User Manual

PePWave Surf Indoor Series:
Surf 200, AP 200, AP 400

PePWave Mesh Connector Indoor Series:
MC 200, 400

PePWave Surf / Mesh Connector Outdoor Series:
Surf AP 200-X, 400-X,
Surf 400-DX,
MC 200-X, 400-X

PePWave CarFi Series:
CarFi 200, 400

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February 08

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1 Copyright

2 Disclaimer

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3 Product Description

It associates to a service provider and authenticates using 802.1x (if needed) on start up. Upon successful association and authentication, it will acquire an IP address from the service provider using DHCP. A DHCP server is built-in on its LAN port. Network Address Translation is performed for all outbound connections. Thus it supports multiple terminals to access the Internet simultaneously.

3.1 Features

- **10/100 Ethernet interface with auto-crossover detection**
- **Reset button for restoring settings to factory defaults**
- **Signal strength LED for showing the current signal strength (Applicable to PePWave Surf indoor and DX series)**
- **WPA/WPA2-Personal and WPA/WPA2-Enterprise support**
- **Network Address Translation (NAT) routing**
- **Built-in DHCP server**
- **Inbound port range forwarding**
- **Integrated Wi-Fi Access Point (Applicable to Surf AP indoor/outdoor and CarFi series)**

Surf 200, AP 200, AP 400

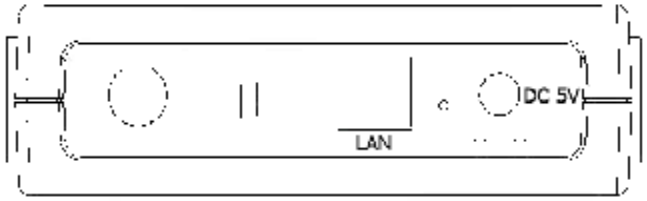
Surf AP 200-X/400-X, MC 200-X, 400-X

Surf 400-DX

MC 200, 400 CarFi 200, 400

3.2 Hardware Setup

3.2.1 Surf Indoor Series

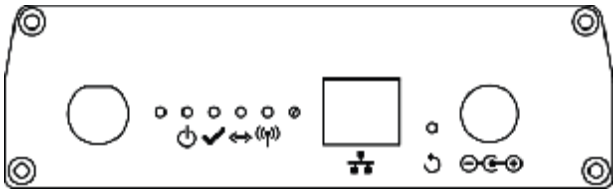


1. **Attach the provided antenna to the left most antenna connector**
2. **Connect the LAN port to the computer's Ethernet port with an Ethernet cable.**
3. **Connect the end of the included power adapter to the power socket (labeled "DC 5V") on PePWave Surf.**
4. **Power on the power adaptor.**

3.2.2 Surf / Mesh Connector Outdoor Series

Please follow the installation guide to set up the PePWave AP 200/400-X, Surf 400-DX, MC 200-X / 400-X devices.

3.2.3 Mesh Connector Indoor / CarFi Series



1. **Attach the antenna provided to the left most antenna connector**
2. **Connect the LAN port to the computer Ethernet port with an Ethernet cable.**
3. **Connect the end of the included power adapter to the power socket on the PePWave Mesh Connector Indoor or CarFi device.**
4. **Power on the power adaptor.**

3.3 LED Description

3.3.1 Surf Indoor Series

LED	Color	Status	Description
Power	Green	On	Power is on
		Off	Power is off
Status	Green	Solid	Received signal is Excellent, Very Good and Good
	Green	Blinking	Received signal is Low
	Amber	Blinking	Received signal is Very Low
	Amber	Solid	No wireless signal is detected
		Off	Booting up / Upgrading firmware
LAN	Green	On	Ethernet is connected
	Green	Blinking	Sending/Receiving data
		Off	Ethernet is not connected
Wi-Fi	Green	On	Associated with an access point
	Green	Blinking	Sending/Receiving data
		Off	Not associated with any access point
Signal Bars	Green	N/A	The number of lit signal bars depends on the strength of the received signal. A larger number of lit signal bars indicate stronger signals.

3.3.2 Surf DX Series LED Description

LED	Color	Status	Description
PWR	Green	On	Power is on
		Off	Power is off
LAN	Green	On	Ethernet is connected
		Off	Ethernet is not connected
Wi-Fi	Green	On	Associated with an access point. The number of LED lights from “MIN” to “MAX” indicates the received signal strength level.
		Off	Not associated with any access point

3.3.3 Mesh Connector Indoor / CarFi Series LED Description

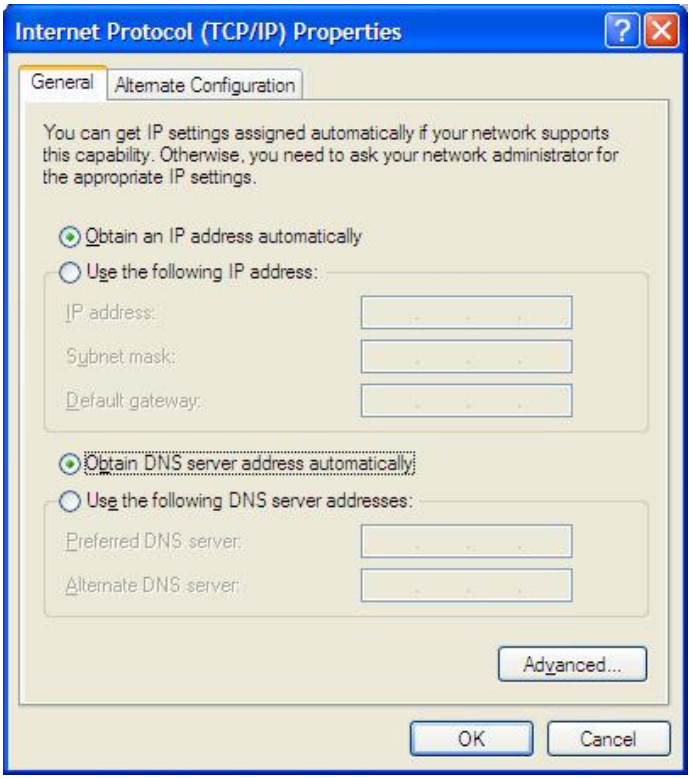
LED	Color	Status	Description
Power	Green	On	Power is on
		Off	Power is off
Status	Green	Solid	Received signal is Excellent, Very Good and Good
		Off	Booting up / Upgrading firmware
LAN	Green	On	Ethernet is connected
		Off	Ethernet is not connected
Wi-Fi	Green	N/A	Associated with an access point
		Off	Not associated with any access point

4 Using the PePWave Devices

4.1 Pre-configuring PC Setup for PePWave Surf / CarFi Series

You should set up your computer's LAN interface to obtain an IP address automatically. If you do so, you should have set it up correctly.

