Intel® PRO/Wireless 5000 Type 3 Mini-PCI Adapter

User's Guide

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Overview

Welcome to the Intel® PRO/Wireless 5000 LAN Mini-PCI Adapter User's Guide. This guide covers software installation, configuration, and troubleshooting. To select a topic, click a link in the contents column to the left. After installing the adapter, register your adapter online.

Introduction to Wireless Networking

The Intel® PRO/Wireless 5000 LAN Adapter is an Intel® PRO/Wireless 5000 LAN network product. Intel® PRO/Wireless 5000 LAN network products are based on the IEEE 802.11a standard and connect computers together to form a wireless network. Intel® PRO/Wireless 5000 LAN Adapters offer 54 Mbps data rates using clean spectrum 5 GHz transmissions.
A Local Area Network (LAN) is a network in a central location. Users at that location share files, printers, and other services. In a LAN, a networked computers that request services are called clients, while servers in a LAN provide services. In a wireless LAN (WLAN), wireless adapters are installed in clients. A wireless client communicates with the WLAN without cables. Instead, wireless clients send and receive information through the air.
A wireless client operates in either infrastructure mode or peer-to-peer mode.

Infrastructure Mode: A WLAN with Access Points

In infrastructure mode, wireless clients send and receive information through access points. When a wireless client communicates with another, it transmits to the access point. The access point receives the information and rebroadcasts it. Then the other device receives the information.
Access points are strategically located within an area to provide optimal coverage for wireless clients. A large WLAN uses multiple access points to provide coverage over a wide area. Access points can connect to a LAN through a wired Ethernet connection. Access points send and receive information from the LAN through this wired connection.

Peer-to-Peer Mode: A WLAN without Access Points

In peer-to-peer mode, also called Ad Hoc Mode, wireless clients send and receive information to other wireless clients without using an access point. In contrast to infrastructure mode, this type of WLAN only contains wireless clients.
You can use peer-to-peer mode to network computers in a home or small office, or to set up a temporary wireless network for a meeting.

Identifying a WLAN

All adapters and access points in a WLAN use a Network Name, or Service Set Identifier (SSID) to identify the WLAN. The SSID indicates what WLAN you are communicating with.

Wireless Security

Wireless networking devices transmit information through the air. Without implementing security, it is easy for an unauthorized person to intercept the information.
A common way of implementing security and protecting information is encryption. Before sending information, the wireless client or access point encrypts or scrambles information using an encryption key. The device receiving the information uses the same key to decrypt or unscramble the information. The information is only readable to wireless devices that have the correct encryption key.

64-bit or 128-bit security

The IEEE 802.11 wireless LAN standard specifies the Wired Equivalent Privacy (WEP) encryption and decryption algorithm. The standard includes two levels of security, using a 64-bit key or a 128-bit key. Some vendors refer to 64-bit encryption as 40-bit. These are identical. A wireless device that claims to have 64-bit encryption interoperates with a device that claims to have 40-bit encryption.
To implement WEP, use either the 64-bit or 128-bit method. For better security, use a 128-bit key. A 128-bit key has several trillion times as many possible combinations as a 64-bit key. For added security, change your keys often.
The same device, host computer or front-end processor usually performs both encryption and decryption. The algorithm, like the pattern of a lock, is standardized and may be used by anyone, but the encrypted data is unreadable without the appropriate key, which is known only by the sender and receiver of the transmitted data. You should change your keys often for added security.

Installation

- Intel® PRO/Wireless 5000 LAN Adapter Features
- LED Descriptions
- Install Drivers Under Windows
- PROSet II Software
- Uninstall the Adapter and Utility Software
- Reinstall

Intel® PRO/Wireless 5000 LAN Adapter Features

Unless otherwise specified, the information in this document applies to both the Intel® PRO/Wireless 5000 LAN Mini-PCI Adapter. Features of the Intel® PRO/Wireless 5000 LAN Adapters include:

- IEEE 802.11a specification compatibility. This open architecture allows Intel® PRO/Wireless 5000 LAN devices to communicate with wireless devices from other vendors that comply with the IEEE 802.11a standard.
- Up to 54 Mbps data rate for high-capacity, fast operation, including superior speeds even at increased range
- Driver support for Microsoft Windows* XP, 98SE, Me, and 2000
- 128, 64 (called 40 by some vendors), and 0 bit Wired Equivalent Privacy (WEP) data security and VPN compatibility
- Operation in 5 GHz UNII spectrum prevents interference from cordless phones, microwaves, Bluetooth* or 802.11b devices
- 802.1x authentication compatibility for Windows XP

Hardware Installation

For general information on how to install and remove the Mini-PCI hardware, see the documentation provided with your computer.

Install Drivers Under Windows

Review the following hardware installation guidelines before proceeding with Windows installation.

START HERE to install Mini-PCI Adapter

1. Install the Mini-PCI adapter hardware according to the manufactures installation instructions.
2. Turn on power to the computer and wait for Windows to load. Install the installation CD, and proceed to Step 3 below to select your version of the Windows operating system.

Install Windows Drivers and Utilities

Notes for First-Time Client Installation

The instructions provided for installation with the Intel® PRO Intelligent Installer apply to a first-time installation of an Intel® PRO/Wireless 5000 LAN adapter on a system on which no other Intel® PRO wired or wireless adapter has been installed. If this is not the first installation of an Intel PRO adapter on your system, the utilities installation may be different from that described in the first-time installation instructions. See the Note on Previous Installations.

The instructions provided here apply to installation of a wireless client adapter using default installation parameters. If you are a network administrator and wish to also install the **Wireless Administration Tools** AP Discovery and Site Survey as part of the installation process, or at some other time, see the Note on Administration Tools.
After completing the hardware installation, proceed to Step 3 and select your version of the Windows operating system..

