PEPWAVE

Broadband Possibilities

User Manual

Pepwave Surf Series:
Surf mini
Surf 400
Surf 400-DX

July 11

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1 Copyright

2 Disclaimer

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3 Product Description

3.1 Product Features

- Signal strength LED for showing the current signal strength
- Always-on, integrated Wi-Fi access point (except Surf 400-DX)
- WPA/WPA2-Personal and WPA/WPA2-Enterprise security support
- Wi-Fi Multimedia (WMM) support
- Built-in DHCP server and NAT routing to manage client devices
- Customizable, built-in web portal for simple web-based configuration

Surf mini /400

Surf 400-DX

3.2 Hardware Setup

3.2.1 Surf mini

1. Attach the provided antenna to the right 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 on Pepwave Surf mini.
4. Switch on the power adaptor.

3.2.2 Surf 400

1. Attach the provided antenna to the right 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 on Pepwave Surf 400.
4. Optionally, connect a 3G USB Modem to the USB Port.
5. Switch on the power adaptor.

3.2.3 Surf DX Series

Please follow the installation guide to set up the Pepwave Surf 400-DX.

3.3 LED Description

3.3.1 Surf mini / 400 Series

LED	Color	Status	Description
PWR	Green	On	Power is on
		Off	Power is off
RDY	Green	On	Device is booted
		Off	Device is not booted
ENET	Green	On	Ethernet is connected
		Blinking	Sending/Receiving data
		Off	Ethernet is not connected
	Green	On	Associated with an access point
		Blinking	Acquiring IP address
		Off	Not associated with any access point
		Number of LED	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

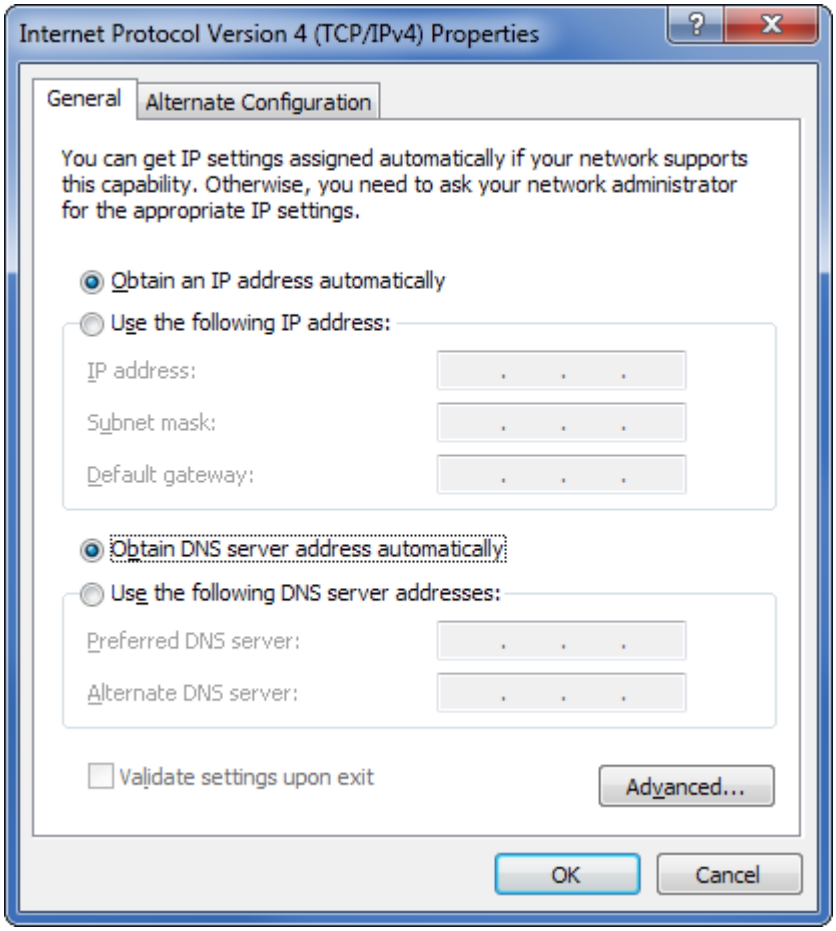
LED	Color	Status	Description
PWR	Green	On	Power is on
		Off	Power is off
LAN	Green	On	Ethernet is connected
		Off	Ethernet is not connected
Wi-Fi	Green	On	Associated with an access point. The number of LED lights from “MIN” to “MAX” indicates the received signal strength level.
		Off	Not associated with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

4 Using the Pepwave Devices

4.1 Pre-configuring PC Setup

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***, and 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 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.

