

Wireless PCI Card

WL-8305

User's Manual



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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 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:

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

FCC Caution

To assure continued compliance. (example-use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm(8 inches) during normal operation.

R&TTE Compliance Statement

This equipment complies with all the requirements of DIRECTIVE 1999/5/CE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL OF 9 March 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE)

The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8,2000.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

EU Countries Intended for Use

The ETSI version of this device is intended for home and office use in Austria Belgium, Denmark, Finland, France (with Frequency channel restrictions). Germany, Greece, Ireland, Italy, Luxembourg .The Netherlands, Portugal, Spain, Sweden and United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states Iceland, Liechtenstein, Norway and Switzerland.

Potential restrictive use

France: Only channels 10,11,12 and 13

Revision

User's Manual for PLANET Wireless PCI Adapter

Model: WL-8305

Rev: 1.0 (July, 2002)

Part No. EM-WL8305V1

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Chapter 1 Introduction

Thank you for purchasing WL-8305 PCI Wireless LAN Adaptor. This wireless adapter for PCI standard version 2.2 compliant desktop PCs, is fully compatible with IEEE 802.11b standard and supporting higher data rate up to 22Mbps. It can operate in either Ad-Hoc mode (Point to Point/Point to Multipoint without Access Point) or Infrastructure mode (Point to Point/Point to Multipoint with Access Point). It operates in 2.4GHz unlicensed ISM band in the home or office environment.

WL-8305 provided with a detachable dipole antenna and is connected to PC's PCI slot. Thus, it is capable of being placed practically anywhere on or around your computer to get better signal quality and longer connection distance.

The WL-8305 is compatible with Windows 98, Me, 2000 and XP. It supports 64/128-bit and 256-bit WEP (Wired Equivalent Privacy) Encryption for securing wireless network connection. It's data rate support 22, 11, 5.5, 2 and 1 Mbps. The 22Mbps data rate is designed by the Packet Binary Convolutional Code (PBCC) modulation technique. With its auto-fallback function, the data rate can be move to lower speed if signal quality is not good enough.

1.1 Features

- 2.4GHz ISM band, unlicensed operation
- Wireless connection without the hassles and cost of cabling
- Wireless LAN IEEE802.11b compliant
- Up to 22Mbps data rate with CSMA/CA, provides up to 20% faster data transfer rates than standard 802.11b compliant devices
- Utilize Direct Sequence Spread Spectrum (DSSS) Technology and support the modulation of PBCC mode to provide robust, interference-resistant solution in a multi-user environment
- Working range up to 300 feet indoor and 1100 feet outdoor
- Support Ad-Hoc / Infrastructure mode
- Roaming capability to provide mobile computing for mobile worker to access network resources anywhere in the field
- Seamless integration with IEEE 802.3 LAN through PLANET WAP-1960, WAP-3000 or other IEEE 802.11b compliant Access Point
- Supports most popular operating systems including Windows 98/Me/2000/XP
- Support one detachable antenna
- Plug-and-Play installation
- Support PCI standard v2.2

1.2 Applications

1.2.1 Infrastructure

The WL-8305 provides access to a wired LAN for wireless workstations. An integrated wireless and wired LAN is called an Infrastructure configuration. A group of WL-8305 PC users and an Access Point compose a Basic Service Set (BSS). Each WL-8305 PC in a BSS can talk to any computer in the wired LAN infrastructure via the Access Point.

An Infrastructure configuration extends the accessibility of a WL-8305 equipped PC to a wired LAN, and doubles the effective wireless transmission range for 2 WL-8305 PCs. Since the Access Point is able to forward data within its BSS, the effective transmission range in an infrastructure LAN is doubled.

The use of a unique ID in a BSS is essential. All WL-8305 equipped PCs configured without roaming options in an independent BSS must be configured with a BSS ID corresponding to the WL-8305 used in the BSS. Check your WL-8305 for its BSS ID or use the Site Survey function on Configuration Utility program to determine the BSS ID.

