

WLAN 802.11b Compact Flash Card Users' Manual v 1.2

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1. Introduction

A WLAN is a local area network that uses radio frequencies to transmit and receive data between computers or other network devices. WLANs can be independent networks, which use small or temporary peer-to-peer configurations, or infrastructure networks.

The Compact Flash card (CF card) allows devices running the Microsoft® Pocket PC operating system to connect to a Wi-Fi IEEE 802.11b WLAN or communicate directly with other devices connected to a WLAN.



This product is a 802.11b 11 Mbps wireless network adapter that provides CF+ host interface with Type-I mechanical design. The CF card is designed to meet the mobility, performance, security, interoperability, management, and reliability requirements of the IEEE 802.11b high data rate standard. The CF card provides PDA or handheld PC users highly mobility from cell-to-cell roaming. With a CF-to PCMCIA adapter, users can easily implement this WLAN device under most Windows platforms.

The product contains two ceramic antennas that provide diversity switch, which support robust and smooth data connection under multi-path (office) environment. New features such as WOL (Wake on LAN) and 802.11d are supported for new applications and requirements.

In addition to WEP, WPA and TKIP are supported to provide the security on your network.

1.1 Features

- Compact Flash form factor fits devices with Compact Flash Type I extended card slots.
- Functions with devices that are running the Pocket PC operating system and that are equipped with Compact Flash Type I extended card slots.
- Compliant with 11 Mbps 802.11b high-speed specification.
- Data rate of 11/5.5/2/1 Mbps; includes automatic fallback in a noisy environment.

- Power management to keep low power consumption and extend battery life of Host system.
- Small size and premium ID design which is suitable for PDA and handheld device. Enables you to be fully mobile.
- Can be operated with IEEE 802.11b compliant equipment.
- User-friendly client manager utility.
- Supports 64- and 128-bit Wired Equivalent Privacy (WEP).
- Direct Sequence Spread Spectrum (DSSS) technology provides robust, interference-resistant, and secure wireless connection.
- Wireless connection without the hassles and cost of cabling.
- Greater flexibility to locate or move a networked device.
- Support 802.11d for universal regulation
- The CF card has two LED indicators: Transmit/receive and power on/off.
- Support Windows XP/ME/2000/98/CE 3.0/Pocket PC 2002,2003

2. Install and Configure the Wireless Network

2.1 Preparation

Before the installation, please check the contents for:

- A 802.11b WLAN CF card
- A software driver CD for your CF card
- A quick install guide.

To install the CF card, you need the items:

- A device equipped with CF Type I extended card slots
- A sync cable that comes with your PDA
- A computer with a CD or DVD drive

2.2 Install Drivers and Utilities From a CD

Please follow the steps to install the drivers and utilities:

Step 1: Connect the sync cable to either a serial or a USB connector on the computer, and connect the other end of the cable to the device.

When a connection exists between the computer and the device, you can transfer data and synchronize the information on your computer with the information on your device.

Step 2: Insert the software driver into the CD drive on the computer.

Step 3: The driver will auto-run. Please click **Install Driver** when you see the screen. (Note: Please go to g:/WinCE/setup.exe to install the driver. Drive g is your CD or DVD driver.)



Step 4: Follow the instructions on your computer screen to finish the installation.

Step 5: Insert the CF card into your device.

You can access the client manager utility from the taskbar on the **Today** screen.

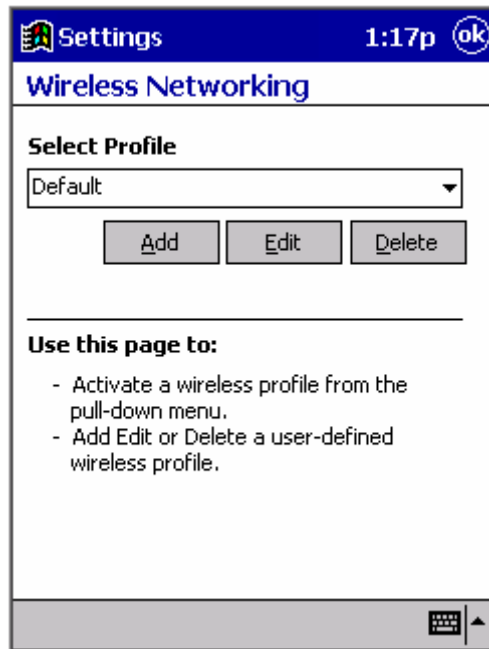
2.3 Configure the Wireless Network on Your Device

After you insert the CF card into the host, please follow the steps to configure the wireless network.