Illustration 1: Welcome Page

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

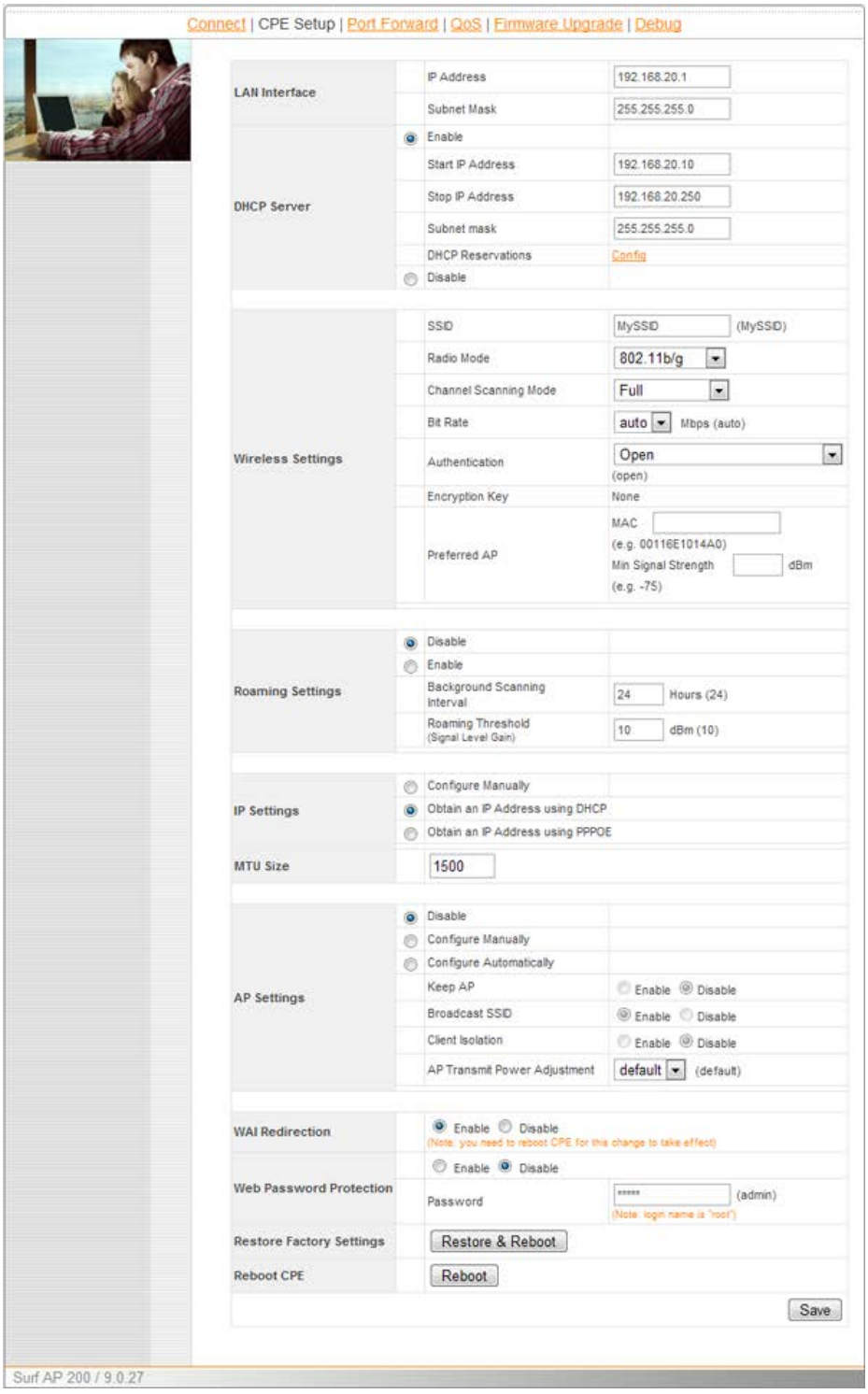


Illustration 2: Pepwave Surf AP Setup Page

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.

