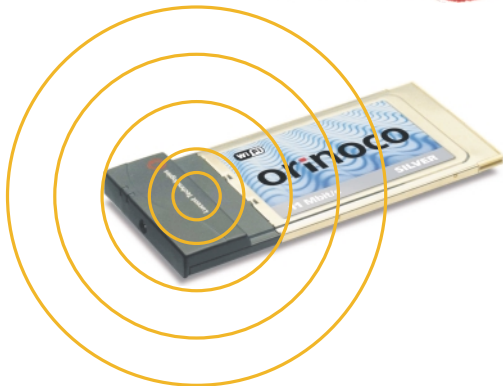*Your Mobile Broadband Connection*

Lucent Technologies
Bell Labs Innovations

oriNOCO™

PC Card　　**User's Guide**

Table of Contents

3   Using ORiNOCO and Windows

About ORiNOCO

<div style="text-align: right; font-size: 2em; font-weight: bold">1</div>

Kit Contents

The ORiNOCO PC Card kit includes the items as pictured in Figure 1-1:

a. One ORiNOCO PC Card.
b. Transparent protective casing
   (for storing your PC Card while not in use).
c. The "ORINOCO PC Card - Getting Started" guide
d. The ORiNOCO Software CD-ROM.

Figure 1-1   ORiNOCO Kit Contents
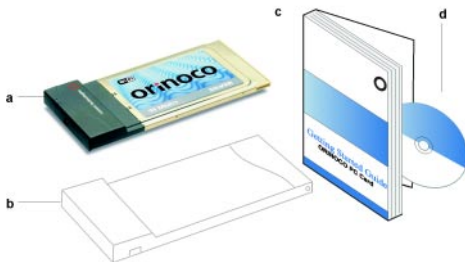
The printed document "ORINOCO PC Card - Getting Started" is an abstract of the "ORINOCO PC Card - User's Guide".

⟹ **NOTE:**

In order to extend the life of the PC Card hardware it is advised to store the card in the protective casing whenever carrying the computer on travel without operating the device.

ORiNOCO Network Scenarios

The ORiNOCO PC Card Kit enables you to:

- Connect your computer to a Peer-to-Peer workgroup of wireless computing devices (see Figure 1-2 on page 1-4).

- Connect your computer to a Small Office/Home Office (SOHO) network that includes a Lucent Technologies Residential Gateway (RG) access point (see Figure 1-3 on page 1-5).

- Connect your computer to a Local Area Network (LAN) Infrastructure that includes Lucent Technologies ORiNOCO AP-1000s[1] (Access Points), or other IEEE 802.11 compliant LAN systems (see Figure 1-4 on page 1-6 and Figure 1-5 on page 1-7).

- Expand the capabilities of your AP-1000s, to support wireless devices that have been equipped with ORiNOCO PC Cards.

Peer-to-Peer Workgroup

The Peer-to-Peer workgroup configuration enables you to quickly set up a small wireless workgroup, where the workgroup participants can exchange files using features like "Files and Printer Sharing" as supported by Microsoft Networking.

---

1 The AP-1000 is formerly identified as WavePOINT-II AP.

Figure 1-2   Peer-to-Peer Wireless Workgroup
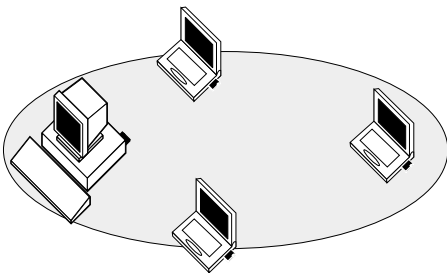
You can use this option to setup a temporary or ad-hoc network in environments where no access points are available (for example in Small Office/Home Office (SOHO) environments).

As long as the stations are within range of one another, this is the easiest and least expensive way to set up a wireless network.

Home Networking

With the Lucent Technologies ORiNOCO Residential Gateway (RG), wireless access to the Internet or other computers is at your fingertips.

Figure 1-3   Connect to a Residential Gateway (RG)
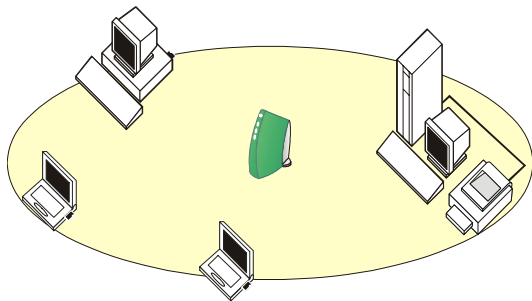
All you need to do is connect the wireless computers to the ORiNOCO Residential Gateway (RG), and you are ready to:

■ Share files and printers, and

■ Access the Internet via the built-in modem of the RG.

Optionally the RG allows you to connect your wireless stations to previously installed wired computers and/or an external cable, an xDSL or a ISDN modem.

Enterprise Networking

Figure 1-4   Stand Alone Wireless LAN
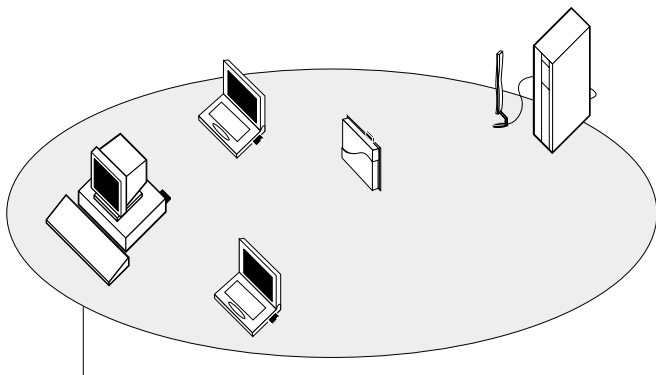
Network Name

With the ORiNOCO AP-1000 you can connect to a corporate Local Area Network (LAN) infrastructure to have wireless access to all network facilities. LAN Infrastructures may either be:

■ Stand-alone wireless LANs as pictured in Figure 1-4.

■ Wireless network infrastructures connected to an existing Ethernet network as pictured in Figure 1-5 on page 1-7.

Figure 1-5   LAN Infrastructure

Network Name
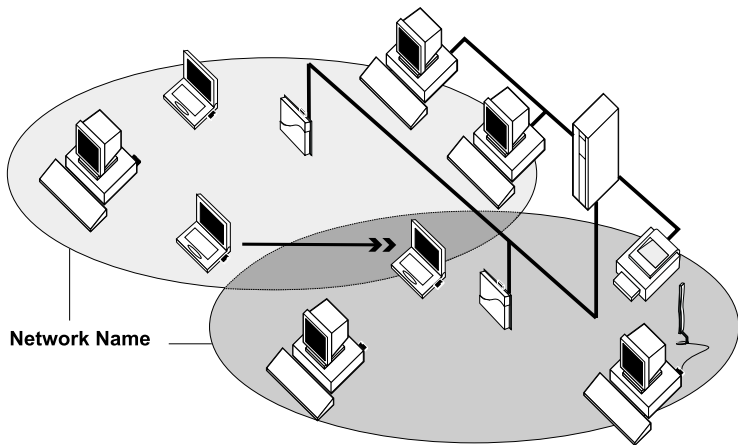
It's Easy

The ORiNOCO PC Card functions like any standard wired Ethernet card, but ORiNOCO does not need any wires!

Where an Ethernet card requires a cable connection to a hub and/or patch panel, the cable physically ties you down to the location of the wired connection.

ORiNOCO allows you to connect your computer to a Local Area Network (LAN) system from anywhere within the wireless coverage area. Expanding or re-designing your network is easy: Add or relocate AP-1000s, power-up your (new) ORiNOCO computers, and you're done!

Unlike Ethernet, ORiNOCO will enable you to roam throughout the network while remaining connected to the LAN.

⇒ NOTE:
> The ORiNOCO PC Card is a radio product. Refer to the flyer "Information to the User" for regulatory information that may apply in your country.

ORiNOCO PC Card Features

The ORiNOCO PC Card is a wireless network PC Card that fits into any standard PC Card Type II slot.

The ORiNOCO PC Card has two LED indicators and two integrated antennas. Optionally you can use the ORiNOCO PC Card in combination with an external antenna (see page 1-16).

Figure 1-6   The ORiNOCO PC Card

a. Integrated Antennas

b. Transmit/ Receive LED

- Off - No wireless activity
- Blinking - Sensing/transmitting wireless data

c. Power ON/OFF LED

- Solid Green - standard operational mode
- Blinking Green - Power Management mode

d. Connector for optional External Antenna (see "External Antennas" on page 1-16).

ORiNOCO PC Card Types

The ORiNOCO PC Card is a wireless network PC Card that complies with the IEEE 802.11 standard on wireless LANs (Revision B). The ORiNOCO PC Card supports data rates up to 11 Mbit/s and is available in two variants:

■ ORiNOCO Silver Label, and

■ ORiNOCO Gold Label.

Both types of ORiNOCO PC Cards are:

■ Wi-Fi (Wireless Fidelity) certified by the Wireless Ethernet Compatibility Alliance (WECA). This means that your ORiNOCO hardware will communicate with other vendors' IEEE 802.11 compliant wireless LAN products.

■ Fully compatible with any other wireless LAN system based on Direct Sequence Spread Spectrum (DSSS) radio technology that complies with the "IEEE 802.11 standard on wireless LANs (Revision B)".

■ Backwards compatible with any other previously released model of the WaveLAN/IEEE product family.

Silver Label Cards

The ORiNOCO Silver PC Cards supports the following wireless LAN
features:

- Automatic Transmit Rate Select mechanism in the transmit range of 11,
  5.5, 2 and 1 Mbit/s.
- Frequency Channel Selection (2.4 GHz).
- Roaming over multiple channels.
- Card Power Management.
- Wired Equivalent Privacy (WEP) data encryption, based on the 64 bit
  RC4 encryption algorithm as defined in the IEEE 802.11 standard on
  wireless LANs.

These features are described in more detail in the ORINOCO PC Card -
User's Guide provided on the CD-ROM.

Gold Label Cards

The ORiNOCO Gold PC Cards support the same functionality as the
ORiNOCO Silver cards. The Gold card however provides an enhanced type
of WEP data encryption, based on the 128 bit RC4 algorithm.

⇒ NOTE:

The ORiNOCO Gold PC Card may not be marketed in all parts of
the world, subject to national legislation or local regulations. For
availability in your country, please consult your authorized
ORiNOCO Reseller.

About the Software CD-ROM

The ORiNOCO software CD-ROM contains both software and documentation for all ORiNOCO products in indoor environments.

If you wish to install ORiNOCO driver software, turn to Chapter 2 "Installation for Windows" and follow the instructions as described for installing your ORiNOCO PC Card.

If you would like to explore the contents of the CD-ROM, the contents map as pictured in Figure 1-7 on page 1-13, may help you find the items you are looking for:

■ ORiNOCO User Guides and other reference documents are located in "D:\Docs\"[1].

■ Software for ORiNOCO client stations and/or infrastructure products, such as the AP-1000s, are located in "D:\Software\"[1].

⇒ **NOTE:**

> Prior to copying or installing the software, you are advised to read the Software License Agreement "License.txt", located in the root folder of the CD-ROM. By installing, copying or using the ORiNOCO software, you are consenting to be bound by this agreement. If you do not agree to all of the terms of the Software License Agreement, do not download, copy or install the ORiNOCO software.

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1 The drive letter of your CD-ROM drive may differ from this example.

Figure 1-7   Contents of the Software CD-ROM
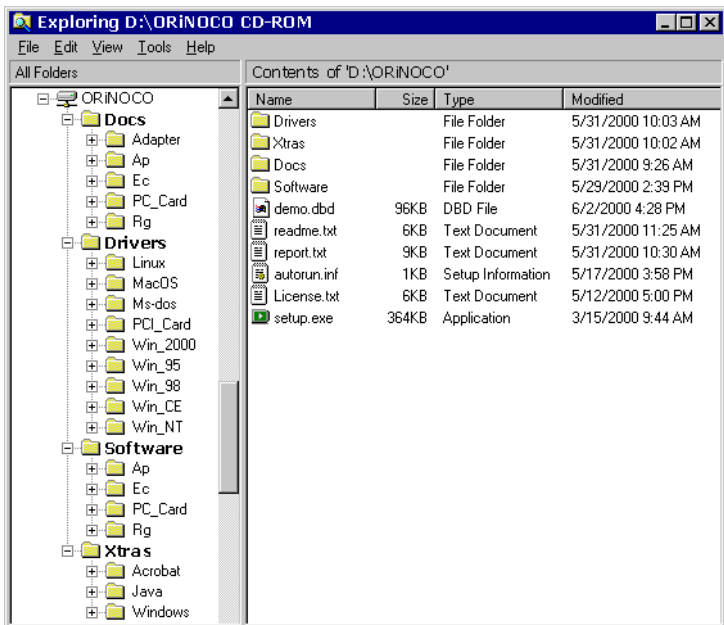
⇒ **NOTE:**

It is the policy of Lucent Technologies to improve products as new technology, components, software and firmware become available. Before you proceed with the installation of this product, we recommend you to consult the ORiNOCO website to:

■ Verify if newer versions of the software that was shipped with your product are available.

■ Download and install the latest software with your purchased product.

You can download the latest software and documentation from the ORiNOCO website at: **http://www.lucent.com/orinoco**.

Looking again at Figure 1-7 on page 1-13 you will see that the CD-ROM also includes a folder named "Xtras". This folder contains additional tools, that may help you install and manage your ORiNOCO Network.

The folder "Acrobat" includes a copy of the **Adobe Acrobat Reader ®,** required to view and/or print the ORiNOCO user documentation included on this CD-ROM.

⇒ **NOTE:**

The Adobe Acrobat Reader is owned by and licensed from Adobe Systems Incorporated. This software is provided "as is."

Lucent makes no warranty or representation, express or implied, relating to the completeness, reliability, effectiveness, accuracy, performance, or operation of the Adobe software, or as to its suitability, merchantability or fitness for a particular purpose or against infringement of intellectual property rights of any party.

For more information about Adobe Acrobat software, please consult the Adobe Website at: **http:\\www.adobe.com\acrobat**

Optionally Available

ORiNOCO Adapter Cards

The Lucent Technologies ORiNOCO solution has been based upon a single wireless PC Card that can be used in a variety of computing systems.

Optionally available are the following adapters for computer systems that do not have a PC Card Type II slot:

- ISA and PCI adapter cards, that enable you to use the ORiNOCO PC Card inside desktop computers
- WaveLAN/EC and WaveLAN/EC-S[1] devices, that allow you to connect computer with a standard 10Base-T interface to your ORiNOCO network.

External Antennas

The ORiNOCO PC Card has been provided with two integrated antennas (see Figure 1-6 on page 1-9), which perform best in an open environment with as few obstacles as possible.

Optionally available are the following types of external antennas:

- Range Extender Antenna.
- Vehicle-Mount Antenna.

---

1 The WaveLAN/EC-S features an additional Serial Port.

These antennas have a Lucent Technologies proprietary connector, that allows you to connect the card directly to the socket on the extended side of the your ORiNOCO PC Card (pictured in Figure 1-6 on page 1-9).

Range Extender Antenna

Use the ORiNOCO Range Extender Antenna to ensure optimal transmission and receiving quality for situations in which the integrated antennas are shielded, for example when:

- The ORiNOCO PC Card is close to metal surfaces.
- The ORiNOCO PC Card is inserted into a AP-1000 device or computer that is installed in a "hidden" location, e.g. under a desk or inside a cabinet.
- Objects like thick stacks of books shield the antenna.

In most situations the ORiNOCO Range Extender Antenna may provide a performance increase of up to 50%.

You can connect the Range Extender Antenna to the ORiNOCO PC Card by inserting the connector into the socket on the extended side of the PC Card. To protect the socket from dust, it is shielded with a little cap, that should be removed prior to connecting the antenna.

The ORiNOCO Range Extender Antenna has a mounting bracket and a base for perfect vertical positioning that allows you to put the antenna on top

of on your desktop computer, a table or filing cabinet, or to hang it on the wall, or ceiling etc.

⚠ CAUTION:

Many computer monitors today support a degauss option, that can either be enabled manually by the user, but is often also enabled automatically whenever you turn on the monitor. The electromagnetic discharge that may occur when degaussing the monitor may cause damage to the ORiNOCO equipment.
To avoid damage to your sensitive ORiNOCO equipment, do not place the Range Extender Antenna on top of, or too close to, your monitor.

Vehicle-Mount Antenna

The ORiNOCO Vehicle-Mount Antenna enables you to connect vehicles with an on-board terminal to your LAN infrastructure.
The ruggedized design of this antenna allows you to mount it on vehicles (for example fork-lift trucks) that need continuous access to networked data, whether inside or outside of the building.

The Vehicle-Mount Antenna is equipped with a 2.5 m antenna cable to connect it directly to the ORiNOCO PC Card.

Installation for Windows

2

Introduction

The complete installation of your PC Card and the necessary drivers (for Windows 95/98) consist of the following steps:

1. Insert the ORiNOCO Software CD-ROM and install the Client Manager software by clicking the **Install Software** button on the start-up screen of the CD-ROM. (see page 2-3).
2. Insert your ORiNOCO PC Card (see page 2-5).
3. Install drivers (see page 2-6).
4. Set basic parameters (see page 2-11).
5. Finish installation (see page 2-19).

This chapter describes the installation of the ORiNOCO PC Card for Microsoft Windows 95 and 98 operating systems only.

For other operating systems please consult the following appendices:

Document	Operating System
Appendix C	Windows CE
Appendix D	DOS
Appendix E	Apple/MAC OS
Appendix F	Windows NT
Readme.txt	Linux

⇒ **NOTE:**
If you intend to use the ORiNOCO PC Card in a ORiNOCO AP-1000[1] (Access Point), or WaveLAN/EC device, please refer to the User Documentation that was shipped with the device. Alternatively you can download these documents from the ORiNOCO website at: **http://www.lucent.com/orinoco**.

