Configuring the EN-4000's 802.11 Wireless Card

The EN-4000 is the newest member of Encore Networks' family of routers. It provides wireless and cabled connections to a local area network (LAN) and to peripheral devices and remote devices.

The 802.11 wireless card was installed in the internal card slot (also called the embedded card slot) before the EN-4000 was shipped. Place the EN-4000 in its network location, and attach antennas to the ports labeled MAIN 1 and AUX 1, to support the internal wireless card. (For details, see the *EN-4000™ Quick Installation Guide*.) The EN-4000 supports 802.11a, b, and n wireless protocols.

After logging in to the EN-4000 Management System, follow the procedures in this discussion to configure the EN-4000's wireless card as a wireless access point or as a wireless client.

Note: For additional details of EN-4000 configuration, see *Configuring General Settings for the EN-4000*.

13.1 Configuring the 802.11 Wireless Card for the Network

The EN-4000's 802.11 wireless card can use one of two operating modes:

- It can function as an access point. See *Configuring the 802.11 Wireless Card as an Access Point*, on page 2.
- It can function as a wireless client. See *Configuring the 802.11 Wireless Card as a Wireless Client*, on page 10.

Note: A single wireless card can support only one mode at a time.

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13.1.1 Configuring the 802.11 Wireless Card as an Access Point

To configure the 802.11 wireless card as an access point, use the steps in the following procedure.

1 On the EN-4000 Management System, select the **Networks** tab; then select the **Wifi** tab.

❖ If the EN-4000 contains a wireless card, the Overview Screen for Wireless Configuration is displayed (Figure 13-1).

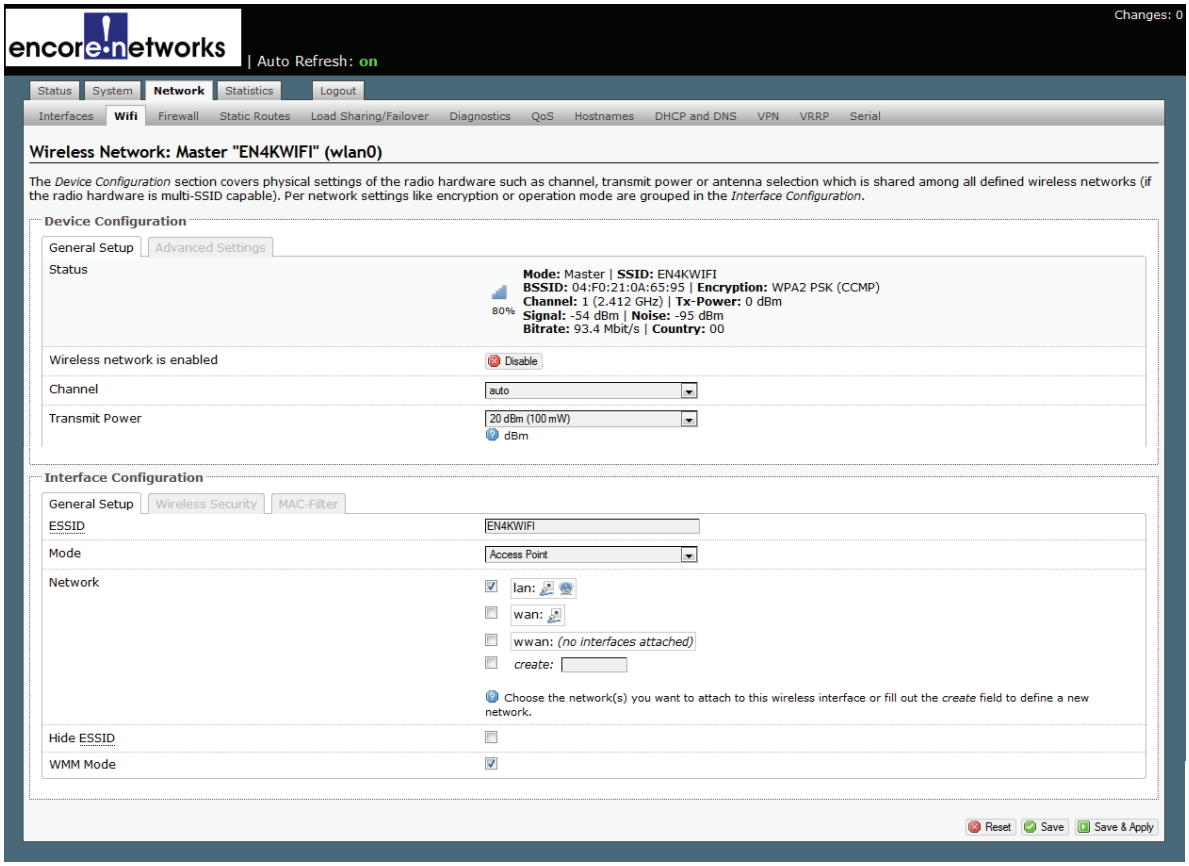
This screen provides basic information about the card's wireless specifications; it displays the MAC ID and supported versions of 802.11 (in Figure 13-1, **802.11abgn**). If the wireless card has already been configured, the display also lists the card's mode and related specifications.

Figure 13-1. Overview Screen for Wireless Configuration

2 In the row for the new wireless card, select the **Add** button.

❖ The Wireless Access Point Initial Configuration Screen is displayed (Figure 13-2).

Figure 13-2. Wireless Access Point Initial Configuration Screen



Note: Configure the fields in the lower half of this screen first (under the heading **Interface Configuration**).

3 Under the heading **Interface Configuration**, make sure the **General Settings** tab is displayed, and do the following:

a For the **Mode**, select **Access Point**.

b In the field labeled **ESSID**, type a name for the access point. (In this example, that name is **EN4KWIFI**.)

c Select the box to indicate that the **Network** is a **LAN**.

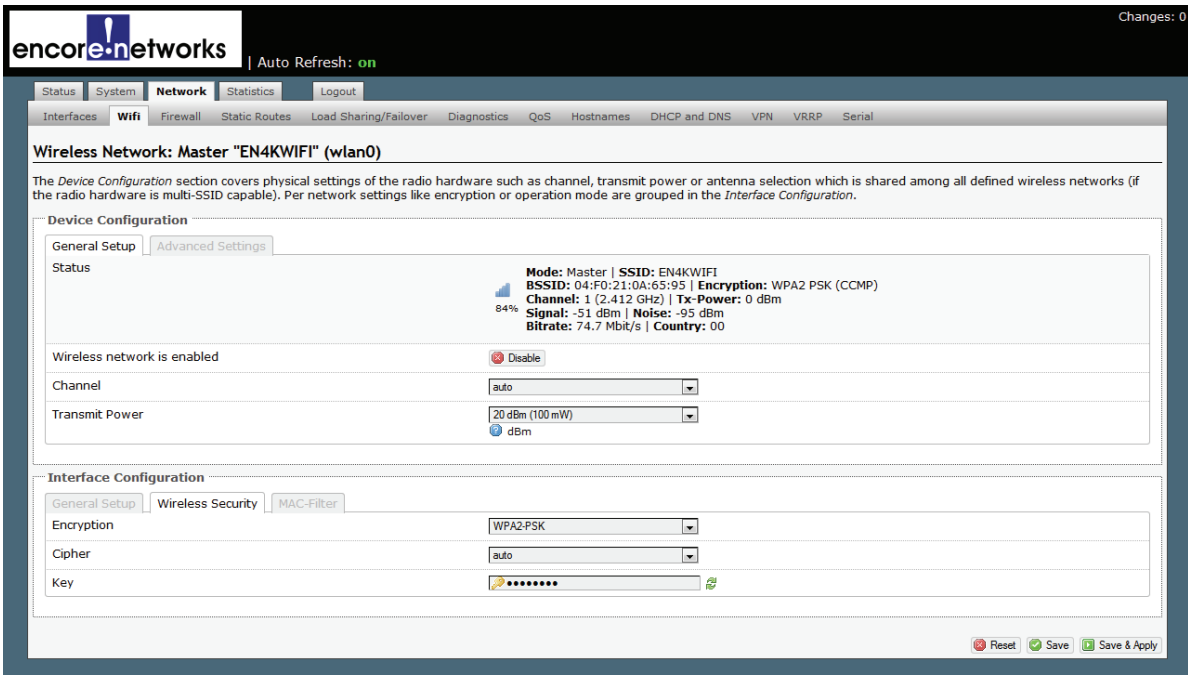
d Leave the field labeled **Hide ESSID** blank.

e Make sure the box for **WMM Mode** contains a check mark.

4 Under the heading **Interface Configuration**, select the **Wireless Security** tab.

❖ The Wireless Configuration Screen, Wireless Security, is displayed (Figure 13-3).