The Infrastructure Wireless LAN configuration is appropriate for enterprise-scale wireless access to a central database, or as a wireless application for mobile users.

Infrastructure mode also supports roaming capabilities for mobile users. More than one BSS can be configured as an Extended Service Set (ESS). The continuous network allows users to roam freely within an ESS. All WL-8305 PCs or other IEEE 802.11b compliant wireless adapters within one ESS must be configured with the same ESS ID and use the same radio channel.

Before enabling an ESS with roaming capability, choosing a feasible radio channel and optimum Access Point position is recommended. Proper Access Point positioning combined with a clear radio signal will greatly enhance performance.



1.2.2 Ad-Hoc

An Ad-Hoc wireless LAN is a group of computers, each equipped with one WL-8305 adapter or other wireless adapters, connected as an independent wireless LAN. Computers in a specific Ad-Hoc wireless LAN must be configured to share the same radio channel.

Ad-Hoc wireless LAN configurations are appropriate for branch level departments or SOHO operations.



1.2.3 General Application

WL-8305 offers a fast, reliable, cost-effective solution for wireless client access to the network in applications like these:

1. Remote access to corporate network information

E-mail, file transfer and terminal emulation.

2. Difficult-to-wire environments

Historical or old buildings, asbestos installations, and open area where wiring is difficult to employ.

3. Frequently changing environments

Retailers, manufacturers and banks who frequently rearrange the workplace and change location.

4. Temporary LANs for special projects or peak time

Trade shows, exhibitions and construction sites need temporary setup for a short time period. Retailers, airline and shipping companies need additional workstations for a peak period. Auditors require workgroups at customer sites.

5. SOHO (Small Office and Home Office) users

SOHO users need easy and quick installation of a small computer network.

6. High security connection

The wireless security network installs quickly and provides the flexibility to reconfigure easily.

1.3 Specification

Product	Wire Free – 22Mbps Wireless PCI Adapter
Model Name	WL-8305
Attach Interface	PCI 2.2 compliant
LED Indicators	Power/Act*
Operating Frequency / Channel	2.412~2.462GHz (FCC, Canada) / 11 Channels 2.412~2.4835GHz (Japan, TELEC) / 14 Channels 2.412~2.472GHz (Euro ETSI) / 13 Channels
RF Modulation	Direct Sequence Spread Spectrum (DSSS) Technology (PBCC, CCK, DQPSK, DBPSK)
RF Output Power	18dBm
Sensitivity	-83dBm (@ PER<8%)
Data Rate	22, 11, 5.5, 2, 1 Mbps with auto-rate fall back
Media Access Protocol	CSMA/CA + ACK
Standard Antenna	Detachable dipole antenna with reverse-polarity SMA connector
Range	Up to 1100 feet outdoor and 300 feet indoor
Working Mode	Ad-Hoc, Infrastructure
Power Consumption	TX: 3.3V, 650mA RX: 3.3V, 350mA Stand by / sleep mode: 3.3V, 20mA
Dimension (mm)	133*121*22 mm
Humidity	0-90%, non-condensing (Operating and storage)
Temperature	0 – 50 degree C (Operating), -20~70 degree C(Storage)
Compatibility	Windows 98, Me, 2000 and XP
Management	Utility or Windows XP built-in management interface
STANDARDS COMPLIANCE	
Electromagnetic Compatibility	FCC Part 15 class B, CE Mark, ETSI 300 328

Note: LED will lights on when WL-8305 get the power source and blinks to indicate activity.

1.4 Package Contents

Before installation, please check the items of your package. The package should include the following items:

WL-8305	x 1
Dipole Antenna	x 1
Quick Installation Guide	x 1
Drivers and User's Manual CD	x 1

If any of the above items are missing, contact your supplier as soon as possible.

1.5 Minimum System Requirements

Before installation, please check the following requirements with your equipment.

