Ruckus Wireless®
ZoneFlex® 7731 802.11n
Point to Point Wireless Bridge

Getting Started Guide

Part Number 800-70236-001 (Revision E)
Published December 2009

www.ruckuswireless.com

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1 About This Getting Started Guide

This *Getting Started Guide* provides information on how to set up the Ruckus Wireless ZoneFlex 7731 802.11n Point to Point Wireless Bridge on your network. Topics covered in this guide include installation, basic configuration, and device mounting.

This guide is intended for use by those responsible for installing and setting up network equipment. Consequently, it assumes a basic working knowledge of local area networking, wireless networking, and wireless devices.

Related Documentation

In addition to this guide, each Ruckus Wireless ZoneFlex 7731 802.11n Point to Point Wireless Bridge documentation set includes the following:

- **User Guide**: Provides detailed information on how to configure the Wireless Bridge. The User Guide is available for download on the Ruckus Wireless Support Web site at:

  http://support.ruckuswireless.com/documents

- **Release Notes**: Provides late-breaking information about the current software release, including new features, enhancements, and known issues. If the information in the Release Notes differs from the information in this guide, follow the instructions in the Release Notes.
- **Online Help**: Accessible from the ZoneFlex 7731 Web interface, the Online Help provides information that helps you configure the device from the Web interface.

2 Unpacking the ZoneFlex Wireless Bridge

1. Open the Wireless Bridge package, and then carefully remove the contents.
2. Return all packing materials to the shipping box, and put the box away in a dry location.
3. Verify that all items listed in Package Contents below are included in the package. Check each item for damage. If any item is damaged or missing, notify your authorized Ruckus Wireless sales representative.

Package Contents

The standard ZoneFlex 7731 Wireless Bridge package contains two ZoneFlex 7731 units and two sets of accessories (one for each unit). A single unit package contains one ZoneFlex 7731 unit and one set of accessories. Refer to Table 1 for package contents for either the single unit package or dual unit package.

Table 1. Package contents

Single Unit	Two Units
• One ZoneFlex 7731 Point to Point Wireless Bridge • One PoE injector box (excluded in some SKUs) • One Power adapter box (SW DC48V/ 0.42A AC100-240V) for the PoE injector (excluded in some SKUs) • One mounting kit (see "Mounting Kit Contents" for details) • One bag containing bottom Wireless Bridge cover and related accessories (see "Bottom Cover and Accessories" for details) • Service Level Agreement / Limited Warranty Statement • Regulatory Statement • This Getting Started Guide	• Two ZoneFlex 7731 Point to Point Wireless Bridge units, pre-provisioned as a "*Root Bridge*" and a "*Non-Root Bridge*" • Two PoE injector boxes (excluded in some SKUs) • Two power adapter boxes (SW DC48V/ 0.42A AC100-240V) for the PoE injector (excluded in some SKUs) • Two mounting kits (see "Mounting Kit Contents" for details) • Two bags containing bottom Wireless Bridge cover and related accessories (see "Bottom Cover and Accessories" for details) • Service Level Agreement / Limited Warranty Statement • Regulatory Statement • This Getting Started Guide

