Edge Wireless System (EWS-150g)

Introducing the EWS-150g
Configuration
Updating the Firmware

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FCC Notice

The enclosed wireless network 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.
2. This device must accept any interference received, including interference that may cause undesired operation.

This wireless network device 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 wireless network device generates, uses, and radiates 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 wireless network device does cause harmful interference to radio or television reception, which can be determined by turning the wireless network device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

◗ Reorient or relocate the receiving antenna.
◗ Increase the separation between the wireless network device and the affected receiver.
◗ Connect the wireless network device into an outlet on a circuit different from that to which the receiver is connected.
◗ Consult the dealer or an experienced radio/TV technician for help.

European Community (EC) Directives and Conformity

This wireless network device is in conformity with the Essential Requirements of R&TTE Directive 1999/5/EC of the European Union.

Non-Modification Statement

Unauthorized changes or modifications to Strix devices are not permitted. Modifications to Strix devices will void the warranty and may violate FCC or other regulations.

RF Exposure Requirements

To ensure compliance with FCC RF exposure requirements, the antenna used for this wireless network device must be installed to provide a separation distance of a minimum of 12 inches or more from all persons, and must not be co-located or operated in conjunction with any other antenna or radio transmitter. Installers and end-users must follow these installation instructions.

Product Images

Some of the images used in this document have been modified for clarity.

For additional information, please visit us at: http://www.strixsystems.com.

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An Introduction to the EWS-150g

Overview

The EWS-150g Edge Wireless System is a CPE device specifically targeted at metropolitan WISPs who are offering low-cost residential wireless service to their customers. When deploying a metropolitan Wi-Fi solution, in many cases the signal is not sufficiently strong enough to penetrate residential buildings and establish a reliable connection with low-end consumer wireless network interfaces. The EWS-150g overcomes this problem by providing a higher transmit power with high gain antennas, ensuring that your wireless customers stay connected. The EWS-150g also offers a suite of management features—including a powerful Web Management Interface (WMI) and SNMP—that have been tailored for residential users, including the ability to upgrade the EWS-150g firmware remotely, performance monitoring, and usage history logs.

Bridging the Network

The EWS-150g bridges connectivity between a Wireless Wide Area Network (WWAN), consisting of multiple Strix Outdoor Wireless System (OWS) nodes formed as a structured mesh, an indoor wired Local Area Network (LAN), and/or an indoor Wireless Local Area Network (WLAN). This bridging function is provided with Layer 2 Network Address Translation (NAT) so that multiple computers can be supported by a single association between the OWS and the EWS-150g, while still receiving IP address assignments from the WISP gateway via DHCP. Figure 1 shows a generalized application for the EWS-150g.
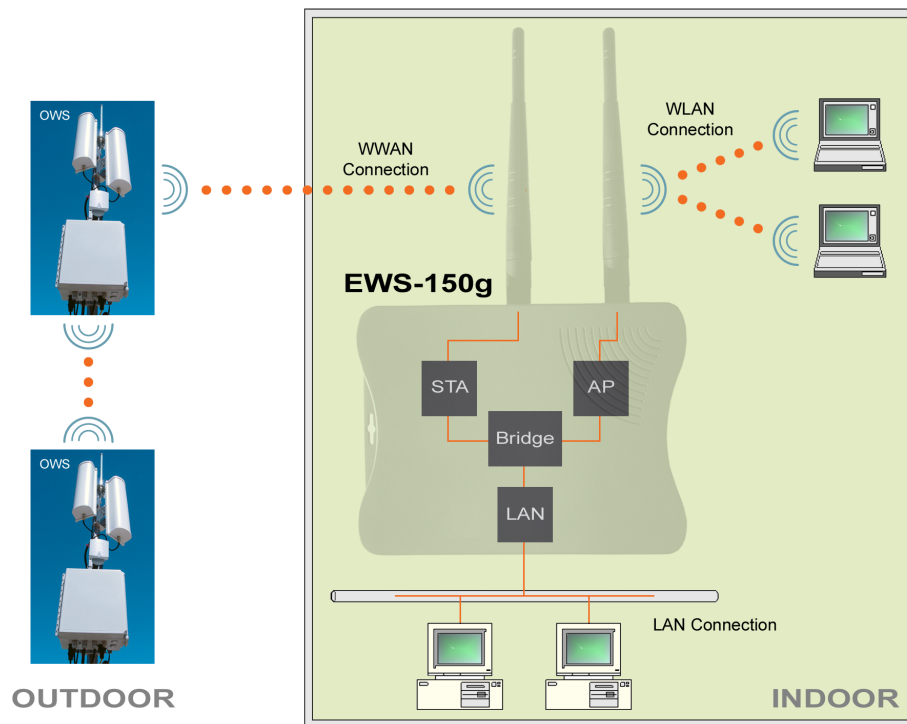

Figure 1. Bridging the Network

802.11g Wireless Technology

The EWS-150g is an 802.11g radio device with the 802.11g radio acting as a Wireless Client Station. Figure 2 shows the rear of the EWS-150g unit, highlighting the antennas, the Ethernet LAN port, the DC power receptacle and the reset button.

