USER GUIDE

EZ Connect™ N
150 Mbps Wireless N USB Adapter

SMCWUSBS-N4

EZ Connect™ N SMCWUSBS-N4 User Guide

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To register SMC products and to review the detailed warranty statement, please refer to the Support Section of the SMC Website at http://www.smc.com.

COMPLIANCES

FEDERAL COMMUNICATION COMMISSION INTERFERENCE STATEMENT

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 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

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:
FCC RADIATION EXPOSURE STATEMENT

This device has been tested for compliance with FCC RF Exposure (SAR) limits in the typical laptop computer configuration and this device can be used in desktop or laptop computers. This device cannot be used with handheld PDAs (personal digital assistants). This device and its antenna must not be co-located or operated in conjunction with any other antenna or transmitter. SAR measurements are based on a 5mm spacing from the body and that compliance is achieved at that distance.

CE MARK WARNING $C\epsilon$ (!)

This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

NATIONAL RESTRICTIONS

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Country	Restriction	Reason/Remark
Bulgaria	None	General authorization required for outdoor use and public service
France	Outdoor use limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz	Military Radiolocation use. Refarming of the 2.4 GHz band has been ongoing in recent years to allow current relaxed regulation. Full implementation planned 2012
italy	None	If used outside of own premises, general authorization is required
Luxembourg	None	General authorization required for network and service supply(not for spectrum)
Norway	Implemented	This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund
Russian Federation	None	Only for indoor applications

ⓘ **NOTE:** Do not use the product outdoors in France.

ABOUT THIS GUIDE

PURPOSE This guide details the hardware features of the wireless adapter, including its physical and performance-related characteristics, and how to install the device and use its configuration software.

AUDIENCE This guide is for PC users with a working knowledge of computers. You should be familiar with Windows operating system concepts.

CONVENTIONS The following conventions are used throughout this guide to show information:

> **NOTE:** Emphasizes important information or calls your attention to related features or instructions.

> **CAUTION:** Alerts you to a potential hazard that could cause loss of data, or damage the system or equipment.

> **WARNING:** Alerts you to a potential hazard that could cause personal injury.

RELATED PUBLICATIONS The following publication gives basic information on how to install and use the wireless adapter.

Quick Installation Guide

Also, as part of the wireless adapter's software, there is online help that describes all configuration related features.

REVISION HISTORY This section summarizes the changes in each revision of this guide.

MAY 2011 REVISION
This is the first revision of this guide.

– 8 –

CONTENTS

1 INTRODUCTION

OVERVIEW OF THE PRODUCT

The adapter is designed to provide a high-speed and unrivaled wireless performance for your notebook and PC. With a faster wireless connection, you can get a better Internet experience, such as downloading, gaming, video streaming and so on.

The SMCWUSBS-N4's auto-sensing capability allows high packet transfer rate of up to 150 Mbps for maximum throughput. The adapter has good capability on anti-jamming and it can also interoperate with other wireless (802.11b/g) products. The adapter supports WEP, WPA and WPA2 encryption to prevent outside intrusion and protect your personal information from being exposed.

The Quick Setup Wizard guides you step by step through the installation process; the SMC Wireless N Client Utility helps you create a wireless connection immediately.

With unmatched wireless performance, reception, and security protection, the SMCWUSBS-N4 is the best choice for easily adding or upgrading wireless connectivity.

FEATURES

◆ IEEE 802.11g, IEEE 802.11b standards

◆ Supports WPA/WPA2 data security, IEEE 802.1X authentication, TKIP/AES encryption, WEP encryption

◆ Make use of IEEE 802.11n wireless technology to provide a wireless data rate of up to 150 Mbps

◆ Automatically adjust to lower speeds due to distance or other operating limitations

◆ Provides USB interface

◆ Supports Ad Hoc and Infrastructure modes

◆ Good capability on anti-jamming

◆ Supports roaming between access points when configured in Infrastructure mode

◆ Easy to configure and provides monitoring information

◆ Supports Windows 2000, Windows XP 32/64, Windows Vista 32, Windows 7

LED STATUS

Table 1: LED Indicator

Status	Working Status
Off	The driver has not been installed.
Flashing Slowing	The driver has been installed but there is no data being transmitted or received.
Flashing Quickly	There is data being transmitted or received.

2   INSTALLATION GUIDE

HARDWARE INSTALLATION

There are two ways to install the Adapter:

1. Plug the Adapter directly to the USB port on your computer.

2. Connect the Adapter and your computer through the USB cable attached in package.

NOTE: The Found New Hardware Wizard screen will pop up when the adapter is installed correctly. Click Cancel.

SOFTWARE INSTALLATION

FOR WINDOWS XP   The CD-ROM that comes with the package contains the USB driver and software utility for the Wireless USB Adapter.

The installation screens are similar for Windows 2000, Windows XP, Windows Vista and Windows 7. The installation interface for Windows XP is shown in this user guide.

To install the Wireless USB Adapter's driver and utilities for Windows 2000 and Windows XP, follow these steps:

1. Turn on your PC and wait until the Windows system has completely started.

2. Load the EZ Installation & Documentation CD that comes with the package. The install program should start automatically.

NOTE: If the install program does not start automatically, double-click My Computer, and then double-click the CD/DVD drive where the installation CD was placed. Open the SMCWUSBS-N4 folder and double-click "Setup.exe."
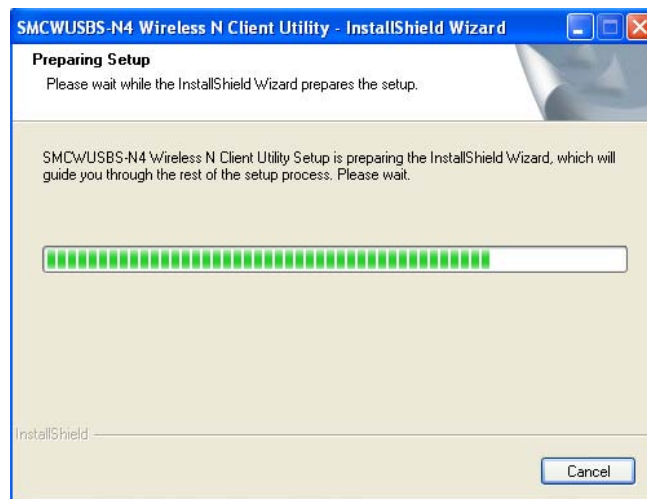
3. Click "Install Driver/Utility" to start the installation.

