

**ASUS®** WiFi-b

Wireless Fidelity Card

## **Installation Guide**

First Edition

June 2003

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## WiFi-b specifications summary\*

<b>Standard</b>	IEEE 802.11b
<b>Technology</b>	Direct Sequence Spread Spectrum (DSSS)
<b>Data Transfer Rate</b>	11Mbps (with automatic fallback to 5.5, 2 and 1Mbps)
<b>Host Interface</b>	ASUS proprietary WiFi-b interface
<b>Network Types</b>	Supports Infrastructure and Ad Hoc networks
<b>Frequency Band</b>	2.4 GHz ~ 2.5 GHz
<b>Security</b>	64-bit/128-bit configurable WEP encryption
<b>Access Point</b>	Software access point function supports up to 31 terminals (Windows® XP only)
<b>Operating Distance</b>	Indoors: 100 ft (30 m) @ 11Mbps Outdoors: 1000 ft (300 m) @ 11Mbps
<b>Supported OS</b>	Windows® 98SE/ME/2000/XP
<b>Antenna</b>	Stand-alone dipole antenna

*\*Specifications are subject to change without notice.*

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## 1. Welcome!

Thank you for buying the ASUS WiFi-b Card! The WiFi-b card is a wireless network interface card for ASUS motherboards with the proprietary Wi-Fi slot. This card conforms to the IEEE 802.11b standard for wireless local area network (WLAN) assuring you of seamless integration to any wireless network. The WiFi-b card is sure to keep you ahead in the world of wireless computing.

## 2. Package contents

Check the following items in your ASUS WiFi-b package. Contact your retailer if any item is damaged or missing.

- ☒ ASUS WiFi-b card
- ☒ ASUS WiFi-b dipole antenna
- ☒ Installation guide
- ☒ Support CD

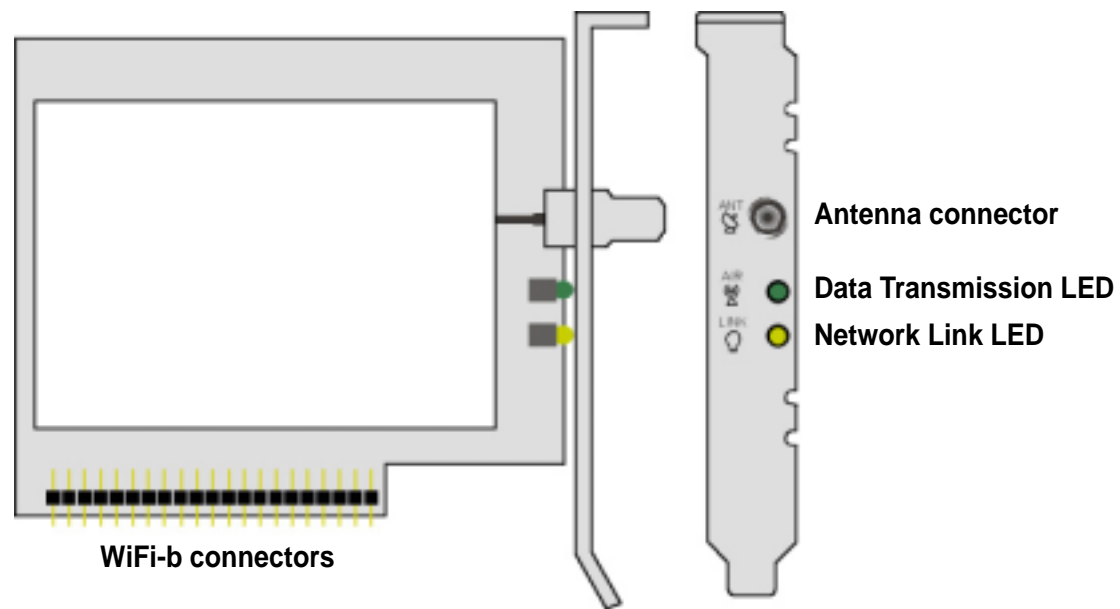
### 3. Features

The WiFi-b card is an easy-to-use wireless solution for desktop PCs. Compliant with the IEEE 802.11b standard, the WiFi-b card gives you freedom to connect to a wireless network and the Internet without wires and cables. Employing the Direct Sequence Spread Spectrum (DSSS) technology, the WiFi-b card is capable of transmitting and receiving signals through radio waves on the 2.4 GHz band.