In order to do so, select the "Start" menu, "Control Panel" and then "Network Connections". Right click on the "Local Area Connection" icon, choose "Properties", double-click on the item "Internet Protocol (TCP/IP)" from the list. On the screen, just set it as follows:

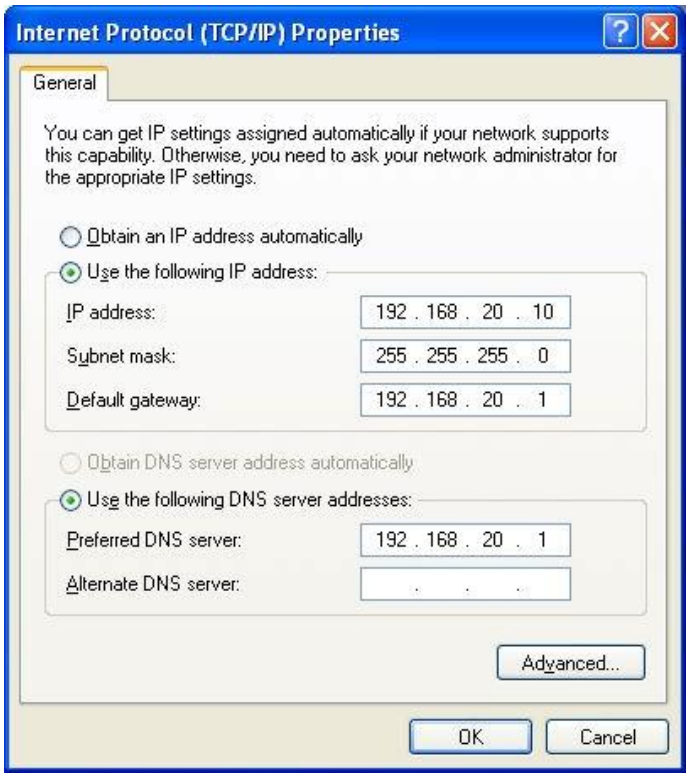


Click the "OK" button to confirm the change.

4.2 Pre-configuring PC Setup for PePWave Mesh Connector

Prior to the PePWave Mesh Connector configuration, a computer with its Local Area Connection set to a static IP address is required to pre-configure to the same subnet as the Mesh Connector (i.e. 192.168.20.X).

An 'Internet Protocol (TCP/IP) Properties' screen will pop up and set it as follows:



Click the "OK" button to confirm the change.

Now you are ready to start the first time configuration of the PePWave Mesh Connector.

4.3 First Time Setup

On your PC, start a web browser, e.g. Internet Explorer, Mozilla Firefox, etc. Visit an Internet web site. If you are not associated to an access point, you should be redirected to a logon page. Or you can go also go to this URL

http://192.168.20.1/

The page will look like this.

Click the "Advanced Config" button to enter the parameters of the access point to associate to. You should see this screen:

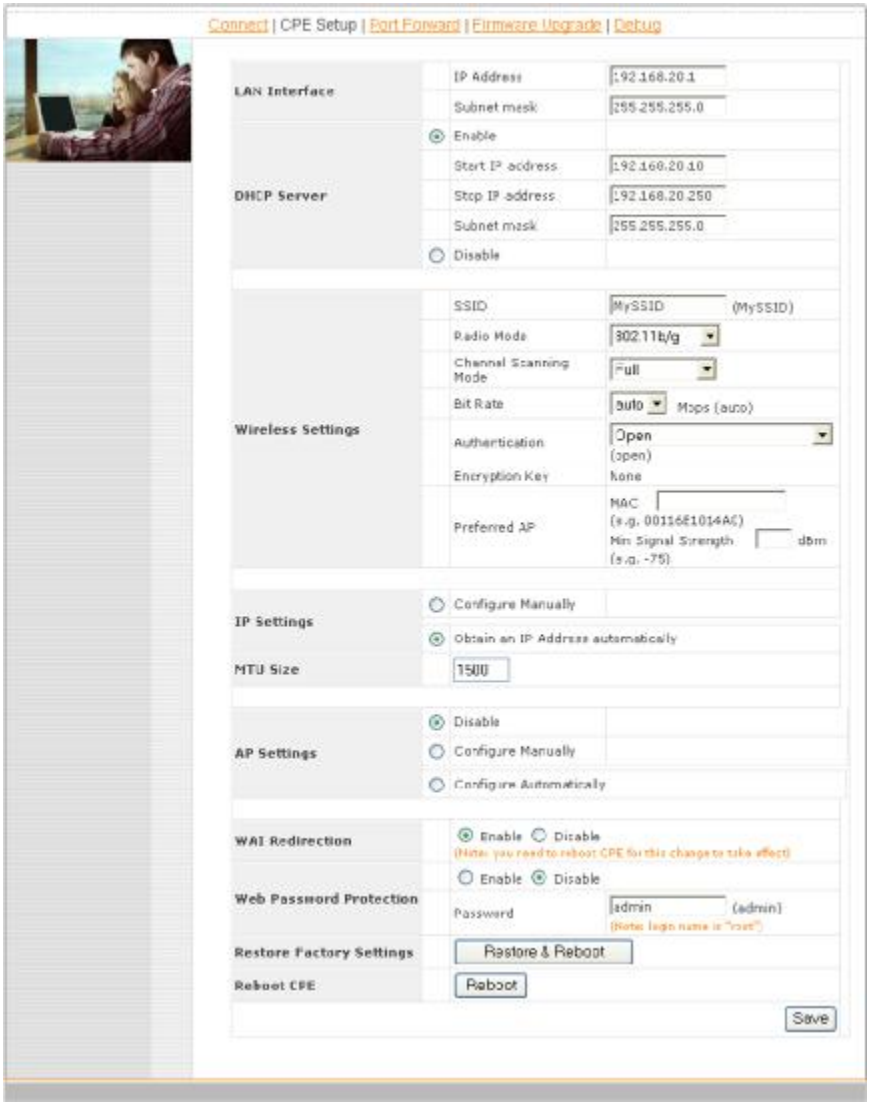


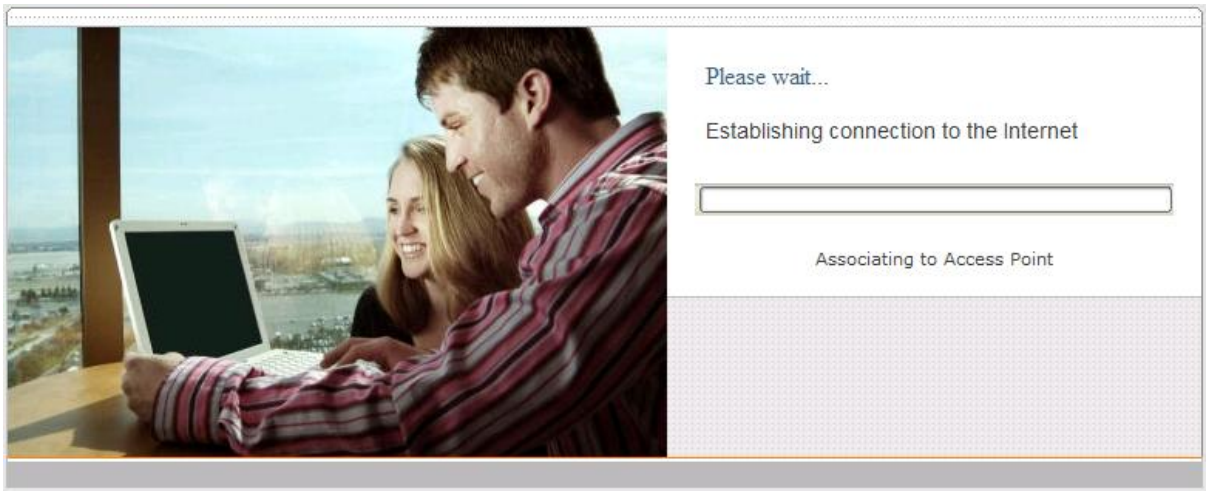
Illustration 1: PePWave Surf Indoor Setup page