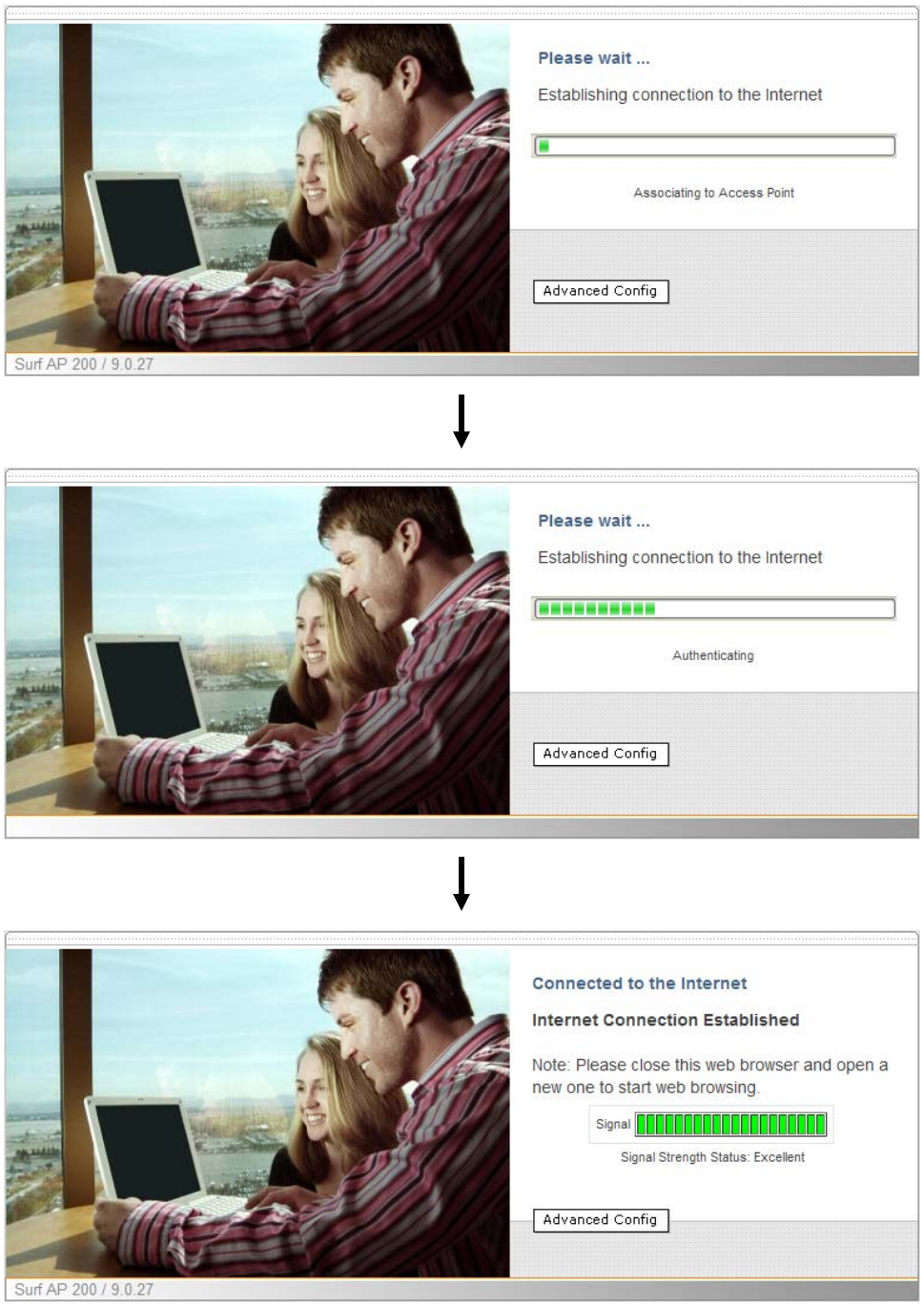


Illustration 3: Establishing Connection to the Internet

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.

4.3 Settings Details

4.3.1 IP Settings

Illustration 4: IP Settings

IP Settings	
LAN Interface	To configure the LAN interface's IP address and subnet mask.
DHCP Server	(Applicable to Surf AP / Surf DX) To configure and enable the built-in DHCP server or not. If enabled, the IP address range can be configured. Configure DHCP Reservation if there is a need to assign a specific IP address to a specific MAC address using DHCP.

4.3.2 Wireless Settings

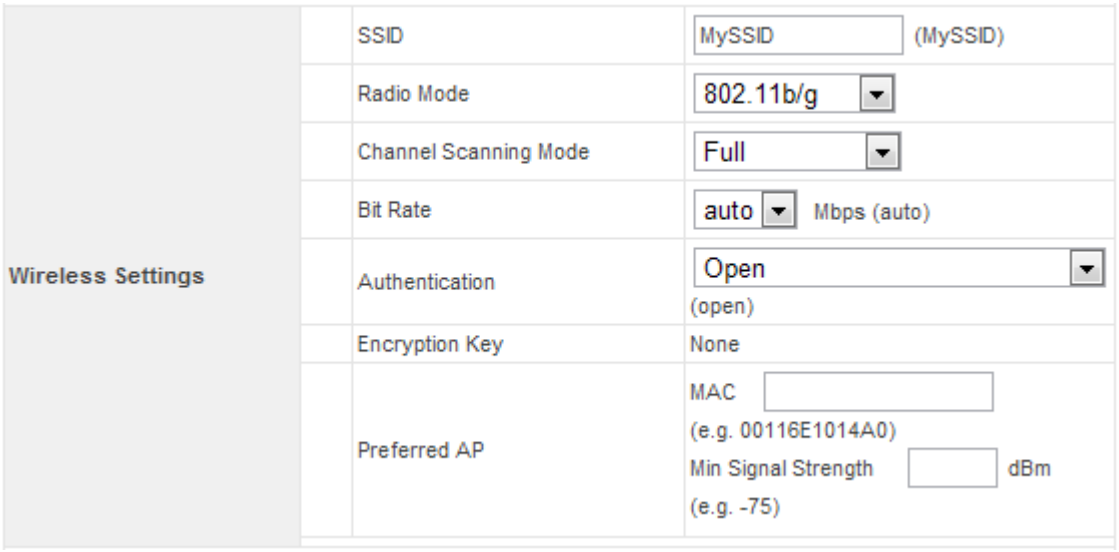


Illustration 5: Wireless Settings

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.
Channel Scanning Mode	To select different channels that preferred to scan.
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.

4.3.3 Roaming Settings for Surf Indoor / Surf DX Series:

Illustration 6: Roaming Settings

Roaming Settings	
Roaming Settings	To configure and enable roaming among APs with the same SSID and authentication method.
Background Scanning Interval	The time interval between background scans.
Roaming Threshold (Signal Level Gain)	If there is another AP with a signal level greater than the signal level of connected AP by the specified value, it will reconnect to the AP with better signal.

