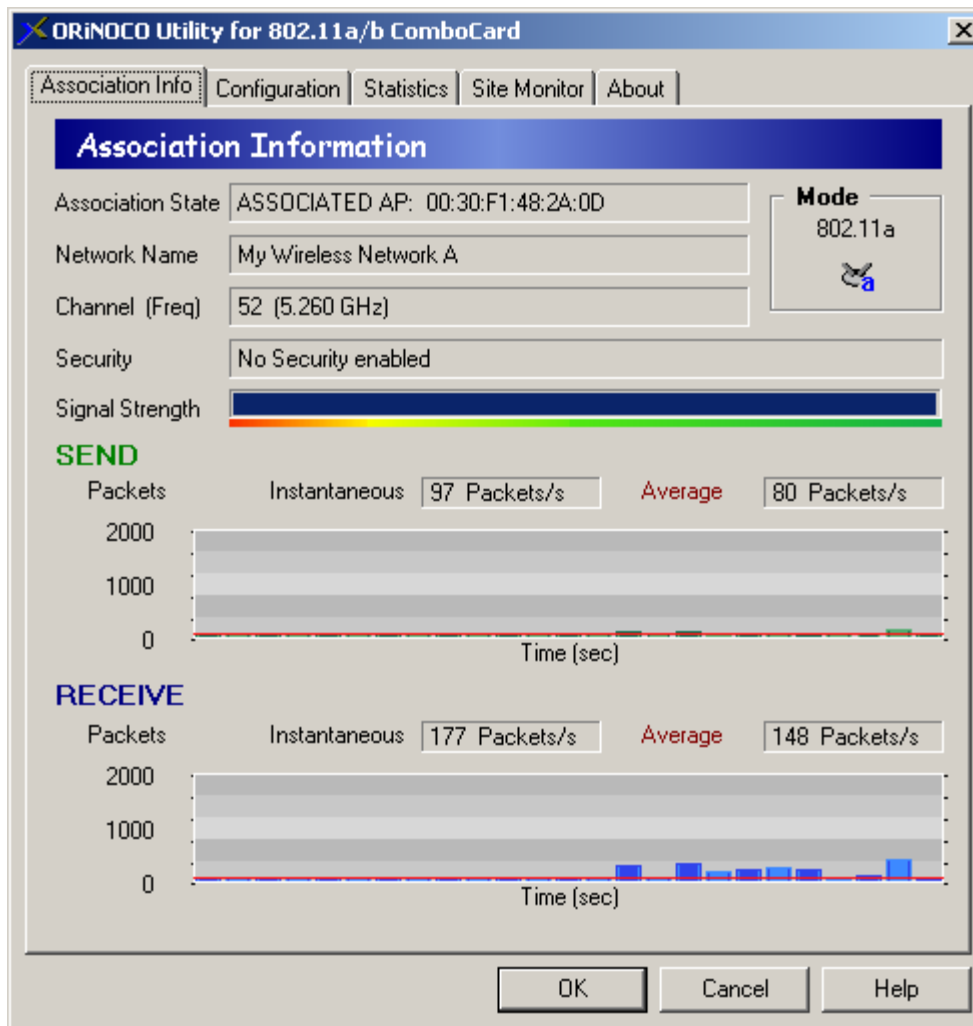


Figure 4-7 Association Information Screen

The Association Information screen reports the following statistics:

- **Mode:** This field reports whether the card is in 802.11a, 802.11b, or 802.11a 2X mode. Also, this field reports "Disabled" if the card's radio has been turned off (by right-clicking the Status Monitor icon and choosing **Disable Device Radio**).
- **Association State:** This field reports if the card is communicating with an Access Point (AP) or Peer-to-Peer Group. When communicating with an AP, this field reports "ASSOCIATED AP" and displays the AP's physical address. This field reports "JOINED AP" if the card has found an AP but cannot associate with it because the card's security settings do not match the AP's security settings. When the card is a member of a Peer-to-Peer Group, this field displays "JOINED PEER-TO-PEER GROUP." If no AP or Peer-to-Peer Group is found, this field displays "NOT JOINED."
- **Network Name:** This field reports the card's current Network Name (also known as the SSID).
- **Channel (Freq):** This field displays the current Channel and center frequency that the card is using.

- **Security:** Reports the type of security that the card is using. Options include “No Security enabled,” “802.1x Security,” “Using Encryption for security,” and “HKM.” If using Harmony Key Management (HKM), this field also reports the connection status: “Not Authenticated,” “User Not Logged In,” “User Associated,” and “User is using Unique Encryption Key” (with time of login). For Windows XP users using the Windows XP Networking Tool, this field reports: “Using Windows wireless configuration settings.” See “Note to Windows XP Users” (below) for more information.
- **Signal Strength:** The Signal bar displays the signal strength for the last packet received by the card. Signal strength is reported in decibels (dB). The color-coded chart below the Signal bar indicates the relative strength of the signal: a signal in the red or orange section indicates a weak connection; a signal in the yellow or light green section indicates a good connection; a signal in the darker green section indicates an excellent connection.
- **Instantaneous Packets/Sec Sent:** This statistic displays the current rate at which the card is transmitting packets to another 802.11a or 802.11b device. This information is represented as the number of packets sent per second by the card and is plotted on the graph located below the Packets/sec field. Note that this statistic will remain zero unless the card is transmitting data to another device.
- **Average Packets/Sec Sent:** This statistic displays the average of the Instantaneous Packets/Sec Sent data points displayed in the bar graph.
- **Instantaneous Packets/Sec Received:** This statistic displays the current rate at which the card is receiving packets from another 802.11a or 802.11b device. This information is represented as the number of packets received per second and is plotted on the graph located below the Packets/sec field. Note that this statistic will remain zero unless the card is receiving data from another device.
- **Average Packets/Sec Received:** This statistic displays the average of the Instantaneous Packets/Sec Received data points displayed in the bar graph.

Configuration

Click the **Configuration** tab to view the Station Configuration screen.

This screen contains three configuration tabs: Basic, Security, and Advanced. In addition, you can also create, edit, and switch between user profiles from this screen.

- For information on the Basic configuration parameters, see “Basic” on page 24.
- For information on the Security configuration parameters, see “Security” on page 27.
- For information on the Advanced configuration parameters, see “Advanced” on page 36.
- For information on how to setup and switch between user profiles, see “Profiles” on page 39.

All of these parameters apply to the card regardless of whether it is in 802.11a/802.11a 2X mode or 802.11b mode, unless otherwise stated.

After you have made one or more changes to the configuration settings, click **Save**. You will then be prompted to confirm that these changes will be saved to your current Profile. Click **Yes** to save the changes, click **No** to revert to the current settings, or click **Cancel** to return to the configuration screen (without saving the changes). Note that you may be prompted to rename the current profile if you are attempting to change the Default Profile. See “Edit a Profile” on page 42 for more information.

Note to Windows XP Users

Windows XP includes its own configuration tool for wireless networks. This tool supports most of the configuration options that are found within the ORiNOCO Utility, and it provides an interface to configure 802.1x settings.

Following the installation of an ORiNOCO ComboCard, the ORiNOCO Utility is enabled by default. This means that you use the ORiNOCO Utility to configure the card and not the Windows XP tool. If you want to use Windows XP’s wireless network tool instead of the ORiNOCO Utility, then you need to disable the ORiNOCO Utility. Disabling the ORiNOCO Utility automatically activates the Windows XP tool.

Follow these steps to disable the ORiNOCO Utility and enable the Windows XP tool:

1. Double-click the Status Monitor icon to launch the ORiNOCO Utility.
2. Click the **Configuration** tab.
3. Remove the check mark from the box labeled **Enable ORiNOCO Configuration** to disable the utility. (This option is only visible on Windows XP computers.)
4. Click **Save** to save the change.

NOTE

When the **Enable ORiNOCO Configuration** option is disabled, the Snoop Tool, the Packet Transmission Success Rate test, and the configuration parameters (including Profiles) are unavailable, as shown in Figure 4-8.

5. Click **OK** to close the utility.
6. You can now use the Windows XP tool to configure the card. Double-click the Windows XP Networking icon in the Windows Taskbar to view the configuration options. See “Using 802.1x with Windows XP” on page 31 for sample screens.

**NOTE**

If the ORiNOCO Utility is disabled and you want to enable it, place a check mark in the **Enable ORiNOCO Configuration** box and click **Save** to activate the ORiNOCO Utility.

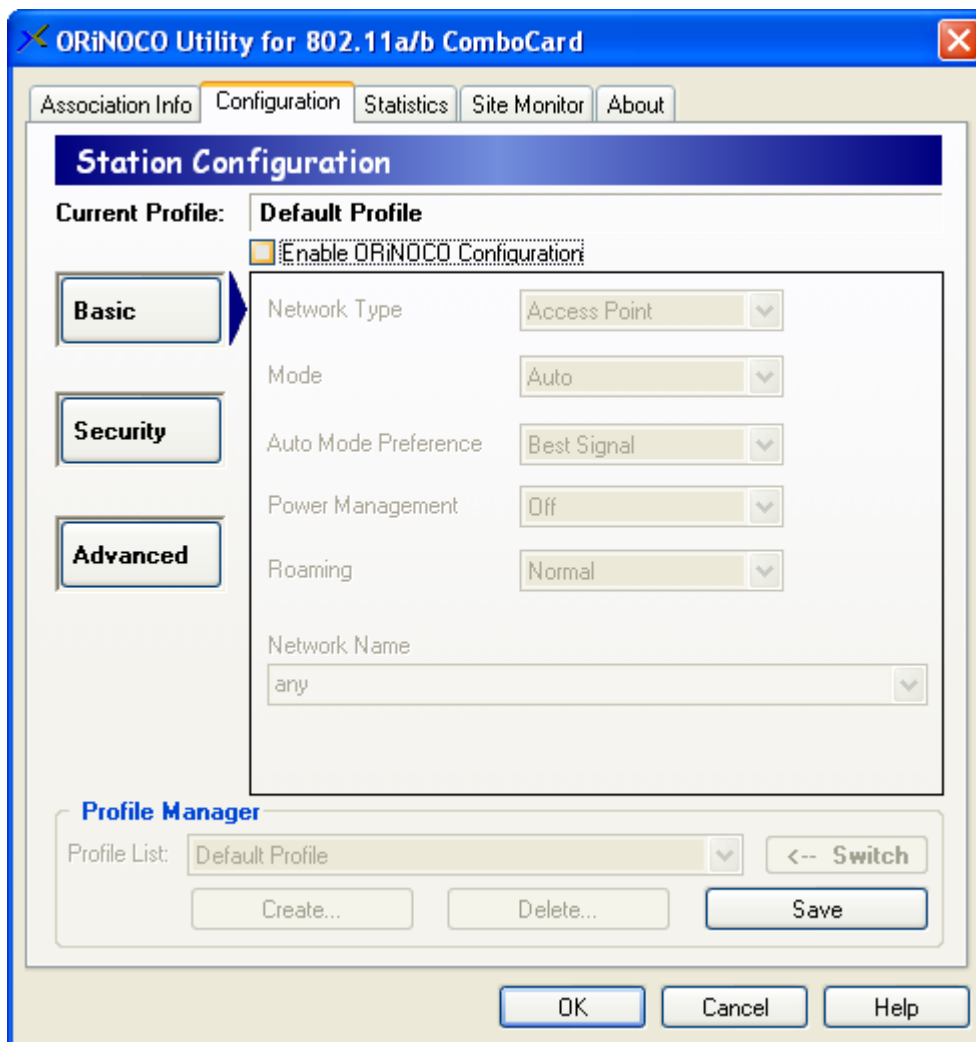


Figure 4-8 Station Configuration Screen: ORiNOCO Configuration Disabled

Basic

The Basic configuration screen is shown in Figure 4-9. You can configure the following parameters:

Network Type

Network Type configures an ORiNOCO ComboCard to communicate with an Access Point infrastructure or a Peer-to-Peer Group (also known as an **Ad Hoc** network).

When set to **Access Point**, the ORiNOCO ComboCard must have the same Network Name (unless set to “any,” see “Network Name” on page 26 for more information) and security settings as the Access Points on the network to communicate. By default, Network Type is set to Access Point.

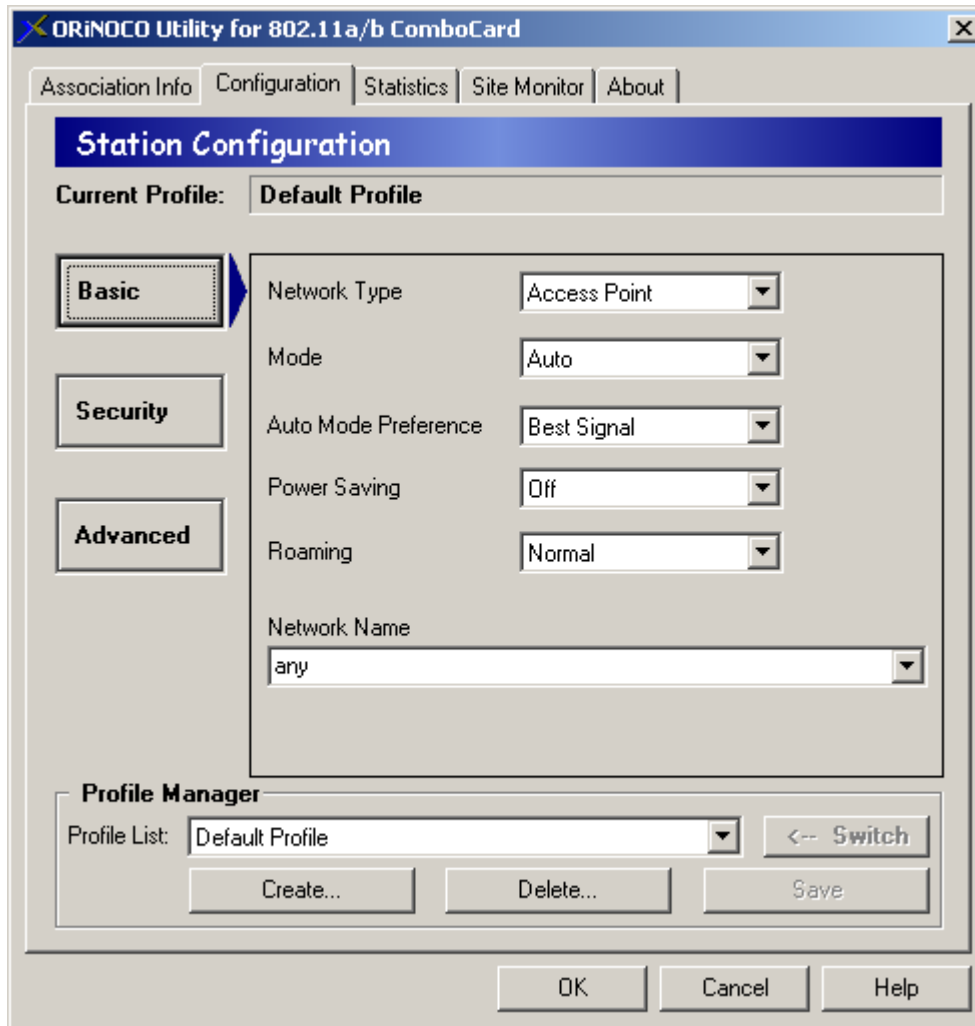


Figure 4-9 Basic Configuration Screen

When set to **Peer-to-Peer Group**, all 802.11a or 802.11b devices must have the same Network Name, Channel, and Encryption Keys (if Encryption is enabled) to communicate. A Peer-to-Peer Group is a wireless network that consists of only wireless client adapters (that is, a network that does not have an Access Point). If you set Network Type to Peer-to-Peer Group, then you must also select a Mode (802.11a, 802.11b, or 802.11a 2X mode). The card cannot operate in Auto mode when set to Peer-to-Peer Group. See “Peer-to-Peer Group” on page 16 for additional information.



