

WI-FIRE PRODUCT MANUAL

DRAFT COPY

REVISED AUGUST 15 2006

License and Limited Warranty

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Taxes. You agree to be responsible for payment of any taxes, other than HField income taxes, resulting from this Agreement.

Patents. hField Products are protected by patents pending with the U.S. Patent Office.

Governing Law. The laws of the State of Pennsylvania, United States of America, shall govern this Agreement.

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.

Operation is subject to the following two conditions:

- 1) This device may not cause harmful interface, and
- 2) This device must accept any interface received, including interface that may cause undesired operation. 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.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

CAUTION:

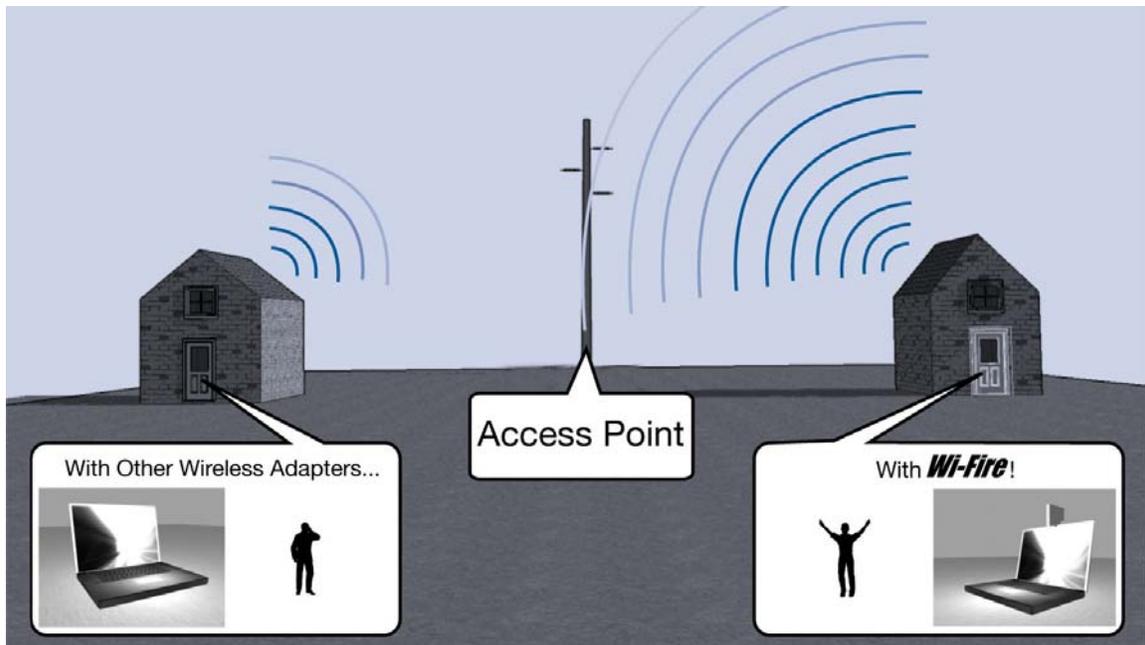
- 1) To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.
- 2) This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Who Should and Should Not Use This Product

Wi-Fire

TYPICAL USAGE RECOMMENDATIONS AND WARNINGS
PLEASE READ PRIOR TO PURCHASE

ATTENTION: PLEASE USE ONLY WHERE YOU KNOW THERE IS WI-FI ACCESS, EVEN THOUGH YOU MAY BE DISSATISFIED WITH THE CONNECTION SPEEDS OR ARE TOTALLY UNABLE TO CONNECT. THE WI-FIRE IS ABLE TO EXTEND YOUR REACH FROM THE TYPICAL 300 FOOT RANGE TO 1,000 FEET OR MORE, DEPENDING ON OBSTRUCTIONS, BUT CAN ONLY DO SO IF A USABLE WI-FI SIGNAL IS PRESENT.