- Operating System: Windows 98/Me/2000/XP
- Desktop PC with CD-ROM driver
- One PCI slot

1.6 SAFETY PRECAUTION

Only use the accessories attached with the device package. Otherwise, the device may not function. If you miss or damage the accessories, please contact your local dealer.

1.7 Installation Considerations

- Please keep the number of walls and ceilings between the Access Point and clients. Each wall or ceiling can reduce your wireless cover range from 3-90 feet. Position your Access points, Residential Gateways, and computers so that the number of walls or ceilings is minimized.
- Building materials make a difference – A solid metal door or aluminum studs may have a negative effect on range. Try to position Access Points, and computers with wireless adapters so that the signal passes through drywall or open doorways and not other materials.
- Keep the wireless product away from electrical devices or appliances at least 3-6 feet, which may generate extreme RF noise.

Chapter 2 Installation

Before you proceed with the installation, it is necessary that you have enough information about the *Wireless PCI Card*. Use the Procedure described in below in this chapter to install under Windows 98/Me/2000/XP.

Note: *If you ever install the other Wireless Card before, please uninstall the existed driver and utility first. If this is the first time to install this device, please refer to the following steps to complete the installation.*

2.1 Windows 98/ME/2000 Driver Installation

Note: *The following installation operates under Window 2000. Procedures will be similar to Window 98/ME. About Windows XP driver installation, please refer to next section.*

1. Slide in WL-8305 to a vacant PCI slot and fix the adapter to your PC.
2. Power on the PC and insert Drivers and User's manual CD into CD-ROM drive.
3. Windows will automatically detect this wireless card and ask the user to install driver. Please click "Next".



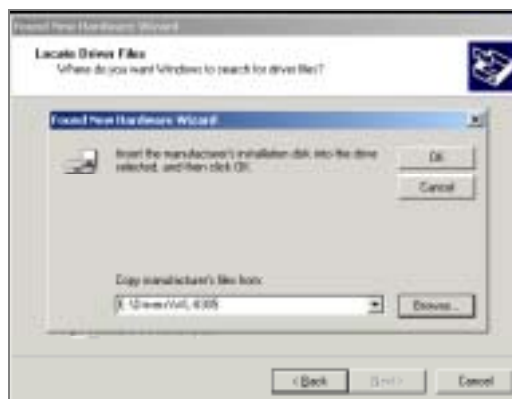
4. Please select the first option and click "Next" to continue.



5. Select "Specify a location" and click "Next".



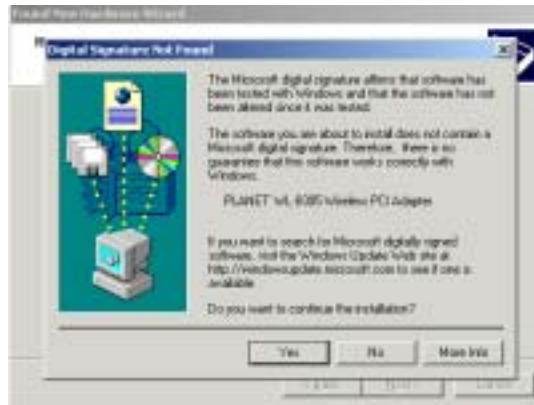
6. You can click "Browse" to find out WL-8305 driver location for Windows to install the correct driver. (Suppose "E" is your CD-ROM drive, you can find the WL-8305 driver in E:\Drivers\WL-8305). Please click "OK" to continue.



7. Windows will show this screen to prompt you that it found a driver for the device you are installing, please click "Next" to continue.



8. Windows 2000 may tell you this driver doesn't contain Microsoft digital signature. Please don't worry about this. You can click "Yes" to continue the installation.



9. Please click “Finish” to complete the driver installation.



(In Win98/Me, Windows will ask you to restart your PC when driver installation finished.)