Figure 1: Install Driver/Utility

4. Wait for the InstallShield Wizard to start.

Figure 2: Prepare to Install

5. When the SMC Client Installation Program starts, click Next to continue.

**Figure 3: Install SMC Client Installation Program**

6. Select "Install Client Utilities and Driver." Otherwise, select "Install Driver Only" to install the driver only. Click Next to continue.

Figure 4: Install Client Utilities and Driver

7. To change the destination location for the software, click Browse and select the new location. Click Next to continue.

Figure 5: Select the Location
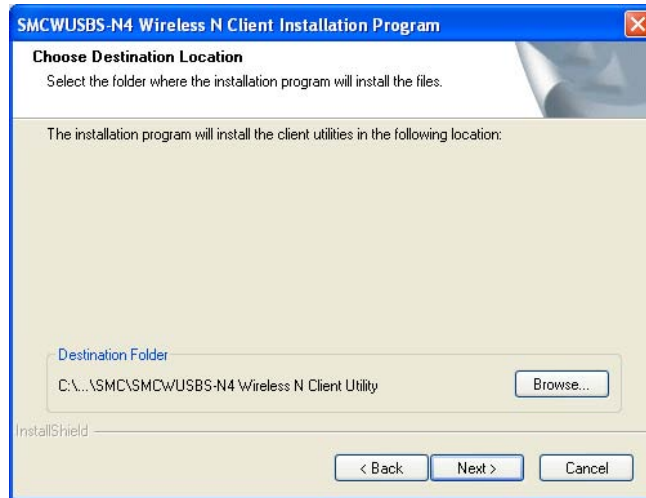
8. Select the program folder. Either create a new folder name or select one from the Existing Folders list. It is recommended to keep the default setting. Click Next to continue.
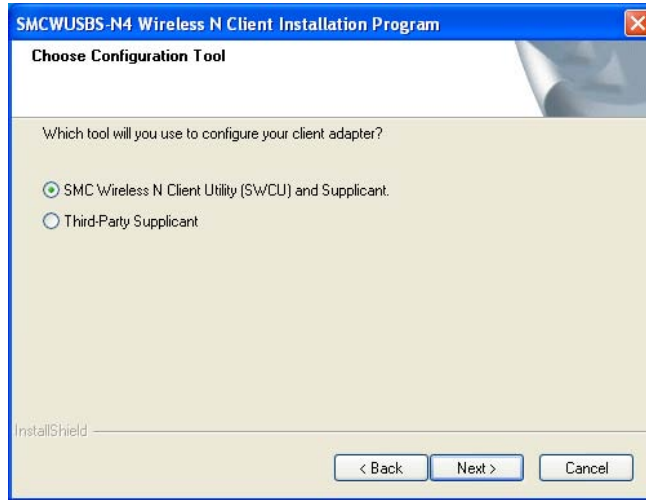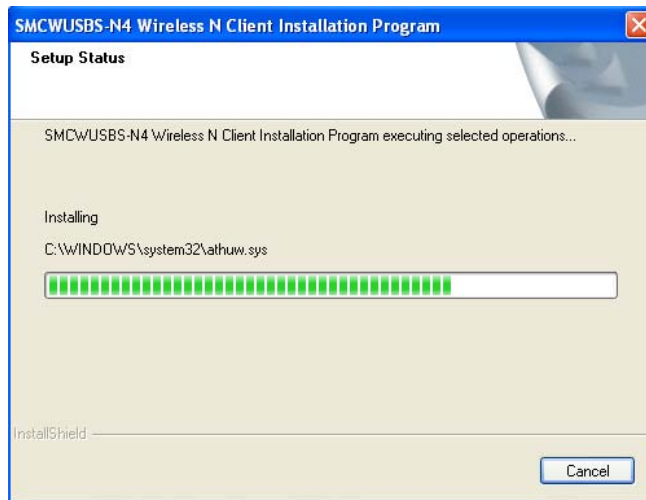
Figure 6: Select Program Folder

9. Choose the wirelesss configuration tool to use. If you are not sure, leave the default setting. Click Next to continue.

Figure 7: Choose Configuration Tool

10. Click OK to continue the Installation. Wait for the installation process to finish.

Figure 8: Installation Processing

ⓘ **NOTE:** For Windows XP, the Setup Wizard will notify you of how to proceed with the installation during these steps (as shown in Figure 9 on page 18). The drivers have been tested thoroughly, and are able to work with the operating system. Click "Continue Anyway" to continue the installation.

Figure 9: Software Installation Warning

11. When the "InstallShield Wizard Complete" message displays, click Finish to reboot the system.

Figure 10: Restart Computer

3 CONFIGURATION GUIDE
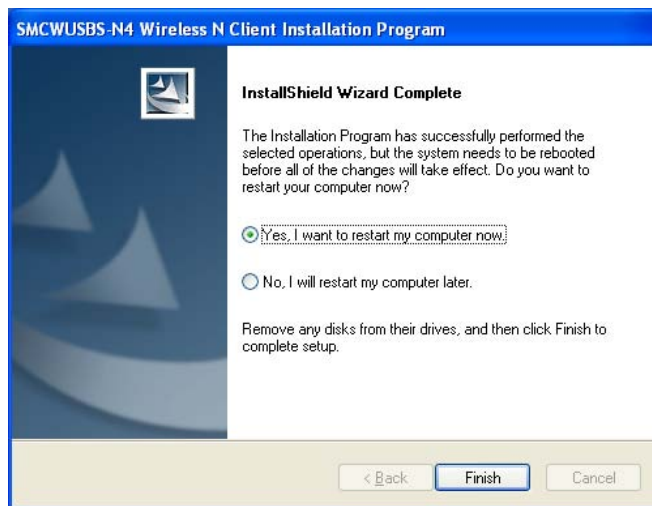
The SMCWUSBS-N4 can be configured by the SMC Wireless N Client Utility in Windows XP and 2000. This chapter describes how to configure your adapter for wireless connectivity on your Wireless Local Area Network (WLAN) and use the data security encryption features.

The configuration of the adapter in Windows XP is similar with that of Windows 2000. This User Guide takes Windows XP for example.