Figure 2. EWS-150g (Rear View)

Installing the EWS-150g

This User's Guide is intended for use by Service Providers who are pre-configuring the device for their subscribers. The physical installation of the EWS-150g is performed by the subscriber. It is the subscriber's responsibility to ensure that the unit is connected to their computer or home network properly, using the components provided. The following items are shipped in the product's carton:

◗ 1 x Strix EWS-150g unit

◗ 1 x Ethernet cable, 5ft length (blue)

◗ 2 x Omni-directional antennas

◗ 1 x Power supply

Factory Default Settings

The following table shows the default settings established at the factory for the EWS-150g.

Function	Factory Default Setting
IP Address	169.254.1.250
User Name	Admin
Password	Admin
802.11g Radio	Enabled, and configured as a wireless client station.
SSID	**Strix Wireless Network** The EWS-150g will always connect to the **Strix Wireless Network** SSID, when available.
DHCP	Enabled
Layer 2 NAT	Enabled
Accessibility	Accessible via the Ethernet port
Manager/One Plug-In	Enabled

Resetting the EWS-150g to its Factory Default State

To reset the EWS-150g to its factory default state, use a paper clip—or other similar tool—to press the **Reset** button (see Figure 2) on the rear panel. Hold the Reset button down until the LEDs on the front panel go OFF and the Power (PWR) LED comes ON again (about 5 seconds) to restore all configuration settings to their factory default values.

Managing the EWS-150g

The EWS-150g is preconfigured for basic functionality by the WISP using the unit's embedded Web Management Interface (WMI). The unit can also be configured remotely.

This User's Guide describes how to configure and monitor your EWS-150g using its embedded Web Management Interface.

Connecting to the Unit

Use an Ethernet cable (provided) to connect the EWS-150g to a computer. Alternatively, you can connect the unit to the computer via an Ethernet switch, hub or router. If the network is using a DHCP server, the unit will be assigned an IP address automatically (even when DHCP assigns an IP address the unit can always be reached from its default IP address, which is 169.254.1.250). If no DHCP server is available, the unit can only be reached via its default IP address (169.254.1.250). To establish a connection, the EWS-150g and your computer must be on the same IP segment.

Use your Web browser to connect with the EWS-150g.

◗ When using a DHCP server, you can identify the IP address assigned by the server by looking in the log files of the DHCP server, or by using the Strix Manager/One plug-in; however, the Manager/One plug-in is only compatible with Microsoft® Internet Explorer, version 6.1 or higher. You can download the plug-in from http://www.strixsystems.com/support/downloads.asp.

◗ If no DHCP server is available, use the unit's default IP address (169.254.1.250).

Logging In

At the Login prompt, use the default user name and password to log in to the EWS-150g. The default user name and password is **Admin** (for both). After entering the user name and password, click on the **OK** button to log in to the unit's Web Management Interface.
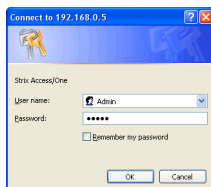
Figure 3. Login Prompt

The Home Page

With a successful login, the EWS-150g home page is displayed. The home page shows the unit's current status information. It also provides information about the top wireless neighbors that are within range of the radio, as well as system details (IP address, MAC address, uptime and firmware version).

A selection of buttons in the left pane of the home page provides immediate access to system monitoring information (**Quick Links**), and a choice of tools for resetting the unit to its factory default state, loading new firmware and rebooting the unit (**Actions**).

The top 2 frames of the home page containing the station and wireless neighbor information will refresh themselves automatically every 10 seconds, but you can force a refresh of these frames at any time by clicking on the **Refresh** button. The bottom frame containing the unit's statistical data can be refreshed manually by clicking on the **Refresh** button (this frame does not refresh itself automatically).