Check out other WiFi-b card advantages.

- Reliable data transfer rates of up to 11Mbps with automatic fallback to 5.5, 2, and 1Mbps
- Secure data transmission via Wired Equivalent Privacy (WEP) encryption
- Operating distance of up to 100 ft (30 m) indoors and 1000 ft (300m) outdoors
- Easy installation and full management software support
- Software access point function supports up to 31 terminals (on Windows® XP only)
- Supports infrastructure (WiFi-b to access point) and ad-hoc (WiFi-b to another Wi-Fi device) network types
- Windows® 98SE/ME/2000/XP compatible

## 4. Card layout



## 5. Card installation

**IMPORTANT!** Before installing the WiFi-b card, make sure that your system meets the following requirements.

### 5.1 System requirements

- ASUS motherboard with Wi-Fi slot (P4C800/P4C800 Deluxe/P4P800/P4P800 Deluxe/P4P8X/P4S800/P4S800D/P4V800/P4V800D/P4R800-V/A7N8X-E)\*
- Intel® Pentium™ 4 system
- Minimum 64MB system memory
- Windows® 98 SE/2000/ME/XP operating system
- CD-ROM drive for software and drivers installation

**NOTE.** Visit the ASUS website for an updated list of motherboards with WiFi slot.

## 5.2 Hardware installation

Follow these steps to install the WiFi-b card in your system.

**CAUTION!** Before handling the card, touch a bare metal portion of your PC to discharge static electricity from your body. Wear a wrist strap grounded to the PC chassis when handling the card.

**IMPORTANT!** The PCI5 and the Wi-Fi slot may not be used simultaneously on certain motherboards. Check your motherboard documentation for this limitation.

1. Make sure that the PC is turned off. Unplug the power cord from the electrical socket.
2. Remove the PC cover.
3. Locate the Wi-Fi slot. Refer to your motherboard documentation for the Wi-Fi slot location.
4. Remove the rear panel bracket opposite the Wi-Fi slot. Keep the screw for later use.





5. Carefully insert the card into the Wi-Fi slot. To prevent incorrect orientation, Pin \_\_\_ of the WiFi-b connector is removed to match the covered hole on the Wi-Fi slot.
6. Secure the card with the screw that you removed earlier.
7. Replace the PC cover and plug in the power cord.
9. Connect the dipole antenna twist-on connector to the antenna connector (male) of the WiFi-b card.
8. Turn on the computer.

### 5.2.1 Indicators

The WiFi-b card is equipped with a Data Transmission (Green AIR) and Network Link (Yellow LINK) LED indicators. Refer to the table below for LED indications.

AIR	LINK	Meaning
Fast Blink	ON	Transmitting/receiving data and connected to the network
ON	ON	No data activity but connected to the network
OFF	OFF	No power or not connected to the network

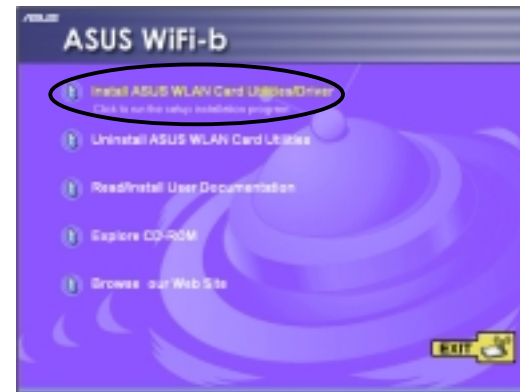
### 5.2.2 Antenna Placement

Place the dipole antenna at an elevated location to maintain quality signal. Avoid placing the antenna under your table or in a close compartment.