FOR WINDOWS XP

After Installing the adapter, the adapter's tray icon will appear in your system tray. It appears at the bottom of the screen and shows the signal strength using color based on the received signal strength indication (RSSI).

Table 2: Signal Strength System Tray Icon

	If the icon is gray, there is no connection.
	If the icon is red, there is poor signal strength and the RSSI is less than 5dB.
	If the icon is yellow, there is poor signal strength and the RSSI is between 5dB and 10dB.
	If the icon is partly green, there is good signal strength and the RSSI is between 10dB and 20dB.
	If the icon is all green, there is excellent signal strength and the RSSI is more than 20dB.

Double-click the icon and the SMC Wireles N Client Utility will run. You can also run the utility by clicking the Start->Program->SMC->SMC Wireles N Client Utility. The utility provides some integrated and easy tools to:

◆   Display current status information

◆   Edit and add configuration profiles

◆   Display current diagnostics information
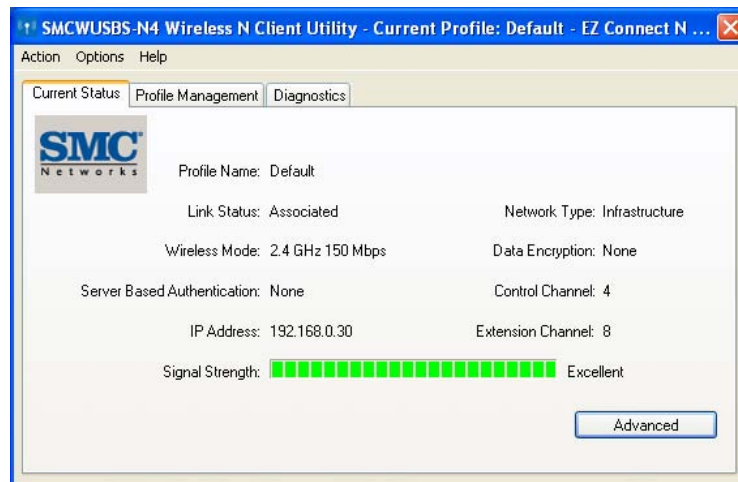
The section below introduces these above capabilities.

CURRENT STATUS

The Current Status tab contains general information about the program and its operations. The Current Status tab does not include any configuration options.

Figure 11: Current Status

The following table describes the items found on the Current Status screen.

◆   **Profile Name** - This shows the name of current selected configuration profile. The configuration of Profiles is described on the Profile Management tab.

◆   **Link Status** - Shows if the station is associated to a wireless network.

◆   **Wireless Mode** - Displays the wireless mode.

◆   **Server Based Authentication** - Shows if server-based authentication is used.

◆   **IP Address** - Displays the computer's IP address.

◆   **Signal Strength** - Shows the current strength of the wireless signal.

◆ **Network Type** - The type of network and the station currently connected are shown here. The options include:

- Infrastructure (access point)

- Ad Hoc

NOTE: You can configure the network type and wireless mode on the Advanced tab of Profile Management.

◆ **Data Encryption** - Displays the encryption type the driver is using. You can configure it on the Security tab of Profile Management.

◆ **Control Channel** - Shows the currently connected channel.

Click Advanced on the screen above, you can see advanced information about the program and its operations.

PROFILE MANAGEMENT

Click the Profile Management tab of the wireless configuration utility and the screen shown in will appear. The Profile Management screen provides tools to:

◆ Add a new profile

◆ Modify a profile

◆ Remove a profile

◆ Activate a profile

◆ Import a profile

◆ Export a profile

◆ Scan available networks

◆ Order profiles

Figure 12: Profile Management Tab
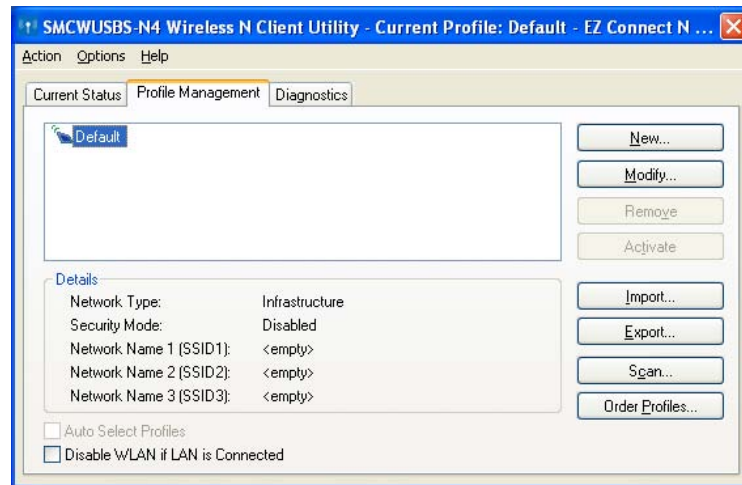
ADD OR MODIFY A CONFIGURATION PROFILE

To add a new configuration profile, click New on the Profile Management tab. To modify a configuration profile, select the configuration profile from the profile list and click Modify. Then you will see the Management dialog box (shown in Figure 13 on page 23).

EDIT THE GENERAL TAB

◆ **Profile Name** - Enter a name that identifies the configuration profile. This name must be unique. Note that the profile names are not case-sensitive.

◆ **Client Name** - Enter the profile name that identifies the client machine.