WHO SHOULD DEFINITELY BENEFIT FROM WI-FIRE

1. The **Seriously Mobile User** should always see benefit at some locations. Situations have been observed where an internal adapter was showing a 1MB/s connection speed only 200 feet from an access point but not even browsing was possible. In the same

WHO SHOULD EXPLORE FURTHER BEFORE PURCHASING WI-FIRE

1. **If you intend to use the Wi-Fire from only one location, or a single location is so critical to you that your experience will be shattered if you don't see improvement at that singular location,** AND, when at that location, Windows XP "view wireless

spot and time with Wi-Fi, speeds achieved exceeded 30MB/s and even streaming video appeared as fast as a wired connection.

2. **Any User, Mobile or Stationary**, who can see at least one bar in the “view wireless locations” of Windows XP should see satisfactory to excellent improvement with Wi-Fi.

locations” does not display any bars, you must question whether there is any usable signal. In this case, we can advise downloading your favorite access point detection software to see the relative strength of signals from different access points around you. Our minimum receive power is a whopping -98dBm. If one of your access points shows at least -88dBm, you should be able to connect at realistic speeds to make your experience productive and enjoyable. If not, you might try moving your equipment slightly in search of a better signal, but that’s also is entirely your option.

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Introduction

Welcome

Thank you for purchasing the Wi-Fire. hField Technologies' Wi-Fire is a fully integrated USB WiFi adapter for today's seriously mobile computer user. With our patent-pending technology, the Wi-Fire allows you to connect from locations you never believed possible before, and allows you to maintain stronger and faster connections with any 802.11b/g WiFi access point. The Wi-Fire is specifically designed for easy use, so it conveniently mounts onto any laptop display or flat screen monitor, as well as lays flat on any surface. In short, the Wi-Fire makes WiFi networks more accessible for you!

Package Contents

- Wi-Fire Adapter
- Universal Mount
- USB Cable
- Quick Install Guide
- Installation CD

Quick Installation

Load PDF

Configuration

After successful installation of the Wi-Fi Adapter's driver, the Wi-Fi Connection Manager icon will display in the task bar. You will be able to access the Wi-Fi Connection Manager through the Network Status Icon (Circle: Gray for Standby, Yellow when Connecting, Green when connected).



Status Icon in standby mode.

If the icon doesn't appear automatically, go to **Start -> Programs -> Wireless LAN Utility -> Wireless LAN Utility**, it will appear in the task bar.



Using the Wi-Fi Connection Manager

All settings are categorized into 4 Tabs:

Main Tab (see below)

Profile Manager Tab (assists in Profile Management, automatically comes up when pressing **Connect** on a new profile)

Information Tab (contains information on the wireless connection).

About Tab (contains information on this software)

Main Tab

The main tab enables you to scan for available networks, select a network to which to connect, modify the settings for the current connection, or set up your station for Ad Hoc connection.



Note □ Only one configuration utility can be active at a time. When Windows Zero Configuration (WZC) is set to be the active utility, opening the Wi-Fire Configuration Manger □ by double-clicking on the its icon in the system tray or right-clicking the icon and selecting Open □ launches the WZC instead of the Wi-Fire Configuration Manager.



To open the Wi-Fire Connection Manager instead, right click on its system tray icon, unselect the WZC option, then either right click on the icon again and click Open, or double click on the icon itself, and the Wi-Fire Connection Manager will be launched instead.