Note: For WinCE3.0, Windows CE4.0, Pocket PC 2002, and Pocket PC 2003 users, the configuration procedure is the same.

1. Click the **Start** → **Settings** → **System**, and then click the **WLAN Network** icon to run the Wireless Networking Setting utility.





- (I) Select a profile and click **OK** to switch from one wireless network to another.
- (II) Click **Add** or **Edit** to add or edit the selected profile.
- (III) Click **Delete** to delete the selected profile.

(I) Select a Profile

Select a configuration profile to switch your station from one wireless network to another.

[NOTE]: Before you can start using configuration profiles, you need to add a configuration profile for each wireless network environment that you want to participate in with your (mobile) wireless client station. If you want to use your wireless client station in multiple networking environments that require different configuration settings, you can define dedicated profiles for each environment. For example, you can create a configuration profile for:

- Your school network
- A branch office
- Your home or small office/home office (SOHO) network

After you create the configuration profiles, switch your base station from one wireless network to another by selecting one of the profiles.

(II) Add/Edit Configuration profile

- Assign a name to your wireless configuration profile and select the network type to identify the type of wireless connection for the profile:
 - Access Point

- Peer-to-Peer Group
- Act as Base Station

The screenshot shows a 'Settings' window with a blue header bar containing a small icon, the text 'Settings', the time '1:23p', and an 'ok' button. Below the header is a title bar that says 'Add/Edit Configuration'. The main area contains two input fields: 'Profile Name:' with a text box containing 'Default', and 'Network Type:' with a dropdown menu showing 'Access Point'. Below these fields is a horizontal line, followed by the text 'Use this page to:' and a bulleted list: '- To assign a name to your wireless profile.' and '- Select the Network Type.'. At the bottom of the main area are two buttons: '< Back' and 'Next >'. The bottom of the window has a grey bar with a keyboard icon and a small upward arrow.

Click **Next** to set up the network name.

➤ Set up the Network Name

Use this screen to identify the name of the wireless network to which you want to connect your computer.

- When connecting to a base station (maybe an Access Point), please consult the LAN administrator to get the correct values of the network, or click **Scan** to retrieve a list of open wireless networks.
- When connecting to a peer-to-peer group, consult one of the workgroup participants for the correct value.

Valid value is a case-sensitive string of ASCII printable characters with a maximum of 32 characters. The value **ANY** allows your computer to connect to the first open base station network that it can find.

The screenshot shows a handheld device screen with a blue header bar. On the left of the header is a small icon and the word 'Settings'. On the right is the time '1:27p' and a circular 'ok' button. Below the header, the title 'Add/Edit Configuration' is displayed. The main area contains a label 'Network Name' followed by a text box containing 'WaveLAN Network'. To the right of the text box is a 'Scan' button. Below this, a horizontal line separates the input section from a section titled 'Use this page to:'. Under this title is a bulleted list: '- Identify the Network Name of the wireless network to which you wish to connect your computer.' At the bottom of the screen are two buttons: '< Back' and 'Next >'. A small status bar at the very bottom right shows a keyboard icon and an upward arrow.

Settings 1:27p ok

Add/Edit Configuration

Network Name WaveLAN Network

Scan

Use this page to:

- Identify the Network Name of the wireless network to which you wish to connect your computer.