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1 The AP-1000 is formerly identified as the WavePOINT-II AP

Installing the Client Manager Software

The ORiNOCO Client Manager program is a software tool that you can use to check the quality of your network connection.

⟹ **NOTE:**

It is not mandatory to install the Client Manager program in order to establish a network connection, but it provides you with more options to:

- View/change the settings of your network connection.
- Monitor your network connection.

To install the Client Manager software, proceed as follows:

1. Insert the ORiNOCO software CD-ROM that came with your PC Card kit in your CD-ROM drive.

   Your operating system will automatically start the CD and display the menu pictured in Figure 2-1 on page 2-4.

Figure 2-1   Start-Up Screen ORiNOCO Software CD-ROM
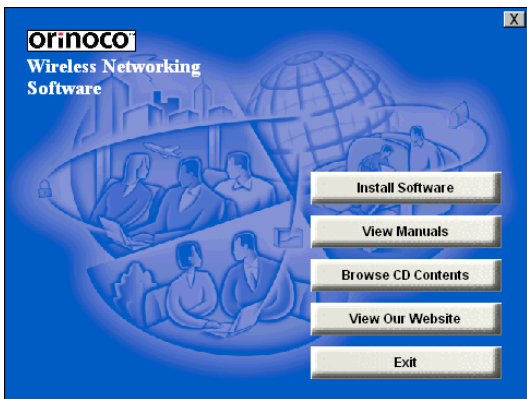
2. Select button **Install Software**.

3. Select **Install Client Manager**.

4. Follow the instructions on your screen.

⟹ NOTE:

If the CD-ROM does not start automatically:

1. Click the Windows **Start** button

2. Select **Run**

3. Browse to the CD-ROM

4. Select the file "setup.exe".

Insert your ORiNOCO PC Card

1. Unpack your ORiNOCO PC Card kit and verify that all items are present, as described in "Kit Contents" on page 1-1.

   If any of the items described appear to be damaged or missing, please contact your supplier.

2. Insert the ORiNOCO PC Card into the PC Card slot of your computer as pictured in Figure 2-2.

Figure 2-2   Inserting the PC Card into Your Computer
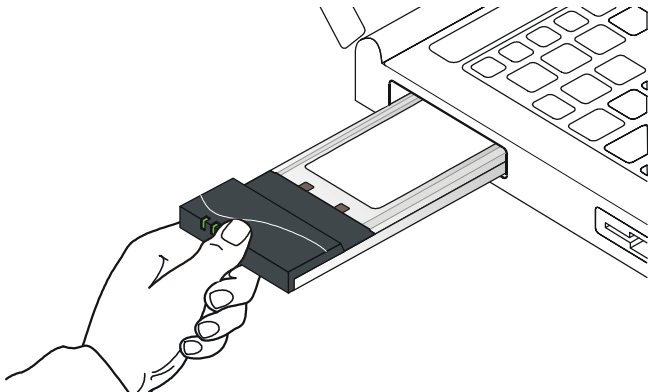
If you want to install the PC Card into a desktop computer, use an ISA Adapter or PCI Adapter.

Install Drivers

Before You Start the Installation

Before you start the installation, you are advised to keep the Windows CD-ROM or software diskettes close at hand. If your computer came with a factory-installed Windows operating system, these files will be stored on your computer's hard disk, in the form of cabinet (*.cab) files.

⇒ **NOTE:**

If you are upgrading from an earlier version of the ORiNOCO Miniport driver, please read Appendix B .

What You Need to Know

Installing a ORiNOCO PC Card requires the same level of expertise that you would need to install a standard Ethernet network adapter card. It is assumed that you have a working knowledge of standard Windows 95/98 operations and of installing network adapter cards. Refer to the Windows Help when necessary (on the Windows task bar, press the **Start** button and select **Help**).

Driver Installation for Windows 95/98

Windows 95/98 operating systems support "Plug & Play" for PC Cards. Once you insert the ORiNOCO PC Card into your computer, these operating systems will automatically:

■ Detect the card, and enable the ORiNOCO Driver, or

■ Start the **Add New Hardware** wizard and prompt you to install the driver, when the operating system cannot find the required driver.

  This would typically occur when inserting the ORiNOCO PC Card into your computer for the very first time.

To install the driver proceed as follows:

1. If Windows starts the **Add New Hardware** wizard follow the instructions of the **New Hardware Found** wizard to install the drivers.

    ■ When you are prompted to locate the driver installation files:

      — Select the ORiNOCO CD-ROM that was included with your PC Card kit and.

      — If you downloaded the drivers from the ORiNOCO website navigate to the folder that matches your Operating system.
      Windows 95:D:\Drivers\Win_95
      Windows 98:D:\Drivers\Win_98
      Windows 2000:D:\Drivers\Win_2000

    When finished installing the drivers, Windows automatically opens the **Add/Edit Configuration Profile** window.

2. Continue with setting the basic parameters as described on page 2-11.

⇒ **NOTE:**
If your computer does not detect the new hardware consult Appendix B.

Windows Network Properties

If this is the very first time that Networking support is installed onto your computer, the Windows operating system will prompt you to enter a computer and workgroup name. These names will be used to identify your computer on the Microsoft Network Neighborhood.

Figure 2-3   Windows Network Identification Properties
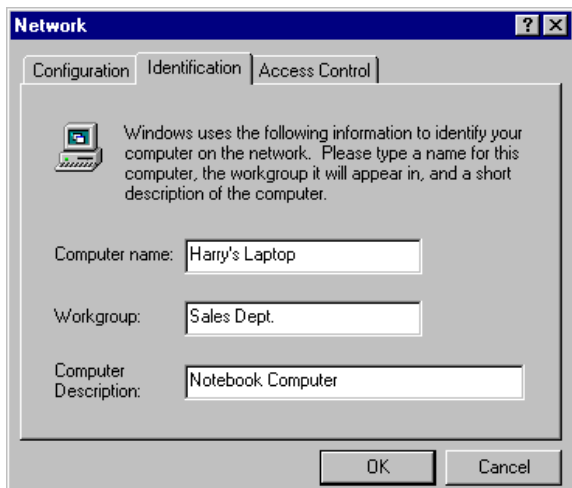
> ⟹ **NOTE:**
>
>   The screen displayed in Figure 2-3 on page 2-9 will not appear if
>   network support had not been installed. If so, move to page 2-11
>   and proceed with setting the basic parameters.

1. The window will pop-up automatically.
2. In the **Computer Name** field, enter a unique name for your computer.
3. In the **Workgroup** field, enter the name of your workgroup.
4. (Optional) Provide a description of the computer in the **Computer Description** field.

For more information about setting your Windows Network Properties, consult your Windows documentation or the Windows on-line help information.

Set Basic Parameters

After installing the drivers, Windows will open the Add/Edit Configuration Profile window for your ORiNOCO PC Card as pictured in Figure 2-4.

Figure 2-4   Add/Edit Configuration Profile window
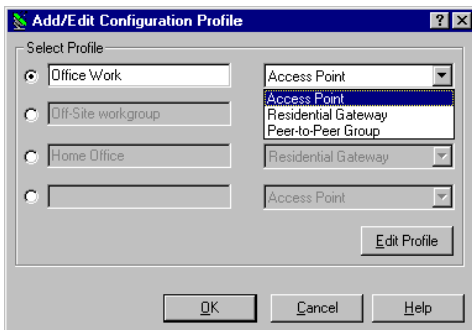
The Add/Edit Configuration Profile window enables you to specify one or more network connection profiles.

For example you can setup profiles for:

- **Office**, to connect to an Enterprise Network via an Access Point.
- **Workgroup Computing**, to share files with colleagues or friends in small Peer-to-Peer workgroups without access point.
- **Home**, to connect to a Residential Gateway (RG) that provides access to the Internet or your home printers.

For more information about the different types of networks, refer to "ORiNOCO Network Scenarios" on page 1-3.

To connect your computer to a wireless network you will need to:

1. Assign a name to the network connection profile
2. Use the pull-down menu on the right to select how you wish to connect to the wireless network.
3. Click the **Edit Profile** button to view/modify the parameters for the selected profile.

For first-time installations, you are advised to setup the single profile using only the Basic Settings.

⇒ **NOTE:**

The number and type of parameters you need to specify may differ according to the selected connection type. See page 2-13 for Access Point connection settings and page 2-15 for the Residential Gateway connection settings.

For information about various option press the F1 key or click the **Help** button.

Basic Settings for Enterprise Networks

If you wish to connect to an Enterprise Network, use the Add/Edit Configuration Profile window to:

- Select to connect to an **Access Point**.
- Set the correct **Network Name**.

Figure 2-5   Edit Configuration window
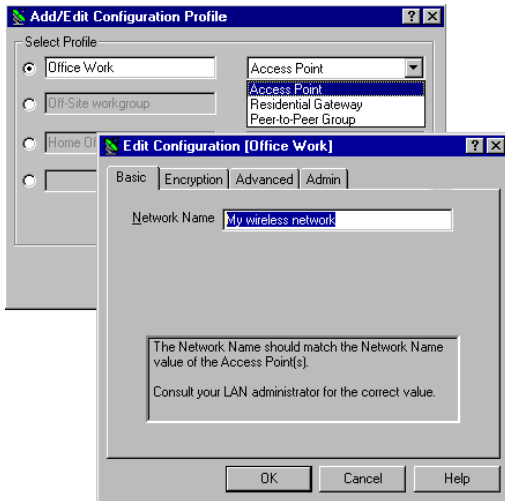
1. In the field **Network Name** define the name of the wireless network to which you want to connect. You can either use:

    ■ **The value "ANY"**

      To connect to any ORiNOCO network in the vicinity of your computer.

    ■ **An "exact" value to connect to**

      Consult your LAN Administrator for the value that applies to your network.

      The Network Name can be any alphanumeric string in the range of "a" to "z", "A" to "Z" and "0" to "9" with a maximum of 32 characters (case-sensitive).

2. Click **OK** to confirm and return to the Add/Edit Configuration Profile window.

3. Click **OK** again to finish with the installation as described on page 2-19.

The ORiNOCO Edit Configuration window, also provides you the possibility to change other parameters (Encryption, AdvancedandAdmin parameters). These parameters are described in the on-line help file of the drivers, and in Chapter 4.

You are advised to leave these parameters to their default settings, unless there are special situations, for example, upon advice of an ORiNOCO expert.

Basic Settings for Residential Gateways

If you wish to connect to a Home Network via a Residential Gateway, use the Add/Edit Configuration Profile window to:

- Select to connect to a **Residential Gateway**.
- Set the correct **Network Name** and **Encryption Key**.

Figure 2-6   Edit Configuration window: Residential Gateway

Installation for Windows - Set Basic Parameters
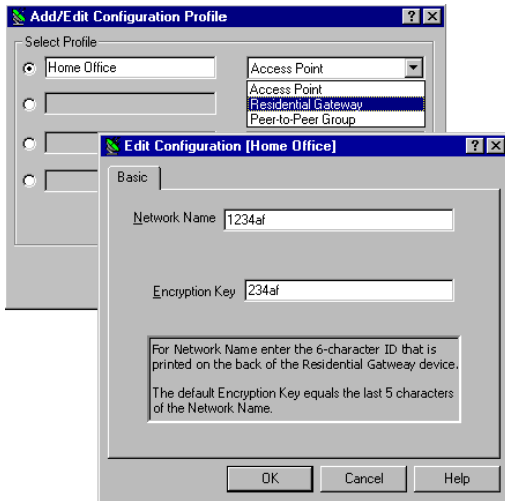
1. In the field **Network Name** enter the 6-character RG ID to define the name of the wireless network to which you want to connect.
   The **Network Name** has to match the unique RG ID (which can be found on the device).

2. In the **Encryption Key** field enter the last 5 digits of the RG ID (default).

➡ **NOTE:**

   If you changed the default Encryption Key on the Residential Gateway (RG) you will need to enter the new value here as well.

3. Click **OK** to confirm and return to the Add/Edit Configuration Profile window.

4. Click **OK** again to finish the installation as described on page 2-19.

Basic Settings for Peer-to-Peer Workgroups

If you wish to connect to a Peer-to-Peer workgroup, use the Add/Edit Configuration Profile window to:

- Select to connect to a **Peer-to-Peer Workgroup**.
- Set the correct **Network Name** and **Encryption Key**.

Figure 2-7   Edit Configuration window: Peer-to-Peer
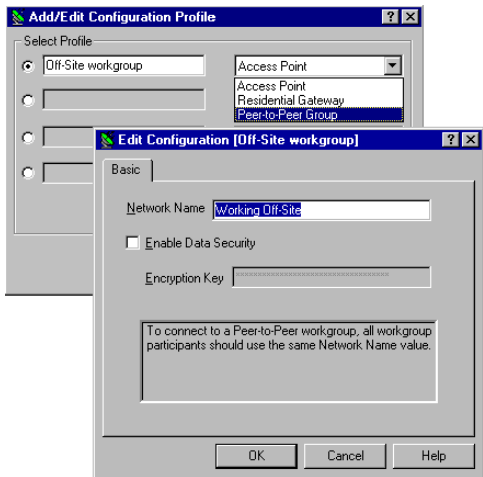
1. In the field **Network Name** define the name of the wireless network to which you want to connect.

   The Network Name can be any alphanumeric string in the range of "a" to "z", "A" to "Z" and "0" to "9" with a maximum of 32 characters (case-sensitive).

   ■ If there is already a Peer-to-Peer group with this name available your computer will automatically connect to this workgroup.

   ■ If there is not yet such a group available, your computer will automatically start one with this name.

2. Click **OK** to confirm and return to the Add/Edit Configuration Profile window.

3. Click **OK** again to proceed with the installation.

   Continue with "Finish the Installation" on page 2-19 to complete the installation procedure.

Finish the Installation

When you have finished "Set Basic Parameters", click the **OK** button to close the Add/Edit Configuration window and to proceed with the installation process. Windows will finish building the driver configuration database and copy some files to your computer's hard disk.

■ If the Windows operating system prompts you to identify the location of the Windows files, specify the drive and directory of the Windows Installation CD-ROM or diskettes.

 When you had a PC Card installed on your computer before, most of these files are already available on your hard disk drive. If you do not have the Windows CD-ROM available, you may try replacing the proposed path in the Copy Files From dialog box with: "C:\Windows\System" or "C:\Windows\"

■ If the Windows operating system prompts you to identify the location of the ORiNOCO driver files (typically file names starting with the characters wv*.v) specify the drive and directory of the ORiNOCO Software:

 — if installing from the ORiNOCO CD-ROM specify the drive in one of the following directories on the ORiNOCO Software CD-ROM.
 Windows 95:D:\Drivers\Win_95
 Windows 98:D:\Drivers\Win_98
 Windows 2000:D:\Drivers\Win_2000

 — if installing files that you downloaded from the Internet, point to the disk drive or directory where you saved the downloaded files.

When Windows has finished the copying of files, it will prompt you to restart your computer (see Figure 2-8). Click the **OK** button to restart your computer.

Figure 2-8   Finished Setting up the Hardware
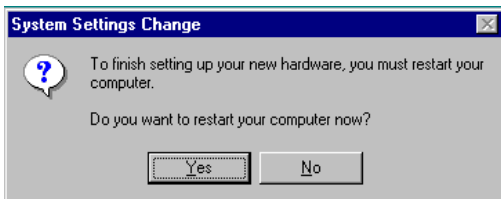
After Restarting Your Computer

After you have restarted your computer, the Windows operating system will detect the ORiNOCO PC Card (you can hear the two-tone sound of the PC Card Socket Controller).

Load the ORiNOCO driver, in a dialog box enter a Windows user name and password.
The password you enter here will be the one used to login to the Windows Network Neighborhood.

Verifying installation

To verify if the installation of the drivers was completed successfully:

- Check if the PC Card icon on the Windows task bar is visible as pictured in Figure 2-9.
- Check the LEDs on your PC Card. The following should be visible:
    - A steady green Power LED to indicate the PC Card is active.
    - A flickering green Transmit/Receive LED to indicate wireless activity while transmitting data.

    For other LED behavior see Appendix B.

- (Optional) To check the quality of the network connection, install the ORiNOCO Client Manager program as described in "Installing the Client Manager Software".

Figure 2-9   PC Card icon on the Windows task bar

Using ORiNOCO and Windows

3

Introduction

This chapter provides general information about:

- Using your PC Card
- View Other Computers
- View Wireless Link Quality
- View/Modify PC Card Settings

Using your PC Card

Radio Antennas

The built-in radio and antennas of your ORiNOCO PC Card perform best in an open environment with as few obstacles as possible.

- To achieve the maximum range for wireless communications do not cover the card with objects such as books or thick stacks of paper.
- If you are using the card inside a desktop computer you may consider the purchase of the optional Range Extender Antenna.

Removing the PC Card

If you do not need the wireless connectivity of your ORiNOCO PC Card, you can remove the PC Card from its slot as pictured in Figure 3-1.

⚠ CAUTION:
When removing the ORiNOCO PC Card you will lose your connection to the network. Prior to removing the PC Card, make sure you have closed all files and network applications (such as e-mail).

You are advised to always disable the PC Card **prior** to removing the card from the PC Card slot. This will allow the Windows operating system to:

■ Log off from the network server

■ Disable the ORiNOCO PC Card driver

■ Disconnect power to the PC Card slot (which will extend battery life for mobile computers).