4.3.4 Wireless IP Settings

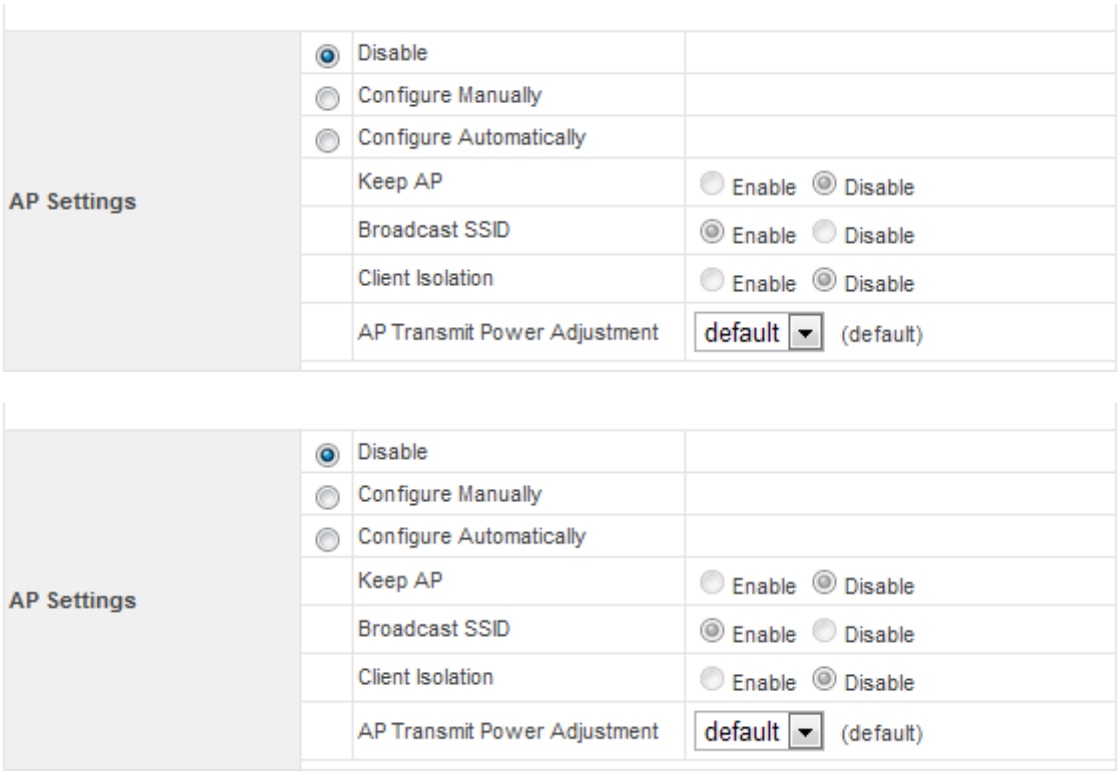


Illustration 7: Wireless IP Settings

Wireless IP Settings	
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 Series) The AP Settings will be covered in detail in the subsequent section **Integrated Wi-Fi Access Point Configuration**.

4.3.5 Restore and Reboot

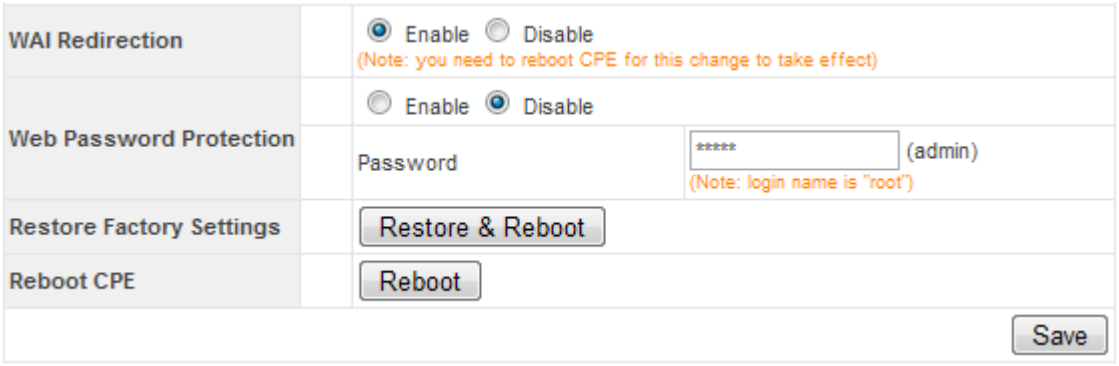


Illustration 8: Restore and Reboot

Restore and Reboot	
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 Factory 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 CPE	To restart the device.

4.4 Integrated Wi-Fi Access Point Configuration

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 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 the ISP's network.

4.4.1 Access Point Disabled

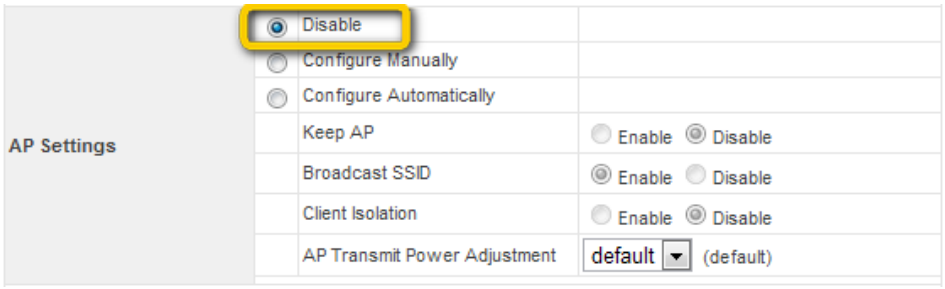


Illustration 9: Access Point Disabled

4.4.2 Access Point configure Manually

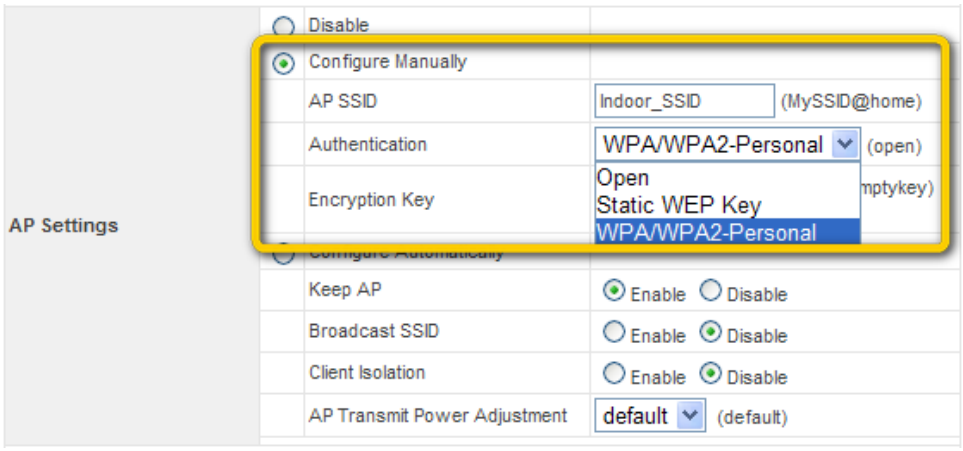


Illustration 10: Access Point Configure Manually

Configure Manually	
AP SSID	In Manual Configuration mode, the SSID is manually entered.
Authentication	It can be one of three configurable values: • **Open** No Encryption Key is necessary. • **Static WEP Key** A 64- or 128-bit Encryption Key is required, and can be entered in either an ASCII or HEX representation. • **WPA / WPA2-Personal** An Encryption Key, of at least 8 characters, is required.

