Configuring the EN-2000's 802.11 Wireless Card

In addition to the EN-2000's wireless and cabled connections to a local area network (LAN), to a wide area network (WAN), and to peripheral devices and remote devices, the EN-2000 also supports 802.11a and 802.11n wireless (WiFi) protocols. This document discusses use of WiFi in the EN-2000.

The EN-2000's 5 GHz 802.11 wireless card or 2.4 GHz 802.11 wireless card was installed in its internal card slot (or both cards were installed in their slots) before the EN-2000 was shipped. Each of the EN-2000's 802.11 wireless cards can use one of the following operating modes:

- It can function as a wireless client.
- It can function as a wireless access point (including designation as a WiFi hotspot).

Note: A single 802.11 wireless card can support only one operating mode at a time.

See the following:

- Section 6.1, *Setting Up the EN-2000*, on page 1
- Section 6.2, *Configuring an 802.11 Wireless Card in the EN-2000*, on page 3
- Section 6.3, *Configuring the 802.11 Wireless Card's Operating Mode*, on page 12

Note: For standard EN-2000 configuration, see the document *Configuring the EN-2000 for its Network Functions*.

6.1 Setting Up the EN-2000

1 Place the EN-2000 in its network location, and attach antennas to the ports on the back of the chassis, to support the internal 802.11 wireless cards. (For details, see the *EN-2000™ Quick Installation Guide*.)

2 Log into the EN-2000 management system. (For details, see *Logging In*, in the document *Using the EN-2000's Management System*.)

❖ The EN-2000 Status Overview Screen (Figure 6-1) is the first screen displayed after you have logged onto the EN-2000 management system.

The status overview includes summaries of the LAN, WAN, and cellular wireless ports. Figure 6-1 also displays 802.11 wireless ports.

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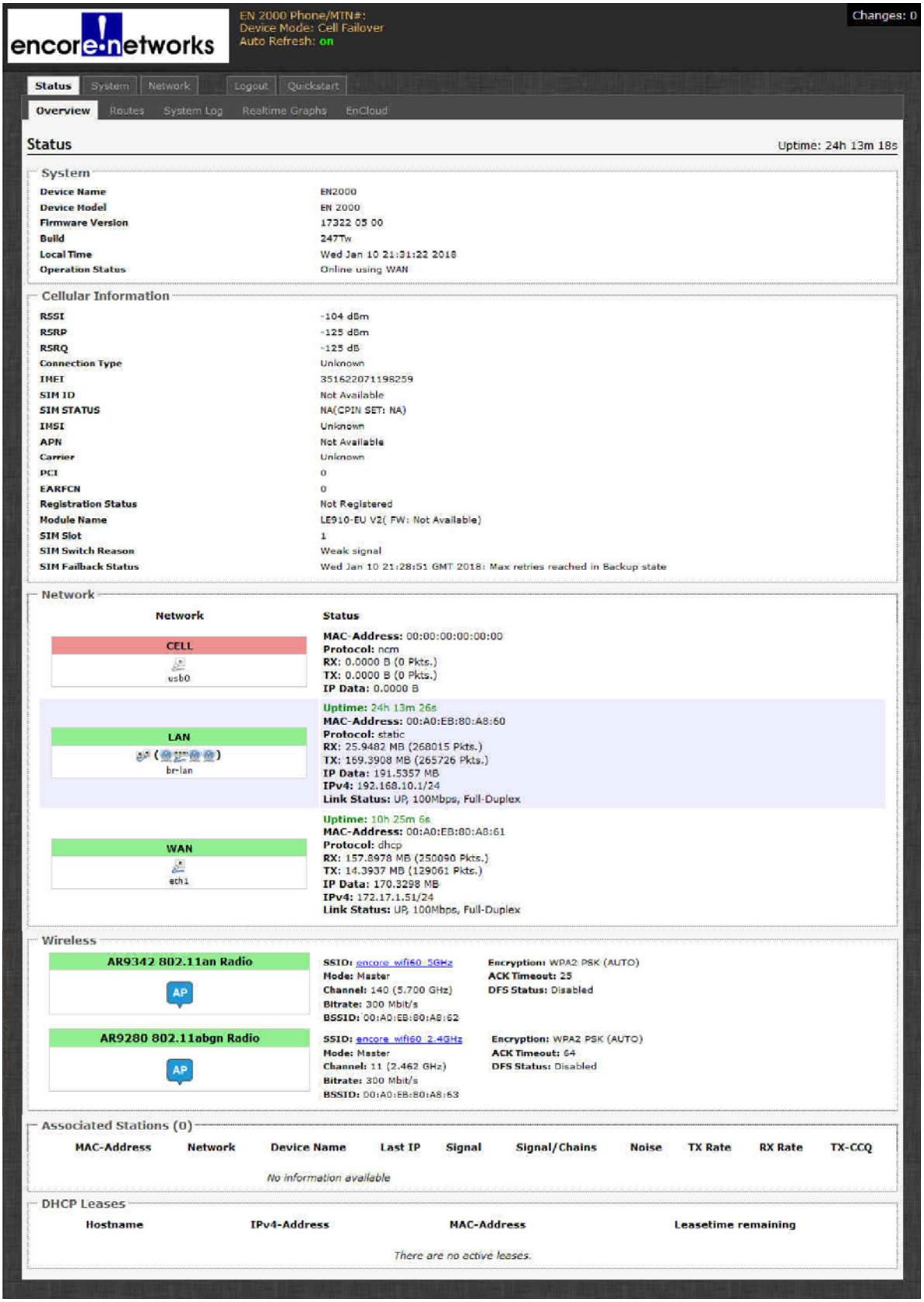
Figure 6-1. EN-2000 Status Overview Screen



6.2 Configuring an 802.11 Wireless Card in the EN-2000

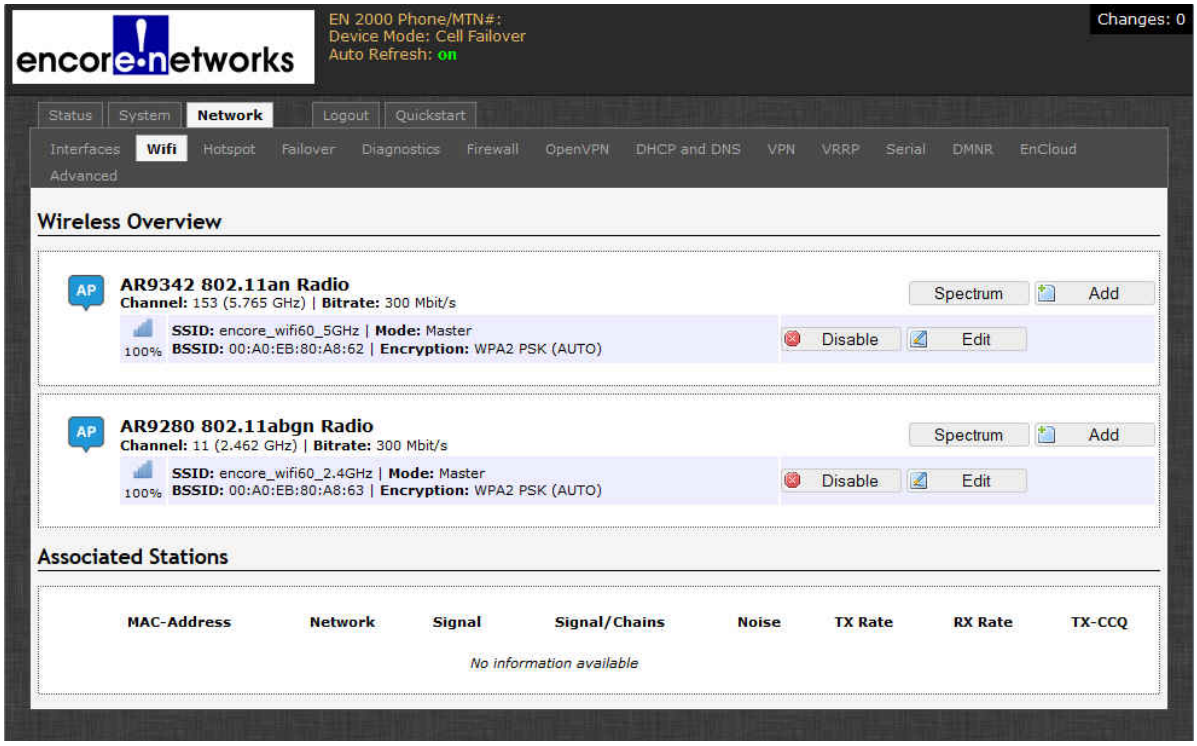
Use the following steps to configure an 802.11 wireless card.

Note: Confer with your network administrator to determine values for parameters.

1 To see the 802.11 wireless network interfaces, select the EN-2000 management system's **Network** tab; then select the **Wifi** tab.

❖ The screen for 802.11 Wireless Network Interfaces is displayed (Figure 6-2).

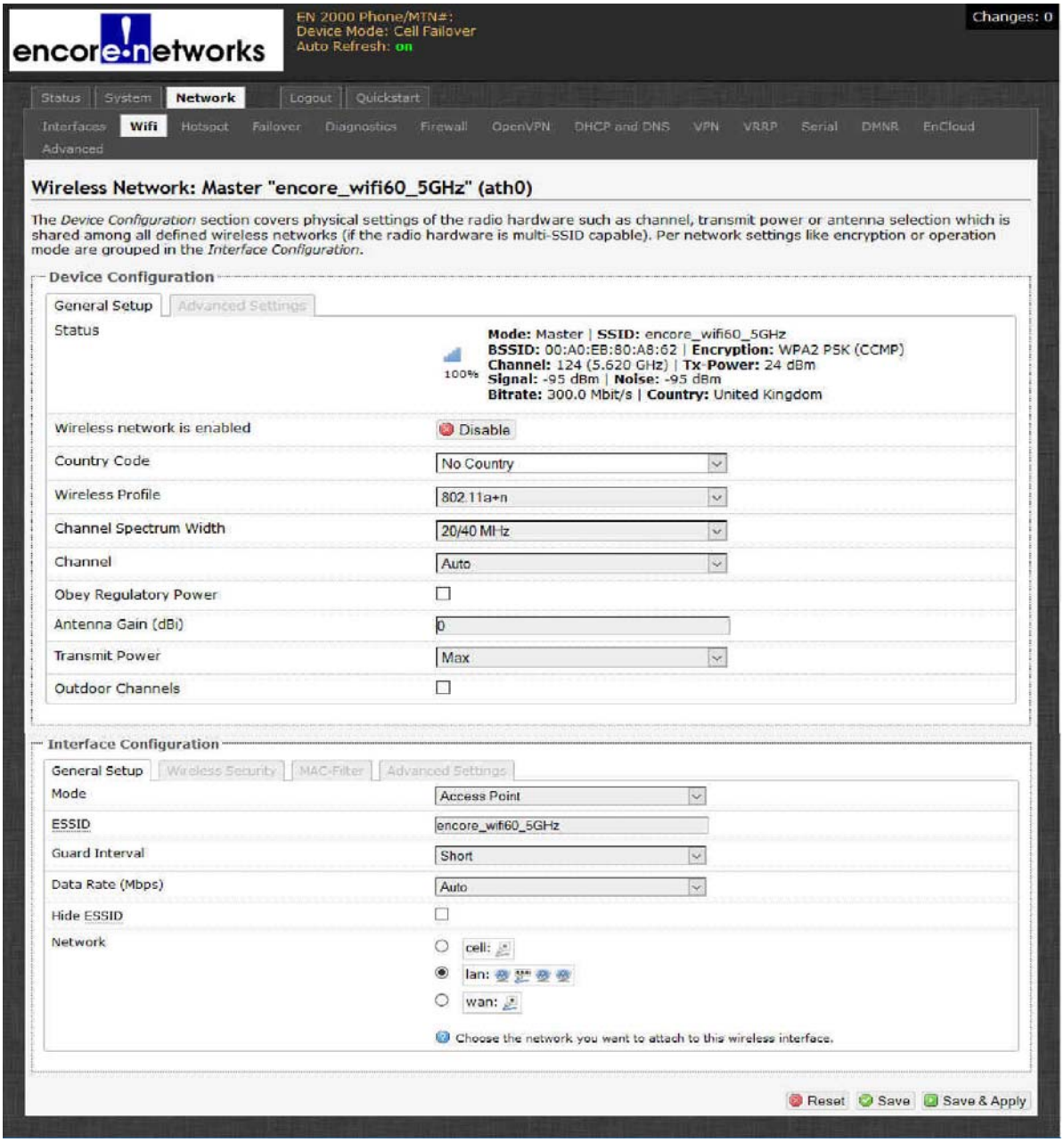
Figure 6-2. 802.11 Wireless Network Interfaces



2 To revise settings for an 802.11 wireless card, select the **Edit** button at the end of that card's row.

❖ The Wireless Network Configuration Screen is displayed (Figure 6-3).