Figure 13-3. Wireless Configuration Screen, Wireless Security



5 On that screen, set the following values:

a Make sure the **Encryption** is **WPA2-PSK**.

b Make sure the **Cipher** is set to **Auto**.

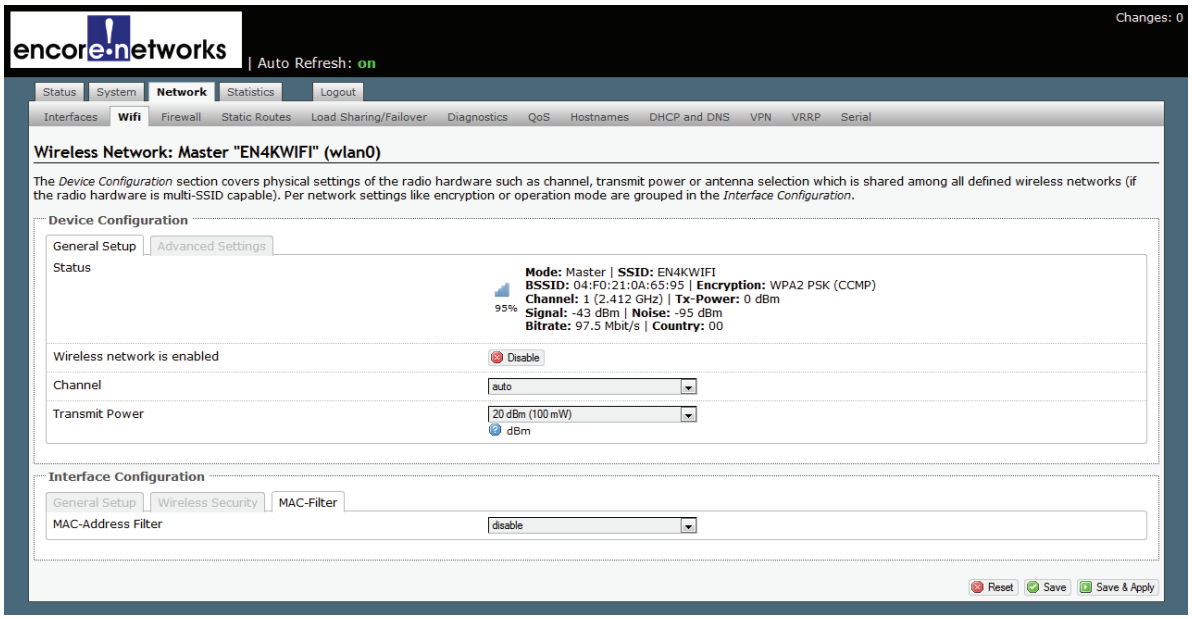
Note: In auto mode, the cipher uses CCMP (AES). Other protocols, such as TKIP, might appear in the list, but 802.11n recommends CCMP (AES).

c For the **Key** field, specify a password for users to gain wireless access through this Access Point.

6 Under the heading **Interface Configuration**, select the **MAC Filter** tab.

❖ The Wireless Configuration Screen, MAC Filter, is displayed (Figure 13-4).

Figure 13-4. Wireless Configuration Screen, MAC Filter



7 On that screen, make sure the **MAC Address Filter** is **disabled**.

Note: You can enable that filter if you wish to allow or block specific MAC addresses.

8 In the top portion of the screen, under **Device Configuration**, make sure the **General Setup** tab is displayed. (Note that the **Status** display is only for information; it cannot be changed.) Then do the following:

a Make sure the **Wireless Network is Enabled**. (Do NOT select Disable.)

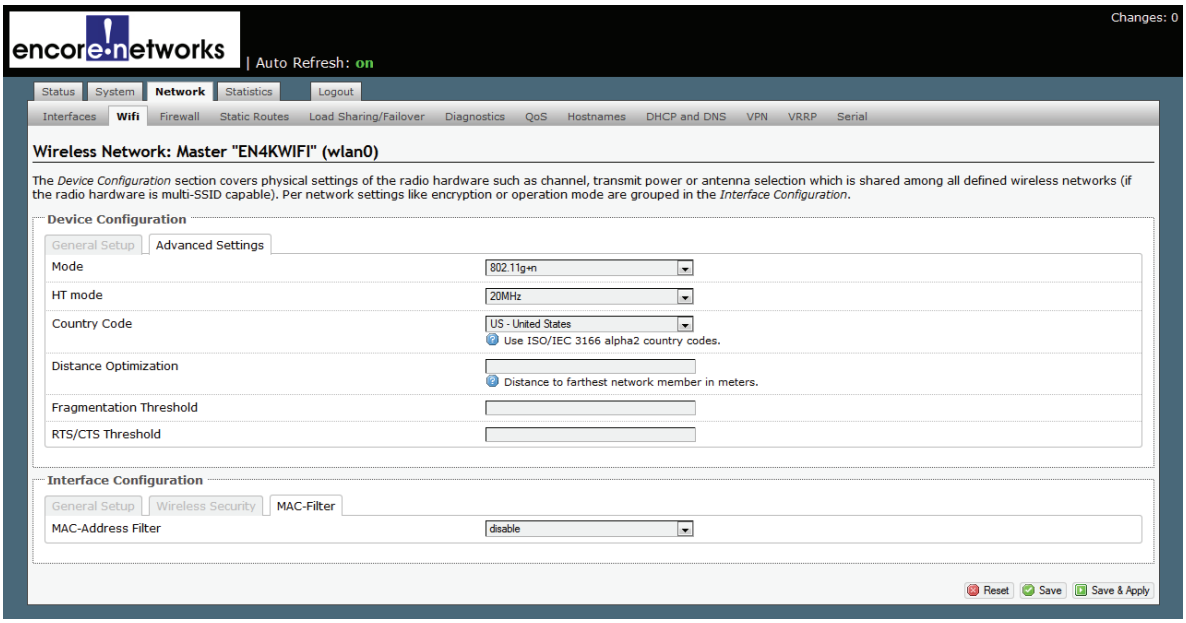
b Leave the **Channel** on **Auto**.

c For **Transmit Power**, select the maximum value allowed under your region's regulations.

9 Under the heading **Interface Configuration**, select the **Advanced Settings** tab.

❖ The Wireless Configuration Screen, Advanced Settings, is displayed (Figure 13-5).

Figure 13-5. Wireless Configuration Screen, Advanced Settings



10 On that screen, do the following:

a Select the **Mode** that provides the highest throughput for your region. **802.11n** is the preferred mode when it is available.

b Select a range that works well for **HT Mode** in your area.

Note: If there are few wireless networks in your area, and if all the devices that will connect to this access point can support 40 MHz, then this access point can use **40 MHz**. If several wireless networks are in the same area, **20 MHz** works better.

c Set the **Country Code** for the country where the device is located (to conform to regulations for use of frequencies, etc.).

d Leave the **Distance Optimization** field blank.

e Leave the **Fragmentation Threshold** field blank.

f Leave the **RTS/CTS Threshold** field blank.

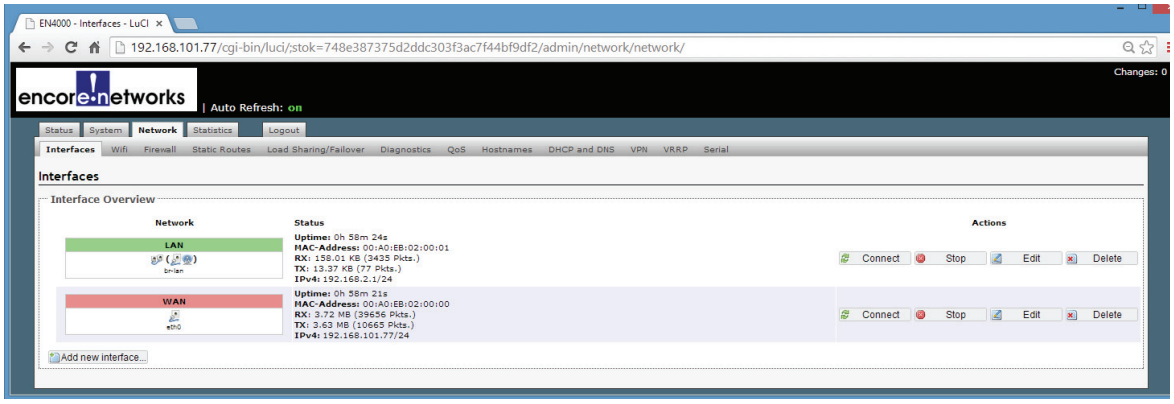
11 Select the **Save & Apply** button.

12 When the EN-4000 is configured as an access point, the 802.11 wireless interface and the LAN interface can be bridged, to allow the user to connect through Ethernet or through 802.11 wireless. Do the following:

a On the EN-4000 Management System, select **Network**, then **Interfaces**.