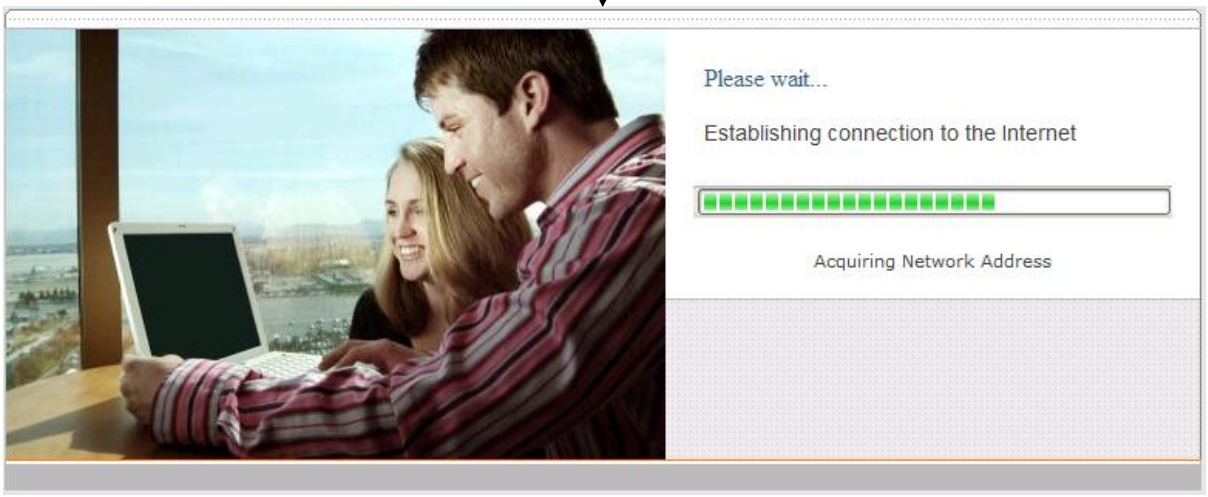
In the field "SSID" under Wireless Settings, input the access point's SSID (sometimes it is called the "network name"). According to the setting of the Access Point you are associating to, you may choose a different "Authentication setting".

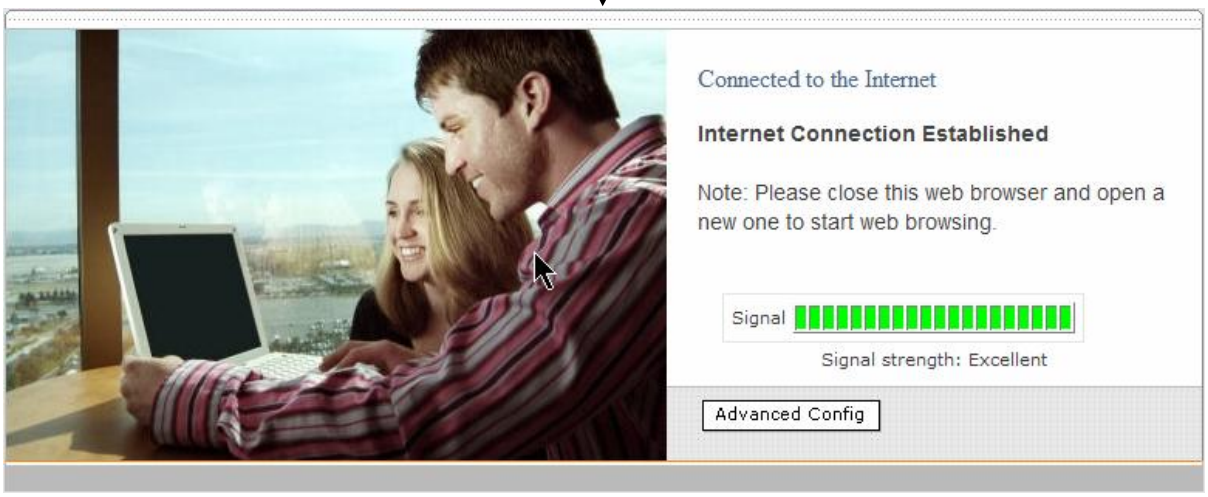
If "Static WEP key" or "WPA/WPA2-Personal" is selected for Authentication, input the Encryption Key field as well. (There are also options of "802.1x with dynamic WEP key" and "WPA/WPA2-Enterprise". You do not need to use these settings unless instructed to do so by your ISP.)

Click the "Save" button at the bottom to complete.

You can now click the "Connect" link on the top bar and then click the "Connect" button to associate with the access point.

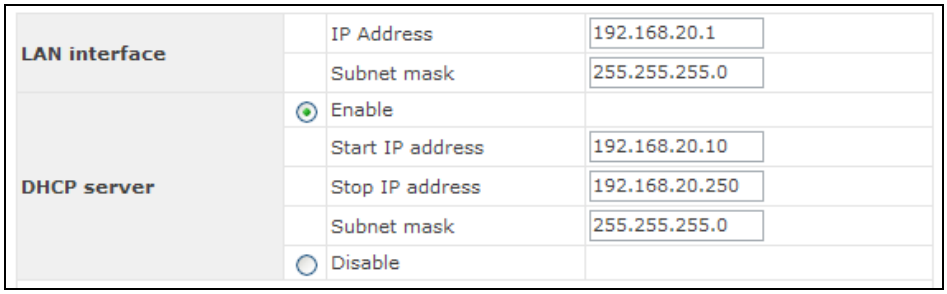






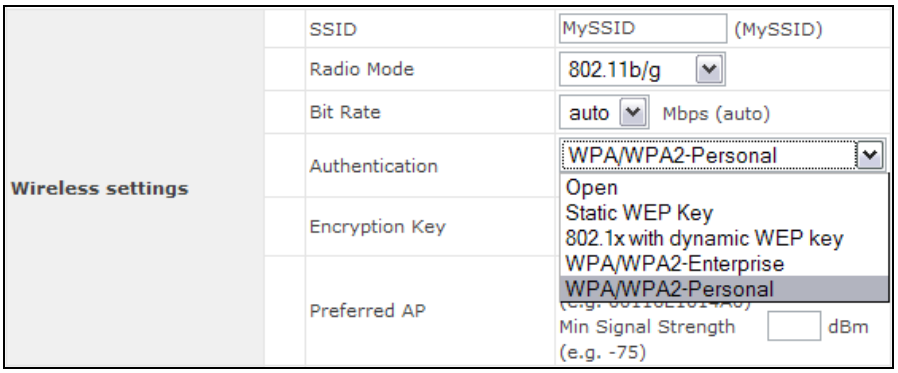
At this point, you are associated with the access point. You may now close the web browser and open a new one to start web browsing.

4.4 Settings Details



LAN Interface: To configure the LAN interface's IP address and subnet mask.