Figure 6-3. Wireless Network Configuration Screen



There are two parts to 802.11 wireless configuration:

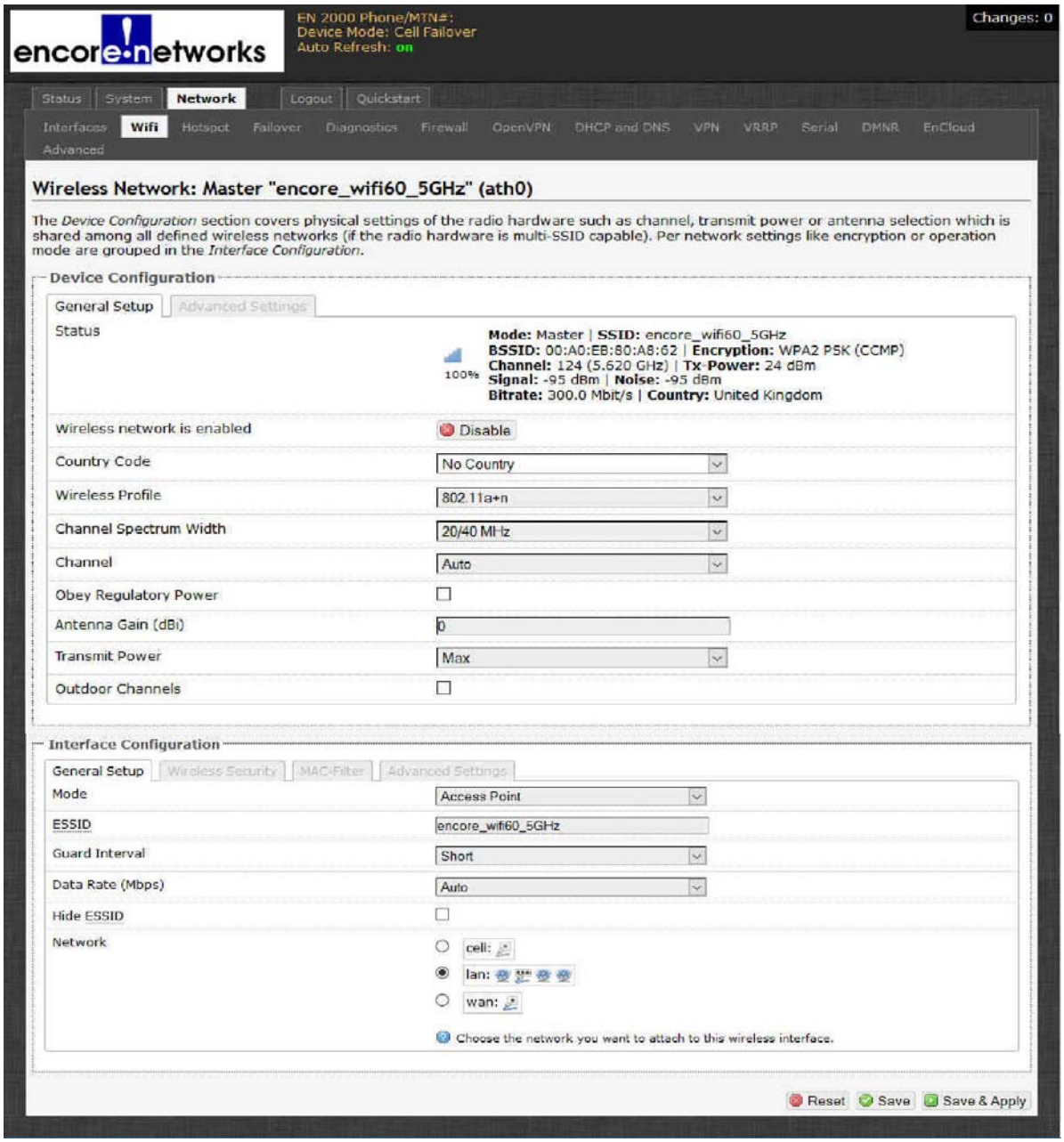
- Section 6.2.1, *WiFi Device Configuration*, on page 4
- Section 6.2.2, *WiFi Interface Configuration*, on page 7

6.2.1 WiFi Device Configuration

3 In the top portion of the Wireless Network Configuration Screen, under the heading **Device Configuration**, make sure the **General Setup** tab is selected.

❖ The Wireless Network Configuration Screen displays parameters for general configuration of the 802.11 wireless device (Figure 6-4).

Figure 6-4. Wireless Network Configuration Screen,
General Setup for Device Configuration



Note: The **Status** display at the top of the **Device Configuration** pane is only for information.

4 On the Wireless Network Configuration Screen, General Setup for Device Configuration, do the following:

a Make sure the **Wireless Network is Enabled**.

Note: If the parameter name is **Wireless Network is Enabled**, the network is already enabled. **Disable** is displayed merely as a selection.

b Select the **Country Code** for the device's location.

c Select a value for the **Wireless Profile**.

d Select the **Channel Spectrum Width**.

e Leave the **Channel** on **Auto**.

f Check the box to **Obey Regulatory Power**.

g Set the **Antenna Gain**.

h For **Transmit Power**, select **Max** to use the maximum value allowed under your region's regulations.

i Indicate whether to use **Outdoor Channels**.

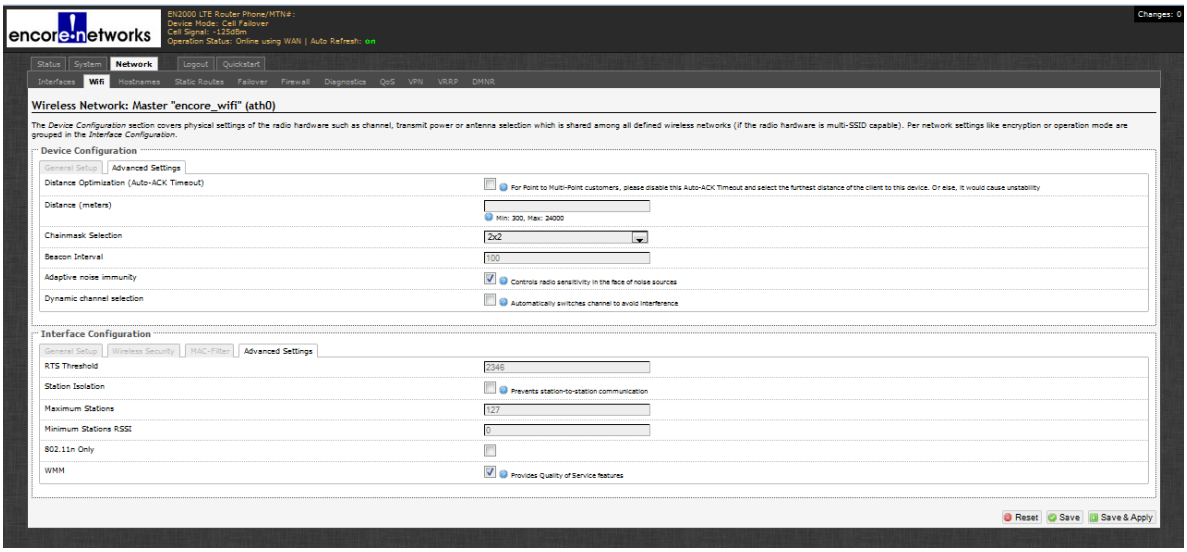
5 After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).

❖ The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.

6 Under the heading **Device Configuration**, select the **Advanced Settings** tab.

❖ The Wireless Network Configuration Screen displays parameters for advanced configuration of the 802.11 wireless device (Figure 6-5).

Figure 6-5. Wireless Network Configuration Screen, Advanced Settings for Device Configuration



7 On that screen, do the following:

a Leave the box for **Distance Optimization** unchecked.

b Set the **Distance**.

c Indicate the **Chainmask Selection**.

d Set the **Beacon Interval**.

e Check the box for **Adaptive Noise Immunity**.

f Indicate whether to use **Dynamic Channel Selection**.

8 After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).

❖ The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.

6.2.2 WiFi Interface Configuration

9 On the Wireless Network Configuration Screen, under the heading **Interface Configuration** (in the lower portion of the screen), make sure the **General Setup** tab is selected.

❖ The Wireless Network Configuration Screen displays parameters for general configuration of the 802.11 wireless interface (Figure 6-6).