2.2 Windows XP driver installation

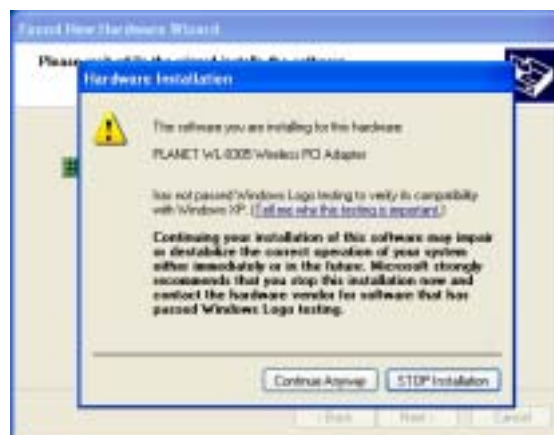
1. Slide in WL-8305 to a vacant PCI slot and fix the adapter to the PC.
2. Power on the PC and insert Drivers and User's manual CD into CD-ROM drive.
3. Windows XP will detect WL-8305 and ask you to install driver. Please select the second option and click “Next”.



4. Please select "Include this location in the search" and then click "Browse" to find out WL-8305 driver location to install driver. (Suppose "E" is your CD-ROM drive, you can find out WL-8305 driver in E:\Drivers\WL-8305). Please click "Next" to continue.



5. WinXP will show you this dialog box to prompt you the driver is not pass Windows logo testing, please press "Continue Anyway" to continue.

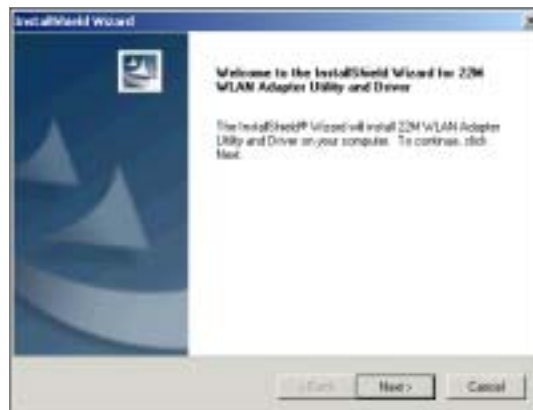


6. Please click "Finish" to complete the driver installation.

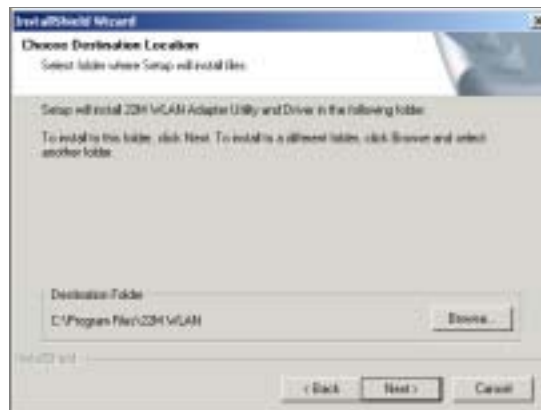


2.3 Configuration Utility Installation

1. Run "setup.exe" under "E:\Utility\WL-8305\" directory, or click the "Start" button and choose "Run". When the box appears, enter "E:\Utility\WL-8305\setup.exe" (Suppose "E" is your CD-ROM drive). You will see the dialog box as the picture. Please click "Next" to continue.



2. You can click "Browse" to specify the Destination Folder that you want to install the configuration utility. Or you can keep the default setting and click "Next" to continue.




3. When installation completed, please click "Finish" to restart your PC.



Note: If the card is not working properly after the restart procedure, you should make sure that your system has free resources since it may show them as being available, although this may not be true.

Chapter 3 Configuration

The Configuration Utility is a powerful application that helps you to configure the WL-8305 and monitor the status of the communication process. By double click the icon  on the system tray, the dialog box as below appears.



This utility can be used to modify the configuration parameters when the device is active. Please find the following for details of configuration options.

3.1 “Link Info.”

In screen above, you can check the status when WL-8305 is working. You can also click “Radio Off” button to let the WL-8305 stop working. When WL-8305 stops working, the button will rename to “Radio On”. If you want WL-8305 to work again, just click the button again.