❖ The EN-4000 Interfaces Screen is displayed (Figure 13-6).

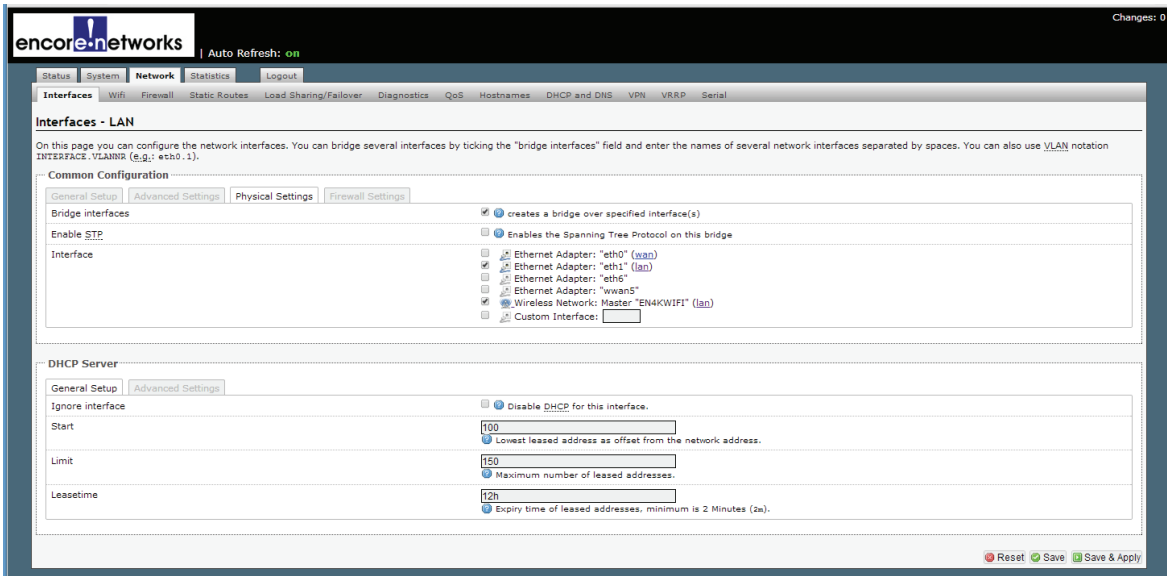
Figure 13-6. EN-4000 Interfaces Screen



b In the LAN row, select the **Connect** button.

❖ The LAN Interfaces Screen is displayed (Figure 13-7).

Figure 13-7. LAN Interfaces Screen

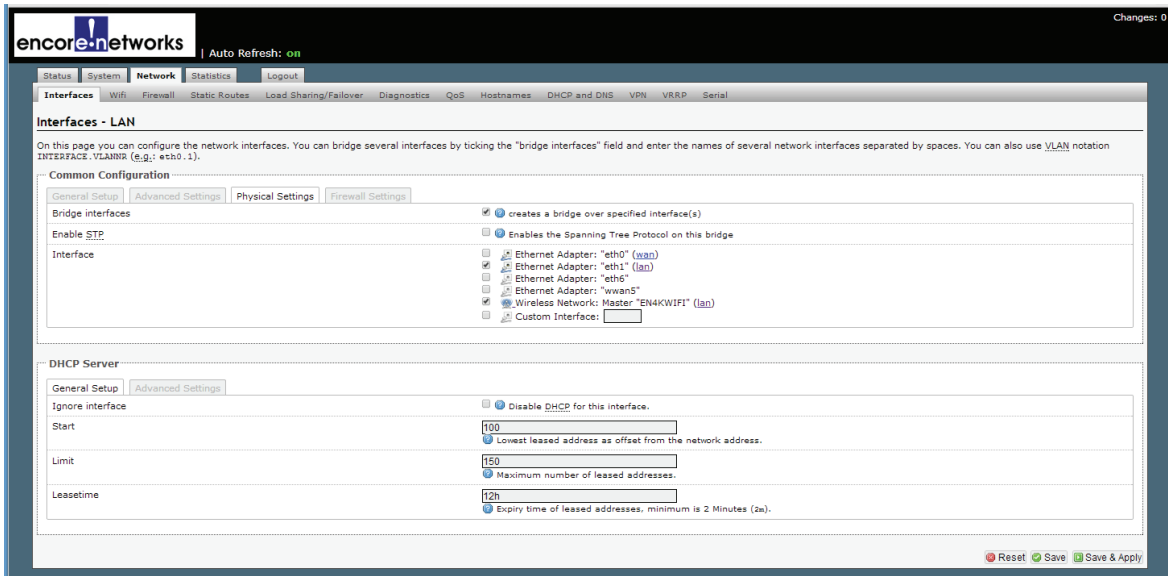


Note: The DHCP server assigns an IP address to each device that connects to this EN-4000 over a wireless connection or over an Ethernet LAN. (The DHCP server's configuration is shown in the lower portion of Figure 13-7.)

c On the LAN Interfaces Screen, select the **Physical Settings** tab.

❖ The LAN Interfaces Physical Settings Screen is displayed (Figure 13-8).

Figure 13-8. LAN Interfaces Physical Settings Screen



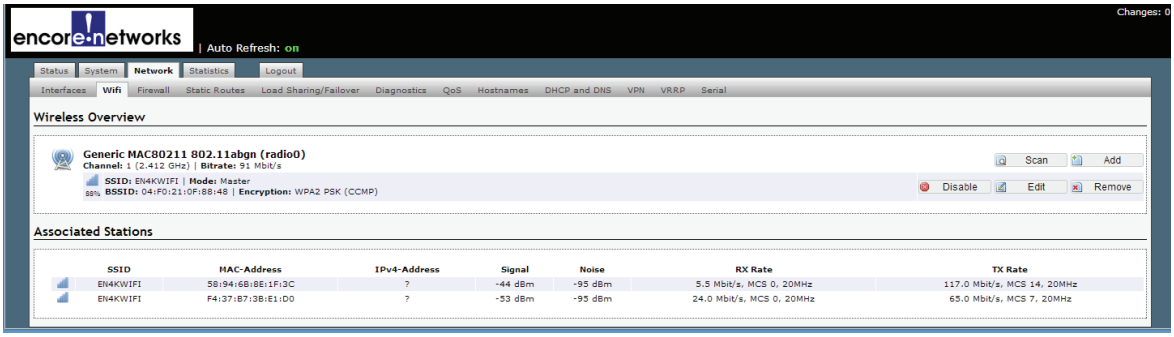
d On that screen, make sure the following settings apply:

- **Bridge Interfaces**: Make sure **Creates a bridge over specified interfaces** is selected.
- **Interface**: Make sure **Ethernet Adapter "eth1" (LAN)** is selected, and make sure **Wireless Network Master *** (LAN)** is selected, where ******* represents the name of the client interface you created in Step 3b on page 3. (******* is **EN4KWIFI** in Figure 13-8.)

e Select the **Save & Apply** button.

❖ The bridge is saved, and the Wireless Overview Screen is displayed (Figure 13-9). Note that the list of associated stations includes two interfaces now.

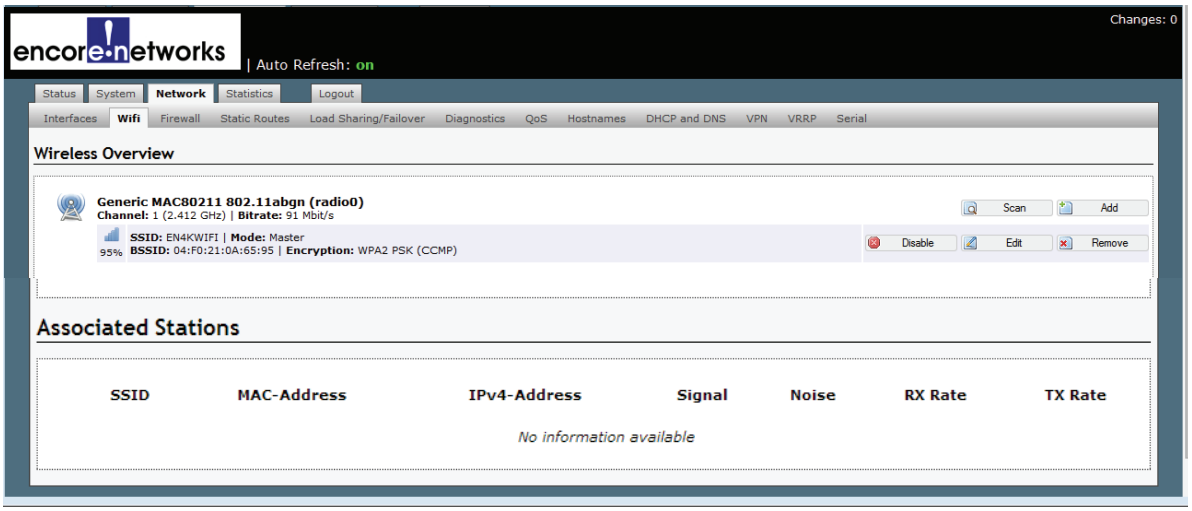
Figure 13-9. Wireless Overview Screen



13 On the EN-4000 Management System, select the **Network** tab; then select the **Wifi** tab.

❖ The Wireless Access Point Configuration Screen is redisplayed, showing the completed configuration for the wireless card as a wireless access point (Figure 13-10).

