



802.11

802.11 a/b/g/n PROTOCOL ANALYZER

Quick Start Guide

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MINIMUM SYSTEM REQUIREMENTS

- PC with Windows XP 32 bit, (Service Pack 2 or higher), Windows 7 (32 or 64 bit).
- Pentium 2 GHz processor
- RAM Requirements: 2 GB minimum, 4 GB recommended
- 100 MB free Hard Disk Space.
- USB 2.0 High Speed enabled port

PURPOSE

This document gives an overview of software installation, hardware setup and data capture using ComProbe[®] 802.11 Protocol Analyzer. We will explain how to set up devices, install hardware, configure the ComProbe 802.11 analyzer, and capture data. To understand how to use ComProbe 802.11 device to analyze the captured data, please refer to the **Frontline[®] ComProbe Protocol Analysis System User Manual**.

INTRODUCTION

The ComProbe 802.11 hardware, in conjunction with the ComProbe Protocol Analysis System (CPAS) captures and displays 802.11 data in Frontline's intuitive display, simplifying and accelerating the debugging process. When used along with Frontline's BPA 500 hardware, CPAS software can display 802.11 / Bluetooth[®] coexistence data with the timestamps precisely synchronized between the two technologies.

SOFTWARE INSTALLATION

From CD:

Insert the CPAS installer disc into your DVD drive. Click on the **Install CPAS** shortcut and follow the directions.

From download:

Download the latest CPAS installer from [here](#). Once downloaded, double-click the installer and follow the directions.

While installing, three separate driver installation dialogs will appear. This is normal.

HARDWARE INSTALLATION

Attaching Antennas

When you remove the ComProbe 802.11 from the box, the first step is to attach the antennas (Figure 1).

Figure 1: Front Panel



1. Attach antennas.

Connecting/Powering the ComProbe 802.11 Analyzer

Once you have attached the antennae, the next step is to power up and connect the ComProbe 802.11 to the computer.

2. Insert the power cable (DC connector) from the 12 volt AC adapter into the "Power" port on the ComProbe (Figure 2).

Figure 2: Back Panel - Power



3. Plug the 12 volt AC adapter into the AC power source.
4. Insert the USB cable into the USB port on the ComProbe (Figure 3).

Figure 3: Back Panel - USB



5. Insert the other end of the USB cable into the PC.
6. It may take as long as thirty seconds for Windows to recognize that the ComProbe 802.11 is there. The Activity light on the front panel of the ComProbe will blink during this period, when the light is steady, the ComProbe is ready.

Setting Up for *Bluetooth* Coexistence

Using Frontline ComProbe analyzer you can see both 802.11 and *Bluetooth* packets together in a single coexistence view. This is possible through the use of ProbeSync™ technology that allows you to connect multiple ComProbe analyzers together. Once connected these devices share a common clock, ensuring that the timestamps are precisely synchronized with each other.

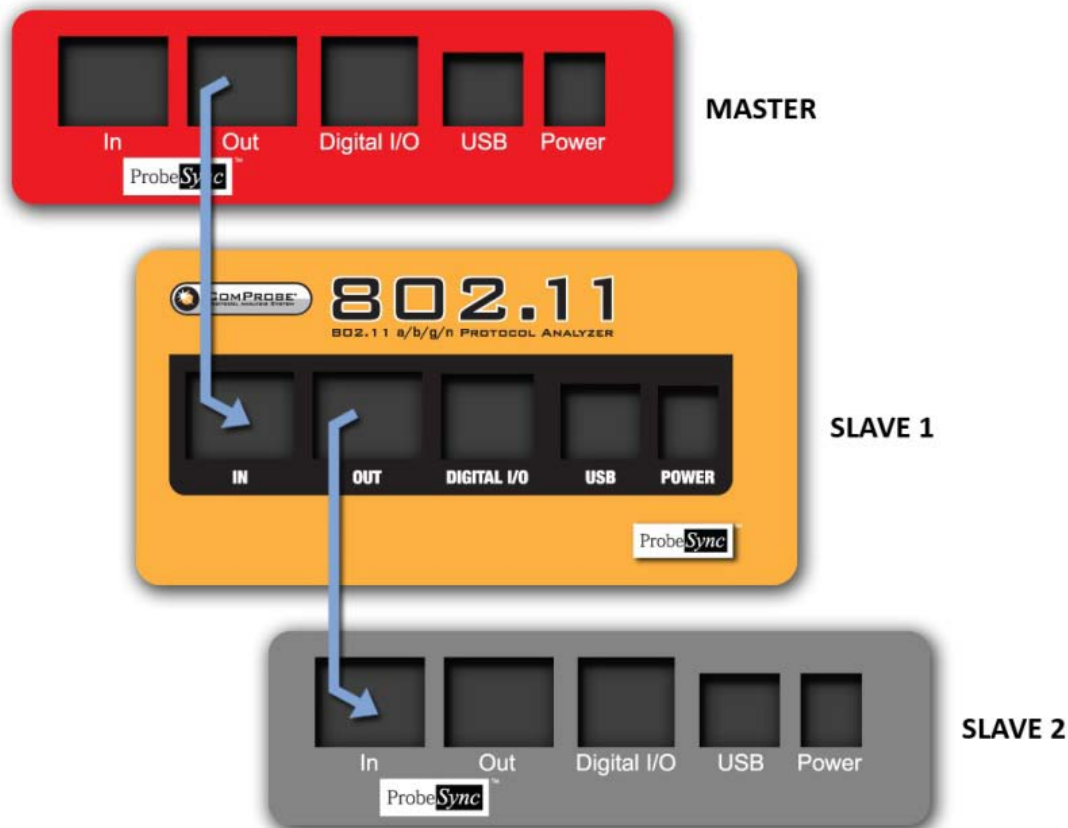
Hardware Requirements:

- ComProbe 802.11 Protocol Analyzer
- ComProbe BPA® 500 Dual Mode *Bluetooth* Protocol Analyzer
- CAT 5 cable (not longer than 1.5 meters)

To connect two analyzers with ProbeSync technology simply plug the supplied CAT 5 cable into the OUT connector on the ComProbe BPA 500 analyzer that will be supplying the clock (the master) and connect the other end to the IN connector on the ComProbe 802.11 analyzer (slave) (Figure 4).

If more than two ComProbes are used, just connect the OUT connector from the first slave to the IN connector of the second slave. Total cable length, of all the ProbeSync cables connected at a given time should not exceed 1.5 meters.

Figure 4: Back Panel – ProbeSync

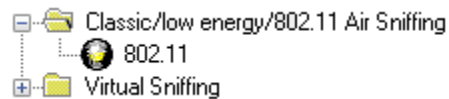


SELECTING A DATA CAPTURE METHOD

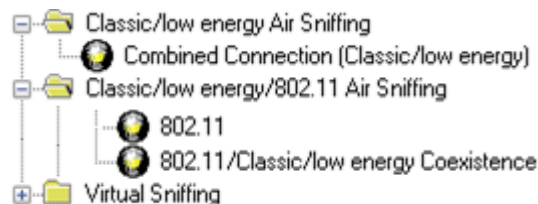
Now that the devices are on and the ComProbe 802.11 configured, the next step is to run the CPAS software and select the data capture method.

Open (double click on) "Frontline ComProbe Protocol Analysis System" from the Start menu or from the "Frontline ComProbe Protocol Analysis System [version #] " desktop folder.

CPAS detects the hardware you have plugged in and automatically present the appropriate shortcuts. If you have just a ComProbe 802.11 plugged in, you'll see only the "Virtual Sniffing" and "802.11" options presented:



If you have the ComProbe 802.11 and a BPA 500 plugged in, you'll see options for Classic Bluetooth, low energy Bluetooth, 802.11 and all of the combinations of those.

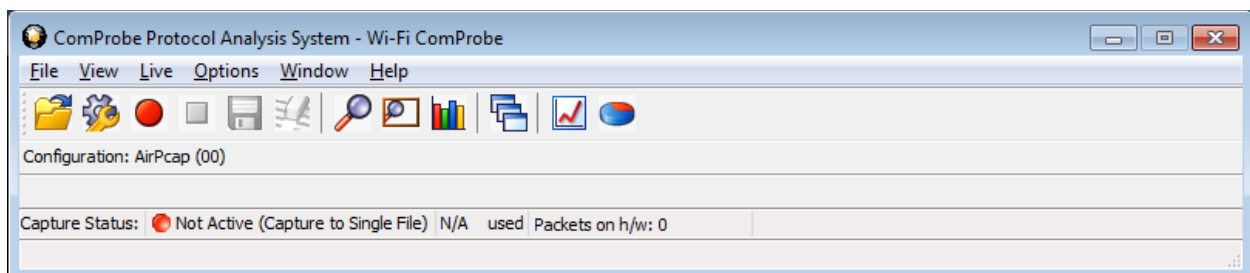


In this guide we are going to select one of the options (the most commonly used), explain how to configure the software, prepare the hardware and capture data. So, let's get started.