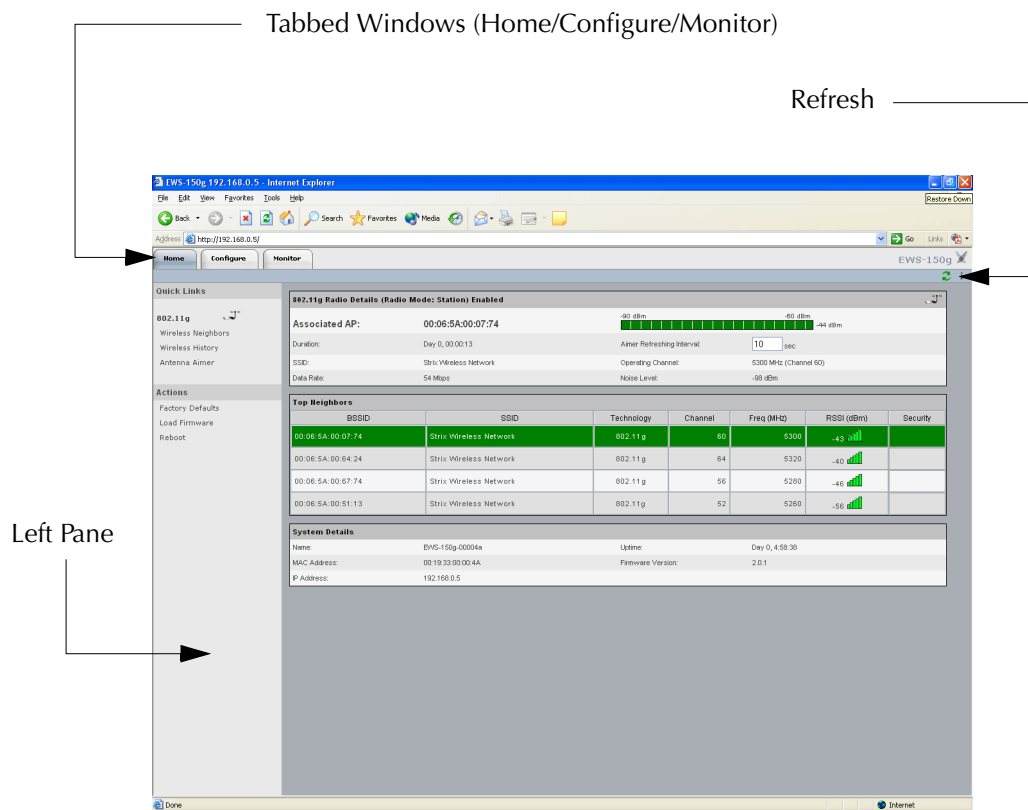Tabbed Windows (Home/Configure/Monitor)

Refresh

Left Pane

Figure 4. Home Page

From the home page you can click on either the **Configure** tab to access the unit's configuration options, or click on the **Monitor** tab to view the current operational status of the unit. You can return to the home page at any time by simply clicking on the **Home** tab.

About the Country Code

The EWS-150g uses the US (United States) as the default country code. You are solely responsible for setting the correct country code to ensure full compliance with your local regulatory laws for wireless communications. Only the US and Canada are presented in the list of available country codes.

To set the country code, click on the **Configure** tab then click on **General** to display the General Settings window.
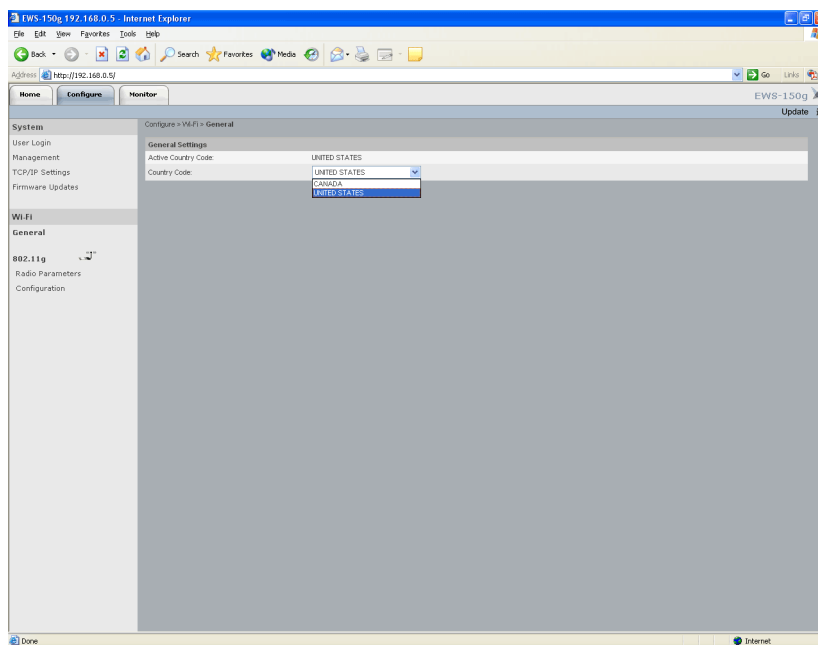

Figure 5. General Settings Window

In the Country Code field, select the country code from the pull down list that applies to your geographic location (either the United States or Canada). All examples from this point forward assume that the US is your country of choice. If you change the country code to Canada you are presented with a warning to remind you that it is your responsibility to comply with your local regulatory laws for wireless communications. You must click on the **OK** button to acknowledge that you understand your responsibility.
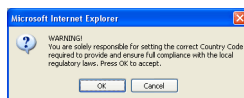

Figure 6. Warning

If you change the country code, click on **Update** to apply your change then click on **Reboot** to reboot the EWS-150g. Only after the unit reboots will your selected country code become active.