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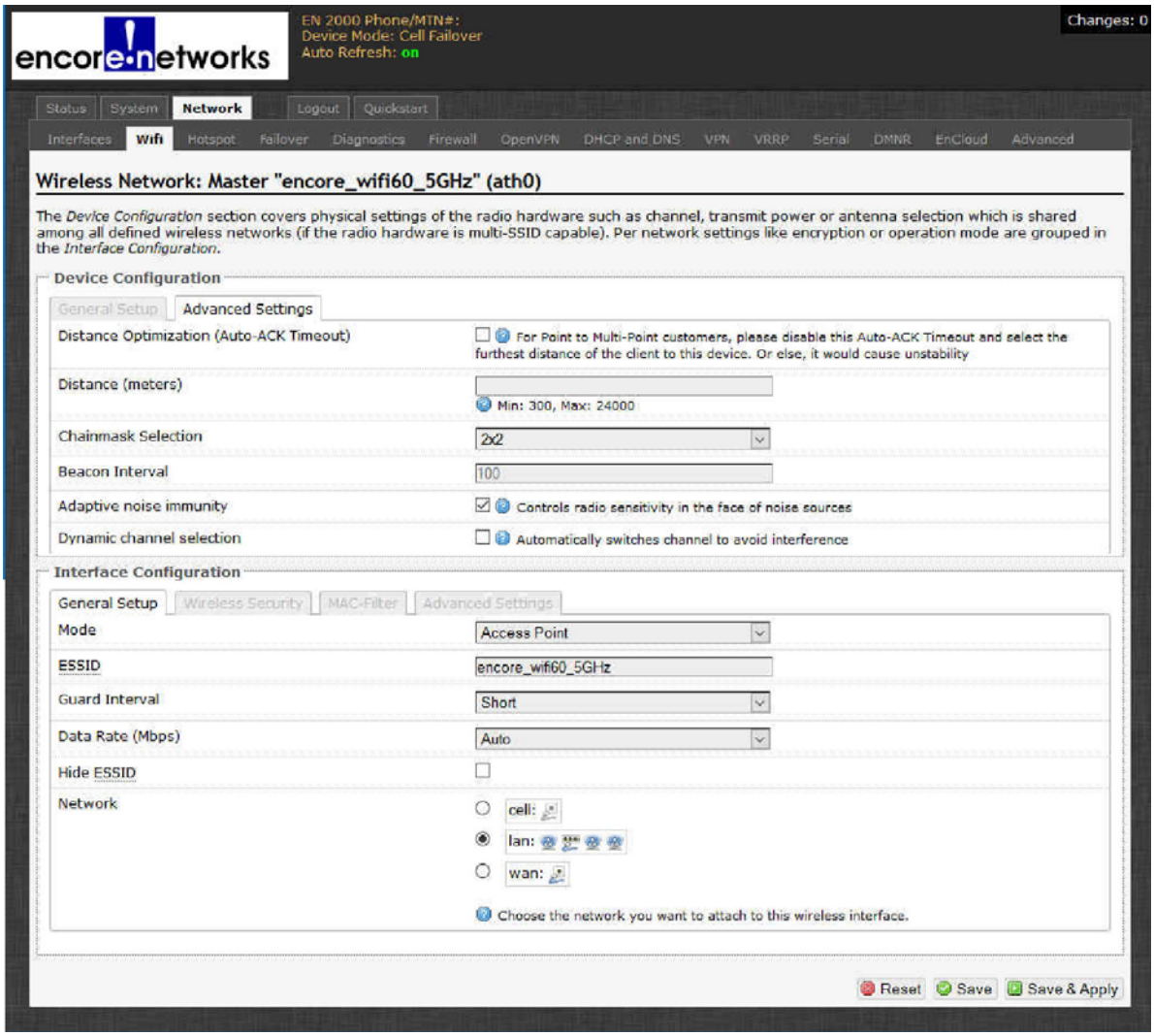
Figure 6-6. 802.11 Wireless Configuration Screen
for Advanced Device Setup and General Interface Setup



10 Do the following:

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

- ❖ A default for the access point name (APN) displays in the field labeled **ESSID**. (If your EN-2000 uses a 5 GHz wireless module, the default name is **encore_wifi###**, where ### represents the final three hexadecimal characters of the device's MAC address.)

b If you wish to use a different name for the access point, type that name into the field. (Check with your network administrator for the APN to enter here.)

c Set the value for the **Guard Interval**.

d Set the **Data Rate**.

e Leave the **Hide ESSID** box unchecked.

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

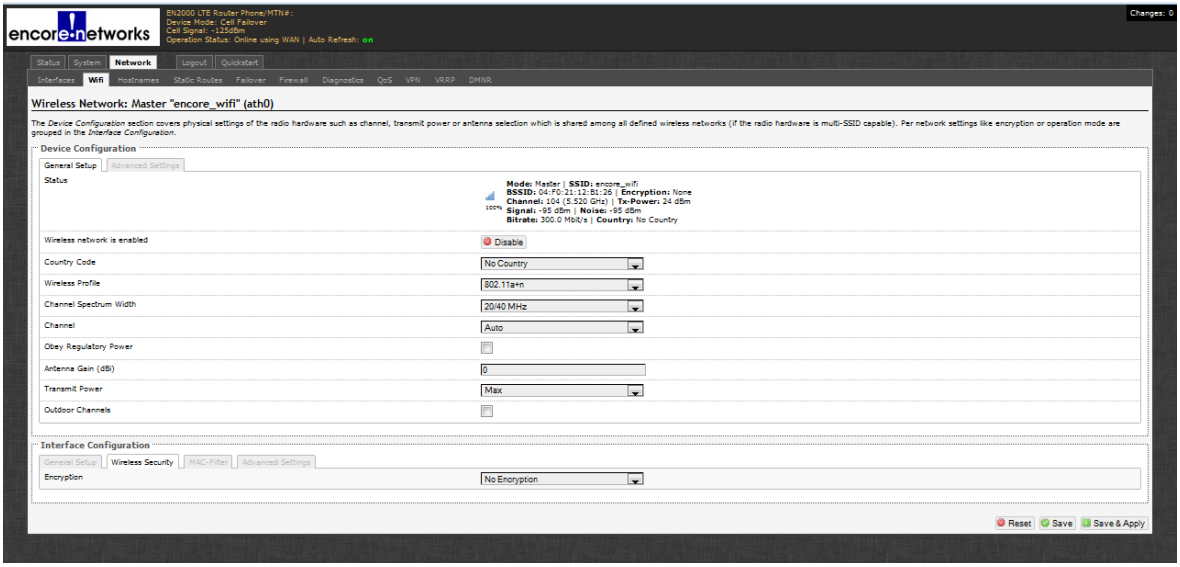
11 After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).

❖ The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.

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

❖ The Wireless Network Configuration Screen displays parameters to configure security for the 802.11 wireless interface (Figure 6-7).

Figure 6-7. Wireless Network Configuration Screen, Wireless Security

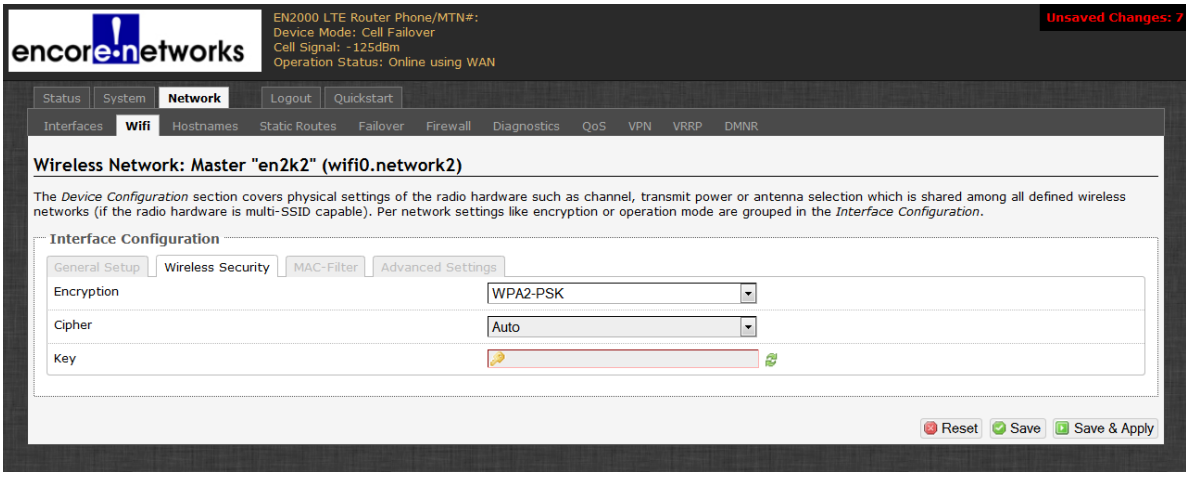


13 On that screen, set the following values:

a By default, the EN-2000's 802.11 **Encryption** is set to **no_encryption**. Set the encryption as directed by your network administrator. For example, select **WPA2-PSK**.

❖ When you select anything other than **no_encryption**, additional fields are displayed (Figure 6-8).

Figure 6-8. Additional Fields to Support 802.11 Wireless Encryption



14 Enter values to configure wireless security. The following example illustrates configuration for **WPA2-PSK** encryption.

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

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

b For the **Key** field, specify a password for users to gain access to an 802.11 wireless network through this access point. Get this password from your network administrator.

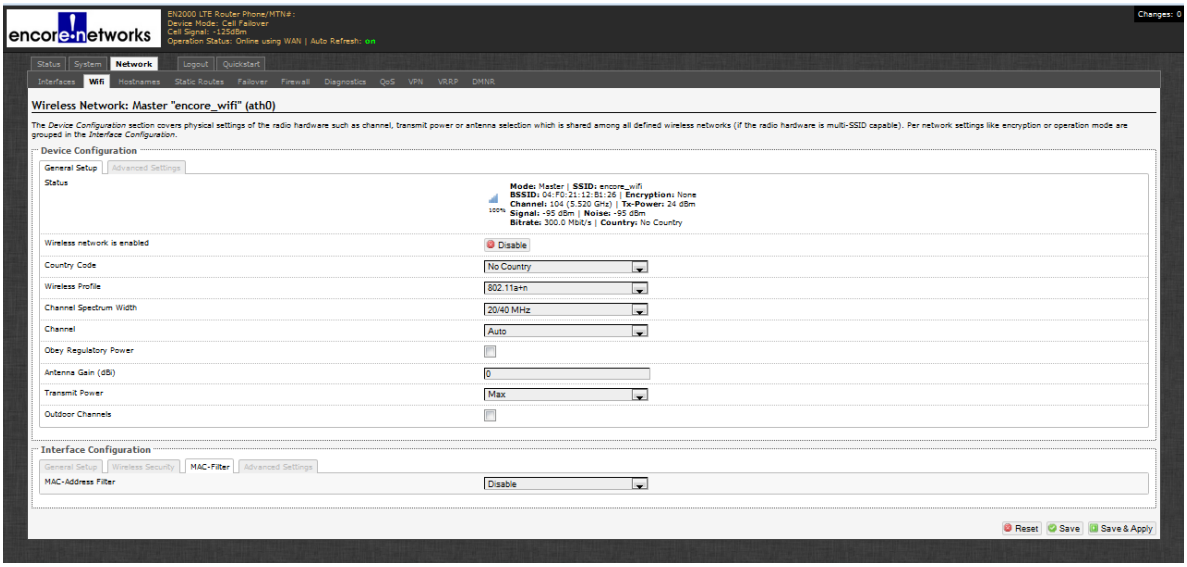
15 After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).

❖ The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.

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

❖ The Wireless Network Configuration Screen displays parameters to configure the MAC filter for the 802.11 wireless interface (Figure 6-9).

Figure 6-9. Wireless Network Configuration Screen, MAC Filter



17 The **MAC Address Filter** is **disabled** by default.

Note: If you wish to allow or block specific MAC addresses, **enable** the MAC address filter.