DHCP Server: To configure and enable the built-in DHCP server or not. If enabled, the IP address range can be configured.



Wireless Settings:

SSID: To configure the SSID / ESSID / Network Name of the wireless network to associate to.

Radio Mode: It allows the user to choose between radio modulations support. E.g. 802.11b/g, 802.11g only, 802.11b, etc. The available settings depend on the Wi-Fi module installed on the device.

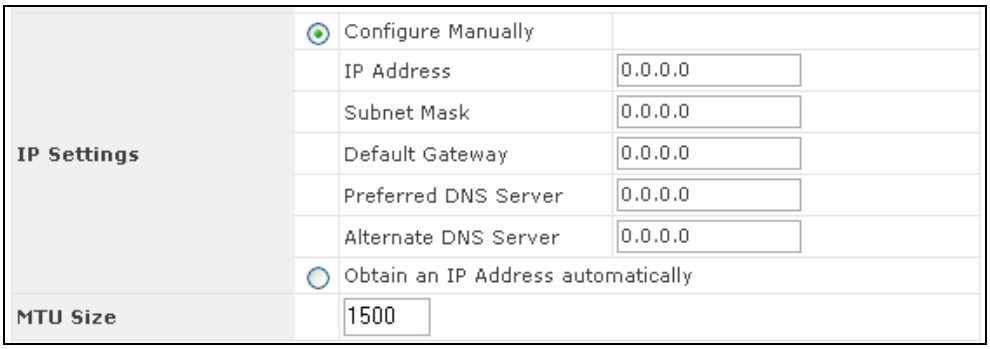
Bit Rate: To fix the 802.11 transmit bit rate. Available options depend on the Radio Mode chosen. If "auto" is chosen, the device will choose the best bit rate dynamically and automatically.

Authentication: Available options are Open, Static WEP Key, 802.1x with dynamic WEP key, WPA/WPA2-Enterprise and WPA/WPA2-Personal. The selection should be according to the setting of the access point you are associating to. Data transferred are encrypted under all modes except in Open mode. When Static WEP Key or WPA/WPA2-Personal is chosen, you should enter an encryption key in the Encryption Key field. (You do not need to use 802.1x and WPA/WPA2-Enterprise unless instructed to do so by your ISP.)

Preferred AP: The MAC address of a preferred access point can be entered here. When the preferred access point is found and its signal strength is higher than the "Min Signal Strength", it will connect to this preferred access point, no matter the other access points are found even they have higher signal strength or the same SSID.

Roaming Settings (applicable to CarFi Series): To configure and enable roaming among APs with the same SSID and authentication method.

Signal Level Threshold: If the signal level of connected AP falls below the specified value, the unit will attempt to roam to another AP with a better signal level.



IP Settings: The IP address can be obtained automatically or configured manually. If you choose to manually configure the IP address for your unit, enter the fields "IP Address", "Subnet Mask", "Default Gateway", "Preferred DNS Server" and "Alternate DNS Server".

MTU Size: You may also set the MTU Size to increase the data packet size your unit can handle at one time.

AP Settings (applicable to Surf AP Indoor/Outdoor and CarFi Series): The AP Settings will be covered in detail in the subsequent section Integrated Wi-Fi Access Point Configuration.

WAI redirection: If the device is not connected to an access point, and the user is accessing an Internet web site, the settings control whether to redirect the web access to the web admin interface page or not. If this is disabled and the device is not connected, the browser will show a web access error message. The user can still access the web admin interface by accessing to the device's LAN IP address. By default, the LAN IP address is set as http://192.168.20.1 .

Web Password Protection: Sets the password to protect the web user interface.

Restore default settings: To restore the device to default settings. When this option is clicked, default settings will be restored and the unit will be restarted.

Reboot: To restart the device.

4.5 Integrated Wi-Fi Access Point Configuration

(Applicable to Surf AP Indoor/Outdoor and CarFi Series)

Integrated Wi-Fi Access Point is configured via the *CPE Setup* tab. The following sections will provide information as a guide through the configuration.

The available Access Point (AP) settings for the Integrated Wi-Fi Access Point functionality are as follows:

- ***Disable***

  Integrated Home Wi-Fi Access Point functionality is disabled

- ***Configure Manually***

  Manual configuration of the SSID, Authentication, and Encryption Key values corresponding to the Access Point.

- ***Configure Automatically***

  The SSID, Authentication, and Encryption Key values corresponding to the Access Point are automatically configured to be the same as the respective values that correspond to Citywide Wi-Fi.