3.2 “Configuration”



In this option, you can configure the settings of WL-8305 for the AP it will connect to. After configuration, please press "Apply" to save settings or "Cancel" to set again.

- ◆ **SSID:** Shows and can be configured the SSID of the BSS that willing to join.
- ◆ **BSS Type:** Click pull-down button and select the operation mode as below.
 - **Ad-Hoc:** This mode indicates the 802.11b peer-to-peer operation. All communication is done from client to client without the use of an Access Point.
 - **Infrastructure:** This operation mode requires the presence of an 802.11b Access Point. All communication is done via the Access Point.
 - **Any:** WL-8305 will connect to other wireless device which is available around it. You can select the device that it will connect to in "SiteSurvey" option.
- ◆ **Channel:** Shows the number of the radio channel used for the network. Only Access Points and Ad-Hoc nodes create the BSSID. This parameter is not active in the infrastructure operation mode.
- ◆ **Tx Rate:** Shows the Data Transfer Rate. There are 1Mbps, 2Mbps, 5.5Mbps, 11Mbps, 22Mbps and Auto. If Auto Mode is selected, the device will choose the best transfer rate automatically.
- ◆ **Preamble (Long/Short):**

Preamble is the first field of PPDU, which is the appropriate frame format for transmission to PHY (Physical layer). There are two options, Short Preamble and Long Preamble. The Short Preamble option improves performance in high network traffic area.
- ◆ **Power Mode:** Shows Power Management modes. There are three optional selections for this mode.
 - **Continuous Access Mode:** Adapter will always set in active mode. This mode consumes the most power.
 - **Maximum Save Mode:** Adapter will enter power saving mode when it is idle. This mode consumes the least power.
 - **Fast Power Save:** Adapter will transfer and receive signal once in each 5 seconds. This mode consumes the moderate amount of power.

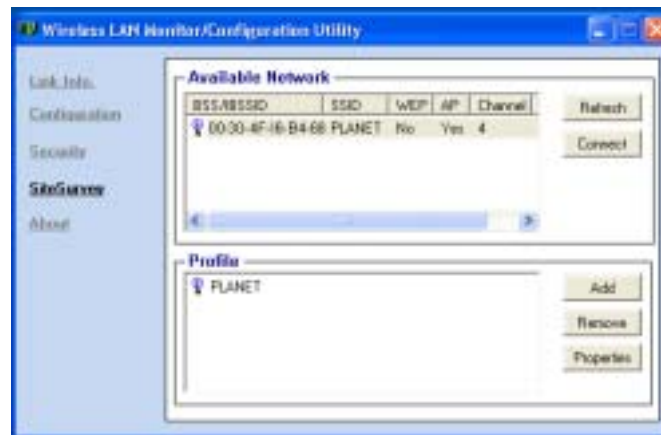
3.3 “Security”



Additional security can be achieved by using the WEP (Wired Equivalent Privacy) encryption. WEP encrypts each frame transmitted from the radio using one of the keys entered from this panel.

- ◆ **Data Encryption:** You can tick this option for enabling WEP function.
- ◆ **Auth. Mode:**
 - **Open Authentication:** With this setting, the station in the WLAN can receives and transmits data from Access Point (null authentication).
 - **Shared Authentication:** With this setting, allows communication only with other devices with identical WEP settings.
 - **Auto Switch:** With this setting, stations can communicate with the Access Point either with or without data encryption. It will detect the AP that it connected is using which Authentication mode and use the same mode to communicate.
- ◆ **Passphrase:** You can enter a number in this field and press “**Done**”. It will create the WEP keys of Hexadecimal code automatically.
- ◆ **WEP Key options:**
 - **Default Key:** There are 4 keys available for the WEP function. Please select one of them for WEP to operate.
 - **Network Key:** You can define the WEP (Wired Equivalent Privacy) Key values by yourself.
 - **Key Length** – Please select which WEP key mode you want to use. There are three modes, each mode has two kind of key length and that is decide on the **Key Format** you selected. 64bit (5ASCII / 10HEX.), 128bit (13ASCII / 26HEX) or 256bit (29ASCII / 58HEX).
- ◆ **Key Format** – You can select WEP key format to **HEX** (Hexadecimal code, 0-9, A-F) or **ASCII** (American Standard Code for Information Interchange, 0-9, a-z, A-Z).