4.4.3 Access Point Configure Automatically

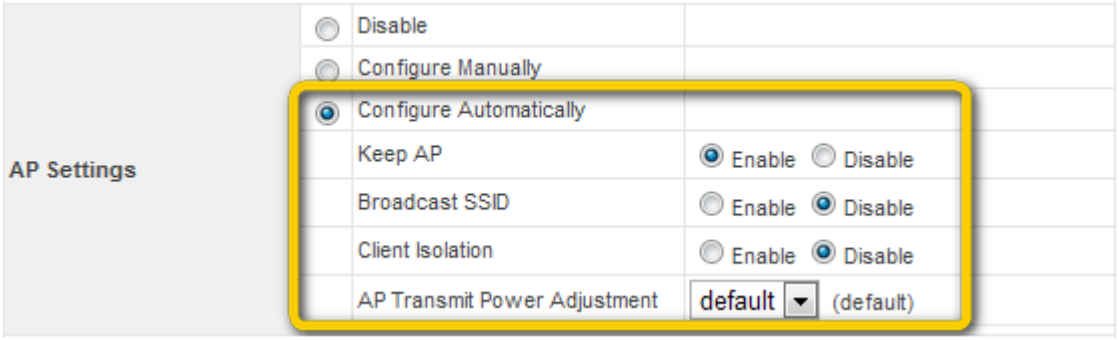


Illustration 11: Access Point Configure Automatically

AP Settings	
Broadcast SSID	With this option enabled, the configured SSID will be broadcast such that it can be detected by an SSID scan. Otherwise, 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.
Client Isolation	Prevent wireless clients connected to the AP from communicating with each other.
Keep AP	With this option enabled, the Wi-Fi Access Point will always on even if there is no connection to the mesh network.
AP Transmit Power Adjustment	An option to retain a lower power setting for indoor home devices. Available options are between -1 dBm and –15dBm.

With the Access Point Configuration set to **Configure Automatically**, the **SSID**, **Authentication**, and **Encryption Key** values of the Integrated Wi-Fi Access Point will be configured to be the same as in the *4.3.2 Wireless IP 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 Wi-Fi Access Point functionality currently does not support authentication via the 802.1x with dynamic WEP key and WPA/WPA2-Enterprise methods.

4.5 Test the Setup

To test the 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.

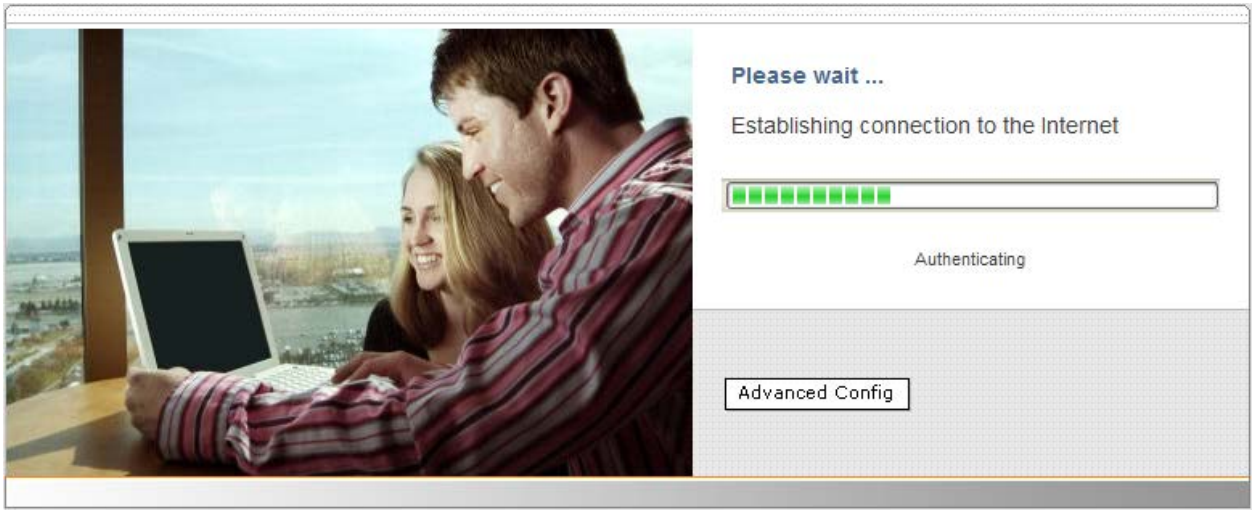


Illustration 12: Establishing Connection to the Internet

After connected, you should see:

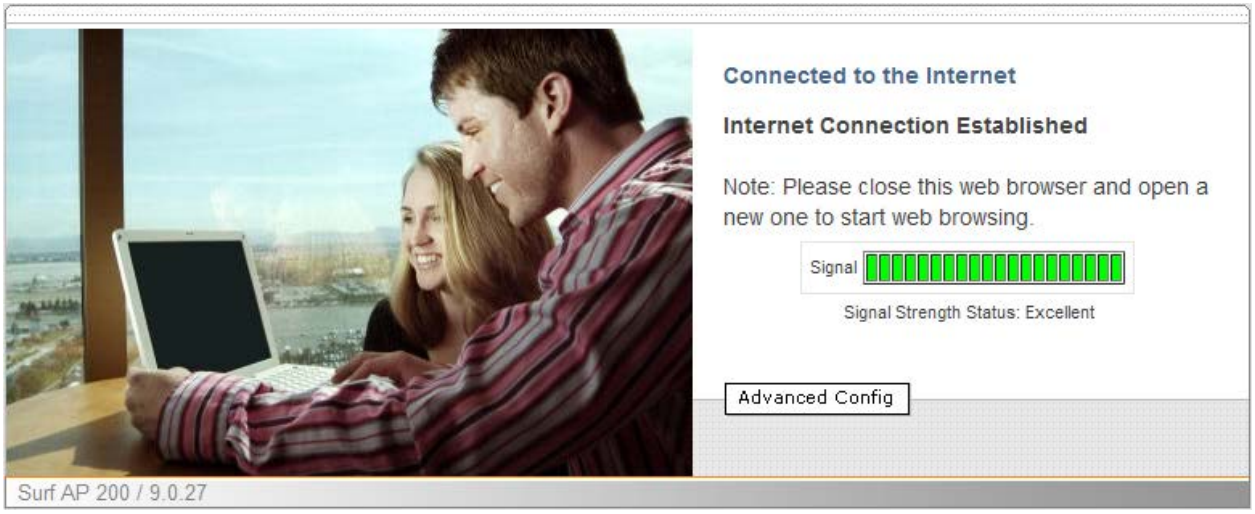


Illustration 13: Internet Connection Established

4.6 Port Forwarding

Port Forwarding Settings	
Service Port Range	Enter a port or a range of ports that would like to forward.
Protocol	The Protocol for the above port(s) forwarding. You should select at least one protocol between **TCP** and **UDP**.
IP Address	The IP address that you would like the traffics forwarded to.
Del	By clicking the button, you can delete the corresponding rows of port forwarding rules.

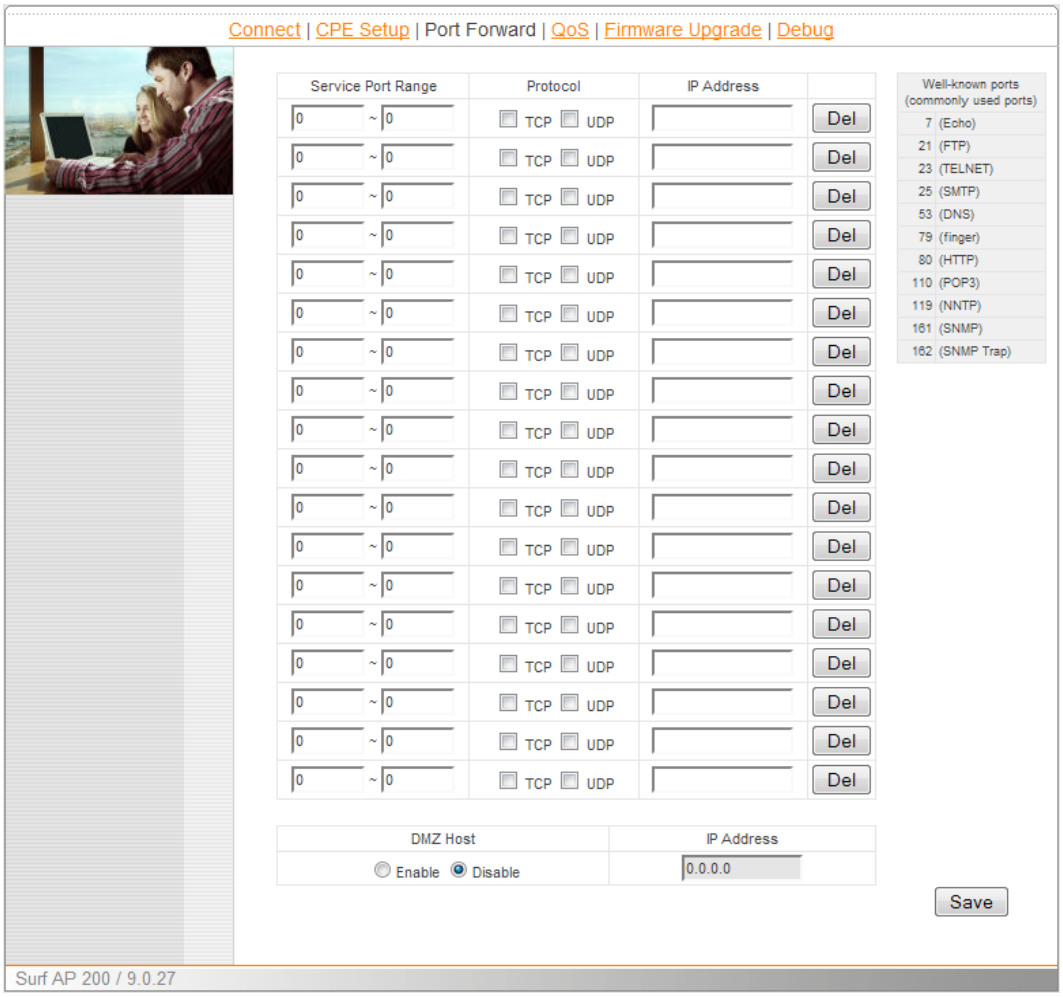


Illustration 14: Port Forwarding

Below the port forwarding table is an option called **DMZ Host**. If you **Enable** this function, your Pepwave Surf will become a DMZ device. You can enter an IP address, which will be the IP address of the device that expose to the Internet. The purpose of a DMZ is to make all external users can has access to any ports of the device, so that user do not need to set up port forwarding and internet traffics can directly reach internal devices.

Tip

Below is a table showing some well-known ports, which is officially registered with IANA.

Port Number	Description	Protocol
7	Echo	TCP, UDP
21	FTP	TCP
23	TELNET	TCP
25	SMTP	TCP, UDP
53	DNS	TCP, UDP
79	Finger	TCP
80	HTTP	TCP, UDP
110	POP3	TCP
119	NNTP	TCP
161	SNMP	TCP, UDP
162	SNMP Trap	TCP, UDP

4.7 QoS

QoS Settings	
Target	To choose whether it is an incoming **(Source)** or outgoing **(Destination)** traffic that should be controlled by the service.
Service Port Range	Enter a port or a range of ports that would like to be controlled by the service.
Protocol	The Protocol for the above port(s). You should select at least one protocol between **TCP** and **UDP**.
IP Address	The IP address that you would like the traffics to be controlled by the service.
Priority	There are three choices for service priority: **Background, Video** and **Voice**. By choosing **Default**, priority will be automatically adjusted.
Del	By clicking the button, you can delete the corresponding rows of port forwarding rules.