3. Select your version of the Windows operating system and continue the installation with Step 4.

    - Windows XP
    - Windows 2000
    - Windows Me (Millennium Edition)
    - Windows 98SE

Windows XP

Introductory Notes for Installation under Windows XP

Before proceeding, make sure that you are operating Windows XP with administrative rights. If you log in to Windows XP without administrative rights, you may run into problems during the installation.

The Intel® PROSet II configuration utility is installed during the Intel® PRO Intelligent Installer process described below. This utility is recommended for setting up profiles and performing other wireless network management tasks. However, in order to use PROSet II for this purpose, you have to turn off the built-in Windows XP wireless configuration feature. See Turn Off Windows XP Wireless Configuration for instructions. For information on the Windows XP feature, see your Windows XP documentation.
To install your PRO/Wireless 5000 Adapter under Windows XP, proceed as follows:

4. Complete steps 1-3 under Install Drivers under Windows for your type of adapter. The **Found New Hardware Wizard** dialog appears. Verify that **Automatic search for a better driver (Recommended)** is checked.
5. Insert the Intel CD-ROM into your CD-ROM drive. The **New Hardware Found Wizard** searches for the correct driver files and copies them to your hard drive. If the Intel® PRO Network Connections menu screen appears, leave it open for future use and proceed to Step 6.
6. If a Windows Logo testing dialog appears, click **Continue Anyway**.
7. The **My WLAN Places** screen appears.
    - click **Next** to install using a default profile or
    - click **Configure** to set up a profile using configuration information obtained from your network administrator. On the **My WLAN Places** dialog, click the **New** button to create a new profile. Type a configuration name and the SSID for your wireless network. Set up security and other parameters if required. Consult your network administrator.. Click **OK** to close the dialog. Click **OK** to finish setting up the profile, then click **Close**.
8. On the **Found New Hardware Wizard** screen, click **Finish**.
9. On the **Intel® PRO Network Connections** screen, click the menu item **Install Software**. If the menu screen is not visible, remove and re-insert the Intel CD-ROM to display it, or run autorun.exe from the Intel CD-ROM.
10. On the **Welcome to the InstallShield Wizard for Intel(R) PRO Intelligent Installer** screen, click **Next**.
11. On the **License Agreement** screen, select **I accept the terms in the license agreement** and click **Next**.
12. On the **Setup Type** screen, select **Typical** and then click **Next**. This is the recommended setting for a first-time client installation. If you see a **Program Maintenance** screen instead of a **Setup Type** screen, see the Note on Previous Installations.
13. On the **Ready to Install the Program** screen click **Install**.
14. After the software is installed on your computer, click **Finish**. Click **OK** to close the log file.

Turn Off Windows XP Wireless Configuration

To turn off the Wireless Configuration feature of Windows XP so that you can use the Intel® PROSet II configuration utility to manage your wireless adapters, proceed as follows:

1. Click **Start**, **Settings**, and **Control Panel**.
2. Double-click **Network Connections**.
3. In the **LAN or High-Speed Internet** window select the **Wireless Network Connection** that is linked with your Intel® PRO/Wireless LAN Adapter.
4. Right-click and select **Properties**.
5. Click the **Wireless Network** tab.
6. Click to clear the check mark from **Use Windows to configure my wireless network settings**.
7. Click **OK**. You can now use PROSet II to set up profiles and perform other management functions on your wireless network.

The Windows XP installation of the Intel PRO/Wireless 5000 LAN Adapter software is complete. Proceed to PROSet II LAN Software for additional information.

Windows 2000

Before proceeding, make sure that you are operating Windows 2000 with administrative rights. If you log in to Windows 2000 without administrative rights, you may run into problems during the installation.

During initial adapter installation and configuration, it may take up to 2 minutes for adapter settings to be confirmed.

4. Complete steps 1-3 under Install Drivers under Windows for your type of adapter. Windows displays the **Found New Hardware Wizard**. Click **Next**. The **Install Hardware Device Drivers** dialog box appears.
5. Insert the Intel CD-ROM into your CD-ROM drive. If the Intel® PRO Network Connections menu screen appears, leave it open for future use and proceed to Step 6.
6. On the **Install Hardware Device Drivers** screen verify that **Search for a suitable driver for my device (recommended)** is selected, then click **Next**.
7. The **Locate Driver Files** dialog appears. Select **Specify a location**, select **CD-ROM** and click **Next**.
8. The **Adapter Properties** screen appears. On the **Settings** tab:
    - click **OK** to install using a default profile or
    - click **Configure** to set up a profile using configuration information obtained from your network administrator. On the **My WLAN Places** dialog, click the **New** button to create a new profile. Type a configuration name and the SSID for your wireless network. Set up security and other parameters if required. Consult your network administrator.. Click **OK** to close the dialog. Click **OK** to finish setting up the profile, then click **Close**.
9. On the **Add New Hardware Wizard** screen, click **Finish**.
10. On the **Intel® PRO Network Connections** screen, click the menu item **Install Software**. If the menu screen is not visible, remove and re-insert the Intel CD-ROM to display it, or run autorun.exe from the Intel CD-ROM.
11. On the **Welcome to the Install Shield Wizard for Intel(R) PRO Intelligent Installer** screen, click **Next**.
12. On the **License Agreement** screen, select **I accept the terms in the license agreement** and click **Next**.

13. On the **Setup Type** screen, select **Typical** and then click **Next**. This is the recommended setting for a first-time client installation. If you see a **Program Maintenance** screen instead of a **Setup Type** screen, see the Note on Previous Installations.
14. On the **Ready to Install the Program** screen click **Install**.
15. After the software is installed on your computer, click **Finish**.Click **OK** to close the log file.

The Windows 2000 installation of the Intel PRO/Wireless 5000 LAN Adapter software is complete. Proceed to PROSet II LAN Software for additional information.