Wi-Fi Configuration Manager Main Tab Indicators

<p>Configure using Windows Zero Configuration Utility</p>	<p>External Configuration Checkbox: A checkbox that enables you to disable the Wi-Fi Configuration Manager and indicates that the station driver is to be configured with Windows XP's Zero Configuration Utility (WZC).</p> <p>On Windows XP systems, the WZC service is automatically stopped when the Wi-Fi Connection Manager is installed. The WZC is started when you check the Configure using Windows Zero Configuration checkbox. (Note: If you wish to switch back and forth between Wi-Fi and your internal adapter, it's recommended that you configure WZC for Automatic startup. WZC can be found in the Windows XP Services menu).</p>
<p>Profile Name</p>	<p>The profile name that is currently connected.</p>
<p>SSID</p>	<p>The SSID is the unique name shared among all points in your wireless network. The name must be identical for all devices and points attempting to connect to the same network.</p> <ul style="list-style-type: none"> ✔ Indicates that the network does not require special security settings and access rights in order to connect. 🔒 Indicates that the network requires special security settings and access rights in order to connect. ⊖ Indicates a hidden network which is not broadcasting its SSID. The SSID for such networks are listed as <Hidden Network>. In order to connect to such a network, you must know the network's SSID.
<p>BSS ID</p>	<p>The MAC address for the Access Point or station.</p>
<p>Current Tx Rate</p>	<p>It displays the currently connected rate.</p>
<p>Channel</p>	<p>The channel that is currently connected.</p>
<p>BSS type</p>	<p>The type of connection, either Access Point or Peer-to-Peer.</p>
<p>Tx Rate/ Rx Rate</p>	<p>The actual instantaneous transmit and receive rates, in Mbps.</p>
<p>Signal Quality</p>	<p>The signal strength from the Access</p>

	Point. The strength is displayed in three formats: a signal quality level (one of five levels, from Bad to Best), a numerical value in dBm, and a signal quality bar graph with a scale of -82 (worst) to -10 (best).
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Wi-Fi Connection Manager Main Tab Buttons

Connect button	(See next page) .
Rescan button	Searches for all the available networks. By clicking on this button the utility will scan and list all the available Access Points to the left. It will continue to scan once every 10 seconds until the utility is closed.
Configure button	Click this to modify the settings for the profiles for the SSID of the selected network. If no profile exists, the Profile Configuration window is displayed so that you can create a new profile.
Cancel button	Discards changes
OK button	Saves any changes to profiles and connection settings.

(BLAKE, THIS IS LOOKING MORE AND MORE LIKE AN OLD VERSION. WE HAD CHANGED THE NAME OF THE UTILITY TO BE CONSISTENT WITH THE NAME ON THE WINDOW, AND WE HAD ADDED THE APPLY BUTTON SOMEWHERE)

Connect Button and Profile Configuration

Highlight one of the devices from the list area and press the **Connect** button to access it. The first time you do this a profile configuration will come up. These details can also be edited by hitting the **Configure** button on the **Main** tab.



Profile Name: Enter the profile name (defaulted to SSID).

Set Configuration:

SSID Name: The SSID for the current connection.

BSS Type: The BSS type, either peer-to-peer or Access Point.

Channel: The preferred channel for the connection (only available on peer-to-peer connections).

Band: The band on which to make the connection.

Privacy

Super Profile: Determines the security settings available to you, and can be the following:

Personal: Enables only the basic security settings that you are likely to need at home.

Enterprise: Enables all security settings, including more complex certificate based settings that you may need in an office.

Security Determines the type of security to use for this connection:

None- No encryption

WEP- Wired Equivalent Privacy, is a data security mechanism based on a 64 Bit/128 Bit/ 256 Bit shared key algorithm. Press the **Configure** button to change WEP configuration:



Note: You must use the same **Default Key #**, **Key Size**, and **Encryption Key** on both the host and destination devices in order to establish a connection.

Key 1 ~ Key 4: You can specify up to 4 different keys, but only one can be used at a time.

Encryption: Enter the key value in this field.

WPA2 and **Any WPA** - WiFi Protected Access, is more secure than WEP.

Authentication Mode: Determines the type of authentication to use for this connection.