1. Select "802.11".
2. Select "Run".

CPAS will open with the Control Window (Figure 5).

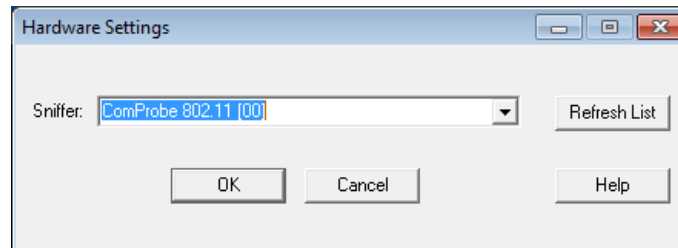
Figure 5: Control Window



SETTING UP 802.11 DATA CAPTURE

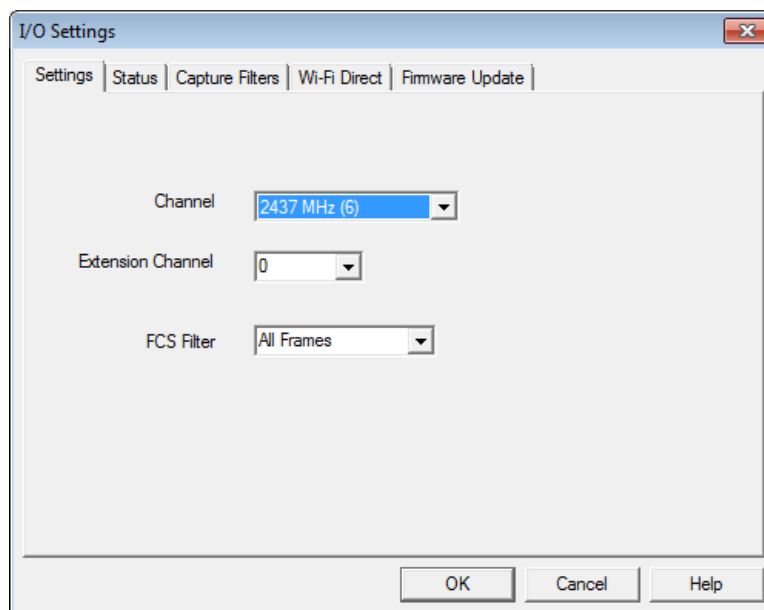
From the Control Window, select Hardware Settings from the Options menu to confirm that the ComProbe 802.11 hardware selected (figure 6)

Figure 6: Hardware Options



Then select I/O Settings from the Options menu where capture parameters are set (figure 7):

Figure 7: I/O Settings



There are five tabs on the I/O Settings dialog:

Settings

Channel – Select the channel you want to capture from the drop down.

Extension Channel - Allows you to extend the range of channels available

0 = Standard 1-14 Wi-Fi channels

-1 = Expanded channels below the standard range

+1 = Expanded channels above the standard range

FCS Filter – The Frame Check Sequence (FCS) filter selects whether or not frames with invalid FCS should be captured. Options are all frames, valid frames only or invalid frames only.

Status

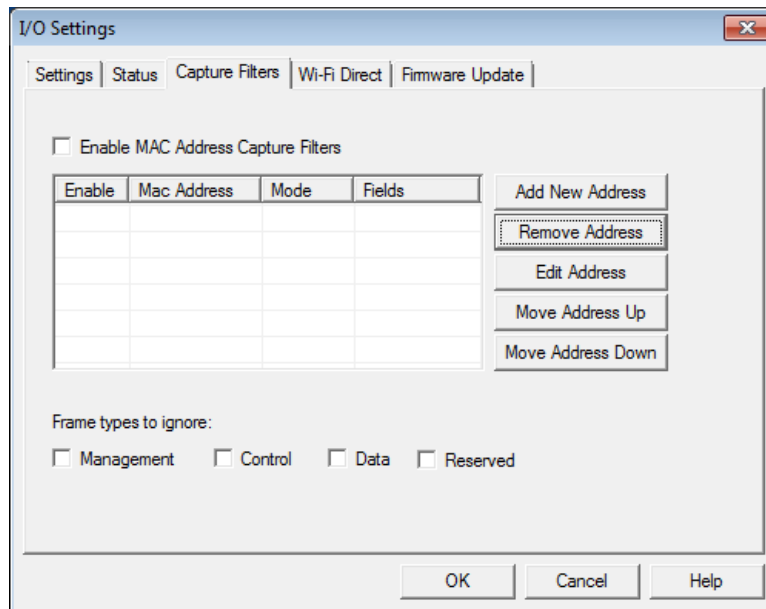
The Status tab displays information about the ComProbe 802.11 hardware and the capture session. Serial number, firmware versions, clock source (internal or external) packets and bytes captured.