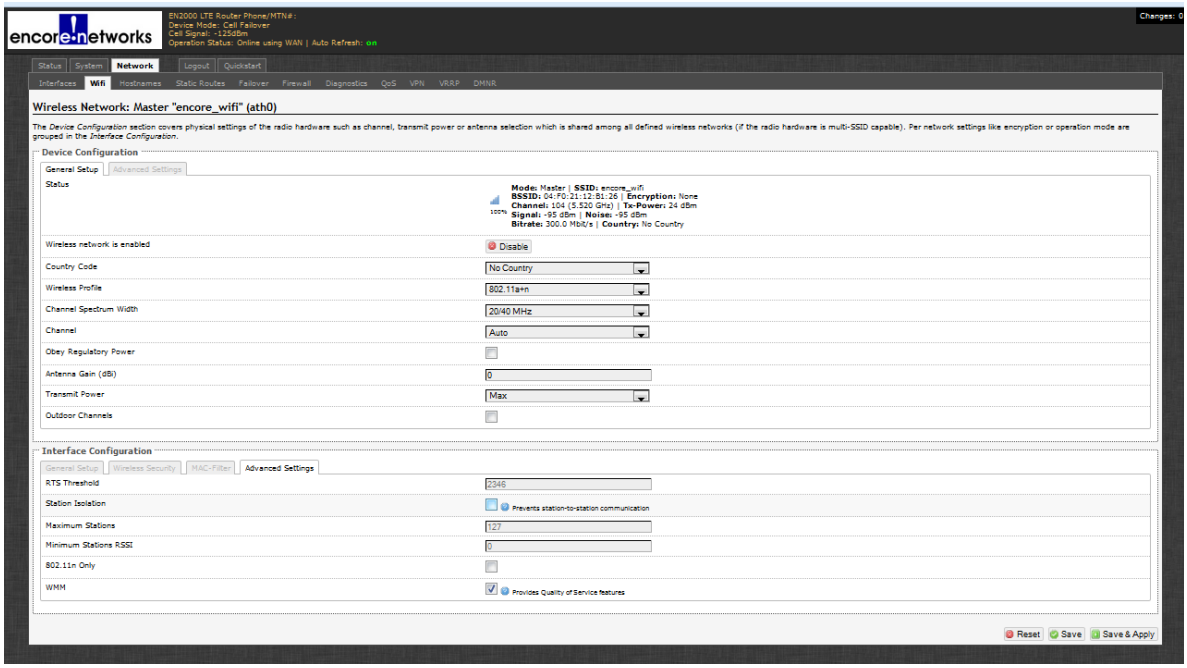
18 After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).

❖ The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.

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

❖ The Wireless Network Configuration Screen displays parameters for advanced configuration of the 802.11 wireless interface (Figure 6-10).

Figure 6-10. Wireless Network Configuration Screen, Advanced Settings for Interface Configuration



20 On that screen, set values for the following fields:

- Leave the **RTS Threshold** field blank.
- If you wish to isolate communication between stations, check the box for **Station Isolation**.
- Set the **Maximum [number of] Stations**.
- Set the **Minimum [number of] Stations RSSI**.
- If the EN-2000 uses only version n of 802.11, check the box for **802.11n Only**.
- Check the box for **WMM** (Wireless Multi-Media, also known as Wireless Multimedia Extension, WME).

21 After you have configured the parameters for this section, select the **Save** button (in the lower right corner of the screen).

❖ The parameter values are saved, and the Wireless Network Configuration Screen is redisplayed.

22 After you have completed configuration of all the sections for the 802.11 wireless port, select the **Save & Apply** button (in the lower right corner of the screen).

❖ The 802.11 wireless card configuration is complete, and is implemented immediately.

6.3 Configuring the 802.11 Wireless Card's Operating Mode

After you have configured the settings in Section 6.2, *Configuring an 802.11 Wireless Card in the EN-2000*, beginning on page 3, you can configure the 802.11 wireless card to use one of the following operating modes:

- To operate as a wireless access point: See Section 6.3.1, *Configuring the EN-2000's 802.11 Wireless Card as a Wireless Access Point*, on page 12.

  After you configure the 802.11 wireless card to operate as a wireless access point, you can choose whether to designate that access point as a WiFi hotspot: See Section 6.3.2, *Designating the EN-2000's 802.11 Wireless Access Point as a WiFi Hotspot*, on page 15.

- To operate as a wireless client: See Section 6.3.3, *Configuring the EN-2000's 802.11 Wireless Card as a Wireless Client*, on page 16.

Note: A single 802.11 wireless card can operate in only one mode at a time.

6.3.1 Configuring the EN-2000's 802.11 Wireless Card as a Wireless Access Point

To configure the 802.11 wireless card as a wireless access point, use the steps in the following procedures:

- Section 6.3.1.1, *Configuring the Wireless Access Point*, on page 12
- Section 6.3.1.2, *Connecting Wireless Clients to the Wireless Access Point*, on page 13

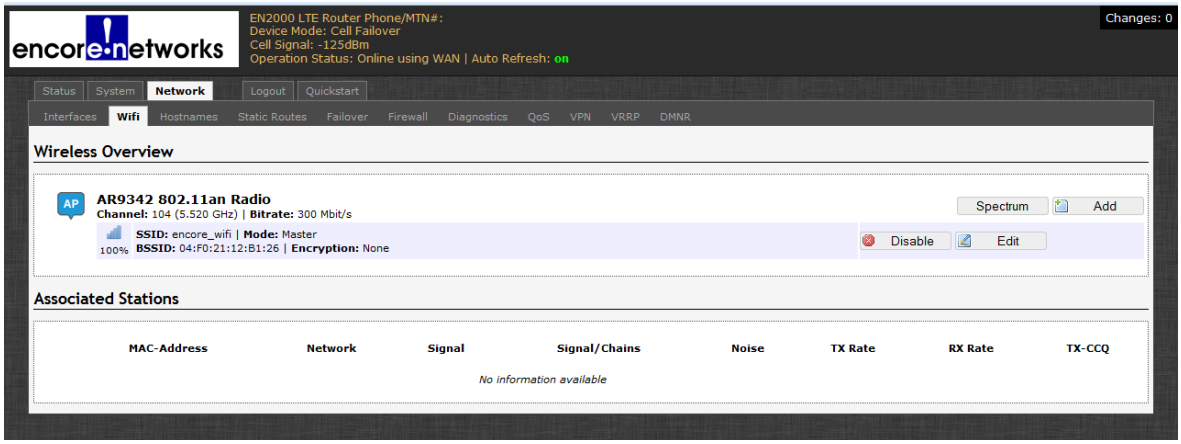
6.3.1.1 Configuring the Wireless Access Point

1 On the EN-2000 Management System, select the **Networks** tab; then select the **Wifi** tab.

❖ The Overview Screen for Wireless Configuration is displayed (Figure 6-11).

This screen provides basic information about the card's wireless specifications; it displays the MAC ID and supported versions of 802.11 (in Figure 6-11, **802.11an**). If the wireless card has already been configured, the display also lists the card's mode and related specifications.

Figure 6-11. Overview Screen for Wireless Configuration



6.3.1.2 Connecting Wireless Clients to the Wireless Access Point

This is a quick procedure for connecting wireless clients to the 802.11 wireless access point that you set up in *Configuring the Wireless Access Point*, on page 12.

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

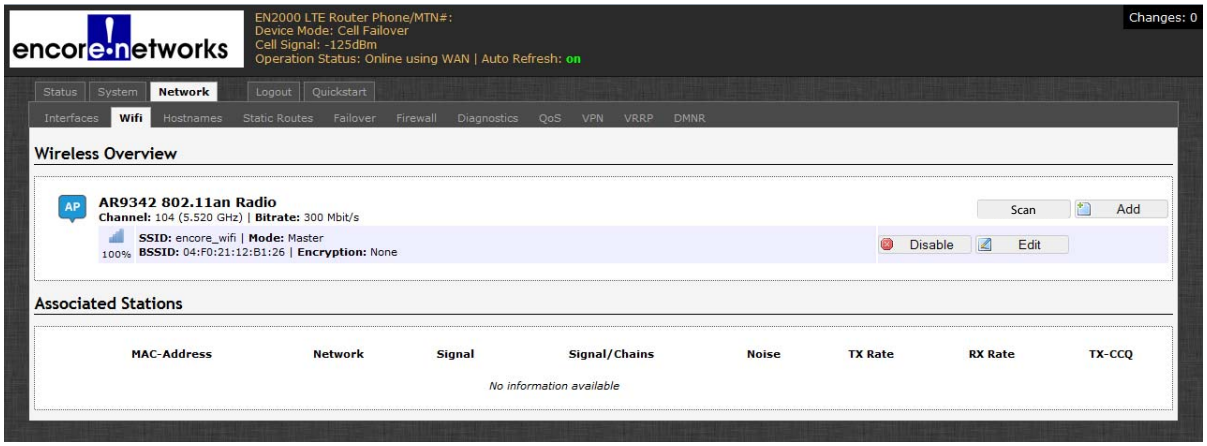
Note: If that other device is an EN-2000 or an EN-4000, you can connect that device to this access point by doing the following on that device's management system:

a Select the **Network** tab.

b Then select the **Wifi** tab.

❖ The Overview Screen for Wireless Configuration is displayed (Figure 6-12).

Figure 6-12. Overview Screen for Wireless Configuration



c Then select the **Scan** Button.

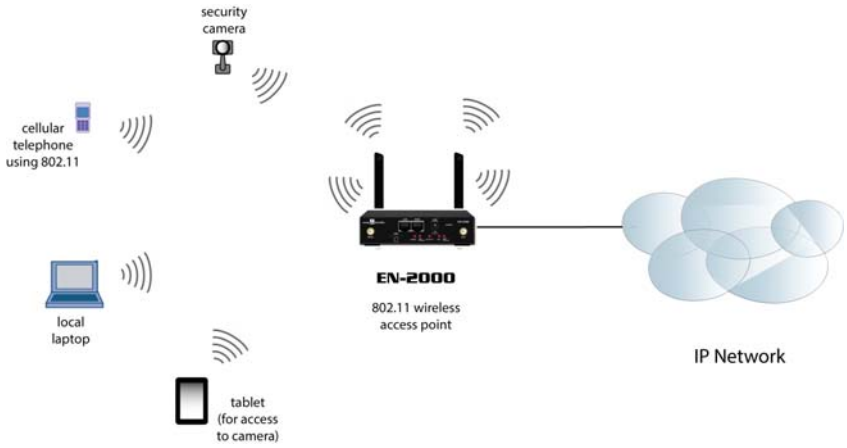
❖ A list displays 802.11 wireless networks within range.

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

❖ That wireless client device connects to the access point. Now the wireless client can go through the access point to reach the wireless network.

Note: Figure 6-13 shows some 802.11 wireless devices connected to an EN-2000 access point.

Figure 6-13. EN-2000 as Wireless Access Point



2 To see a list of devices connected to the 802.11 access point, do the following:

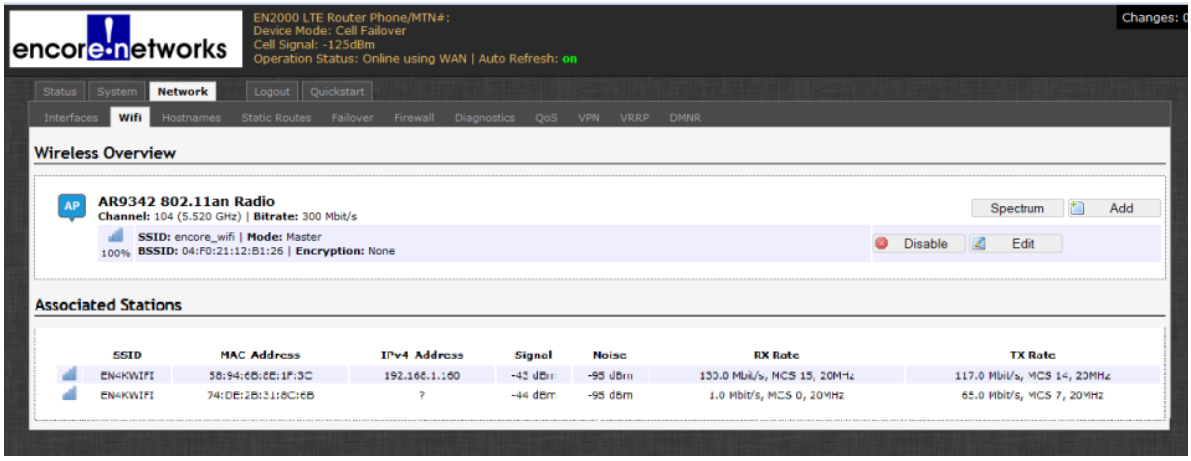
a Log onto the EN-2000 that is the 802.11 wireless access point.

b Select the **Network** tab, then the **Wifi** tab.