Figure 13-10. Wireless Access Point Configuration Screen Completed



14 Open a device that will use this access point to reach the wireless network. That can be any mobile or static device with 802.11 wireless capability. Use that device's system to connect to the wireless access point.

Note: If you are connecting another device to this access point, that device must be an 802.11 wireless client. If that other device is an EN-4000, you can connect that device to this access point by doing the following on that EN-4000's management system:

a Select the **Network** tab,

b Then select the **Wifi** tab.

c Then select the **Scan** Button.

❖ A list displays 802.11 wireless networks within range.

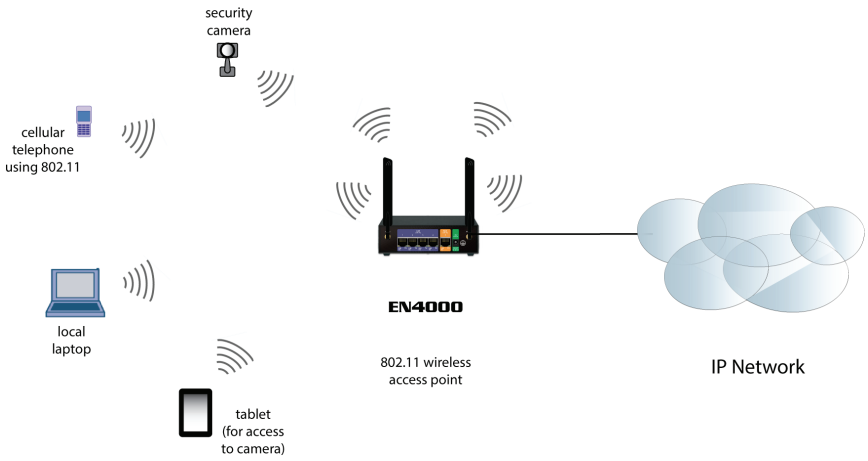
d In that list, find the access point's network and select **Join Network**.

Note: For details, see step 1 through step 3 and Figure 13-14 and Figure 13-15, on page 10 through page 11 of *Configuring the 802.11 Wireless Card as a Wireless Client*.

❖ That device connects to the access point and can now access the wireless network.

Figure 13-11 shows some 802.11 wireless devices connected to the EN-4000 access point.

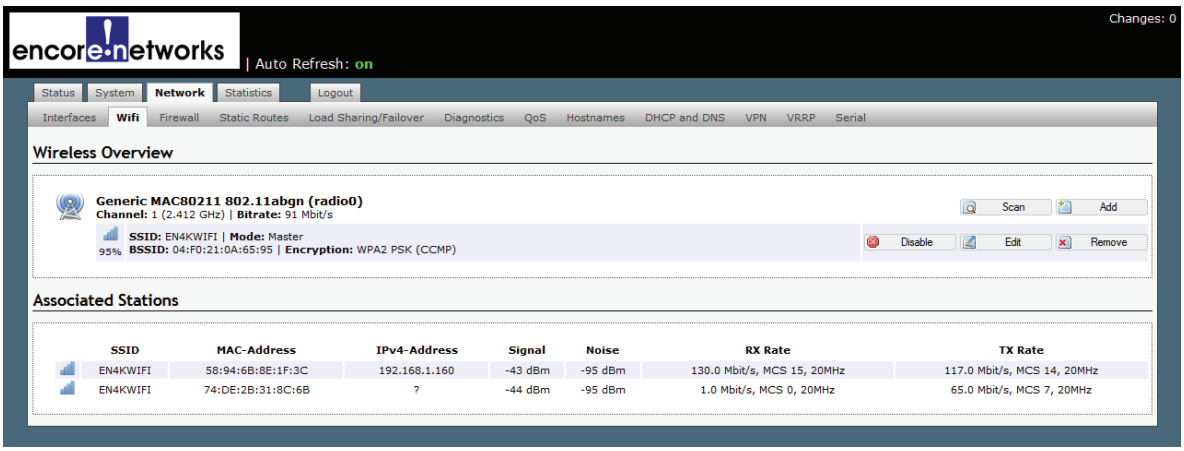
Figure 13-11. EN-4000 as Wireless Access Point



15 On the EN-4000 that is the wireless access point, select the **Network** tab, then the **Wifi** tab.

❖ The Wireless Overview Screen is displayed (Figure 13-12). The list of associated stations includes the IP address of an EN-4000 that connected in step 14.

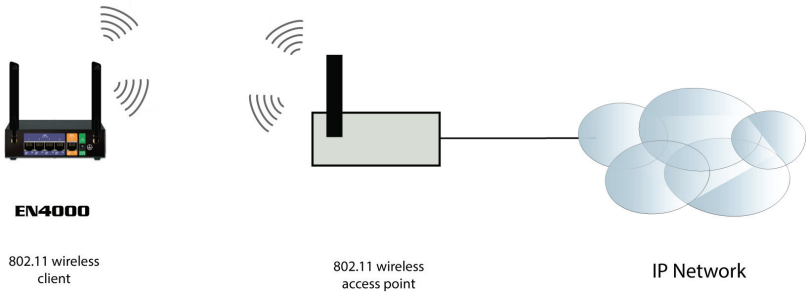
Figure 13-12. Wireless Overview Screen
Listing Associated Stations



13.1.2 Configuring the 802.11 Wireless Card as a Wireless Client

Figure 13-13 shows the EN-4000 as a wireless client.

Figure 13-13. EN-4000 as Wireless Client



To configure the wireless card as a client, you must first identify the wireless access point that the wireless card will connect to. That access point must support the type of 802.11 wireless transmission that the EN-4000 supports (802.11a, 802.11b, 802.11n; or combined support for 802.11a+n). You must also know the password (and other credentials, if applicable) to log on to that access point.

1 On the EN-4000 Management System, select the **Network** tab; then select the **Wifi** tab.

❖ If the EN-4000 contains a wireless card, the Overview Screen for Wireless Configuration is displayed (Figure 13-14).

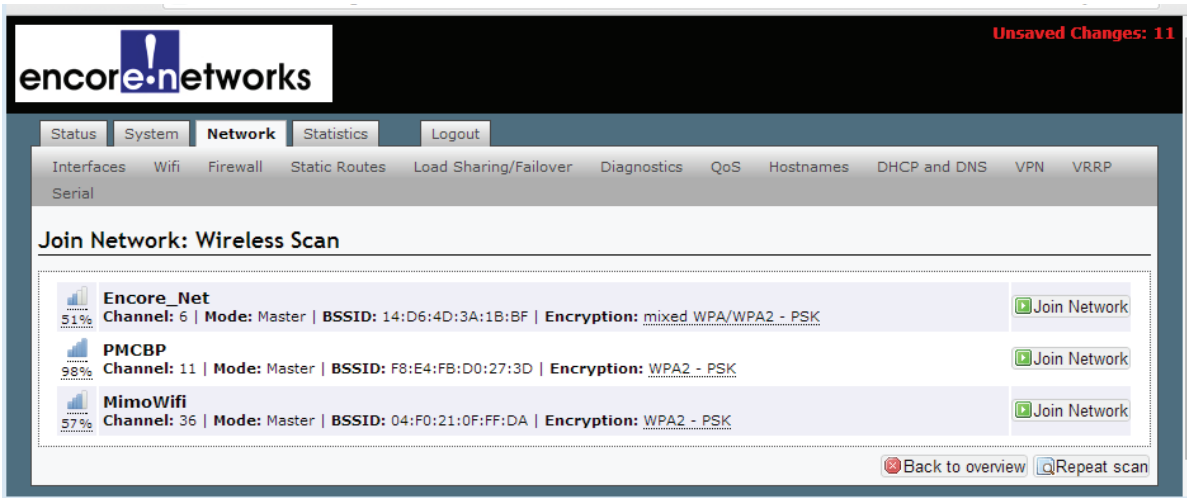
This screen provides basic information about the card's wireless specifications; it displays the MAC ID and supported versions of 802.11 (in Figure 13-14, **802.11abgn**). If the wireless card has already been configured, the display also lists the card's mode and related specifications.

Figure 13-14. Overview Screen for Wireless Configuration

2 On the Overview Screen for Wireless Configuration, select the **Scan** button.

❖ The screen lists available wireless networks (Figure 13-15).