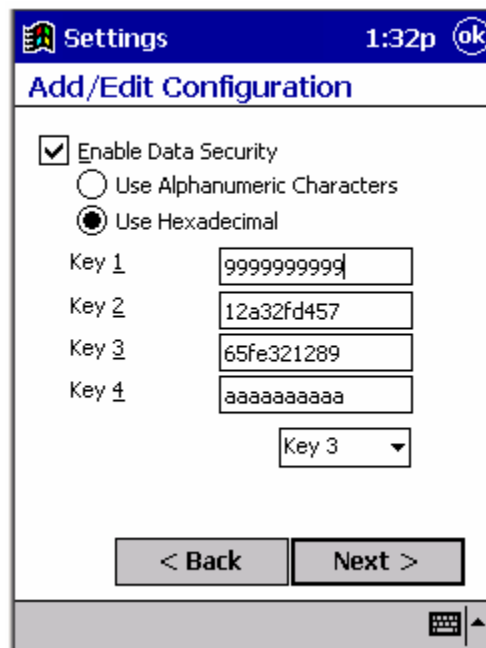
< Back Next >

Click **Back** to go back to the previous screen.
Click **Next** to set up the encryption key.

➤ Security Settings

Users can enable the wireless data encryption by ticking the box “Enable the data security” or ignore the item. When users choose to enable the data security, please enter the encryption key that applies to your network.

You can enter key values using either the alphanumeric value or the hexadecimal value. The encryption key value is case-sensitive. Consult your LAN administrator for the correct value.



The screenshot shows a 'Settings' window with a blue title bar containing a small icon, the text 'Settings', the time '1:32p', and an 'ok' button. Below the title bar is a section header 'Add/Edit Configuration'. The main area contains a checkbox labeled 'Enable Data Security' which is checked. Below this are two radio buttons: 'Use Alphanumeric Characters' (unselected) and 'Use Hexadecimal' (selected). There are four text input fields labeled 'Key 1', 'Key 2', 'Key 3', and 'Key 4'. The values entered are '9999999999', '12a32fd457', '65fe321289', and 'aaaaaaaaaa' respectively. Below these fields is a dropdown menu currently showing 'Key 3'. At the bottom are two buttons: '< Back' and 'Next >'. A small keyboard icon is visible in the bottom right corner of the window.

Click **Back** to go back to the previous screen.

Click **Next** to configure the power management settings.

➤ Card Power Management

Users can enable power management for lower power consumption ,or disable power management to keep the default power consumption settings and maximize wireless performance. Select the choice you want.

Settings 1:34p ok

Add/Edit Configuration

Card Power Management

☒ Off ☐ On

Use this page to:

- Enable Power Management for lower power consumption and wireless performance.

< Back Finish

Click **Back** to go back to the previous screen.
Click **Finish** to complete setup.

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 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.

The term "IC:" before the radio certification number only signifies that Industry Canada Technical specifications were met.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

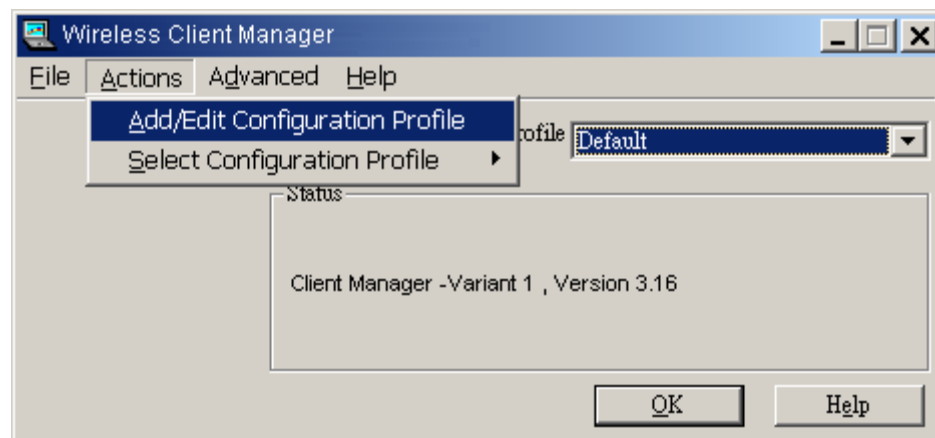
Configure the CF card under Windows Operating Systems

For Windows XP users, click the taskbar Wireless network Connection icon to open the client manager screen and view the wireless network status. Select the available network and click Connect. Once the connection is established, users can see the indicator flickering to connect with the network.