4.5.1 Access Point Disabled

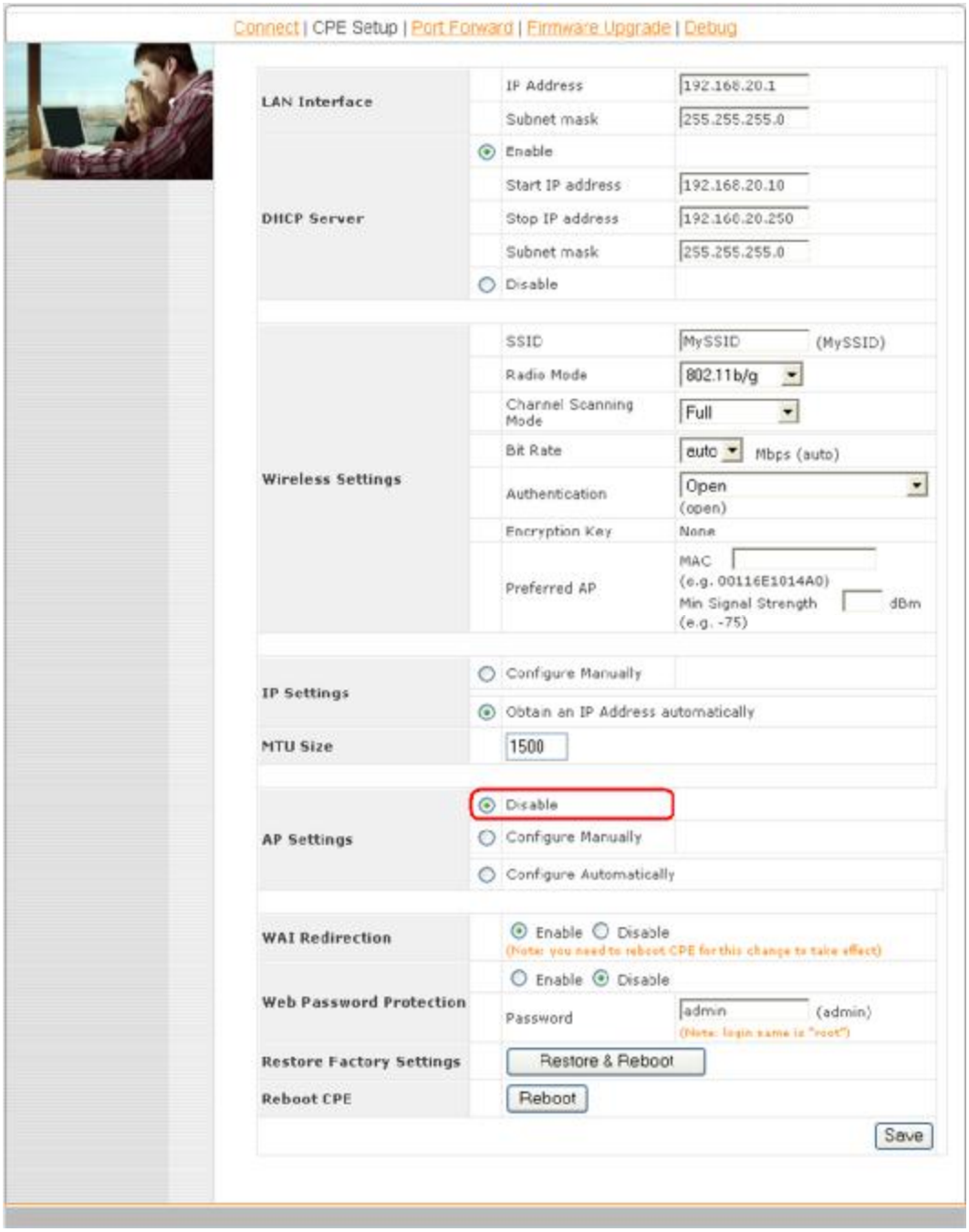


Illustration 2: Access Point Disabled, as shown with the red marker box

4.5.2 Manual Access Point configuration

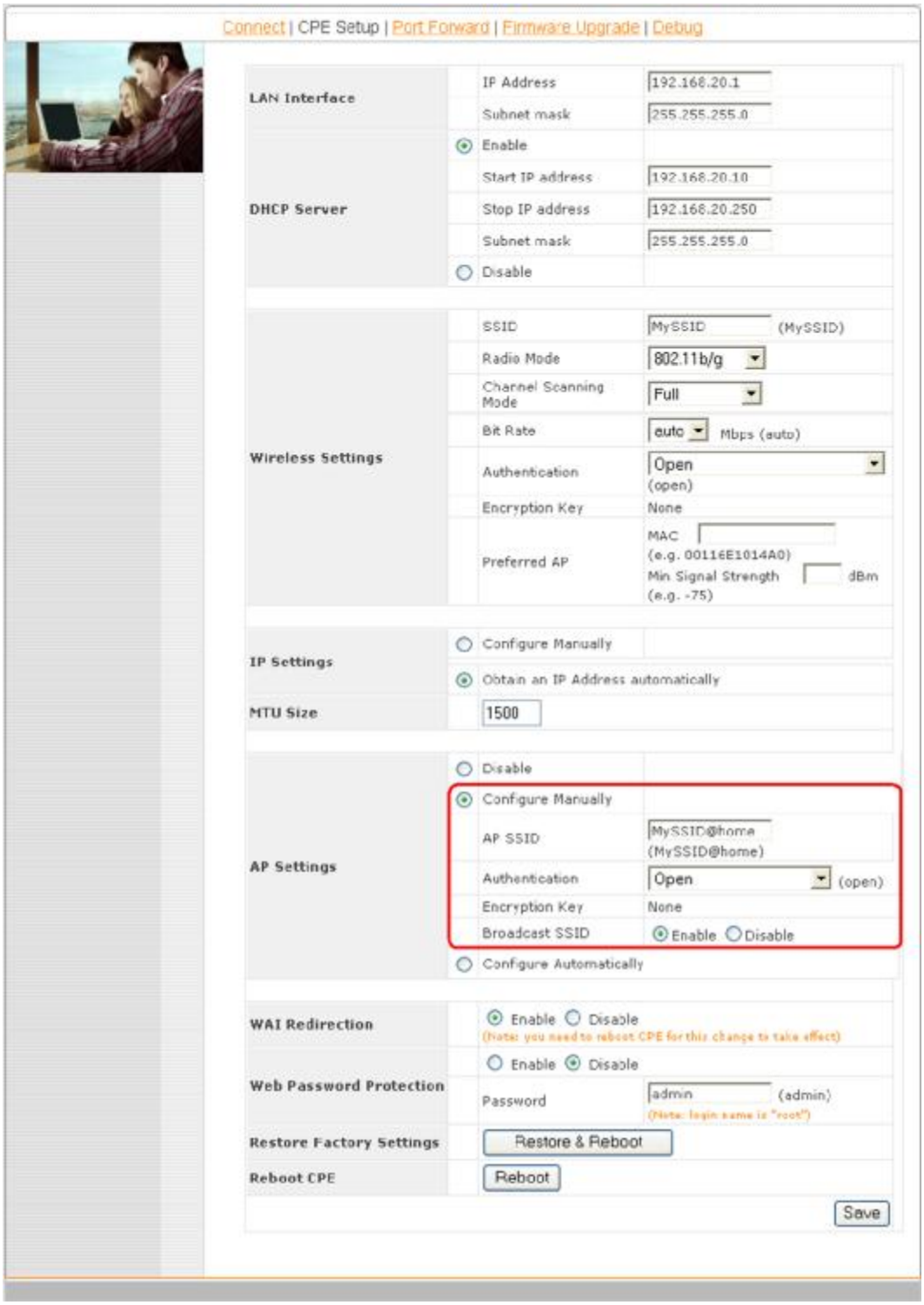


Illustration 3: Manual Access Point Configuration, as shown with the red marker box

In Manual Configuration mode, the *SSID* is manually entered.

***Authentication* can be one of three configurable values:**

- ***Open***

  For *Open* Authentication Mode, no Encryption Key is necessary.

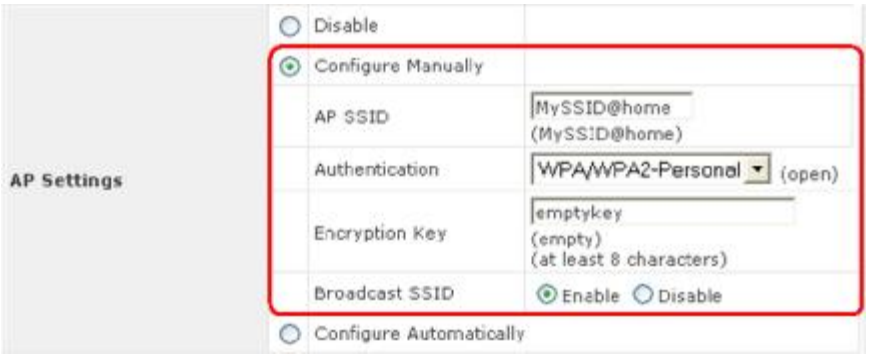
- ***Static WEP Key***

  For *Static WEP Key* Authentication Mode, a 64- or 128-bit Encryption Key is required, and can be entered in either an ASCII or HEX representation.

Static WEP Key Authentication Configuration

- ***WPA / WPA2-Personal***

  For *WPA / WPA2-Personal* Authentication Mode, an Encryption Key, of at least 8 characters, is required.



WPA/WPA2-Personal Authentication Configuration

***Broadcast SSID* can be one of two configurable values:**

- ***Enable***

  The configured SSID will be broadcast such that it can be detected by an SSID scan.

- ***Disable***

  The configured SSID will not be broadcast such that it cannot be detected by an SSID scan. In order to connect with the access point, the SSID needs to be known by the client.