## 5.3 Software installation

Follow these steps to install the WiFi-b card driver and the Control Center Utility.

1. Turn on your computer.
2. Insert the support CD into the CD-ROM drive.
3. Click “Install ASUS WLAN Card Utilities/Driver” when the ASUS WiFi-b installation window appears.
4. Restart your computer after the device driver and the Control Center Utility are installed.



**NOTE.** If Autorun is NOT enabled in your computer, browse the contents of the support CD and double click the Setup.exe file to run the CD.

### 5.3.1 Other support CD contents

The support CD also contains the following options.

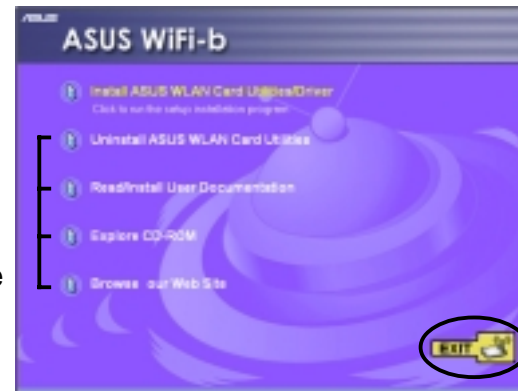
**Uninstall ASUS WLAN Card Utilities.** Click this option to uninstall the Control Center Utility from your system.

**Read/Install User Documentation.** Click to view the installation and quick setup guides in PDF format.

**Explore CD-ROM.** Click this option to explore the support CD contents.

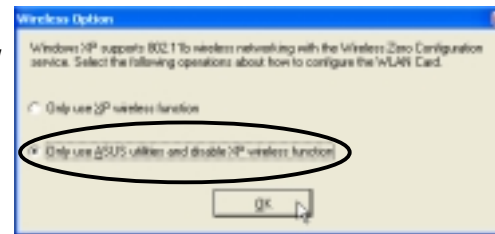
**Browse our Web Site.** Click this option to visit the ASUS website.

Click **EXIT** to close the installation window.



## 5.4 Windows® XP Wireless Options

The first time that the Control Center Utility is launched in Windows® XP, it will automatically show the Wireless Options window. Select “**Only use ASUS utilities and disable XP wireless function**” to avail all WiFi-b card features. Click OK.













## 6. Using the Control Center Utility

The Control Center Utility is a management software that launches applications and activate network location settings. The Control Center Utility starts automatically when the system boots and displays an icon in the Windows taskbar. The Control Center icon serves as application launcher, and indicator of signal quality and Internet connection (see next section).






The Control Center icon indicates the quality of link to the Access Point and whether or not the system is connected to the Internet. Refer to the table below for icon meanings.

**Infrastructure Network Mode (WiFi-b to an Access Point)**

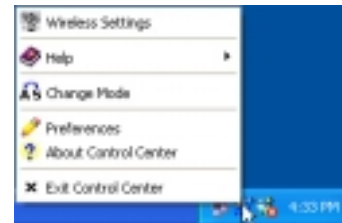
	Excellent link quality and connected to the Internet		Excellent link quality but not connected to the Internet
	Good link quality and connected to the Internet		Good link quality but not connected to the Internet
	Fair link quality and connected to the Internet		Fair link quality but not connected to the Internet
	Poor link quality but connected to the Internet		Poor link quality and not connected to the Internet
	Not linked but connected to the Internet		Not linked and not connected to the Internet