Windows Me (Millennium Edition)

4. Complete steps 1-3 under Install Drivers under Windows for your type of adapter. Windows detects the adapter and the **Add New Hardware Wizard** dialog appears. DO NOT click **Next** yet. Verify that **Automatic search for a better driver (Recommended)** is checked.
5. Insert the Intel CD-ROM into your CD-ROM drive. Windows installs the driver from the CD-ROM. If the Intel® PRO Network Connections menu screen appears, leave it open for future use and proceed to Step 6.
6. The **Adapter Properties** screen appears. On the **Settings** tab:
    - click **OK** to install using a default profile or
    - click **Configure** to set up a profile using configuration information obtained from your network administrator. On the **My WLAN Places** dialog, click the **New** button to create a new profile. Type a configuration name and the SSID for your wireless network. Set up security and other parameters if required. Consult your network administrator.. Click **OK** to close the dialog. Click **OK** to finish setting up the profile, then click **Close**.
7. Click **Finish** on the **Add New Hardware Wizard** screen when the driver installation is complete.
8. When prompted to restart the computer, click **No**. You will restart it manually later.
9. On the **Intel® PRO Network Connections** screen, click the menu item **Install Software**. If the menu screen is not visible, remove and re-insert the Intel CD-ROM to display it, or run autorun.exe from the Intel CD-ROM.
10. On the **Welcome to the Install Shield Wizard for Intel(R) PRO Intelligent Installer** screen, click **Next**.
11. On the **License Agreement** screen, select **I accept the terms in the license agreement** and click **Next**.
12. On the **Setup Type** screen, select **Typical** and then click **Next**. This is the recommended setting for a first-time client installation. If you see a **Program Maintenance** screen instead of a **Setup Type** screen, see the Note on Previous Installations.
13. On the **Ready to Install the Program** screen click **Install**.
14. After the software is installed on your computer, click **Finish**.Click **OK** to close the log file.
15. Restart the computer.

The Windows Me (Millennium Edition) installation of the Intel PRO/Wireless 5000 LAN Adapter software is complete. Proceed to PROSet II LAN Software for additional information.

Windows 98SE

4. Complete steps 1-3 under Install Drivers under Windows for your type of adapter. Windows detects the adapter and the **Add New Hardware Wizard** dialog appears. Click **Next**.
5. Insert the Intel CD-ROM into your CD-ROM drive. If the Intel® PRO Network Connections menu screen appears, leave it open for future use and proceed to Step 6..
6. On the **New Hardware Wizard** screen to make it active, select **Search for the best driver for you device (Recommended)**, and click **Next**, then select **CD-ROM drive** and click **Next**.
7. The **Adapter Properties** screen appears. On the **Settings** tab:
    - click **OK** to install using a default profile or
    - click **Configure** to set up a profile using configuration information obtained from your network administrator. On the **My WLAN Places** dialog, click the **New** button to create a new profile. Type a configuration name and the SSID for your wireless network. Set up security and other parameters if required. Consult your network administrator.. Click **OK** to close the dialog. Click **OK** to finish setting up the profile, then click **Close**.
8. On the **Add New Hardware Wizard** screen, click **Finish**.
9. When prompted to restart the computer, click **No**. You will restart it manually later.
10. On the **Intel® PRO Network Connections** screen, click the menu item **Install Software**. If the menu screen is not visible, remove and re-insert the Intel CD-ROM to display it, or run autorun.exe from the Intel CD-ROM.
11. On the **Welcome to the Install Shield Wizard for Intel(R) PRO Intelligent Installer** screen, click **Next**.
12. On the **License Agreement** screen, select **I accept the terms in the license agreement** and click **Next**.
13. On the **Setup Type** screen, select **Typical** and then click **Next**. This is the recommended setting for a first-time client installation. If you see a **Program Maintenance** screen instead of a **Setup Type** screen, see the Note on Previous Installations.
14. On the **Ready to Install the Program** screen click **Install**.
15. After the software is installed on your computer, click **Finish**. Click **OK** to close the log file.
16. Restart the computer.

The Windows 98SE installation of the Intel PRO/Wireless 5000 LAN Adapter software is complete. Proceed to PROSet II LAN Software for additional information.

Note on Previous Installations

If this is not the first installation of an Intel PRO adapter on your system, the procedure for installing utilities may be different. Instead of the **Setup Type** screen displaying **Typical** and **Custom** options, a **Program Maintenance** screen appears with **Modify**, **Repair**, and **Remove** options. Follow the steps below to install the PRO/Wireless 5000 Adapter utilities from the **Program Maintenance** screen. The result will be the same as if you were doing a first-time install and had selected the **Typical** installation on the **Setup Type** screen in the Intel PRO Intelligent Installer.

1. On the **Intel® PRO Network Connections** screen, click the menu item **Install Software**. If the menu screen is not visible, remove and re-insert the Intel CD-ROM to display it, or run autorun.exe from the Intel CD-ROM.
2. On the **Welcome to the Install Shield Wizard for Intel(R) PRO Intelligent Installer** screen, click **Next**.

3. On the **Program Maintenance** screen, select **Modify** and click **Next**.
4. On the **Custom Setup** screen, accept the default settings and click **Next**.
5. On the **Ready to Install the Program** screen, click **Install**.
6. After the software is installed on your computer, click **Finish**. The result will be the same as if you had selected the **Typical** installation on the **Setup Type** screen.