◆ **Network Names (SSIDs)** - Enter the IEEE 802.11 wireless network name. This field has a maximum limit of 32 characters.
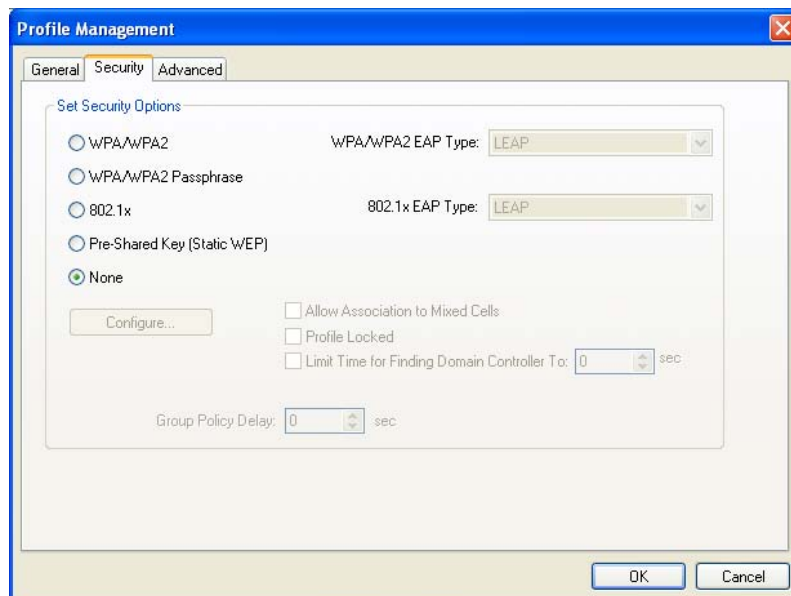
Figure 13: Profile Tab - General
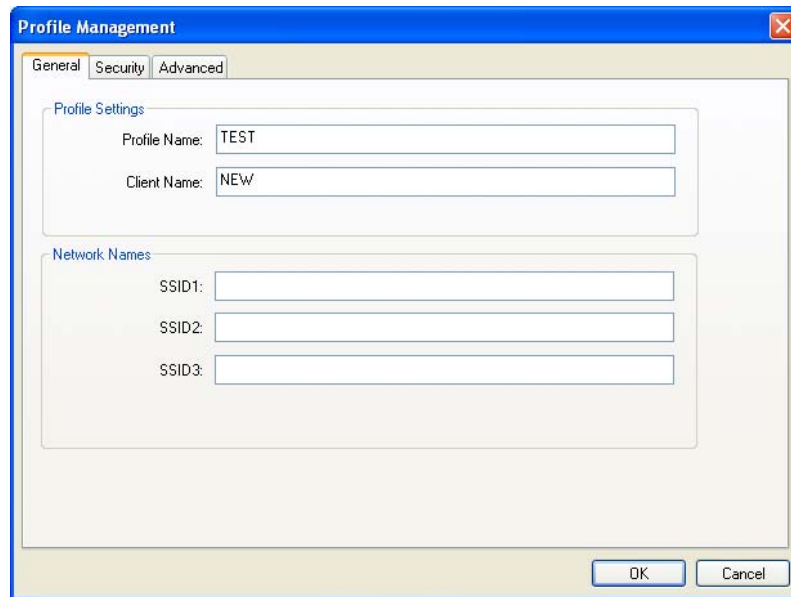
EDIT THE SECURITY TAB

Select the Security tab in the screen above, then you can edit the fields to configure the profile.

Figure 14: Profile Tab - Security

To define the security mode, select the radio button of the desired security mode as follows:

◆ **WPA/WPA2**: Wi-Fi Protected Access

◆ **WPA/WPA2 Passphrase**: Wi-Fi Protected Access Passphrase

◆ **802.1x**: Enables 802.1X security.

◆ **Pre-Shared Key (Static WEP)**: Enables the use of shared keys that are defined on both the access point and the station. To define shared encryption keys, choose the Shared Key radio button and click Configure to fill in the Define Shared Keys window (shown in Figure 15 on page 24).

◆ **None**: No security (not recommended).

ⓘ **NOTE:** If the access point to which the adapter is associated has WEP set and the client has WEP enabled, make sure that "Allow Association to Mixed Cells" is checked on the Security tab to allow association. To complete WEP encryption configuration, you must select the 802.11 Authentication Mode as appropriate on the Advanced tab of this Profile Management dialog.

To configure the Encryption Keys under the Pre-Shared keys (Static WEP) Security mode:

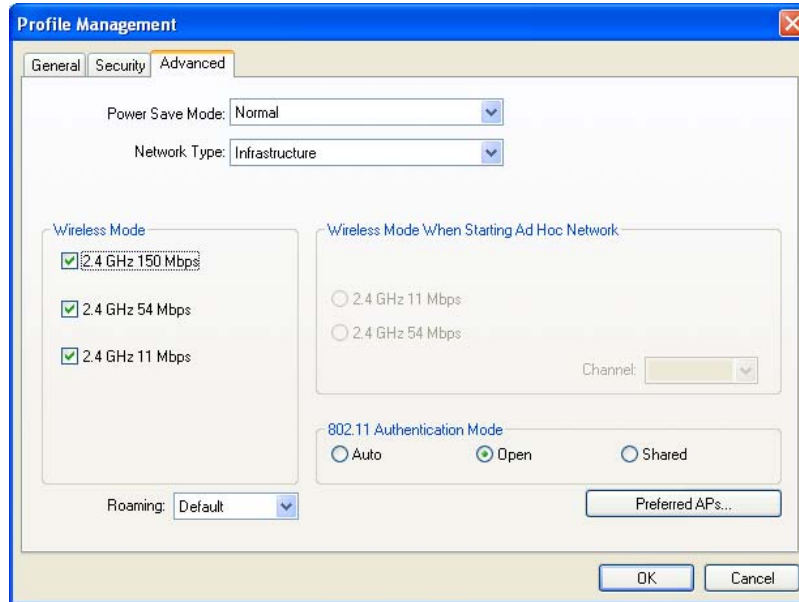**Figure 15: Profile Tab - Security (Static WEP)**
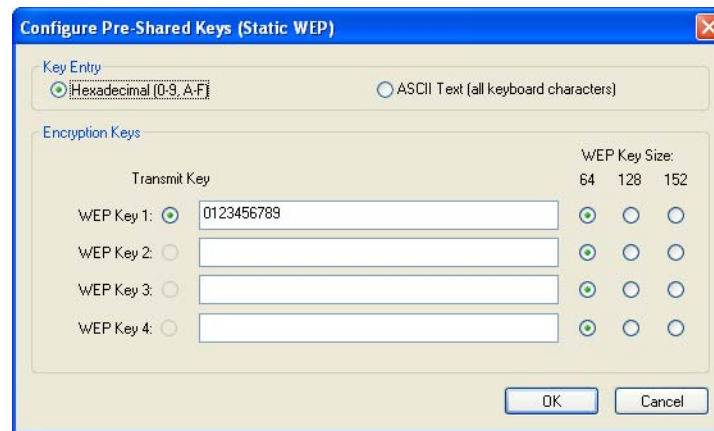
ⓘ **NOTE:** When you select different security options, the configuration is different, you can then configure the exact keys as needed.