Figure 13-15. Available Wireless Networks

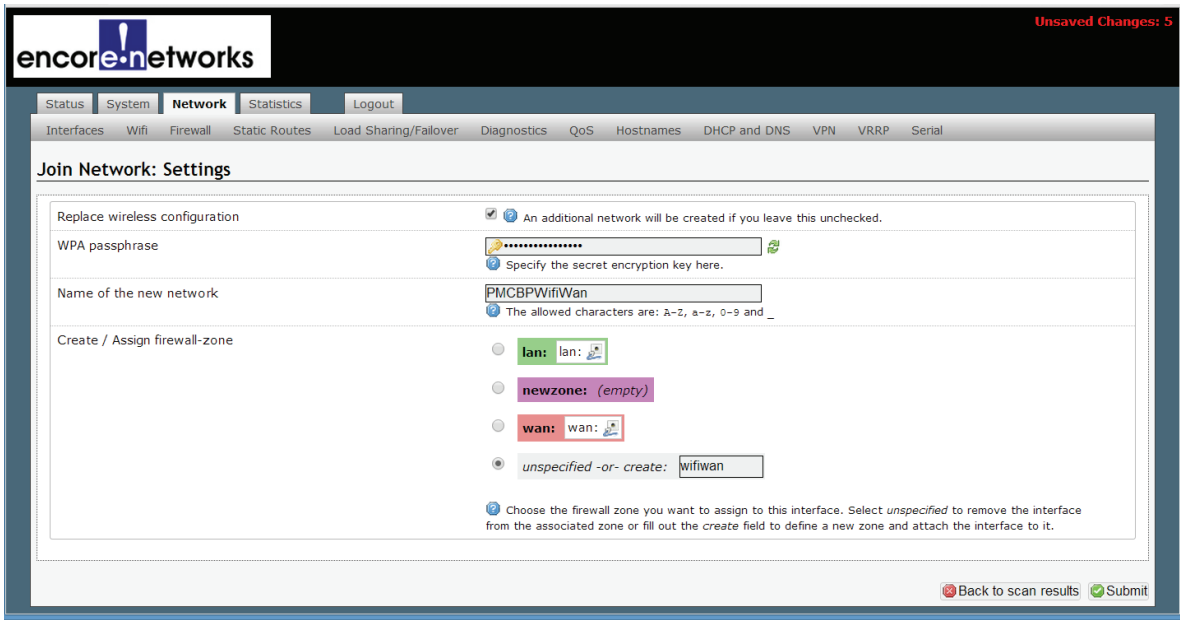


3 Select the **Join Network** button for the network you wish to join.

❖ The selected network requests log-in credentials (Figure 13-16).

Note: You should already have requested the password and other log-in information for the selected network.

Figure 13-16. Log-In Screen for a Wireless Network



4 Do the following:

a Make sure the box is checked to **Replace wireless configuration**.

b In the field for the **WPA passphrase**, type the password provided by the network.

c Specify the **Name of the new network**. This can be any unique name in your network. We recommend including the name of the network you selected in step 3 as part of this name.

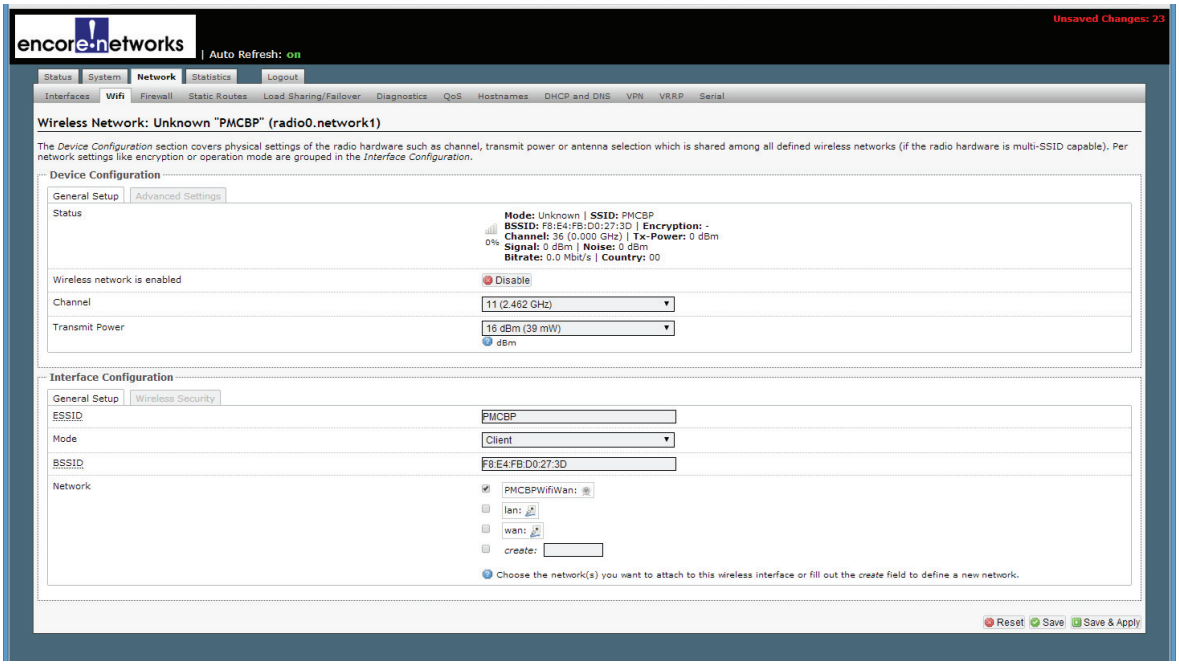
d In the list for **Create/Assign firewall zone**, select **unspecified or create**, and type a name for the set of firewall rules that will apply to packets from the selected wireless network.

e When all the information has been entered, select the **Submit** button (in the lower right corner of the screen).

❖ If your credentials are approved, the Wireless Network Configuration Screen is displayed (Figure 13-17).

Note: Under the heading **Interface Configuration** (in the lower half of the screen), the card's **Mode** as a wireless **Client** has automatically been specified.

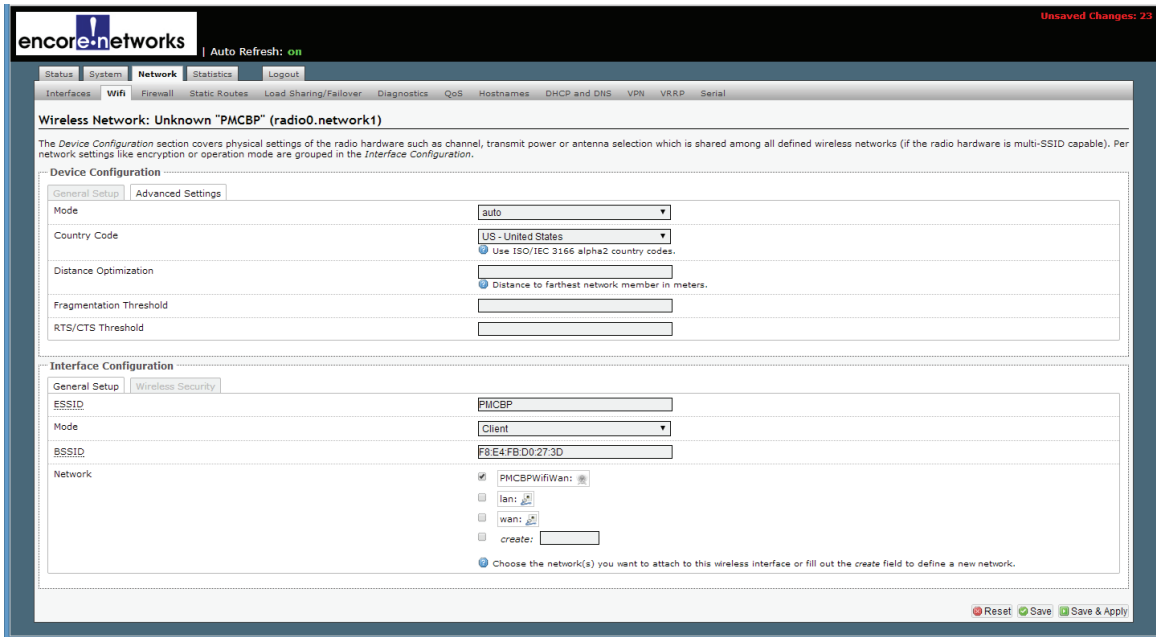
Figure 13-17. Wireless Network Configuration Screen



5 In the area for **Device Configuration**, select **Advanced Settings**.

❖ The screen displays applicable fields (Figure 13-18).