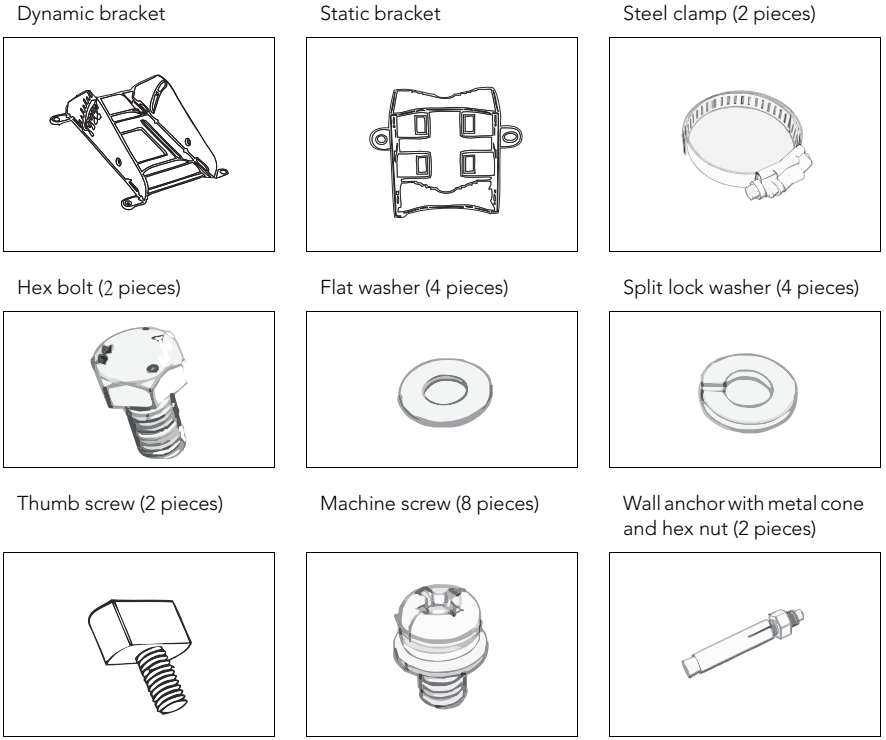
WARNING: The Ruckus Wireless PoE injector and power adapter (if supplied with your Wireless Bridge) are for indoor use only. Never mount the PoE injector and power adapter outdoors with the Wireless Bridge.

Mounting Kit Contents

Each mounting kit contains:

- Dynamic bracket
- Static bracket
- Steel clamps (2 pieces)
- Machine screws (8 pieces)
- Hex bolts (4 pieces)
- Split lock washers (4 pieces)
- Flat washers (4 pieces)
- Split lock washers (4 pieces)
- Machine screws (8 pieces)
- Thumb screws (2 pieces)
- Wall anchors (2 pieces)

Figure 1. Mounting kit contents

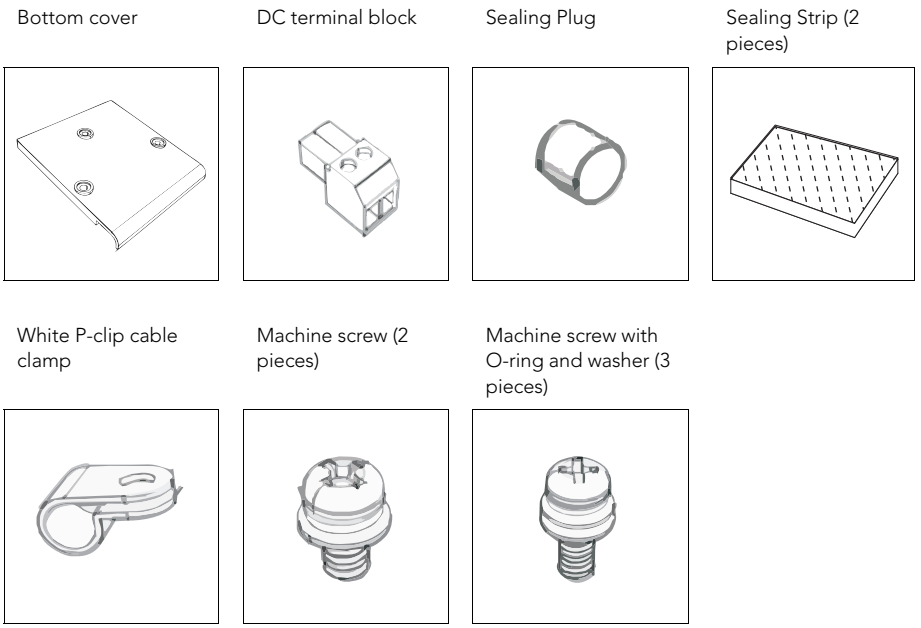


Bottom Cover and Accessories

Each bottom cover accessory bag contains:

- Bottom cover of the Wireless Bridge
- DC terminal block
- 20mm x 30mm sealing strips (2 pieces)
- Sealing plug
- White P-clip cable clamps (2 pieces)
- Machine screws (2 pieces)
- Machine screws with washers (3 pieces)

Figure 2. Bottom cover and accessory package contents



3 Before You Begin

Prepare the Required Hardware and Tools

You must supply the following tools and equipment:

- A notebook or desktop computer running Windows (2000/XP/Vista/7) with one Ethernet card installed
- 6mm flathead screwdriver
- 6mm Phillips screwdriver
- 10mm ratchet wrench
- 3mm Phillips screwdriver (if you will be using DC power)
- Electric drill with 8mm drill bit (if mounting on a flat surface)

NOTE: At the beginning of each procedure, this guide lists the specific tools, accessories, and equipment that you will need to complete the procedure.