NOTE

ORiNOCO ComboCards sold in Europe do not support Peer-to-Peer Groups when in 802.11a or 802.11a 2X mode.

Mode

Mode configures the ORiNOCO 802.11a/b ComboCard to operate in **802.11a**, **802.11b**, **802.11a 2X**, or **Auto** mode.

- In 802.11a mode, the card complies with the IEEE 802.11a standard and provides data rates of up to 54 Mbps.
- In 802.11b mode, the card complies with the IEEE 802.11b standard and provides data rates of up to 11 Mbps.
- In 802.11a 2X mode, the card provides data rates of up to 108 Mbps. 2X mode employs the same operating theory as 802.11a but uses twice the bandwidth to provide twice the data rate. Note the following:
 - 2X mode is not available in all countries.
 - 2X mode is not part of the IEEE 802.11a standard.
 - Other products, such as the ORiNOCO AP-2000, refer to 2X mode as **Turbo** mode.

- In Auto mode, the card can automatically switch between the other three modes (802.11a, 802.11b, and 802.11a 2X mode) based on the signals it receives from Access Points in its vicinity. If you set the card to Auto, you should also configure **Auto Mode Preference**. Note that if you want the card to join a Peer-to-Peer Group, you cannot use Auto mode. You must select 802.11a, 802.11b, or 802.11a 2X mode.

Auto Mode Preference

If you set **Mode** to **Auto**, you should also configure **Auto Mode Preference**. This parameter determines which type of network the card will associate with if multiple networks are detected.

- When set to **Best Signal** (the default setting), the card will associate with the Access Point that provides the strongest signal, regardless of whether the AP is using 802.11a, 802.11b, or 802.11a 2X mode.
- When set to **802.11a**, the card will associate with an 802.11a or 802.11a Access Point in 2X mode over an 802.11b Access Point (if multiple Access Points are detected).
- When set to **802.11b**, the card will associate with an 802.11b Access Point over an 802.11a or 802.11a Access Point in 2X mode (if multiple Access Points are detected).



NOTE

For best performance, Proxim recommends that you set **Auto Mode Preference** to **Best Signal** (if **Mode** is set to **Auto**).

Power Management

The ORiNOCO ComboCard supports optional power management to conserve battery life. When Power Management is set to **Normal** or **Maximum**, the card enters a “doze” mode where it becomes inactive and only wakes up periodically to receive control messages from the Access Point. The card wakes up more often in Normal mode than in Maximum mode so a card in Normal mode will respond sooner to network requests than a node in Maximum mode. However, Maximum mode draws less power than Normal mode.

When an Access Point receives a packet destined for a dozing client, it buffers the packet and includes a notification within its control message to alert the client that a packet is waiting for it. Once the card receives the control message, the card polls the Access Point to request that the buffered packet be sent to it.

When set to **Off** (the default setting), the card does not use Power Management.

Roaming

The Roaming parameter allows you to determine how quickly the ORiNOCO ComboCard will try to roam from one Access Point to another in order to maintain a strong wireless connection.

In areas with many Access Points that provide heavy overlapping coverage, set this parameter to **Fast** to maintain high throughput for the card. The card will begin looking for a new Access Point with a stronger signal once the signal from its current Access Point weakens.

In most networks, set Roaming to **Normal** (the default setting). Wireless throughput will not change noticeably, and an overabundance of Access Points is not required. When compared to a card set to Fast, a card set to Normal has a higher roaming threshold so it will wait for an Access Point’s signal to grow weaker before roaming to another Access Point.

If the coverage area provided by Access Points is sparse, set Roaming to **Slow**. The card will not roam until it is nearly out of range of the Access Point with which it is associated.

Network Name

The Network Name is a text string that all members of the same 802.11 network share. It is sometimes referred to as the **SSID** (Service Set ID) or **ESSID** (Extended Service Set ID). Devices that do not share the same Network Name cannot communicate. The Network Name may be up to 32 alphanumeric characters long, including spaces.

When configured to “any” (the default setting), an ORiNOCO ComboCard can communicate with any available Access Point regardless of the Access Point’s Network Name. Note that this assumes that the AP does not have the “closed system” feature enabled.

If an Access Point is a closed system, the card’s Network Name must match the AP’s Network Name exactly. The card cannot use the “any” Network Name. (Not all Access Points support the closed system feature; refer to your AP’s user guide for more information.)

In an infrastructure network with multiple Access Points, the Network Name must match on all Access Points and clients (unless a client’s Network Name is “any” and the APs are not closed systems).

In a Peer-to-Peer Group without an Access Point, each 802.11 device must have the same Network Name to participate in the network. A node cannot use the “any” Network Name to join a Peer-to-Peer Group.

Security

The ORiNOCO ComboCard offers up to four security options:

- **No Security**
- **WEP Encryption** (see page 28)
- **802.1x Security** (see page 31)
- **Harmony Key Management (HKM)** (see page 33)

An ORiNOCO ComboCard communicating with an Access Point supports WEP Encryption, 802.1x Security, and Harmony Key Management; a card in a Peer-to-Peer Group supports WEP Encryption only (802.1x Security and Harmony Key Management require an Access Point).



NOTE

Harmony Key Management is available with the Gold ORiNOCO ComboCard (Model 8460) only. This security feature is not available with the Silver ORiNOCO ComboCard (Model 8461).

The Security configuration screen is shown in Figure 4-10.

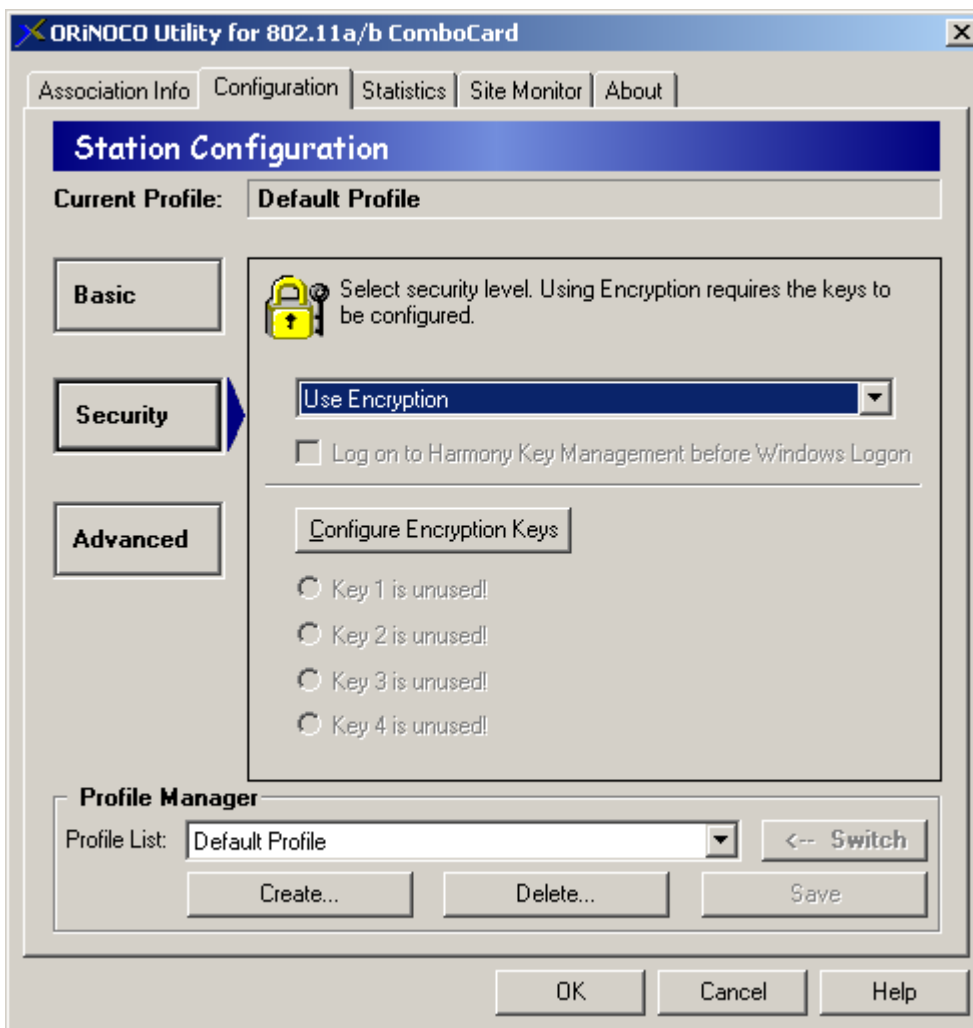


Figure 4-10 Security Configuration Screen

Encryption (WEP)

The IEEE 802.11 standards specify an optional encryption feature, known as Wired Equivalent Privacy or WEP, that is designed to provide a wireless LAN with a security level equal to what is found on a wired Ethernet network. WEP encrypts the data portion of each packet exchanged on an 802.11 network using a 64-bit, 128-bit, or 152-bit Encryption Key (also known as a WEP Key).

When Encryption is enabled, two 802.11 devices must have the same Encryption Keys and both devices must be configured to use Encryption in order to communicate. If one device is configured to use Encryption but a second device is not, then the two devices will not communicate, even if both devices have the same Encryption Keys.

In addition, the 802.11 standards define two authentication mechanisms: Open System Authentication and Shared Key Authentication. Open System Authentication allows a client to join the network if it has the correct Network Name (or its Network Name is set to "any," if not a closed system). Shared Key Authentication requires that a client demonstrate knowledge of the network's Encryption Key before being allowed to associate with an Access Point. In theory, Shared Key Authentication should prevent unauthorized devices from associating with the 802.11 network.

The ORiNOCO ComboCard supports both Open System Authentication and Shared Key Authentication. However, the card will use Shared Key Authentication only if the Access Point it is trying to associate with has this feature enabled.

⇒ NOTE

Recent studies have shown that WEP Encryption as currently implemented in the 802.11 standards may not be as secure as originally intended. If you are concerned about the security of your wireless network, you should consider implementing other security measures, such as 802.1x (see "802.1x" on page 31) or Harmony Key Management (see "Harmony Key Management" on page 33), to safeguard your network traffic.

Encryption Keys

The ORiNOCO ComboCard supports WEP encryption using 64-bit, 128-bit, or 152-bit Encryption Keys. You can configure up to four Encryption Keys (all four Keys must have the same Key Size). The card can decrypt information that was encrypted with any of its four Encryption Keys, but it will only use the Default Key to encrypt outgoing information.

An Encryption Key is composed of the secret key (entered by the user) and a 24-bit Initialization Vector (IV). Some products report the Encryption Key Size with the IV and some report the Key Size without the IV. Therefore, two terms are used interchangeably within the wireless LAN industry to describe the same Key Size: 64-bit encryption is also referred to as 40-bit encryption, 128-bit encryption is also referred to as 104-bit encryption, and 152-bit encryption is also referred to as 128-bit encryption.

⇒ NOTE

The ORiNOCO 802.11a/b ComboCard includes the IV when displaying Key Size options. For Windows XP users, Microsoft's Wireless Networks tool reports the Key Size without the IV (as 40 or 104 bit encryption).

For 64-bit encryption, an Encryption Key is 5 ASCII characters (A-F, a-f, and 0-9) or 10 hexadecimal digits (0-9 and A-F); for 128-bit encryption, an Encryption Key is 13 ASCII characters or 26 hexadecimal digits; and for 152-bit encryption, an Encryption Key is 16 ASCII characters or 32 hexadecimal digits.

The following table summarizes the Key Sizes, the names used to refer to them, and the number of digits each supports:

Key Size reported in ORiNOCO Utility (With IV)	Key Size Without IV	Number of ASCII characters for Key Size	Number of Hex digits for Key Size	Comment
64 bit	40 bit	5	10	Encryption
128 bit	104 bit	13	26	Stronger encryption
152 bit	128 bit	16	32	Strongest encryption

Enabling Encryption

Follow these steps to enable WEP Encryption:

1. Open the ORiNOCO Utility and click the **Configuration** tab.
2. Click the **Security** sub-tab.
3. Select **Use Encryption** from the Security Level box.
4. Click **Configure Encryption Keys**.
5. Select a **Key Size** from the drop-down menu (64 bit, 128 bit, or 152 bit).

⇒ NOTE

All 802.11 devices need to use the same Key Size. Not all 802.11 products support all three Key Sizes. Check the documentation that came with your other 802.11 equipment to determine what Key Sizes they support.

6. Select a **Key Format** from the drop-down menu (Hexadecimal or ASCII).
7. Enter one to four Encryption Keys in the fields provided, as shown in Figure 4-11. Enter hexadecimal digits or ASCII characters depending on the Key Format you selected.
 - To enter an Encryption Key in hexadecimal format, enter the appropriate number of digits for the specified Key Size, using only 0 through 9 and A through F.
 - For 64-bit encryption, enter 10 digits for each Key.
 - For 128-bit encryption, enter 26 digits for each Key.
 - For 152-bit encryption, enter 32 digits for each Key.
 - To enter an Encryption Key in ASCII format, enter the appropriate number of characters for the specified Key Size. ASCII characters include all letters of the alphabet (upper and lower cases) and numbers (0 through 9).
 - For 64-bit encryption, enter 5 characters for each Key.
 - For 128-bit encryption, enter 13 characters for each Key.
 - For 152-bit encryption, enter 16 characters for each Key.

⇒ NOTE

When WEP Encryption is enabled, Proxim recommends that you configure all 802.11 devices on the wireless network with the same Encryption Keys in the same order (but the devices do not need to use the same default Key).

Figure 4-11 Encryption Keys Configuration Screen

⇒ NOTE

If you created a text file that contains the Encryption Keys in hexadecimal format, click **Read Keys** to upload those Keys to the card. See “Read Key File Format” on page 30 for formatting information.

8. Click **OK** to save the Encryption Keys.
9. Select one of the Keys you configured as the **Default Key**. In Figure 4-12, the Default Key is Key 3.
10. Click **Save** and **Yes** (when prompted) to save the new Encryption settings to your current profile.
11. If you need to change an Encryption Key at a later date, click **Configure Encryption Keys** and enter one to four new Keys. Note that any Keys you entered previously will not be visible (stars appear in place of the digits).

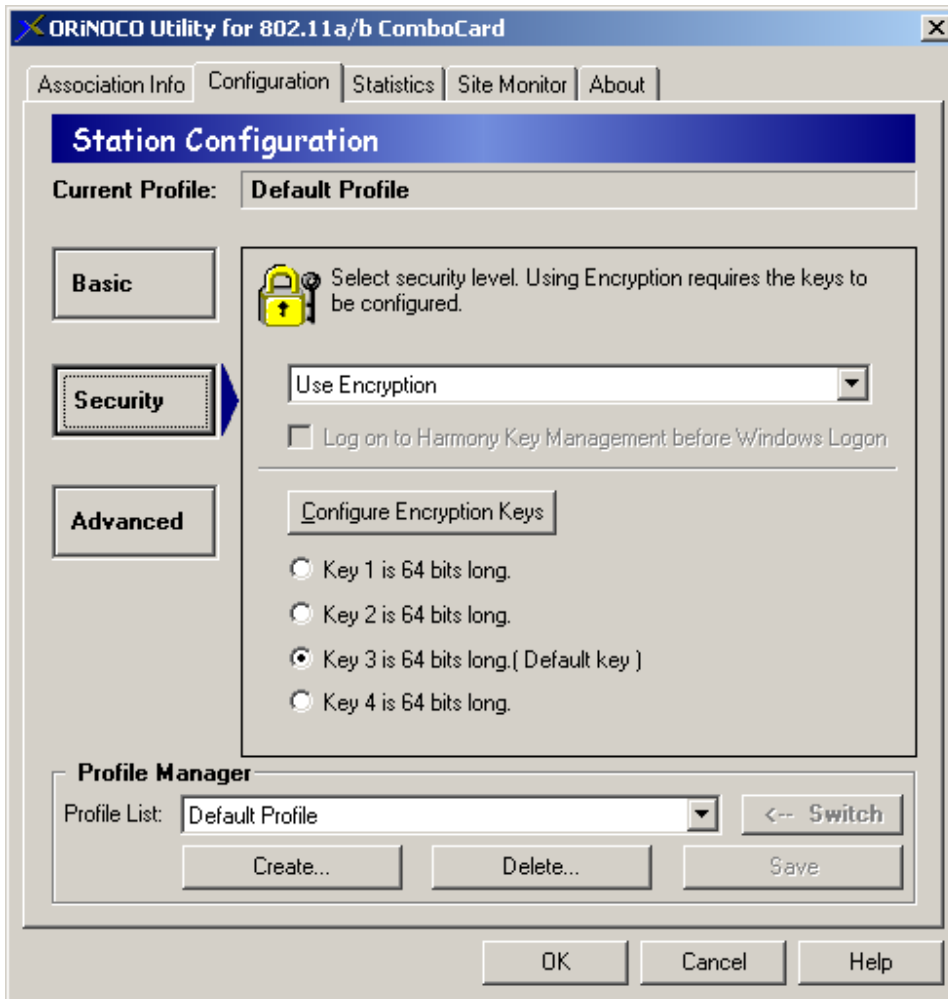


Figure 4-12 Security Configuration Screen: Encryption Enabled

Read Key File Format

If you have multiple clients to configure, you can avoid having to enter each Encryption Key manually by creating a text file that contains the Keys. Once you have the text file, you can upload the Keys to a client by clicking the **Read Keys** button found on the Encryption Keys Configuration screen.