Nothing needs to be set here.

Capture Filters

CPAS may be configured to include or exclude MAC addresses or to ignore certain frame types (figure 8).

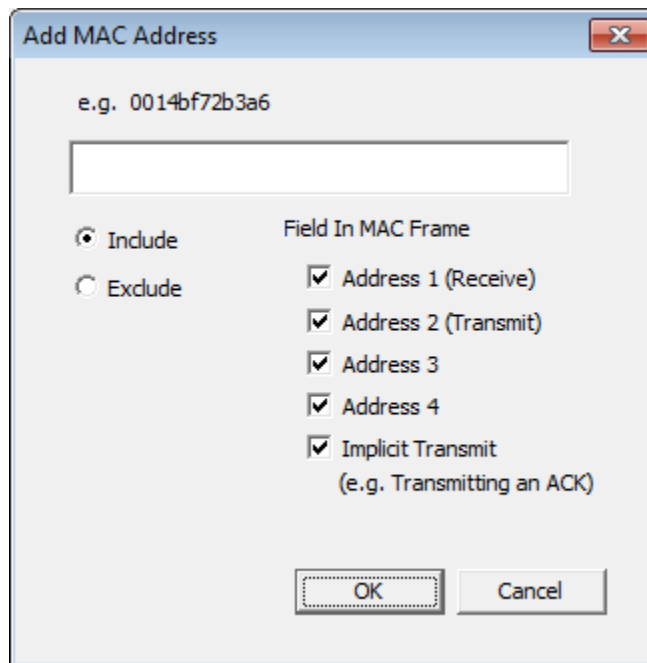
Figure 8: Capture Filters



To include or exclude frames based on MAC address:

1. Check the Enable MAC Address Capture Filters checkbox.
2. Click on Add New Address, the following dialog will appear (figure 9):

Figure 9: Add MAC Address



Enter a MAC address into the text field, without separators (eg. 0014bf72b3a6 not 00:14:bf:72:b3:a6)

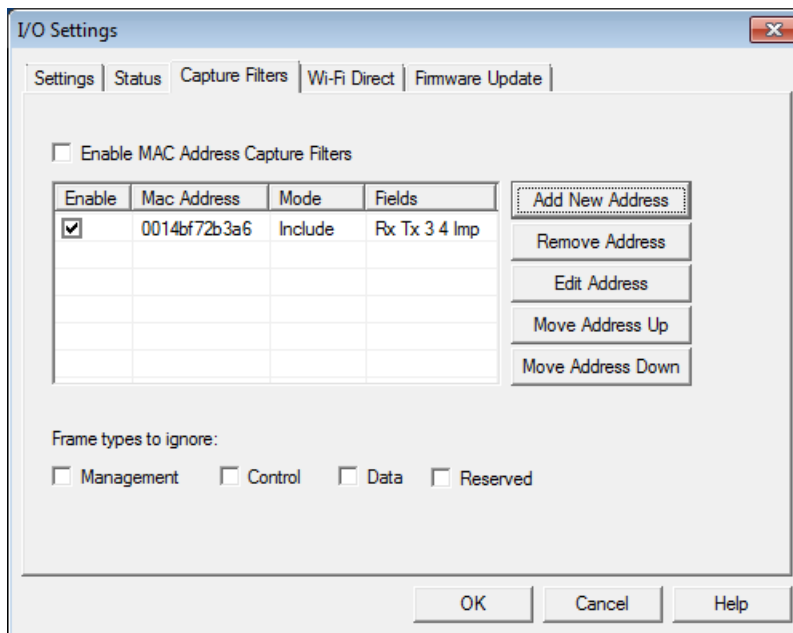
Select Include to include frames with the specified MAC, select Exclude to exclude frames with the specified MAC.

Since that MAC address may appear in different fields within the frame, check boxes are provided to tell CPAS which field(s) to check for the MAC in. Check the boxes that apply.

Click OK

Your filter will appear in the list (figure 10):

Figure 10: Enable Filter



You may check or uncheck the Enable box to enable or disable any filter you've saved.

In addition, you may exclude management frames, control frames, data frames and/or reserved frames from the capture by selecting the corresponding checkbox.