Get to Know the Hardware Features

Figure 3 and Figure 5 identify the Wireless Bridge features that are relevant to the installation and mounting instructions that this guide provides. Before you begin the installation process, Ruckus Wireless recommends that you become familiar with these features.

Figure 3. Wireless Bridge LEDs and bottom connectors

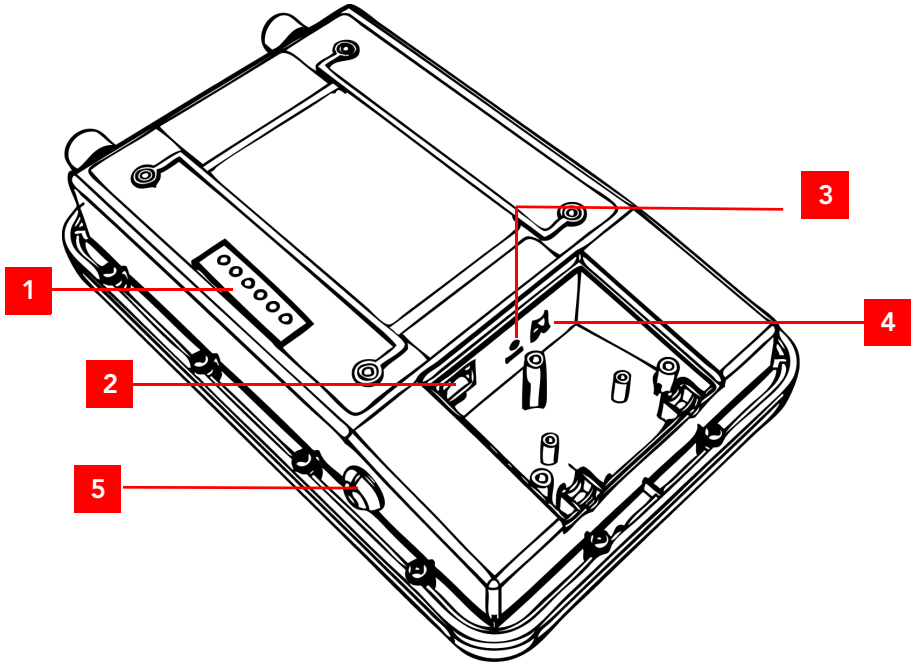


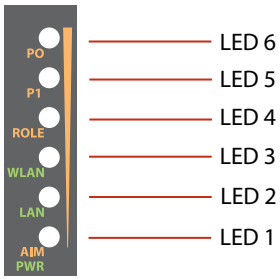
Table 2. LEDs and bottom panel connectors

No	Label	Description
1	LEDs	See "LED Colors and What They Mean" below for more information.
2	RJ45	LAN port that supports Power over Ethernet (PoE) and 10/100/1000 Mbps network connections
3	Reset	Using a pointed object (for example, a pen), press this button to restart the Wireless Bridge or to restore it to factory default settings: • To restart the Wireless Bridge, press the Reset button once. • To restore the Wireless Bridge to factory default, press the Reset button for six (6) seconds. *WARNING: Restoring the Wireless Bridge to factory default settings removes all configuration changes that you have made. These include the IP address, password, access control list, and wireless settings. Returning the configuration of these features to their factory default settings may result in network connectivity issues.*
4	12V DC	In addition to PoE, you can also use direct current or DC (from a battery, for example) to supply power to the Wireless Bridge.
5	Aiming Button	Press this button to set the Wireless Bridge to Aiming Mode. When Aiming Mode is set, the LEDs can be used to determine signal strength. See "Aiming Mode" for more information.

