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Pure Networking 802.11b Wireless Mini USB Adapter

FEDERAL COMMUNICATIONS COMMISSION and INDUSTRY CANADA RADIO FREQUENCY INTERFERENCE STATEMENTS

Class B Digital Device. This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular 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. If this equipment does cause harmful interference to radio or telephone 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 an experienced radio/TV technician for help.

CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To meet FCC requirements, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

EUROPEAN UNION DECLARATION OF CONFORMITY

This equipment complies with the requirements of the European EMC Directive 89/336/EEC.

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NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

   A: El cable de poder o el contacto ha sido dañado; u

   B: Objetos han caído o líquido ha sido derramado dentro del aparato; o

   C: El aparato ha sido expuesto a la lluvia; o

   D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

   E: El aparato ha sido tirado o su cubierta ha sido dañada.

TRADEMARKS USED IN THIS MANUAL

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NetWare is a registered trademark of Novell, Inc.

Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

Contents

Chapter   **Page**

1. Specifications

Antenna: Internal antenna

Distance (Maximum): 328 ft. (100 m)

Frequency Band: 2.4000–2.4835 GHz

Modulation: OFDM with BPSK, QPSK, 16AQM, 64QAM (11g), BPSK, QPSK, CCK (11b)

Operating System: Compatible with all major operating systems; Drivers included for Windows® 98 SE/Me/XP, Windows 2000, and Linux®

Security: 64-/128-/152-bit WEP Data Encryption, WPA (TKIP with IEE 802.1x), and AES

Speed: 11, 5.5, 2, 1 Mbps with auto fallback

Standards: IEEE 802.11b

Bus Type: USB Type A

Radio Technology: Direct Sequence Spread Spectrum (DSSS)

Connectors: (1) USB Type A

Indicators: (1) Link/Activity LED

Temperature: 32 to 131°F (0 to 55°C)

Humidity: Up to 95%, noncondensing

Power: From the interface

Transmit Power: 16 dBm

Size: 0.3"H x 1"W x 3.5"D (0.8 x 2.5 x 8.9 cm)

2. Introduction

2.1 Overview

Connect your PC to another network device without cable. The Pure Networking 802.11b Wireless Mini USB Adapter installs in your notebook, laptop, or desktop PC and uses wireless technology to transfer data. It also supports Windows OS plug-and-play installation and USB hot swap, allowing you to plug it in or remove it without rebooting your computer. The adapter complies with the IEEE 802.11b 2.4 GHz (DSSS) standard, which supports wireless network connections up to 11 Mbps. High throughput maximizes multimedia data bandwidth and 64-/128-bit WEP data encryption for a high level of security. It also supports peer-to-peer communication among wireless users, with no access point required. Automatic fallback increases data security and reliability. The card works with Windows 98 SE/Me/XP and Windows 2000.

2.2 What's Included

Before you begin the installation, check the contents of your package. The package should include the following items:

- (1) Pure Networking 802.11b Wireless Mini USB Adapter

- (1) 3.2 ft. (1-m) USB extension cable

- (1) CD-ROM containing this users' manual in PDF format and software drivers

If anything is missing or damaged, please contact Black Box at 724-746-5500.

3. Installation

Before you proceed with the installation, read the following notes.

NOTES

Do not install the adapter in your PC's USB port before installing the software program from the CD.

The installation described in Section 3.1 was operated under Windows 2000. (Procedures are the same for Windows 98 SE/Me.)

If you have installed the Pure Networking 802.11b Wireless Mini USB Adapter driver and utility before, please uninstall the old version first.