A.1.1 Automatic Access Point Configuration

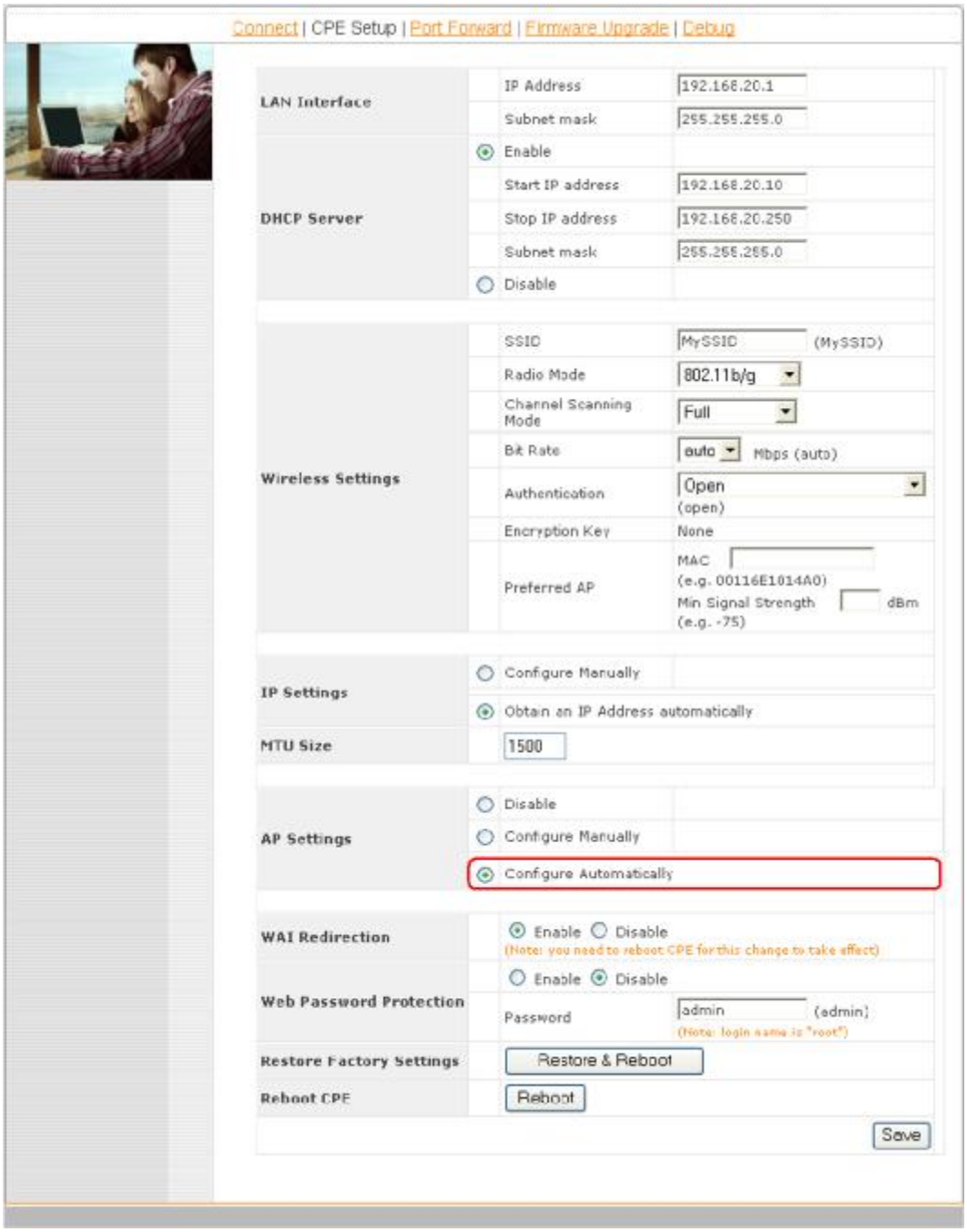


Illustration 4: Auto Access Point Configuration, as shown with the red marker box

With the Access Point Configuration set to *Configure Automatically*, the *SSID*, *Authentication*, and *Encryption Key* values of the Integrated Home Wi-Fi Access Point will be configured to be the same as in the *Wireless Settings* section.

This configuration mode is effectively equivalent to directly connecting 802.1b/g devices on the customers' premises with Citywide Wi-Fi.

Important Note:

In the *Wireless Settings* section, if *Authentication* is set to either *802.1x with dynamic WEP key* or *WPA / WPA2-Enterprise*, then the *Configure Automatically* option of the Access Point Configuration becomes unavailable, because the Integrated Home Wi-Fi Access Point functionality currently does not support authentication via the 802.1x with dynamic WEP key and WPA/WPA2-Enterprise methods.