**Ad-Hoc Network Mode (WiFi-b to other Wi-Fi device)**

	Linked
	Not Linked
	Connected to the Internet

## 6.1 Control Center Right-Click Menu

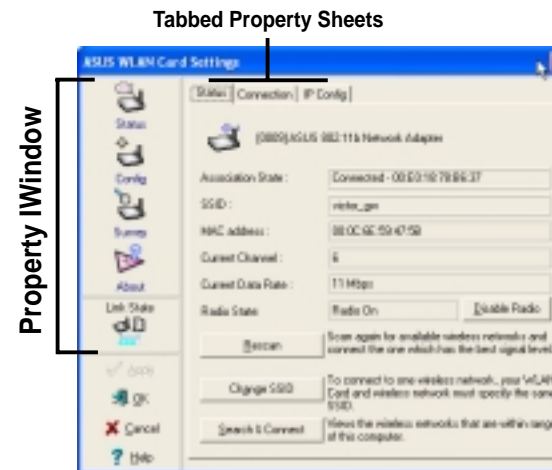
Right-clicking the Control Center icon displays the right-click menu. The following sections describe the right-click menu items.



### 6.1.1 Wireless Settings

The Wireless Settings is the main interface that allows users to control the ASUS WiFi-b. Use the Wireless Settings to view the operational and connection status, or to modify the WiFi-b configuration.

The Wireless Settings window is composed of the property window and tabbed property sheets. Click the icons in the property window to display their tabbed property sheets.



## Status - Status Tab

The Status Tab provides general information on the WiFi-b card.

**Association State.** This field displays the connection status and MAC address of the network where the system is connected.

**Service Set Identifier (SSID).** This field displays the SSID of the network which the card is associated or is intending to join. The SSID is a group name shared by every member of a wireless network. Only client PCs with the same SSID are allowed to establish a connection.



The **MAC Address** field displays the hardware address of a device connected to a network.

The **Current Channel** field displays the radio channel that the card is currently tuned. The channel changes as WiFi-b scans the available channels. See page 29 for channel information.

The **Current Data Rate** field displays the data transfer rate between the WiFi-b card and the access point.

The **Radio State** field displays the radio communication status. Click the **Disable Radio** button if you wish to disable radio communication with the access point.

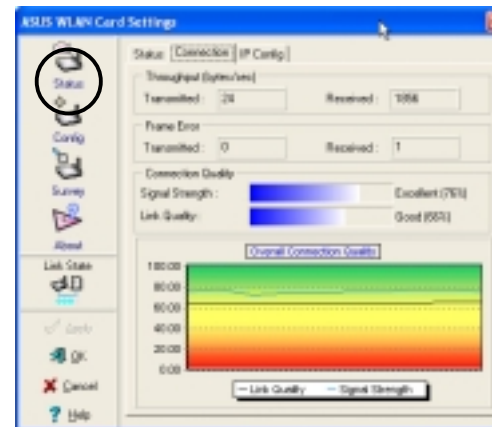
**Rescan** button - Click to allow WiFi-b to scan available wireless networks and to connect to the network with the best signal quality.

**Change SSID** button - Click to change the SSID. Clicking this button opens the Config-Basic window. See page 18 for details.

**Search and Connect** button - Click to view all wireless networks within the range of your system. Clicking this button opens the Site Survey window. See page 22 for details.

### Status - Connection Tab

The Connection Tab provides real-time information on connection throughput, frame errors, signal strength, link quality and overall connection quality in graph representation.





## Status - IP Config Tab

The IP Config tab displays the current host and ethernet adapter configurations. IP Config displays TCP/IP information including the IP address, subnet mask, default gateway, DNS and Windows Internet Naming Service (WINS) configurations.