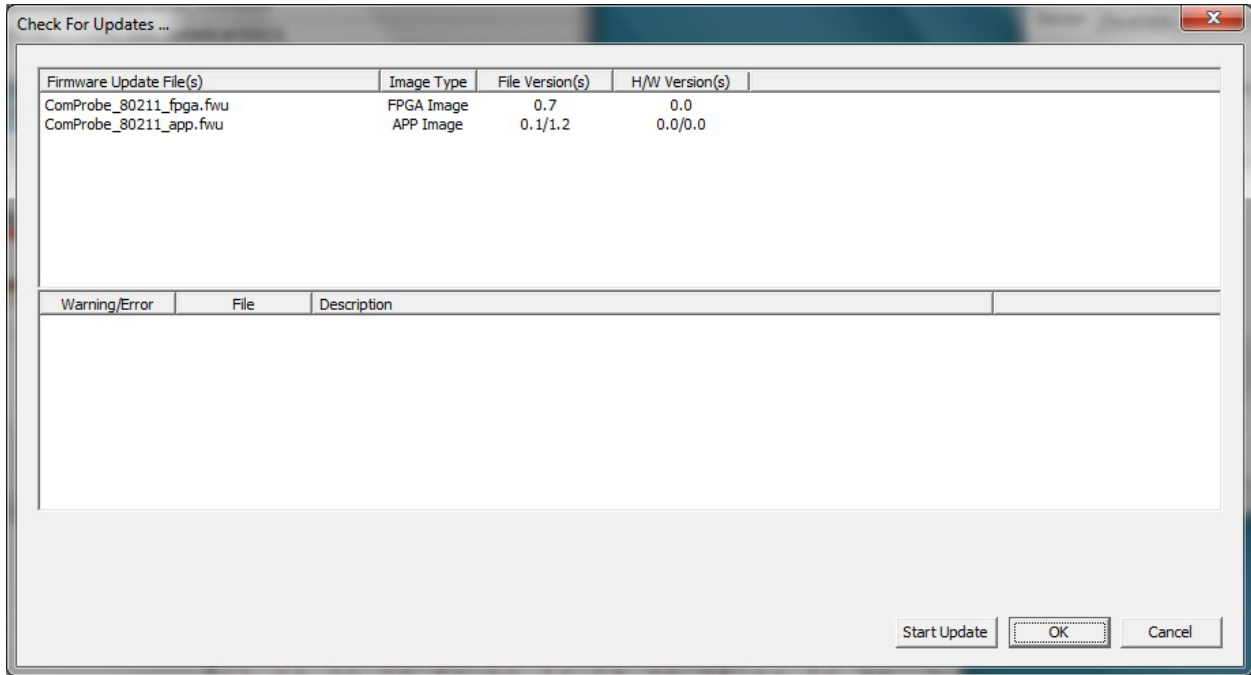
Wi-Fi Direct

When a Wi-Fi Direct device joins a group, it changes its operating channel to that of the group it joins. Therefore to continue sniffing communications with the Wi-Fi Direct device after it joins a group, CPAS has to know which channel to change to in order to follow the Wi-Fi Direct device. You enter that information on the Wi-Fi Direct dialog.

The address of the device to follow may be entered in either of two different ways. If you know the address, just click the Edit button and type it in. If you don't know the address, CPAS can find it for you. Just click the Discover Devices button; you'll see the following dialog (figure 11):