EDIT THE ADVANCED TAB

This screen allows you to make advanced configurations for a profile.

Figure 16: Profile Tab - Advanced

◆ **Power Save Mode** - Select the power save mode from the drop-down list.

- Maximum - Selects maximum mode to let the access point buffer incoming messages for the adapter. The adapter will detect the access point if any messages are waiting periodically.

- Normal - Normal mode uses maximum when retrieving a large number of packets, then switches back to power save mode after retrieving the packets.

- Off - Turns power saving off, thus powering up the Wireless USB Adapter continuously for a short message response time.

◆ **Network Type** - There are basically two modes of networking:

- Infrastructure - All wireless clients will connect to an access point or wireless router.

- Ad Hoc - Directly connects to another computer for peer-to-peer communication using wireless network adapters on each computer, such as two or more SMCWUSBS-N4 wireless adapters.

ℹ **NOTE:** An Infrastructure network contains an access point or wireless router. All wireless devices or clients connect to the wireless router or access point.
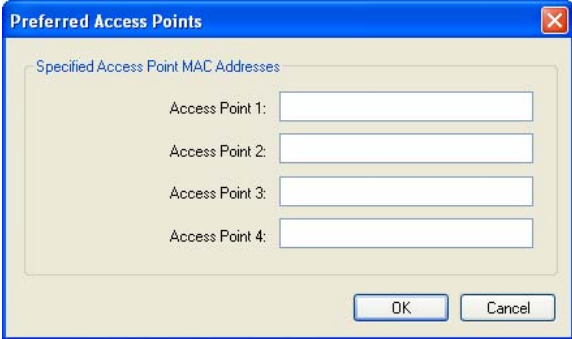
NOTE: An Ad Hoc network contains only clients, such as laptops with wireless desktop adapters. All the adapters must be in Ad Hoc mode to communicate.

Restricted by local law regulations, version for North America does not have region selection.

◆ **Wireless Mode** - Specifies 2.4 GHz 150 Mbps, 2.4 GHz 54 Mbps or 2.4 GHz 11 Mbps operation in an access point network. The wireless adapter must match the wireless mode of the access point with which it associates.

◆ **Wireless Mode when Starting an Ad Hoc Network** - Specifies 2.4 GHz 54/11 Mbps to start an Ad Hoc network if no matching network name is found after scanning all available modes. This mode also allows the selection of the channel that the wireless adapter uses. The channels available depend on the regulatory domain. If the adapter finds no other ad hoc adapters, the channel that the adapter starts the ad hoc network with will be selected automatically. The adapter must match the wireless mode and channel of the clients to which it associates.

◆ **802.11 Authentication Mode** - Select which mode the adapter uses to authenticate to an access point:

  ▪ Auto - Automatic causes the adapter to attempt authentication using "Shared," but switches it to "Open" authentication if shared fails.

  ▪ Open - Open System enables an adapter to attempt authentication regardless of its WEP settings. It will only associate with the access point if the WEP keys on both the adapter and the access point match.

  ▪ Shared - Shared-key only allows the adapter to associate with access points that have the same WEP key.

For infrastructure (access point) networks, click Preferred APs to specify four access points at most to which the client adapter that attempts to be associated. The four access points have different priorities; the first has the higher priority.

Figure 17: Preferred Access Point

REMOVE A PROFILE 1. Go to the Profile Management tab (shown in Figure 12 on page 22).

2. Select the profile name in the Profiles List.

3. Click Remove.

(i) **NOTE:** The current profile being used cannot be removed.

SWITCH ANOTHER PROFILE 1. Go to the Profile Management screen (shown in Figure 12 on page 22).

2. Select the profile name required in the Profiles List.

3. Click Activate.

EXPORT A PROFILE 1. From the Profile Management screen (shown in Figure 12 on page 22), highlight the profile to export.

2. Click Export, the Export Profile window will then appear.

3. Browse and select the folder to where you want to export the profile.

4. Click Save. The profile should then be exported to the specified location.

Figure 18: Export a Profile
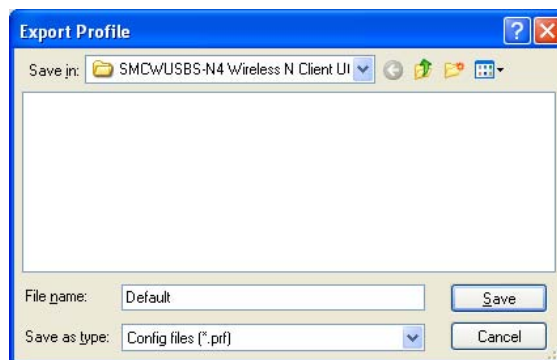
IMPORT A PROFILE 1. From the Profile Management screen (shown in Figure 12 on page 22), click Import. The Import Profile will appear.

2. Browse to the directory where the profile is located.

3. Highlight the profile name.

4. Click Open. The imported profile then appears in the Profiles List.

Figure 19: Import a Profile
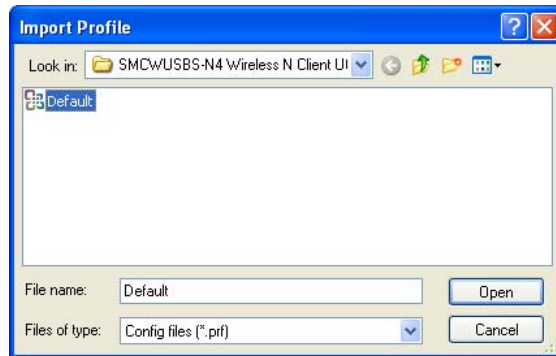
SCAN AVAILABLE NETWORKS

1. Click Scan on the Profile Management screen (shown in Figure 12 on page 22), the Available Infrastructure and Ad Hoc Networks window will appear.

2. Click Refresh to refresh the list at any time.

3. Highlight a network name and click Activate to connect to an available network. If no configuration profile exists for that network, the Profile Management window will open the General tab screen. Fill in the Profile name and click OK to create the configuration profile for that network.