Figure 3-1   Removing the PC Card
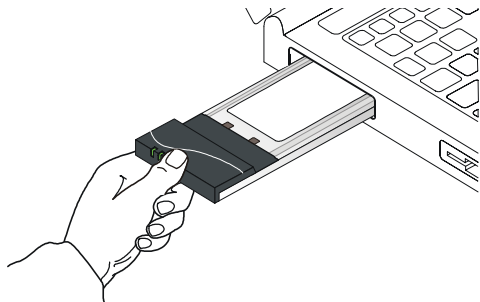
To stop using the ORiNOCO PC Card:

1. Click once on the PC Card icon on the right side of the Windows task bar.

2. Select the option **Stop ORiNOCO PC Card**[1].

---

1   Alternatively, disable the PC Card via the PC Card icon on the Control Panel menu.

3. Wait a few seconds until the operating systems displays a pop-up message to indicate you can safely remove the PC Card.

Maintenance of your PC Card

If you are not using the ORiNOCO PC Card for wireless communications, extend its life by storing it inside the transparent plastic casing that was shipped with the product.

To clean the PC Card, gently wipe it with a soft (damp) cloth.

⚠ **CAUTION:**
To avoid damage to the PC Card do not use abrasive materials, or rinse the card with liquids.

View Other Computers

When multiple ORiNOCO stations are up-and-running in your wireless network, you can use the procedure described below to display the other computers:

1. Start Windows Explorer.
2. Scroll down the list of files and folders to look for the item **Network Neighborhood**.
3. Double-click the **Network Neighborhood** item to display all stations in your Microsoft Networking Group.
4. To display other workgroups in the network environment, double-click the **Entire Network** icon.

If you cannot find other (ORiNOCO) networked computers, verify whether the other ORiNOCO computers are:

■ Powered up and logged on to the network.
■ Configured to operate with identical Microsoft Network settings concerning:
  — Networking Protocol.
  — Wireless Network Name
  — Workgroup Name

To view or modify the **Station Name** or **Workgroup** of your computer, proceed as follows:

1. Click the Start button from the Windows task bar.

2. Click on **Settings**, and then on **Control Panel**.

3. In the Control Panel window, double-click the **Network** icon.

4. In the Network Settings window, select the **Identification** tab.
   You can verify and change the **Station Name** or **Workgroup** parameters.

⟹ **NOTE:**

   You have to restart your computer before changes to the Network Settings will be effected.

To verify the radio connection with other stations refer to "View Wireless Link Quality" on page 3-7.

Using the Client Manager

If you installed the ORiNOCO Client Manager as described in "Installing the Client Manager Software" on page 2-3, you can use the Client Manager to:

■ Verify the quality of your wireless connection to the network.

■ View/Modify the configuration settings of your wireless PC Card.

The Client Manager will start automatically every time you power up your computer.

The Client Manager icon is displayed in the "System Tray" of your Windows task bar at the right-side on the bottom of your screen, indicating that the Client Manager program is running.

■ Click the icon once with your **left** mouse button to retrieve a more detailed status overview.

■ Click the icon once with your **right** mouse button to display a menu with more options.

View Wireless Link Quality

You can use the Client Manager icon on the Windows task bar to verify the link quality of your network connection.

An overview of all possible icons is given in Table 3-1. When the Client Manager icon is not indicating excellent or good radio connection, act as described below.

Table 3-1   Client Manager Icon

Icon	Description	Color
	Excellent radio connection	Green
	Good radio connection	Green
	Marginal radio connection: The radio signal is weak. Move closer to the: ■ ORiNOCO AP-1000, or ■ ORiNOCO Base Station	Yellow
	Poor radio connection: The radio signal is very weak. Save your files and move closer to the: ■ ORiNOCO AP-1000, or ■ ORiNOCO Base Station	Red
	No radio connection because: ■ Looking for initial connection, or ■ You have moved out of range of the network.	Red
	Peer-to-Peer network connection	Blank

View/Modify PC Card Settings

If you would like to view or modify ORiNOCO parameters, for example because you would like to connect to another network or type of network, proceed as follows:

1. Right-click on the Client Manager ![icon] icon on the Windows task bar.
2. From the menu, select **Configuration Profile** (see Figure 3-2) and select:
   - ■ **Add/Edit Profile** to add a new profile or to modify an existing profile.
   - ■ **One of the existing profiles** (if present) to select a profile without viewing or modifying the settings.

After selecting and another profile, the PC Card will use the selected profile to connect to the wireless network.

Figure 3-2   Edit Wireless Configuration Settings
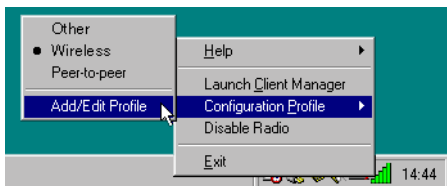
If your Client Manager icon is not visible, you have to start the
Client Manager program again:

1. Click the ![Start] button from the Windows task bar.
2. Select **Programs**, and then select the **ORiNOCO** workgroup.
3. Next select **Client Manager** to start the Client Manager program.

Alternatively you can to change the PC Card configuration via the Control
Panel:

1. Click the ![Start] button from the Windows task bar.
2. Click on **Settings**, and then on **Control Panel**.
3. In the Control Panel window, double-click the **Wireless Network** icon.
4. (Optional) Change the parameters you would like to modify, and click
    - the **OK** button to confirm your changes, or
    - the **Cancel** button to ignore your modifications.

Finding More Information

If you are looking for more information than contained in this manual, please consult one of the following options:

- **The online "**ORINOCO PC Card - User's Guide**"** - for more information about the Client Manager program and for information about installing the ORiNOCO PC Card in other operating systems, such as:
  — MS Windows NT
  — MS Windows CE
  — MS DOS
  — Apple Macintosh

  The online **"**ORINOCO PC Card - User's Guide**"** can be found on the ORiNOCO Software CD-ROM that came with your PC Card kit.

- **The on-line help system** of your ORiNOCO wireless system - for information about software and driver functionality.

  To view the on-line help system click the **Help** button or press the F1 function key on your keyboard in any ORiNOCO window, or

- **The "ORiNOCO Manager Suite User's Guide"** - a reference guide for LAN Administrators that need to setup, monitor and manage corporate LANs.

Advanced Configurations

4

Introduction

Although your ORiNOCO PC Card will work fine in most network environment with the Basic Parameters as described on page 2-11, you may wish to explore the advanced parameters options as displayed on the ORiNOCO PC Card's Edit Configuration windows.

Only if connected to an existing network advanced parameters can be specified for an ORiNOCO PC Card. Consult your LAN Administrator for information about whether these parameters apply to your situation.

Encryption Parameters Tab

The encryption tab enables you to define the encryption keys that your ORiNOCO PC Card should use to:

- Decrypt wireless messages received via its wireless interface.
- Encrypt data that will be transmitted via the wireless interface.

⚠ CAUTION:
Encryption needs to be the same for all ORiNOCO stations.

Figure 4-1   Setup ORiNOCO Encryption Parameters
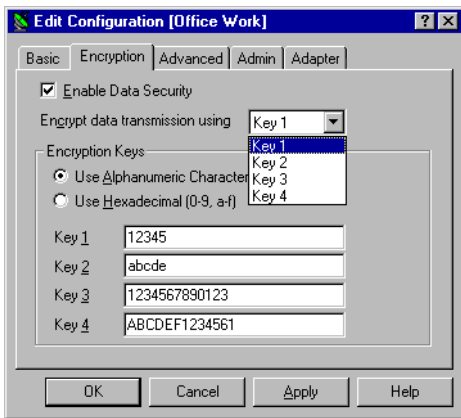
You can identify up to 4 different key values to decrypt wireless data, and select one of these keys to encrypt wireless data transmissions.

For more information consult your LAN Administrator. You can also refer to the helpfile and the "ORiNOCO Manager Suite User's guide".

Advanced Parameters Tab

On the Advanced parameters tab of the Edit Configuration window you can adjust a number of parameters.

Figure 4-2   Setup ORiNOCO Advanced Parameters
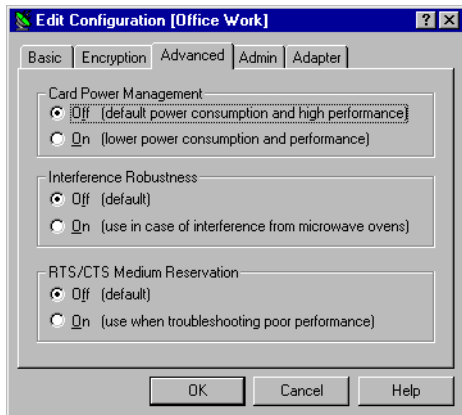
■ Card Power Management	To extend the battery life of (mobile) wireless devices.
■ Interference Robustness	Can be activated in exceptional cases when troubleshooting slow performance of the ORiNOCO network that could be related to in-band interference from e.g. microwave ovens.
■ RTS/CTS Medium Reservation	This parameter can be activated:

— if density of ORiNOCO stations and access points is very low

— as a result of poor network performance due to excessive frame collisions at the access points.

For more information consult your LAN Administrator. You can also refer to the helpfile and the "ORiNOCO Manager Suite User's guide".

Admin Parameters Tab

On the Admin parameters tab of the Edit Configuration window the following parameters can be specified.

Figure 4-3   Setup ORiNOCO Admin Parameters
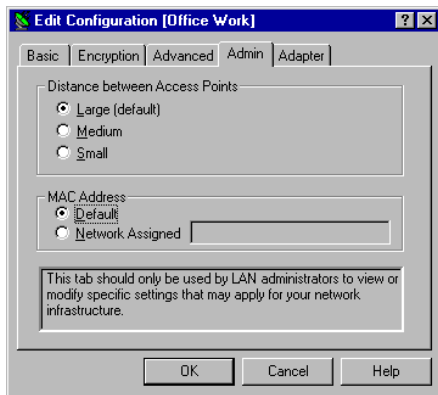
■ Distance between   Depending on the number of access points in a
   Access Points   ORiNOCO network this parameter controls the
                          network performance.

■ MAC Address   Can be activated in exceptional cases when
                          troubleshooting slow performance of the
                          ORiNOCO network that could be related to in-
                          band interference from e.g. microwave ovens.

For more information consult your LAN Administrator. You can also refer to
the helpfile and the "ORiNOCO Manager Suite User's guide".

Card Specifications

A

Physical Specifications

Form Factor	PC Card Type-II Extended	
Color[1]	■ Black for ORiNOCO PC Card (both Gold and Silver Label) ■ Red for IEEE Fixed Wireless PC Cards	
Dimensions	(LxWxH)	117.8 x 53.95 x 8.7 mm
Weight	45 gram (PC Card)	
Temperature & Humidity		
Operation	0° to 55° C[2]	maximum humidity 95%
Transit	-20° to 70° C	15 to 95% (no condensation allowed)
Storage	-10° to 60° C	10 to 90% (no condensation allowed)

1 Color of the Range Extender Antenna is related to the Radio Characteristics described on page A-3
2 Although the PC Card may still operate in the range of -20° to 70°C, operation outside the range of 0° to 55° C may no longer be according to specifications.

Power Characteristics

Doze Mode	10 mA
Receive Mode	180 mA
Transmit Mode	280 mA
Power Supply	5 V

Networking Characteristics

Compatibility	■ IEEE 802.11 Standard for Wireless LANS (DSSS) ■ Wi-Fi (Wireless Fidelity) certified by the Wireless Ethernet Compatibility Alliance (WECA).	
Network Operating System	■ Novell® Client 3.x & 4.x ■ Microsoft Windows® Networking	
Host Operating System	Microsoft Windows® 95: ■ NDIS3 Miniport Driver	
	Microsoft Windows® NT v4.0: ■ NDIS4 Miniport Driver	
	Microsoft Windows® 98 and 2000: ■ NDIS5 Miniport Driver	
	MS-DOS & Microsoft Windows 3.x: ■ DOS ODI Driver ■ Packet Driver	
	Windows CE ■ Windows CE v.2.0 & 2.11	
	Apple Macintosh Operating Systems: ■ Apple PowerBook G3	
Media Access Protocol	CSMA/CA (Collision Avoidance) with Acknowledgment (ACK)	
Data Rate	■ High	11 Mb/s
	■ Medium	5.5 Mb/s
	■ Standard	2 Mb/s
	■ Low	1 Mb/s
	The cards use an automatic Transmit Rate Select mechanism.	

Radio Characteristics

Radio Characteristics of ORiNOCO PC Cards may vary:

- According to the country where the product was purchased.
- According to the type of product that was purchased.

Wireless communication is often subject to local radio regulations. Although ORiNOCO wireless networking products have been designed for operation in the license-free 2.4 GHz band, local radio regulations may impose a number of limitations to the use of wireless communication equipment.

⇒ **NOTE:**
Refer to the flyer "Information to the User" for regulatory information that may apply in your country.

To comply with such regulations, ORiNOCO PC Cards are marketed with dedicated channel-sets with a number of factory-programmed channels identified by the following acronyms:

- ETS for countries that adhere to the regulations as defined by the European Telecommunications Standards Institute (ETSI).
- FCC for countries that adhere to the regulations as defined by the US Federal Communications Commission (FCC).
- FR for France, and
- JP for Japan.

Card Specifications

The acronym of the channel-set supported by your card is printed on a label on the back-side of your ORiNOCO PC Card (see Table "ORiNOCO IEEE 802.11 Channels Sets" on page A-10 for a detailed list of channels).

If you plan to install and use ORiNOCO PC Cards to connect your AP-1000 or other computing device to an outdoor antenna installation, additional regulations may apply.

To comply with such regulations Lucent Technologies offers two types of ORiNOCO PC Cards:

- In countries that adhere to the FCC regulations, you can use the standard black-colored ORiNOCO PC Card.
- In countries that adhere to the ETSI regulations, including France and Japan, you must select the card-type based upon the antenna that will be used:
    - You can use the black-colored ORiNOCO PC Card when connecting the device to standard Lucent Technologies omni-directional antennas.
    - You *must* use the red-colored IEEE Fixed Wireless PC Card when connecting the device to the standard Lucent Technologies 14 dBi directional antenna for outdoor use.

When you ordered the ORiNOCO Outdoor Router kit[1] for outdoor antenna installations, your kit includes the correct card type that complies with the regulations that apply in your country.

⚠ **WARNING:**

At all times, it will be the responsibility of the end-user to ensure that an outdoor antenna installation complies with local radio regulations. The end-user must verify that:

- *The antenna installer is aware of these regulations.*
- *The correct type of PC Card is used to connect the host device to the outdoor antenna installation.*

Lucent Technologies and its resellers or distributors are not liable for any damage or violation of government regulations that may arise from failing to comply with these guidelines.

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1 Formerly identified as the WaveLAN Office Router, WaveACCESS LINK WP-II, or WaveLAN IEEE PTP Kit

Radio Characteristics ORiNOCO PC Card

R-F Frequency Band	2.4 GHz (2400-2500 MHz)			
Number of selectable sub-channels	North America (FCC)	11		
	Europe (ETS)	13		
	France (FR)	4		
	Japan (JP)	1		
	Other Countries:	FCC 11, ETS 13		
Modulation Technique	Direct Sequence Spread Spectrum ■ CCK for High & Medium Transmit Rate ■ DQPSK for Standard Transmit Rate ■ DBPSK for Low Transmit Rate			
Spreading	11-chip Barker Sequence			
Bit Error Rate (BER)	Better than 10^{-5}			
Nominal Output Power	15 dBm			
Range (100 bytes User Data) / Transmit Rate	**High Speed 11 Mb/s**	**Medium Speed 5.5 Mb/s**	**Standard Speed 2 Mb/s**	**Low Speed 1 Mb/s**
Open Office Environment	160 m (525 ft.)	270 m (885 ft.)	400 m (1300 ft.)	550 m (1750 ft.)
Semi-Open Office Environment	50 m (165 ft.)	70 m (230 ft.)	90 m (300 ft.)	115 m (375 ft.)
Closed Office	25 m (80 ft.)	35 m (115 ft.)	40 m (130 ft.)	50 m (165 ft.)
Receiver Sensitivity	-83 dBm	-87 dBm	-91 dBm	-94 dBm
Delay Spread (at FER of <1%)	65 ns	225 ns	400 ns	500 ns

The range of the wireless signal is related to the Transmit Rate of the wireless communication. Communications at lower Transmit range may travel larger distances.

➡ **NOTE:**

The range values listed in Table "Radio Characteristics" are typical distances as measured at the Lucent Technologies ORiNOCO laboratories. These values may provide a rule of thumb and may vary according to the actual radio conditions at the location where the ORiNOCO product will be installed.

- The range of your wireless devices can be affected when the antennas are placed near metal surfaces and solid high-density materials.

- Range is also impacted due to "obstacles" in the signal path of the radio that may either absorb or reflect the radio signal.

Table "Radio Characteristics" on page A-3 lists the typical ranges when used indoors in "office environments" that can be described as follows:

- In **Open Office environments**, antennas can "see" each other, i.e. there are no physical obstructions between them.

- In **Semi-open Office environments**, work space is divided by shoulder-height, hollow wall elements; antennas are at desktop level.

In **Closed Office environments**, work space is separated by floor-to-ceiling brick walls. If you intend using the ORiNOCO PC Card as part of an outdoor antenna installation, the range of the outdoor antenna installations will be related to:

■ Type of outdoor antennas connected to the ORiNOCO PC Card.

■ Length of antenna cables.

■ Clearance of the radio signal path.

For more information please consult the "ORiNOCO Outdoor Antenna Installation Guide"

ORiNOCO Fixed Wireless PC Card

R-F Frequency Band	2.4 GHz (2400-2500 MHz)	
Number of selectable sub-channels:	Europe (ETS)	13
	France (FR)	4
	Japan (JP)	14
	Other Countries (ETS)[1]	13
Modulation Technique:	Direct Sequence Spread Spectrum ■ CCK for High & Medium Transmit Rate ■ DQPSK for Standard Transmit Rate ■ DBPSK for Low Transmit Rate	
Spreading	11-chip Barker Sequence	
Bit Error Rate (BER)	Better than 10^{-5}	
Nominal Output Power:	8 dBm	
Range	Consult the "ORiNOCO Outdoor Antenna Installation Guide"[2]	

1 The Fixed Wireless PC Card is not available in FCC regulated countries.

2 This card is designed for outdoor antenna installations in countries that adhere to radio regulations as defined by the ETSI.