❖ The Wireless Overview Screen, Including a List of Associated Stations is displayed (Figure 6-14).

Note: The first associated station listed in Figure 6-14 displays the IP address of an EN-4000 router that connected (in step 1) to this access point.

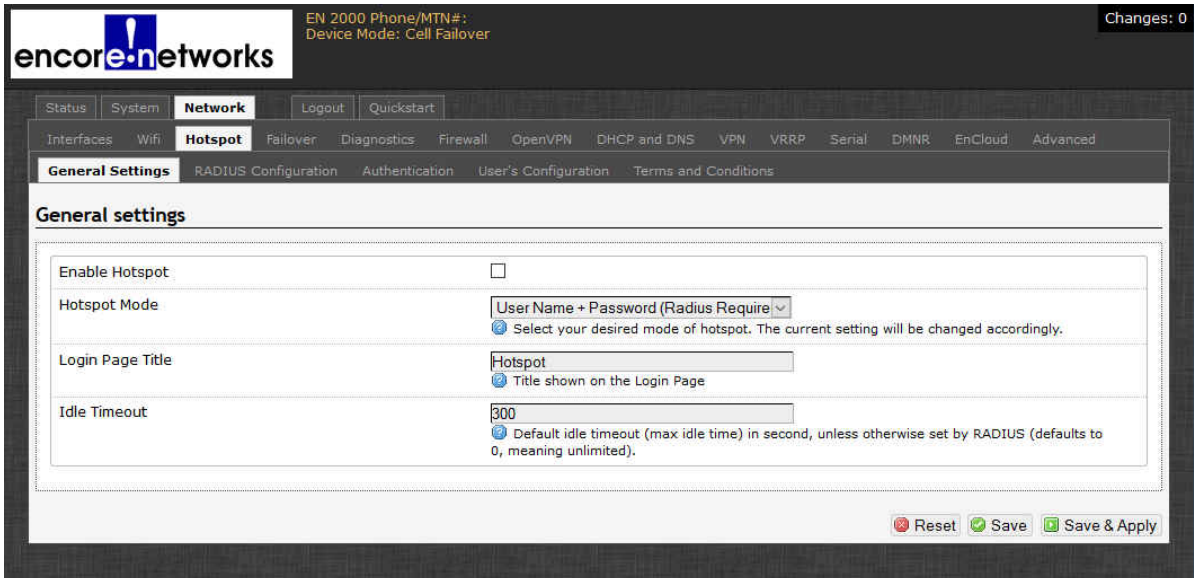
Figure 6-14. Wireless Overview Screen, Including a List of Associated Stations



6.3.2 Designating the EN-2000's 802.11 Wireless Access Point as a WiFi Hotspot

A WiFi hotspot is an 802.11 wireless access point provided for public use. It requires adherence to terms and obligations of use, and it generally requires a password.

Figure 6-15. Hotspot General Settings



1 On the EN-2000 management screen, select the **Network** tab; then select **Hotspot**, **General Settings**.

2 Select the box to **Enable Hotspot**.

3 In the field for **Hotspot Mode**, select **password (no radius)**.

❖ The field allows you to set a password for entry to the hotspot.

4 Select the button under that field, and set a password.

Note: General WiFi usually uses the password **encore#5** (for 5 GHz) or **encore#2** (for 2.4 GHz).

5 In the field **Login Page Title**, give the hotspot a name—for example, **Encore Cafe**.

6 Leave the **Idle Timeout** at **300**.

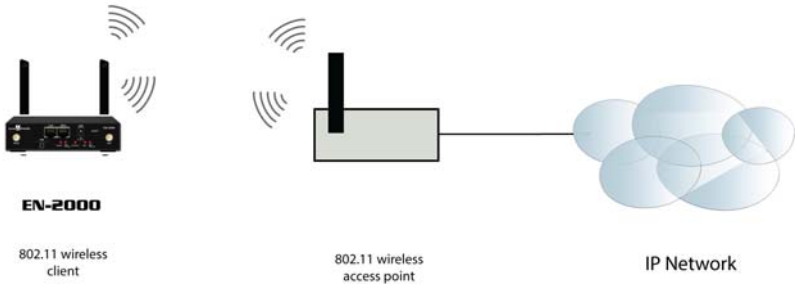
7 Select the **Save & Apply** button (in the lower right corner of the screen).

❖ The settings are saved. After customers log into WiFi, the next prompt will display the hotspot information.

6.3.3 Configuring the EN-2000's 802.11 Wireless Card as a Wireless Client

Figure 6-16 shows the EN-2000 as a wireless client.

Figure 6-16. EN-2000 as Wireless Client



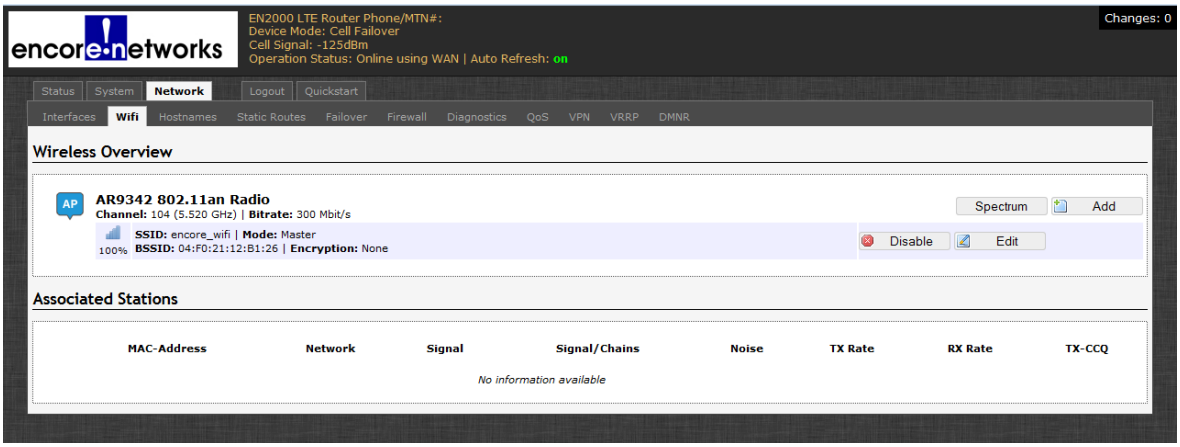
To configure the wireless card as a client, you must first identify the wireless access point that the wireless card will connect to. That access point must support the type of 802.11 wireless transmission that the EN-2000 supports (802.11a, 802.11n, or combined support for 802.11a+n). You must also know the password (and other credentials, if applicable) to log on to that access point.

Note: Make sure you have already obtained the password and other log-in information for the selected network.

1 On the EN-2000 Management System, select the **Network** tab; then select the **Wifi** tab.

❖ If the EN-2000 contains an 802.11 wireless card, the Overview Screen for Wireless Client Configuration is displayed (Figure 6-17).

Figure 6-17. Overview Screen for Wireless Configuration

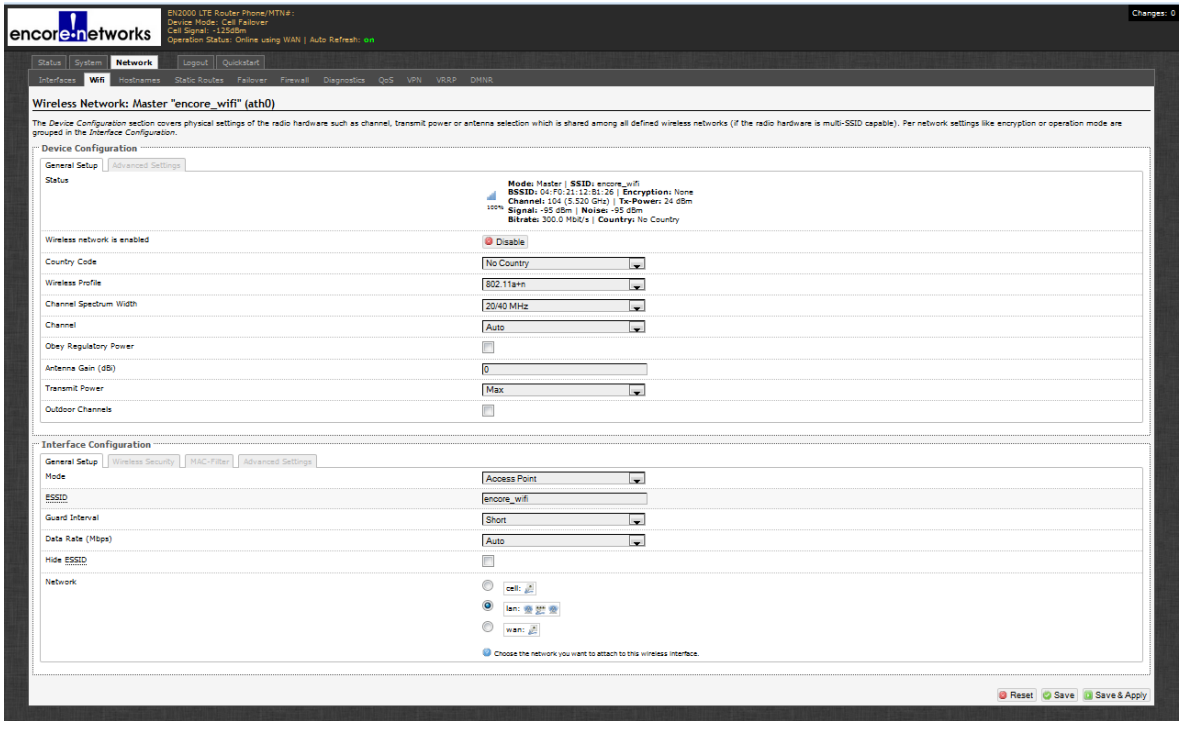


This screen provides basic information about the card's wireless specifications; it displays the MAC ID and supported versions of 802.11 (in Figure 6-17, **802.11an**). If the wireless card has already been configured, the display also lists the card's mode and related specifications.

2 In the row for the 802.11 wireless card, select the **Edit** button.

❖ The Wireless Network Configuration Screen is displayed (Figure 6-18).