To create the text file, use a text program such as Microsoft Notepad or WordPad. The text file should have a ".txt" extension. The first line of the text file must read "[WEP_KEY_VALUE]". Then, enter one to four Keys in the following format: "key#=<key value>", where # indicates the Key number (1-4) and <key value> is the specified Key's hexadecimal digits.

Each Key must contain hexadecimal digits only (0-9 and A-F), and you must use the same number of digits for each Key. The number of digits depends upon the Key Size you select in the Encryption Keys Configuration screen:

- For 64 bit, use 10 hexadecimal digits per Key.
- For 128 bit, use 26 hexadecimal digits per Key.
- For 152 bit, use 32 hexadecimal digits per Key.

NOTE

The **Read Keys** feature does not support ASCII characters. You must use hexadecimal digits with this feature.

The following example illustrates the Encryption Key file format for 64-bit encryption:

```
[WEP_KEY_VALUE]
key1=1234567890
key2=0987654321
key3=ABCDEF1234
key4=ABCDEFABCD
```

802.1x

802.1x is an IEEE security standard for authenticating users on local area networks based on the Extensible Authentication Protocol (EAP). For more information on this standard, refer to the IEEE Web site at <http://www.ieee.org/>.

On a wireless LAN with 802.1x enabled, an Access Point acts as an intermediary between wireless clients and the network's RADIUS (Remote Authentication Dial-In User Service) server. The Access Point blocks all traffic from a wireless client until after the user has been authenticated by the RADIUS server.

The wireless client and the RADIUS server use EAP to communicate. EAP is a flexible protocol which does not specify an authentication type. The available authentication types will vary based upon your RADIUS server and your client software; many EAP types offer advanced features such as mutual authentication between client and server and data encryption. For data encryption, a unique Encryption Key is generated for each user following authentication. This Encryption Key is used to encrypt packets between the Access Point and wireless client. Refer to your Access Point's user guide for more information on 802.1x requirements and to determine what model RADIUS servers and EAP types it supports.

To enable 802.1x support and configure 802.1x settings (like EAP authentication type), in addition to an ORiNOCO ComboCard installed in a computer that has the ORiNOCO Utility loaded, you also need a client utility provided by a RADIUS server manufacturer, like Microsoft or Funk Software. Refer to Microsoft's (<http://www.microsoft.com/>) and Funk Software's (<http://www.funk.com/>) Web sites or the documentation that came with your 802.1x solution for details.

The exact procedure for setting up 802.1x will vary depending on which 802.1x client utility you are using, but here are the steps to enable 802.1x support:

1. Open the ORiNOCO Utility and click the **Configuration** tab.
2. Click the **Security** sub-tab.
3. Set Security Level to **Use 802.1x Security**. This setting disables WEP encryption and Harmony Key Management so the card can accept dynamic Encryption Keys following after successful 802.1x authentication.
4. Click **Save** and **Yes** (when prompted) to save the new security settings to your current profile.
5. Click **OK** when prompted that 802.1x security settings must be configured manually using an 802.1x utility.
6. Launch the 802.1x utility provided by your RADIUS server's manufacturer and configure the card's 802.1x settings.

Using 802.1x with Windows XP

Microsoft provides 802.1x support for Windows XP users as part of the operating system. (As of the release of this user's guide, Microsoft has not yet released 802.1x support for other Windows operating systems.)

Follow these steps to enable 802.1x on a Windows XP computer:



NOTE

The instructions and figures below document the configuration of a computer running Windows XP Professional. The instructions and/or figures may differ for users running Windows XP Service Pack 1 (SP 1) or Windows XP Home.

1. Open the ORiNOCO Utility and click the **Configuration** tab.
2. Click the **Security** sub-tab.
3. Set Security Level to **802.1x Security**.
4. Click **Save** and **Yes** (when prompted) to save the new security settings to your current profile.
5. Click **OK** when prompted that 802.1x security settings must be configured manually using an 802.1x utility.
6. Remove the check mark from the box labeled **Enable ORiNOCO Configuration**. This will enable the Windows XP Wireless Network tool.
7. Click **Save** and **Yes** (when prompted) to save the change.
8. Click **OK** to close the ORiNOCO Utility.
9. Click the networking icon in the Windows Taskbar (shown in Figure 4-13) to open Windows XP's built-in wireless network utility.

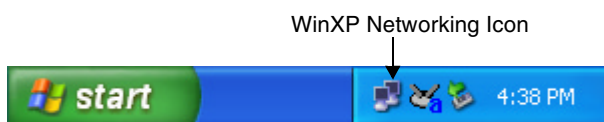


Figure 4-13 Windows XP Networking Icon

10. Click **Properties** (if associated with an AP) or **Advanced** (if not associated).

11. Click the **Authentication** tab, as shown in Figure 4-14.
12. Configure the 802.1x settings. Contact your network administrator or refer to Windows XP's on-line Help if you need assistance configuring these settings.

➡ NOTE

Depending on the network's EAP authentication type, your network administrator may need to provide you with a smart card or install a digital certificate on your computer.

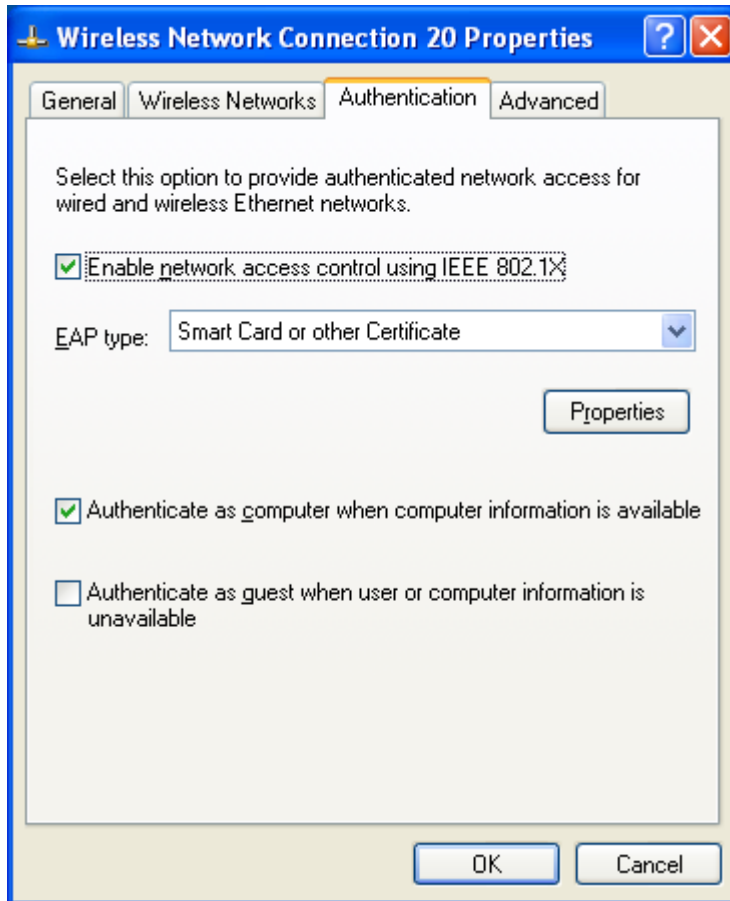


Figure 4-14 Windows XP Networking: Authentication Screen

13. Click the **Wireless Networks** tab.
14. Access the Wireless Network Properties for your network.
 - If your network is listed in **Available networks**, highlight it and click **Configure**.
 - If your network is listed in **Preferred networks**, highlight it and click **Properties**.
 - If your network is not listed, click **Add** and enter the Network Name.
15. Configure the network's Encryption settings. Note the following:
 - If your EAP type supports dynamic Encryption Keys, place a check mark next to the **Data encryption (WEP enabled)** and **The key is provided for me automatically** options (as shown in Figure 4-15).
 - Windows XP's Wireless Network tool supports 64-bit or 128-bit encryption using ASCII characters (5 characters for 64-bit or 13 characters for 128-bit encryption).
 - Windows XP's Wireless Network tool does not include the Initialization Vector (IV) when reporting Key Sizes; therefore, the tool reports the Key Size as 40-bit instead of 64-bit or 104-bit instead of 128-bit. See "Encryption Keys" on page 28 for more information.
 - Windows XP's Wireless Network tool does not support 152-bit encryption.
 - Windows XP's Wireless Network tool lets you configure only one Encryption Key.
 - The Key index (advanced) parameter corresponds to setting the Default Key; select between 0 to 3 (which corresponds to Keys 1 to 4 in the ORiNOCO Utility).
16. Click **OK** twice to exit the network's properties window.

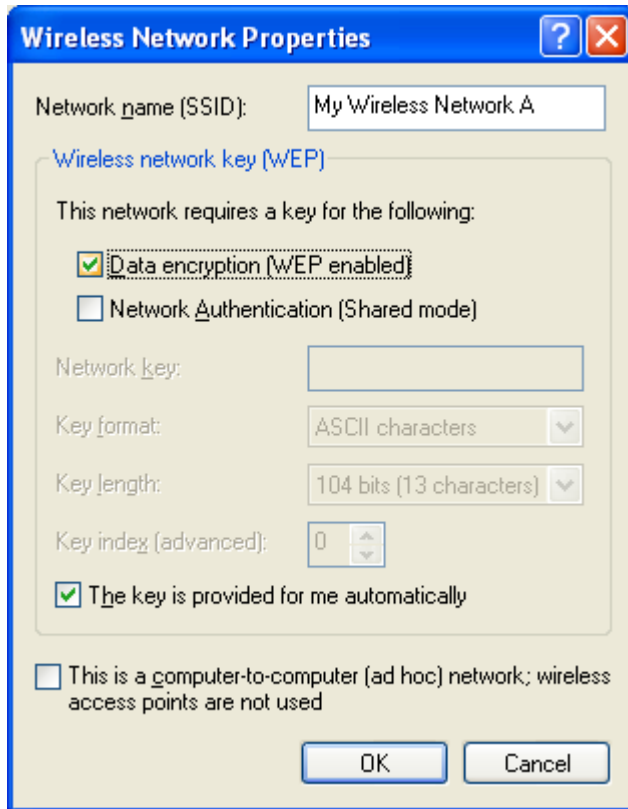


Figure 4-15 Windows XP Networking: Properties Screen

Harmony Key Management

Harmony Key Management (HKM) is a protocol developed by Proxim that automates encryption security and assigns a unique and dynamic Encryption Key to each user. Harmony Key Management (which is also referred to as the **Harmony Security Protocol**) includes the following features:

- Uses 152-bit WEP Encryption
- Generates a unique Encryption Key for each user that is valid only for the current network session
- Periodically renews the user's Harmony session and assigns a new Encryption Key without requiring any end user interaction
- Incorporates the end user's logon prompt into Microsoft Windows' standard logon procedure on the client device

You need the following equipment to use Harmony Key Management:

- A Gold ORiNOCO ComboCard (the Silver card does not support HKM) operating in 802.11a mode
- A Harmony 802.11a Access Point
- A Harmony Access Point (AP) Controller

Each device plays a role in Harmony Key Management: the AP Controllers maintain a database of user names and passwords to authenticate users; the Access Points block all network traffic to or from a client until after the user has been successfully authenticated by the Harmony System; and the client card includes a software utility that incorporates the Harmony logon prompt into the standard Windows logon procedure.

When Harmony Key Management is enabled on a Gold ORiNOCO ComboCard, the user is prompted to enter his or her Harmony User Name and Password during boot up, either immediately before or after the Windows logon prompt (depending on the device configuration).

Once the user has been authenticated by the Harmony System, the wireless client receives a unique 152-bit Encryption Key from the Harmony System, and the client can begin to exchange data with the Ethernet network. Refer to the *Harmony Access Point Controller User's Guide* for more information on Harmony Key Management.

Harmony Key Management Guidelines

- If you want to use Harmony Key Management on your network, you must enable the protocol on all of your network's Harmony Access Points and clients.
- At this time, Harmony Key Management's client application supports Windows 98 SE, ME, 2000 Professional, and XP. The protocol does not support Windows 2000 Server.
- Harmony Key Management is not available for Silver ORiNOCO ComboCards.
- A network administrator who manages the network's Harmony Access Point Controller(s) must assign each user a Harmony User Name and Password and enter this information into the Harmony System's User Database. Refer to the *Harmony Access Point Controller User's Guide* for details.
- If you enable Harmony Key Management, you do not need to configure Encryption Keys on a wireless client (the Harmony System will generate keys for you).

Setting up Harmony Key Management

Follow these steps to enable Harmony Key Management on a Gold ORiNOCO ComboCard that has Network Type set to Access Point and Mode set to Auto, 802.11a, or 802.11a 2X mode:

NOTE

Harmony Key Management is not available for Gold ORiNOCO ComboCards operating in 802.11b mode.

1. Select **Use Harmony Key Management (HKM)** within the Security Level box.
2. Place a check mark in the **Log on to Harmony Security before Windows Logon** box if you want to connect to the wireless network before logging on to the Windows operating system, as shown in Figure 4-16.