Figure 12: Firmware Update

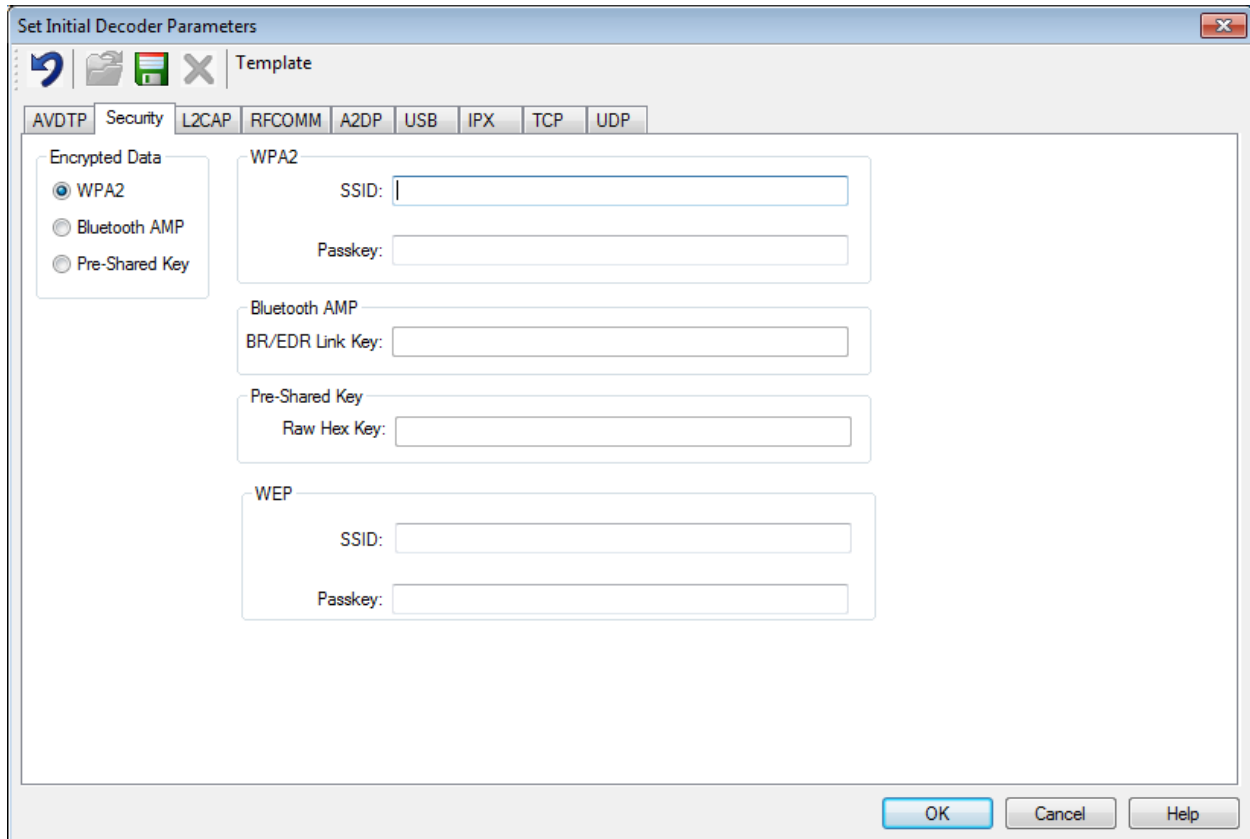


Click Start Update to update our ComProbe 802.11.

SECURITY

The ComProbe 802.11 is able to decrypt both WEP and WPA2 encrypted data, as long as it has the proper keys. This is done on the Security tab of the Set Initial Decoder Parameters dialog on the Options menu from the Control Window (Figure 13)

Figure13: Security Settings



WPA2

For WPA2 encryption, you need to:

1. Select the WPA2 radio button under Encrypted Data. This will activate the WPA2 and WEP text boxes.
2. Set the Service Set Identifier (SSID).
3. Set the passkey.
4. Click OK.

WEP

For WEP encryption:

1. Select the WPA2 radio button under Encrypted Data. This will activate the WPA2 and WEP text boxes.
2. Set the passkey.
3. Click OK.

Bluetooth AMP

When Bluetooth employs AMP, the Bluetooth link key is passed from Bluetooth to 802.11 and the same link key is used for 802.11 encryption. When this is done, CPAS handles this automatically, you only need to select the Bluetooth AMP radio button. Everything else should be left blank. If you know the BR/EDR link key and the SSID, they may be entered here.

Pre-Shared Key

The Pre-Shared key may also be entered as a 32 bit hex number.

1. Select the Pre-Shared key radio button. The Pre-Shared Key and WEP text boxes are activated.
2. Enter the 32 bit Pre-Shared Key
3. Enter the WEP SSID.
4. Enter the WEP passkey.
5. Click OK

STARTING DATA CAPTURE

To start capture, click on the Start Capture button on the Control Window toolbar.

Further information about data views and analysis are explained in the Frontline ComProbe Protocol Analysis System User Guide.

TECHNICAL SUPPORT

Technical support is available in several ways. The online help system provides answers to many user related questions. Frontline's website has documentation on common problems, as well as software upgrades and utilities to use with our products.

Web: <http://www.fte.com>, click Support

Email: tech_support@fte.com

If you need to talk to a technical support representative, support is available between 9am and 5pm, U.S. Eastern time, Monday through Friday. Technical support is not available on U.S. national holidays.

Phone: +1 (434) 984-4500

Fax: +1 (434) 984-4505