Setting Up the User Login Parameters

Establishing user login parameters determines both the administrator and guest user privileges. To set up these parameters, click on the **Configure** tab then click on **User Login** to display the User Login window.
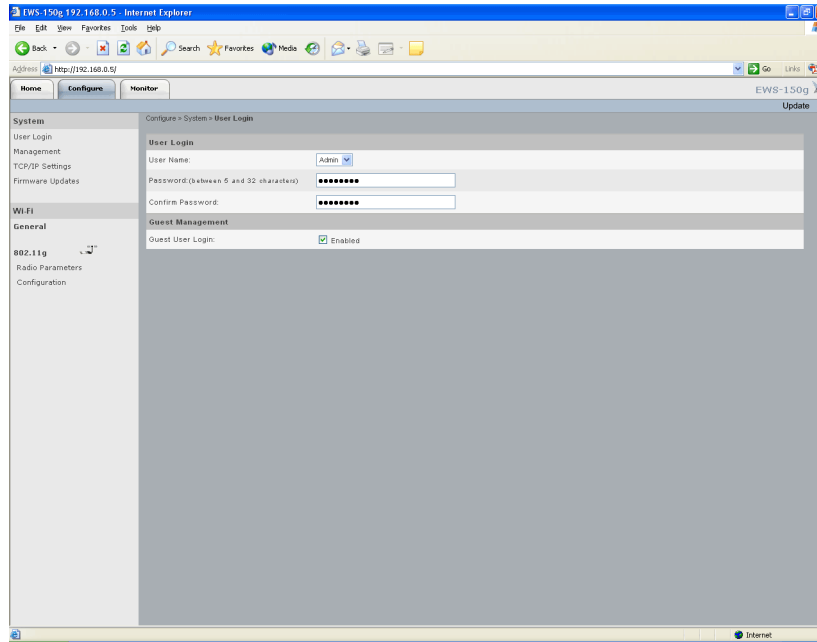

Figure 7. User Login Window

1. In the User Name field, select the type of user (either Admin or Guest) from the pull-down list.

2. In the Password field, enter a password (between 5 and 32 characters). The password is case-sensitive.

3. In the Confirm Password field, retype your password (otherwise the system will reject it).

    *The default for the user name and the password is **Admin** (with a capitalized A) for both. We strongly recommend that you change the default password immediately after your initial login.*

4. In the Guest User Login field, check the enabled box if you want to allow guest access. Leave this box unchecked to deny all guess access.

5. When finished, click on **Update** to apply your changes then click on **Reboot** to reboot the EWS-100. Only after the unit reboots will the user login parameters you defined here be in effect.

Setting Up the System Management Options

The EWS-150g can be managed from any of the following management options:

◗ **Web**—from your Web browser using its embedded Web Management Interface (WMI).

◗ **LAN**—This option allows you to manage the EWS-150g using either Web, Telnet or SNMP with a direct connection from the unit's LAN port.

◗ **SNMP**—Allows management via an SNMP (Simple Network Management Protocol) management console. The EWS-150g supports the 802.11 MIB (Management Information Base), as well as Strix proprietary MIBs. Any MIB I or MIB II compliant SNMP management console (such as HP OpenView) can be used to manage the unit.

To set up the system management options, click on the **Configure** tab then click on **Management** to display the Management window.
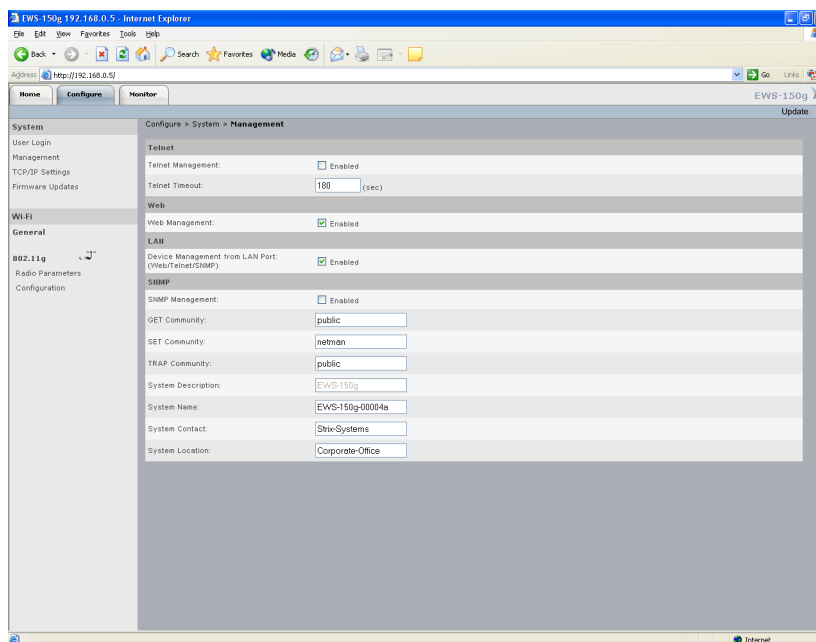

Figure 8. Management Window

Enable or disable your preferred system management options, as desired. If you enable the Telnet option you must also provide the Telnet timeout (in seconds)—the default is 180. If you enable SNMP management, you must also provide the SNMP communities you are using and the system contact information. When finished, click on **Update** to apply your changes then click on **Reboot** to reboot the EWS-150g. Only after the unit reboots will you be able to manage the EWS-150g from any of the selected management options.

Establishing the TCP/IP Network Settings

You have the option of obtaining all IP addresses (unit, default gateway, DNS server and SNTP server) automatically using DHCP, or you can configure static IP addresses manually. The default is to have the DHCP server assign all IP addresses. In addition, there is an option to enable or disable DHCP functionality over the LAN port. The default is to have this option enabled so that DHCP can assign IP addresses for the initial configuration; however, after completing the TCP/IP configuration you must **disable** this option to prevent the reassignment of IP addresses over the unit's Ethernet port—see also, DHCP Over LAN (below).