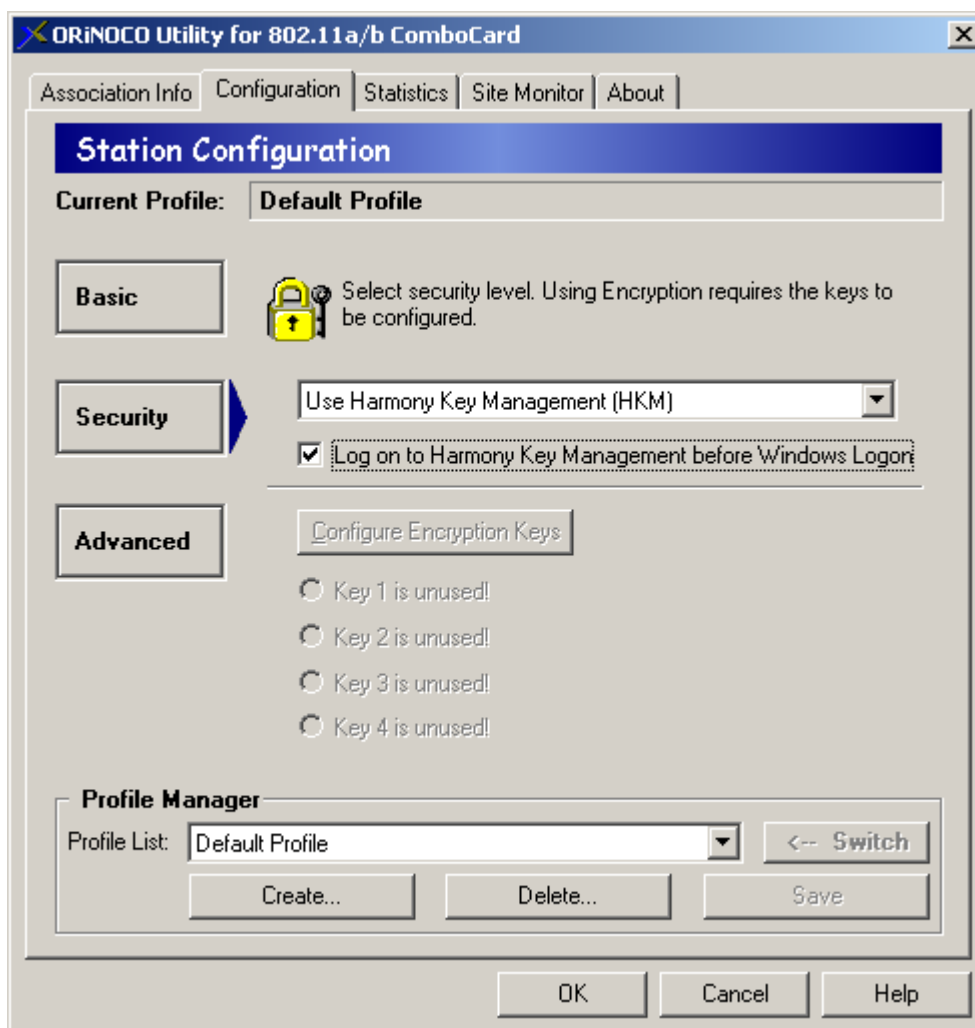


Figure 4-16 Security Configuration Screen: HKM Enabled

⇒ NOTE

You should enable **Log on to Harmony Security before Windows Logon** if your computer connects to a Windows Domain Controller, connects to a Novell network, automatically reconnects to shared network drives during Windows logon, or runs networking software (e.g., PC Anywhere) before connecting to the network.

3. Click **Save** and **Yes** (when prompted) to save the new security settings to your current profile.
4. Restart the computer, if prompted. Otherwise, log out of your current Windows session.
5. Log on to Windows when prompted (if **Log on to Harmony Security before Windows Logon** is disabled).
6. The Harmony logon prompt will appear. Enter your Harmony User Name and Password in the fields provided. The Windows 98/ME logon prompt (with all options visible) is shown in Figure 4-17.

⇒ NOTE

The Harmony logon prompt will not appear if your Windows User Name and Password match your Harmony User Name and Password, you are within range of a properly configured Access Point, and the **Log on to Harmony Security before Windows Logon** option is disabled.

7. If you are not in range of a Harmony 802.11a Access Point, place a check mark in the box labeled **Defer logon for current session if Access Point is out of range**. The Harmony software will store your User Name and Password and automatically initiate the logon procedure without any user intervention once the card has associated with an Access Point.
8. If desired, click **Change Password** (Windows XP/2000 Professional) or **Options...** (Windows 98/ME) to modify your Harmony user account. The Windows 98/ME logon prompt is shown below in Figure 4-17.

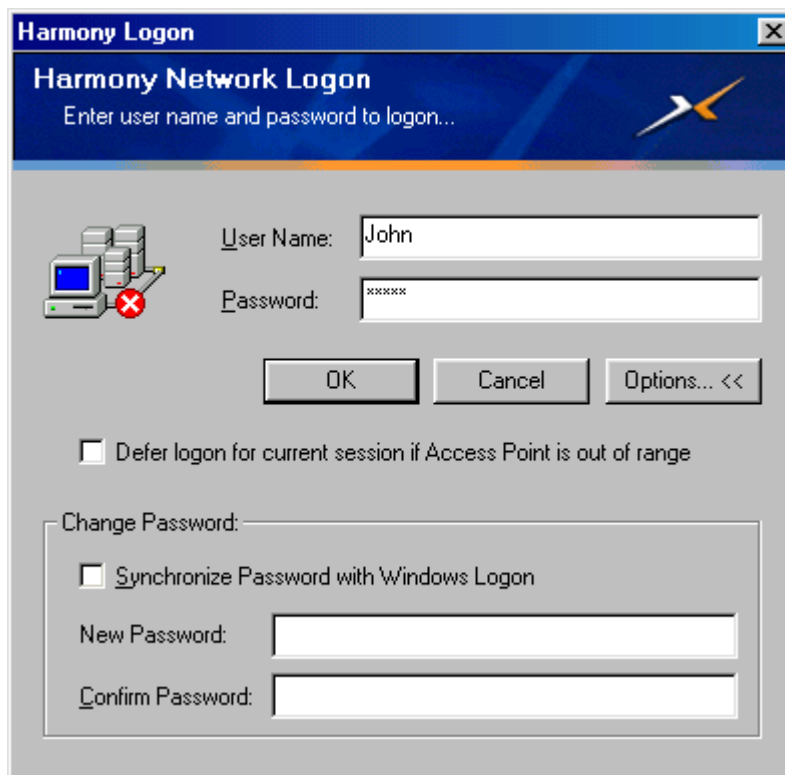


Figure 4-17 Harmony Logon Screen for Windows 98/ME

- Enter a new password twice in the fields provided to change your Harmony Password. The Password can be up to 32 characters and is case sensitive.
 - To reset your Harmony Password to match your Windows Password, check the box labeled **Synchronize Password with Windows Logon**. You should only choose this option if **Log on to Harmony Security before Windows Logon** is disabled.
9. Click **Logon** to log on to the Harmony System.
 10. Log on to Windows if prompted (if the **Log on to Harmony Security before Windows Logon** option is enabled).
- See “Common Technical Support Questions” on page 53 for troubleshooting suggestions if you have difficulty logging onto the network.

Advanced

The Advanced configuration screen is shown in Figure 4-18. You can configure the following parameters:

Channel

In a wireless network, the **Channel** specifies the range of frequencies that the network members use to communicate. 802.11a and 802.11b devices both communicate by spreading a radio signal over a range of frequencies, but they operate at different frequencies and employ different communication techniques. 802.11a devices operate in the 5 GHz band; 802.11b devices operate in the 2.4 GHz band.

When the card's Network Type is set to Access Point, it automatically receives a Channel assignment from its Access Point (the AP can be using 802.11a, 802.11b, or 802.11a 2X mode). Therefore, Channel is not a configurable parameter when Network Type is set to Access Point.

When the card's Network Type is set to Peer-to-Peer Group, you can set the Channel the card will use or use the **Automatic** option.

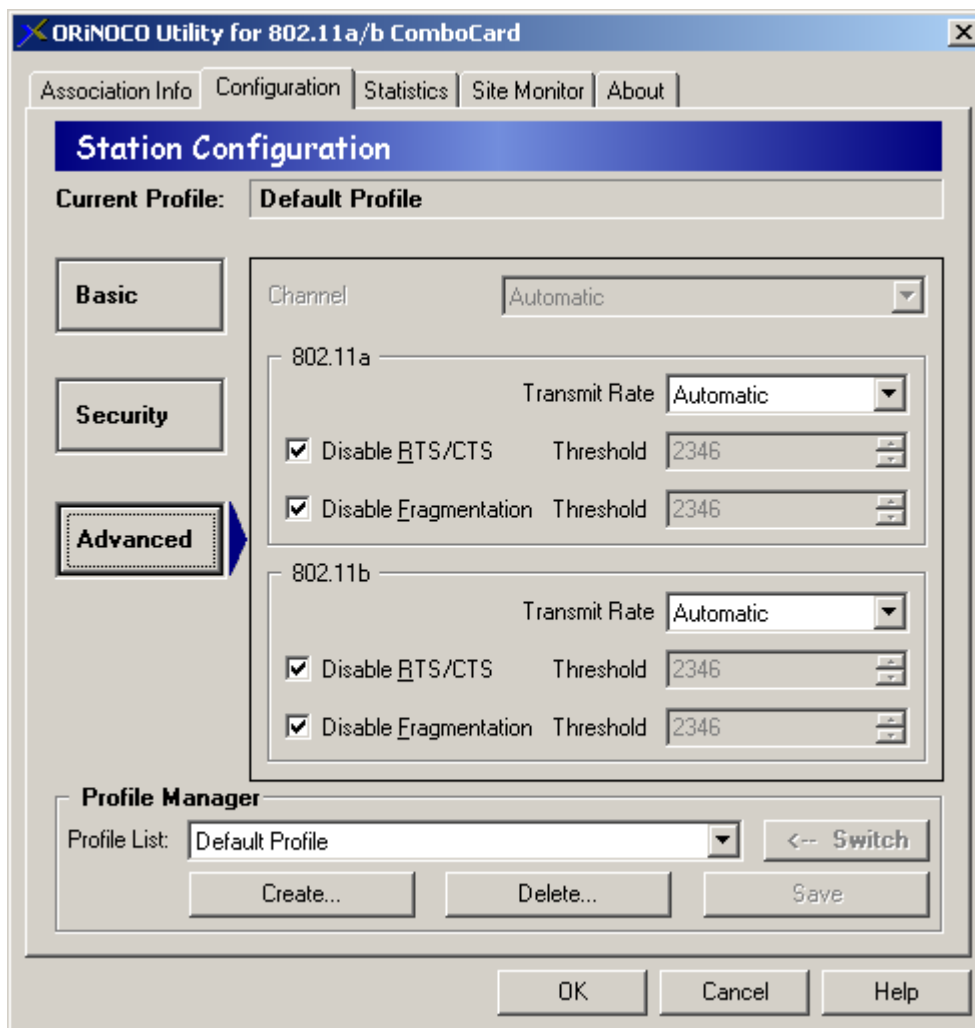


Figure 4-18 Advanced Configuration Screen

Follow these steps to configure the Channel for a card set to Peer-to-Peer Group (cards sold in Europe do not support Peer-to-Peer Groups when in 802.11a or 802.11a 2X mode):

1. Click the **Advanced** configuration tab within the ORINOCO Utility.

2. Do one of the following:

- Select a Channel number from the **Channel** drop-down menu. This should be the same Channel that the other Peer-to-Peer stations are using. If the card cannot locate a Peer-to-Peer Group on the specified Channel, it will start its own group.
- Select **Automatic** from the **Channel** drop-down menu to let the card search the available Channels for an existing Peer-to-Peer Group. If the card cannot locate a Peer-to-Peer Group, it will form its own group using the first available Channel.

3. Click **Save** and **Yes** (when prompted) to save the new Channel setting to your current profile.

NOTE

If you wish to install multiple Peer-to-Peer Groups in the same vicinity, configure each network with a unique Channel to avoid interference between networks. Keep in mind that each Channel in 802.11a 2X mode overlaps multiple 802.11a Channels. For example, Channel 50 for 802.11a 2X devices overlaps portions of Channels 42, 48, 52, and 56 for 802.11a devices.

The list of available Channels varies depending on the card's operating mode (802.11a, 802.11a 2X mode, or 802.11b). See "Warranty and Regulatory Information" on page 59 for a list of countries in which the ORiNOCO ComboCard has been certified. The model number suffix, found on the product label, identifies the type of card that you have. For example, an 8460-05 is a Gold ORiNOCO ComboCard sold in the United States or Canada. The available card types are identified below.

802.11a

The IEEE 802.11a specification allocates the available frequencies in the 5 GHz band into a series of operating Channels that are identified by a Channel number and a center carrier frequency. The number of available Channels varies by region based on local regulatory rules.

For United States and Canada (-05 suffix): The ORiNOCO ComboCard can use one of thirteen Channels: Channel 36 (5.180 GHz), Channel 40 (5.200 GHz), Channel 44 (5.220 GHz), Channel 48 (5.240 GHz), Channel 52 (5.260 GHz), Channel 56 (5.280 GHz), Channel 60 (5.300 GHz), Channel 64 (5.320 GHz), Channel 149 (5.745 GHz), Channel 153 (5.765 GHz), Channel 157 (5.785 GHz), Channel 161 (5.805 GHz), or Channel 165 (5.825 GHz).

NOTE

See "Radio Frequency Interference Requirements" on page 7 for important regulatory information concerning Channel selection. Some of the Channels listed above may not be available on your other 802.11a products.

For Europe: Some European countries, such as France, allow 802.11a device to operate only in the 5.15-5.25 GHz frequency band; other countries, such as the U.K. and Germany, allow 802.11a devices to operate in the 5.15-5.35 GHz band. Therefore, there are two versions of the ORiNOCO ComboCard in Europe (availability varies by country; to determine which version you have, see "Product Approvals" on page 62 and check the model number suffix, found on the product label):

- **5.15-5.25 GHz ORiNOCO ComboCard (-02 suffix):** The card can use one of four Channels as assigned by its Access Point: Channel 36 (5.180 GHz), Channel 40 (5.200 GHz), Channel 44 (5.220 GHz), or Channel 48 (5.240 GHz).
- **5.15-5.35 GHz ORiNOCO ComboCard (-03 suffix):** The card can use one of eight Channels as assigned by its Access Point: Channel 36 (5.180 GHz), Channel 40 (5.200 GHz), Channel 44 (5.220 GHz), Channel 48 (5.240 GHz), Channel 52 (5.260 GHz), Channel 56 (5.280 GHz), Channel 60 (5.300 GHz), or Channel 64 (5.320 GHz).

NOTE

ORiNOCO ComboCards sold in Europe do not support Peer-to-Peer Groups when in 802.11a mode. An ORiNOCO ComboCard in Europe always receives its Channel assignment from its Access Point.

For Japan (-JP or -J1 suffix): The ORiNOCO ComboCard can use one of four Channels: Channel 34 (5.170 GHz), Channel 38 (5.190 GHz), Channel 42 (5.210 GHz), or Channel 46 (5.230 GHz).

For Singapore (-SG suffix): The ORiNOCO ComboCard can use one of nine Channels: Channel 36 (5.180 GHz), Channel 40 (5.200 GHz), Channel 44 (5.220 GHz), Channel 48 (5.240 GHz), Channel 149 (5.745 GHz), Channel 153 (5.765 GHz), Channel 157 (5.785 GHz), Channel 161 (5.805 GHz), or Channel 165 (5.825 GHz).

NOTE

For Singapore, some of the Channels listed above may not be available on your other 802.11a products.

802.11a 2X Mode

As of the release of this user's guide, 802.11a 2X mode is not available in Europe or Japan. An 802.11a 2X Channel uses twice the bandwidth of an 802.11a Channel to provide twice the data rate.

For United States and Canada (-05 suffix): The ORiNOCO ComboCard can use one of five Channels: Channel 42 (5.210 GHz), Channel 50 (5.250 GHz), Channel 58 (5.290 GHz), Channel 152 (5.760 GHz), or Channel 160 (5.800 GHz).

For Singapore (-SG suffix): The ORiNOCO ComboCard can use one of three Channels: Channel 42 (5.210 GHz), Channel 152 (5.760 GHz), or Channel 160 (5.800 GHz).

**NOTE**

For the U.S., Canada, and Singapore, some of the Channels listed above may not be available on your other 802.11a products.

802.11b

The IEEE 802.11b specification allocates the 2.4 GHz frequency band into 14 overlapping operating Channels. Each Channel corresponds to a different set of frequencies; the center frequency for each of the 14 Channels is shown in the table below. Two 802.11b Channels must be separated by 25 MHz to be independent of each other (that is, to not overlap). For example, in the U.S., Channels 1, 6, and 11 are independent and do not overlap with each other.

Channel	Center Frequency	Channel	Channel Frequency	Channel	Center Frequency
1	2.412 GHz	6	2.437 GHz	11	2.462 GHz
2	2.417 GHz	7	2.442 GHz	12	2.467 GHz
3	2.422 GHz	8	2.447 GHz	13	2.472 GHz
4	2.427 GHz	9	2.452 GHz	14	2.484 GHz
5	2.432 GHz	10	2.457 GHz		

The number of available Channels varies by region.