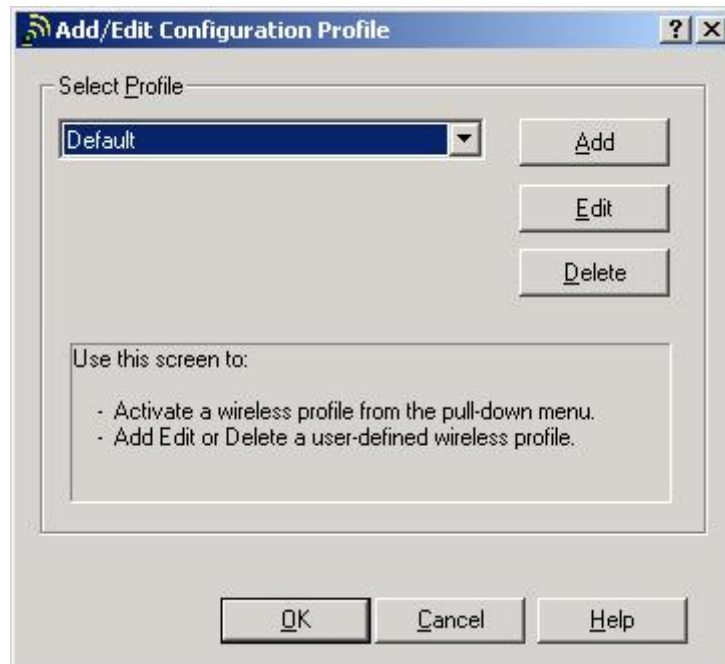
For Windows 98SE/ME/2000 users, right click the taskbar icon to launch the client manager screen or follow the steps to click Program -> Wireless-> Client Manager.

If the adapter can catch the current configuration file, select the network you want and click **OK**. If the adapter cannot catch the correct configuration, please do as follow:

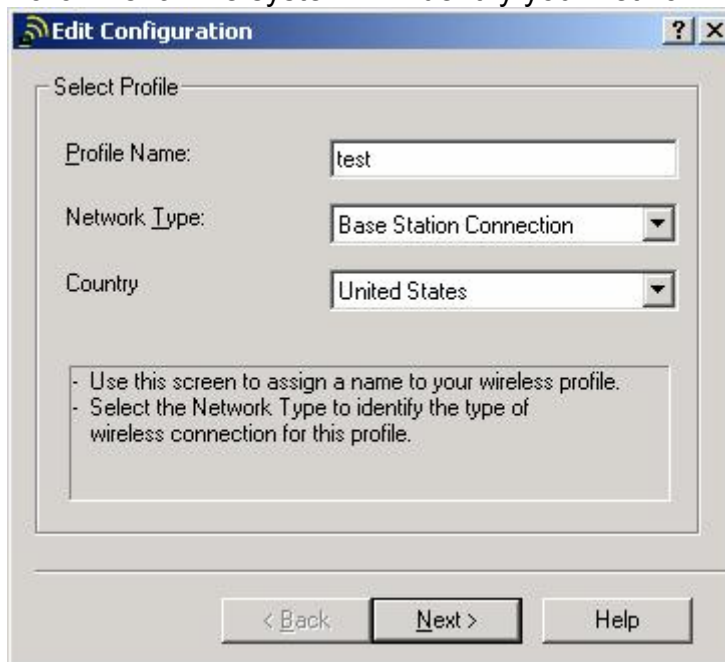
(1) Click **Actions** and point the cursor to **Add/Edit Configuration Profile**, and then click OK.