LED Colors and What They Mean

The ZoneFlex 7731 Wireless Bridge includes 6 dual color LEDs. The LEDs function in two modes, normal operation mode and aiming mode.

Figure 4. LED Indicators



- For *Normal Operation Mode* LED states and what they indicate, refer to Table 3.
- For *Aiming Mode* LED states and what they indicate, refer to Table 4.

Normal Operation Mode

In Normal Operation Mode, the WLAN LED indicator is off when disconnected, flashing green while connecting and solid green when a connection has been established.

Table 3. Normal Operation Mode LED indicators

LED	Meaning
LED 1 (AIM/PWR)	Solid Green = Power on Off = Power off
LED 2 (LAN)	Solid Green = Link Up Blinking Green = Activity Off = Link Down
LED 3 (WLAN)	Solid Green = Associated Blinking Green = Not Associated Off = Radio Off
LED 4 (ROLE)	Solid Yellow = This unit is the root bridge Off = This unit is the non-root bridge
LED 5 & 6 (P0 and P1)	Alternating Blinking = Provisioning in process Simultaneous Blinking = Provisioning complete; reboot pending

Aiming Mode

In Aiming Mode, LED 1 indicates that the Wireless Bridge is in Aiming Mode. LED indicators 2 - 6 are used together to indicate signal strength, and should be read from bottom to top (the higher the LEDs go, the stronger the signal).

Table 4. Aiming Mode LED indicators

LED	Meaning
LED 6	Signal strength 5
LED 5	Signal strength 4
LED 4	Signal strength 3
LED 3	Signal strength 2
LED 2	Signal strength 1
LED 1 (AIM/PWR)	Solid Yellow = Aiming Mode (RSSI >= 5) Solid Green = Normal Operation Mode Off = Off

In Aiming Mode, each LED has three states to represent different values. Solid yellow indicates the highest value, flashing yellow indicates medium value and off indicates the lowest value. If all six LEDs are solid yellow, the Wireless Bridge has the strongest signal possible. If some LEDs are flashing yellow or off, reposition the Wireless Bridge to achieve a better signal. For more detailed information on signal strength levels, see "RSSI values of LED indicators" on page 57.

Push Buttons

The ZoneFlex 7731 includes two push buttons:

- A recessed factory default reset button (located inside the bottom panel)
- A large blue Aiming Mode button that sets the bridge to Aiming Mode (located on the outside of the unit)

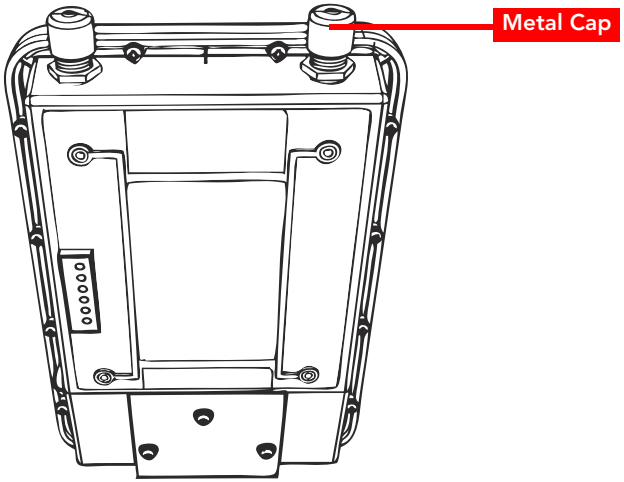
To reset the unit to its factory defaults, press and hold the Reset button for six (6) seconds. Press and hold the blue Aiming button for four (4) seconds to initiate aiming between the root and non-root bridge.

CAUTION: Resetting the ZoneFlex 7731 to its factory defaults will result in loss of all configuration settings, including the pre-provisioning (pairing of the root and non-root bridge) settings that were enabled prior to shipping. If you do need to reset to defaults, you will need to re-provision the pair.