To set up the TCP/IP options, click on the **Configure** tab then click on **TCP/IP** to display the TCP/IP Settings window.
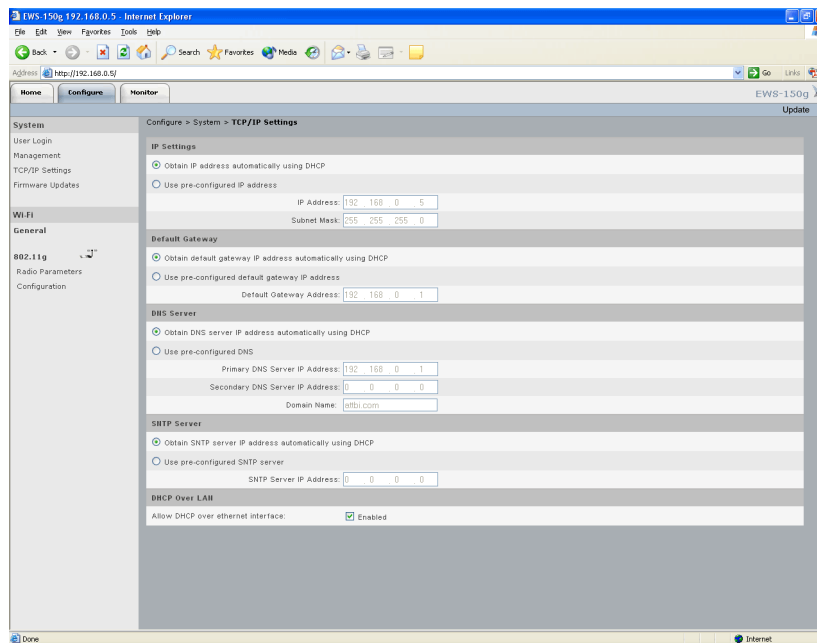

Figure 9. TCP/IP Settings Window

If you want to assign any IP addresses manually (static IP addresses), enter the addresses in the corresponding fields, otherwise allow DHCP to assign the addresses for you.

DHCP Over LAN

This option should be checked (enabled) during the initial configuration process, but when you have completed the TCP/IP configuration and all IP addresses have been assigned you must **disable** this option to prevent users from reassigning IP addresses over the unit's Ethernet port.

When finished, click on **Update** to apply your changes then click on **Reboot** to reboot the EWS-100. Only after the unit reboots will the IP addresses defined by your TCP/IP configuration options be in effect.

Disable the DHCP over LAN option!

Setting Up the Radio Parameters

To set up the 802.11g radio parameters, click on the **Configure** tab then click on **Radio Parameters** to display the 802.11g **Radio Parameters** window.
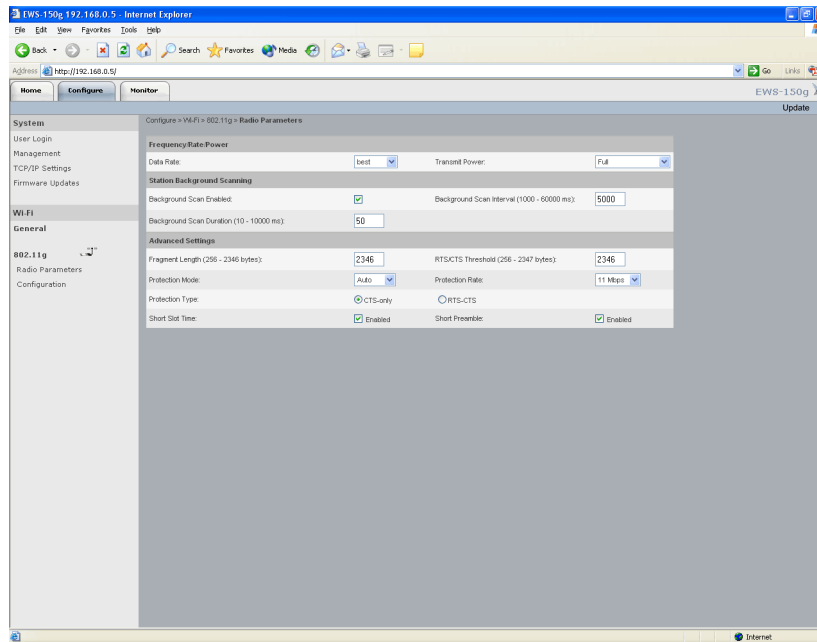

Figure 10. Radio Parameters Window

1. In the Data Rate field, choose the preferred data rate from the pull-down list. The default for this field is **Best**, which means the EWS-150g will select the best data rate available automatically.

2. In the Transmit Power field, choose the preferred transmit power from the pull-down list (either Full, Half, Quarter, One Eighth, or Minimum). The default for this field is **Full**, which means the radio is always operating at full (maximum) power.