3.1 Windows 98 SE/Me and Windows 2000

1. Insert the CD into the CD-ROM drive and type Utility\setup.exe. The InstallShield Wizard screen will appear (see Figure 3-1); click **Next** to continue.
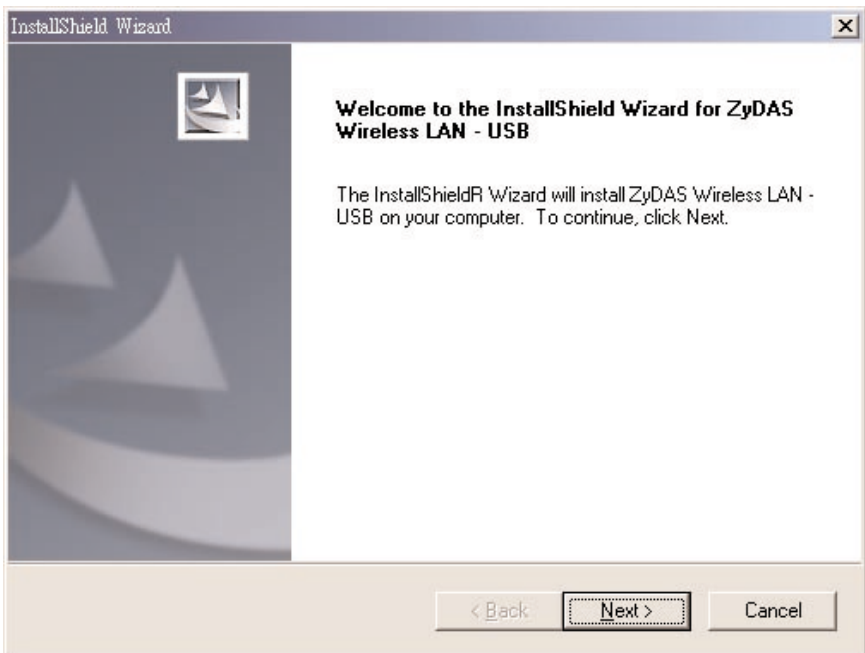

Figure 3-1. InstallShield Wizard screen.

2. The Choose Destination Location screen (see Figure 3-2) will show you the default destination chosen by the program. If you want to install the utility in another location, click on the **Browse** button and select an alternate destination. When you are ready to continue, click on the **Next** button.
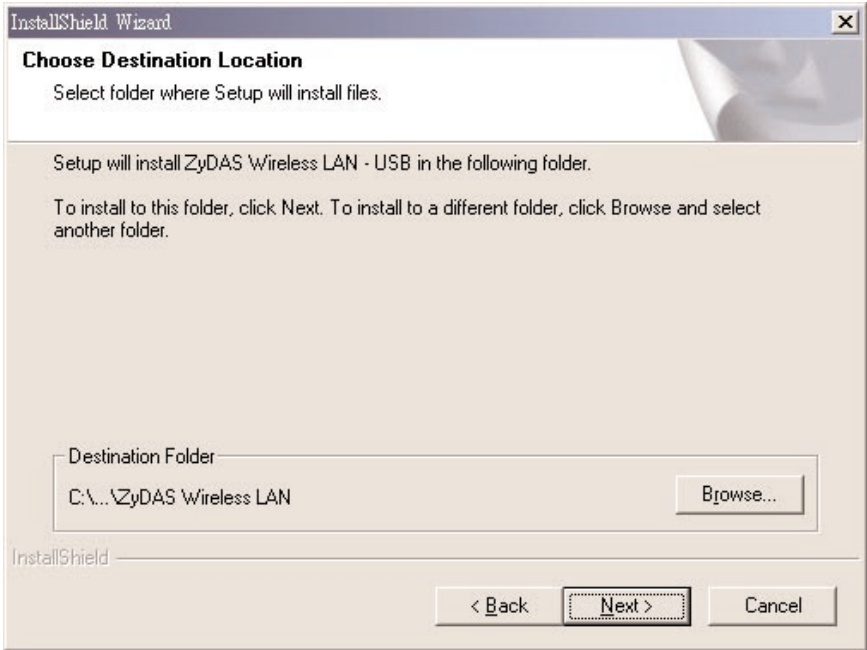

Figure 3-2. Choose Destination Location screen.