External Antenna Connectors

The ZoneFlex 7731 Wireless Bridge includes one purpose designed internal directional antenna. If you want to extend the range of your wireless network, you can connect an external high gain 5GHz antenna to the two standard N-type external antenna connectors on the top panel of the Wireless Bridge. The antenna must have a gain of less than 23dBi to comply with FCC and CE regulations. For more information, refer to "Mounting and Connecting the External Antenna (Optional)" on page 56.

Figure 5. The antenna connectors are protected by metal caps



4 Pre-Installation Configuration

This section describes the configuration procedures required before you begin mounting the bridges in their permanent locations.

Summary of Pre-Installation Tasks

1. Supply power to both units.
2. Access the units using an administrative computer.
3. Set the country code to your current location.
4. Change other configuration settings (optional).
5. Use the SpeedFlex tool built into the Web interface to test the link between the units.

NOTE: If you purchased the Wireless Bridge in the United States, the country code is fixed to "United States" at the factory and is not user configurable. If not, you must set the country code to your location prior to mounting to ensure compliance with national regulatory requirements.

CAUTION: If changing the Country Code over the air, you will need to configure the remote unit first followed by the local unit, to avoid loss of connectivity.

In addition to setting the country code (required), the following optional configuration settings may be changed at this time:

- Change the device name and SSID
- Manually assign static IP addresses
- Enable SNMP or FlexMaster network management
- Configure security settings
- Configure management VLAN

CAUTION: Changing any settings of either the root or non-root bridge will require that you also change the same settings on the other device.

To customize any of these settings before deploying the bridge pair, you will need to connect an administrative computer directly to each ZoneFlex 7731 using the unit's default IP address, and provide power using either DC power or Power over Ethernet before you can access the unit's Web interface.

The default IP addresses for the root and non-root bridge are as follows:

- **Root Bridge**: `192.168.2.1`
- **Non-Root Bridge**: `192.168.2.254`

NOTE: In general, you should first make configuration changes to the Root bridge, followed by the Non-Root bridge.

What You Will Need

Before starting with the configuration task, make sure that you have the following requirements ready:

- An administrative computer running Microsoft Windows (2000/XP/Vista/7)
- Mozilla Firefox 2.0 (or later) or Microsoft Internet Explorer 6.0 (or later) installed on the administrative computer
- Two Ethernet cables
- PoE injector (if not supplied with the Wireless Bridge, you can purchase a third party 802.3af-compliant PoE injector or switch)
- 6mm Phillips screwdriver

If you are planning to power the Wireless Bridge using a 12v DC connection, you will also need the following:

- One 3.1mm-3.3mm UL1185 (80°, 300V) single shielded DC cable
- 12v DC, 1A DC power source (for example, a battery)
- 3mm Phillips screwdriver

Access the Web Interface

CAUTION: Do not attempt to access the Web interface of both ZoneFlex 7731 units at the same time by connecting both to the same Layer 2 switch or to the same broadcast domain on a live network. This will cause a network loop, which can disrupt your entire network.

Step 1: Connect the Power and Ethernet Cables

The procedure for connecting cables to the Wireless Bridge depends on the power source that you will be using. You can do one of the following:

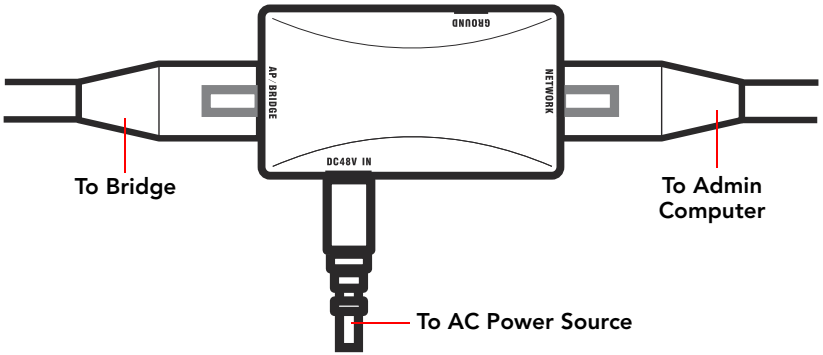
- Use Power Over Ethernet
- Use DC Power

NOTE: You only need to connect one type of power source at this point, even if you are planning to use both PoE and DC power in your final deployment.