3. In the Background Scan Enabled field, check this box to enable background scanning for wireless client stations. the default for this field is **enabled**.

4. In the Background Scan Interval field—If you enabled background scanning—enter a value between 1000 and 60000 ms to define the interval (elapsed time) between scans. The default for this field is 5000 milliseconds.

5. In the Background Scan Duration field—If you enabled background scanning—enter a value between 10 and 10000 ms to define the duration of each scan. The default for this field is 50 milliseconds.

6. In the Fragment Length field, enter a value between 256 and 2346. This setting determines the size of the wireless frame. Wireless frames are reassembled by the EWS-150g before being forwarded to the Ethernet port, but only if the frame is smaller than the Ethernet MTU (1536 bytes). The default value for this field is **2346**.

7. In the RTS/CTS Threshold field, enter a value between 256 and 2346. This value determines at what frame length the RTS-CTS function is triggered. By default, the threshold is set at its highest value (**2346**). A lower value means that the RTS-CTS function is triggered for smaller frame lengths. A lower threshold value may be necessary in environments with excessive signal noise, but may result in some performance degradation.

8. In the Protection Mode field, choose the desired 802.11g protection mode from the pull-down list (either Auto, None or Always). The default for this field is **Auto**.

◗ **Auto**—This is the default mode and will enable protection for 802.11g stations if the EWS-150g finds an 802.11b client. In this mode, if the 802.11b client leaves the network the protection mode will revert to None automatically.

◗ **None**—This assumes there are no wireless stations using 802.11b (11 Mbps) technology. If operating in a mixed 802.11b/g network with minimal 802.11b traffic, choose this option to ensure the best performance for your 802.11g stations.

◗ **Always**—Protects 802.11b traffic from colliding with 802.11g traffic. This mode is not recommended, especially if only a few wireless stations are operating with 802.11b. Only use this mode in environments with heavy 802.11b traffic or where there is interference.

9. In the Protection Rate field, choose the data rate at which the RTS-CTS (Request-to-Send and Clear-to-Send) packets are sent (either 1 Mbps, 2 Mbps, 5.5 Mbps, or 11 Mbps). The default data rate for this field is **11 Mbps**.

10. In the Protection Type field, choose either CTS-only or RTS-CTS. With CTS-only selected, the client is not required to send an RTS (Request-to-Send) to the AP. As long as the client receives a CTS (Clear-to-Send) frame from the AP then the client is free to send data. With the RTS-CTS option enabled, the client is required to send an RTS to the AP and wait for a CTS from the AP before it can send data (this option creates additional overhead and can cause performance degradation). The default for this field is **CTS-only**.

11. In the Short Slot Time field, check the box to enable this feature. 802.11g defines the long slot time as 20 microseconds and a short slot time as 9 microseconds. 802.11b only supports the long slot time of 20 microseconds. In an environment with 802.11g devices only, this option (Short Slot Time) must be enabled for better performance—giving precedence to 802.11g traffic. The default is to have the short slot time **enabled**.

12. In the Short Preamble field, check the box to enable this feature. Short slot preamble improves network efficiency by reducing the preamble from 128 bits to 56 bits. 802.11g is required to support both short and long preambles (802.11b support for a short preamble is optional). If this option is enabled, any 802.11b clients associated with the network must support a short preamble. The default is to have the short preamble **enabled**.

13. When finished, click on **Update** to apply your changes then click on **Reboot** to reboot the EWS-150g. Only after the unit reboots will these changes take effect.

Station Configuration

To establish the 802.11g Station Configuration parameters, click on the **Configure** tab then click on **Configuration** to display the 802.11g **Station Configuration** window.
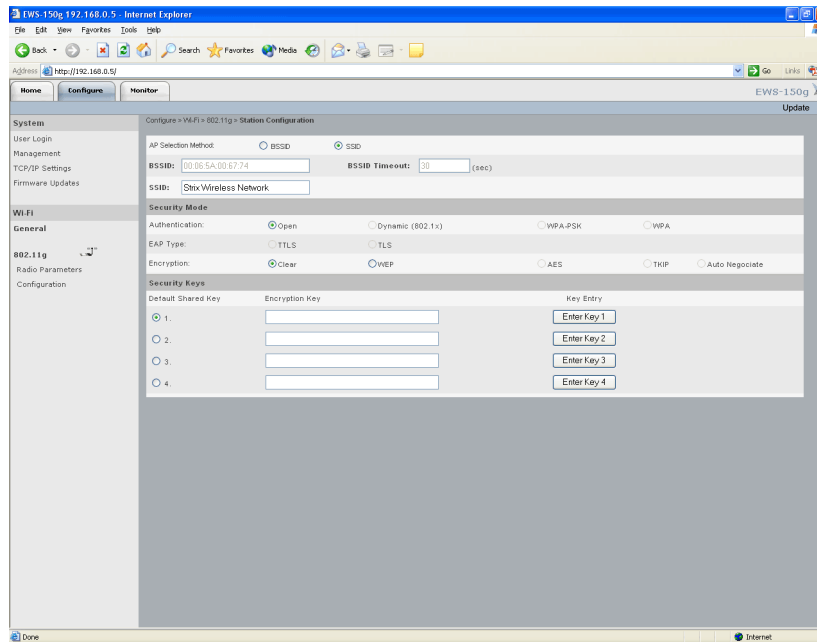

Figure 11. Station Configuration Window

1. In the AP Selection Method field, choose either BSSID or SSID as the AP selection priority. If BSSID is selected and the EWS-150g cannot locate the BSSID within the elapsed time specified in the BSSID Timeout field, the unit defaults to the SSID. The default for this field is **SSID**.