Note on Administration Tools

If you are a network administrator and wish to install the **Wireless Administration Tools** AP Discovery and Site Survey as part of the installation process, or later, proceed as follows:

1. Insert the Intel CD and click **Install Software** on the Intel® PRO Network Connections menu screen, then click **Next** on the **Welcome** screen.
2. Proceed to the **Custom Setup** screen:
    - **For systems with no previous Intel PRO installations:** Accept the software license agreement and click **Next.** On the **Setup Type** screen, select **Custom** and click **Next**, then continue with Step 3.
    - **For systems with a previous Intel PRO installation:** On the **Program Maintenance Screen**, select **Modify** and click **Next**, then continue with Step 3.
3. On the **Custom Setup** screen, expand the **Configuration Tools** item by clicking the **plus sign** + at the left.
4. Click the **X** next to **Wireless Administration Tools** and select **Install this feature and all subfeatures**.
5. Click **Next**. On the **Ready to Install the Program** screen, click **Install**. Click **OK** to close the log file.

PROSet II Software

The PROSet II LAN Software utility is a Windows application that allows you to configure, manage, and set up security encryption for your adapter. Once installed, PROSet II software can be accessed from the System Tray by clicking on the green icon. When you select your PRO/Wireless LAN Adapter, PROSet II displays the following tabs: General, Setting, Mobility, Network Driver, Statistics, and Diagnostics. For detailed information about each of these tabs, press F1 on your keyboard with PROSet II open for online Help, or view Configuring with Intel® PROSet II.
The Windows installation instructions above include the steps required for installation of PROSet II software.

Uninstalling Adapter and Utility Software

How to Uninstall Mini-PCI Adapter Drivers Using Device Manager

Uninstall Drivers under Windows 2000 and Windows XP

1. Right-click **My Computer** and select **Manage**.
2. Select **Device Manager** from the list on the left.
3. Expand the **Network Adapters** item in the tree on the right.
4. Right-click **Intel PRO/Wireless 5000 LAN Mini-PCI Adapter** and select **Uninstall**.

Uninstall Drivers under Windows 98SE and Windows Me

1. Right-click the **My Computer** icon and select **Properties**.
2. Select the **Device Manager** tab.
3. Under **Network Adapters** find and select the **Intel PRO/Wireless 5000 LAN Mini-PCI Adapter** from the displayed list.
4. Click **Remove**. Windows removes the adapter.

How to Uninstall PROSet II Utility Software Using Add/Remove Programs

1. Open the **Start** menu, select **Settings**, and then select **Control Panel**.
2. Double-click **Add/Remove Programs**.
3. Find **Intel(R) PROSet II**.
4. Click **Install/Uninstall** or **Change/Remove**.
5. If you have installed the Access Point Administration Tools, repeat Steps 2 through 4 to uninstall those tools.

How to Uninstall Wired Drivers and PROSet II Software Using the Intel® PRO Intelligent Installer

The following instructions apply to drivers for Intel PRO wired adapters and PROSet software only. To remove the adapter drivers, use the instructions above under How to Uninstall Mini-PCI Adapter Drivers Using Device Manager.

1. On the **Intel® PRO Network Connections** screen, click the menu item **Install Software**. If the menu screen is not visible, remove and re-insert the Intel CD-ROM to display it, or run autorun.exe from the Intel CD-ROM.
2. On the **Program Maintenance** screen, select **Remove** and click **Next**. Wired drivers and PROSet software will be removed.
3. On the next screen, click **Finish**. Click **OK** to close the log file.

Reinstalling Adapter and Utility Software

To reinstall PRO/Wireless hardware and software, first uninstall the PRO/Wireless 5000 LAN Mini-PCI Adapter drivers and software as described under the heading Uninstalling Adapter Drivers and Software. After uninstalling, reboot the computer, then reinstall the PRO/Wireless 5000 LAN Adapter using the installation instructions in this document.

Configuring with Intel® PROSet II

Intel® PROSet II software allows you to configure and manage all Intel wired and wireless LAN connections.

The Intel® PROSet II configuration utility can be installed during the adapter installation process. This utility can be used to set up profiles and perform other wireless network management tasks. Intel® PROSet II provides the following features:

- Wired and wireless auto-sensing and switching
- Network performance management
- Profile management
- Power management
- Diagnostics
- User-configurable settings

For Windows XP users: In order to use PROSet II as your configuration utility (recommended), you have to turn off the built-in Windows XP wireless configuration feature. See Turn Off Windows XP Wireless Configuration for instructions. For information on the Windows XP feature, see your Windows XP documentation.

Viewing and Changing Network Settings

Intel® PROSet II allows you to change two groups of network settings:

- Mobile unit settings are settings for your laptop. You configure a laptop to communicate with either an access point or other computers in a peer-to-peer network.
- Security settings allow you to protect data. Data in a wireless network is broadcast through the air. If the data is unprotected, anyone can intercept it.

To view or change the network settings:

1. Double click the Intel® PROSet II icon on the right side of the Windows taskbar. If the icon is not present, click **Start**, select **Settings**, and **Control Panel**, and then double-click the Intel® PROSet II icon. To display the PROSet II icon on the taskbar, make sure **Show the tray icon** is checked in the PROSet II main window.
2. Select the wireless adapter on the left side of the Intel® PROSet II window.

3. To view or change basic settings, click the **Settings** tab.

For more information about configuring wireless network settings, click **Help** on the PROSet II Help menu.

Connecting to the Network Using an Access Point

An infrastructure network consists of one or more access points and one or more laptops with wireless adapters installed. Each access point can have a wired connection to the Local Area Network (LAN). Laptops with an installed wireless adapter communicate with an access point.

1. Double click the Intel® PROSet II icon on the right side of the Windows taskbar.
2. Select the wireless adapter on the left side of the Intel® PROSet II window.

3. Click the **Settings** tab.
4. Click **Network Settings**.
5. For the operating mode, select **Communicate with access point (802.11 Station)**.
6. Enter a **Network Name** (SSID) or select one from the list.

Use the Network Name (SSID) assigned to the access points in the wireless LAN (WLAN). The wireless adapter scans the access point and uses the channel selected by the access point. You cannot change the channel.