Use Power Over Ethernet

1. Take out the PoE injector and the power adapter from the Wireless Bridge package.
2. Obtain two Ethernet cables.
3. Connect one end of one Ethernet cable to the **AP/BRIDGE** port on the PoE injector, and then connect the other end to the **RJ45** port on the ZoneFlex 7731.
4. Connect one end of the other Ethernet cable to the **NETWORK** port on the PoE injector.
5. Connect the power jack to the **DC 48V IN** connector on the PoE injector, and then plug the power adapter into a power source. The single LED on the PoE injector turns green.
6. Check the power LED on the ZoneFlex 7731 to ensure power is being supplied to the bridge.

Figure 6. Connect the Ethernet cables and power adapter to the PoE injector



You have completed connecting the Wireless Bridge to a PoE power source.

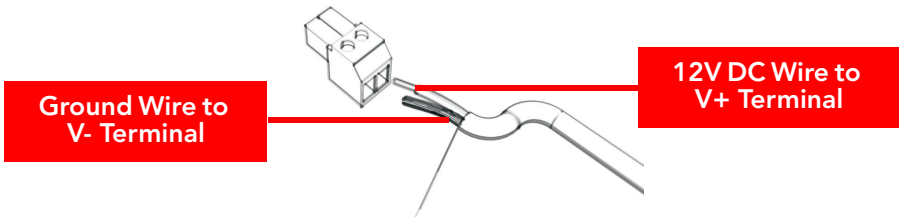
Use DC Power

To use DC to power the Wireless Bridge, you need to connect a DC cable (not supplied with the Wireless Bridge) to the DC terminal block.

1. Take out the DC terminal block from the small plastic bag that contains the bottom cover of the Wireless Bridge.

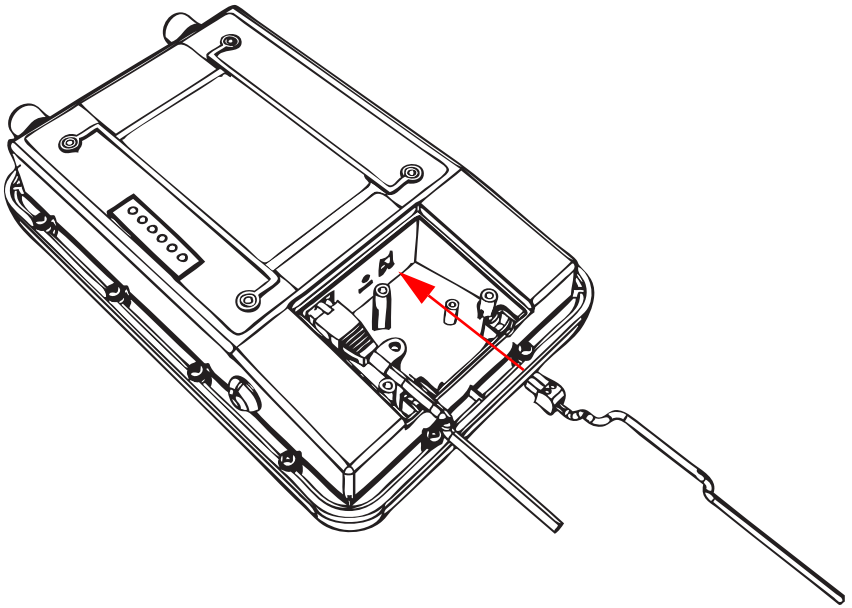
2. Connect the DC cable's ground wire to V- terminal. If you are looking at the terminal block with the wiring terminal screws on top, the V- terminal is on the *left side*.
3. Connect the DC cable's +12v DC wire to the V+ terminal. If you are looking at the terminal block with the wiring terminal screws on top, the V+ terminal is on the *right side*.

Figure 7. Connect the ground wire to the V- terminal and the +12v DC wire to the V+ terminal



4. Using a 3mm Phillips screw, tighten the wiring terminal screws. Screw torque value must be 20.5 mN-m ± 2 mN-m.
5. Connect the DC terminal block to the **12V DC** port on the Wireless Bridge.