Figure 6-18. Wireless Network Configuration Screen, General Setup for Interface Configuration



3 On the Wireless Network Configuration Screen, under the heading **Interface Configuration** (in the lower portion of the screen), make sure the **General Setup** tab is selected, and do the following:

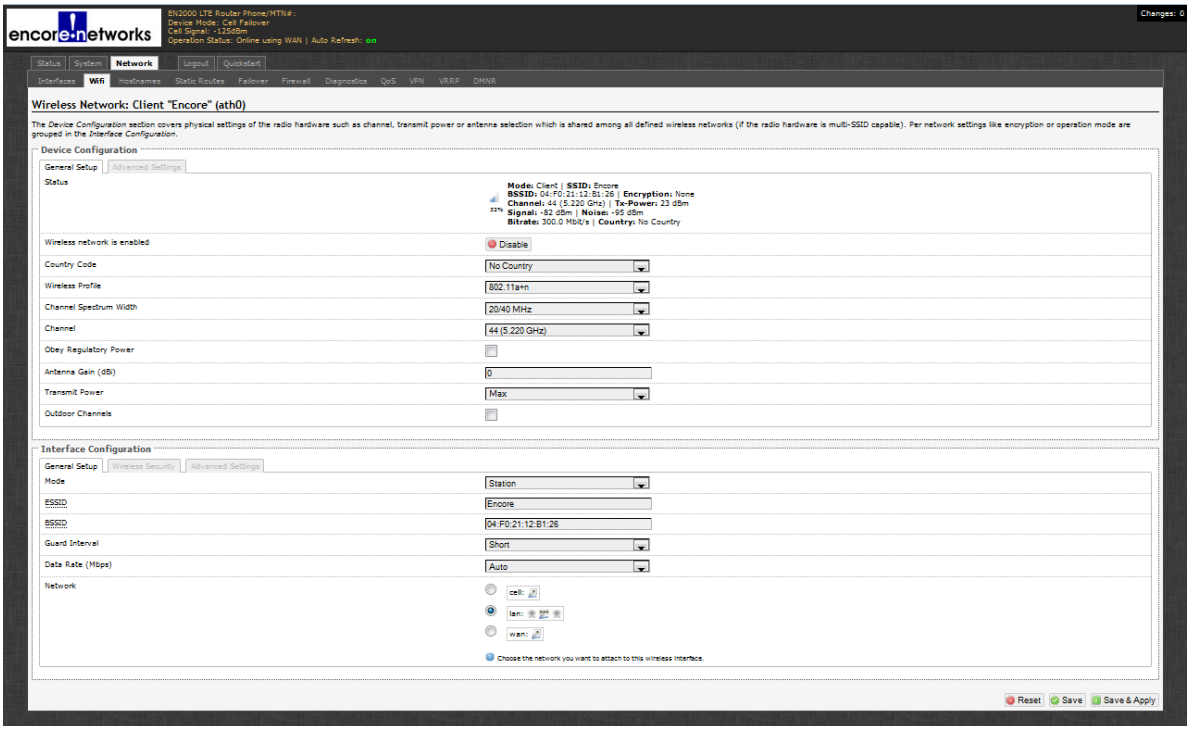
a For the **Mode**, select **Station**.

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

❖ The 802.11 card is established as a wireless client, and the screen is redisplayed.

Note: The upper portion of the screen now identifies the card as an 802.11 wireless client (Figure 6-19), but the configuration is not yet complete.

Figure 6-19. Wireless Network Configuration Screen, EN-2000 as 802.11 Wireless Client

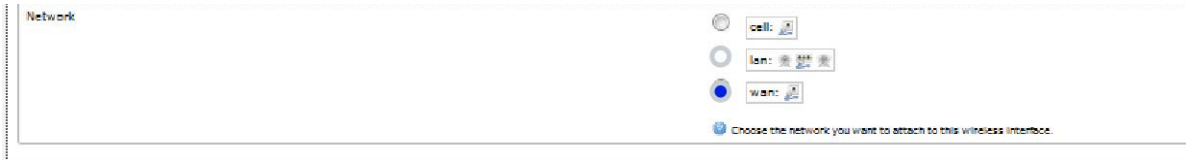


Note: The **Network** section, in the lower area of the screen, shows that the LAN port is still selected (detail in Figure 6-20).

Figure 6-20. Detail: LAN Port is Still Selected

4 Select the WAN port as the 802.11 wireless client (detail in Figure 6-21).

Figure 6-21. Detail: Select the WAN Port



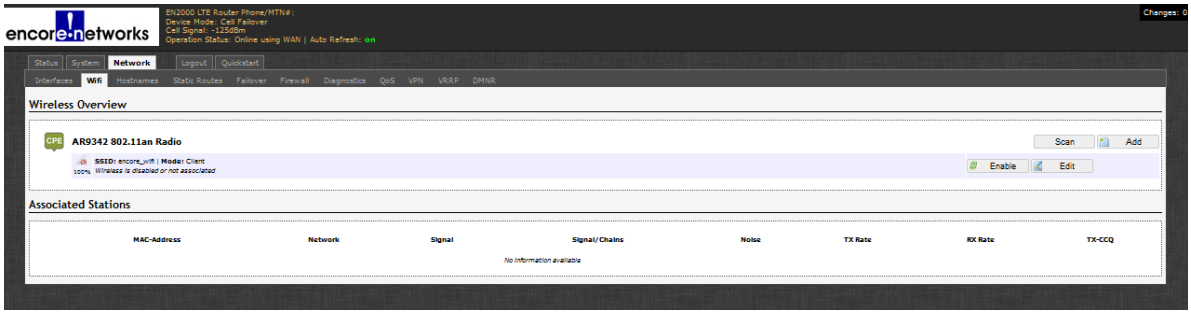
5 Select the **Save & Apply** button (in the lower right corner of the screen).

❖ The WAN port is now the 802.11 wireless client.

6 On the EN-2000 Management System, again select the **Network** tab; then select the **Wifi** tab.

❖ The Overview Screen for Wireless Client Configuration is redisplayed (Figure 6-22). Now it has information for the 802.11 card as a wireless client.

Figure 6-22. Overview Screen for Wireless Client Configuration



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

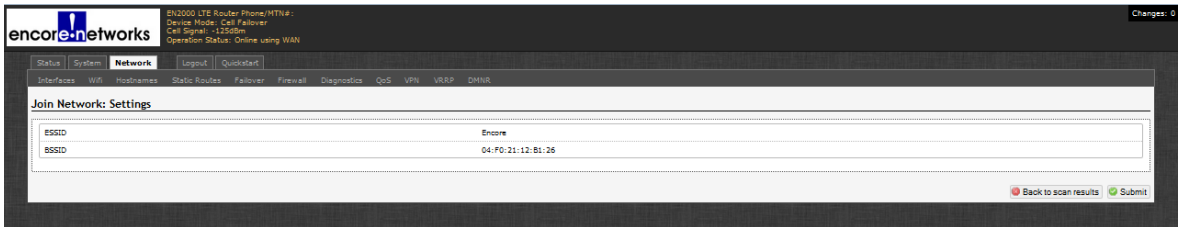
❖ The screen lists available wireless networks (Figure 6-23).

Figure 6-23. Available Wireless Networks

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

❖ The selected network displays settings for connection to the network (Figure 6-24).

Figure 6-24. Log-In Screen for a Wireless Network

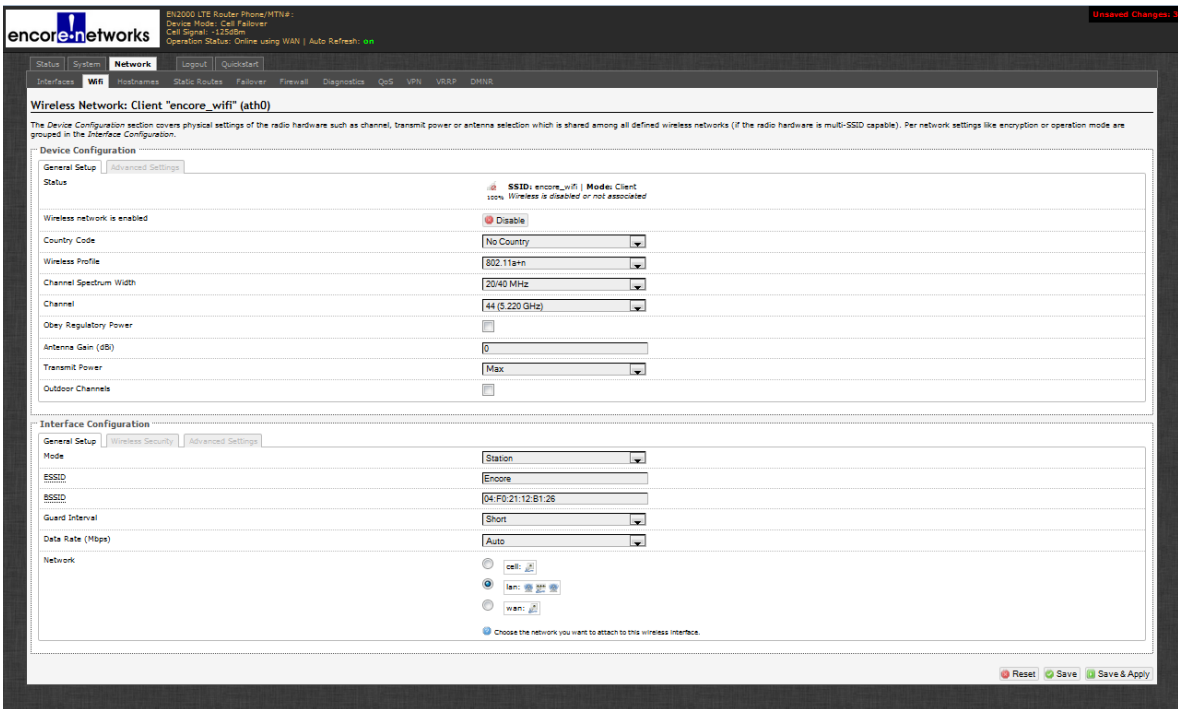


a When you have reviewed the information, select the **Submit** button (in the lower right corner of the screen).

❖ After your settings are implemented, the Wireless Network Client Configuration Screen is displayed (Figure 6-25).

Note: The screen heading identifies the 802.11 card as a wireless **Client**.

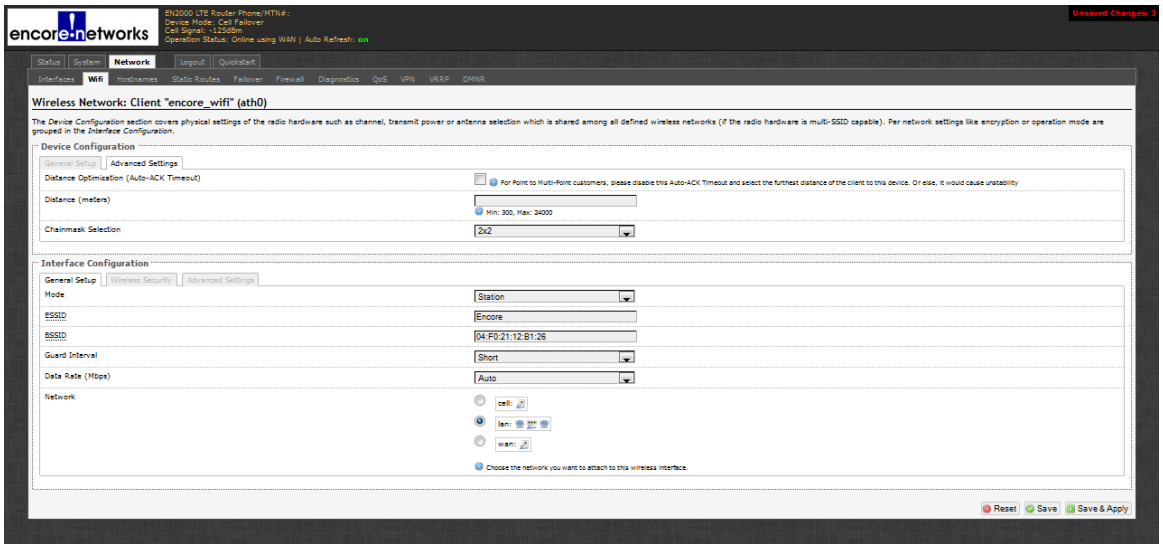
Figure 6-25. Wireless Network Client Configuration Screen



9 In the area for **Device Configuration** (in the upper portion of the screen), select **Advanced Settings**.

❖ The screen displays applicable fields (Figure 6-26).