Connecting to a Peer-to-Peer Network

A peer-to-peer wireless network is a simple network of wireless computers that communicate directly with each other without using an access point.

To connect to a peer-to-peer network:

1. Double click the Intel® PROSet II icon on the right side of the Windows taskbar.
2. Select the wireless adapter on the left side of the Intel® PROSet II window.
3. Click the **Settings** tab.
4. Click **Network Settings**.
5. For the operating mode, select **Peer to Peer (802.11 Ad Hoc)**.
6. Enter a **Network Name** (SSID) or select one from the list.
7. Select a **Channel Number** from the pull-down list.

The Network Name (SSID) and Channel Number must be the same for all the computers in a peer-to-peer network.

Protecting Your Network with WEP Encryption

You can prevent unauthorized reception of your wireless data using the IEEE 802.11 Wired Equivalent Privacy (WEP). The standard includes two levels of security, using a 64-bit key (sometimes referred to as 40-bit) or a 128-bit key. For better security, use a 128-bit key. If you use encryption, all wireless devices on your WLAN must use the same encryption settings.

To set up 64-bit (40-bit) encryption:

1. Double click the Intel® PROSet II icon on the right side of the Windows taskbar.
2. Select the wireless adapter on the left side of the Intel® PROSet II window.
3. Click the **Settings** tab.
4. Click **Network Settings**.
5. Click **WEP Keys**.
6. If required, enter your WEP password.
7. Click **OK** . The WEP Key Configuration dialog box is displayed.
8. Enter Keys 1 through 4. Use numbers 0 through 9 and letters A through F. Only the first two columns are available for 64-bit (40-bit) encryption.
9. Select the key you want to use for encryption. The keys and selected key must be the same for the access point or for all other computers in a peer-to-peer network.

To set up 128-bit encryption:

1. Double click the Intel® PROSet II icon on the right side of the Windows taskbar.
2. Select the wireless adapter on the left side of the Intel® PROSet II window.
3. Click the **Settings** tab.

4. Click **Network Settings**.
5. Click **WEP Keys**.
6. If required, enter your WEP password.
7. Click **OK** . The WEP Key Configuration dialog box is displayed.
8. Enter Keys 1 through 4. Use numbers 0 through 9 and letters A through F .
9. Select the key you want to use for encryption. The keys and selected key must be the same for the access point or for all other computers in an Ad Hoc (peer-to-peer) network.

Using Wireless Profiles

A profile is a saved group of network settings. If you are moving from one wireless network to another, it is convenient to save the network settings for each wireless network as a profile. Then you can easily select the profile for the appropriate network.
Settings include but are not limited to the network name (SSID), channel, security settings, and TCP/IP settings. Intel® My WLAN Places allows you to edit profiles and create new profiles.

To set up a profile:

1. Double click the Intel® PROSet II icon on the right side of the Windows taskbar.
2. Select the wireless adapter on the left side of the Intel® PROSet II window.
3. Click the **Settings** tab.
4. Click **My WLAN Places**.

To edit a profile:

1. Click the **Settings** tab.
2. Click **My WLAN Places**.

To start using a profile:

1. Click the **Settings** tab.
2. From the pull-down menu, select the appropriate wireless LAN profile for your networking situation.
3. Click **Activate Profile**.

For more information about My WLAN Places, select **Contents** from the pull-down Help menu in the My WLAN Places window.

Switching Between Wired and Wireless Adapters

Adapter switching allows your computer to seamlessly switch between wired and wireless adapters. You also indicate what type of adapter you prefer to use. If this type of adapter is unavailable, your computer uses the type of adapter available.
To change the Adapter Switching settings:

1. Double click the Intel® PROSet II icon on the right side of the Windows taskbar.
2. Select the wireless adapter on the left side of the Intel® PROSet II window.
3. Click the **Mobility** tab.
4. Click **Adapter Switching**.

Limitations on the Adapter Switching Feature

- Adapter switching requires the use of DHCP. It cannot be used with fixed IP addressing.

- Only Intel wired and wireless adapters are supported.
- Adapter switching cannot be used on a Virtual Private Network (VPN).
- Adapter switching should not be applied while an active data transfer is in progress.

Setting the Adapter's Power Consumption

If your notebook computer is operating on battery power, you can adjust the power settings to extend battery life.

1. Double click the Intel® PROSet II icon on the right side of the Windows taskbar.
2. Select the wireless adapter on the left side of the Intel® PROSet II window.
3. Click the **Settings** tab.
4. Click **Power Settings**.
5. Make sure that the **Switch power mode based on power source** check box is not checked.
6. Make sure that **Let adapter manage power** is checked.

For more information about the power settings, click the **Help** button.

Managing the Adapter from the Control Panel

After you install the driver for the Intel® PRO/Wireless 5000 LAN Adapter, you can access the Intel® PRO/Wireless 5000 LAN Adapter property pages from the Networking icon in the Windows Control Panel and configure the wireless settings for the adapter. For driver installation instructions, click here.

To display the adapter properties in Windows Me and 98SE:

1. Double-click **My Computer**, and then double-click **Control Panel**.
2. Double-click **Network**.
3. Select the Intel® PRO/Wireless 5000 LAN Adapter and click **Properties**.

To display the adapter properties in Windows 2000 and XP:

1. Double-click **My Computer**, and then double-click **Control Panel**.
2. Double-click **Network** .
3. Right-click the Local Area Connection for the wireless adapter and click **Properties**.

Updating the Driver and Firmware Version

Verify that the Intel® PRO/Wireless 5000 LAN Adapter driver and firmware is the most recent version to ensure optimal functionality.