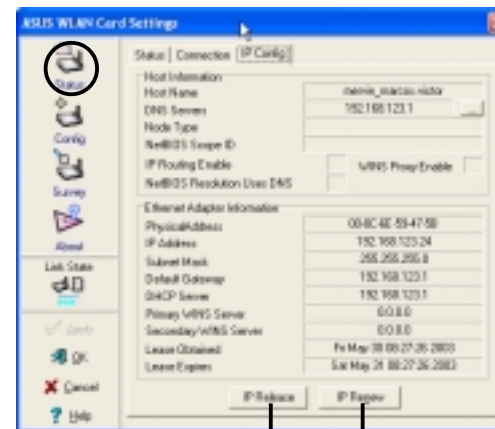
Use the IP Config Tab to verify your network settings.

### IP Buttons

**IP Release.** Click to release the DHCP IP address for the WiFi-b card.

**IP Renew.** Click to renew the DHCP IP address for the WiFi-b card.

**NOTE.** The Dynamic Host Configuration Protocol (DHCP) allows a computer or computers on a network to be automatically assigned a single IP address from a DHCP server.



IP Buttons

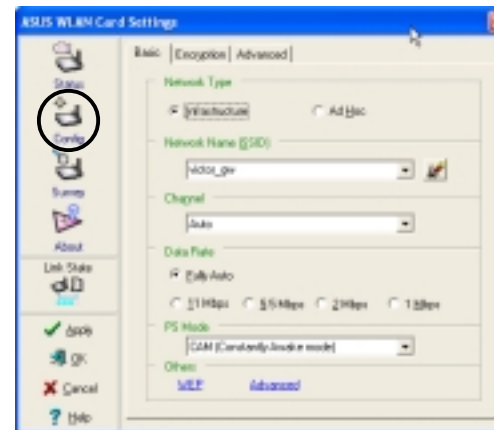
## Config - Basic Tab

The **Basic** tab provides general information on network types and other configurations.

**Network Type.** Select which type of network you wish to use. Select *Infrastructure* mode to establish a connection with an Access Point (AP). In this mode, your system can access wireless LAN and wired LAN (Ethernet) via the AP. Select the *Ad Hoc* mode to communicate directly with other Wi-Fi devices within the WiFi-b operating range.

**Network Name** - Displays the network SSID. The network SSID is a string used to identify a wireless LAN. Assign different SSIDs to segment the wireless LAN and increase network security. Set the SSID to a null string to allow your station to connect to any available Access Point. Null string may not be used in *Ad Hoc* mode.

**Channel.** In *Infrastructure* mode, WiFi-b automatically selects the correct frequency channel. In *Ad Hoc* mode, select a channel that is allowed for use in your country/region. See page 29 for channel information.



**Data Rate.** Select *Fully Auto* to allow WiFi-b to adjust to the most suitable connection. You may also fix data transfer rates to 11, 5.5, 2 and 1 Mbps.

**PS Mode.** This field allows control of the WiFi-b card power saving features. The *CAM (Constantly Awake mode)* is recommended for systems running on AC power.

**Others.** Click the *WEP* or *Advanced* link to open the Encryption or Advanced property tab sheet.

## Config - EncryptionTab

Wireless data transmissions between your WiFi-b and the AP are secured using the Wired Equivalent Privacy (WEP) encryption. Check the *Data encryption (WEP enabled)* option to assign the WEP keys.

Check the *Network Authentication (Shared Mode)* option if you wish to use a network key to authenticate a preferred wireless network. Unchecking this option allows the network to operate on an Open System mode.



**Key Format** allows you to set a hexadecimal digit or ASCII character WEP key.

**Key Length** allows you to choose a 64-bit or a 128-bit WEP key. A 64-bit encryption contains 10 hexadecimal digits or 5 ASCII characters. A 128-bit encryption contains 26 hexadecimal digits or 13 ASCII characters.

**NOTE.** 64-bit and 40-bit WEP keys use the same encryption method and can interoperate on wireless networks. This lower level of WEP encryption uses a 40-bit (10 hexadecimal digits assigned by the user) secret key and a 24-bit Initialization Vector assigned by the WiFi-b. 104-bit and 128-bit WEPs use the same encryption method.