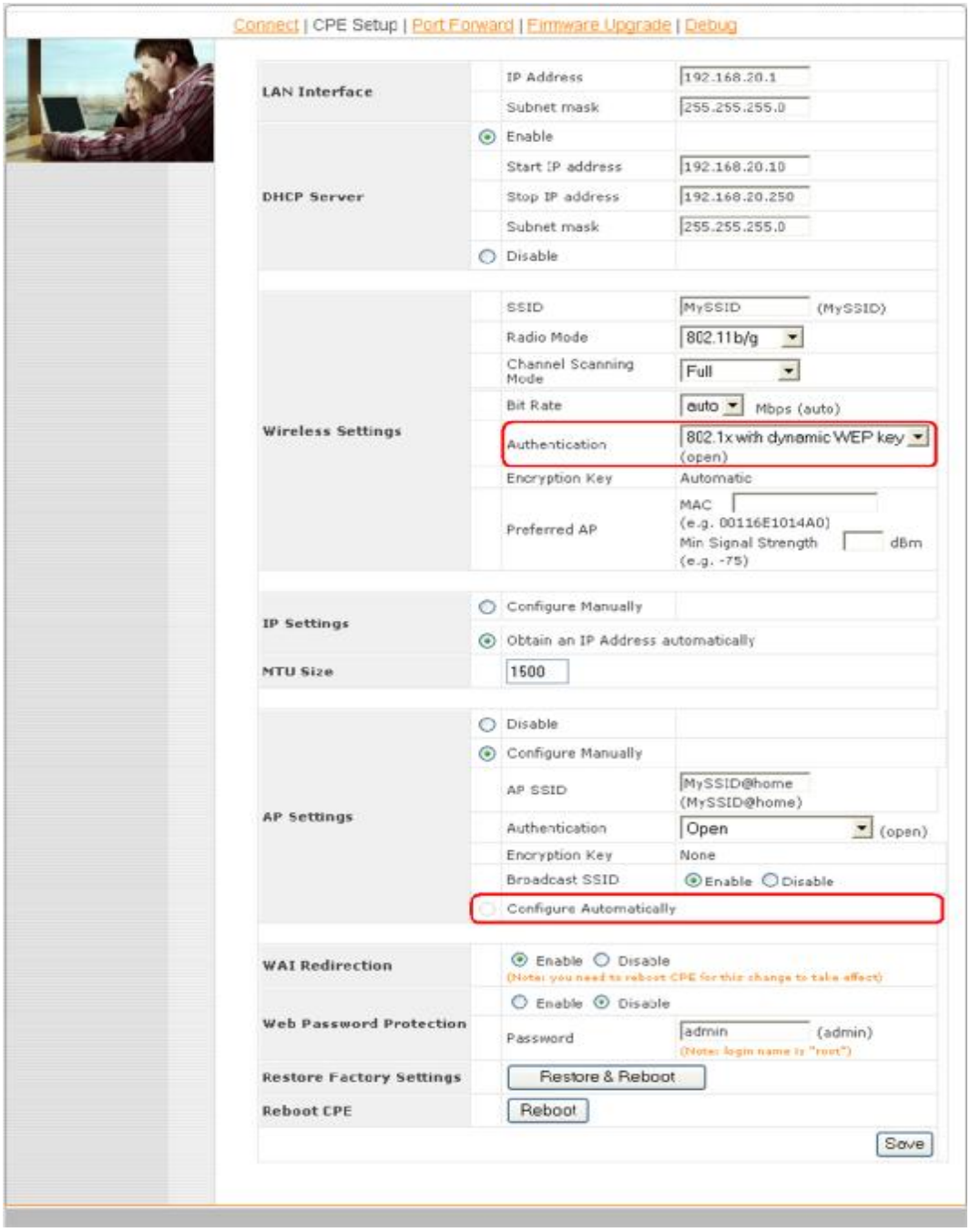


Illustration 5: Automatic Access Point Configuration is unavailable with 802.1 with Dynamic WEP Key Authentication

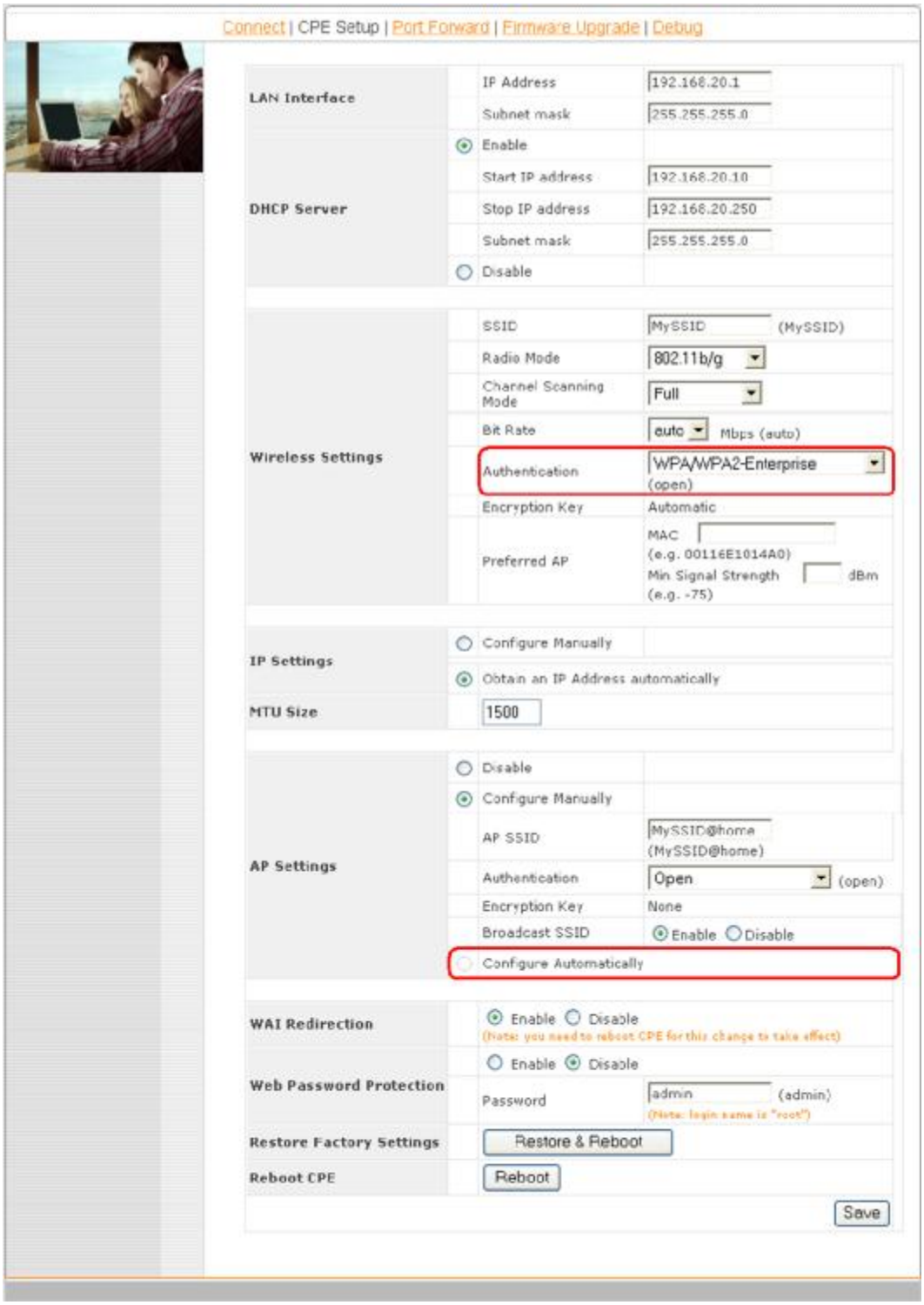
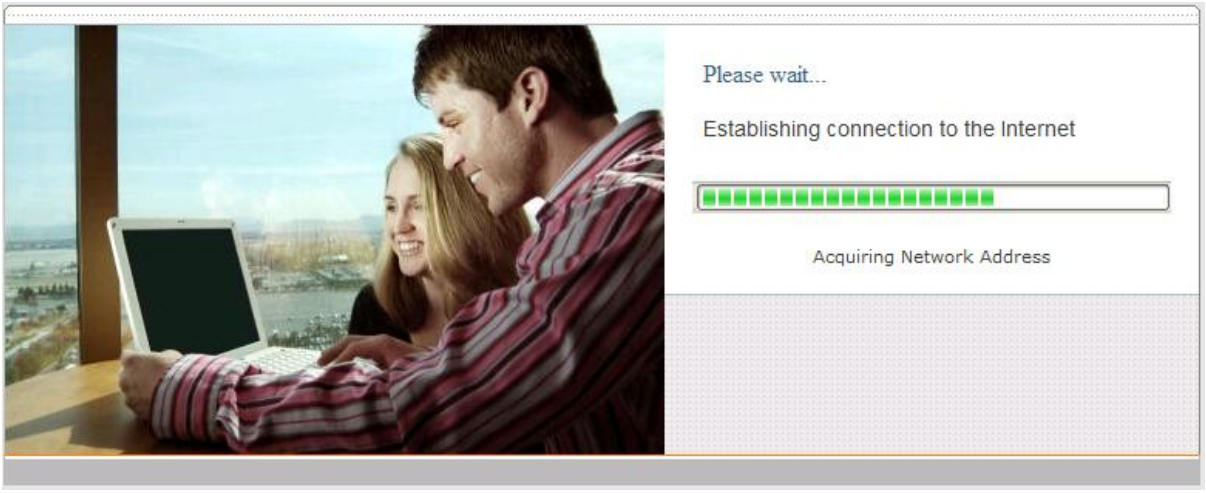


Illustration 6: Automatic Access Point Configuration is unavailable with WPA/WPA1-Enterprise Authentication

4.6 Test the Setup

To test to setup, you can now go to the unit's Main page, enter the user name and password. The realm (the text box next to the "@" sign) value can be left empty. Then click the Connect button.