Figure 20: Scan Available Networks
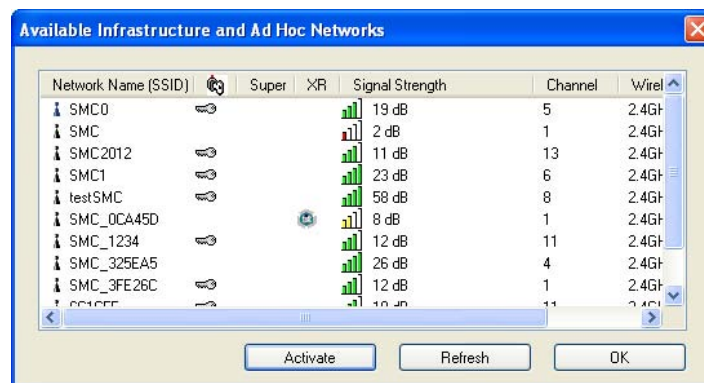
AUTO PROFILE SELECTION MANAGEMENT

The auto selection feature allows the adapter to automatically select a profile from the list of profiles and use it to connect to the network. To add a new profile into the Auto Selected Profiles list, follow these steps.

1. On the Profile Management screen (shown in Figure 12 on page 22), click Order Profiles.

2. The Auto Profiles Selection management window will appear (shown in Figure 21 on page 29) with a list of all created profiles in the Available Profiles.

Figure 21: Auto Selection Management
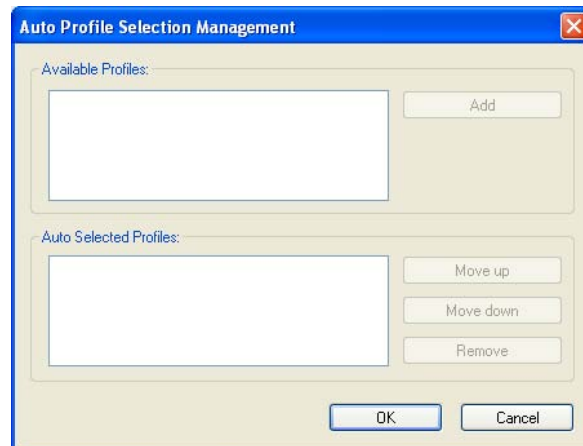
3. Highlight the profiles to add to auto profile selection, and click Add. The profile will appear in the Auto Selected Profiles box.

4. Highlight a profile in the Auto Selected Profiles box.

5. Click Move Up or Move Down as appropriate.

> **NOTE:** The first profile in the Auto Selected Profiles box has highest priority, while the last profile has the lowest priority.

6. Click OK.

7. Check the Auto Select Profiles checkbox on the Profile Management tab (shown in Figure 12 on page 22).

> **NOTE:** When auto profile selection is enabled by checking Auto Select Profiles on the Profile Management tab, the client adapter will scan for an available network. The profile with the highest priority and the same SSID as one of the found networks will be used to connect to the network. If the connection fails, the client adapter will try the next highest priority profile that matches the SSID until an available network is found.

DIAGNOSTICS

The Diagnostics tab of the SMC Wireless Lite-N Client Utility provides buttons used to retrieve receiving and transmitting statistics. The Diagnostics tab does not require any configuration.

The Diagnostics tab lists the following receiving and transmitting diagnostics for frames received or transmitted by the wireless network adapter:

◆ Multicast frames transmitted and received

◆ Broadcast frames transmitted and received

◆ Unicast frames transmitted and received

◆ Total bytes transmitted and received

Figure 22: Diagnostics Tab
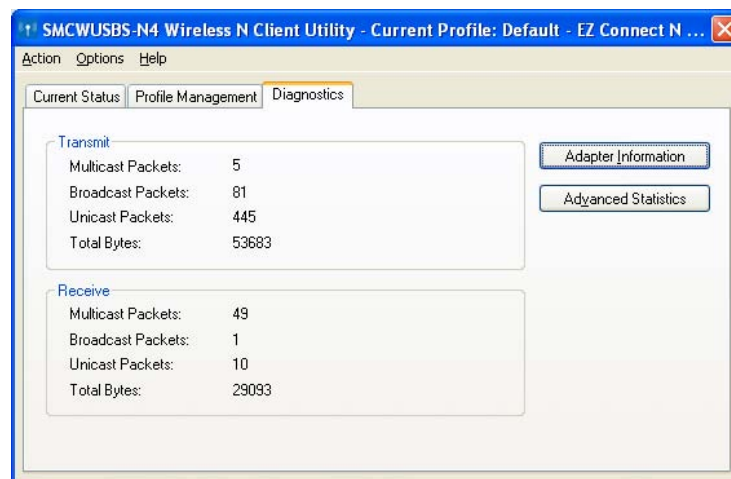
CHECK DRIVER
INFORMATION
Click the Adapter Information button in the screen above, you will see the adapter information, including general information about the wireless network adapter and the Network Driver Interface Specification (NDIS) driver. Access the adapter information from the Diagnostics tab.

◆ **Card Name** - The name of the wireless network adapter.

◆ **MAC Address** - The MAC address of the wireless network adapter.

◆ **Driver** - The driver name and path of the wireless network adapter driver.

◆ **Driver Version** - The version of the wireless network adapter driver.

◆ **Driver Date** - The creation date of the wireless network adapter driver.

◆ **Client Name** - The name of the client computer.

CHECK RECEIVE AND TRANSMIT STATISTICAL INFORMATION

The Advanced Statistics show receiving and transmitting statistical information about the following receiving and transmitting diagnostics for frames received by or transmitted to the wireless network adapter.

Figure 23: Advanced Statistics

4

WPS CONFIGURATION
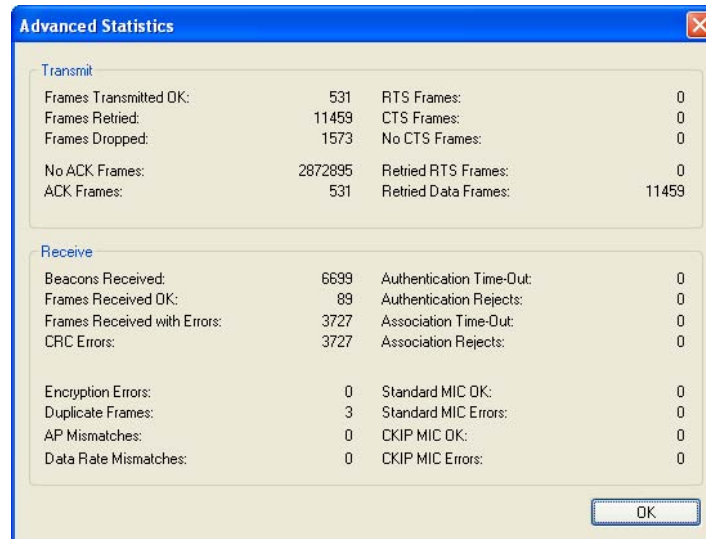
The WPS (Wi-Fi Protected Setup) function allows you to add a new wireless device to an existing network quickly.

i **NOTE:** The WPS function is not supported in Windows 7.