### **Two ways to assign WEP keys**

**Manual Assignment.** For a 64-bit encryption, enter 10 hexadecimal digits (0~9, a~f, A~F) in each of the four WEP keys.

**Automatic Generation.** Type a combination of up to 64 letters, numbers, or symbols in the Passphrase field. The Wireless Settings Utility uses an algorithm to generate four WEP keys based on the typed combination.

**NOTE.** After assigning the WEP keys, Click **APPLY** to save and activate the encryption. Manually assigned encryptions are more secured than automatically generated encryptions.

## Config - Advanced

The **Advanced** tab displays the WiFi-b card advance settings. It is recommended that you do not make any changes on these settings.



## Site Survey

The **Site Survey** tab displays the available networks within the range of the WiFi-b card. The following network attributes are displayed:

**BSSID** - The IEEE MAC address of the network

**SSID** - SSID (service set identifier) of the network.

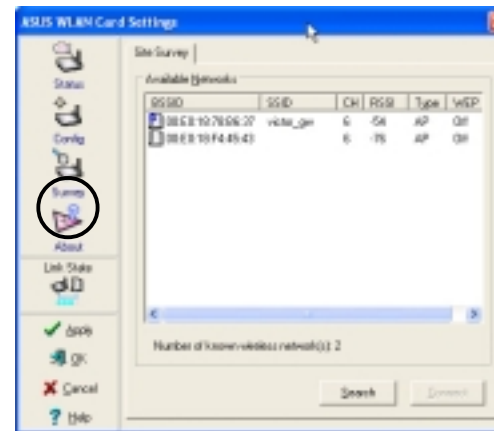
**CH** - Direct sequence channel used by the network

**RSSI** - Received Signal Strength Indicator (RSSI) in dBm.

**Type** - wireless network mode. AP indicates an Infrastructure network type. STA indicates an Ad Hoc network type.

**WEP** - shows whether a network has an enabled (On) or disabled (Off) WEP encryption.

Select an available network and click **Connect** to establish connection. Click **Search** to rescan available networks.



## About

Click the **About** icon to view the software version, driver version, and copyright information.

## Link State

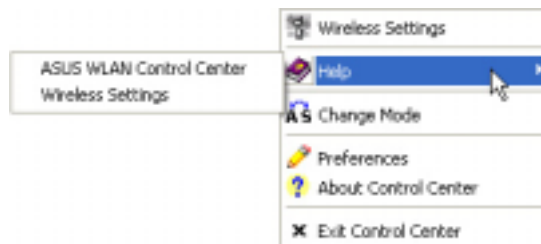
Displays the current connection status of the WiFi-b card to the AP or to other Wi-Fi device.



### 6.1.2 Help Menu

The Control Center Utility is equipped with a Help menu to guide you in using and configuring the WiFi-b card.

Right-click the Control Center icon on the taskbar, then select **Help**. Select the Help menu you wish to browse.



### 6.1.3 Configuring your system as an Access Point (AP)

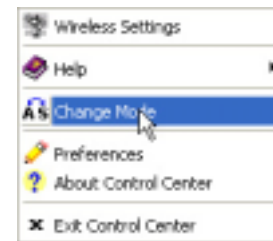
The Control Center Utility can configure your system as soft access point (AP). The WiFi-b soft AP function can support up to 31 wireless clients. Before configuring your system as soft AP, make sure your system meets the following requirements:

- Connection to the Internet (cable, DSL, satellite, etc) and wired LAN
- Windows® XP operating system

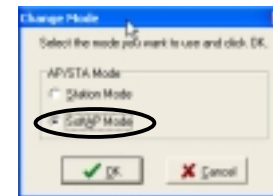


Follow these instructions to configure your system as soft AP.

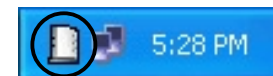
Right-click the Control Center icon on the taskbar, then select **Change Mode** in the pop-up menu. A **Change Mode** window appears.