Figure 13-18. Wireless Network Configuration Screen, Advanced Settings



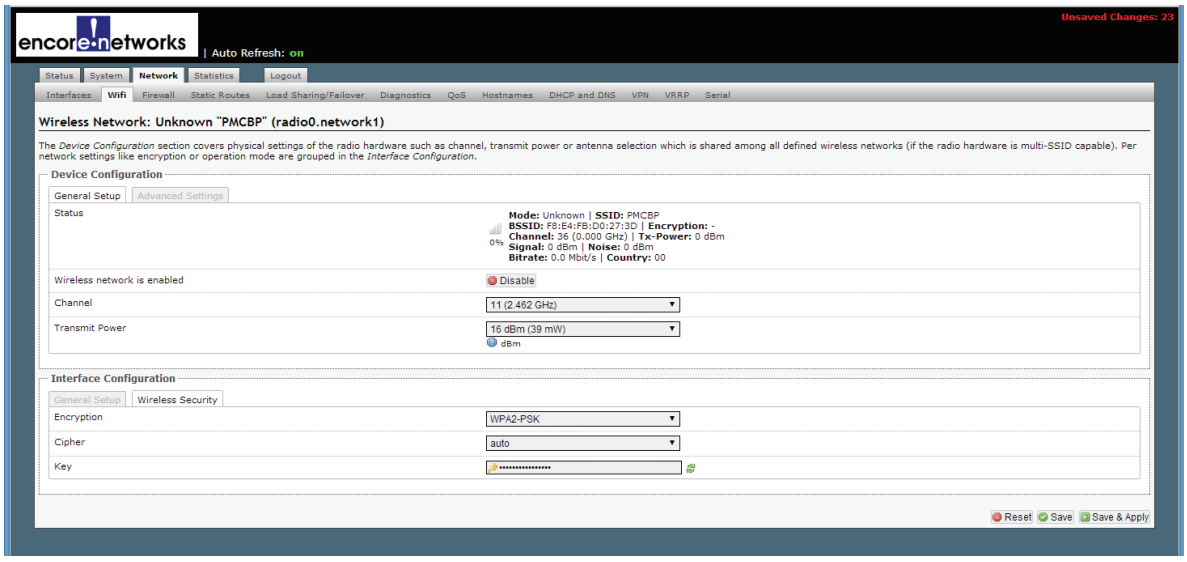
6 In the field for **Country Code**, select the arrow for the drop-down list. Then, in the drop-down list, select the country where the router is located, to comply with local regulations for frequencies, etc.

Note: All other fields were automatically populated with the proper values. You do not need to change them.

7 In the area for **Interface Configuration**, select **Wireless Security**.

❖ The screen displays applicable fields (Figure 13-19).

Figure 13-19. Wireless Network Configuration Screen, Wireless Security



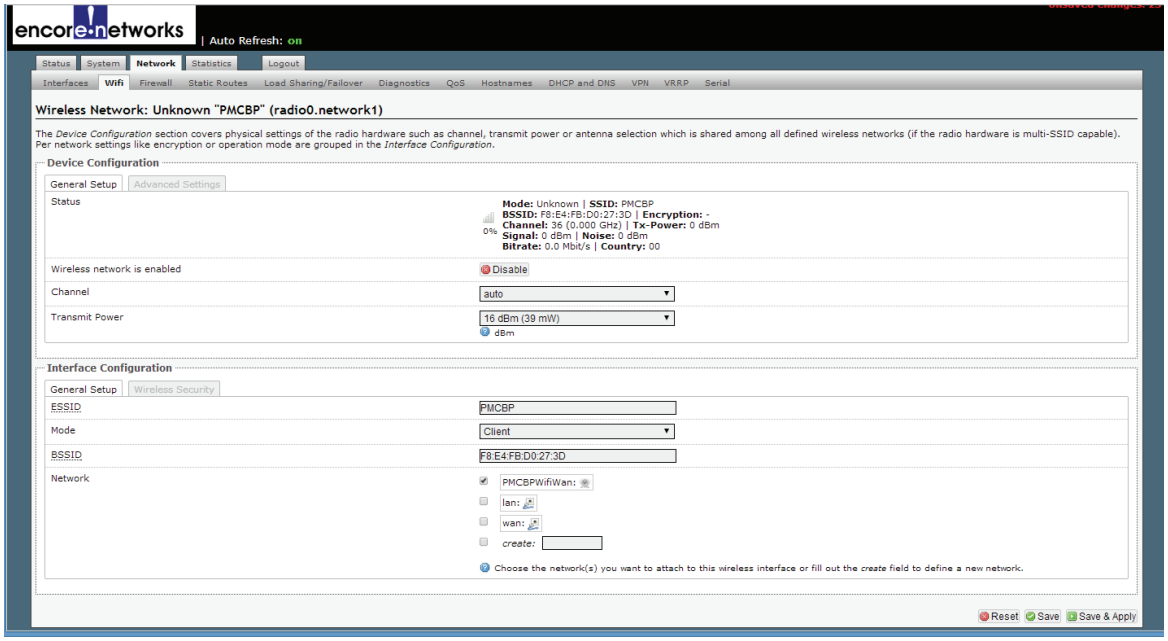
8 Set the **Encryption** to match the encryption used by the network you are connecting to.

9 Set the **Cipher** to match the cipher used by the network you are connecting to.

10 In the area for **Device Configuration**, select **General Settings**.

❖ The screen displays applicable fields (Figure 13-20).

Figure 13-20. Wireless Network Configuration Screen, General Device Settings



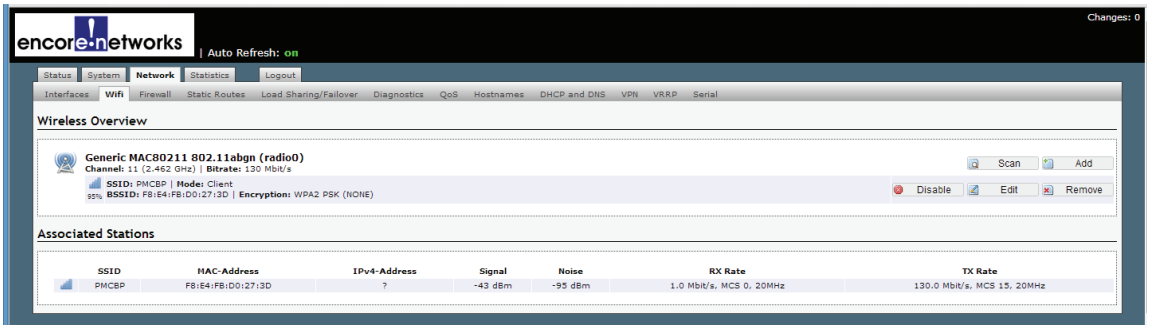
11 Set the **Channel** to **Auto**.

12 Set the **Transmit Power** to the highest value allowed in your region.

13 Select the **Save & Apply** button (in the lower right corner of the screen).

14 The EN-4000 is accepted as a wireless client, and the card's Wireless Overview screen is redisplayed, with updated information (Figure 13-21).

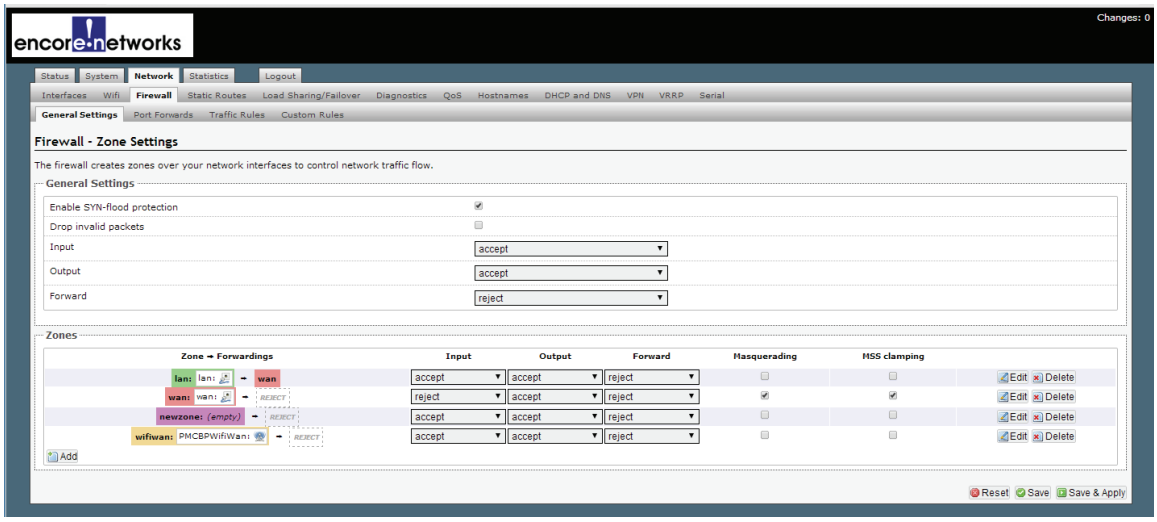
Figure 13-21. Completed Configuration as Wireless WAN Client



15 On the EN-4000 Management Screen, select the **Network** tab; then select the **Firewall** tab. If necessary, select the **General Settings** tab.