Figure 8. Connect the DC terminal block to the 12V DC port



6. Connect the DC cable to a DC power source (for example, a battery).

You have completed connecting the Wireless Bridge to a DC power source.

Step 2: Prepare the Administrative Computer

NOTE: The following procedure is applicable if the administrative computer is running Windows XP or Windows 2000. If you are using a different operating system, refer to the documentation that was shipped with your operating system for information on how to modify the computer's IP address settings.

1. On your Windows XP or Windows 2000 computer, open the **Network Connections** (or **Network and Dial-up Connections**) control panel according to how the Start menu is set up:
   - On Windows XP, click **Start** > **Control Panel** > **Network Connections.**
   - On Windows 2000, click **Start** > **Settings** > **Network Connections**.
2. When the Network Connections window appears, right-click the icon for Local Area Connection, and then click **Properties**.

NOTE: Make sure that you configure the Local Area Connection properties, not the Wireless Network Connection properties.

3. When the **Local Area Connection Properties** dialog box appears, select **Internet Protocol (TCP/IP)** from the scrolling list, and then click **Properties**. The **Internet Protocol (TCP/IP) Properties** dialog box appears.
4. Write down all of the currently active network settings. You will need this information later when you restore your computer to its current network configuration.
5. Click **Use the following IP address**, and then configure the IP address settings with the values listed in Table 5. For a sample configuration, refer to Figure 9.

Table 5. Configure your computer's IP address settings

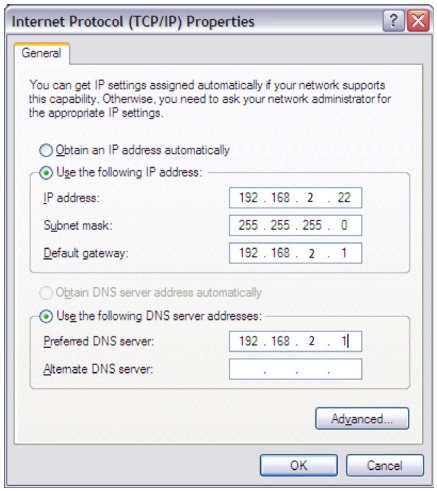
IP address	`192.168.2.22` (or any address in the `192.168.2.x` network—with the exception of `192.168.2.1` and `192.168.2.254` which will be used by the bridges)
Subnet mask	`255.255.255.0`
Default gateway	`192.168.2.1`
Preferred DNS server	`192.168.2.1`

You can leave the **Alternate DNS server** box blank.

6. Click **OK** to save your changes and close the TCP/IP Properties dialog box.
7. Click **OK** again to close the Local Area Connection Properties dialog box.

Windows saves the IP address settings that you have configured.

Figure 9. Sample configuration in the Internet Protocol (TCP/IP) Properties dialog box



Step 3: Connect the Wireless Bridge to the Admin Computer

If you have not already done so, connect the admin computer to the ZoneFlex 7731 using an Ethernet cable, or two Ethernet cables and a PoE injector if you are using Power over Ethernet (see "Connect the Ethernet cables and power adapter to the PoE injector" on page 14).