2. If BSSID is selected as the AP selection method, enter the MAC address of the AP in the BSSID field.

3. If BSSID is selected as the AP selection method, enter a value (in seconds) in the BSSID Timeout field to define the elapsed time before the EWS-150g defaults to the SSID to locate the AP.

4. In the SSID field, enter the SSID of the network that you want to grant client access to.

5. In the Authentication field, choose the desired level of authentication. Client authentication ensures that users are who they say they are. If authentication is required (strongly recommended), you must define the level of authentication you want to assign to this Access Point. Currently, not all authentication types are available with the EWS-150g. The default for this field is **Open**.

6. The EAP Type is currently not supported.

7. In the Encryption field, choose either Clear or WEP (other encryption methods are currently not supported). The default for this field is **Clear**.

8. If you want to use a shared Client Connect key (or multiple shared keys), click on the button corresponding to the shared key you want to define (1 through 4) to generate the key entry pop-up window, then choose either 64 bit, 128 bit or 152 bit encryption. After choosing the encryption type, enter the key then click on the **Update** button.
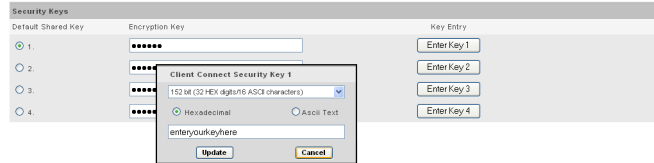

Figure 12. Defining a Shared Key

The shared key you entered is displayed as coded black dots in the corresponding Encryption Key field. You can enter up to 4 shared keys.

9. When finished, click on **Update** to apply your changes then click on **Reboot** to reboot the EWS-100. Only after the unit reboots will these changes take effect.

Monitoring Your Network

The EWS-150g is equipped with a variety of monitoring features and a troubleshooting aid, all of which are available from the Monitor tab in the unit's Web Management Interface. In addition, there are several quick links on the home page that will direct you to the key monitoring functions. The home page also includes an Antenna Aimer, which allows you to monitor signal strength while manually directing the unit's antenna (this function is only available from the home page). Monitoring functions include:

◗ Event Log

◗ L2NAT

◗ Troubleshooting

◗ Wireless Neighbors (802.11g)

◗ Statistics (802.11g)

◗ Wireless History (802.11g)

Because the EWS-150g monitors are intuitive and to avoid redundancy, this document does not provide examples of all available monitors. It does, however, provide an example of the Troubleshooting window and the Antenna Aimer, which are unique to the EWS-150g.

Where monitors are in tabular form the table can be sorted by column by simply clicking in the column header. For example, in Figure 13 (Wireless Neighbors) you may want to display the results sorted by RSSI value. In this case, click in the RSSI (dBm) column header. To reverse the displayed order (descending instead of ascending), click in the column header again.

Figure 13. Wireless Neighbors

Troubleshooting

This feature is provided as a convenient tool for testing your wireless configuration and associations. To initiate the troubleshooting tool, click on the **Monitor** tab then click on **Troubleshooting** to display the Troubleshooting window.

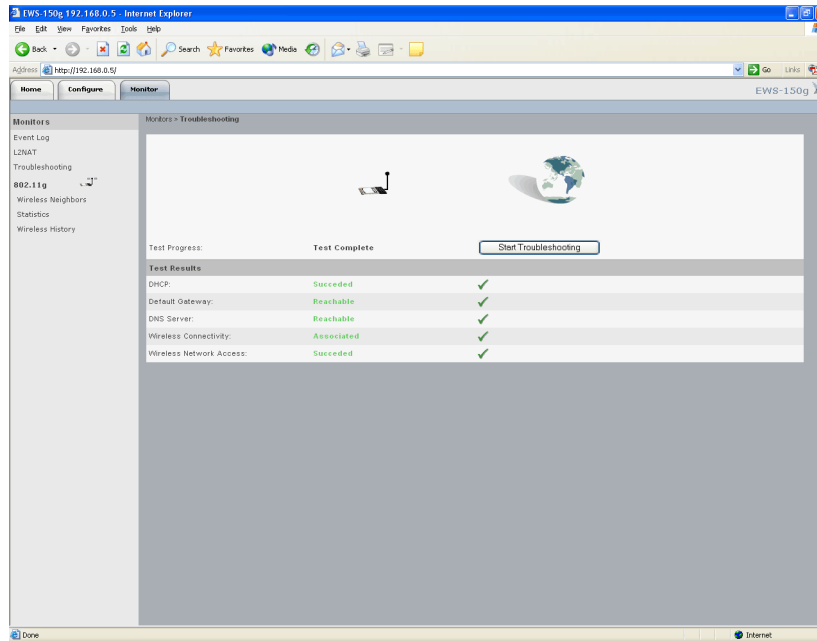Click on the **Start Troubleshooting** button to begin the process.