❖ The interface's Firewall Zone Settings Screen is displayed (Figure 13-22).

Figure 13-22. Firewall Zone Settings Screen

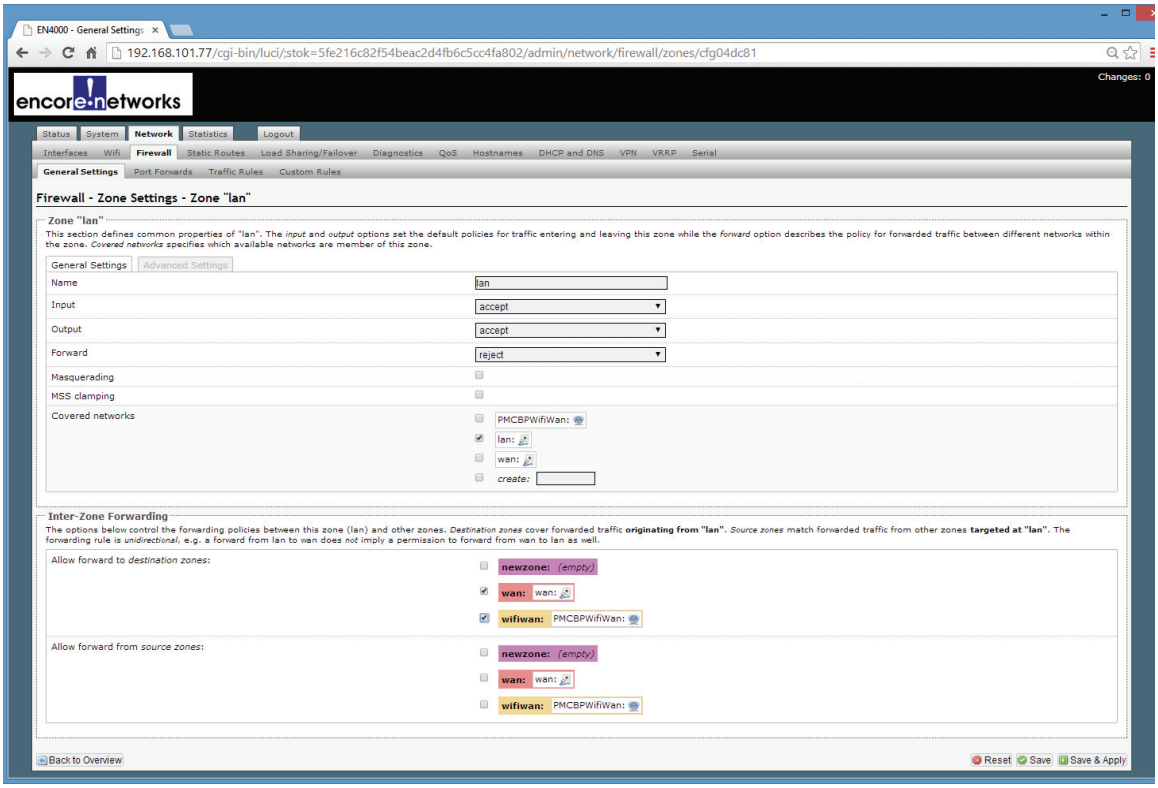


Note: Firewall forwarding must be set up for each network that will be part of a failover set. (For an example of policies, weights, and measures used to configure failover priorities, see *Configuring a MultiWAN for the EN-4000*.)

16 In the area under **Zones**, in the column labeled **Zone => Forwarding**, select the **Edit** button in the row that starts with the label **LAN** (the first row in the list).

❖ The Firewall Zone Settings LAN Screen is displayed (Figure 13-23).

Figure 13-23. Firewall Zone Settings LAN Screen

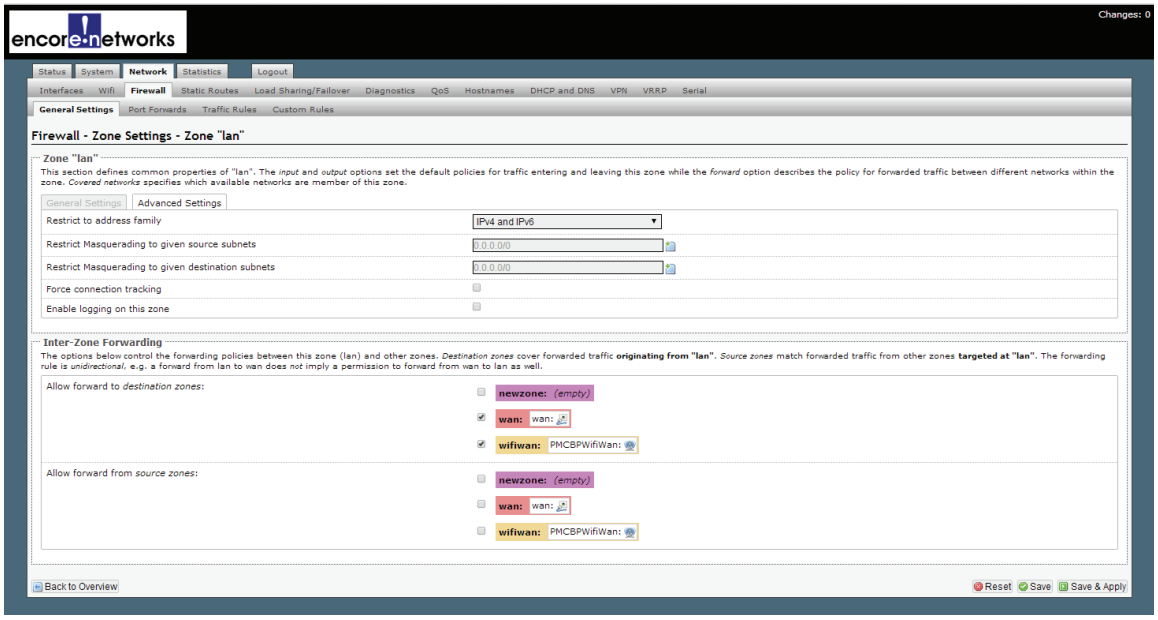


17 On that screen, make sure **LAN** is selected under **Covered Networks**, and make sure **WAN** and the new client network you created (**WIFIWAN** in this example) are selected under **Allow Forward to Destination Zones**.

18 On the Firewall Zone Settings LAN Screen, select **Advanced Settings**.

❖ The applicable fields are displayed.

Figure 13-24. Firewall Zone Settings LAN Screen, Advanced Settings



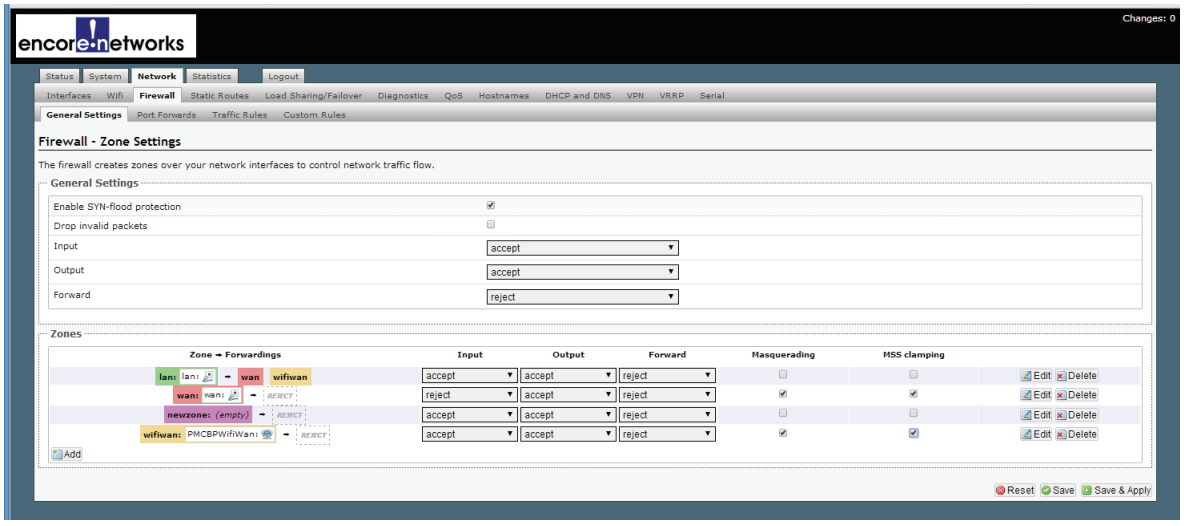
19 You can use this screen if you wish to restrict masquerading for specific source or destination IP addresses.