Verifying the Driver and Firmware Versions

In Windows XP, 2000, Me, and 98SE, use PROSet II to view driver and firmware versions.
To view the driver and firmware version:

1. Double click the Intel® PROSet II icon on the right side of the Windows taskbar.
2. Select the wireless adapter on the left side of the Intel® PROSet II window.
3. Click the **Network Driver** tab.
4. If you have a newer firmware file from Intel, you can click the **Update** button and update the Firmware.

Troubleshooting

Except for the lack of a wired network connection, the Intel® PRO/Wireless 5000 LAN Adapter is just like any mobile network adapter. The troubleshooting techniques that apply to mobile network adapters in general also apply to the Intel® PRO/Wireless 5000 LAN Adapter.
For an adapter to communicate with an access point:

- The Network Name (SSID) of the adapter and access point must match.
- If the WEP encryption option is enabled on the access point, the adapter must support this option and the adapter and access point must use the same encryption keys.

Windows 98SE and Me Troubleshooting Tips

For additional troubleshooting information on Windows 98SE, click here.
Use the tools provided by Windows 98SE and LAN analyzers (FTP Software NETXRAY, Novell LAN analyzer) to diagnose problems. Some common problems exhibited when the Intel® PRO/Wireless 5000 LAN Adapter has not been properly installed include:

- Windows 98SE/Me does not recognize the Intel® PRO/Wireless 5000 LAN Adapter when installed.

  Verify that Windows 98SE/Me PC Card support is installed.

  Verify the computer has a Plug and Play BIOS.

- The driver fails to load.

  A resource conflict could exist. Use the Device Manager to resolve resource conflicts. Select the System applet from the Control Panel . Select the Device Manager tab.

- The workstation cannot associate to the Intel® PRO/Wireless 5000 LAN Access Point.

  Verify the adapter Network Name (SSID) matches the Network Name of the access point. Refer to the Intel® PRO/Wireless 5000 LAN Adapter Quick Installation Guide for details on how to configure the WLAN access point and adapter.

- Degraded performance from the Intel® PRO/Wireless 5000 LAN Adapter is detected.

  Verify that the adapter is firmly seated in a PC Card slot.

  Verify that the protruding end containing the adapter antenna is not damaged.

  Associate the adapter with a different access point.

- Network drive mappings disappear when the laptop suspends or the adapter is removed then reinserted. Windows 98SEMe does not restore NetWare network drive mappings under these conditions.

  Log out and log in again, or restart the machine to restore the connections.

- Non-functioning adapter LEDs.

  Verify that the adapter Network Name (SSID) matches the Network Name of the access point.

Windows 2000 and XP Troubleshooting Tips

To diagnose problems, use the tools provided by Windows 2000 or Windows XP.

- The workstation cannot associate to the Intel® PRO/Wireless 5000 LAN Access Point.

  Verify the adapter Network Name (SSID) matches the Network Name of the access point. Refer to the Intel® PRO/Wireless 5000 LAN Adapter Quick Installation Guide for details on how to configure the WLAN access point and adapter.

- Degraded performance from the Intel® PRO/Wireless 5000 LAN Adapter is detected.

  Verify that the adapter is firmly seated in a PC Card slot.

  Verify that the protruding end containing the adapter antenna is not damaged.

- Non-functioning adapter LED.

  Verify that the adapter SSID matches the SSID of the access point.

Wireless Configuration Feature (Microsoft Windows XP only)

Microsoft Windows XP provides a built-in wireless configuration utility. It is recommended that the XP utility be disabled and that Intel PROSet II be used to configure your wireless adapter. If the XP utility is enabled and PROSet II is also loaded under Windows XP, the Windows XP utility overrides PROSet II. The PROSet II main screen displays the current status and signal strength information, but profiles in PROSet II are disabled and cannot be activated.

General Troubleshooting Guidelines

Use the Latest Release of Your Intel Installation CD-ROM

If you have more than one Intel Installation CD-ROM for your Intel PRO/Wireless 5000 LAN products, use the CD-ROM with the highest version number.

Use the Latest Version of PROSet II

The Intel® PRO/Wireless LAN software (PROSet II) included in this release supports the following:

- Intel® PRO/Wireless 5000 LAN Mini-PCI Adapter

Previous versions of PROSet II will NOT support the Intel® PRO/Wireless 5000 LAN Mini-PCI Adapter. Use the version of PROSet II that is included in this release.

Additional Sources of Information

Consult your computer and network documentation as needed. For the latest technical notes on PRO/Wireless 5000 LAN products, see the Wireless Release Notes on the Intel CD.
See Intel Support Services for additional information.

Intel® PRO/Wireless 5000 LAN Mini-PCI Adapter
Specifications

Specifications by Model		
Models	Intel® PRO/Wireless 5000 LAN Mini-PCI Adapter model WM3A5000	
Mini-PCI Adapter Physical Specifications	Form Factor	Mini-PCI Type 3A
	Dimensions	2.35" x 2" x .20" (59.75 mm x 50.97 mm x 5 mm)
	Weight	.6 oz (17 g)
	Antenna Interface Connector	Hirose U.FL, Coax, surface-mount connectors
	Connector Interface	124-pin Mini-PCI
	LEDs	Link, Activity
	Power	3.3 V
General Specifications		
Frequency and modulation	Frequency band	5.15 GHz to 5.35 GHz
	Modulation	BPSK, QPSK, 16 QAM, 64 QAM
	Wireless Medium	Orthogonal Frequency Division Multiplexing (OFDM) 5 GHz UNII
	Channels	8 Non-overlapping (4 non-overlapping in some countries)
Network	WLAN Standard	IEEE 802.11a
	Wired Standard	10/100BTx
	Architecture	Infrastructure, ad-hoc (peer-to-peer)
	Roaming	802.11a compliant for seamless roaming between access points
	Wired-to-wireless switching	Intel® PROSet II software
Security	Encryption	64-bit and 128-bit WEP
	802.11i (802.1x, Radius, EAP): enhanced wireless authentication security	Pending IEEE ratification in 2002
QOS	DCF	CSMA/CA
Range and Throughput	Data Rates	54, 48, 36, 24, 18, 12, 9, 6 Mbps
	Indoor Range	• 40 feet @ 54 Mbps • 300 feet @ 6 Mbps