Figure 6-26. Wireless Network Client Configuration Screen, Advanced Settings for Device Configuration



10 Confer with your network administrator to determine the following:

a Whether to select the box for **Distance Optimization**.

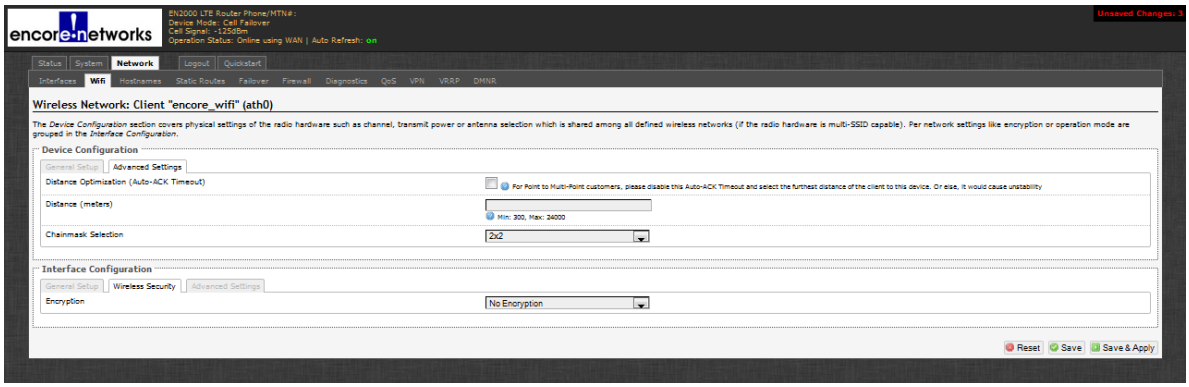
b Whether to set the maximum **Distance** for transmission.

11 Confer with your network administrator to determine the **Chainmask Selection** for this site.

12 In the area for **Interface Configuration** (in the lower portion of the screen), select the **Wireless Security** tab.

❖ The screen displays applicable fields (Figure 6-27).

Figure 6-27. Wireless Network Client Configuration Screen for Wireless Security



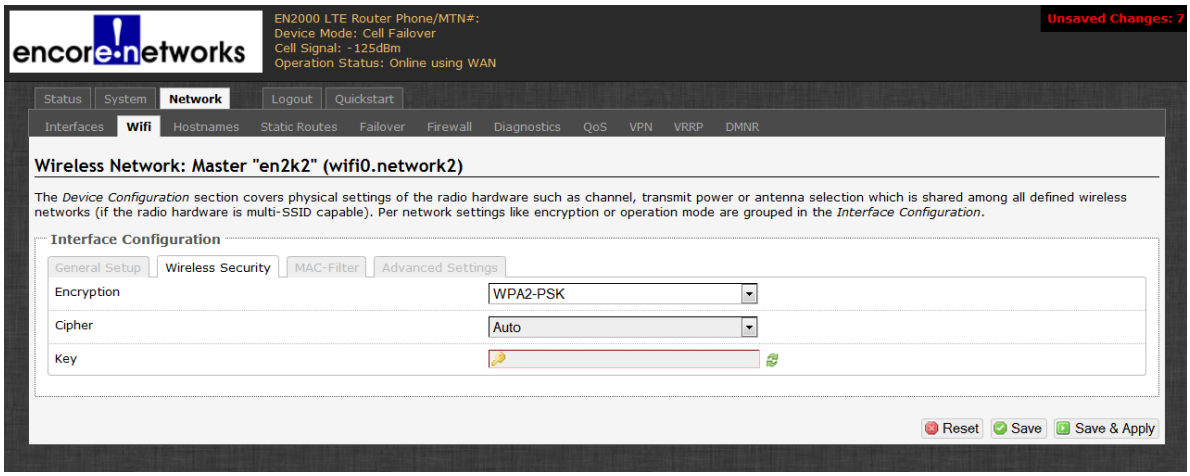
Note: By default, the EN-2000's 802.11 **Encryption** is set to **no_encryption**.

13 On the Wireless Network Client Configuration Screen for Wireless Security, set the following values:

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

Note: When you select anything other than **no_encryption**, additional fields are displayed (Figure 6-28).

Figure 6-28. Additional Fields to Support 802.11 Wireless Encryption



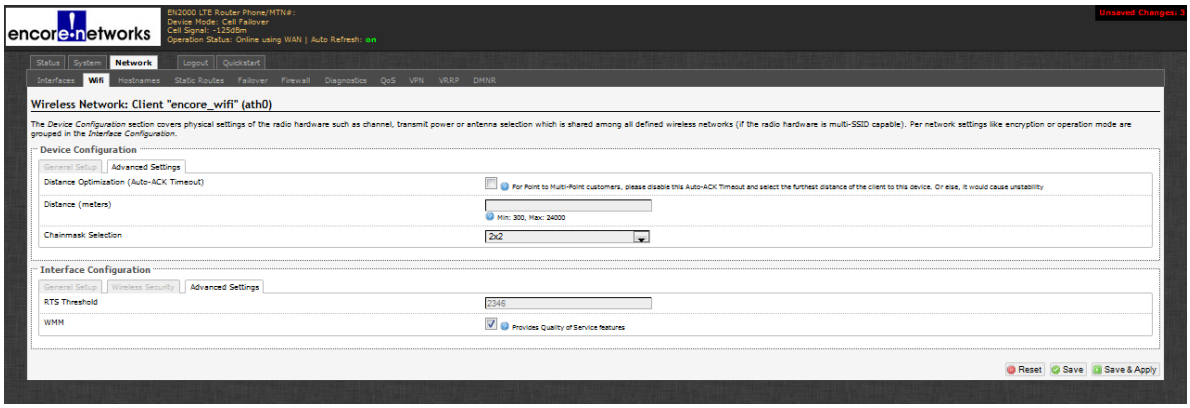
b Set the **Cipher** to match the cipher used by the network you are connecting to.

c For the **Key** field, specify the password to gain access to the 802.11 wireless network access point. Get this password from your network administrator.

14 In the area for **Interface Configuration**, select the **Advanced Settings** tab.

❖ The screen displays applicable fields (Figure 6-29).

Figure 6-29. Wireless Network Client Configuration Screen, Advanced Settings for Interface Configuration

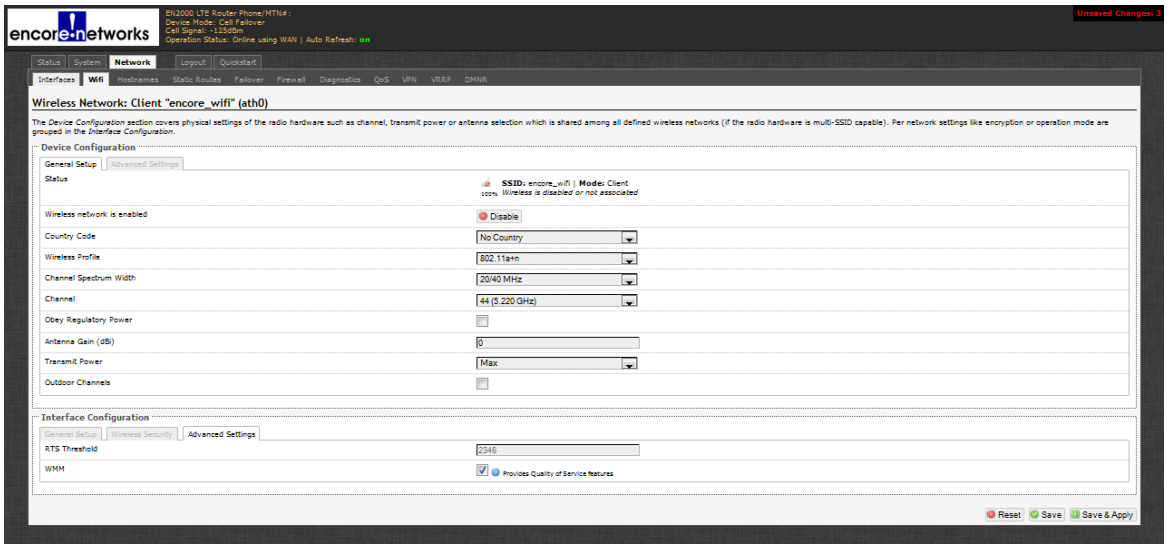


15 Confer with your network administrator to determine settings to use.

16 In the area for **Device Configuration** (in the upper part of the screen), select **General Settings**.

❖ The screen displays applicable fields (Figure 6-30).

Figure 6-30. Wireless Network Client Configuration Screen, General Settings for Device Configuration



Note: The **Status** display is only for information.

17 On the Wireless Network Client Configuration Screen, General Settings for Device Configuration, do the following:

a Make sure the parameter name reads **Wireless Network is Enabled**. (Do NOT select the option **Disable**, listed in the parameter field.)

b Select the **Country Code** to indicate the device's location.

c For the **Wireless Profile**, select the value **802.11 Wireless a+n**.

d Set the **Channel Spectrum Width**.

e Set the **Channel** to **Auto**.

f Check **Obey Regulatory Power**.

g Set the **Antenna Gain**.

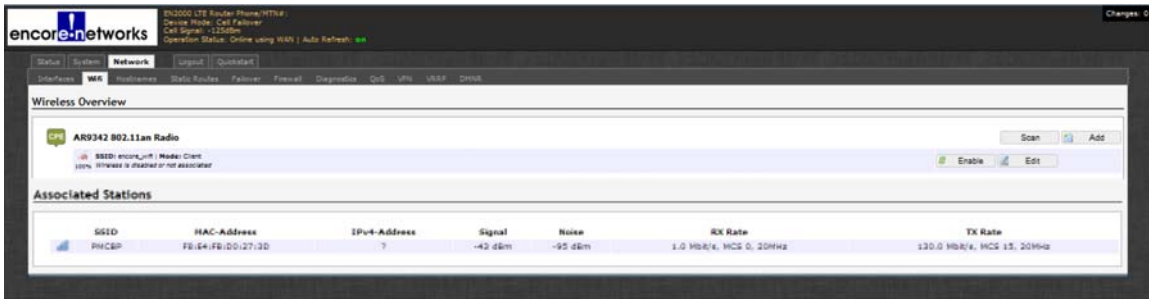
h Set **Transmit Power** to the highest value allowed in your region.

i Indicate whether to use **Outdoor Channels**.

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

❖ The EN-2000 is accepted as a wireless client, and the card's Wireless Overview screen is redisplayed, with updated information (Figure 6-31).