3. The program will finish the installation automatically (see Figure 3-3).
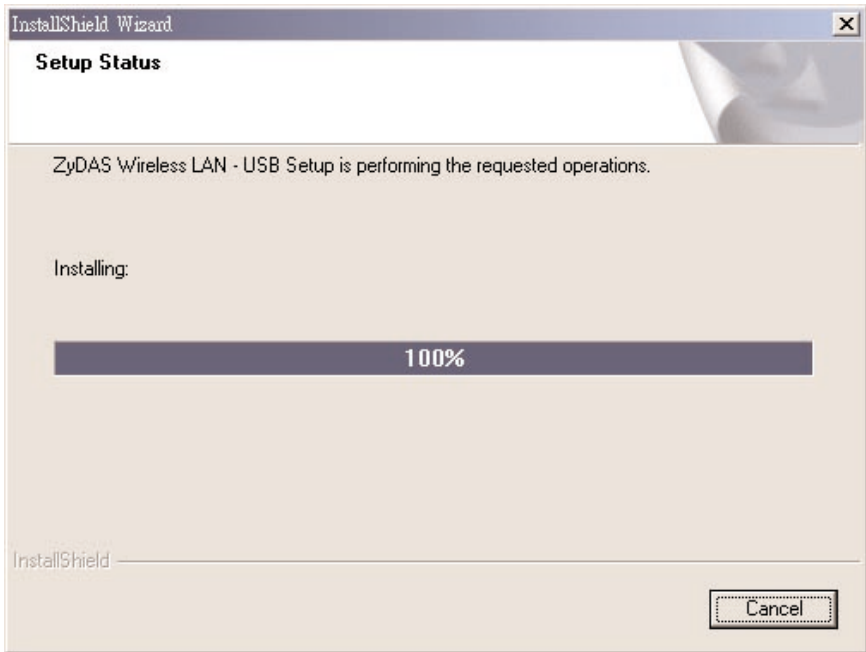

Figure 3-3. Setup Status screen.

4. When the installation is done, insert the Pure Networking 802.11b Wireless Mini USB Adapter into the computer's USB port.

5. The system will automatically detect the adapter as a new device and display the Add New Hardware Wizard dialog box. Follow the installation wizard to complete the device setup step by step.

6. After completing the installation, run the ZDConfig program (click on the **Start** button in the system tray [the leftmost icon in Figure 3-4] and select **ZyDAS Wireless LAN—USB**) to start using the Pure Networking 802.11b Wireless Mini USB Adapter.

3.2 Windows XP

The Windows XP installation process is similar to the process described in **Section 3.1**. Please follow those instructions. Once it's installed, return to this section and either use the Windows XP utility (see **Section 3.2.1**) or the card's utility (see **Section 3.2.2**). We strongly recommend using the card's utility.

3.2.1 USING THE WINDOWS XP UTILITY

Click on the workstations icon (fourth from left) in the system tray (see Figure 3-4). The screen shown in Figure 3-5 appears. Click on **Connect** to start using the Windows XP wireless utility.

Figure 3-4. System tray.

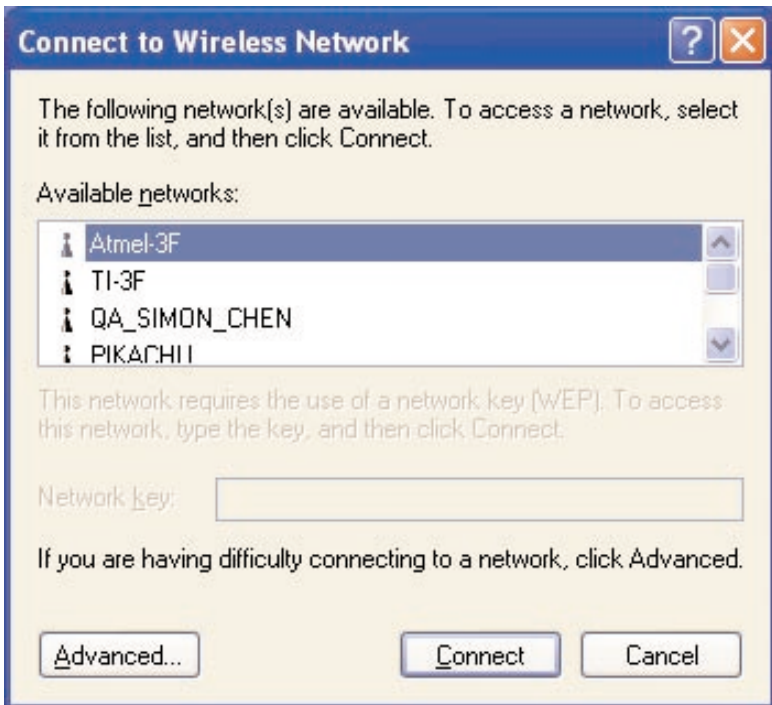
Figure 3-5. Connecting to the wireless network.