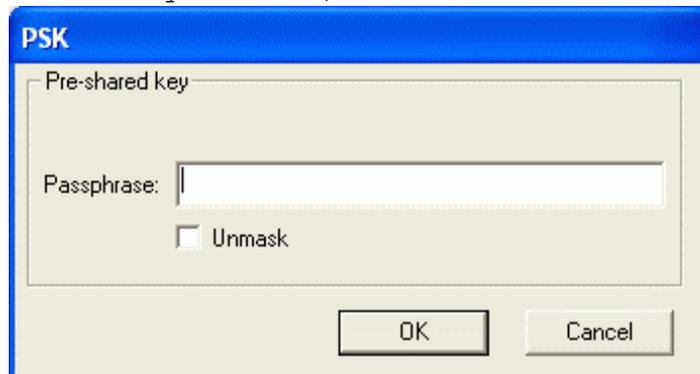
With **Super Profile** set to **Personal** and encryption enabled, this field can be set to:

Open: If your access point is using "Open" authentication, then the Wi-Fi Adapter will need to be set to the same authentication type.

Shared Key: Is when both the sender and the recipient share a secret key.

Auto Switch: To enable the adapter to automatically select.

PSK: In the **Passphrase** field, enter the key that you are sharing with the network for the WiFi connection. By default, the key that you type is masked with asterisks. To view the key that you enter, check **Unmask**.



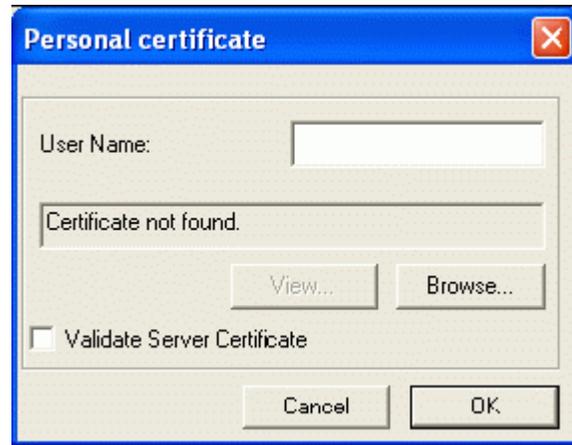
With **Super Profile** set to **Enterprise** and encryption enabled, this field can also be one of the following:

TLS

PEAP- MS-CHAP-v2 (only with CCX mode enabled)
PEAP- GTC (only with CCX mode enabled)
LEAP (only with CCX mode enabled)

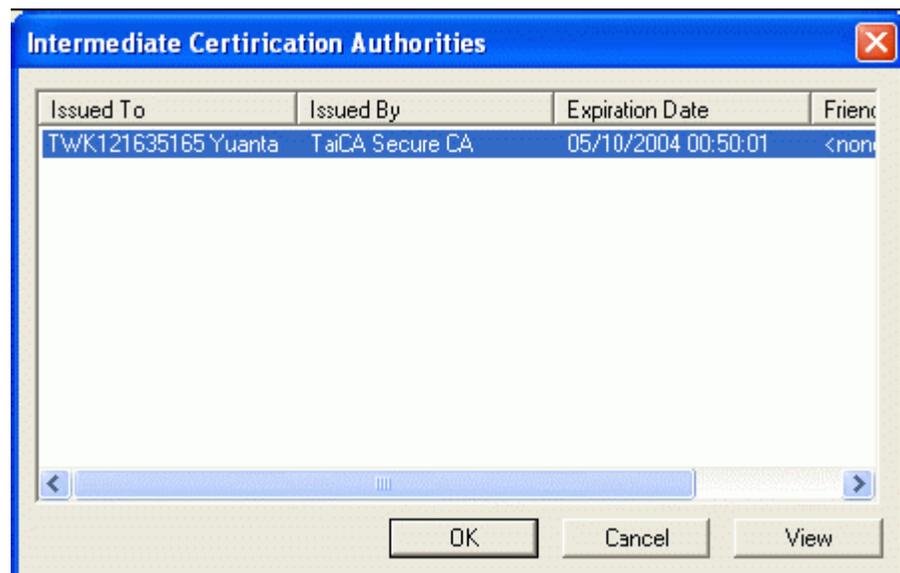
The **Personal Certificate** window enables you to supply a personal certificate for use with **TLS** and **PEAP- MS-CHAP-V2 authentication**. This window is only applicable with Enterprise security and encryption enabled.