	Outdoor Range	• 100 feet @ 54 Mbps • 1000 feet @ 6 Mbps
Power	Output Power	50 mW to 200 mW, depending on frequency channel
	Transmit	450-480 mA
	Receive	420-440 mA
	Idle	420 mA
	Standby	30 mA
Operating Temperature	CardBus and PCI Adapters	0 to 65 degrees Celsius
	Access Point	0 to 45 degrees Celsius
Humidity		10 to 90% non-condensing
Compatibility	OS	Microsoft Windows* 98SE*, Me*, 2000*, XP*
	WECA	Pending ratification of interoperability test and logo program by WECA (when 5 GHz standard is available)
	WHQL	Yes
Regulatory and Safety	Safety	UL, C-UL
	United States	FCC Part 15.249
	Canada	Industry Canada RSS 210
	Japan	VCCI, JATE, Telec
	Singapore	IDA
	Japan	A-tick

Intel® PRO/Wireless LAN Mini-PCI Adapter
Safety and Regulatory Notices

This section provides the following safety and regulatory notices covering the following product: Intel® PRO/Wireless 5000 LAN Mini-PCI Adapter.

Safety Notices

The FCC with its action in ET Docket 96-8 has adopted a safety standard for human exposure to radio frequency (RF) electromagnetic energy emitted by FCC certified equipment. The Intel PRO/Wireless 5000 LAN products meet the Human Exposure limits found in OET Bulletin 65, 2001, and ANSI/IEEE C95.1, 1992. Proper operation of this radio according to the instructions found in this manual will result in exposure substantially below the FCC's recommended limits.

- Do not touch or move antenna while the unit is transmitting or receiving.
- Do not hold any component containing the radio such that the antenna is very close or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- Do not operate the radio or attempt to transmit data unless the antenna is connected; if not, the radio may be damaged.
- Use in specific environments:
    - The use of wireless devices in hazardous locations is limited by the constraints posed by the safety directors of such environments.
    - The use of wireless devices on airplanes is governed by the Federal Aviation Administration (FAA).
    - The use of wireless devices in hospitals is restricted to the limits set forth by each hospital.
- Antenna use:
    - In order to comply with FCC RF exposure limits, low gain integrated antennas should be located at a minimum distance of 7.9 inches (20 cm) or more from the body of all persons.
    - High-gain, wall-mount, or mast-mount antennas are designed to be professionally installed and should be located at a minimum distance of 12 inches (30 cm) or more from the body of all persons. Please contact your professional installer, VAR, or antenna manufacturer for proper installation requirements.
- Explosive Device Proximity Warning (see below)
- Antenna Warning (see below)
- Use on Aircraft Caution (see below)
- Other Wireless Devices (see below)
- Power Supply (Access Point) (see below)

Explosive Device Proximity Warning

Warning: Do not operate a portable transmitter (such as a wireless network device) near unshielded blasting caps or in an explosive environment unless the device has been modified to be qualified for such use.

Antenna Warning

Warning: To comply with the FCC and ANSI C95.1 RF exposure limits, it is recommended when using a wireless device with an integrated antenna (whether an Access Point, a PC Card inserted into a laptop computer, or a PCI or Mini-PCI card installed in a desktop computer), that the antenna should not be positioned closer than 20 cm (7.9 inches) from your body or other persons for extended periods of time while it is transmitting (or operating). If the antenna is positioned less than 5 cm (two inches) from the user, it is recommended that the user limit exposure time.

Use On Aircraft Caution

Caution: Regulations of the FCC and FAA prohibit airborne operation of radio-frequency wireless devices because their signals could interfere with critical aircraft instruments.

Other Wireless Devices

Safety Notices for Other Devices in the Wireless Network: Refer to the documentation supplied with wireless Ethernet adapters or other devices in the wireless network.

FCC Regulations

FCC Regulations Part 15 Declaration of Conformity (DoC)

Intel Corporation declares that the equipment described in this document is within the requirements of the Code of Federal Regulations listed below:
Title 47 Part 15, Subpart B, Class B for a digital device.

This declaration is based upon the compliance of the Intel PRO/Wireless Mini-PCI Adapter model WM3A5000 to the above standards. Intel has determined that the models listed have been shown to comply with the applicable technical standards if no unauthorized change is made in the equipment and if the equipment is properly maintained and operated.
These units are identical to the units tested and found acceptable with the applicable standards. Records maintained by Intel continue to reflect that units being produced under this Declaration of Conformity, within the variation that can be expected due to quantity production and tested on a statistical basis, continue to comply with the applicable technical standards.

FCC Rules and Regulations - Part 15

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and,
2. This device must accept any interference received, including interference that may cause undesired operation.

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

off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

CAUTION: The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency. Any changes or modification to said product not expressly approved by Intel could void the user's authority to operate this device.

Canadian Department of Communications Industry Canada (IC) Notice

These digital apparatuses do not exceed the Class B limits for radio noise emissions from digital apparatuses set out in the Radio Interference Regulations of the Canadian Department of Communications.
Les présents appareils numériques n'ément pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.
These devices comply with Class B Limits of Industry Canada. Operation is subject to the following two conditions:

1. The device may not cause harmful interference, and
2. The device must accept any interference received, including interference that may cause undesired operation.

These devices are certified to the requirements of ANSI/IEEE C95.1-1992 and RSS-210 for 5 GHz UNII band devices. The use of these devices in a system operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations. For further information, contact your local Canada Industry office.