For United States and Canada (-05 suffix): The ORiNOCO ComboCard can use Channels 1 through 11.

For Europe (except France) and Singapore (-02, -03, or -SG suffix): The ORiNOCO ComboCard can use Channels 1 through 13.

For France (-02 suffix): The ORiNOCO ComboCard can use Channels 10 through 13.

For Japan (-JP or -J1 suffix): The ORiNOCO ComboCard can use Channels 1 through 14. Note that Channel 14 is only available when the card's Transmit Rate is set to 1 or 2 Mbps.

Transmit Rate

The Transmit Rate specifies the data rate at which the ORiNOCO ComboCard transmits packets. The ORiNOCO ComboCard supports a number of data rates that correspond to different transmission techniques. For wireless devices, there is a trade-off between range and data rate. Transmission techniques that provide high data rates operate over short distances; techniques that provide slower data rates operate over greater distances.

By default, the ORiNOCO ComboCard operates in Automatic mode; as it travels away from an Access Point or from the members of a Peer-to-Peer Group, the data rate automatically decreases in order to maintain a usable radio connection. For example, a client in 802.11b mode that is close to an Access Point may operate at 11 Mbps, but a second 802.11b client that is far away from the same Access Point may operate at 1 Mbps. However, you can also manually configure a Transmit Rate to force the card to transmit at a specific rate.

**NOTE**

Forcing the card to operate at only a high data rate will reduce the range of the product.

There are two Transmit Rate fields: one under the 802.11a heading and one under the 802.11b heading. The 802.11a value applies when the card is in 802.11a or 802.11a 2X mode; the 802.11b value applies when the card is in 802.11b mode.

802.11a

The IEEE 802.11a specification supports eight data rates: 54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, and 6 Mbps. 802.11a 2X mode supports eight data rates: 108 Mbps, 96 Mbps, 72 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, and 12 Mbps.

802.11b

The IEEE 802.11b specification supports four data rates: 11 Mbps, 5.5 Mbps, 2 Mbps, and 1 Mbps.

RTS/CTS

The 802.11 standard supports optional RTS/CTS communication based on packet size. Without RTS/CTS, a sending radio listens to see if another radio is already using the medium before transmitting a data packet. If the medium is free, the sending radio transmits its packets. However, there is no guarantee that another radio is not transmitting a packet at the same time, causing a collision.

When RTS/CTS occurs, the sending radio first transmits a Request to Send (RTS) packet to confirm that the medium is clear. When the receiving radio successfully receives the RTS packet, it transmits back a Clear to Send (CTS) packet to the sending radio. When the sending radio receives the CTS packet, it sends the data packet to the receiving radio. The RTS and CTS packets contain a reservation time to notify other radios that the medium is in use for a specified period. This helps to minimize collisions.

While RTS/CTS adds overhead to the radio network, it is particularly useful for large packets that take longer to resend after a collision occurs.

There are two RTS/CTS fields: one under the 802.11a heading and one under the 802.11b heading. The 802.11a value applies when the card is in 802.11a or 802.11a 2X mode; the 802.11b value applies when the card is in 802.11b mode.

For all modes, you can configure the ORiNOCO ComboCard to never use RTS/CTS (i.e., Disable RTS/CTS) or to use RTS/CTS for packets over a certain size. For example, if the RTS/CTS Threshold is set to 1000 bytes, then a sending radio will use RTS/CTS before transmitting any packet 1000 bytes or larger.

The RTS/CTS Threshold supports a range between 256 and 2346 bytes. If set to 256, then a sending radio will use RTS/CTS before transmitting all packets 256 bytes or larger. If set to 2346, then a sending radio will use RTS/CTS before transmitting only those radio packets that are 2346 bytes or larger.

Fragmentation

The ORiNOCO ComboCard supports an optional feature called Fragmentation. In harsh radio environments, wireless devices may have difficulty transmitting large packets that exceed a certain size. However, when Fragmentation is enabled, a wireless device can break up large packets into a number of smaller packets (called “fragments”) that can be successfully transmitted to another wireless device. The receiving device then reassembles the original packet once it has received all of the fragments.

There are two Fragmentation fields: one under the 802.11a heading and one under the 802.11b heading. The 802.11a value applies when the card is in 802.11a or 802.11a 2X mode; the 802.11b value applies when the card is in 802.11b mode.

For all modes, you can configure the ORiNOCO ComboCard to never use Fragmentation (i.e., Disable Fragmentation) or to fragment only those packets that exceed a certain size. For example, if the Fragmentation Threshold is set to 1000 bytes, then a sending radio will fragment any packet 1000 bytes or larger before transmitting.

The Fragmentation Threshold supports a range between 256 and 2346 bytes. If set to 256, then a sending radio will fragment all packets 256 bytes or larger. If set to 2346, then a sending radio will fragment only those radio packets that are 2346 bytes or larger.

Profiles

If you use the ORiNOCO ComboCard in a laptop computer that moves between several wireless networks, you can create an individual profile for each network to simplify configuration. For example, if you have an 802.11a network at the office and an 802.11b network at home, you can use the same laptop on both networks and switch between the each network’s unique configuration settings with a click of a button.

Note Concerning IP Addressing and Profiles

Depending on your card’s IP addressing type (static or dynamic) and your computer’s operating system, you may need to manually update the card’s IP address each time you switch profiles.

Refer to the following guidelines to determine if you need to change IP addresses manually:

- If your networks use dynamic IP addresses (via the Dynamic Host Configuration Protocol (DHCP)) and your computer is running Windows 2000 or Windows XP, you will not need to change the card’s IP address; in this case, the Windows operating system should automatically release and renew the card’s dynamic IP address each time you switch profiles and connect to a different network.

- If your networks use dynamic IP addresses and your computer is running Windows 98 or Windows ME, you may need to manually release and renew the card's IP address each time you switch profiles and connect to a different network. Follow these steps to release and renew a dynamic IP address:
 - Click **Start > Run**.
 - Type **winipcfg** in the **Open:** field and click **OK**.
 - Select **ORiNOCO 802.11a/b ComboCard** from the drop-down menu, as shown in Figure 4-19.
 - Click **Release**.
 - Click **Renew**.
 - Click **OK** to close the IP Configuration utility.
- If your networks use static IP addresses, you will need to manually change the card's IP address each time you switch profiles and connect to a different network if the networks do not share the same IP addressing scheme.

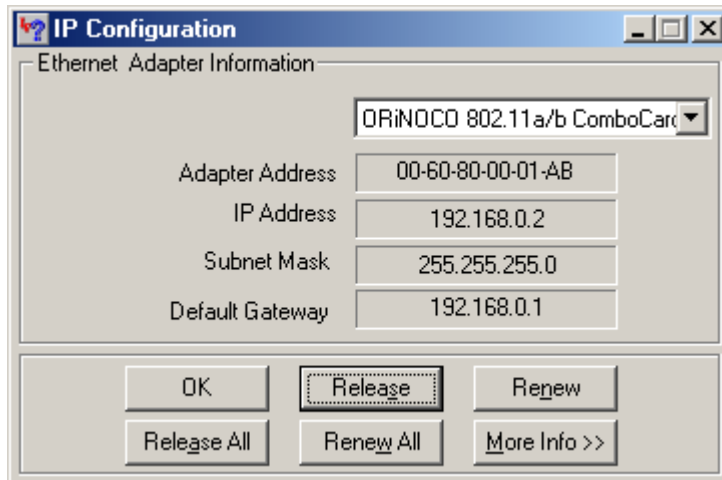


Figure 4-19 IP Configuration Utility for Windows 98/ME

Create a New Profile

After installing the ORiNOCO Utility, only one profile exists: the **Default Profile**. Follow these steps to create one or more new profiles:

1. Double-click the Status Monitor icon to open the ORiNOCO Utility.
2. Click the **Configuration** tab.
3. Click **Create...** located under the **Profile Manager** heading at the bottom of the screen.

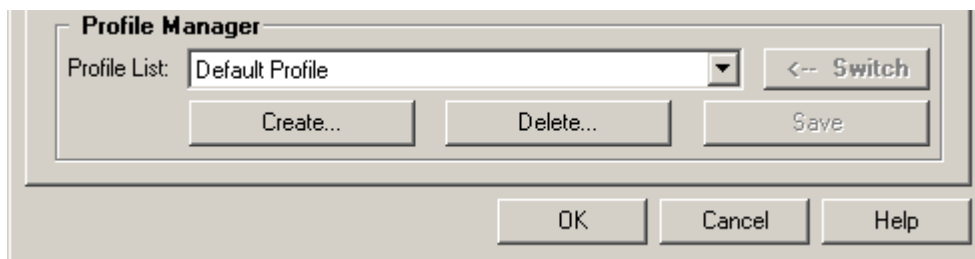


Figure 4-20 Configuration Screen – Profile Options

4. Enter a name for the new profile in the **Profile Name:** field.
5. Select an existing profile to use as the basis for the new profile from the **Copy settings from Profile:** drop-down menu or use the default settings, as shown in Figure 4-21.
6. Click the drop-down menu to select a Network Name for the profile or enter a new Network Name in the field provided.
7. Click **Add**.

8. When prompted, select **Yes** if you want to begin using the new profile immediately; otherwise, click **No**.
9. Edit the profile's settings as necessary. See "Edit a Profile" on page 42 for details.

**NOTE**

You can also create a new profile by associating with a device in the Site Monitor List. See "Associate" on page 47 for details.

Figure 4-21 Create New Profile Screen

Switch Between Profiles

Once you have created multiple profiles, you can switch between them with the click of a button.

Follow these steps to switch profiles from the utility's Station Configuration screen:

1. If necessary, open the ORiNOCO Utility and click the **Configuration** tab.
2. Select a profile from the **Profile List**: drop-down menu, located at the bottom of the screen.

Figure 4-22 Selecting a Profile

3. Click **<-- Switch** to change to the selected profile.

Figure 4-23 Switching Profiles

- The card immediately adopts the settings stored in the selected profile.

➤ NOTE

The ORiNOCO Utility reports the card's current profile at the top of the Station Configuration screen.

In addition, you can also switch between profiles by right-clicking the Status Monitor icon in the Windows Taskbar. Follow these steps:

- Right-click the Status Monitor icon in the Windows Taskbar.
- Scroll over the **Switch to Profile** option with the mouse cursor.
- Select a profile from the pop-up menu. The card's current profile has a check mark next to its entry.

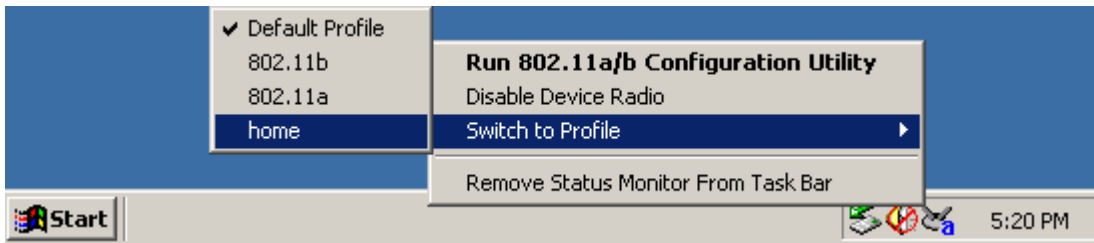


Figure 4-24 Switching Profiles Using the Status Monitor

- Left-click once to switch to the selected profile. The card immediately adopts the settings stored in the selected profile.

Edit a Profile

Follow these steps to change the setting stored in a profile:

- Switch to the profile that you want to edit. See “Switch Between Profiles” on page 41 for details.
- If necessary, open the ORiNOCO Utility and click the **Configuration** tab.
- Change the card's settings as necessary within the Basic, Security and Advanced screens.
- Click **Save** and **Yes** (when prompted) to save the changes to your current profile.
- If you made changes to the Default Profile, a dialog box will appear that lets you change the profile's name (see Figure 4-25). Proxim recommends that you rename the profile to avoid confusion (**Default Profile** is no longer a suitable name for the profile since it does not use the default values).
 - To rename the Default Profile, enter a new name in the field provided and click **OK**.
 - If you want the name to remain as **Default Profile**, click **Cancel**.

➤ NOTE

You can also change a profile's settings by associating with a device in the Site Monitor List. See “Associate” on page 47 for details.

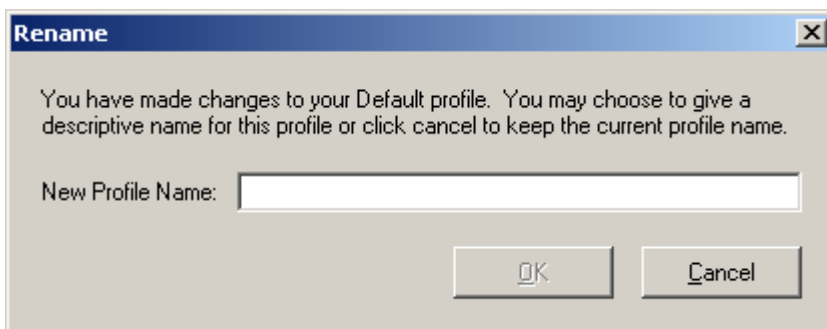


Figure 4-25 Rename Default Profile

Remove a Profile

Follow these steps to delete a profile:

1. Double-click the Status Monitor icon to open the ORiNOCO Utility.
2. Click the **Configuration** tab.
3. Click **Delete...**
4. Select the profile to delete from the drop-down menu.
5. Click **OK**.

Statistics

Click the **Statistics** tab to view information about the number of packets sent and received by the ORiNOCO ComboCard.

The default Statistics screen displays the following statistics:

- **Unicast Packets Sent:** This statistic reports the number of packets transmitted by the card that were destined for a single network node.
- **Multicast Packets Sent:** This statistic reports the number of packets transmitted by the card that were destined for more than one network node.
- **Unicast Packets Received:** This statistic reports the number of packets received that were destined only for this card.
- **Multicast Packets Received:** This statistic reports the number of packets received that were destined for more than one network node.

Click **Reset Values** to reset the statistics to zero.



NOTE

The statistics are automatically reset to zero each time you switch profiles, launch the Snoop Tool, or launch the Packet Transmission Success Rate test.

You can view more statistics by clicking **Advanced Statistics**; an example is shown in Figure 4-26. The advanced Statistics screen displays the following additional statistics:

Send

- **Transmit Rate:** This field reports the card's current transmit rate.
- **Unicast Bytes Sent:** This statistic reports the total number of bytes contained in the unicast packets transmitted by the card.
- **Multicast Bytes Sent:** This statistic reports the total number of bytes contained in the multicast packets transmitted by the card.
- **Single Retries:** After the card sends a packet, it waits for an acknowledgment from the receiving radio to confirm that the packet was successfully received. If an acknowledgment is not received within a fixed period of time, the card will retransmit the packet. This statistic reports the number of packets that required one retry before the card received an acknowledgment.
- **Multiple Retries:** This statistic reports the number of packets that required more than one retry before the card received an acknowledgment.
- **Excessive Retries:** This statistic reports the number of packets that were not successfully transmitted because the card did not receive an acknowledgment within the maximum number of retries.
- **Last ACK RSSI:** This statistic reports the RSSI (Received Signal Strength) for the last acknowledgment (ACK) received by the card. RSSI is reported in decibels (dB) and typically ranges from 0 to 75. In general, an RSSI less than 15 indicates a weak signal and an RSSI greater than 30 indicates a strong signal.
- **ACK Errors:** This statistic reports the number of unicast transmit attempts for which no acknowledgement (ACK) was received.
- **CTS Errors:** This statistic reports the number of Clear To Send (CTS) errors. When the card uses RTS/CTS before transmitting a packet, it first sends a Request to Send (RTS) message to the packet's recipient. The packet's recipient then returns a CTS message to the card. When the card receives the CTS, it sends the packet to the recipient. However, if the card does not receive a CTS within a fixed period of time, it will resend the RTS. After a fixed number of retries, the card will record a CTS Error if a CTS has not been received.