3.2.2 USING THE CARD'S UTILITY

1. From the scroll-down menu in the Connect to Wireless Network screen (Figure 3-5), select the network you want to connect to. Then click on the **Advanced** button. The Wireless Network Connection 2 Properties screen appears (see Figure 3-6).
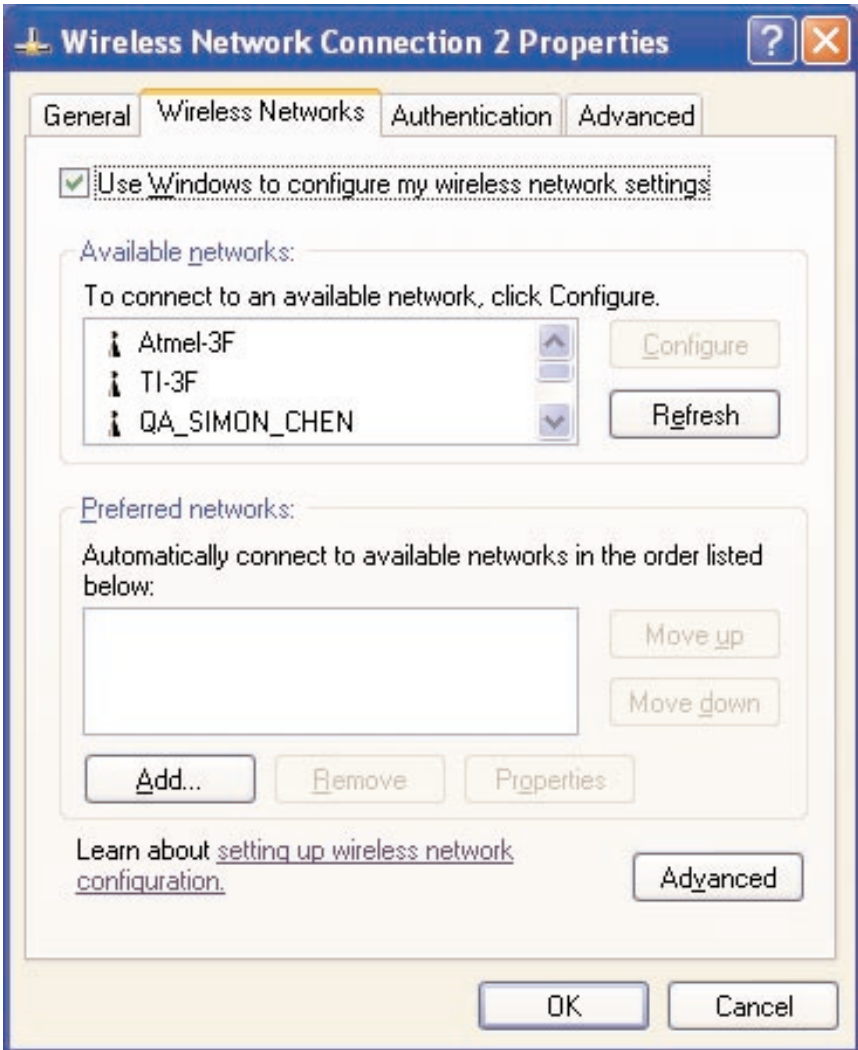

Figure 3-6. Wireless network connection properties tab.

2. Select the Wireless Networks tab (see Figure 3-6) in the Wireless Network Connection Properties screen, then clear the **Use Windows to configure my wireless network settings** check box by clicking on the √. If you want to enable the Windows XP built-in utility, select the check box again, and the √ will reappear. Click on the **OK** button.

3. Run the ZDConfig program (click on the **Start** button in the system tray [the leftmost button in Figure 3-4]). The ZyDAS Wireless LAN Configuration Tool screen appears (see Figure 3-7). Select **ZyDAS Wireless LAN—USB** from the drop-down list.
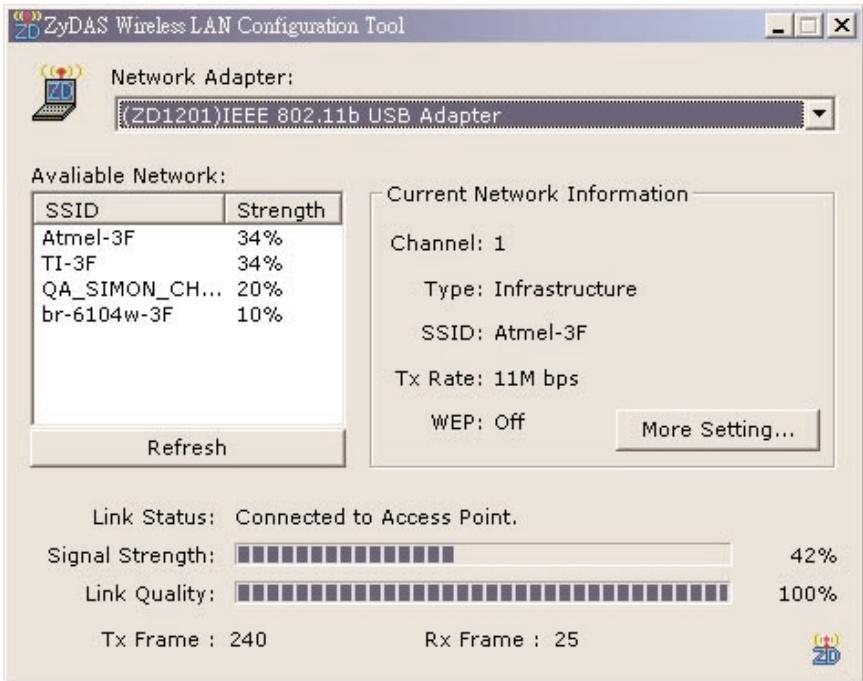