Figure 14. Troubleshooting

Antenna Aimer

Available from the home page, this tool is provided to assist users when attempting to find the optimum placement for the EWS-150g. The process is dynamic and interactive, which means that when you reposition the unit or its antennas you are presented with an immediate response indicating the received signal strength.
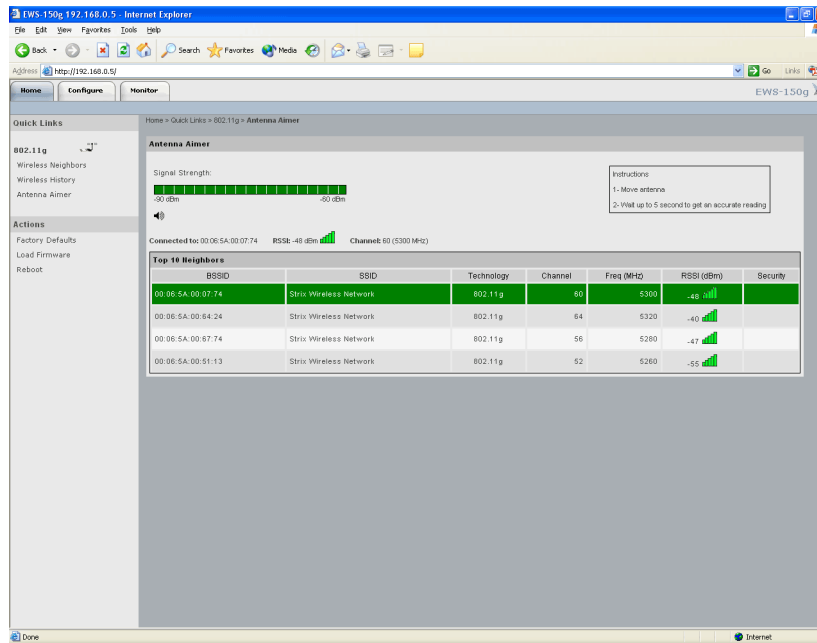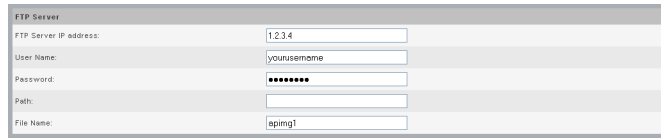
Figure 15. Antenna Aimer

Updating the Firmware

To update the EWS-150g firmware, you must first establish the FTP file transfer parameters so that the unit knows where to locate the new image file. To do this, click on the **Configure** tab then click on **Firmware Updates** to display the Firmware updates window.

Figure 16. Firmware Updates Window

After entering the FTP location parameters, click on **Update** to apply your change then click on **Reboot** to reboot the unit. When the unit has completed its reboot process, go to the home page and click on **Load Firmware** to display the Load Firmware window. If you need to change the FTP location parameters, click on the FTP Parameters link, otherwise click on the **Start Download** button to begin the firmware update procedure.
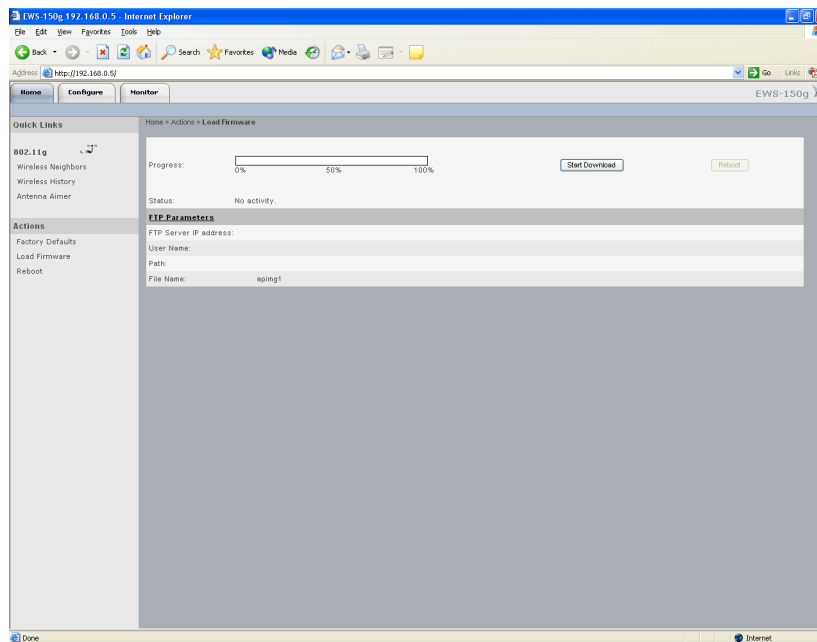
Figure 17. Updating the Firmware

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