Personal Certificate:



To supply a personal certificate:

1. In the **User Name** field, type in the user name assigned to the certificate.
2. Select a certificate by clicking **Browse**. The standard Windows **Select Certificate** window is displayed:



3. Select a certificate from the list, and click **OK**. The name of the certificate is displayed in the textbox in the middle of the *Personal Certificate* window.
4. To view the certificate, click **View**. The certificate is displayed:



The **Password** window enables you to supply login a name and password for use when selecting a **LEAP** or **PEAP- GTC** authentication.

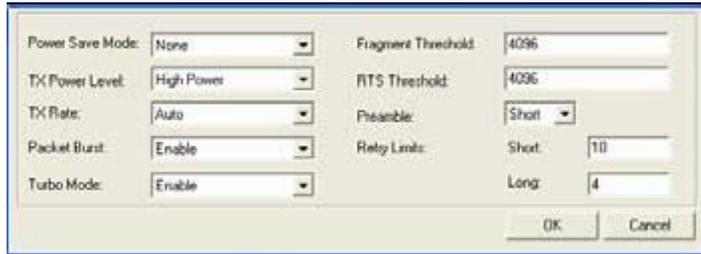
To specify a user name and password:

1. Select the appropriate radio button to indicate whether:
 - a. You are supplying a user name and password now
 - b. The utility prompts you for them each time you try to connect to a network.
2. To provide a user name and password now, enter them in the fields provided.

Enable CCX mode: Enables connections in CCX mode. When checked, additional authentication modes are available. This checkbox is only enabled when **Super Profile** is set to **Enterprise**.

Configure button: Click **Configure** to open the configuration window in order to enter security information when security is enabled.

Open Advanced Mode: Click **Open Advanced Mode** to configure:



Power Save Mode:	None	Fragment Threshold:	4096
TX Power Level:	High Power	RTS Threshold:	4096
TX Rate:	Auto	Preamble:	Short
Packet Burst:	Enable	Retry Limits:	Short: 10
Turbo Mode:	Enable	Long:	4

OK Cancel

Power Save Mode: Indicates whether to use power saving. This can be modified for:

None- No power save mode.

Max- Max power save mode.

Tx Power Level- The transmit power level, can be:

Low Power (6% of full power)

Medium/Low Power (12%)

Medium Power (25%)

Medium/High Power (50%)

High Power (100%)

Rx Rate: The preferred rate of transmission, in Mbps. The options for this field are based on the selected band and channel.

Packet Burst: Indicates whether the Packet Bursting feature is enabled.

Turbo Mode: Indicates whether the Texas Instruments Proprietary 4X feature is enabled for bursts to 125 Mbs. To use this mode, your access points must be running the same feature.

Fragment Threshold: The maximum fragment length, in bytes. The value is an even number from 256 to 4096 (default 4096).

RTS Threshold: The minimum packet length for sending an RTS frame, in bytes. The value must be greater than 0 (default to 4096).

Preamble: Either short or long.

Retry Limits: The number of retries to attempt, if necessary, when sending a frame. There are two fields:

Short: For frames without an RTS frame.

Long: For frames with an RTS frame.

(YES, IT IS AN OLDER VERSION - WE HAD DEFINITELY ADDED WORDS TO THE TURBO MODE AS IT IS NOT AT ALL EXPLANATORY - I'LL TRY TO PUT IN AS BEST AS I CAN WHAT I REMEMBER SAYING)

Optimizing Wi-Fire Performance

In order to see the most benefit from your Wi-Fire, it is important to understand how it works and how to use it for optimal performance. The Wi-Fire is able to offer significantly better performance than standard WiFi adapters because its integrated antenna can focus the strength of wireless signal coming from a specific direction. Because the antenna is directional, your Wi-Fire must be pointed toward a wireless signal in order to optimize its performance.