Supported Frequency Sub-bands

Subject to the radio regulations that apply in your country, your ORiNOCO PC Card may support a different set of 2.4 GHz channels (see table below). Consult your Authorized ORiNOCO Reseller or Lucent Technologies Sales office for information about the radio regulations that apply in your country.

ORiNOCO IEEE 802.11 Channels Sets

Frequency Range	2400-2500 MHz[1]			
Channel ID	FCC	ETSI	France	Japan
1	2412	2412	-	2412
2	2417	2417	-	2417
3	**2422**	**2422**	-	2422
4	2427	2427	-	2427
5	2432	2432	-	2432
6	2437	2437	-	2437
7	2442	2442	-	2442
8	2447	2447	-	2447
9	2452	2452	-	2452
10	2457	2457	2457	2457
11	2462	2462	**2462**	2462
12	-	2467	2467	2467
13	-	2472	2472	2472
14	-	-	-	**2484**

1   printed in bold are the factory-set default channels

When installing ORiNOCO PC Cards the channel configuration is managed as follows:

■ For wireless clients that operate in an ORiNOCO Infrastructure, the ORiNOCO PC Card will automatically start operation at the channel identified by the AP-1000s. When roaming between different access

points the station can dynamically switch to another channel if required.

■ For ORiNOCO PC Cards installed into wireless clients that operate in an "Peer-to-Peer" mode, the PC Card will default use channel 10.

When inserted into a AP-1000, the ORiNOCO PC Card will use the factory-set default channel (printed in bold), unless the LAN Administrator selected a different channel when configuring the AP-1000 device.

Can I Upgrade ORiNOCO Cards?

To enhance (wireless) performance of your ORiNOCO PC Cards, future updates will be made available via the ORiNOCO website.

■ Whenever an update becomes available, you will be able to download the latest WSU tool from our website at: **http://www.lucent.com/orinoco**. You are advised to visit the ORiNOCO website at regular intervals to check if newer versions are available for your product.

Troubleshooting

B

Introduction

This appendix is divided into a number of sections, each with it's own specific troubleshooting tips:

1. Common Troubleshooting tips - A section with troubleshooting tips which are operating system independent.
2. Windows Operating Systems - A section with troubleshooting tips for Windows 95, 98 and NT.
3. MS-DOS Systems - A section with troubleshooting tips for MS-DOS operating systems.

Common Troubleshooting Tips

LED Activity

If you encounter difficulty using and/or installing your ORiNOCO product, the error may be related to various causes:

- Out-of range situation, which prevents the ORiNOCO PC Card from establishing a wireless connection with the network.
- Configuration mismatch, which prevents the ORiNOCO PC Card from establishing a wireless connection with the (correct) network.
- Absence of, or conflict of the ORiNOCO Driver.
- A problem or conflict with the PC Card slot which prevents the PC Card from powering on.
- A conflict of the ORiNOCO hardware with another device.

The starting point to troubleshoot problems with your ORiNOCO PC Card is looking at the LED activity of the ORiNOCO PC Card.

Table B-1 on page B-3 provides an overview of the various modes of operation and the associated LED activity. Table B-1 also includes a number of troubleshooting hints, if required, that may help you solve the problem.

Table B-1   LED Activity Table

Power LED	Transmit Receive LED	Description/Action
Continuous Green	Blinking	Standard operational mode. ■ Card is powered on. ■ Sensing/transmitting wireless data.
	Off	■ Card is powered on. ■ No wireless activity. No action is required.
Flicker	Flicker	Power Management mode: ■ Card is powered on, but set to power saving mode, to conserve battery life. ■ Flashes indicates that the card wakes up at regular intervals to verify if there is wireless data addressed to your computer.
Both LEDs blink once every 10 seconds		The PC Card works fine, but did not yet succeed establishing a wireless connection with the wireless Infrastructure. Actions: ■ Contact the LAN Administrator to verify the ORiNOCO Network Name assigned to the wireless infrastructure. ■ Contact the LAN Administrator to verify the correct value(s) of the encryption keys. ■ Contact the LAN Administrator to verify whether the network infrastructure has been closed[1]. ■ Change the configuration of your ORiNOCO PC Card to enter the correct Network Name ■ If there are no AP-1000 devices available, change the configuration of your ORiNOCO PC Card to run in "Peer-to-Peer" mode.

Table B-1   LED Activity Table—*Continued*

Power LED	Transmit Receive LED	Description/Action
Off	Off	Card is not powered on, so it can not transmit/receive data. The cause may either be: ■ No Driver loaded/installed ■ Card - Driver mismatch which prevented the driver from loading ■ Device conflict which prevented the driver from loading Actions: ■ Verify if a driver has been installed, if not install the driver. ■ Verify the device settings of the PC Card to determine the occurrence of a conflict with another device. If so, change the settings of either your PC Card or the conflicting device to resolve the problem. ■ Verify the versions of the driver, and the embedded software in the PC Card (also referred to as Station firmware). ■ Consult the ORiNOCO website at: **http://www.lucent.com/orinoco** to see if newer versions are available and if so, upgrade both the embedded software and driver to the latest available version.

1   Only for networks that include ORiNOCO AP-1000s.

Can Not Connect To The Network

If your PC Card seems to be working fine, but you are not able to connect to the network, this error might be due to a configuration mismatch.

For example if both LEDs of your PC Card blink once every ten seconds, the problem is likely to be caused by a configuration mismatych of:

■ Network Name

■ Encryption Key

The ORiNOCO Network Name is case-sensitive.

On MS-DOS systems the Network Name should be entered between quotation marks. If you omit the quotation marks, the driver will interpret the value as all upper-case e.g. 12CAFE instead of "12Cafe".
If your AP-1000s have been configured with both lower- and upper-case characters, the driver will not be able to establish a radio connection.

LEDs Work But Can't Connect to Network

If you can not connect to the network while the LEDs indicate that the network is working properly (Power LED is on, Transmit Receive LED blinks) probably the TCP/IP settings of your network are not properly set.

⟹ **NOTE:**

Some older versions of the Windows 95 operating system will not automatically install the necessary TCP/IP network protocol.

Changing TCP/IP Settings

Consult your LAN Administrator for your the values of your TCP/IP settings.

To change the TCP/IP Settings:

1. On the Windows task bar click the **Start** button
2. Select **Settings** and then select **Control Panel**.
3. On the Control Panel window, double click on the **Network** icon to view the **Network Properties**.
4. From the list of installed components, check if the **TCP/IP -> ORiNOCO PC Card** protocol is installed.
   - If this protocol is not yet installed, click the **Add** button and select the **TCP/IP** protocol from the list. Refer to the Windows Help for more information.
   - If this protocol is installed, select this protocol and click the **Properties** button. Check if the parameters resemble the settings provided by your LAN Administrator. Make Changes if necessary, and click **OK** when you're done.
5. When prompted, restart your computer.

Windows Operating Systems

Generic Problems

Windows does not detect my new card

- Windows NT operating systems v3.51 and v4.0 do not support "Plug & Play". On such systems, you will need to manually introduce the PC Card to your operating system as described in Appendix F "Installation for Windows NT"

- In some occasions, Windows 95 and/or Windows 98 do not detect a new card either. This may be the case in one of the following situations:

    - The laptop computer into which you wish to install the ORiNOCO PC Card is a brand-new "out-of-the-box" computer, where the Windows 95/98 operating system was already factory-installed (see "Enabling the PC Card Controller" on page B-8).

    - A previous installation of the ORiNOCO PC Card was aborted before it was finished.

Enabling the PC Card Controller

Today, most brand-new "out-of-the-box" laptop computers come with the
Windows 95/98 operating system factory-installed. On some of these
computers, a number of options like PC Card & Socket Services have been
disabled by default to save on disk and memory space. In order to use such
options you must first finalize the Windows 95/98 installation in order to
enable such options.

If a Windows 95/98 computer does not detect your ORiNOCO PC Card,
proceed as described below, to enable the PC Card socket interface, or to
verify that it has been enabled, proceed as follows:

1. Click the **Start** button on the Windows Taskbar.
2. Click on **Settings**, then **Control Panel**.
3. In the Control Panel window, double-click the **PC Card** icon
   to open the PC Card Properties window (see Figure B-1).

   PC Card
   (PCMCIA)

4. In the PC Card Properties window, double-click one of the
   PC Card Sockets.

   If the PC Card socket interface was not yet enabled, the Windows
   operating system will display a message that it is finalizing the PC Card
   Socket installation.

5. Click the **OK** button to confirm and close the PC Card Properties window.

Figure B-1   Enabling the PC Card Controller
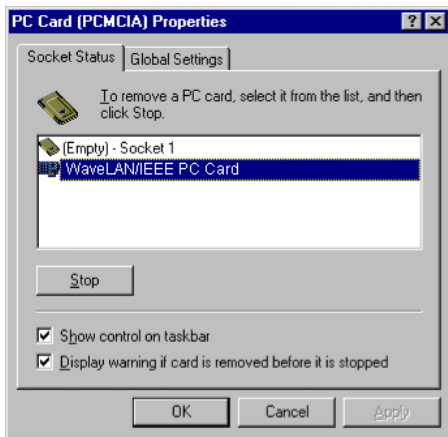
Station Cannot Connect to the Network

This situation may occur in any of the following situations:

- Incorrect ORiNOCO Network Name
- No driver loaded
- Station not authorized to access network.
- Card defect
- Hardware Conflict

ORINOCO PC Card - User's Guide   **B-9**

Hardware Conflict

When installing adapter cards or peripheral devices on a computer you may occasionally run into hardware conflict that may:

■ prevent your ORiNOCO PC Card from working properly, or

■ disturb operation of other devices after the installation of the ORiNOCO drivers.

Such problems are most of the times caused when multiple devices installed onto your computer are using identical values for I/O Base Address and/or Interrupt Request (IRQ).

The factory-set values of your ORiNOCO PC Card have been set to use the following defaults:

Table B-2   Default Strappings of the ORiNOCO Hardware

Device	Resource	Default Value
ORiNOCO PC Card[1]	I/O Port	0400-0437
	IRQ	10

1   For older driver versions the default I/O Base Address value is 0300

Unlike the Windows 95 or Windows 98 operating systems, Windows NT is not able to check automatically whether the proposed values are already used by another device.

To avoid or troubleshoot hardware conflicts with another device, you are advised to use the Windows NT Diagnostic program, to determine whether the default I/O port and IRQ for your ORiNOCO PC Card are available, and if not to select an alternative value.

⇒ **NOTE:**

Sometimes it may be pretty difficult to determine where a device conflict is located. As a rule of thumb, you can use the following troubleshooting hint:

■ When the conflict is related to an conflicting I/O Base setting, in most cases the ORiNOCO PC Card will not work at all: i.e. you will not see any LED activity.

■ If the problem is related to a conflicting IRQ value, LEDs may flicker, but you can not connect to the network.

In a number of cases you may be able to verify that the PC Card succeeded in establishing a radio connection with a AP-1000 device, but fails to really connecting to the network operating system.

Running Windows NT Diagnostics

When installing the ORiNOCO PC Card, the Windows NT operating system will prompt you to confirm or modify the factory-set device values for your ORiNOCO PC Card.

Starting Windows NT Diagnostics

1. Click the **Start** button on the Windows NT Taskbar.
2. Click on **Programs**, and then **Administrative Tools**.
3. From the list of **Administrative Tools**, click the item **Windows NT Diagnostics**.

Windows NT
Diagnostics

Verifying IRQ Settings

To display the IRQ values that are already in use by other devices installed on your computer:

1. Click the **Resources** tab in the Windows NT Diagnostics window. This will display the window pictured in Figure B-2.

Figure B-2   Verifying IRQ Availability
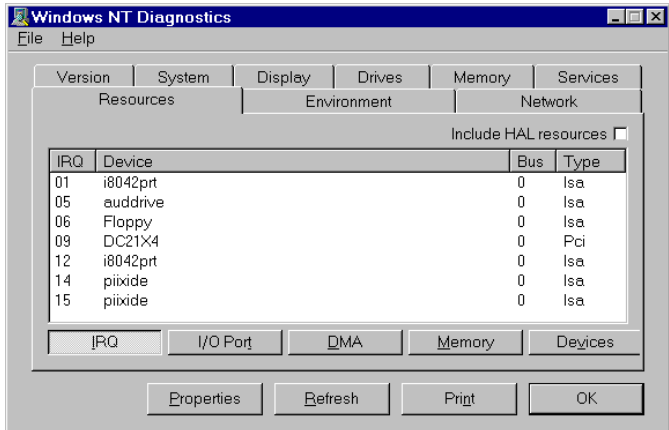
2. Click the **IRQ** button to display the Interrupt Request (IRQ) vectors currently in use by other devices in your computer.

   The default IRQ value for ORiNOCO PC Card is 10. Is the value 10 already listed?

   ■ If **No**, you can use the ORiNOCO default. Write down IRQ 10 and proceed with the next step.

   ■ If **Yes**, this means that another device is already using the IRQ, i.e. you will need to select another value for your ORiNOCO PC Card .

3. See whether one of the following values is available (i.e. not listed in the Windows NT Diagnostics window):
   03, 04, 05, 07, 09, **10**, 11, 12, 15.

4. Select one non-listed value and write it down before you proceed with "Verifying I/O Port Settings".

Verifying I/O Port Settings

To display the values of I/O Ports that are already in use by other devices installed on your computer, proceed as follows:

1. On the **Resources** tab of the Windows NT Diagnostics program, click the button **I/O Port**. This will display the window pictured in Figure B-3.

   The default I/O Port value for ORiNOCO PC Card is 0400[1].

   Is this appropriate value already listed for your version of the Miniport driver?

   - If **No**, you can use the ORiNOCO default. Write down I/O Port 0400 and proceed with the next step.

     - If **Yes**, this means that another device is already using this port address, i.e. you will need to select another value for your ORiNOCO PC Card .

---

1 This applies to ORiNOCO Miniport driver version 1.33 and higher. For earlier versions of this driver, the default I/O Base Address is 0300.
If you are unsure about the version of the Miniport driver that is currently installed, use the Client Manager tool. Use the menu option **Help** and select **Version Info** to list the version numbers of the card's hardware, embedded software and driver. For the latest ORiNOCO Miniport driver, consult the ORiNOCO website at: **http://www.lucent.com/orinoco**

Figure B-3   Verifying I/O Port Availability
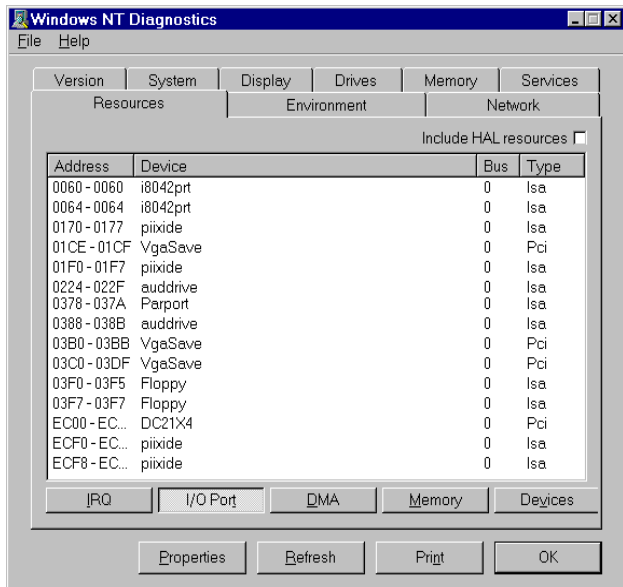
If the default ORiNOCO I/O Port has already been assigned to another device, select an alternative I/O Port value from the range listed below:

0200	0300*	0400**	0500	0600	0700
-	-	0440	0540	0640	0740
0280	0380	0480	0580	0680	0780
-	-	04C0	05C0	06C0	07C0

* For driver versions 1.32 or earlier, the default was 0300.

** For version 1.33 or higher, the default setting is 0400.

2. Verify that the alternative value is available (i.e. not listed in the Windows NT Diagnostics window).

3. Write down the alternative I/O Port value and close the Windows NT Diagnostics Program.

   Having finished these steps, you should now have a note that identifies the following (alternative) values:

   ■ IRQ value

   ■ I/O Port Address

   You can use these values to install the ORiNOCO Miniport Driver as described later in this chapter.

Despite NT Diagnostics, still facing problems

The Windows NT Diagnostics program is not "bullet-proof". Occasionally you may run into a hardware conflicts despite the fact that the Windows NT Diagnostics program displayed resources as being available to your ORiNOCO PC Card .

This may be the case when your computer has one or more devices and/or peripherals installed which claimed an I/O Base Address and/or IRQ value without notifying the Windows NT operating system: Your Windows NT Diagnostics program will not be able to display these values, simply because it "doesn't know".

If this is the case, a value you perceived as being available to your ORiNOCO PC Card, had already claimed by a conflicting device resulting in:

- A ORiNOCO PC Card that does not work, and/or
- A conflicting device that does not work properly.

It will depend on your preferences and the configuration options supported by each of the conflicting devices to determine which device settings should be changed to allow flawless operation.

In most situations the ORiNOCO Miniport driver will prove most flexible to select alternative settings for I/O Base Address or IRQ values. However since the conflicting device apparently did not communicate its System

Resource claims to Windows NT, you may need to try multiple values before the problem will be resolved.

■ Consult the documentation that came with your computer and/or the conflicting device to find out which values are used by the conflicting device that have not been listed in the Windows NT Diagnostics.

![Caution icon] **CAUTION:**
To isolate the problem, you are advised to change only one parameter at a time. For example: first try to resolve a possible conflict with the I/O Base Address. If that does not work, try to resolve a possible IRQ conflict.

PC Card Conflict

When your ORiNOCO PC Card installation has completed successfully, but it does not become operational, it is possible that there is an I/O Port conflict.