3.4 “Site Survey”



This screen shows the APs or Adapters which available from WL-8305 to connect. When operating in work mode “Any”, it will show the available APs and Adapters at the same time. Click “**Refresh**” to collect the BSSID and Channel information of all the wireless devices around you.

If you wish to connect to any device on the “**Available Network**” list, select the device on the list and click “**Connect**”, then WL-8305 will connect to the selected device and create a profile for the selected device automatically.

You can configure profile with those buttons:

- **Add:** Add a new profile.
- **Remove:** Delete the profile you selected.
- **Properties:** Modify the profile you selected.

After press **Add** or **Properties**, the dialog box as below will appear for configuring profile. You can refer to above to know how to configure the setting for your need.



3.5 “About”



It shows the current **Driver**, **Firmware** and **Utility** version.

Appendix

This section provides some technology document of IEEE802.11b. Read the description below to know the standards about IEEE802.11b.

✓ **What is the IEEE 802.11b standard?**

The IEEE 802.11b Wireless LAN standards subcommittee, which is formulating a standard for the industry. The objective is to enable wireless LAN hardware from different manufactures to communicate.

✓ **What IEEE802.11 features are supported?**

The product supports the following IEEE 802.11 functions:

- ♦ CSMA/CA plus Acknowledge protocol
- ♦ Multi-Channel Roaming
- ♦ Automatic Rate Selection
- ♦ RTS/CTS feature
- ♦ Fragmentation
- ♦ Power Management

✓ **What is PBCC?**

This new products use the ACX100 chip from Texas Instruments. In addition to meeting the existing standard, the chip also supports a new modulation scheme developed by TI, called Packet Binary Convolution Code (PBCC). It's this scheme that gives the products the extra kick: Even at lower speeds, PBCC provides better performance at greater distances, and it can also work at 22 Mbps.

✓ **What is Ad-hoc?**

An Ad-hoc integrated wireless LAN is a group of computers, each with a WLAN adapter, Connected as an independent wireless LAN. Ad-hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

✓ **What is Infrastructure?**

An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

✓ **What is BSS ID?**

A specific Ad-hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSS ID.

✓ **What is WEP?**

WEP is Wired Equivalent Privacy, a data privacy mechanism based on a 64/128 bit shared key algorithm, as described in the IEEE 802.11b standard.

✓ **Can Wireless products support printer sharing?**

Wireless products perform the same function as LAN products. Therefore, Wireless products can work with Netware, Windows NT/2000/XP, or other LAN operating systems to support printer or file sharing.

✓ **Would the information be intercepted while transmitting on air?**

WLAN features two-fold protection in security. On the hardware side, as with Direct Sequence Spread Spectrum technology, it has the inherent security feature of scrambling. On the software side, WLAN series offer the encryption function (WEP) to enhance security and Access Control. Users can set it up depending upon their needs.

✓ **What is DSSS? What is FHSS? And what are their differences?**

Frequency-hopping-spread-spectrum (FHSS) uses a narrowband carrier that changes frequency in a pattern that is known to both transmitter and receiver. Properly synchronized, the net effect is to maintain a single logical channel. To an unintended receiver, FHSS appears to be short-duration impulse noise. Direct-sequence spread-spectrum (DSSS) generates a redundant bit pattern for each bit to be transmitted. This bit pattern is called a chip (or chipping code). The longer the chip, the greater the probability that the original data can be recovered. Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the radio can recover the original data without the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers.

✓ **What is Spread Spectrum?**

Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communication 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).