If the wireless card supports Wi-Fi Protected Setup (WPS), you can establish a wireless connection between wireless card and router using either the Push Button Configuration (PBC) method or PIN method.

First, the WPS software should be installed. Follow these steps:

1. Insert the Resource CD into your CD-ROM drive.

2. Double-click My Computer, and then double-click the CD/DVD drive where the installation CD was placed.

3. Open the SMCWUSBS-N4 folder, and double-click "wps.exe." The following figure (Figure 24) displays.

Figure 24: Prepare to Install WPS
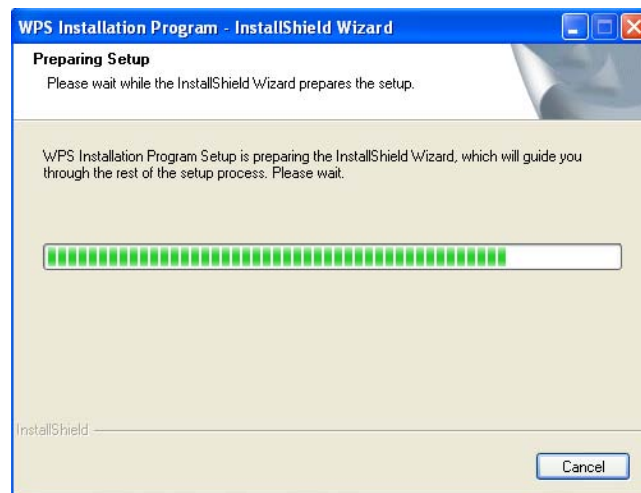
4. Follow the step-by-step instructions to complete the WPS installation.

When completed, the WPS function can be enabled. The following sections describe the two ways to use WPS.

PBC (PUSH BUTTON CONFIGURATION) METHOD

1. Press the WPS button of the AP/router. There are two ways:

a. Press the WPS button directly on the front panel of the AP/router, as shown in Figure 25.

Figure 25: WPS Button
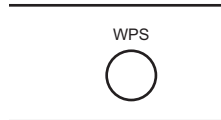
b. Open the AP/router's web-based utility and click the WPS link on the main menu. Figure 26 will display. Click Add device, then Figure 27 displays. Select "Press the button of the new device in two minutes" and click Connect.

Figure 26: WPS Setup

Figure 27: Add a New Device
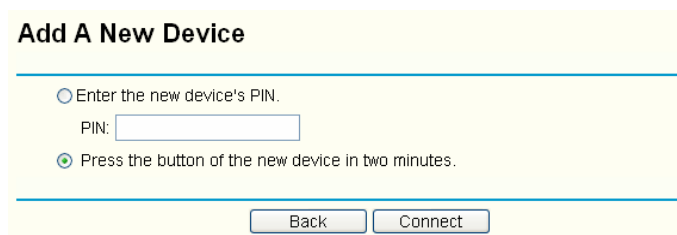
2. Press the WPS button of the adapter. There are two ways:

a. Press and hold the WPS button of the adapter directly for 2 or 3 seconds.

b. Double-click the WPS icon on the desktop to open the WPS utility. You will see the welcome screen, as shown in Figure 28. Click Next to continue, then select "Push the button on my access point" in the next screen (Figure 29) and click Next.

Figure 28: Start to Install WPS

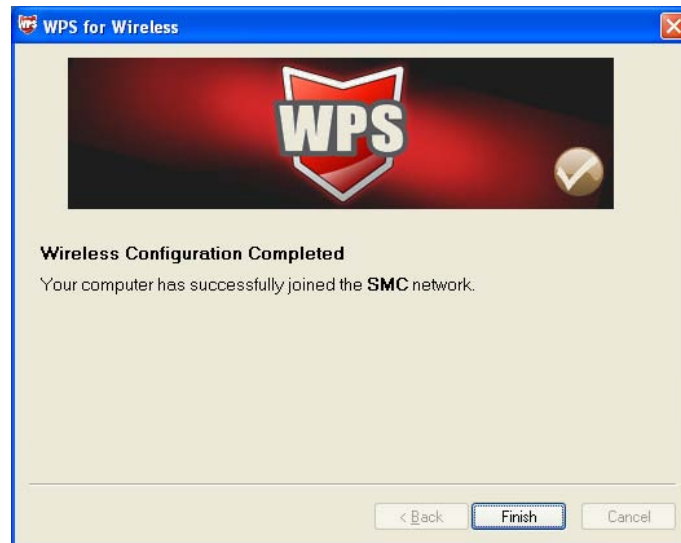**Figure 29: Select the Method**

3. Wait until the following figure appears. Click Finish to complete the WPS configuration.

Figure 30: WPS Configuration Completed

PIN METHOD

There are two ways to configure the WPS by PIN method:

1. Enter a PIN into your AP/router device.

2. Enter the PIN from your AP/router device.

The detailed configuration procedures for each method follows.

ENTER A PIN INTO YOUR AP/ROUTER DEVICE

1. Double-click the WPS icon on the desktop to open the WPS Utility. You will see the welcome screen, as shown in .

2. Click Next to continue. The "Join a Wireless Network" screen displays, as shown in .

3. Select the second option, "Enter a PIN into my access point or a registrar." You will see the PIN value of the adapter displayed, which is randomly generated. Click Next.

Figure 31: Enter a PIN into the Access Point

4. Open the AP/router's web-based utility and click the WPS link on the main menu. Then the Figure 26 on page 33 will appear.