The Windows Resource Manager may not have been able to detect the conflict, allowing the installation to complete successfully, but not allowing the PC Card to operate properly because another device has been assigned the specified port.

The default I/O Base address used by your ORiNOCO PC Card is 0400 (when using Miniport driver version 1.33 or higher) and 0300 (when using Miniport version 1.32 or earlier).

You are advised to try different I/O Port values, as described in "Verifying I/O Port Settings" on page B-14.

Table B-3   Default Configuration Settings

Description	Default Value
Station Name	(none)
Connect to Network Type	IEEE 802.11 Infrastructure
	■ Connect via access points
	■ Peer-to-Peer (Ad-Hoc) disabled
ORiNOCO Network Name	(none)
MAC Address	(none: use Universal MAC Address)[1]
Distance between APs	High Distance
Transmit Rate	High - Auto Rate Select
RTS/CTS Medium Reservation	OFF
Card Power Management	OFF
■ Receive All Multicasts	Enabled
■ Maximum Sleep Duration	100
Encryption	OFF

1   The Universal MAC Address of your ORiNOCO PC Card is printed on a label on the backside of the card.

Upgrading the ORiNOCO Miniport Driver

Upgrading the ORiNOCO Miniport Driver installed may be required in one of the following situations:

- You would like to use new features that have become available for your ORiNOCO PC Card.
- You installed a newer version of the Client Manager tool.
- Your Client Manager "Card Diagnostics" reported a Driver/Firmware mismatch.

⚠️ **CAUTION:**

   Upgrading the ORiNOCO Miniport Driver should only be done by a skilled LAN Administrator or support engineer that has a working knowledge of the Microsoft Windows 95, 98 and/or the Windows NT operating system.

The procedure to upgrade device drivers differs between the various Windows operating systems:

- Windows 98 and Windows NT systems feature an "update driver" function that allows you to easily replace the current driver with a more recent version.
- Windows 95 systems usually require you to first to completely remove the driver from your computer, prior to installing the latest driver. This is described on page B-25.

Upgrading the driver for Windows 98

1. On the Windows Taskbar, click the **Start** button.

2. Click on **Settings**, and then click **Control Panel**.

3. In the Control Panel window, double-click the **System** icon.

4. In the System Properties window, select the tab **Device Manager** .

Figure B-4   The Windows 98 Device Manager tab
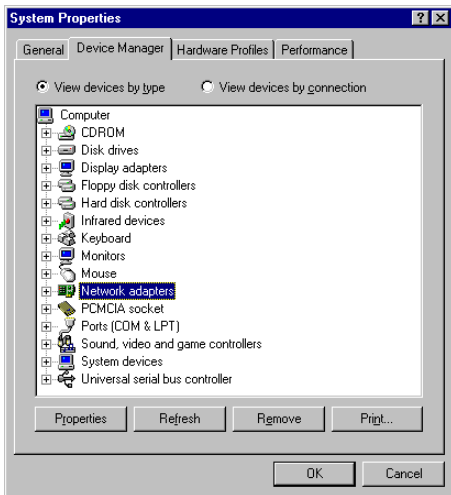
5. In the top section of the **Device Manager** tab, select the option **View devices by type** as pictured in Figure B-4 on page B-21.

6. In the list of computer devices, double-click **Network Adapters**.

7. Select the item **ORiNOCO PC Card** and click the **Properties** button.

8. In the ORiNOCO PC Card Properties window, select the **Driver** tab to display the window pictured in Figure B-5.

Figure B-5   Windows 98 Update Driver Window
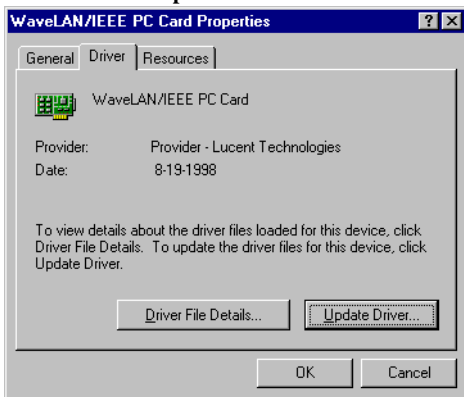
- To display information about the currently installed driver, click the **Driver File Details** button.

- To upgrade your current driver to a newer version click the **Update Driver** button and follow the instructions displayed on your screen.

9. Restart your computer to finish the driver upgrade procedure and to have the new driver loaded by the operating system.

10. (Optional) Upgrade the Client Manager program.

➡️ **NOTE:**

The procedure described above may look familiar to users of computers that run Windows 95 operating systems which are identified as OSR2 versions. Although such systems may also show an **Update Driver** button, thorough testing in the Lucent Technologies ORiNOCO labs have proven that this procedure does not work for the Windows 95 systems (the operating system will NOT replace the current driver). For Windows 95 systems, proceed as described on page B-25.

Upgrading the driver for Windows NT

1. On the Windows Taskbar, click the **Start** button.

2. Click on **Settings**, then click **Control Panel**.

3. In the Control Panel, double-click the **Network Neighborhood** icon.

4. Select the **Adapters** tab to display the window as pictured in Figure B-6 on page B-24

5. Select the **ORiNOCO Adapter** and click **Update**.

6. Follow the instructions as they appear on your screen.

Figure B-6   Update Driver in Windows NT
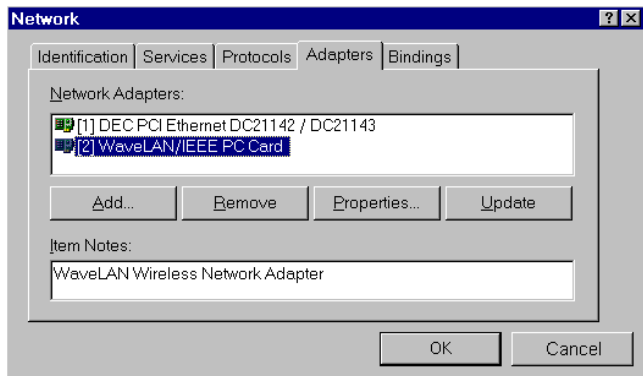
Upgrading the driver for Windows 95

To upgrade the ORiNOCO Miniport driver on a Windows 95 system, you will typically need to perform the following three steps:

1. Remove the current ORiNOCO Miniport Driver.
2. (Optional) Physically delete the driver file from your hard disk.
3. (Re-)install the latest ORiNOCO Miniport Driver.

Step 2 is optional, subject to the type of driver you have currently installed:

■ When the interface of your current driver looks as displayed in Figure B-7 on page B-26, you **must** delete the driver files from the hard-disk, **prior** to installing the new drivers.

■ When the interface of your current driver looks as pictured in Figure B-8 on page B-27, you may, but do not need to delete the driver files from the hard-disk.

Why delete the old driver? The "Plug & Play" support of Windows 95 operating systems associates a specific driver with specific hardware. When you select the option **Remove Driver** from the Network (Neighborhood) Control Panel, the operating system will only disable the driver, but will not delete the driver from your harddisk.

Figure B-7   Interface of early ORiNOCO Drivers
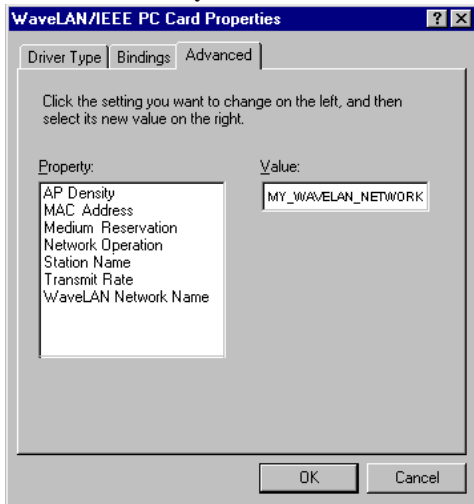
When trying to upgrade a driver, the Windows operating system will recognize your ORiNOCO PC Card as a piece of hardware that had been installed before and will attempt to re-install the old driver: i.e. when the operating system finds the appropriate driver files on your hard disk, it will not bother copying the files from the diskette with the new drivers.

Figure B-8   Setup ORiNOCO Parameters
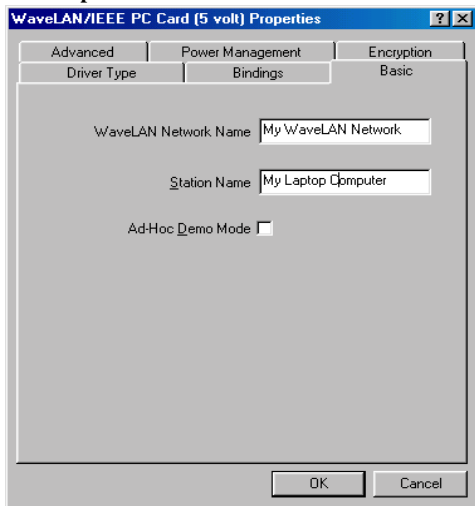
Removing the Miniport Driver

1. Close all applications that are currently open

2. On the Windows Taskbar, click the **Start** button.

3. Click on **Settings**, then click **Control Panel**.

4. In the Control Panel window, double-click the **Network** icon.

5. Select the **ORiNOCO Adapter** and click the **Remove** button.

   The Windows operating system will disable the Miniport driver and update the driver configuration files. It will not delete the driver from your computer's harddisk.

   This means that when you would re-insert the ORiNOCO PC Card, your Windows operating system will attempt to activate the same driver files again.

6. When prompted to **Restart your computer** select:

   ■ **Yes**, if you don't mind that the driver and configuration files reside on your hard disk (the restart will finish your procedure to disable the driver).

   ■ **No**, if you would like to physically remove the drivers from your hard disk (typically required to upgrade the driver on a Windows 95, 98 operating system).

   Proceed as described under "Deleting the ORiNOCO Driver Files" on page B-29 to delete the driver and its information and configuration files from your harddisk.

Deleting the ORiNOCO Driver Files

The procedure to physically remove the ORiNOCO Miniport Driver files from your harddisk is similar for all Windows operating systems.

⚠️ **CAUTION:**

Prior to deleting the files from your harddisk, it is important to remove the drivers as described on page B-28.
Failing to do so prevents the Windows operating system from cleaning the Windows Registry, which might lead to complications when you try to re-install the ORiNOCO driver in the future.

1. Open the Windows Explorer.
2. In the Explorer menu, click on **View** and select **Options**.
3. From the **View** tab, select **Show all files** and clear the check-box **Hide MS-DOS file extensions**.
4. Click the **Apply** button to return to the Explorer window.
5. Back in the Explorer, open the Windows System folder:
   - "c:\windows\system**"** for Windows 95 and 98
   - "c:\winnt\system32\drivers" for Windows NT systems
6. Delete the ORiNOCO driver files listed below, as identified for your operating system:
   - For Windows 95/98 delete the following files from the folder "c:\windows\system":
     — **wvlan41.sys** or **wnlucxx.sys**

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— **wvlanuif.vxd**

If present (subject to the driver version you had previously installed) also delete the files:

- — **wv41int.dll** or **wnlucxx.dll**
- — **wvlan41.hlp** or **wnlucxx.hlp**
- — **wvlan41.cnt** or **wnlucxx.cnt**

■ For Windows NT systems delete the files listed below from the folder "c:\windows\system32":

- — **wvlan41.dll** or **wnlucxx.dll**
- — **wvlan41.hlp** or **wnlucxx.hlp**
- — **wvlan41.cnt** or **wnlucxx.cnt**

From the folder "c:\windows\system32\drivers" delete:

- — **wvlan41.sys** or **wnlucxx.sys**

7. Next delete the inf files:

■ For Windows 95 open the folder "c:\windows\inf" and delete the file: **wvlan41.inf**

■ For Windows 98 delete the file: **Provider - Lucent Technologies** or **WVLAN41** and/ or **wnlucxx** from the folder "c:\windows\inf" and/or "c:\windows\inf\other"

8. Close the Windows Explorer and Restart your computer.

When deleting the ORiNOCO Miniport Driver files was part of an "Upgrade Driver" routine, you can now (re-)install the new ORiNOCO Miniport Driver as described in Chapter 2 "Installation for Windows".

MS-DOS Systems

Error Messages

No PACKET.INI found

The WaveLAN Packet Driver will display this error message in one of the following two situations:

■ The driver could not find the file "PACKET.INI"

■ The file "PACKET.INI" contained invalid parameter values that prevented the driver from loading.

Subject to the type of error, the driver may either load using the factory-set defaults or not load at all.

You are advised to verify the path statement in the "AUTOEXEC.BAT" file. You may need to add a statement to your "AUTOEXEC.BAT" file that will make the directory that contains the WaveLAN Packet driver the active directory. When the PACKET.INI file is stored in the same directory as the WaveLAN Packet Driver, the driver should be able to automatically find the "PACKET.INI" file.

Installation for Windows CE

C

Introduction

Windows CE devices are most commonly used on hand-held computing devices also referred to as H/PC devices.

Subject to the type and brand of the device, you will see that multiple versions of the Windows CE operating system exist today, where each CE device may also use a specific type of processor.

The ORiNOCO drivers will only work with CE devices that:

- Run the MS-Windows CE operating system version 2.0 in combination with a MIPS, SH3 and X86 processor, or
- Run the MS-Windows CE operating system version 2.11[1] in combination with a SH4, ARM or X86 processor.

To determine whether your Windows CE device satisfies these requirements:

1. Click the ![Start] button on the Windows Taskbar.
2. Click on **Settings**, then **Control Panel**.

---

1 v2.11 is sometimes also referred to as MS-Windows CE HPC PRO v3.0.

3. On the Control Panel, double-click the **System** icon to display the window pictured in Figure C-1.
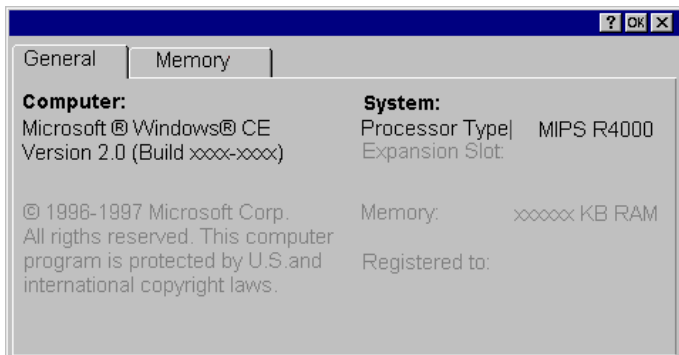
Figure C-1   Windows CE CPU Type

Installing the ORINOCO Driver

⇒ **NOTE:**

Lucent Technologies recently rebranded its WaveLAN/IEEE product line to ORINOCO, your mobile broadband wireless connection. In case you received your ORINOCO PC Card with drivers and/or documentation that still reflects the name WaveLAN, it is important to know that you can use such drivers and documentation without difficulty to install and use your product. Alternatively, consult the ORINOCO website to see whether updated drivers and documentation are available for your product.

What you Need

Windows CE devices are typically used in combination with desktop computers running 'Windows CE Services' to transfer data between the desktop computer and the H/PC device.

To use ORiNOCO PC Card in your Windows CE device, you will need to:

1. Run the ORiNOCO installation file "setup.exe" for Windows CE to copy the Miniport driver and configuration files from the floppy disk to the "synchronization folder" for Windows CE services on your desktop computer, and

2. Use the Windows CE Services to transfer files to your H/PC device.

   The default location of the Windows CE "synchronization folder is:
   C:\Program Files\Windows CE Services\wavelan

Please refer to the Microsoft Handheld PC Companion booklet and the user documentation of your H/PC device for more information about installing the Windows CE Services.

Running the Installation Program

To install the ORiNOCO drivers on your Windows CE device, simply do the following:

1. Insert the ORiNOCO CD-ROM into the desktop computer.
2. Browse to the CD-ROM folder that includes the Windows CE driver files. For example: **d:\drivers\win_ce**

   Where "d:\" represents the drive letter of your CD-ROM drive.
3. Double-click the "setup2xx.exe" file that matches the version of the Windows CE operating system on the handheld device:

   - Use **setup200.exe** when your handheld device runs Microsoft Windows CE version 2.0
   - Use **setup211.exe** when your handheld device runs Microsoft Windows CE version 2.11
   - Use **setup212.exe** when your handheld device runs Microsoft Windows CE version 2.12
   - When finished, use the serial cable and/or docking station to connect your Windows CE device to the desktop computer.

Once the computers have been connected, the Windows CE services will automatically copy the files and drivers from your desktop computer to the Windows CE device.

➡️ **NOTE:**

If you encounter difficulty copying the driver files to your Windows CE device, please refer to the Microsoft Handheld PC Companion booklet and the user documentation of your H/PC device for more information about installing and/or troubleshooting the Windows CE Services.

If you encounter difficulty establishing a network connection after you installed the ORiNOCO drivers successfully, consult the **readme.txt** of the ORiNOCO driver files for Windows CE for troubleshooting hints.

Using ORiNOCO with Windows CE

When you insert the ORiNOCO card into your Windows CE device, it will start operation with the following factory-set defaults:

- Connect to a Network Infrastructure
- Use the Network Name "ANY" to connect to the first access point that provides a communications quality that is acceptable or better.

On the Control Panel of your Windows CE device, you will also find a ORiNOCO (Wireless Network) icon, to view or modify the ORiNOCO parameters.

Monitoring Wireless Performance

The ORiNOCO software for Windows CE devices, does not include diagnostic tools. This is partially due to the memory limitations of Windows CE devices.

However you can use other ORiNOCO stations to monitor wireless communications between the other station and your Windows CE device.

- For Peer-to-Peer workgroup environments, you should start the Client Manager program on a wireless computer running either the Windows 95, 98 or Windows NT operating system.

   The Link Test mode of this utility enables you to analyze the communications quality between the "Initiator" station and your Windows CE device (identified as the "Remote Station").