Receive

- **Receive Rate:** This field reports the data rate at which the card is currently receiving packets sent by another wireless device.
- **Unicast Bytes Received:** This statistic reports the total number of bytes contained in the unicast packets received by the card.
- **Multicast Bytes Received:** This statistic reports the total number of bytes contained in the multicast packets received by the card.
- **WEP Undecryptable:** This statistic displays the number of packets that were discarded due to a problem during decryption, such as mismatched Encryption Keys.
- **Bad Frame Checksum:** This statistic displays the number of received packets that failed the CRC (Cyclic Redundancy Check) of the Frame Check Sequence (FCS).

ORiNOCO Utility for 802.11a/b ComboCard

Association Info | Configuration | **Statistics** | Site Monitor | About

Network Traffic Statistics

SEND		RECEIVE	
36	Unicast Packets	0	Unicast Packets
29	Multicast Packets	5	Multicast Packets
54	Transmit Rate (Mb/s)	36	Receive Rate (Mb/s)
4,943	Unicast Bytes	0	Unicast Bytes
1,108	Multicast Bytes	1,393	Multicast Bytes
0	Single Retries	0	WEP Undecryptable
0	Multiple Retries	1	Bad Frame Checksum
1	Excessive Retries	49	Last Frame's RSSI
44	Last ACK RSSI	0	Duplicate Frames
5	ACK Errors		
0	CTS Errors		

Reset Values Basic Statistics

OK Cancel Help

Figure 4-26 Advanced Statistics Screen

- **Last Frame's RSSI:** This statistic reports the RSSI (Received Signal Strength) for the last packet received by the card. RSSI is reported in decibels (dB) and typically ranges from 0 to 75. In general, an RSSI less than 15 indicates a weak signal and an RSSI greater than 30 indicates a strong signal.
- **Duplicate Frames:** This statistic displays the number of duplicate packets received by the card. When the card successfully receives a packet, it sends an acknowledgment (ACK) to the transmitting node. If the ACK does not reach the transmitting node within a specified period of time after it sent the packet (due to interference or some other type of delay), it will resend the packet to the recipient. In this case, the card then receives the packet a second time, records that it received a duplicate packet, and sends an ACK again.

Site Monitor

Click the **Site Monitor** tab to view the list of Access Points and/or Peer-to-Peer stations within range of the card. In Figure 4-27, an ORINOCO ComboCard found five 802.11 wireless devices.

The Site Monitor screen reports the following information for each detected Access Point or Peer-to-Peer station:

- **Station Address:** This field reports the physical (or MAC) address of the detected Access Point or the Basic Service Set ID (BSSID) of the detected Peer-to-Peer station.
- **Network Name:** This field reports the detected device's Network Name. See "Network Name" on page 26 for more information.
- **Channel:** This field displays the Channel used by the detected device. See "Channel" on page 36 for more information.
- **Signal Strength:** This field displays the strength of the radio signal received from the detected wireless device as a percentage.

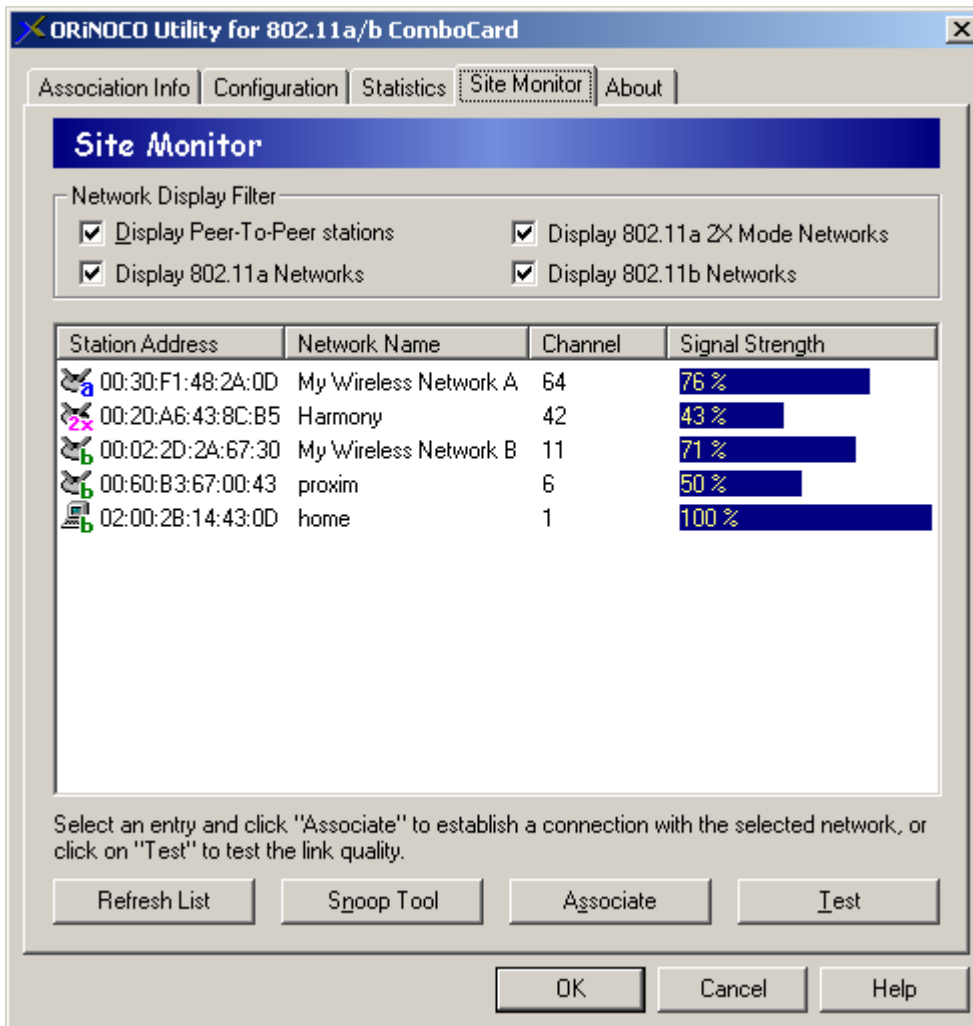


Figure 4-27 Site Monitor Screen

The Site Monitor screen also includes Network Display Filter settings that let you customize which devices appear in the Site Monitor list.

- To see all Peer-to-Peer stations within range, place a check mark in the **Display Peer-to-Peer stations** box.
- To see 802.11a Access Points, place a check mark in the **Display 802.11a Networks** box.
- To see 802.11a 2X Access Points, place a check mark in the **Display 802.11a 2X Mode Networks** box.
- To see 802.11b Access Points, place a check mark in the **Display 802.11b Networks** box.

All four filters are available when in Auto mode. Fewer options are available when Mode is set to 802.11a, 802.11b, or 802.11a 2X mode. For example, when mode is set to 802.11a, only the **Display 802.11a Networks** and **Display Peer-to-Peer stations** options are available.

In addition, there are four buttons at the bottom of the Site Monitor screen: **Refresh List**, **Snoop Tool**, **Associate**, and **Test**. These options are described in the following sections.

Refresh List

If a device that you expected to see does not appear on the Site Monitor screen, click **Refresh List** to update the device table. Note that it may take a few seconds for the list to refresh.

Snoop Tool

The Snoop Tool sweeps the available Channels in the 2.4 GHz or 5 GHz band and reports the 802.11 radio activity it detects.

To launch the tool, click the **Snoop Tool** button on the Site Monitor screen. Note that running the Snoop Tool will terminate any current connection that the card has. When prompted, click **Yes** to continue.

There are three scan modes: 802.11a, 802.11b, and 802.11a 2X mode. The Snoop Tool only scans the Channels that correspond to the selected mode. See “Channel” on page 36 for the list of available Channels in each mode.

After you have selected a mode, the tool scans each Channel in turn, as indicated by the red outline. When an 802.11 signal is detected, the tool displays the signal's maximum and average RSSI (Received Signal Strength Indicator) value. This value is reported as a percentage; a higher percentage means a stronger signal. If there are 802.11 Access Points or Peer-to-Peer Groups operating nearby, the tool will report their signal strength.

Click one of the Channels in the **Channel RSSI Map** to determine if any 802.11 devices are transmitting at that frequency. A selected Channel has a blue outline. If one or more 802.11 devices are using the selected Channel, information about these devices will appear in the **APs on specific channel selected from RSSI Map** box. This is the same information that is reported in the Site Monitor screen (Station Address, Network Name, Channel, and Signal Strength). See Figure 4-28 for an example.

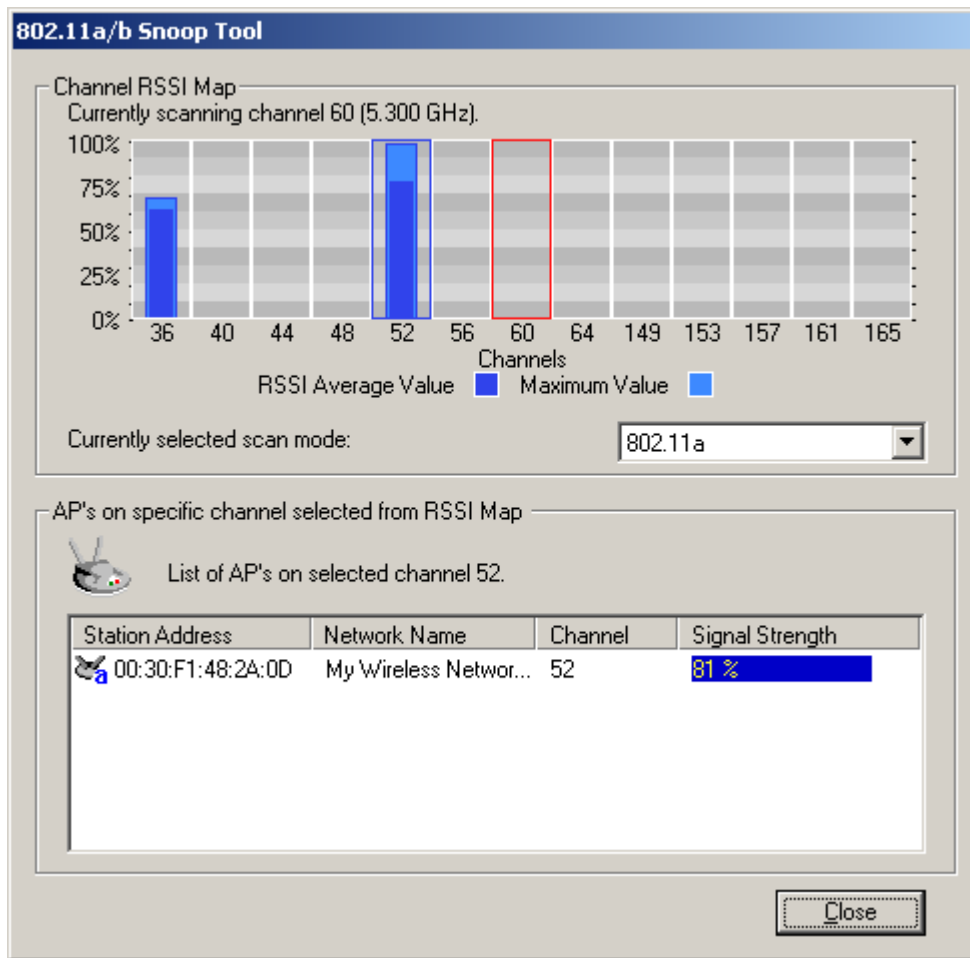


Figure 4-28 802.11a/b Snoop Tool

Associate

Follow these steps if you want the card to associate with one of the detected Access Points or join the same Peer-to-Peer Group as one of the detected Peer-to-Peer stations:

1. Highlight the device that you want the card to associate with and click **Associate**. Alternatively, you can right-click the entry and select **Associate** from the pop-up menu.
2. The **Associate with Wireless Network** dialog box will appear, as shown in Figure 4-29.

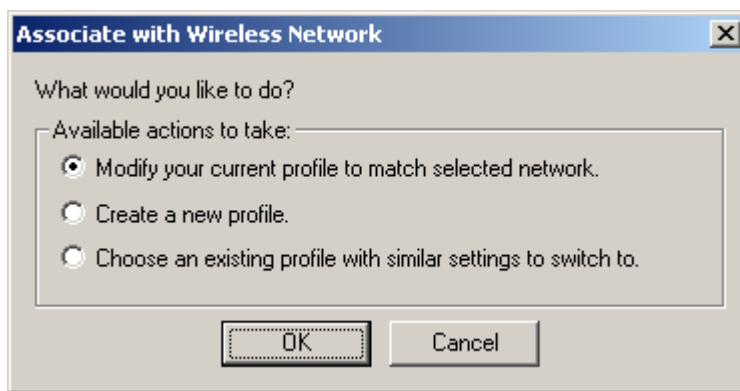


Figure 4-29 Associate with Wireless Network Dialog Box

The dialog box offers the following options:

- **Modify your current profile to match selected network.** When you select this option, the card's current profile changes to match the Mode, Network Type, and Network Name used by the selected device. For example, if you selected an 802.11b Access Point to associate with, the current profile's Mode will change to 802.11b, its Network Type will change to Access Point, and its Network Name will change to match the Access Point's Network Name.
 - **Create a new profile.** When you select this option, the Create New Profile screen appears. Enter a Profile Name and select an existing profile to use as the basis for the new profile. Note that you cannot enter a Network Name since the new profile will automatically use the Network Name of the selected device.
 - **Choose an existing profile with similar settings to switch to.** This option is only available if a profile already exists that has the same Network Name and Network Type as the selected device. When you select this option, the **Switch Profile** dialog box appears so you can choose from the profiles that have settings similar to the selected device. In the example shown in Figure 4-30, the profile called "802.11a" refers to a profile that has Network Type set to Access Point and uses the same Network Name as the selected Access Point ("My Wireless Network A").
3. Select one of the available options from the **Associate with Wireless Network** dialog box and click **OK**.
 4. If applicable, follow the on-screen instructions to create a new profile or switch to a similar profile.
 5. The ORiNOCO ComboCard will associate with the selected device and adopt the settings contained in the new or modified profile.

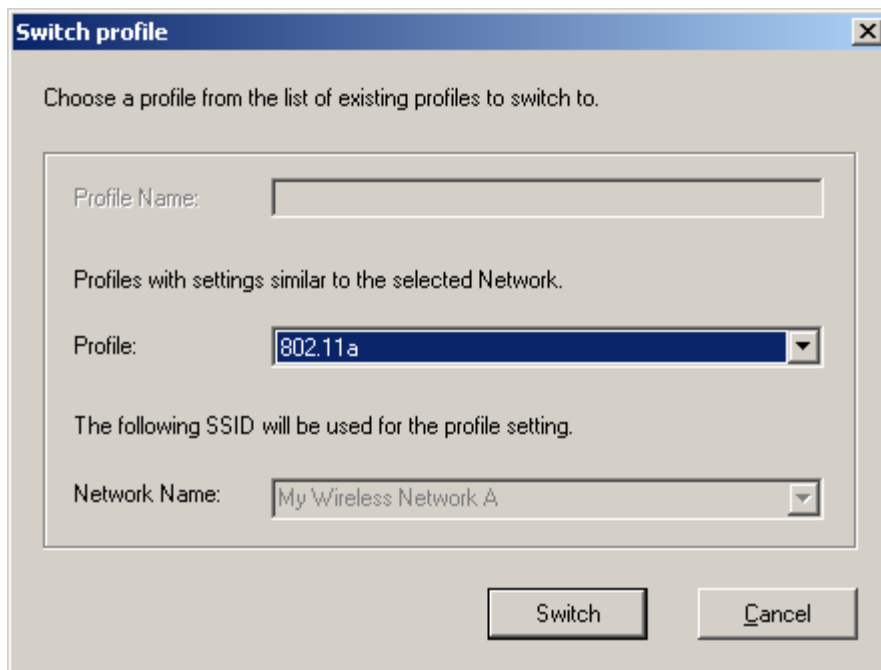


Figure 4-30 Switching to an Existing Profile with Similar Settings

Packet Transmission Success Rate

Select one of the detected Access Points in the Site Monitor screen and click **Test** to determine the link quality between the card and the selected device. You can also start a rate test by right-clicking one of the entries in the Site Monitor list and selecting **Test Transmission** from the pop-up menu.