5. Click Add device. The screen in Figure 32 appears.

Figure 32: Enter the device's PIN

6. Select Enter the new device's PIN and enter the PIN value of the adapter, click Connect.

7. When Figure 29 on page 34 appears, the WPS configuration is complete.

ENTER THE PIN FROM YOUR AP/ROUTER DEVICE

1. Open the WPS Utility. You will see the welcome screen, as shown in Figure 28 on page 34.

2. Click Next to continue. The "Join a Wireless Network" screen displays, as shown in Figure 33 on page 37.

3. Select the third option, "Enter the PIN from my access point." Then enter the PIN value, which is labeled on the bottom of the AP/router. Click Next.

Figure 33: Enter the PIN from the Access Point

4. When the screen in Figure 34 appears, the WPS configuration is complete.

Figure 34: WPS Configuration Complete
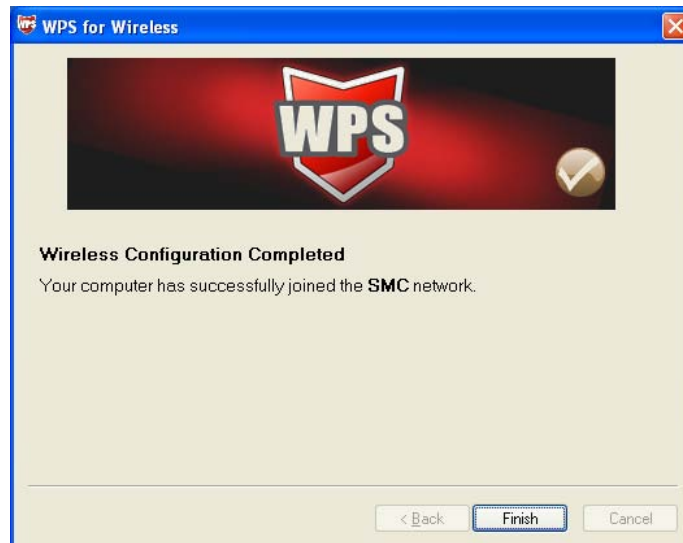
ⓘ **NOTE:** If you generate a new PIN code for your router, enter the new one instead.

A HARDWARE SPECIFICATIONS

INTERFACE USB 2.0 Interface

STANDARDS IEEE 802.11n
IEEE 802.11g
IEEE 802.11b

OPERATING SYSTEM Windows 2000
Windows XP
Windows Vista
Windows 7

RADIO DATA RATE 11n: up to 150 Mbps
11g: 6/9/12/18/24/36/48/54 Mbps
11b: 1/2/5.5/11 Mbps

MODULATION 11n: QPSK, BPSK, 16-QAM, 64-QAM
11b: CCK, QPSK, BPSK
11g: OFDM

MEDIA ACCESS PROTOCOL CSMA/CA with ACK

DATA SECURITY WPA/WPA2
64/128/152-bit WEP
TKIP/AES

FREQUENCY 2.4 ~ 2.4835 GHz

SPREAD SPECTRUM Direct Sequence Spread Spectrum (DSSS)

SAFETY & EMISSIONS FCC, CE

TEMPERATURE   Operating: 0 °C to 40 °C (32 °F to 104 °F)
Storage: -40 °C to 70 °C (-40 °F to 158 °F)

HUMIDITY   Operating: 10% to 90% RH (non-condensing)
Storge: 5%-90% RH (non-condensing)

GLOSSARY

IEEE 802.11B The 802.11b standard specifies wireless product networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4 GHz. It supports WEP encryption for security. All 802.11 networks are also referred to as Wi-Fi networks.

IEEE 802.11G The specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4 GHz. Includes backward compatibility with IEEE 802.11b devices and WEP encryption for security.

AD HOC NETWORK An ad hoc network is a group of computers, each with a wireless adapter, connected as an independent 802.11 wireless LAN. Ad hoc wireless computers operate on a peer-to-peer basis, communicating directly with each other without the use of an access point. Ad hoc mode is also referred to as an Independent Basic Service Set (IBSS) or as peer-to-peer mode, and is useful at a departmental scale or SOHO operation.

DSSS (DIRECT-SEQUENCE SPREAD SPECTRUM) DSSS generates a redundant bit pattern for all data transmitted. This bit pattern is called a chip (or chipping code). Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the receiver can recover the original data without the need of retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers. However, to an intended receiver (that is, another wireless LAN endpoint), the DSSS signal is recognized as the only valid signal, and interference is inherently rejected (ignored).

FHSS (FREQUENCY HOPPING SPREAD SPECTRUM) FHSS continuously changes (hops) the carrier frequency of a conventional carrier several times per second according to a pseudo-random set of channels. Because a fixed frequency is not used, and only the transmitter and receiver know the hop patterns, interception of FHSS is extremely difficult.

INFRASTRUCTURE NETWORK An infrastructure network is a group of computers or other devices, each with a wireless adapter, connected as an 802.11 wireless LAN. In infrastructure mode, the wireless devices communicate with each other and to a wired network by first going through an access point. An infrastructure wireless network connected to a wired network is referred to as a Basic Service Set (BSS). A set of two or more BSS in a single network is referred to as an Extended Service Set (ESS). Infrastructure mode is useful at a corporation scale, or when it is necessary to connect the wired and wireless networks.

SPREAD SPECTRUM Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communications systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not tuned to the right frequency, a spread-spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS).

SSID A Service Set Identification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless access point and to the wireless network name. See also Wireless Network Name and ESSID.

WEP (WIRED EQUIVALENT PRIVACY) A data privacy mechanism based on a 64-bit, 128-bit, or 152-bit shared key algorithm, as described in the IEEE 802.11 standard. To gain access to a WEP network, you must know the key. The key is a string of characters that you create. When using WEP, you must determine the level of encryption. The type of encryption determines the key length; 128-bit encryption requires a longer key than 64-bit encryption. Keys are defined by entering a string in HEX (hexadecimal - using characters 0-9, A-F) or ASCII (American Standard Code for Information Interchange – alphanumeric characters) format. The ASCII format is provided so you can enter a string that is easier to remember. The ASCII string is converted to HEX for use over the network. Four keys can be defined so that you can change keys easily.

WI-FI A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see http://www.wi-fi.net), an industry standards group promoting interoperability among 802.11b devices.

WLAN (WIRELESS LOCAL AREA NETWORK) A group of computers and associated devices communicate with each other wirelessly, which serves network users in a limited local area.

WPA (WI-FI PROTECTED ACCESS) A wireless security protocol that uses TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.

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