■ In Infrastructure Networks, consult the LAN Administrator to run the AP Manager tool. The "Remote Link Test" of this utility enables the LAN Administrator to analyze the communications quality between the AP-1000 (identified as the "Initiator" station) and your Windows CE device (identified as the "Remote Station").

Modifying Configuration Parameters

To view or modify the ORiNOCO configuration parameters, open the Control Panel on your Windows CE device and double-click the ORiNOCO (Wireless Network) icon.

For more information about these parameters, please consult:

■ The ORiNOCO help system for your Windows CE drivers by clicking the "**?**" help icon, or

■ The chapters about other Windows operating systems described earlier in this User's Guide.

Installation for MS-DOS

<div style="text-align: right">

D

</div>

Introduction

What You Need to Know

Installing the ORiNOCO PC Card requires the same level of expertise that you would need to install any other type of standard Ethernet network adapter card. It is assumed that you have a working knowledge of MS-DOS operations and of installing network adapter cards and network client software.

⇒ **NOTE:**

Lucent Technologies recently rebranded its WaveLAN/IEEE product line to ORINOCO, your mobile broadband wireless connection. In case you received your ORINOCO PC Card with drivers and/or documentation that still reflect the name WaveLAN, it is important to know that you can use such drivers and documentation without difficulty to install and use your product. Alternatively, consult the ORINOCO website to see whether updated drivers and documentation are available for your product.

Driver Types

When your computer runs the MS-DOS operating system, or Microsoft Windows for Workgroups (usually referred to as Windows 3.x), you can use one of the following network drivers:

- DOS ODI Driver (WVLAN43.COM)
- Packet Driver (WVLAN42.COM)

To install these network drivers, you will also need a program called the "Card Access Driver" (WaveCAD).

The WaveCAD software is included with the MS-DOS Driver software that was shipped with your ORiNOCO PC Card. The WaveCAD driver (wvlancad.sys) will enable you to access the ORiNOCO PC Card via any PC Card slot that is controlled by an Intel 82365 PCIC or computers that support Card & Socket Services.

Installation Overview

To install the ORINOCO PC Card in an MS-DOS environment, you will need to:

1. Copy the ORiNOCO software manually to the hard disk of your computer.
2. Setup the WaveCAD program.
3. Install the Network Client Software for your network operating system.

4. Setup the ORiNOCO configuration parameters.

5. Restart the computer to verify that the WaveCAD executes successfully and the network driver is loaded.

To setup the various configuration parameters, you may need to edit a number of system files. You can use any MS-DOS line editor to edit these files, for example the MS-DOS EDIT command.

Example DOS commands:

```
c:\
edit config.sys
```

Copy the ORiNOCO Software

The ORiNOCO PC Card CD-ROM includes a small batch file ("CPY2HDSK.BAT"). This file will:

- Create a new directory on your hard disk, and
- Copy the ORiNOCO PC Card software to this new directory.

To copy the ORiNOCO software, proceed as follows:

1. Choose a name for the hard disk directory where you would like to store the ORiNOCO software: e.g. "c:\ORiNOCO"
2. Place the ORiNOCO CD-ROM in your computer
3. Run the batch file "CPY2HDSK.BAT" with the chosen hard disk directory name as parameter.

   Example DOS commands:

   ```
   d:\drivers\ms-dos\cpy2hdsk c:\ORiNOCO
   ```

Setup the WaveCAD Program

To allow MS-DOS-based computers to "identify" the presence of a PC Card in the PC Card slot, the computer needs dedicated software that will enable it to do so. For your ORiNOCO PC Card this can either be:

- Card & Socket services software as provided by various software vendors, or
- The Card Access Driver (wlancad.sys), a Lucent Technologies proprietary driver, that was designed specifically for ORiNOCO cards.

The card software must be loaded before any other program (network driver or utility) tries to access the ORiNOCO card.

In this section, we describe the proper WaveCAD installation procedure and settings for the following systems:

- Computers using Card & Socket Services
- Intel 82365 PCIC based computers

Card & Socket Services

To ensure the WaveCAD is always run at start-up time, you must edit the system file "CONFIG.SYS" to include a "**DEVICE**" statement that will identify the path and filename of the WaveCAD program.

Example DOS commands:

```
c:\
edit c:\config.sys
```

The format of the device line is as follows:

```
DEVICE = [path name]wvlancad.sys
```

When for example your device line looks as follows:

```
DEVICE = c:\wavelan\wavecad\wvlancad.sys
```

With Card & Socket Services, you do not need to set any parameters (Memory, IRQ, I/O Port) in the **"DEVICE"** statements. However, if you would like to overrride the default settings, follow the directions for "Intel 82365 PCIC" on page D-6, using Table D-1 on page D-8 to identify valid parameter values that can be included in the wvlancad.sys **"DEVICE"** statement.

Intel 82365 PCIC

For Intel 82365 PCIC based computers, you must start the ORiNOCO Card Access Driver ("wvlancad.sys") before any other program (network driver or utility) can access the ORiNOCO card.

To ensure the WaveCAD is always run at start-up time, you must edit the system file "CONFIG.SYS" to include a **"DEVICE"** statement that will identify the:

■ Path and file name of the wvlancad.sys program

- ■ Memory Address of the ORiNOCO card
- ■ I/O Port Address of the ORiNOCO card
- ■ Interrupt Request Line number (IRQ) of the ORiNOCO card.

Use Table D-1 on page D-8 to identify valid parameter values that can be included in the wvlancad.sys "**DEVICE**" statement.

In order for your card to function properly, you will need to verify whether the values that you select to include in the "**DEVICE**" statement are not already used by another device that has been installed in your computer. Consult your LAN Administrator or a computer expert to determine an available Memory Address, I/O Port Address and IRQ value that you can use to install the WaveCAD driver.

Alternatively you can use the Microsoft Diagnostics program ("MSD.EXE") to determine the available values. For more information about Microsoft diagnostics, please refer to the documentation that came with your MS-DOS operating system.

You can use any MS-DOS line editor to edit the "CONFIG.SYS" file.

The format of the device line is as follows:

```
DEVICE = [path name]wvlancad.sys /m=xxxx /b=xxxx /i=nn
```

For example, if your device line looks as follows:

```
DEVICE = c:\wavelan\wavecad\wvlancad.sys /m=d100 /b=0340 /i=11
```

The WaveCAD will be programmed to use:

- Memory Address d100 - dFFF
- I/O Port Address 0340H and
- IRQ 11

Table D-1   WaveCAD Configuration Parameter Values

Parameter	Description	Valid Values
<path>	Disk drive and directory containing WaveCAD program "wavecad.sys" (do not type brackets)	
/m=xxxx	Memory Address	4-digit hexadecimal value Valid range: C000 - EF00 in increments of 100 For example: C000, C100, C200, or C300, etc.
/b=xxxx	I/O Port Address	4-digit hexadecimal value Valid range: 0300 - FFC0 in increments of 40 For example: 0300, 0340, 0380, 03C0 or FF00, FF40, FF80, or FFC0
/i=nn	IRQ	1- or 2-digit decimal value Valid values: 3, 4, 5, 7, 9, 10, 11, 12, 14, or 15

$\Longrightarrow$ **NOTE:**

When editing the "CONFIG.SYS" file, please note the following:

— Remove any other PCMCIA-related "**DEVICE**" statement from the "CONFIG.SYS" file. When for example the "CONFIG.SYS" file includes "**DEVICE**" statements for "Card Services" or "Socket Services" you must remove these statements. Consult the documentation that came with your computer or other PCMCIA device to help you to identify these statements.

— When your computer has a memory manager program installed, for example "EMM386.EXE", you must exclude the Memory Address space that you assigned to the WaveCAD program in the previous step (see page D-7).

To exclude the Memory Space address, you must add an exclude parameter to "**DEVICE**" statement that activates the memory manager program.

For example, if your computer uses the "EMM386.EXE" memory manager program, your "**DEVICE**" statement could look as follows:

```
DEVICE=c:\dos\emm386.exe noems x=d100-d1ff
```

— When your computer runs Microsoft Windows 3.x, you must also edit the Windows "SYSTEM.INI" to protect the Memory Address space that you assigned to the WaveCAD program in the previous step (see page D-7).

You can use any ASCII text editor, such as Windows Notepad to edit the "SYSTEM.INI" file and add the following statement to the section "**386Enh**":

Example:

```
= [386Enh] ... EMMExclude=D100-D1FF
```

Install the Network Client Software

To use the ORiNOCO card in a network environment, you will need to install Network Client software.

If you already had Network Client software installed, you are advised to remove this software, and run the Network Client installation program again.

1. Make the directory that contains the Network Client software the active directory.

   For example when installing the Network Client software from a floppy disk:

   a. Insert the disk into floppy drive **A:**, and
   b. Make drive **A:** the active drive.

2. Proceed as described in the User documentation that came with the Network Client software to start the installation.

3. When prompted to select a driver use the option "Other driver". Sometimes this option is referred to as "updated" or "OEM" driver, or "driver provided by other vendor".

4. Remove the Network Client software disk from the floppy disk drive and insert the ORiNOCO CD-ROM.

5. Follow the instructions as they appear on your screen.

Setup the ORiNOCO Parameters

To connect your ORINOCO PC Card to a ORiNOCO network system, you must configure the ORiNOCO parameters to match the values of the network.

In LAN Infrastructure environments, these values should typically match the values as set for the AP-1000 access points. Consult your LAN Administrator for the values that apply in your network.

This section describes how to set the parameters for the following ORiNOCO Drivers:

■ DOS ODI Driver
■ Packet Driver

DOS ODI Driver Configuration

When you are installing the Network Client software for Novell NetWare, the installation program will prompt you to enter the ORiNOCO parameters, and save your parameter settings in the Novell network configuration file "NET.CFG".

If your Network Client Software did not prompt you to enter the parameters, or if you wish to modify the ORiNOCO parameter settings you may need to

edit the "NET.CFG" file manually, as described in "About the NET.CFG File" on page D-19.

Table D-1 lists the various ORiNOCO parameters with their value ranges and usage.

$\Longrightarrow$ **NOTE:**

Alphabetical character values are case-sensitive and should be entered between "quotation marks ". Values without quotes will be interpreted as UPPERCASE only.

Table D-2   ORiNOCO DOS ODI Driver Parameters

Parameter	Description
1 Station Name	Alphanumeric string with a maximum of 32 ASCII characters that will identify your computer on the network when using the WaveMANAGER/CLIENT diagnostics tool. Valid Values: any character in the range of "A-Z", "a-z" and "0-9". Enter your value between "quotes".
2 Network Type	Use this parameter to select the type of network to which you wish to connect your computer. Valid values: 1 or 3. ■ 1 will connect your computer to an anonymous Ad-hoc workgroup (IBSS) ■ 3 Will connect your computer to an IEEE 802.11 Infrastructure (ESS) identified by parameter 2a "WaveLAN Network Name".

Table D-2   ORiNOCO DOS ODI Driver Parameters—*Continued*

2a WaveLAN Network Name	Alphanumeric string with a maximum of 32 ASCII characters that identifies the network to which you would like to connect your computer. This parameter is only used when you selected the Network Type "Infrastructure". Valid Values: any character in the range of "A-Z", "a-z" and "0-9" where:
	■ The value "**ANY**" enables your station to connect to any IEEE 802.11 compliant network (see also "Closed System").
	■ A "user-defined name" allows your station to connect to a specific network only. This value should match the value as set for the AP-1000 access points in your network.
3 Transmit_Rate[1]	Controls the data rate at which your WaveLAN card will transmit its data. Valid Values:
	■ Fixed Low
	■ Fixed Standard
	■ Auto Select High-Medium-Standard-Low (default).
	■ Fixed Medium (Turbo cards only)
	■ Fixed High (Turbo cards only)
	■ Auto Select Standard-Low
	■ Auto Select Medium-Standard-Low

Table D-2   ORiNOCO DOS ODI Driver Parameters—*Continued*

4a Card Power Management	Enables/disables Power Management Valid Values: ■ Y - Yes, enable Power Management ■ N - No, disable Power Management (=default). When enabling Power Management you will also need to set the Maximum_Sleep_Duration, and Receive_All_Multicasts parameter. When you disable Power Managment, these two parameters will be disabled as well.
4b Maximum Sleep Duration	This parameter specifies the maximum time the station is allowed to spend consecutively in DOZE state. Valid Values: any numerical value in the range of 1-65535 (default value is 100). This parameter determines the Listen Interval of the station's Power Management scheme. If 4a Card Power Management is disabled, this parameter will be ignored

Table D-2   ORiNOCO DOS ODI Driver Parameters—*Continued*

4b Receive All Multicasts	This parameter specifies whether the station must receive all multicast frames when in Power Management mode. Valid Values: ■ Y - Yes, receive all Mulitcasts (= default) ■ N - No, do not receive all Multicast When this parameter is enabled, the WaveLAN station will wake up at regular intervals to receive the multicast frames. Although enabling this option may yield less optimal power savings, you are advised to leave this parameter enabled when using your computer in regular networking environments. If 4a Card Power Management is disabled, this parameter will be ignored.
5 AP Density	Parameter that controls the Roaming sensitivity of your computer (must be set according to the settings of the AP-1000 access points). Valid Values: ■ Low Density (default) ■ Medium Density ■ High Density

Table D-2   ORiNOCO DOS ODI Driver Parameters—*Continued*

6 Medium Reservation	Enables/disables the RTS/CTS Mechanism Valid Values: ■ 2347 (default) Disables Medium Reservation ■ Numeric value in the range of "0-2346" Enables the RTS/CTS Mechanism, and sets the frame length threshold from which the station should start using the RTS/CTS Mechanism (recommended value is "500"). See "ORiNOCO Manager Suite User's Guide" for more information.
7 Node Address (MAC Address)	To be used only when your network system requires Local MAC Addressing. Valid Values: ■ "None" to use the card's factory installed Universal MAC address (=default) ■ 12 hexadecimal digits that identify the user-defined Local MAC Address.[2] The 2nd digit of the first digit-pair must be 2, 6, A, or E.

Table D-2   ORiNOCO DOS ODI Driver Parameters—*Continued*

8 Enable Encryption	Enables/disables WEP encryption. Valid values: ■ Y - Yes, enable WEP encryption ■ N - No, do not enable WEP encryption (=default). When this parameter is enabled, you can: ■ Select up to four key for decrypting data received via the wireless interface. ■ Select one Transmit key (8e) for encryptiing data that will be transmitted via the wireless interface. This parameter should only be enabled when using WaveLAN IEEE Silver cards. If you decide to enable encryption, please note that all stations will be configured with identical WEP key values.
8a WEP Key 1	Identifies one of the four keys that your waveLAN card can use to decrypt data received via its wireless interface. Valid values for Silver cards: ■ 5-character ASCII key or 10-digit hexadecimal key. Valid values for Gold cards: ■ 5-character ASCII key or 10-digit hexadecimal key. ■ 13-characterASCII key or 26-digit hexadecimal key. The key value is case-sensitive. Hexadecimal values must be preceded by "0x". All wireless clients and access points should be configured with identical key values.
8b WEP Key 2	See 8a WEP Key 1
8c WEP Key 3	See 8a WEP Key 1
8d WEP Key 4	See 8a WEP Key 1

Table D-2   ORiNOCO DOS ODI Driver Parameters—*Continued*

8a WEP Transmit Key	Use this parameter to select one of the identified WEP decription keys for encrypting data that will be transmitted via the wireless interface. Valid values: ■ 1 - to use WEP Key 1 ■ 2 - to use WEP Key 2 ■ 3 - to use WEP Key 3 ■ 4 - to use WEP Key 4
9 Media Frame Type	Use this parameter to select the frametype that is used within the network to which you wish to connect the computer. Consult your LAN Administrator for the value that applies in your network. Valid values: ■ Ethernet 802.2 (=default) ■ Ethernet 802.3 ■ Ethernet 802.II ■ Ethernet 802.SNAP

1   This parameter does not influence at which data rate the station will be able to receive data. I.E. When the transmit rate is locked to
    Fixed Low, the station may still receive messages that were transmitted at Standard speed.

2   Note: The Access Control security feature of AP-1000 access points does not recognize Local MAC addresses. When the AP-1000 devices in your network infrastructure have been programmed to use this feature, leave this parameter Access Control

About the NET.CFG File

The WaveLAN configuration parameters for the DOS ODI driver are stored in a network configuration file called "NET.CFG".
A sample of the "NET.CFG" file is included on the IEEE 802.11 WaveLAN software diskette.

If you installed the Novell Network Client software as described earlier in this chapter, this file was created automatically. You may skip this section and proceed with "Finishing Installation" on page D-28, unless you would like to modify the WaveLAN parameter settings or wish to learn more about the "NET.CFG" file.

A "NET.CFG" file must always include a "Link Driver" statement that refers to the appropriate network driver, and a list of parameters and parameter values that apply to the referenced driver. For the IEEE 802.11 WaveLAN driver the "NET.CFG" file will look as follows:

```
LINK DRIVER WVLAN43
; BASIC PARAMETERS
WAVELAN_NETWORK_NAME XXXXXXXX
PORT_TYPE X
STATION_NAMEXXXXXXXX
;ADVANCED PARAMETERS
;AP_DENSITYx
;TRANSMIT RATEX
;MEDIUM RESERVATIONXXXX
;NODE ADDRESS
```

All lines that start with a semi-colon (;) are informational comments to the user, i.e. the driver will ignore this information.

The basic parameters that you should set are:

- WaveLAN Network Name
- Station Name for your station
- Port Type - to identify the type of network to which you wish to connect your computer.

All other parameters are optional and should preferable only be used in special situations, typically upon advice of a WaveLAN IEEE 802.11 expert.

Table D-2 on page D-12 lists the various WaveLAN parameters with their value ranges and usage. The WaveLAN parameter values for the WaveLAN DOS ODI driver are not case-sensitive: the WaveLAN DOS ODI Driver will interpret all values as upper-case values.