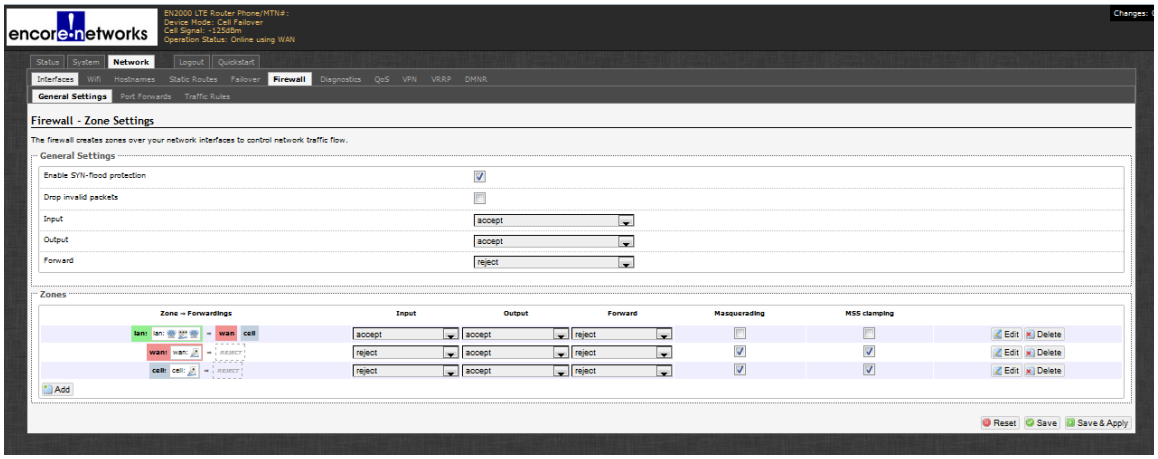
Figure 6-31. Completed Configuration as Wireless WAN Client



18 On the EN-2000 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 6-32).

Figure 6-32. Firewall Zone Settings Screen

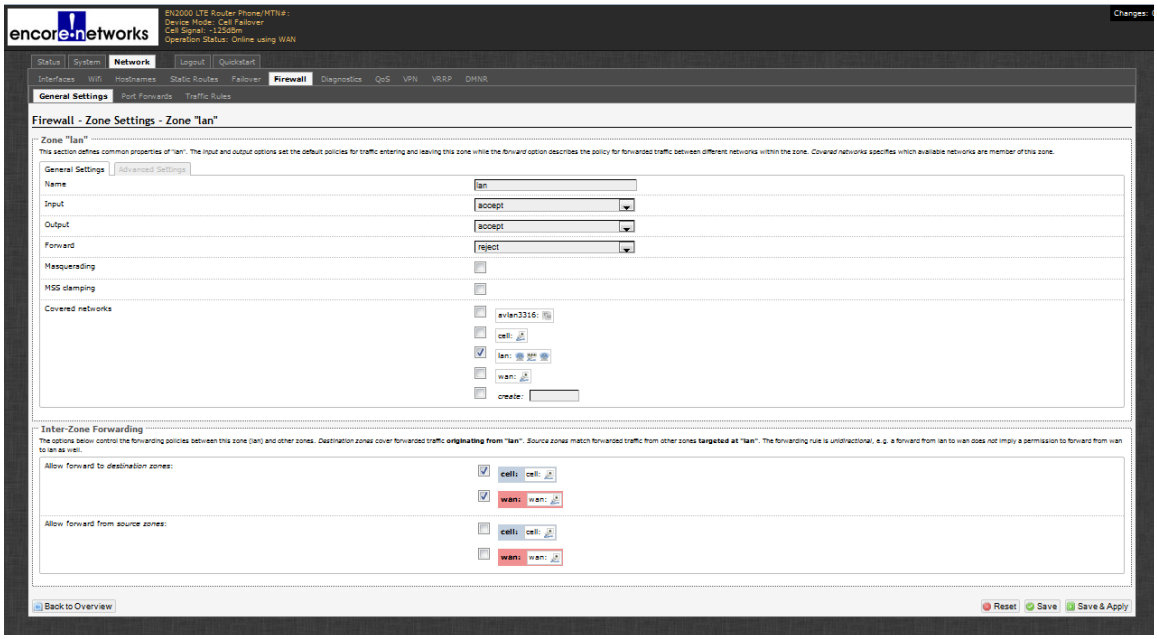


Note: Firewall forwarding must be set up for each network that will be part of a failover set.

19 In the area under **Zones**, select the **Edit** button in the row that starts with the label **LAN** (the first row in the **Zone Forwarding** list in Figure 6-32).

❖ The Firewall Zone Settings LAN Screen is displayed (Figure 6-33).

Figure 6-33. Firewall Zone Settings LAN Screen

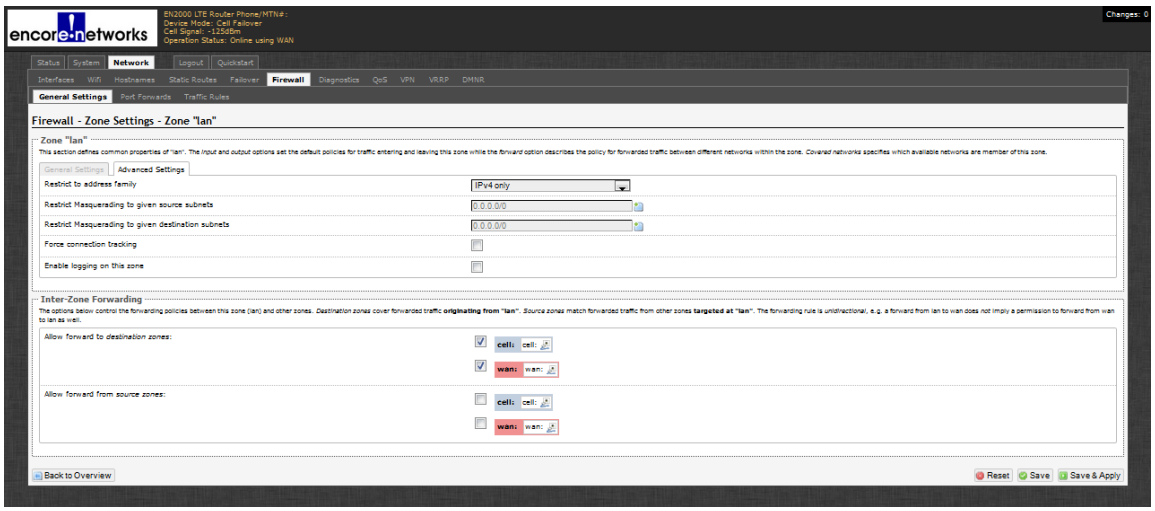


20 On that screen, make sure **LAN** is selected under **Covered Networks**, and make sure **WAN** and the new client network you created are selected under **Allow Forward to Destination Zones**.

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

❖ The applicable fields are displayed.

Figure 6-34. Firewall Zone Settings LAN Screen, Advanced Settings



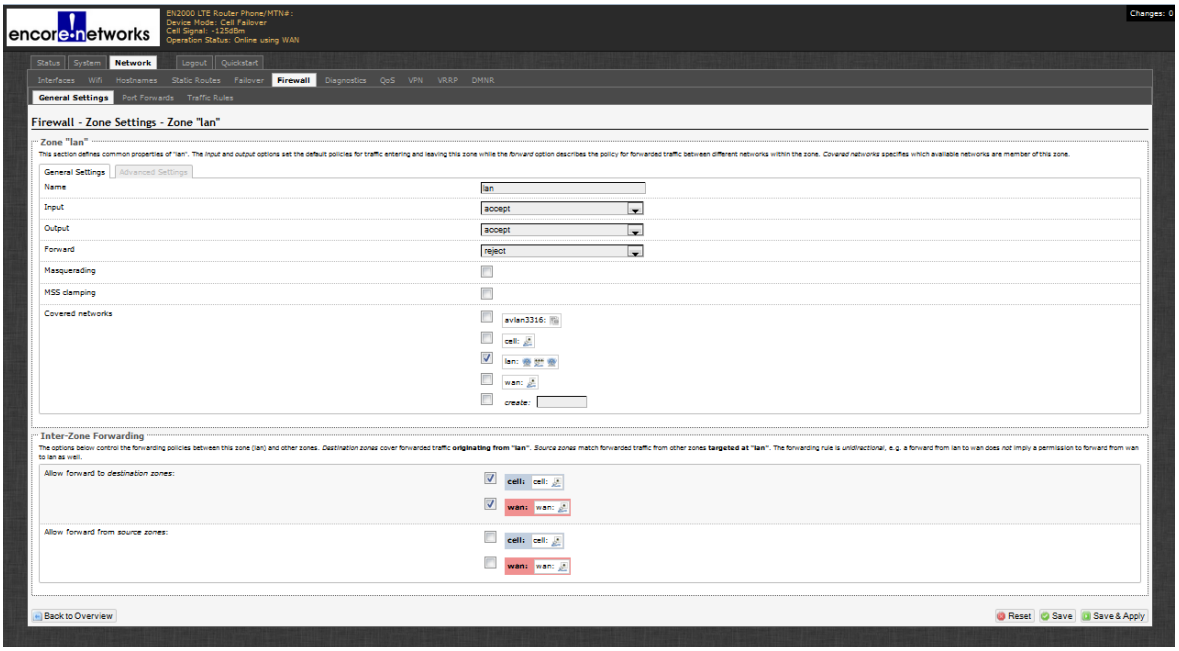
22 You can use this screen if you wish to restrict masquerading for a specific source IP address or destination IP address.

Note: Figure 6-34 does not use any rules to restrict masquerading.

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

❖ The applicable fields are displayed.

Figure 6-35. Firewall Zone Settings LAN Screen, General Settings



24 Make sure **Masquerading** and **MSS Clamping** are selected for the networks to which you forwarded firewall settings in step 20 (in this example, **WAN** and the new client network).

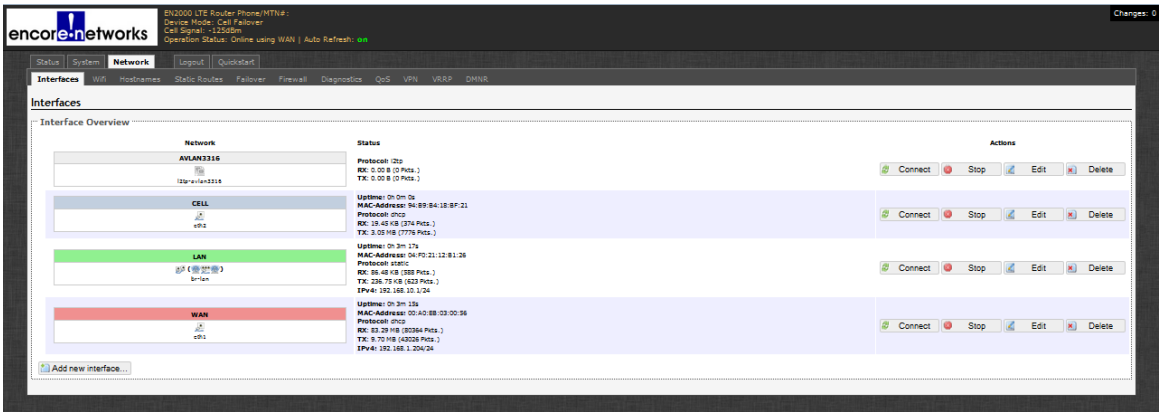
25 Select the **Save & Apply** button.

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

26 On the EN-2000 Management Screen, again select the **Network** tab, then the **Interfaces** tab.

❖ Interfaces on the EN-2000 are redisplayed, with updated information (Figure 6-36). This includes the client interface that you just configured.

Figure 6-36. Interfaces on the EN-2000



Note: It is possible for other devices on the EN-2000's wired LAN to use the EN-2000 Wireless Client's connection to reach the internet (Figure 6-37).

Figure 6-37. Additional Devices on the Wired LAN Using the EN-2000 Wireless Client's Connection to the Internet