Figure 3-7. ZyDAS Wireless LAN Configuration Tool screen.

NOTE

Disable the Windows XP utility as described in Section 3.2.2, step 2, before using the adapter's utility . If you don't, you can only see the link status when the adapter is using its own utility.

4. Configuration Utility

The Configuration Utility is a powerful application that helps you configure the Pure Networking 802.11b Wireless Mini USB Adapter and monitor the link status during the communication process.

This utility can be used to change the following configuration parameters when the device is active.

4.1 Wireless Connection

In the ZyDAS Wireless LAN Configuration Tool (see Figure 4-1), you can access any of the wireless devices' information. Check the link status while the Wireless Mini USB Adapter is linking to one of the wireless devices.
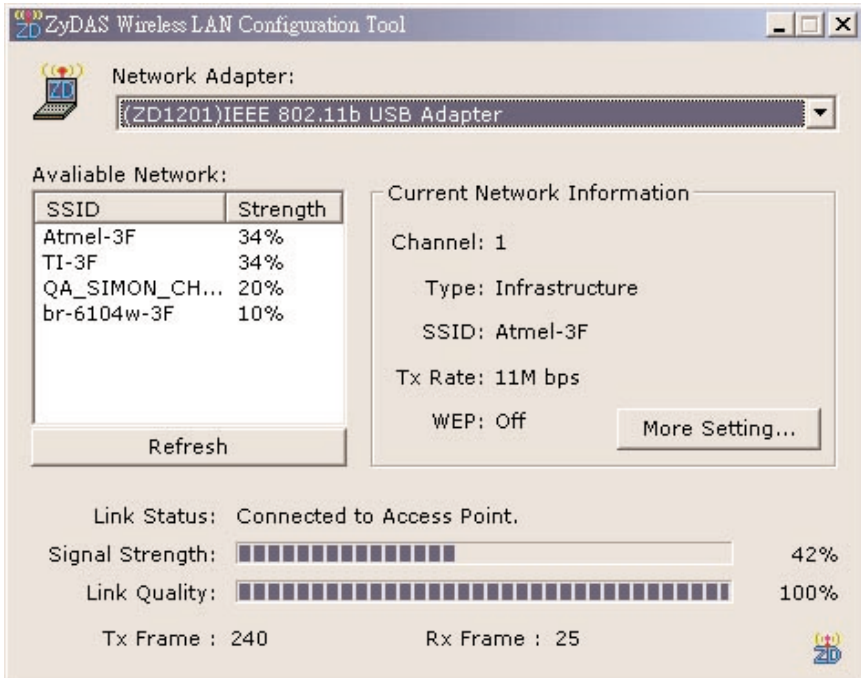

Figure 4-1. Configuration Tool.

Table 4-1. Wireless LAN configuration tool screen parameters.

Parameter	Description
Network Adapter	Displays the USB Adapter's name.
Available Network	Displays the SSID and Signal Strength of wireless devices nearby. To re-survey the available wireless devices, click on the **Refresh** button. There are two ways to automatically make the connection between the USB Adapter and the wireless device on the list. 1. Double-click on the wireless device in the list. 2. Click once on the device you intend to connect. The **Refresh** button changes to the **Connect this site** button. Click on this button.
Current Network Information	Displays the information about the wireless network this adapter is connecting to. The information includes Channel, Type, SSID, TX Rate, and WEP settings. Refer to **Section 4.2** for a description of each item.
More Setting button	Press this button for more settings including disable/enable WEP and Power Saving Mode. Please refer to **Sections 4.2** through **4.4**.
Link Status	Displays the status of the wireless connection.
Signal Strength	This bar shows the signal strength level. The higher percentage shown in the bar, the stronger the radio signal that's received by the adapter. This indicator helps to find the proper position of the wireless device for quality network operation.