When the installation program of your Network Client software did not prompt you to identify a driver or specify the WaveLAN parameters you may need to identify the proper location of the WaveLAN DOS ODI driver and the "NET.CFG" file. This will allow your Network Client software to find the correct driver.

You are advised to copy the WaveLAN DOS ODI Driver and the "NET.CFG" file to the same directory that you selected to install the network operating system software.

For example, when you selected the directory "c:\network" use the following copy commands:

```
c:\
cd\wavelan\drivers\dosodi
copy wvlan43.com c:\network
copy net.cfg c:\network
```

1. Edit the "NET.CFG" file to add the statement "**Link Driver WVLAN43**".
2. Enter the WaveLAN parameter values on a new line, directly after the "link driver" statement.

   Consult your LAN Administrator for values that apply in your network environment.

⇒ **NOTE:**

When modifying the "NET.CFG" file ensure that all WaveLAN parameter lines will be indented. Use the [TAB] key of your keyboard to create an indent at the beginning of each line that will contain a WaveLAN parameter.

3. When finished, save the "NET.CFG" file and restart your computer.
4. Proceed with "Finishing Installation" on page D-28.

Packet Driver Configuration

The installation of the WaveLAN Packet Driver is a procedure that requires you to edit a number of system files manually.

To ensure that the WaveLAN Packet Driver is loaded at start-up, you will need to add a few command line statements to the "AUTOEXEC.BAT" file. These statements should include:

■ A path to the directory that contains the Packet Driver.

■ A "load driver" statement.

The WaveLAN parameters will be identified in a network configuration file called "PACKET.INI".
The WaveLAN Packet Driver and the "PACKET.INI" file must reside in the same directory on the hard disk of your computer. When you used the commands as identified "Copy the ORiNOCO Software" on page D-4, this directory is typically "c:\wavelan\drivers\packet".

Setup the WaveLAN Packet Driver

1. Edit the "AUTOEXEC.BAT" file of your computer to add the path and file name of the WaveLAN Packet Driver, and the "load driver" statement:

       cd\wavelan\packet
       lh=wvlan42.com l

2. To set the WaveLAN parameters, edit the "PACKET.INI" file.
   The structure of the "PACKET.INI" file is as follows:

       ; BASIC PARAMETERS
       WAVELAN_NETWORK_NAME XXXXXXXX
       STATION_NAMEXXXXXXXX

```
;ADVANCED PARAMETERS
;AP_DENSITYx
;TRANSMIT RATEX
;MEDIUM RESERVATIONXXXX
;MAC ADDRESS
```

All lines that start with a semi-colon (;) are informational comments to the user, i.e. the driver will ignore the information.

The basic parameters that you should set are:

- WaveLAN Network Name

- Station Name for your station.

All other parameters are optional and should preferably only be used in special situations, typically upon advice of a WaveLAN IEEE 802.11 expert.

$\Longrightarrow$ **NOTE:**

The string for a "WaveLAN Network Name" is case-sensitive. If your network includes stations that also use the WaveLAN DOS ODI Driver, you are advised to select upper-case characters only (see also "DOS ODI Driver Configuration" on page D-11).

3. To set a parameter value, remove the semi-colon (**;**) preceding the parameter name and enter a value within the range as specified in Table D-3 on page D-25.

At the end of the "PACKET.INI" file you will find an additional set of generic Packet Driver parameters that are not directly related to WaveLAN operation.

;DRIVER_CLASSX
;NOVELL_FLAGYES/NO
;PACKET_INTERRUPT0x XX

4. Consult your LAN Administrator to select the appropriate values that apply in your situation from the range as specified in Table D-4 on page D-27.

5. When finished, save the "PACKET.INI" file and restart your computer.

6. Proceed with "Finishing Installation" on page D-28.

Table D-3   WaveLAN Packet Driver Parameter Values

Parameter	Description
WaveLAN_Network_Name	Alphanumeric string with a maximum of 32 ASCII characters that identifies the network to which you would like to connect your computer. Valid Values: any character in the range of "a-z" and "0-9" (no spaces allowed) where: ■ The value "**ANY**" enables your station to connect to any IEEE 802.11 network. ■ A user-defined name allows your station to connect to a specific network only. This value should matches the value as set for the AP-1000 access points in your network.
Station_Name	Alphanumeric string with a maximum of 32 ASCII characters that will identify your computer on the network, e.g. when using the WaveMANAGER/CLIENT diagnostics tool. Valid Values: any character in the range of "a-z" and "0-9" (no spaces allowed).
AP_Density	Parameter that controls the Roaming sensitivity of your computer (must be set according to the settings of the AP-1000 access points). Valid Values: ■ Low Density (default) ■ Medium Density ■ High Density

Installation for MS-DOS

Transmit_Rate[1]	Controls the data rate at which your WaveLAN card will transmit its data. Valid Values: ■ Fixed 1 Mbit/second ■ Fixed 2 Mbit/second ■ Auto Rate Select 2 Mbit/s -1 Mbit/s (default)
MAC_Address	To be used only when your network system requires Local MAC Addressing. Valid Values: ■ "None" to use the card's factory installed Universal MAC address (=default) ■ 12 hexadecimal digits that identify the user-defined "Local MAC Address".[2] The 2nd digit of the first digit-pair must be 2, 6, A, or E.
Medium_Reservation	Enables/disables the RTS/CTS Mechanism Valid Values: ■ 2347 (default) Disables Medium Reservation ■ Numeric value in the range of "0-2346" Enables the RTS/CTS Mechanism, and sets the frame length threshold from which the station should start using the RTS/CTS Mechanism (recommended value is "500"). See "ORiNOCO Manager Suite User's Guide" for more information.

1   This parameter does not influence at which data rate the station will be able to receive data. I.E. When the transmit rate is locked to 1 Mbit/s, the station may still receive messages that were transmitted at 2 Mbit/second.

2   Note: The Access Control security feature of AP-1000 access points does not recognize Local MAC addresses. When the AP-1000 devices in your network infrastructure have been programmed to use this feature, leave this parameter blank.

For more information about each of the WaveLAN parameters:

- Consult the description for the WaveLAN parameters as described in Chapter 4 "Advanced Configurations".

- Alternatively type the following command lines at the MS-DOS prompt to display help for the WaveLAN Packet Driver.

  ```
  cd\wavelan\drivers\packet
  wvlan42.com h
  ```

Table D-4	Packet Driver Specific Parameters
Driver_Class	A specific "Packet Driver" parameter that controls the frame format. Valid Values: ■ DIX Ethernet (v2.0) frame format (Default) ■ IEEE 802.3 with 802.2 headers frame format.
Novell_Flag	Enables support the Novell IPX 802.3 frame format. Valid Values: ■ convert all 802.3 type packets to 8137 type packets. ■ No, do not use the NovellFlag (=default)
Packet_Interrupt	This parameter identifies the software interrupt number that the Packet Driver should use. Valid Values (hexadecimal): ■ 0x60 (default) ■ 0x70 Enter the value without the 0x prefix.

Finishing Installation

To finish the installation insert your ORINOCO PC Card and restart your computer. Carefully read the messages that appear on your screen, to verify that:

- The WaveCAD program executes correctly, and
- Your computer loads the correct driver parameter settings of your ORINOCO PC Card.

Correct execution of the WaveCAD program is confirmed with the message (example):

```
WaveLAN/IEEE Card Access Driver, Variant X, Version XX.XX
Memory: xxxx, I/O Base: xxxx, IRQ xx
Card Access Driver Installed
```

Where:

- $xx.xx$ identifies the version of the WaveLAN Driver
- xx or xxx identifies the values that you entered upon installation of the WaveCAD software as described in "Intel 82365 PCIC" on page D-6

A successful load of the WaveLAN Driver is confirmed with either one of the following messages (see next page):

Example WaveLAN DOS ODI Driver:

```
WaveLAN/IEEE DOS ODI Driver Variant X, v0.0x (yymmdd)
Desired SSID = AAAAAAAAA
Driver loaded successfully
IRQ xx, Port xxxx, Node Address = xxxxxxxxxxxx L
Max Frame 1514 bytes, Line Speed 2 Mbps, Bus ID 3
Board 1, Frame ETHERNET_802.2, LSB Mode
```

Where:

- AAAAAAAAA identifies the WaveLAN Network Name that you entered in the NET.CFG file,

- xx or xxx identifies the values that you entered upon installation as described in "Intel 82365 PCIC" on page D-6

Example WaveLAN Packet Driver:

```
WaveLAN/IEEE Packet Driver, Variant X, Version X.XX
Novell Flag NOT set
IO Base=xxxx IRQ=xx MAC Address=xxxxxxxxxxxx
Packet Interrupt=0xXX
```

Where:

- Version x.xx identifies the version of the WaveLAN Packet Driver

- xx or xxx identifies the values that you entered upon installation of the WaveCAD software as described in "Intel 82365 PCIC" on page D-6

- Packet Interrupt 0xxx identifies the value you specified in the "PACKET.INI" file.

Advanced Options

Dual Card Configuration

When you intend to use multiple WaveLAN PC Cards in a single computing device, for example a wireless server, the "CONFIG.SYS" file should contain a **DEVICE** statement with unique parameter values for each card. Example:

```
DEVICE = c:\wavelan\wavecad\wavecad.sys /m=d100 /b=0340 /i=11
DEVICE = c:\wavelan\wavecad\wavecad.sys /m=e300 /b=04C0 /i=14
```

Start-up Menu Configuration

If you intend to use your computer in combination with multiple PC Cards, an MS-DOS Start-up Menu may provide a useful solution in one or more of the following situations:

- You are using your computer in combination with another PC Card that requires "Card & Socket Services", or
- You would like to use your computer with either your WaveLAN card or an Ethernet adapter card.

The Start-up Menu will enable you to setup your computer to prompt the computer user to select a specific configuration. Subject to the selected

menu option, the computer will automatically load the drivers and programs required for each specific option.

The Start-up Menu is a standard MS-DOS feature that is described in the Microsoft MS-DOS User's Guide.

➡️ **NOTE:**

When using Multiple Boot options to swap WaveLAN with Ethernet adapters and vice versa, you will need to install the Network Client software twice, selecting separate directories for each of the Network Client configurations. The start-up Menu should identify which Network Configuration file will be loaded for each item subject to the selected menu-item.

Failing to do so could lead to a situation where the Network Client install programs would simply overwrite the configuration settings of the card you installed first.

Example of a Start-up Menu Configuration

This section includes samples of the system files "CONFIG.SYS" and "AUTOEXEC.BAT" that enable you to setup a Start-up Menu.
The names and values printed do not necessarily correspond with the actual path and file names or parameter values that apply in your situation.

CONFIG.SYS File

```
[MENU]
menuitem=WaveLAN
menuitem=CSSS

[COMMON]
DEVICE=c:\dos\himem.sys
DEVICE=c:\dos\emm386.exe noems x=xxxx-xxxx¹
DEVICE=c:\dos\setver.exe

[WaveLAN]
REM This menu item will enable WaveLAN Card Access Driver
DEVICE = c:\wavelan\wavecad\wvlancad.sys /m=xxxx /b=xxxx /i=xx²

[CSSS]
REM This menu item will enable Card and Socket Services
DEVICE=c:\csss\socksvce.exe³
DEVICE=c:\csss\cardsvce.exe

[COMMON]
DEVICE=c:\windows\ifshlp.sys
```

---

1 See page D-21
2 See "Intel 82365 PCIC" on page D-6
3 The program path and file names should match the actual path and file names of your Card Services and Socket Services (CS&SS) software.

AUTOEXEC.BAT File

```
SET TEMP=c:\temp
PROMPT $P$g
SET DIRCMD=/O/P
GOTO %config%

:WaveLAN
REM This section contains WaveLAN related commands
PATH c:\dos;\c:\wavelan;c:\network\wavelan¹;c:\windows
c:\network\wavelan\startnet
goto end

:CSSS
REM This section contains Card and Socket Services related
commands
PATH c:\dos;\c:\wavelan;c:\network\ethernet\²;c:\windows
c:\network\ethernet\startnet
goto end

:end

LH c:\windows\smartdrv.exe
LH c:\dos\doskey.com
LH c:\mouse\mouse.com
LH c:\windows\odi.hlp
c:\windows\net start
win
```

For more information about MS-DOS Start-up Menus, please consult the
user documentation that came with your computer or MS-DOS software.

---

1 Path to the "NET.CFG" file that contains the parameter values for your WaveLAN card.
2 Path to the second "NET.CFG" file that contains the parameter values for an Ethernet card.

Installation for Apple MacOS

E

Introduction

To connect your Apple PowerBook to a wireless network, you will need to perform the following steps:

1. Install the ORiNOCO PC Card software
2. Install one or more networking protocols to allow your ORiNOCO computer to communicate with other wireless and/or wired computers on the network.
3. Power up the computer with the ORiNOCO PC Card.
4. Configure the networking protocols of your MAC operating system to select the ORiNOCO interface for network communication.

> **NOTE:**
>
> Lucent Technologies recently rebranded its WaveLAN/IEEE product line to ORINOCO, your mobile broadband wireless connection. In case you received your ORINOCO PC Card with drivers and/or documentation that still reflect the name WaveLAN, it is important to know that you can use such drivers and documentation without difficulty to install and use your product. Alternatively, consult the ORINOCO website to see whether updated drivers and documentation are available for your product.

Before you start...

⟹ **NOTE:**

Before you proceed, please note the following:

■ When upgrading from previous driver versions, always remove previously installed drivers as described in "Removing the ORiNOCO Driver" on page E-17.

■ When installing a new driver, always do so **without** the PC Card inserted into the computer.

■ New ORiNOCO drivers must be installed **prior** to inserting the card!

Installing the ORiNOCO Driver

Install PC Card Software

To install the PC Card software:

1. Insert the ORiNOCO CD-ROM into your Apple PowerBook.

2. Double-click the CD-ROM icon on the "desktop" of your computer, to display the contents of the ORiNOCO CD-ROM.

3. Now double-click the file called "ORiNOCO Installer" to start the installation program[1].

4. In the welcome window click the button **Continue** to proceed.

5. From the list of options select **Easy Install** (see Figure E-1).

⇒ **NOTE:**
   The pictures in this appendix might still show the previous name of the wireless networking system "WaveLAN" in stead of "ORiNOCO". Wherever WaveLAN is displayed, this can be replaced by ORiNOCO.

---

1 Subject to the version of the software the program might also be called the "WaveLAN Installer".

Figure E-1   PC Card Software Installation
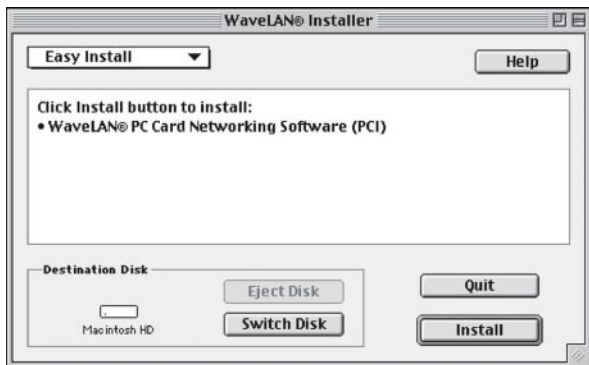
6. Click the **Install** button to start the installation.

   If you have any applications open during the ORiNOCO installation process, you will be prompted to close these applications.

   ■ Click **No** to abort installation, or

   ■ Click **Continue** to proceed and have the MAC operating system close all the open applications.

7. Follow the instructions as they appear on your screen and restart your computer.

⟹ **NOTE:**

Now that you have installed the ORiNOCO driver, you will need to add a networking protocol to allow communication with other networking devices.

Installing Networking Protocols

Subject to the type of networking environment, you should install one or more of the following protocols:

- **AppleTalk**, most commonly used to connect a number of Apple workstations to a networking environment identified as the "AppleTalk zone" or "AppleShare server"
- **TCP/IP** to connect to larger network infrastructures, and/or allow connections to the internet via the network.

Optionally you can install and enable both networking protocols. For more information about installing protocols, please consult the "balloon help" and User's Manual that came with your Apple PowerBook.

To finish the installation of the ORiNOCO drivers and networking protocols, please restart your Apple PowerBook computer.

Enabling your ORiNOCO PC Card

To enable your PC Card insert the ORiNOCO PC Card into
your computer. Once your PC Card is inserted, you will see
the ORiNOCO icon appear on the desktop of your Apple
PowerBook.

WaveLAN/IEEE

➡ **NOTE:**

If this icon is not displayed, verify if the PC Card is properly inserted
into the PC Card slot of your Apple PowerBook.

To enable your ORiNOCO connection, you will need to configure the
AppleTalk protocol to use the ORiNOCO PC Card for its network
communication.

1. Double-click the **ORiNOCO** icon on your desktop to open the AppleTalk
   Parameter window.
2. In the AppleTalk window, open the pull-down menu of the field **Connect
   via:**
3. Select the item **ORiNOCO** (some versions might still show **WaveLAN/
   IEEE**) as pictured in Figure E-2.

Figure E-2   Setting the AppleTalk Parameters
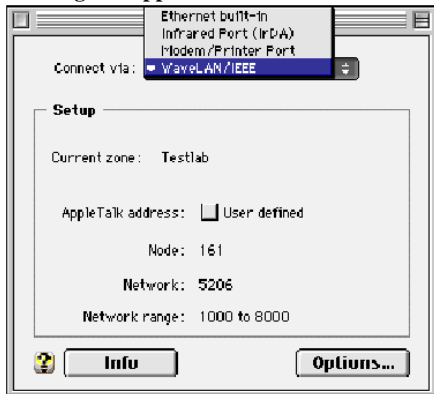
4. Click the button on the top-left side of the window to confirm your changes and close the window.