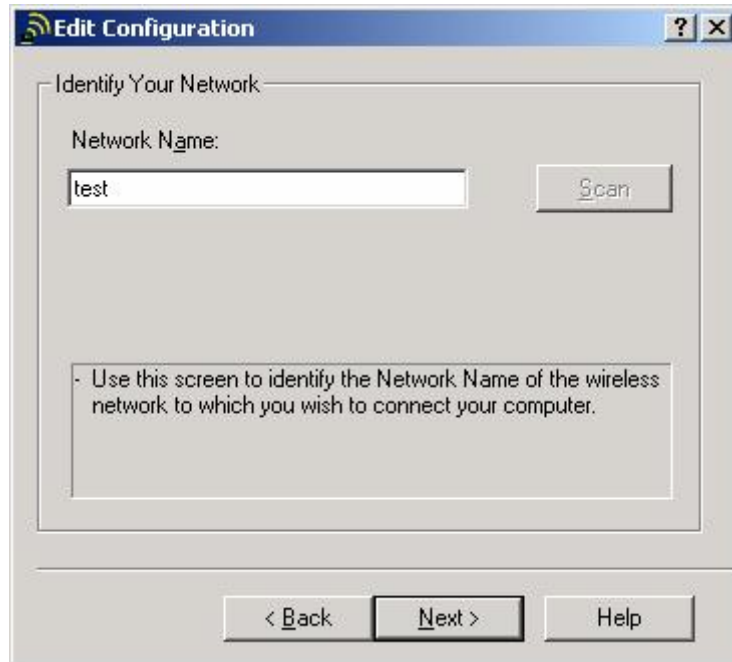
(2) Click **Add/Edit** to add or edit a profile.



(3) Enter the **Profile Name**, select the **Network_Type**, choose the country and then click **Next**. The system will identify your network.



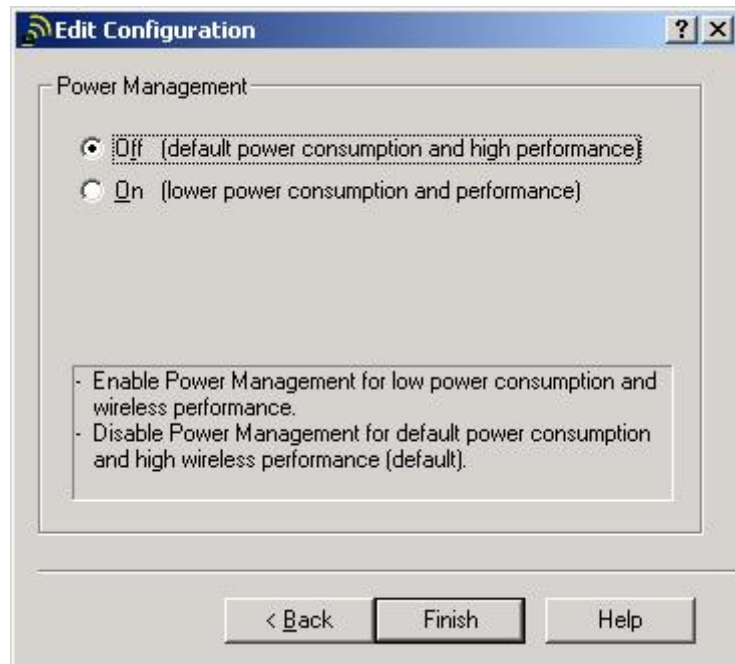
If you do not know the network name, click **Edit** and then **Scan** and then select the one you want.



(4) If you want to set security, Tick **"Enable Data Security"**, select the encryption option, enter the keys and choose the key that you want to encrypt data with. Click **Next** to the next step.



(5) Choose **On** or **Off** to turn on or off power management. Click **Next** to continue the configuration.



Click **OK** to finish the configuration. After the configuration, you can see the indicator flickering when it connects to the network.

3. Using the Client Manager Utility

3.1 Installing the Client Manager

When you complete the driver installation, please insert the CF card into the CF card slot in the device. The client manager utility can be launched from the taskbar on the **Today** screen.