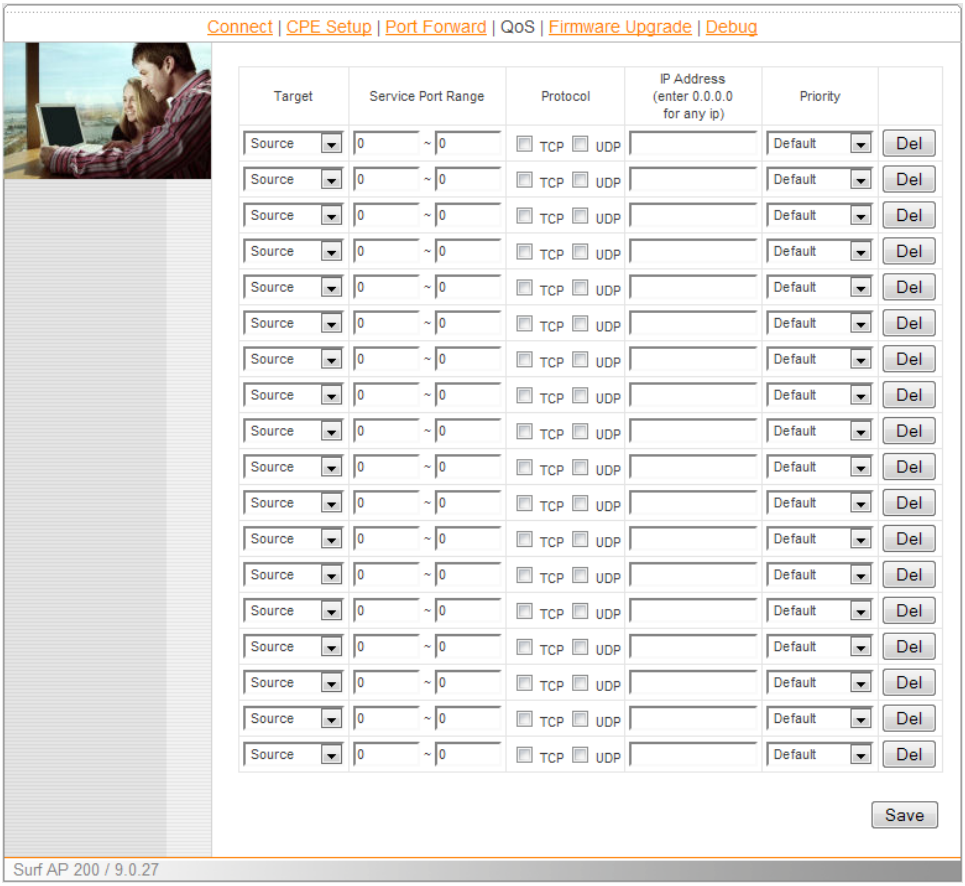


Illustration 15: QoS

4.8 Firmware Upgrade

The Pepwave devices are able to check whether a newer firmware (the software running on the unit) is available.

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 they will upgrade the firmware remotely.

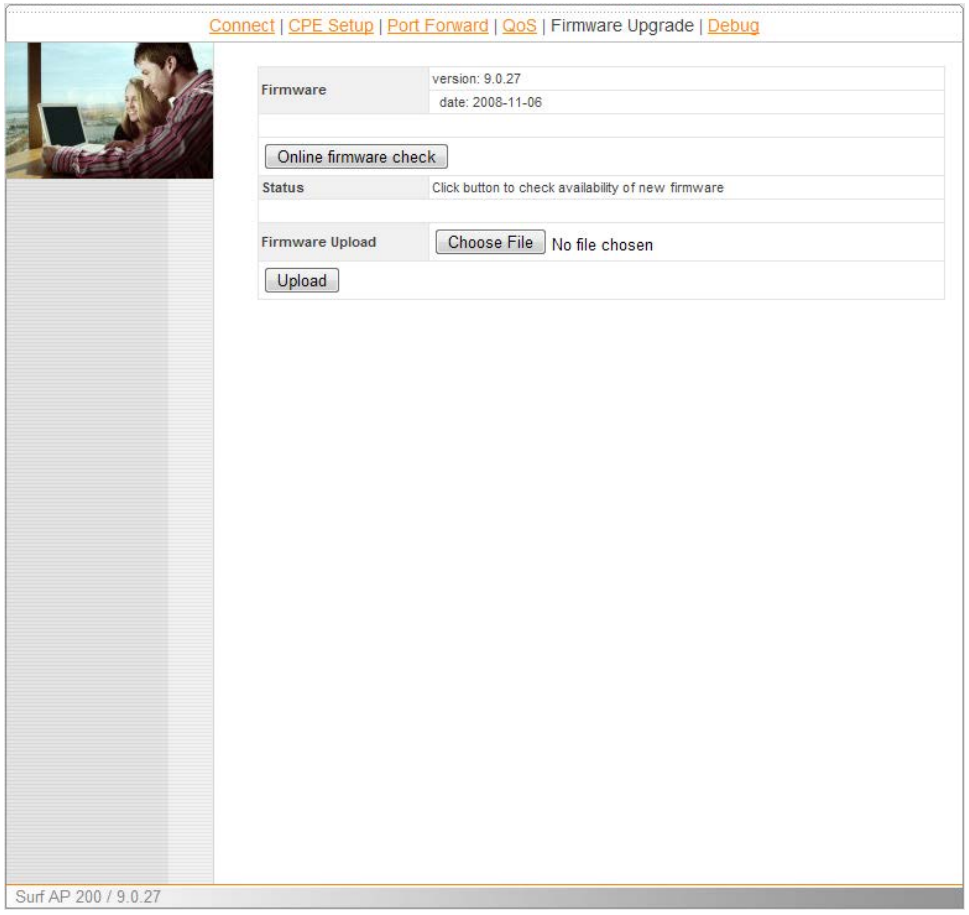


Illustration 16: Firmware tab showing the system information

Tip

It is highly recommended users to download the configuration file (download directory can be found in the next section) for backup propose before doing firmware upgrade.