Select **SoftAP Mode**. Click OK.



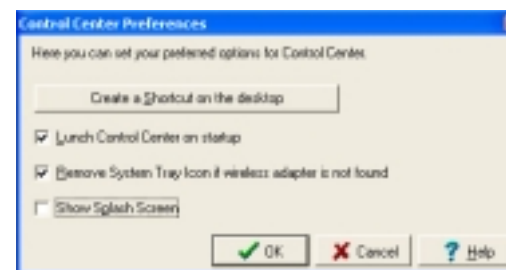
The **Access Point** icon replaces the Control Center icon in the Windows® taskbar.



**IMPORTANT.** Make sure that the network type of wireless clients is set to **Infrastructure** mode. Wireless clients must also have the same SSID with the soft AP to establish connection.

### 6.1.4 Preferences

The **Preferences** window allows you to customize the Control Center Utility settings.



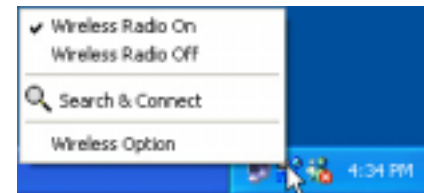
### 6.1.5 About Control Center

The **About Control Center** menu displays the software, drivers, and copyright information.



## 6.2 Control Center Left-Click Menu

Left-clicking the Control Center icon displays the Left-Click menu. The options are described below.



**Wireless Radio On** – Turns the WiFi-b radio ON.

**Wireless Radio Off** – Turns the WiFi-b radio OFF.

**Search & Connect** – View available wireless networks within range.

**Wireless Option** (Windows® XP only) – Sets your Windows® XP wireless networking environment. See page 12 for details.

## 7. Appendix

### 7.1 Channels

The IEEE 802.11b standard for Wireless LAN allocated the 2.4 GHz frequency band into 14 overlapping operating **channels**. Each channel corresponds to a different set of frequencies. The table below shows the center frequencies of each channel.

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

**IMPORTANT!** If several WiFi-b devices are operating in the same vicinity, the distance between the center frequencies of channels used must be at least 25 MHz to avoid interference.

The number of channels available for the WiFi-b varies by country/region. Refer to the table below to determine the number of channels available in your location.

Country/Region	Available Channels
United States (FCC) and Canada (IC)	Channels 1 to 11
Europe (ETSI) except Spain and France	Channels 1 to 13
Spain	Channels 10 and 11
France	Channels 10 to 13
Japan (MKK)	Channels 1 to 14

**NOTE.** Channels 1,6 and 11 are independent and do not overlap each other. It is recommended to tune your WiFi-b card to these channels.

## 7.2 Safety Information

In order to maintain compliance with the FCC RF exposure guidelines, this equipment should be installed and operated with minimum distance **[20cm]** between the radiator and your body. Use only with supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

**CAUTION!** Any changes or modifications not expressly approved in this manual could void your authorization to use this device.

### MPE Statement

Your device contains a low power transmitter. When device is transmitted it sends out Radio Frequency (RF) signal.

### Caution Statement of the FCC Radio Frequency Exposure

This Wireless LAN radio device has been evaluated under FCC Bulletin OET 65C and found compliant to the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247(b)(4) addressing RF Exposure from radio frequency devices. The radiation output power of this Wireless LAN device is far below the FCC radio frequency exposure limits. Nevertheless, this device shall be used in such a manner that the potential for human contact during normal operation – as a mobile or portable device but use in a body-worn way is strictly

prohibited. When using this device, a certain separation distance between antenna and nearby persons has to be kept to ensure RF exposure compliance. In order to comply with the RF exposure limits established in the ANSI C95.1 standards, the distance between the antennas and the user should not be less than **[20cm]**.

### **SAR Exposure**

This device has been tested for compliance with FCC RF Exposure (SAR) limits in typical laptop configurations.

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

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