Table 4-1 (continued). Wireless LAN configuration tool screen parameters.

Parameter	Description
Link Quality	This bar indicates the quality of the link. The higher the percentage, the better the quality.
TX Frame	The number of data frames that are transmitted by the adapter successfully.
RX Frame	The number of data frames that are received by the adapter successfully.

4.2 General Connection Setting

In the More Setting screen (see Figure 4-2), you can designate the wireless network that the adapter intends to connect to, enable or disable the WEP data encryption, save or load the setting values into or from a file, etc.
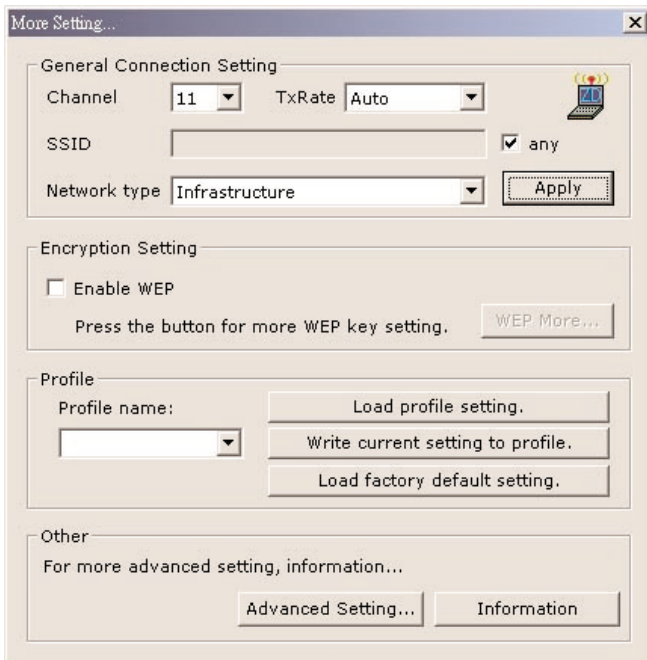

Figure 4-2. More Setting screen.

Table 4-2. More Setting screen parameters.

Parameter	Description
General Connection Setting	
Channel	Select the number of the radio channel used for the networking. The channel setting of the wireless stations within a network should be the same.
Tx Rate	Select the basic transmit rate: 11, 5.5, 2, or 1 Mbps. If you select **Auto**, the adapter will automatically adjust to the highest possible rate according to the interference or obstacles.
SSID	The SSID (up to 32 printable ASCII characters) is the unique name identified in a WLAN. The ID prevents the unintentional merging of two co-located WLANs. You may specify a SSID for the adapter; then, only the device with the same SSID can interconnect to the adapter.
Any	If the **Any** box has a check mark in it, the adapter will survey and connect to one of the available wireless stations without checking the consistency of the channel and SSID with the wireless station.
Network Type	Infrastructure: This mode requires the presence of an access point (AP) or router to create a wireless network. All the communication is processed through the AP or router.
	Ad-Hoc: This mode enables wireless network adapters to interconnect without an AP or router. Select this mode if there is no AP or router in the network.

Table 4-2 (continued). More Setting screen parameters.

Parameter	Description
Change button	Pressing the **Change** button enables you to set the General Connection Setting's parameters. Meanwhile, the button will change to the **Apply** button for you to confirm your settings.
Encryption Setting	In the Encryption Setting section of the screen shown in Figure 4-2, set up the WEP key for the data encryption within the network. To do this, first check (√) the Enable WEP box and click on the **WEP More** button, then refer to **Section 4.3** for details.
Profile	
Profile Name	Type the profile name in the Profile Name box, or use the drop-down menu to select the Profile Name.
Load profile setting	Automatically loads the setting values corresponding to the file named in the Profile Name. The new settings will be activated immediately.
Write current setting to profile	Saves the setting values for the selected profile to the file named in the Profile Name field.
Load factory default setting	To restore the settings to the factory default, press this button. The default values are as follows: Channel: 6 Tx Rate: Auto SSID: Any Network Type: Infrastructure

Table 4-2 (continued). More Setting screen parameters.