4.9 Debug and System information

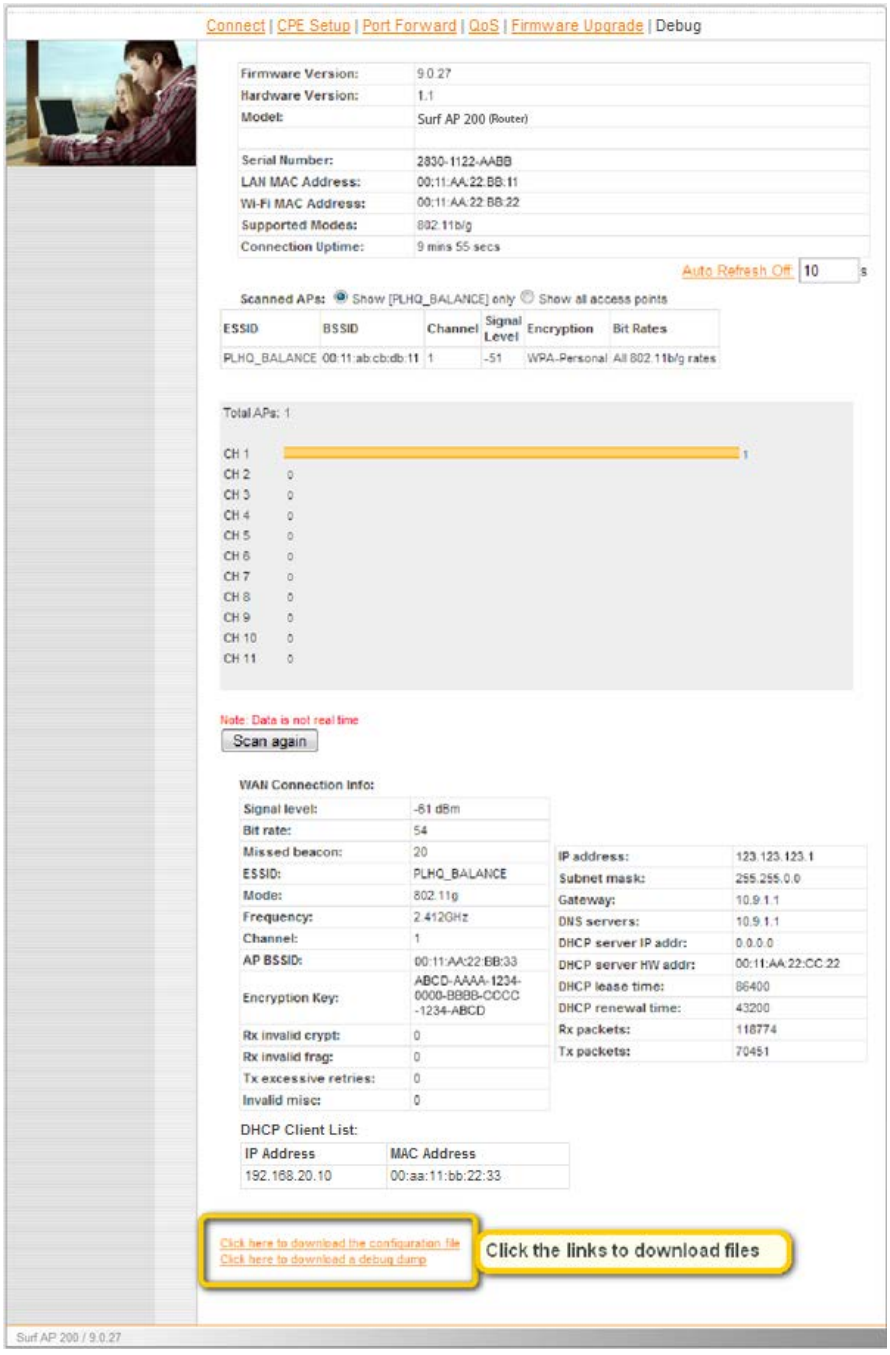


Illustration 17: Debug tab showing the system information

Tip

Debug dump and **configuration file** can be downloaded through clicking the links illustrated above. If you encounter issues and would like to contact Pepwave Support Team (email: support@pepwave.com), please download the above files and attach it along with a description of your encountered issue.

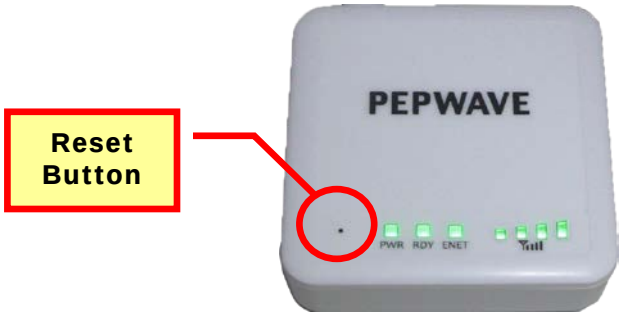
4.10 Restore to Default Settings

4.10.1 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.



4.10.2 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.

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.

PEPWAVE

Broadband Possibilities

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