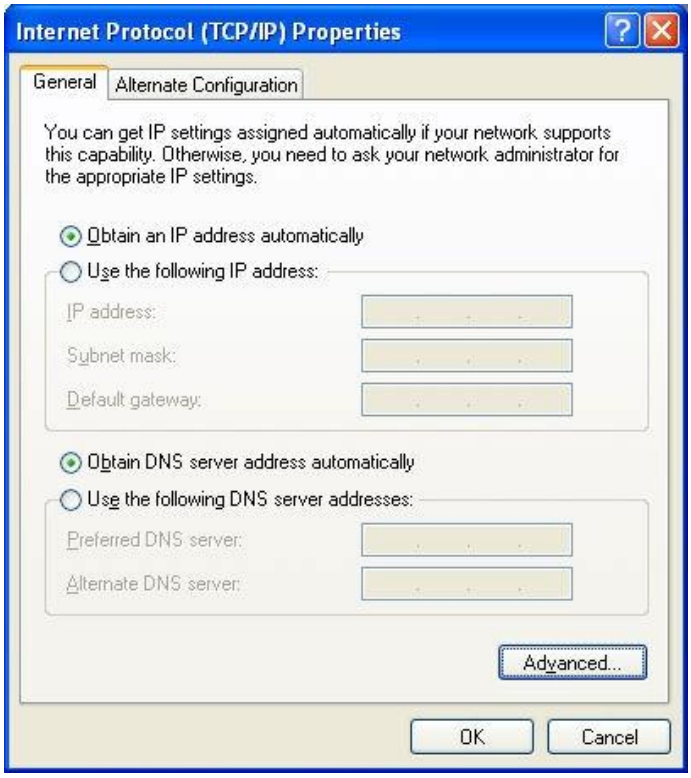


After connected, you should see:

4.7 Post-configuring PC Setup for Mesh Connector Series

At this point an Internet connection should have been successfully established between the access point and the PePWave Mesh Connector. The PC that was previously pre-configured to administrate the Surf has to reconfigure its Local Area Connection and be set to 'Obtain an IP address automatically'.

An 'Internet Protocol (TCP/IP) Properties' screen will appear. Please set as follows:



Click the "OK" button to confirm the change.

For now the PC will send a DHCP request directly to the access point via the PePWave Mesh Connector, and an IP address will be assigned from the access point to the PC.

4.8 Firmware Upgrade

The PePWave Surf Series is able to check whether a newer firmware (the software running on the unit) is available. This can be done in the Firmware Upgrade section.

However, it is recommended that you do not update the firmware unless specifically instructed by your ISP to do so. When a firmware upgrade is needed, your ISP will either give you instructions or upgrade the firmware remotely.

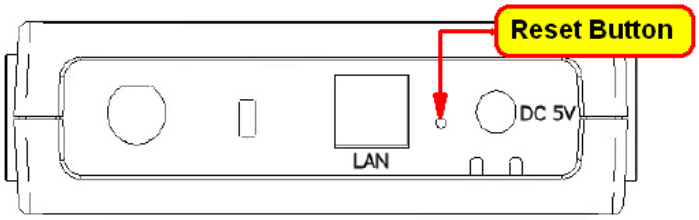
4.9 Restore to Default Settings

4.9.1 Surf Indoor Series

There are two ways to restore the PePWave Surf Indoor unit to default settings.

If you are able to access the web admin interface, go to the "CPE Setup" page, and click the *Restore and Reboot* button.

Otherwise, you can also power up the unit and wait for about 1 min. Then press the *Reset Button* at the rear side of the unit using a pin and then hold it for 5 seconds. The unit will restore the settings to factory default and reboot.



4.9.2 Surf DX Series

There are two ways to restore the PePWave Surf DX to default settings.

If you are able to access the web admin interface, go to the "CPE Setup" page, and click the *Restore and Reboot* button.

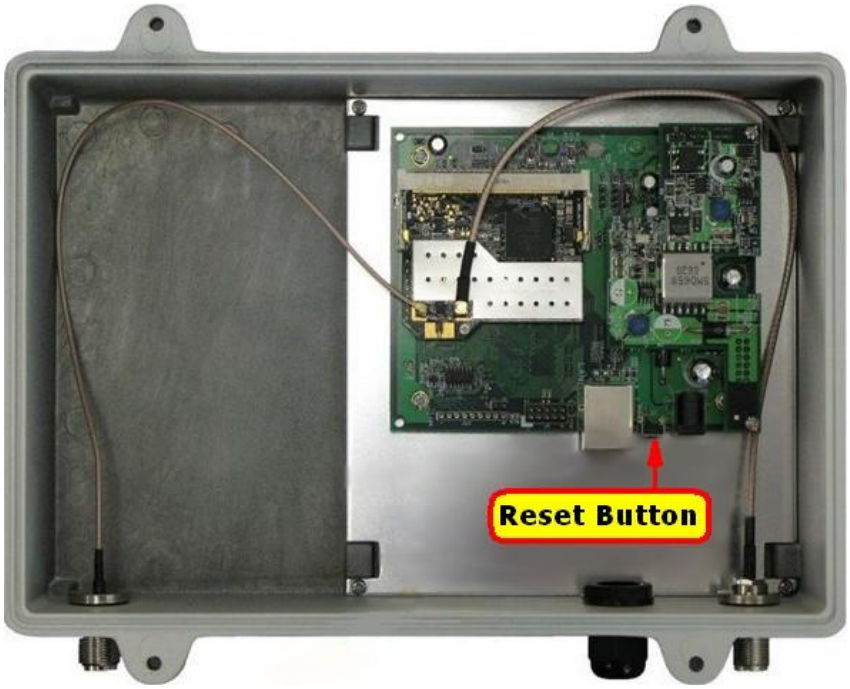
Otherwise, you can also power up the Surf DX unit and wait for about 1 min. Then push the *Reset Button* at the panel side of the unit and then hold it for 5 seconds. The unit will restore the settings to factory default and reboot.

4.9.3 Surf AP Outdoor / Mesh Connector Outdoor Series

There are two ways to restore the PePWave Surf AP outdoor/ Mesh Connector outdoor device to default settings.

If you are able to access the web admin interface, go to the "CPE Setup" page, and click the *Restore and Reboot* button.

Otherwise, you need to open the cover of the outdoor device and also power up the device and wait for about 1 min. Then push the *Reset Button* (see the illustration blow) and then hold it for 5 seconds. The device will restore the settings to factory default and reboot.



4.9.4 Mesh Connector Indoor / CarFi Series

There are two ways to restore the PePWave Mesh Connector Indoor or CarFi unit to default settings.

If you are able to access the web admin interface, go to the "CPE Setup" page, and click the *Restore and Reboot* button.

Otherwise, you can also power up the unit and wait for about 1 min. Then push the *Reset Button* at the rear side of the unit using a pin and then hold it for 5 seconds. The unit will restore the settings to factory default and reboot.

Appendix:

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:

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/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.

IMPORTANT NOTE

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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