Note that it can take a few seconds for the test to start. A sample Packet Transmission Success Rate screen is shown in Figure 4-31.



NOTE

You cannot perform a transmission test with Peer-to-Peer stations.

The Packet Transmission Success Rate screen displays the Network Name and physical address of the selected Access Point.

The card sends a series of packets to the selected device and monitors the number of replies it receives. This information is converted to a percentage and plotted on a graph.

In addition, the utility displays the current success rate in the **Instantaneous Success** field and the average of the graph's data points in the **Average Success** field.

By default, the card uses a packet size of 500 bytes and automatically switches between all rates as necessary during the test (greater range generally means a lower transfer rate). However, you can also specify a transfer rate and/or a packet size (between 1 and 1500 bytes) using the drop-down menu. If you change either the transfer rate or the packet size, click **Apply** for these changes to take effect.

When finished running the test, click **Close** to exit the Packet Transmission Success Rate screen.

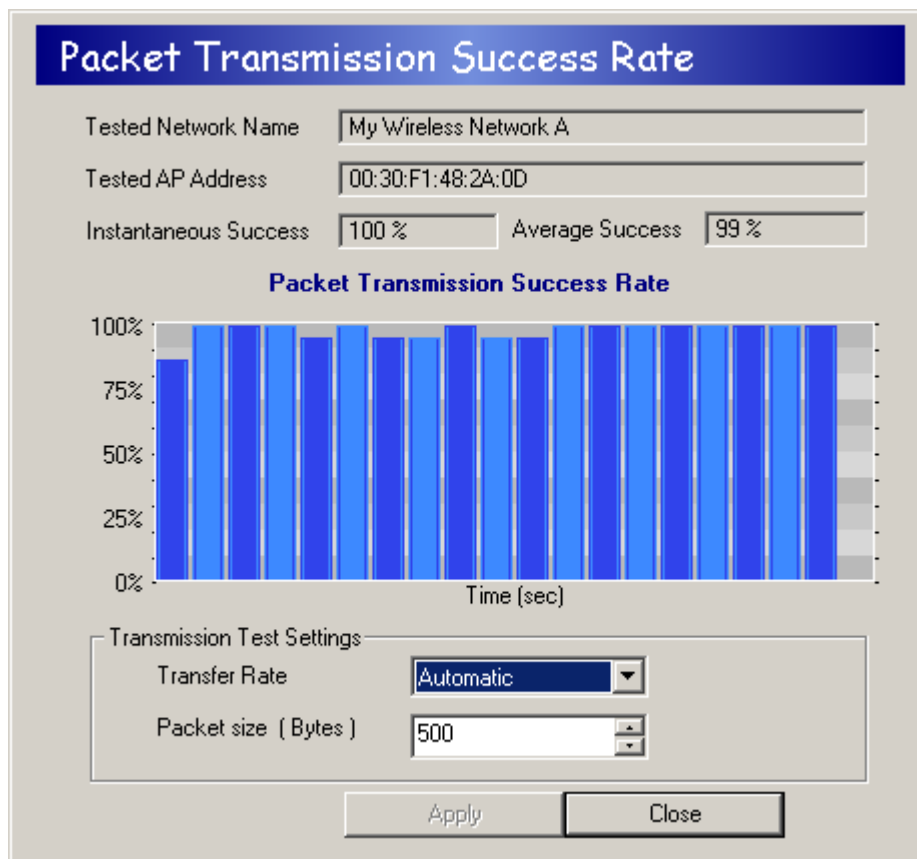


Figure 4-31 Packet Transmission Success Rate Screen

Version Information

Click the **About** tab to view version information for the ORiNOCO ComboCard's driver and utility.

Troubleshooting

In This Chapter

The ORiNOCO 802.11a/b ComboCard is designed to be very easy to install and operate. However, if you experience any difficulties, use the information in this chapter to help diagnose and solve the problem. If you still cannot resolve the problem, contact ORiNOCO Technical Support as described in Appendix B, “Technical Support,” on page 58.

- [How to Obtain Help with Your LAN Installation](#)
- [Common Installation Problems](#)
- [Configuring Networking Clients and Protocols](#)
- [Uninstalling an ORiNOCO 802.11a/b ComboCard](#)
- [Range](#)
- [LED Indicators](#)
- [Common Technical Support Questions](#)

How to Obtain Help with Your LAN Installation

If you require assistance to install your Local Area Network (LAN), Proxim can put you in touch with a reseller in your area. The reseller is an expert in the design, installation, and maintenance of LANs and will be able to examine your needs and recommend the most cost-effective solution for your LAN whether you are installing a new LAN or adding on to an existing one. For the location of the ORiNOCO reseller nearest you, contact Proxim at 1-800-229-1630 or 1-408-731-2700 and ask for the Sales Department.

Common Installation Problems

“Installation,” beginning on page 7 describes how to install an ORiNOCO ComboCard in a computer running Windows 98 Second Edition (SE), Windows Millennium Edition (ME), Windows 2000, or Windows XP. This section provides suggestions to resolve some of the common installation problems with an ORiNOCO ComboCard.

Card Inserted Before Running the Installation Program

If you inserted the ORiNOCO ComboCard into a Windows computer before running the ORiNOCO Installation program, you can install the card using Microsoft’s Add New Hardware Wizard.

Follow these steps:

1. Turn on the computer and logon to Windows, if applicable.
2. Insert the card into an available CardBus slot.
3. Be patient while Windows automatically detects the card and launches the Add New Hardware Wizard.
4. Insert the ORiNOCO CD into the computer’s CD-ROM drive.
5. Follow the on-screen instructions to install the card using the Add New Hardware Wizard.
 - Windows 2000/XP users: If prompted that the software is not Microsoft-certified, click **Yes** or **Continue Anyway** to continue the installation. The software is fully compatible with Windows 2000 and Windows XP.
 - Windows 98/ME users: Insert the Windows installation CD if prompted. If you do not have a Windows installation CD, see “Windows ME and Windows 98 SE Installation CD Requirement” on page 8.
6. If prompted, restart the computer and logon to Windows.
7. Run *SETUP.EXE* from the ORiNOCO Installation CD to launch the ORiNOCO Utility Setup program.
8. Follow the on-screen instructions to install the ORiNOCO Utility.

Refer to “Configuration Utility,” beginning on page 20 for information on how to use the ORiNOCO Utility.

NOTE

Windows XP users: You may need to enable the ORiNOCO Utility's configuration parameters before you can use the utility to change the card's settings. See "Note to Windows XP Users" on page 23 for details.

Card Not Listed in Device Manager

Follow these steps if you have installed the ORiNOCO ComboCard but it does not appear as a network adapter in the Device Manager:

1. Open the Device Manager (located within the Control Panel's System icon).
2. Check the Other Devices category for a **PCI Ethernet Controller** or **Ethernet Controller** entry.
3. If the entry appears in the Other Devices category, highlight it and click **Remove**.
4. Close the Device Manager.
5. Shut down the computer and remove the card from the computer.
6. Follow the instructions in "Installation," beginning on page 7, to install the ORiNOCO driver and utility.

Card Not Installed Properly

If the ORiNOCO Device Setup program or Windows Networking reports that the ORiNOCO ComboCard has not been properly installed or configured after you have completed the ORiNOCO Installation program, open the Device Manager (found within the Control Panel's System icon) and locate the card's entry in the Network adapters category.

If a yellow exclamation point ("!") appears next to the card's Device Manager entry, then the card is not working properly. Follow these steps:

1. Uninstall the card as described in "Uninstalling an ORiNOCO 802.11a/b ComboCard" on page 52.
2. Reinstall the card following the instructions in "Installation," beginning on page 7.

Configuring Networking Clients and Protocols

An ORiNOCO ComboCard will bind to any existing networking components, such as Client for Microsoft Networks and the Internet Protocol (TCP/IP). Refer to the steps below that correspond to your computer's operating system to configure the card's networking components.

Windows XP/2000

Follow these steps to configure the card's networking clients and protocols in a Windows XP or 2000 computer:

1. Open the Control Panel's **Network and Dial-up Connections** (Windows 2000) or **Network Connections** (Windows XP) icon.
2. Scroll through the list of network connections and right-click the Local Area Connection that corresponds to the ORiNOCO ComboCard.
3. Select **Properties** from the drop-down menu to view the connection's properties screen.
4. Select a client or protocol from the list of components and click **Properties** to configure its settings.

For example, if you want to assign the card a static IP address, highlight **Internet Protocol (TCP/IP)** and click **Properties**.

NOTE

To add a new client or protocol, click **Install...** and follow the on-screen instructions.

Windows ME/98 SE

Follow these steps to configure a card's networking clients and protocols in a Windows 98/ME computer:

1. Open the Control Panel's **Network** icon.
2. Select a client or protocol from the list of installed components and click **Properties** to configure its settings.

For example, if you want to assign the card a static IP address, highlight **TCP/IP** or **TCP/IP -> ORiNOCO 802.11a/b ComboCard** and click **Properties**.

NOTE

To add a new client or protocol, click **Add...** and follow the on-screen instructions.

Uninstalling an ORiNOCO 802.11a/b ComboCard

Follow these steps if you need to uninstall the card:

1. Right-click the Status Monitor and choose **Remove Status Monitor From Task Bar**.
2. Open the Control Panel and double-click the **Add/Remove Programs** icon.
3. Select **ORiNOCO 802.11** from the list of installed programs and click **Add/Remove...** (Windows 98/ME) or **Change/Remove** (Windows XP/2000).
4. Select **Automatic** from the list of uninstall options and click **Next**.
5. Click **Finish** to continue.
6. Click **Remove** to uninstall the ORiNOCO ComboCard.
7. Click **Close** after the card has been removed.
8. **Gold Card users:** If you installed the Boingo software during the ORiNOCO Installation, follow the on-screen instructions to remove it. Click **No** when prompted to restart the computer.
9. If prompted, click **Yes** or **Yes to All** to remove the shared files detected by the uninstall utility. It is safe to remove these files; the ORiNOCO installation program installed them on your computer.
10. When prompted, click **Cancel** to prevent the computer from restarting.
11. Shut down the computer.
12. Remove the card from the computer.



NOTE

Gold Card users: If you installed the Boingo Wireless Software and want to remove it but not the ORiNOCO ComboCard or utility, you can uninstall the Boingo software from the Control Panel's **Add/Remove Programs** icon.

Range

Every environment is unique with different obstacles, barriers, materials, etc., and, therefore, it is difficult to determine the exact range that will be achieved without testing. Radio signals may reflect off of some obstacles or be absorbed by others depending on their construction.

The IEEE 802.11 standards and the 802.11a 2X mode specification each supports multiple data rates that correspond to different transmission techniques. For wireless devices, there is a trade-off between range and data rate.

Transmission techniques that provide high data rates operate over short distances; techniques that provide slower data rates operate over greater distances. By default, ORiNOCO ComboCard automatically switches between these data rates to maintain a usable radio connection and achieve the best data rate based on the card's distance from the Access Point. Therefore, a client that is close to an Access Point will operate at a higher data rate than a client that is farther away from the Access Point.

The ORiNOCO ComboCard includes two integral omnidirectional antennas. Note that the coverage footprint of the card's antennas will vary depending on the laptop's design and the location of the CardBus slot in the computer. Two antennas are provided to support antenna diversity, a technique which can improve system reliability. Due to the characteristics of radio waves, it is possible that one antenna may provide better performance than a second antenna installed a short distance away.

Proper antenna placement can help improve range. Here are some guidelines:

- Try to keep the card's antennas free of obstructions (particularly metal objects) and do not place a sheet of metal (like a filing cabinet) between the antennas of two 802.11 devices.
- Use the ORiNOCO Utility to evaluate the signal strength and link quality between 802.11 devices.
- Refer to the documentation that came with your Access Points for suggestions on how to locate the AP and its antennas to maximize range and performance.

LED Indicators

The ORiNOCO 802.11a/b ComboCard includes two crescent-shaped, green LED indicators on the end of the card. These LEDs display the following behavior:

- Both LEDs are off when the card is not receiving power or when the ORiNOCO driver is not installed.
- The LEDs blink in an alternating pattern (when one LED is on, the other LED blinks rapidly) to indicate that the card is searching for an Access Point or Peer-to-Peer Group to communicate with.
- The LEDs blink in unison every second when the card has associated with an Access Point or joined a Peer-to-Peer Group.
- When there is network activity, the LEDs blink at a faster rate; the LEDs will blink in unison more often as the card's Transmit or Receive Rate increases.

Common Technical Support Questions

This section discusses some of the most common problems using an ORiNOCO ComboCard and offers possible solutions.

Symptom/Question	Possible Solution/Answer
I installed the adapter card in the computer before running <i>SETUP.EXE</i> . What should I do?	Follow the on-screen instructions to install the card using Microsoft's Add New Hardware Wizard. When prompted, point the Wizard to search the ORiNOCO Installation CD for driver files. Then, after you have installed the driver, run <i>SETUP.EXE</i> from the ORiNOCO Installation CD to install the ORiNOCO Utility.
My office has an existing 802.11b network. Is the ORiNOCO ComboCard compatible?	Yes, the ORiNOCO ComboCard complies with the 802.11a and the 802.11b wireless standards. The card can communicate with 802.11b devices in Auto or 802.11b mode.
I want to install an 802.11a network in my office that has an existing 802.11b network. Will the 802.11a network interfere with the 802.11b network?	No. 802.11a and 802.11b devices will not interfere with each other since they operate at different frequencies. 802.11a devices operate in the 5 GHz band, and 802.11b devices operate in the 2.4 GHz band.
Is an ORiNOCO ComboCard compatible with 802.11a and 802.11b products from other vendors?	Yes, the card can interoperate with 802.11a-compliant or 802.11b-compliant products from other vendors.
In throughput tests, the card doesn't seem to transfer data as quickly as I'd expect.	Data rate is the raw signaling rate of a networking device; it does not equal data throughput. Actual data throughput is always less than the data rate since some of the available bandwidth is used to send control messages and regulate activity over the wireless medium. Also, throughput will depend on several factors such as network overhead, the file transfer program in use, the computer's operating system, and the computer's processor speed.
Does the card support IEEE 802.1x Authentication?	Yes, but you also need a configuration utility supplied by your RADIUS server vendor. Note that Windows XP includes built-in support for the IEEE 802.1x standard.
There seems to be a delay when the card roams from Access Point to Access Point.	If you are using Access Points of only one type (802.11a, 802.11b, or 802.11a 2X mode), set Mode (see page 25) to match that type. For example, if you have only 802.11b APs on your network, change Mode from Auto to 802.11b ; this should improve performance while roaming.
Whom should I contact if I have questions concerning the Boingo software?	If you are a Boingo customer, contact Boingo Technical Support for assistance at 1-800-880-4117 or support@boingo.com . See http://www.boingo.com for more information.
How long will my battery last when using the ORiNOCO ComboCard?	Battery life will vary from unit to unit and depends on many factors including battery type, length of battery life without the card inserted, and how frequently the card transmits and receives data. Frequent network activity will drain the battery faster than if the card were left idle in doze mode. Configuring the card to use one of the Power Management modes will prolong battery life. However, you should perform some tests under normal operating conditions to accurately determine a device's battery life with the card installed.