Parameter	Description
Other	
Advanced Setting button	Press this button for more advanced settings. For details, refer to **Section 4.3**.
Information button	To view the adapter's driver name, firmware version, and MAC address, press the button.

4.3 WEP Encryption

WEP is an authentication algorithm that protects authorized wireless LAN users against eavesdropping. The authentication mode and WEP key settings must be the same on the wireless stations within the network. This adapter supports the 64-/128-bit WEP encryption function. With this function, your data will be transmitted over the wireless network securely. To access the WEP key setting screen (Figure 4-3), check (√) the **Enable WEP** box in the More Setting screen (Figure 4-2), then click on the **WEP More** button.
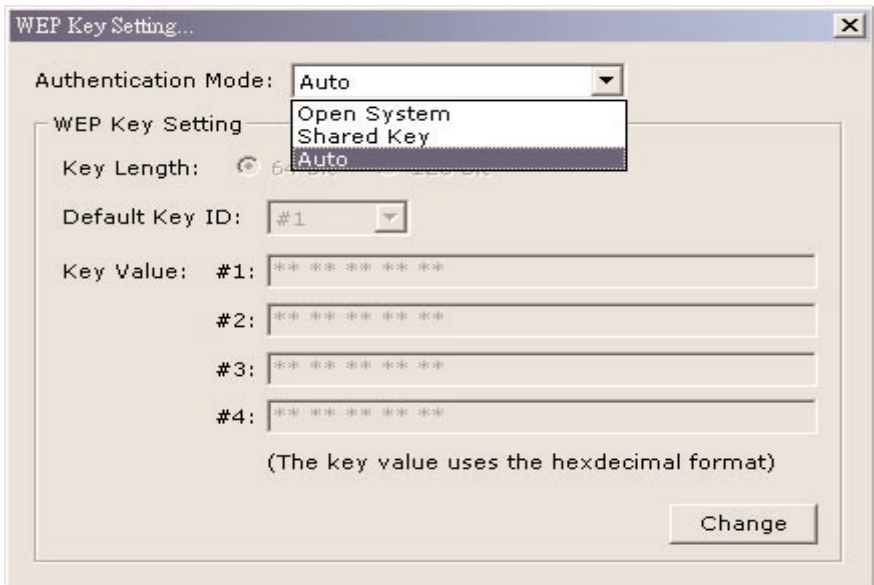

Figure 4-3. WEP setting screen.

Table 4-3. WEP parameters.

Parameter	Description
Authentication Mode	This setting has to be consistent with the wireless stations to which the adapter intends to connect.
	• Open System—No authentication is needed among the wireless stations.
	• Shared Key—Only wireless stations using a shared key (WEP Key identified) are allowed to connect to each other. Set up the same key as the wireless stations that the adapter intends to connect to.
	• Auto—Autoswitch the wireless stations to the desired access point.
Key Length	You may select 64 bit or 128 bit to encrypt transmitted data. A larger key length will provide a higher level of security, but the throughput will be lower.
Default Key ID	Select one of the keys (1–4) as the encryption key.
Key Values #1–#4	The keys are used to encrypt data transmitted in the wireless network. Fill the text box, keeping in mind the points listed below. • 64-bit—Type in 10-digit Hex values (in the A–F, a–f, and 0–9 range) as the encryption keys. For example, "0123456aef". • 128-bit—Type in 26-digit Hex values (in the A–F, a–f, and 0–9 range) as the encryption keys. For example, "01234567890123456789abcdef".