Orienting the unit in the optimal direction is easy. If you know exactly where the Access Point you are connecting to is, start by turning your Wi-Fire so that it is pointing toward it, then follow the next steps to make sure it's perfectly aimed. If you are unsure or have no idea where the Access Point is, optimizing Wi-Fire's performance is still easy - just follow the following steps.

Aiming the Wi-Fire

Use your choice of configuration software to check your current signal strength, either the Wi-Fire Connection Manager or Windows Zero Configuration Utility. Keep in mind that the Wi-Fire Connection Manager will have the advantage of updating signal strength and scanning for additional access points on a much more frequent basis. Rotate the Wi-Fire slowly in its mount and observe how the signal strength changes on screen. The signal strength should increase or decrease as you move it closer or further from the wireless signal. Feedback on your Wi-Fire Connection Manager should be rapid. By performing this simple operation, you can make sure your Wi-Fire is aimed optimally and will provide the best performance for your wireless needs.

Understanding Wireless Topology

TPJ
21-july-06

CASE STUDY
MAKE UP SOME SCENARIO
LIKE SITTING AT
NEIGHBORS POOL, ETC.

- THRU INTERNAL &
EXTERNAL BRICK WALLS,
WITH TREES OBSTRUCTING.

200' +

W/O Wi-FIRE
Internal Adapter, Dell D610

Windows showed 1 bar &
connection at 1 Mbps.
But normal browsing took
prohibitively long & video
was impossible

W/ Wi-FIRE

Wi-FIRE connected at
24 to 36 Mbps showing
a signal of -74 to -77dB.
Both browsing and video
were similar to a wired
broadband connection
experience

Troubleshooting

TROUBLESHOOTING

When you Receive the Product:

1. Not all the parts are in the box.	

Upon Installation:

1. After installation, the Wi-Fire Connection Manager displays, “driver not installed”.	It is possible that there is a very similar device driver installed on your computer for the type of device used as a USB adapter in the Wi-Fire. In this case, go to “device manager” by following: control panel – system – hardware – device manager – and highlight the 802.11g Wireless USB Adapter under Network Adapters. Right click to go to Properties, go to the Driver tab, and click the Uninstall box. Close all boxes below, and allow Windows to find the device and when prompted, point it toward our CD in your CD/DVD drive or to a directory where you stored the contents of our CD. This is rare occurrence but you should now have the correct driver installed and the Wi-Fire Connection Manager will start scanning access points.

Hardware:

1. Not all the parts are in the box.	

Software:

1. Not all the parts are in the box.	

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Connecting to the Internet:

1. You are having trouble configuring Wi-Fi for your security settings.	
2. You tried to click "Connect" but the Wi-Fi Connection Manager started scanning on its own, displaying more access points.	The Wi-Fi Connection Manager scans for new access points at a very high rate, much more frequently than you're used to with Windows XP. It is very unusual, but it is possible that automatic scanning will briefly interrupt or delay one of your commands. Don't worry, you should have found that your command was simply recognized next and it seemed to connect automatically. If not, make sure that the profile for your access point is listed in the profile tab and that the authentication data is entered in the configuration. Then, OK that profile and try to connect again.
3.	

Product Specifications

Physical Specification:

- 4 ounces
- 4 in(L), 0.375 in(W), 3.25 in(D)

System Requirements:

- Works with Windows XP

Security:

- 0/64/128 bit WEP
- 0/64/128 bit WPA

Wireless:

- IEEE 802.11 b/g protocols
- Frequency Range: 2.421 Ghz - 2.4835 Ghz
- Channels: US - 11 channels
- Transmit Power: +14dBm
- Antenna Gain: +10.4 dBi
- Minimum Receive Power: -98 dBm

Host Interface:

- USB 2.0

Media Access Control:

- CSMA/CA with ACK

Data Rate:

- 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
- 802.11b: 1, 2, 5.5, 11 Mbps

Power Requirements:

- 5V DC (from USB port)

Modulation:

- Direct Sequence Spread Spectrum (CCK, DQPSK, DBPSK)
- OFDM

Certification:

- FCC Part 15