❖ Figure 13-24 does not use any rules to restrict masquerading.

20 On the Firewall Zone Settings LAN Screen, select **General Settings**.

❖ The applicable fields are displayed.

Figure 13-25. Firewall Zone Settings LAN Screen, General Settings



21 Make sure **Masquerading** and **MSS Clamping** are selected for the networks to which you forwarded firewall settings in step 17 (in this example, **WAN** and the new client network **WIFIWAN**).

22 Select the **Save & Apply** button.

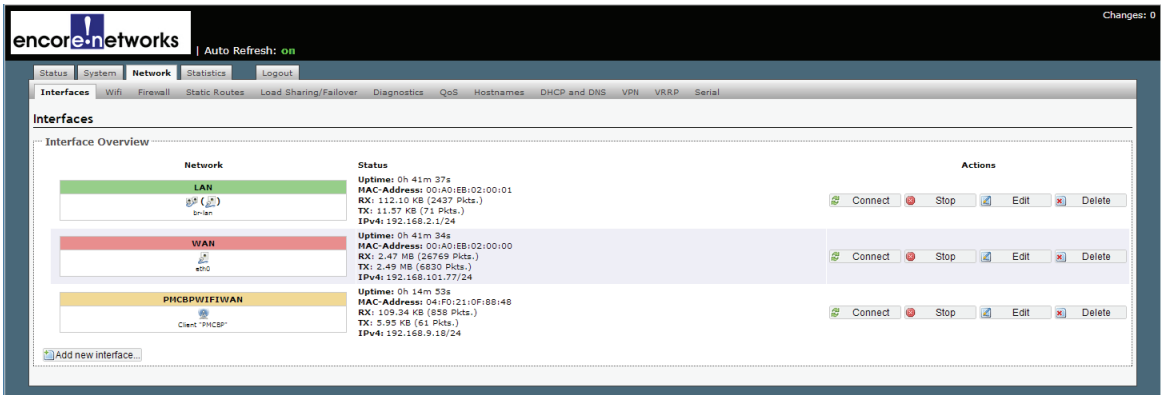
❖ The LAN's firewall rules are applied to the wireless WAN (the wireless card's wireless client interface).

23 On the EN-4000 Management Screen, again select the **Network** tab, then the **Interfaces** tab.

❖ Interfaces on the EN-4000 are redisplayed, with updated information (Figure 13-26). This includes the client interface that you just configured.

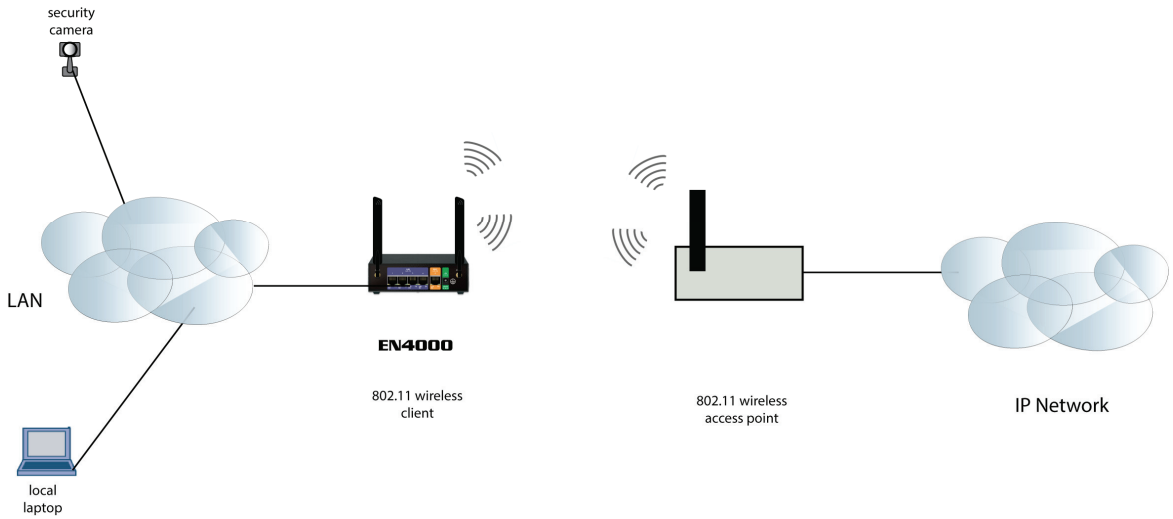
❖ Configuration of the wireless card as a wireless client is complete.

Figure 13-26. Interfaces on the EN-4000



Note: It is possible for other devices on the EN-4000's wired LAN to use the EN-4000 Wireless Client's connection to reach the internet (Figure 13-27).

Figure 13-27. Additional Devices on the LAN Using the EN-4000 Wireless Client's Connection to the Internet



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13.2 Checking the Status of the Wireless Card

Select the **Status** tab, then the **Overview** tab, to display the status for the EN-4000 (Figure 13-28). The **Wireless** heading and information are in the lower portion of the display.
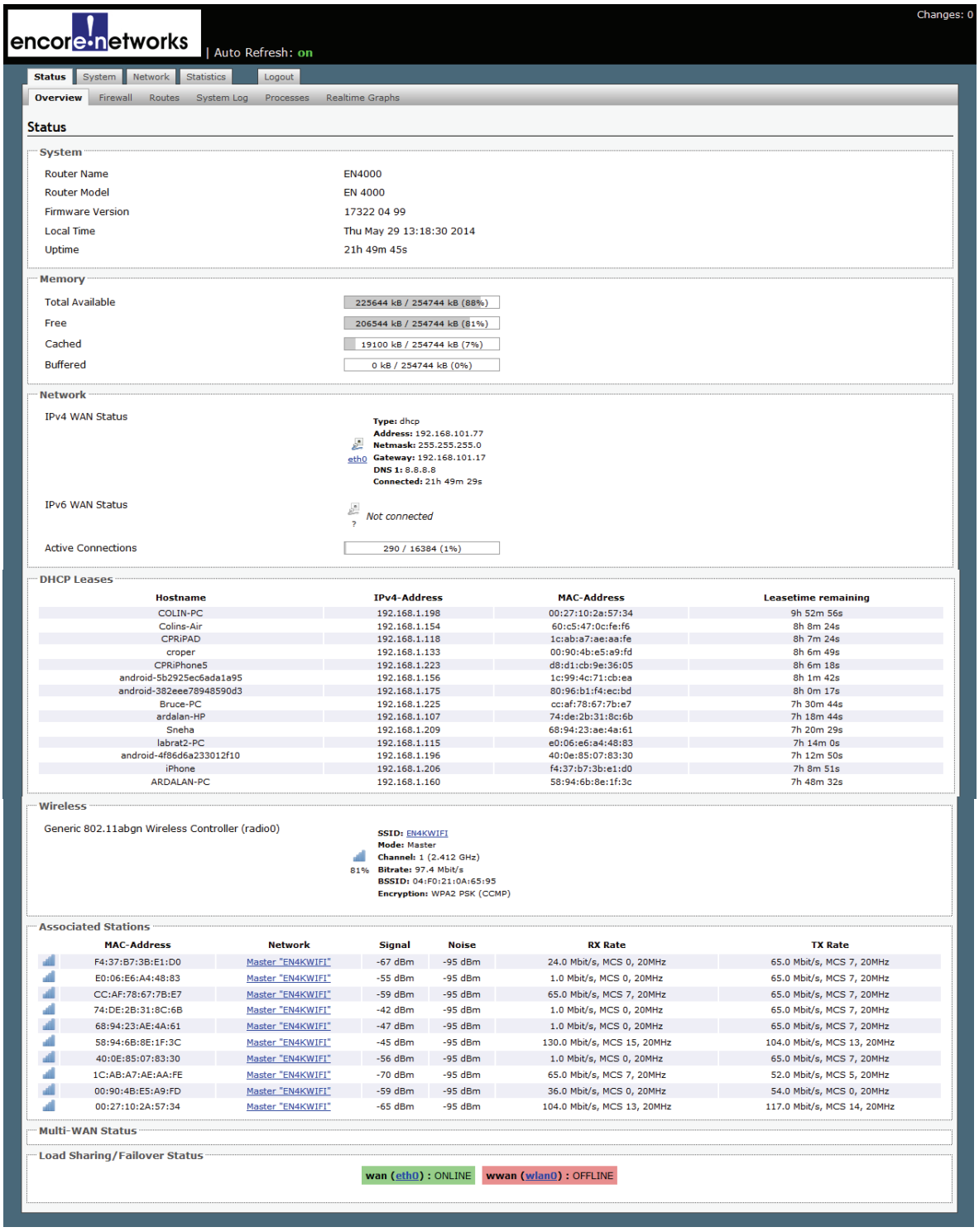
Figure 13-28. EN-4000 Status