4.4 Advanced Setting

The Advanced Setting option (see Figure 4-4) allows you to enable/disable power-saving mode, and to set the adapter's fragmentation and RTS/CTS threshold. To access the Advanced Setting screen (Figure 4-4), click on the **Advanced Setting** button in the More Setting screen (Figure 4-2).
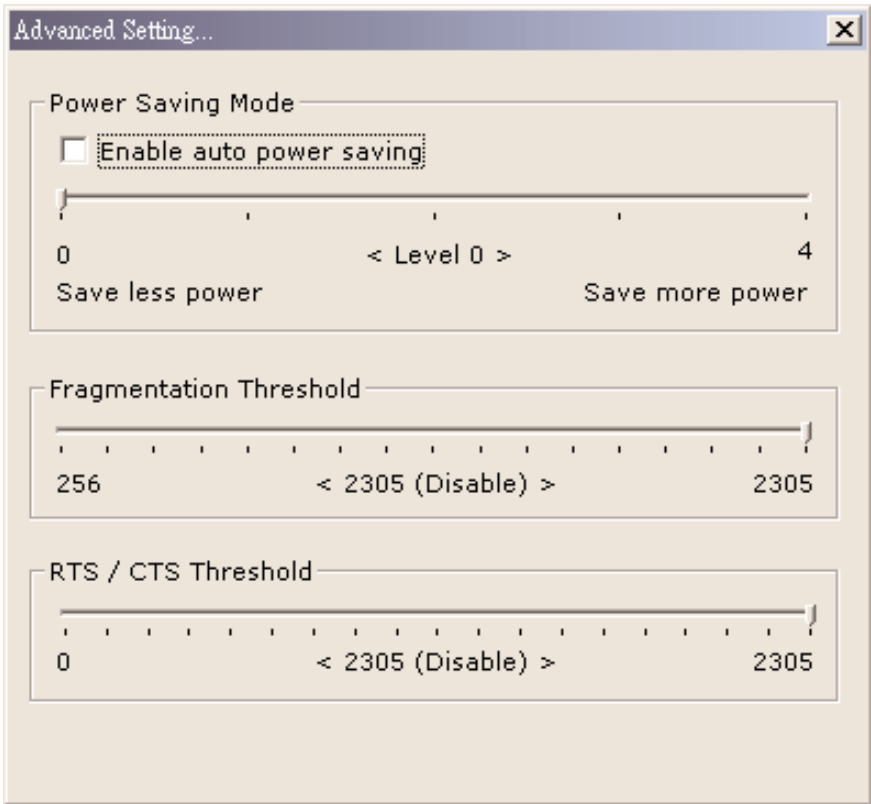

Figure 4-4. Advanced Setting screen.

Table 4-4. Advanced setting parameters.

Parameter	Description
Enable auto power saving	A check in this box enables power-saving mode. You may control the power consumption of the adapter by adjusting the save power level from 1 to 4. The higher the power save level selected, the lower the power used. This may slow down the transmission rate of the adapter.
Fragmentation Threshold	The value defines the maximum size of packets; any packet size larger than the value will be fragmented. If you have decreased this value and experience high packet error rates, you can increase it again, but it will likely decrease overall network performance. Select a setting within a range of 256 to 2305 bytes. We recommend changing the size in small increments.
RTS/CTS Threshold	This is the minimum packet size required for an RTS/CTS (Request To Send/Clear to Send). For packets smaller than this threshold, an RTS/CTS is not sent and the packet is transmitted directly to the WLAN. Select a setting within a range of 0 to 2305 bytes. We recommend changing the size in small increments.

5. Troubleshooting

5.1 Frequently Asked Questions

1. What is the IEEE 802.11b standard?

   The IEEE 802.11b Wireless LAN standard subcommittee formulates the standard for the industry. The objective is to enable wireless LAN hardware from different manufacturers to communicate.

2. What does the IEEE 802.11 feature support?

   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

3. What is ad-hoc?

   An ad-hoc integrated wireless LAN is a group of computers linked to each other *without* using an access point; each has a Pure Networking 802.11b Wireless Mini USB Adapter connected as an independent wireless LAN. You'd typically use an ad-hoc wireless LAN for a branch or SOHO operation.

4. What is infrastructure?

   When you connect a wireless LAN and a combination (wireless and wired) LAN together, it's called an infrastructure configuration. Infrastructure is applicable on an enterprise scale for wireless access to a central database, or for a wireless application for mobile workers.

5. 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.

6. What is WEP?

   WEP is Wired Equivalent Privacy, a data privacy mechanism based on a 40-bit shared key algorithm, as described in the IEEE 802 .11 standard.

7. Can wireless products support printer sharing?

   Wireless products perform the same function as LAN products. Therefore, wireless products can work with NetWare®, Windows 2000, or other LAN operating systems to support printer or file sharing.

8. 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 scrambling feature. 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.

9. 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 is, 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.

10. 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).

5.2 Calling Black Box

If you determine that your Pure Networking 802.11b Wireless Mini USB Adapter is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

• the nature and duration of the problem.

• when the problem occurs.

• the components involved in the problem.

• any particular application that, when used, appears to create the problem or make it worse.

5.3 Shipping and Packaging

If you need to transport or ship your Pure Networking 802.11b Wireless Mini USB Adapter:

• Package it carefully. We recommend that you use the original container.

• If you are shipping the Pure Networking 802.11b Wireless Mini USB Adapter for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.