Symptom/Question	Possible Solution/Answer
Harmony Key Management is enabled and I've entered my Harmony User Name and Password but I can't log on to the network.	Either your User Name or Password is incorrect or you are not in range of an Access Point. To determine whether or not you are in range of an Access Point, click Cancel to access the Windows desktop and locate the Association State field within the ORiNOCO Utility. Then, log on to Windows again to bring up the Harmony logon prompt. If you are out of range of an Access Point, check the Defer logon for current session if Access Point is out of range box and click Logon . If you think that your User Name or Password is incorrect, contact your network administrator for assistance.
I deferred my Harmony logon until my computer was in range of an Access Point. However, once the card associated with an Access Point, I could not access the network.	Open the ORiNOCO Utility's Association Information screen and locate the Security field. If the field reports "HKM: User is not authenticated," then either your User Name or Password is incorrect. Try logging on to Windows again. If problems persist, contact your network administrator to confirm your User Name and Password.
My Harmony User Name and Password are synchronized with my Windows User Name and Password so the Harmony logon prompt does not appear after I logon to Windows. But now I want to change my Harmony Password. What can I do?	Enable the Log on to Harmony Security before Windows Logon option so the Harmony logon screen appears before the Windows logon screen. You can also change your Windows Password; the Harmony logon prompt will reappear after you log on to Windows once your Windows Password and Harmony Password no longer match. A third alternative is to contact your network administrator who can change your Password via the Harmony System's User Database.
My computer can't reestablish a network connection when Harmony Key Management is enabled.	You need to logon to the Harmony System first before logging on to Windows to gain immediate access to network resources. Open the ORiNOCO Utility's Security configuration screen and place a check mark next to the Log on to Harmony Security before Windows Logon option. Then, save your changes and logon to Windows again.



Specifications

In This Appendix

- [Technical Specifications](#)
- [Parameters](#)

Technical Specifications

The following technical specification is for reference purposes only. Actual product's performance and compliance with local telecommunications regulations may vary from country to country. Proxim Corporation will only ship products that are type approved in the destination country.

General

Compatibility	Fully interoperable with IEEE 802.11a compliant products in 802.11a mode; Fully interoperable with IEEE 802.11b compliant products in 802.11b mode
Warranty	3-years parts and labor (return to factory)
LED Indicators	Two (2) LEDs indicate Power On, Sleep Mode, Transmit Activity, Association, and Power Off

Network Information

Security	64, 128 & 152-bit Wired Equivalent Privacy (WEP) data encryption; 802.1x authentication; and Harmony Key Management (HKM) (HKM available with Gold Model 8460 only)
Network Architecture	Supports Ad Hoc Peer-to-Peer Groups and communication to wired infrastructure networks via Access Points
Installation & Diagnostics	Complete configuration utility application included; Utility's site survey tool surveys other wireless units and reports packet throughput; Desktop icon continuously reports status
Operating System Support	Windows 98SE, 2000, ME, XP
Roaming	Seamless among 802.11a compliant access points (in 802.11a or 802.11a 2X mode) and/or 802.11b compliant access points (in 802.11b mode)

Radio (802.11a Mode)

Media Access Protocol	IEEE 802.11a
Radio Data Rate	54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, 6 Mbps in 802.11a mode; 108 Mbps, 96 Mbps, 72 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps in 802.11a 2X mode
Frequency Band (802.11a)	5.15-5.35 & 5.725-5.850 GHz; actual frequencies in use vary by country
Radio Type	Orthogonal Frequency Division Multiplexing
Modulation	64 QAM, 16 QAM, QPSK, BPSK
Channels	Varies by country. See "Channel" on page 36.

Radio (802.11b Mode)

Media Access Protocol	IEEE 802.11b
Radio Data Rate	11 Mbps, 5.5 Mbps, 2 Mbps, 1 Mbps
Frequency Band	2.4 GHz frequency band; actual frequencies in use vary by country
Radio Type	Direct Sequence Spread Spectrum
Modulation	CCK, QPSK, BPSK
Channels	Varies by country. See "Channel" on page 36.

Environmental

Operating Temperature	0°C to +70°C
Storage Temperature	-65°C to 150°C
Humidity	5% to 95% non-condensing

Physical

Bus Interface	32-bit CardBus
Voltage	3.3 Volts
Weight	1.41 ounces (40 g)

Parameters

Parameter	Range	Default
Network Type	Peer-to-Peer Group*, Access Point	Access Point
Mode	Auto, 802.11a, 802.11b, 802.11a 2X mode*	Auto
Auto Mode Preference	Best Signal, 802.11a, 802.11b	Best Signal
Power Management (this is only applicable when Network Type is set to Access Point)	Off, Normal, Maximum	Off
Roaming	Fast, Slow, Normal	Normal
Network Name	Up to 32 characters	any
Security Level	No Security, Use Encryption, 802.1x Security, Harmony Key Management (Gold card only)	No Security
Key Size	64 bit, 128 bit, 152 bit	64 bit
Encryption Keys (When Security Level is set to Use Encryption)	Up to 4 Keys: 10 hexadecimal or 5 ASCII digits per key for 64 bit, 26 hexadecimal or 13 ASCII digits per key for 128 bit, 32 hexadecimal or 16 ASCII digits per key for 152 bit	Blank
Default Key	One of the four configured Encryption Keys	Encryption Key 1
Channel (Configurable when Network Type is set to Peer-to-Peer Group; assigned by AP when Network Type is set to Access Point)	802.11a U.S. & Canada (-05): Channels 36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161 & 165 Europe (-02): Channels 36, 40, 44 & 48 Europe (-03): Channels 36, 40, 44, 48, 52, 56, 60 & 64 Japan (-JP): Channels 34, 38, 42 & 46 Singapore (-SG): Channels 36, 40, 44, 48, 149, 153, 157, 161 & 165 802.11a 2X* U.S. & Canada (-05): Channels 42, 50, 58, 152 & 160 Singapore (-SG): Channels 42, 152 & 160 802.11b U.S. & Canada (-05): Channels 1-11 Europe (except France) & Singapore (-02, -03 & -SG): Channels 1-13 France (-02): Channels 10-13 Japan (-JP): Channels 1-13 (all rates), Channel 14 only at 1 Mbps or 2 Mbps	Depends on Mode and Network Type
Transmit Rate	802.11a Automatic or select one of the following: 54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, and 6 Mbps 802.11a 2X* Automatic or select one of the following: 108 Mbps, 96 Mbps, 72 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, and 12 Mbps 802.11b Automatic or select one of the following: 11 Mbps, 5 Mbps, 2 Mbps, 1 Mbps, and 1/2 Mbps auto select	Automatic
RTS/CTS	Enabled, Disabled	Disabled
RTS/CTS Threshold	256 to 2346	2346
Fragmentation	Enabled, Disabled	Disabled
Fragmentation Threshold	256 to 2346	2346

*Peer-to-Peer Groups are not available in Europe for 802.11a or 802.11a 2X mode; 802.11a 2X mode is not available in Europe or Japan.

Technical Support

If you are having a problem using an ORiNOCO 802.11a/b ComboCard and cannot resolve it with the information in “Troubleshooting,” beginning on page 50, gather the following information and contact ORiNOCO Technical Support:

- What kind of network are you using?
- What were you doing when the error occurred?
- What error message did you see?
- Can you reproduce the problem?
- What version of the ORiNOCO driver are you using?

You can reach ORiNOCO Technical Support by phone or e-mail, as described below.

For the U.S. and Canada:

Phone: 1-866-ORiNOCO (1-866-674-6626), choose prompt 2

E-mail: **USAsupport@orinocowireless.com**

For the Caribbean and Latin America:

Phone: 1-866-ORiNOCO (1-866-674-6626), choose prompt 2

E-mail: **CALAsupport@orinocowireless.com**

For Asia Pacific:

Phone: +1 661-367-2230

E-mail: **APACsupport@orinocowireless.com**

For Europe, the Middle East, and Africa (EMEA):

Your local supplier in the EMEA region is trained to give you the support you require. Local suppliers have direct access to the ORiNOCO Technical Support Center and will help you in every way they can.

Phone: +1 661-367-2230

E-mail: **EMEAsupport@orinocowireless.com**



NOTE

The latest software and documentation is available for download at <http://www.proxim.com> or <http://www.orinocowireless.com>.



Warranty and Regulatory Information

Limited Warranty, Disclaimer, Limitation Of Liability

For a period of three (3) years from the date of purchase by the retail customer, Proxim warrants the ORiNOCO 802.11a/b ComboCard against defects in materials and workmanship. Proxim will not honor this warranty if there has been any attempt to tamper with or remove the product's external foil label.

This warranty does not cover and Proxim will not be liable for any damage or failure caused by misuse, abuse, acts of God, accidents, or other causes beyond Proxim's control, or claim by any entity other than the original purchaser.

If, after inspection, Proxim determines there is a defect, Proxim will repair or replace the ORiNOCO ComboCard at no cost to you. To return defective merchandise to Proxim, please contact ORiNOCO Technical Support (as described in "Technical Support" on page 58) to obtain a Return Merchandise Authorization (RMA) number.

In no event shall Proxim Corporation be responsible or liable for any damages arising:

- From the use of the product
- From the loss of use, revenue or profit of the product
- As a result of any event, circumstance, action, or abuse beyond the control of Proxim Corporation

Whether such damages be direct, indirect, consequential, special, or otherwise and whether such damages are incurred by the person to whom this warranty extends or a third party.

Warranty Return Policy

If you have a problem with an ORiNOCO 802.11a/b ComboCard, please contact ORiNOCO Technical Support for assistance. (See "Technical Support" on page 58 for contact information.) ORiNOCO Technical Support will assist with resolving any technical difficulties you may have with your ORiNOCO ComboCard.

After calling ORiNOCO Technical Support, if your product is found to be defective, you may return the product to Proxim after obtaining an RMA (Return Merchandise Authorization) number. The product must be returned in its original packaging. The RMA number should be clearly marked on the outside of the box. Proxim cannot be held responsible for any product returned without an RMA number, and no product will be accepted without an RMA number.

Regulatory Information

FCC WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Regulatory Information

Products labeled with the CE 0336 (!) contain a radio transmitter that complies with the R&TTE Directive 1999/5/EC implying conformity to the following European Norms.

Les produits portant la marque d'alerte CE 0336 (!) contiennent un émetteur radio conforme à la directive R&TTE (1999/5/EC) qui impliquent la conformité aux normes de la Commission de la Communauté Européenne.

I prodotti che recano l'avvertenza CE 0336 (!) contengono un trasmettitore radio conforme alla Direttiva R&TTE (1999/5/EC) emessa dalla Commissione della Comunità Europea.

Funkprodukte mit der CE 0336 (!) Kennzeichnung enthalten einen Funktransmitter, der die von der Kommission der EU verabschiedete Richtlinie R&TTE (1999/5/EC) erfüllt.

Los productos con la marca CE0336 (!) contienen un transmisor de radio que cumple con la Directiva R&TTE (1999/5/EC) emitida por la Comisión Europea.

- IEC60950, Third Edition (1999)/CB Scheme - Product Safety
- EN 300328 - Radio LAN equipment operating in the 2.4 GHz band
- EN 301893 - Radio LAN equipment operating in the 5 GHz band
- EN 301489-17 - General EMC requirements for radio equipment

To determine the type of transmitter, check the product identification label on your Wireless LAN product.

Pour identifier le type d'émetteur, reportez-vous à l'étiquette d'identification de votre produit.

Per determinare il tipo di trasmettitore, controllare la targhetta di identificazione del prodotto.

Um welchen Transmittertyp es sich handelt, können Sie auf dem Typenschild auf dem Produkt ablesen.

Para determinar el tipo de transmisor, compruebe la etiqueta de identificación del producto.

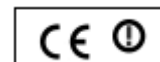
Some European countries using this product may be subject to specific restrictions as listed in "Product Approvals" on page 62.

Dans certains pays, l'utilisation du produit peut être subordonnée à des conditions spécifiques comme indiquées dans la section "Product Approvals" à la page 62.

In alcuni paesi l'uso del prodotto può essere soggetto a limitazioni specifiche, come indicato nelle sezioni Omologazioni radio ("Product Approvals" alla pagina 62).

In einigen Ländern kann der Betrieb dieses Produktes bestimmten Beschränkungen unterliegen, wie sie in dem Abschnitt Funkgenehmigungen ("Product Approvals" auf Seite 62).

En algunos países la utilización de este producto puede estar sujeta a restricciones concretas, tal y como se describe en el apartado Permisos de utilización ("Product Approvals" en la página 62).



Japanese Regulatory Information

日本の通達

Association of Radio Industries and Businesses (ARIB)

電波産業会 (ARIB) STD-T71) 通達

このセクションは、5.15 ~ 5.25 GHz 帯域で運用されている IEEE 802.11a 準拠の送信機のみ当てはまります。使用の際に適用される制限については、本冊子の「[Product Approvals: 5GHz: For Indoor Use Only.](#)」セクションをご覧ください。

電波産業会 (ARIB) STD-T66) 通達



このセクションは、2.4 GHz 帯域で運用されている IEEE 802.11b 準拠の送信機のみ当てはまります。この製品は、「第二世代低電力データ通信システム」に分類され、「電子通信企業に関する法律」および「電磁波に関する法律」に規定されている「端末装置の技術基準」に適合しています。承認番号については、「[Product Approvals](#)」セクションをご覧ください。

この製品は、ディレクトシーケンススペクトラム拡散 (DSSS) を採用しており、無線周波数帯は 2.400 ~ 2.483 MHz です。この周波数帯域は、次のような産業・科学・医療機器でも使用されています。



- ・ 電子レンジ
- ・ 次のいずれかを含む移動体識別用システム (RF-ID)
 - ・ 免許を要する構内無線局
 - ・ 免許を要しない工場製造ライン用特定小電力無線局

この装置を使用する前に、

- 1 無線 LAN 装置を使用する場所の近くに、移動体識別用システム (RF-ID) がないことを確認してください。40 メートル以内に近づくと、干渉が起きる場合があります。
- 2 移動体識別用システム (RF-ID) への RF 干渉が発生した場合は、無線信号の発信を停止するか、装置が使用する周波数チャネルを変更してください。免許を要する移動体識別用システム (RF-ID) の付近で RF 干渉が発生した場合は、ただちに無線信号の発信を停止してください。

無線装置から移動体識別用システム (RF-ID) への干渉が発生するなどの問題が生じた場合は、正規の代理店またはメーカーまでご連絡ください。

お問い合わせ先については、Web サイト <http://www.orinocowireless.com> を参照してください。

Product Approvals

Proxim will only ship products that are type approved in the destination country.

As of the release of this user's guide, the ORiNOCO 802.11a/b ComboCard has been certified in the following countries:

Country Pays Paese Land País	Restrictions Restrictions Limitazioni Beschränkungen Restricciones	Version Version Versione Ausführung Versión
Canada	For indoor use only. Uniquement pour usage d'intérieur.	-05
Denmark	Nemlig indendørs hjælp bare.	-02
Finland	Indoor käyttöä varten vain.	-03
France	Uniquement pour usage d'intérieur.	-02
Germany	Für nur Innengebrauch.	-03
Iceland	Fyrir inni- nota eini	-02
The Netherlands	Alleen voor gebruik binnen.	-03
Norway	Bruk bare innenfor	-02
Portugal	Para dentro de casa usar apenas	-02
Japan	5GHz: For Indoor Use Only.	-JP or -J1
Singapore	For indoor use only.	-SG
Sweden	För indoor använda bara.	-02
Switzerland	Nur für Innengebrauch. Uniquement pour usage d'intérieur. Per uso interno solo.	-02
United Kingdom	For indoor use only.	-03
USA	For indoor use only.	-05

NOTE

See "Channel" on page 36 for an explanation of the card versions (-02, -03, -05, -JP/-J1, and -SG).

This product may be approved in other countries in addition to those listed above. If your country is not on the list above or you have questions regarding product certification, contact Proxim Technical Support (see "Technical Support" on page 58 for contact information).

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