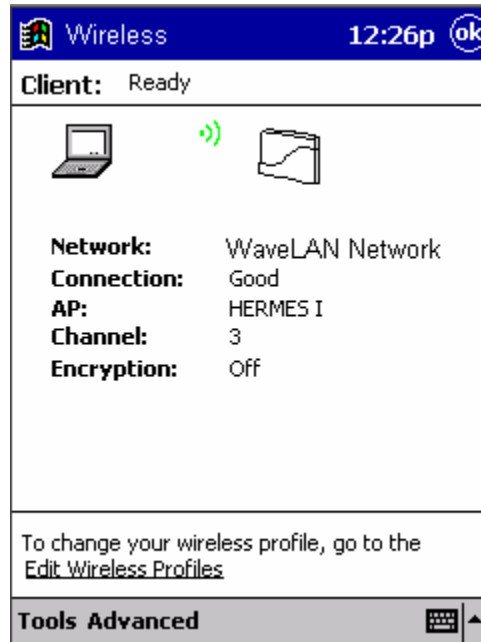
Users may test the network connection and a site survey by using the client manager. The client manager taskbar icon conveys the real-time signal strength and connection status.

3.2 Taskbar Icon Status

ICON	Status
	Excellent connection
	Good connection
	Marginal connection
	Poor connection
	No connection
	No quality information available (no driver, incompatible driver, and so on)

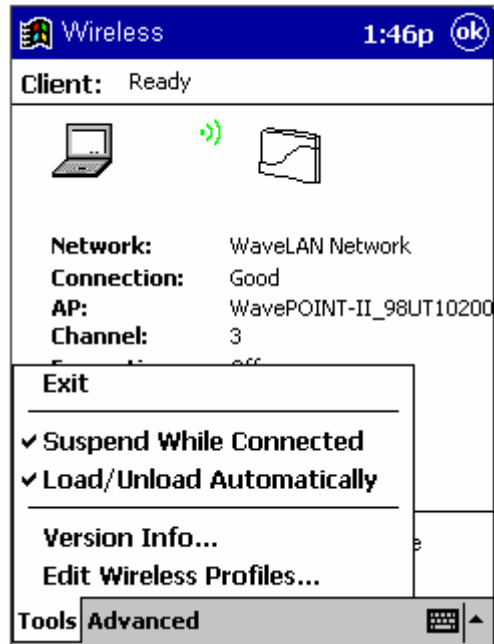
3.3 Using the Client Manager

Click the taskbar icon to open the client manager screen to check the wireless network status.



Use the **Tools** pop-up menu to:

- Enter the configuration profile edit screen.
- Check the driver and firmware revision.
- Enable/disable the settings **suspend while connected** and **Load/Unload automatically**.
- Click the **Client Manager** which is hidden on the taskbar.



You can use the **Advanced** pop-up menu to:

- Scan and monitor the access points in range.
- Select a partner to do a link test.



4. Specifications

4.1 Physical Specifications

Form Factor		Compact Flash card Type I extended
Dimensions		52.56 x 42.80 x 5.57 mm
Temperature & Humidity		
Operation	0° to 70° C	Maximum humidity 95%
Storage	- 15° to 85° C	5% to 95% (Non condensing, relative humidity)

4.2 Power Characteristics

Sleep Mode	2-15 mA
Receive Mode	165 mA
Transmit Mode	265 mA
Power Supply	5/3.3 V

4.3 Networking Characteristics

Compatibility	• IEEE 802.11 Standard for WLANS (DSSS) • Wi-Fi certified by the Wireless Ethernet Compatibility Alliance (WECA)	
Network Operating System	Microsoft Windows 98SE/ME/2000/XP Windows CE 3.0/ .NET Pocket PC 2002, 2003	
Host Operating System	Pocket PC	
Media Access Protocol	CSMA/CA (Collision Avoidance) with Acknowledgment (ACK)	
Data Rate	• High	11 Mb/s
	• Medium	5.5 Mb/s
	• Standard	2 Mb/s
	• Low	1 Mb/s
	The card uses an automatic transmit-rate select mechanism.	