Japan Regulatory Notices

TELEC

This equipment has been certified to conform with the technical regulations of the specified radio equipment under the radio law of Japan. If you open the case to modify the circuit, you may be punished by law.
This equipment is for indoor use only under the Radio Wave law.

JATE

Refer to the JATE approval number on the equipment.

Customer Support

Intel support is available on the Web or by phone. The services contain the most up-to-date information about Intel products. You can access installation instructions, troubleshooting information, and general product information.

Web and Internet Sites

Support: http://support.intel.com
Network Products: http://www.intel.com/network
Gigabit Products: http://www.intel.com/network/solutions/gigabit.htm
Corporate: http://www.intel.com

Telephone Support

US and Canada: 1-916-377-7000 (7:00 - 17:00 M-F Pacific Time)
Worldwide access: Intel has technical support centers worldwide. Many of the centers are staffed by technicians who speak the local languages. For a list of all Intel support centers, the telephone numbers, and the times they are open, visit http://www.intel.com/support/9089.htm.

Intel® PRO/Wireless LAN Products Software License Agreement

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Intel® PRO/Wireless LAN Products Hardware Warranties

Intel® PRO/Wireless LAN Adapters - Limited Lifetime Hardware Warranty

Intel warrants to the original owner that the hardware product delivered in this package will be free from defects in material and workmanship. This warranty does not cover the product if it is damaged in the process of being installed. Intel recommends that you have the company from whom you purchased this product install the product. Intel reserves the right to fill your order with a product containing new or remanufactured components.
THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF NONINFRINGEMENT OF INTELLECTUAL PROPERTY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE ARISING OUT OF ANY PROPOSAL, SPECIFICATION, OR SAMPLE.
This warranty does not cover replacement of hardware products damaged by abuse, accident, misuse, neglect, alteration, repair, disaster, improper installation, or improper testing.
If the hardware product is found to be otherwise defective, Intel, at its option, will replace or repair the hardware product at no charge except as set forth below, provided that you deliver the hardware product along with a Return Material Authorization (RMA) number (see below), either to the company from whom you purchased it or to Intel (North America only). If you ship the hardware product, you must assume the risk of damage or loss in transit. You must use the original container (or the equivalent) and pay the shipping charge.
Intel may replace or repair the hardware product with either new or remanufactured product or parts, and the returned hardware product becomes Intel's property. Repaired or replaced products will be returned at the same revision level as received or higher, at Intel's option. Intel reserves the right to replace discontinued product with an equivalent current generation product.
This warranty gives you specific legal rights and you may have other rights which vary from state to state. All parts or components contained in this hardware product are covered by Intel’s limited warranty for this product; the product may contain fully tested, recycled parts, warranted as if new. For warranty information call the number below.

Returning a defective product

From North America:

Before returning any hardware product, contact Intel Customer Support to obtain a Return Material Authorization (RMA) number by calling +1 916-377-7000.
If the Customer Support Group verifies that the hardware product is defective, they will have the RMA department issue you an RMA number to place on the outer package of the hardware product. Intel cannot accept any product without an RMA number on the package.

All other locations:

Return the hardware product to the place of purchase for a refund or replacement.

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Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you.

Critical Control Applications

Intel specifically disclaims liability for use of the hardware product in critical control applications (including, for example only, safety or health care control systems, nuclear energy control systems, or air or ground traffic control systems) by you or your customers, and such use is entirely at the user's risk. You agree to defend, indemnify, and hold Intel harmless from and against any and all claims arising out of use of the hardware product in such applications by you or your customers.

Software

Software provided with the hardware product is not covered under the hardware warranty described above. See the applicable software license agreement which shipped with the hardware product for details on any software warranty.

Intel® PRO/Wireless LAN Access Point - Limited Hardware Warranty (3 Years)

Intel warrants to the original owner that the hardware product delivered in this package will be free from defects in material and workmanship for three (3) years following the latter of: (i) the date of purchase only if you register by returning the registration card as indicated thereon with proof of purchase; or (ii) the date of manufacture; or (iii) the registration date if by electronic means provided such registration occurs within thirty (30) days from purchase. This warranty does not cover the product if it is damaged in the process of being installed. Intel recommends that you have the company from whom you purchased this product install the product. Intel reserves the right to fill your order with a product containing new or remanufactured components. THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF NONINFRINGEMENT OF INTELLECTUAL PROPERTY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE ARISING OUT OF ANY PROPOSAL, SPECIFICATION, OR SAMPLE.

This warranty does not cover replacement of hardware products damaged by abuse, accident, misuse, neglect, alteration, repair, disaster, improper installation, or improper testing.
If the hardware product is found to be otherwise defective, Intel, at its option, will replace or repair the hardware product at no charge except as set forth below, provided that you deliver the hardware product along with a Return Material Authorization (RMA) number (see below), either to the company from whom you purchased it or to Intel (North America only). If you ship the hardware product, you must assume the risk of damage or loss in transit. You must use the original container (or the equivalent) and pay the shipping charge.
Intel may replace or repair the hardware product with either new or remanufactured product or parts, and the returned hardware product becomes Intel's property. Intel warrants the repaired or replaced hardware product to be free from defects in material and workmanship for a period of the greater of: (i) ninety (90) days from the return shipping date; or (ii) the period of time remaining on the original three (3) year warranty.
This warranty gives you specific legal rights and you may have other rights which vary from state to state. All parts or components contained in this hardware product are covered by Intel's limited warranty for this product; the product may contain fully tested, recycled parts, warranted as if new. For warranty information call the number below.

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Critical Control Applications

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Software provided with the hardware product is not covered under the hardware warranty described above. See the applicable software license agreement which shipped with the hardware product for details on any software warranty.

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