5. Click **Save** to save the new configuration.

If you are using TCP/IP as networking protocol you will need to configure the TCP/IP protocol to use the ORiNOCO PC Card for its network connections. You can access the TCP/IP settings via the option **Control Panels** in the **Apple** menu. Please consult the "balloon help" and User's Manual that came with your Apple PowerBook for more information.

Customize PC Card Settings

When you insert the ORiNOCO PC Card into your Apple PowerBook computer, it will start operation with the following factory-set defaults:

- Connect to a Network Infrastructure.
- Use the ORiNOCO Network Name "ANY" to connect to the first access point that provides a communications quality that is acceptable or better.

To view or modify the ORiNOCO parameters, open the **ORiNOCO Setup** window that is listed under the **Apple** menu, as an item in the **Control Panels** (see Figure E-3 below).

Figure E-3   Setup ORiNOCO Parameters
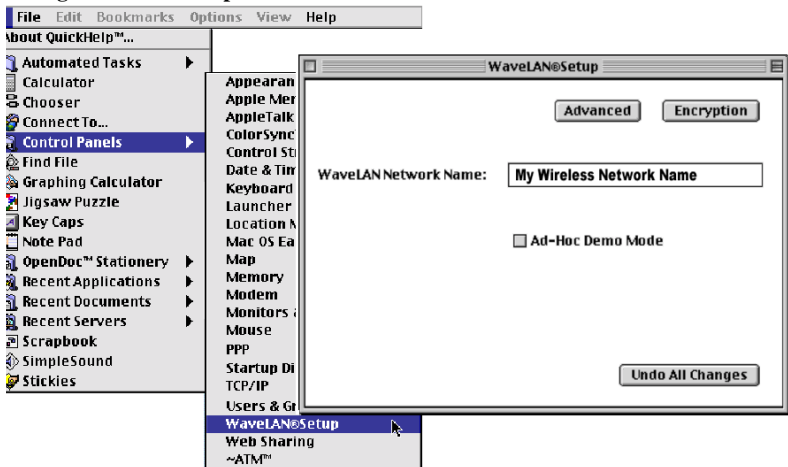
Basic Parameters

For standard operation of your ORiNOCO PC Card, you will only need to set the following parameters, characterized as the Basic Parameters:

- Type of network to which you wish to connect your wireless computer.
- The ORiNOCO Network Name of the network.

Type of Network

IEEE 802.11 compliant LANs identify two types of networks:

- **IEEE 802.11 Infrastructures** - Wireless networks that include access points to allow the wireless stations to connect to other wired or wireless stations, and provide seamless wireless connectivity to roaming mobile stations.

- **Ad-hoc wireless workgroups** - small stand-alone workgroups of wireless computers, which do not include access point devices.

⟹ **NOTE:**

Ad-hoc demo mode is not compatible with Peer-to-Peer mode.

To connect to an infrastructure network:

1. Clear the **Ad-hoc Demo Mode** tick box, and
2. Enter the name of the ORiNOCO wireless infrastructure in the field **Network Name**.

To connect to an Ad-hoc workgroup of wireless stations:

1. Place a check mark in the **Ad-Hoc Demo Mode** tick box. In this mode your ORiNOCO PC Card will:

   - Ignore the ORiNOCO Network Name value.
   - Ignore ORiNOCO access points.
   - Fix the radio channel to operate at its factory-set default channel.

This means that your ORiNOCO station can communicate with any other ORiNOCO station within its range, provided that these stations have been equipped with cards that have a matching default radio frequency (see Table A on page A-10).

ORiNOCO Network Name

If you selected to connect to an infrastructure network, you will need to identify the name of that network. Consult your LAN Administrator for the value that applies in your situation.

- Valid values are any alphanumeric string in the range of "a-z", "A-Z" and "0-9" including spaces, with a maximum of 32 characters. For example: "My Wireless Network".

- Alternatively, you can use the value "ANY" (all-uppercase). This might be the preferred option when:

    - You operate your computer in multiple network environments that are identified by different WaveLAN Network Names.

    - You do not know the ORiNOCO Network Name of the network to which you would like to connect your computer.

$\implies$ **NOTE:**

> If you select the value "ANY" please note that the LAN Administrator may have selected to "close" the network infrastructure.

Advanced Parameters

The other parameters available from the ORiNOCO Setup window, are advanced parameters that will work most efficient when you leave the settings to these parameters to their factory-set defaults.

You may only need to modify these parameters when troubleshooting ORiNOCO performance upon advice of a ORiNOCO expert, or a ORiNOCO Technical Support representative.

A detailed description of these parameters can be found in Chapter 4 "Advanced Configurations". Although this paragraph is basically oriented at Microsoft Windows 95/98 operating systems, this chapter will provide you sufficient information to learn more about the setting of these parameters.

➡ **NOTE:**

The parameter names described in Chapter 4 "Advanced Configurations" are slightly different from the names in the ORiNOCO Setup window for Macintosh operating systems.

You have access to these advanced parameters by clicking the **Advanced** or **Encryption** button on the ORiNOCO Setup window.

Advanced Settings Window

On the Advanced Settings windows you can adjust the following parameters (see Figure E-4):

- ■ Mac Address
- ■ Distance between APs
- ■ Microwave Oven Robustness
- ■ RTS/CTS Medium Reservation
- ■ Card Power Management

For more information about these parameters refer to the information as described in the installation of MS-Windows systems (Chapter 4 "Advanced Configurations").

Figure E-4   Advanced Settings Window
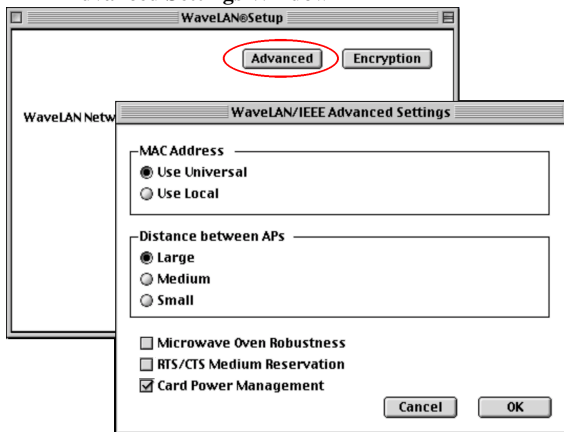
Encryption Settings Window

On the Encryption Settings windows you can enable encryption and define up to four different encryption keys (see Figure E-5).

For more information about encryption refer to the information about installation of MS-Windows systems (paragraph "Encryption Parameters Tab" on page 4-1).

In most networks encryption settings are defined by the LAN Administrator. For more information contact your LAN Adminstrator.

Figure E-5   Encryption Settings Window
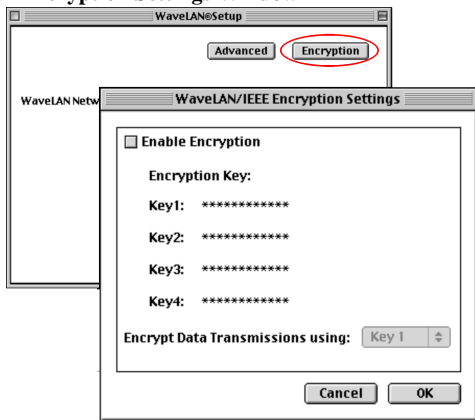
Using ORiNOCO with PowerBooks

Monitoring Wireless Performance

The ORiNOCO software for Apple PowerBook devices, does not include diagnostic tools to validate the radio link quality.

However if your network also includes MS-Windows 95/98 or MS-Windows NT v4.0 computers, you can use such stations to monitor wireless communications between the other station and your Apple PowerBook device.

■ For Independent Network environments, you should start the Client Manager program on a ORiNOCO computer running either the MS-Windows 95, 98 or Windows NT operating system.

The **Link Test** mode of this utility enables you to analyze the communications quality between the Initiator Station and your Apple PowerBook device (identified as the "Remote Station").

■ In Infrastructure Networks, consult the LAN Administrator to run the AP Manager tool.

The **Remote Link Test** of this utility enables the LAN Administrator to analyze the communications quality between a AP-1000 device (identified as the Initiator Station) and your Apple PowerBook (identified as the Remote Station).

Modifying Configuration Parameters

To view or modify the ORiNOCO parameters, open the ORiNOCO Setup window that is listed under the Apple Menu, as an item in the Control Panels (see Figure E-3 on page E-9).

- Click the button at the top-left side of the window to confirm changes and close the window.
- Click the button **Undo Changes** at the lower left-side of the window to restore any modification, and click the button at the top-left side of the window to close the window again.

Removing the ORiNOCO PC Card

To remove the ORiNOCO PC Card while your computer is powered on:

1. Change the settings of the ORiNOCO PC Card using TCP/IP and/or AppleTalk protocols: change the option **Connect via** to another port than WaveLAN/IEEEE or ORiNOCO.
2. Next click the ORiNOCO PC Card icon on your desktop and drag this to the Trash icon on your desktop.
   The PC Card will be ejected from your computer.

Removing the ORiNOCO Driver

If you wish or need to remove previously installed drivers, you can do so using the ORiNOCO Installer program.

Removing previously installed drivers is mandatory if you wish to upgrade a driver.

To remove the drivers, proceed as follows:

1. Insert the ORiNOCO CD-ROM for the MAC operating system into your Apple PowerBook.
2. Double-click the CD-ROM icon on the "desktop" of your computer, to display the contents of this ORiNOCO CD-ROM.
3. Now double-click the file called "ORiNOCO Installer" to start the installation program[1].
4. In the welcome window click the button **Continue** to proceed.
5. From the list of options select **Custom Remove**.
6. Select the check-boxes of all items you want to remove (normally you want to remove all items).

---

1   In case of older versions of the software, the file is called "WaveLAN Installer".

7. Click the **Remove** button to remove all selected items.

   If you have any applications open during the ORiNOCO installation process, you will be prompted to close these applications.

   - Click **No** to abort the process, or
   - Click **Continue** to proceed and have the MAC operating system close all the open applications.

8. Follow the instructions as they appear on your screen and restart your computer.

Installation for Windows NT

F

Introduction

Unlike Windows 95/98, Windows NT operating systems (v3.51 and v4.0) do not support "Plug & Play" and "Hot Swapping" of PC Cards:

- In order to start the driver installation for your ORiNOCO PC Card, you will need to "introduce" the card to the operating system.
- To swap PC Cards, Windows NT machines typically require you to restart the computer in order to recognize the card and load the drivers.

The Windows NT operating system also identifies user profiles (accounts) that are associated with dedicated levels of authority (privileges) like the ones listed below:

- Users - are allowed to change the visual appearance of the Windows NT desktop and user-defined preferences.
- Power Users - can create "User Accounts" or "User Groups".
- Administrators - can manage and control the overall configuration of the workstation.

⇒ **NOTE:**

To install (or uninstall) the ORiNOCO PC Card in a Windows NT environment, you will need to login as the "Administrator", or ensure that your login profile provides the same level of privileges. The privilege settings for each user (account) are set in the Microsoft Windows NT "User Manager" program. Please consult the documentation that was shipped with your Microsoft Windows NT operating system or station for more information.

Installing the ORiNOCO Driver

Overview

1. Starting installation
2. Enabling PCMCIA Services
3. Enabling Network Support for your (client) station.

⇒ **NOTE:**

Some computer manufacturers that ship computers with a factory-installed version of the Microsoft Windows NT operating system, often include a PC Card wizard, that enables "Plug & Play" for the Windows NT operating system. If your computer automatically detects the new card, you may skip the following section and turn to "Enabling Network Support" on page F-6.

Starting Installation

To install the ORiNOCO PC Card on a computer running Windows NT (version 3.51 or 4.0), proceed as follows:

1. Insert the ORiNOCO PC Card into your computer.
2. Power up your computer.
3. Continue with Enabling PCMCIA Services.

⇒ **NOTE:**

To be able to perform the steps as described on the following pages, you will need the privileges of the Windows NT station administrator. From the Start menu, use the option "Log Off xxxxx" to close all windows" and log on as "Administrator".

Secondly, you will need to verify that the computer system has at least NT Service pack v4.0 installed (check the blue start-up screen of Microsoft Windows NT).

If the computer on which you plan to install the WaveLAN PC Card is running with Service Pack v3.0 or lower, you will need to download Service Pack v4.0 from the Microsoft website (**http://www.microsoft.com**) and install the Service Pack prior to installing the ORiNOCO PC Card.

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Enabling PCMCIA Services

To allow the Windows NT operating system to detect PC Cards in the computer's PC Card slot, you must enable the PC Card Socket controller, identified as the PCMCIA device.

1. Click the **Start** button, then select **Settings** and then click **Control Panel**.

2. Double-click the **Devices** icon.

3. Scroll down the list of devices and select the item **PCMCIA**.

Figure F-1   Enable the PCMCIA service for Windows NT
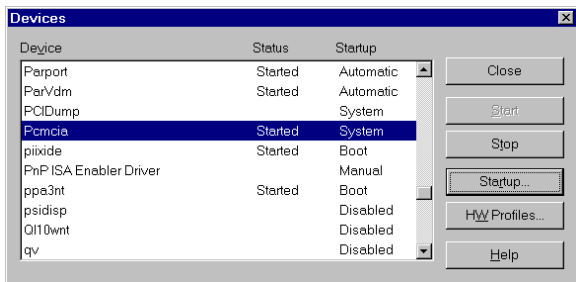
4. Click the button **Startup** on the right side of the **Devices** window, and set the Startup type for the item PCMCIA to **Boot**.

5. Click **OK** to confirm and return to the Devices window.

6. Click **Close** to return to the Control Panel.

Enabling Network Support

To introduce your ORiNOCO network adapter card to the Windows NT operating system, you will need to enable Network support for your ORiNOCO wireless station.

1. From the Windows NT Taskbar, click the **Start** button.

2. Click on **Settings**, then **Control Panel**.

3. In the Control Panel window, double-click the **Network** icon to open the Network Settings window.

   Network

   ■ If no network has been installed yet, you will be prompted to install it now.
     Click **Yes** to install Windows NT Networking, and follow the instructions as they appear on your screen.

   ■ If networking support was already installed, you will see a window with multiple tabs.

4. Select the tab **Adapters**, and click the **Add** button.

5. When prompted to select a driver, select "Driver from diks provided by hardware manufacturer" and enter the following path: **d:\drivers\win_nt**[1].

6. Follow the instructions on your screen and restart your computer when prompted to do so.

7. Configure your ORiNOCO PC Card as described in "Set Basic Parameters" on page 2-11.

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1 Where d:\represents the drive letter of your CD-ROM.

Warranty Repair Card

W

About Warranty and Repair

In case your ORiNOCO product is not working properly, you are advised to consult Appendix B "Troubleshooting" prior to contacting ORiNOCO Technical Support.

In case this does not help you solving the problem, contact ORiNOCO Technical Support as described on the last pages of this document.

If it appears that your unit needs a rpair or replacement retrun to your Dealer/Distributor in its original packaging

Warranty Repairs:

When returning a defective product for Warranty, always include the following documents:

- Problem Report Form (an electronic copy is available on the CD-ROM (**report.txt**).
- The Warranty Repair card, and
- A copy of the invoice/proof of purchase

Warranty Repair Card

All other Repairs:

When returning a defective product for Repair, always include the the
Warranty Repair card.

You are advised to read the Information about "Limited Warranty" as
described on the following page.

Limited Warranty

Lucent Technologies extends a limited warranty from date of purchase of:

- Thirty-six (36) months for ORiNOCO hardware products
- Twelve (12) months for AP-1000
- Twelve (12) months for the media on which the software is furnished and
  the reproduction of the software on the media.

Upon proof-of-purchase Lucent Technologies shall at its option, repair or replace the defective item at no cost to the buyer.

Defective items shall be returned to the dealer/distributor:

■ Freight prepaid.

■ Accompanied by a copy of proof-of-purchase.

■ Accompanied by a filled out Warranty/Repair card.

This warranty is contingent upon proper use in the application for which the products are intended and does not cover products which have been modified without the seller's approval or which have been subjected to unusual physical or electrical demands or damaged in any way.

**This Warranty constitutes the sole and exclusive remedy of any buyer or seller's equipment and the sole and exclusive liability of Lucent Technologies in connection with the products and is in lieu of all other warranties, express, implied or statutory, including, but not limited to, any implied warranty of merchantability of fitness for a particular use and all other obligations or liabilities of Lucent Technologies.
In no event will Lucent Technologies Inc. or any other party or person be liable to you or anyone else for any damages, including lost profits, lost savings or other incidental or consequential damages, or inability to use the software provided on the software media even if Lucent Technologies or the other party person has been advised of the possibility of such damages.**

Warranty Repair Card

To be filled out by the User:

Product Description:	
COMCODE (Product ID):	
Serial Number:	
Invoice Date:	(dd/mm/yyyy)
Name:	
Title:	
Company:	
Address:	
City/State/Zipcode:	
Country:	
Telephone:	
Fax:	
Email:	

To be filled out by the Dealer/Distributor:

Dealer Name:	
Address:	
City/State/Zipcode:	
Country:	
Telephone:	
Fax:	
Warranty	**Comment**
❏ Yes	
❏ No	

Return Approval Reference:

Reported Problem:		**Problem Description:**
❏	Out-of-Box Failure	
❏	Other	

Technical Support

If you encounter problems when installing or using this product, please consult the ORiNOCO website at: **http://www.lucent.com/orinoco** for:

- the latest software, user documentation and product updates
- the Frequently Asked Questions (FAQ)

Alternatively please contact your local authorized ORiNOCO reseller for Technical Support.

Help us helping you by completing the ORiNOCO problem report form and include it with your e-mail or fax when contacting Technical Support. You can find the problem report form (**report.txt**) on:

- the ORiNOCO CD-ROM, and
- the support pages of the ORiNOCO website.

Addresses of authorized ORiNOCO resellers are listed in the "Contact & Ordering" section of the ORiNOCO website.

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