4.4 Radio Characteristics

Radio characteristics of CF cards may vary:

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

Wireless communication is often subject to local radio regulations. Although CF card wireless networking products have been designed for operation in the license-free 2.4 GHz band, local radio regulations may impose limitations on using wireless communication equipment.

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

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

The acronym of the channel set supported by your CF card is printed on a label on the reverse side of your CF card.

RF Frequency Band	2.400 – 2.462 GHz (2.4 GHz ISM Band)			
Number of Selectable Subchannels	11			
Modulation Technique	DSSS (Direct Sequence Spread Spectrum), DBPSK, DQPSK, CCK			
Bit Error Rate (BER)	Better than 10^{-5}			
Nominal Output Power	15dBm +/- 1 dBm			
Range (100 bytes User Data) / Transmit Rate	High Speed 11 Mb/s	Medium Speed 5.5 Mb/s	Standard Speed 2 Mb/s	Low Speed 1 Mb/s
Open Office Environment	160 m (525 ft.)	270 m (885 ft.)	400 m (1300 ft.)	550 m (1750 ft.)
Receiver Sensitivity	-82dBm	-87 dBm	-89 dBm	-93 dBm
Delay Spread (at FER of <1%)	65 ns	300 ns	400 ns	500 ns

CAUTION: To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

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.**
- (2) This device must accept any interference received, including interference that may cause undesired operation.**

This device is intended only for OEM integrators under the following conditions:

(1) The transmitter module may not be co-located with any other transmitter or antenna. As long as conduction above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following:
"Contains TX FCC ID: IXMCF-B-AG-02 "

Manual Information That Must be Included

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the users manual of the end product which integrate this module.

The users manual for OEM integrators must include the following information in a prominent location "

IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements. The antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

USI declared that CF-B-AG-02 is limited in CH1~11 by specified firmware controlled in USA.

5. Basic Troubleshooting

If you cannot connect your CF card to the network, check the light on your CF card:

[Note]: The 802.11b WLAN CF card has two LED indicators Transmit/Receive and Power ON/OFF LED Indicators.

- Power light on, transmit/receive light off
- Power light on, transmit/receive light flickering
- Both power light and transmit/receive light blink once every 10 seconds
- Power light is flickering
- No light activity

If there is light activity, use the Client Manager diagnostic tool on your station to run the link test to verify the quality of wireless network-interface radio communications with the network.

Power Light on, Transmit/Receive Light off

Indicates normal operation:

- The CF card is in operation.
- The transmit/receive light indicates that there is no activity on the wireless network.

The absence of activity on the wireless network interface could be related to the fact that:

- You moved out of wireless range of the base stations that could provide access to the selected network.
- There are no wireless client stations in the wireless range of your computer to participate in the selected peer-to-peer group.
- The base stations that could provide access to the selected network are not functioning properly or are turned off.
-

Power Light on, Transmit/Receive Light Flickering

Indicates normal operation:

- The CF card is in operation.

- The transmit/receive light indicates that there are activities on the wireless network.

If the radio of your CF card seems to communicate with other radio devices but does not succeed in actually connecting to the network (in other words, the power and radio light shows normal activity), you may need to verify whether your operating system installed the correct network protocol settings.

Power Lights Blink Once Every 10 Seconds

Indicates that the CF card is in operation and working properly, but that the card is unable to establish a wireless connection to the wireless network.

Possible causes might be:

- Your wireless station is outside the wireless range of the base stations that could provide access to the selected network.
- The wireless network interface of your station has been configured with an incorrect network name or encryption key settings.
- You selected an incorrect configuration profile on your wireless station.
- The base stations that could provide access to the selected network have been configured to deny access to stations that use the value **ANY** as their network name.

Contact your LAN administrator for information about the correct values of the parameter settings that apply to your network.

No Light Activity

If there is absolutely no light activity on the power light and receive/transmit light of the CF card:

- The CF card device is not properly connected to your computer.
- No driver was installed to allow communication between your computer and the wireless network interface.

Power Light Is Flickering

Indicates that you enabled the card power management option for the CF card of a wireless client station (advanced settings).