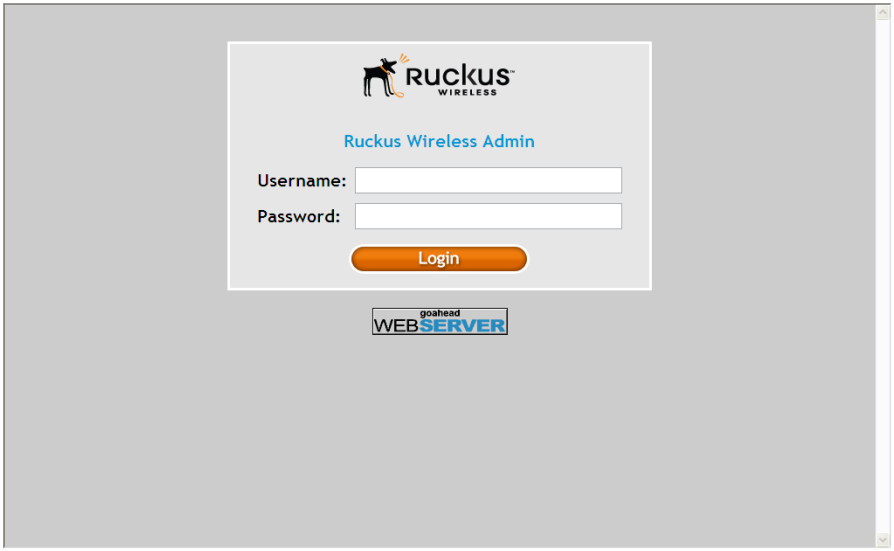
Step 4: Log In to the Web Interface

1. Open a Web browser window from the admin computer.
2. In the address or location bar, type the following address:

   Root Bridge: `http://192.168.2.1`

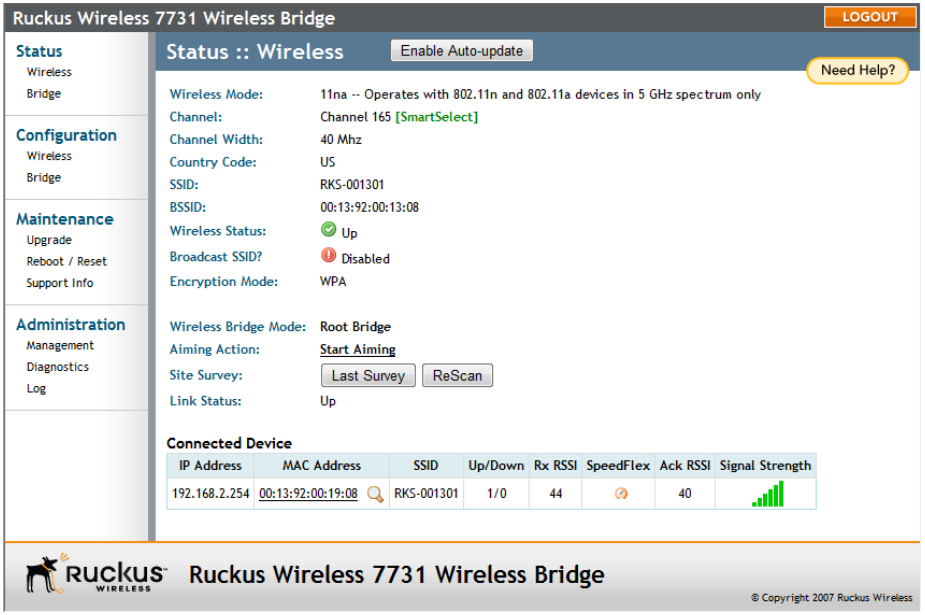
   Non-Root Bridge: `http:/192.168.2.254`
3. Press <Enter> on the keyboard to connect to the Wireless Bridge's Web interface. A security alert message appears.
4. Click **Yes** or **OK** (depending on the browser) to continue. The Wireless Bridge's login page appears.

Figure 10. The ZoneFlex Wireless Bridge login page



5. In **User name**, type `super`.
6. In **Password**, type `sp-admin`.
7. Click **Login**. The Web interface appears, displaying the **Status > Wireless** page.

Figure 11. Ruckus ZoneFlex 7731 Wireless Bridge **Status :: Wireless** *page*



8. Continue to "Step 5: Change the Country Code".

Step 5: Change the Country Code

Change the Country Code setting to your location and reboot the bridge for updates to take effect.

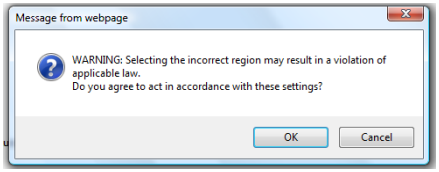
CAUTION: If changing the Country Code after the pair has been mounted, you will need to configure the remote unit first followed by the local unit, to avoid loss of connectivity.

NOTE: If you purchased the Wireless Bridge in the United States, this value is fixed to "United States" at the factory and is not user configurable.

If you purchased the Wireless Bridge outside of the United States, verify that the value is set to your country or region. Selecting the correct country code ensures that the Wireless Bridge uses only the radio channels allowed in your country or region.

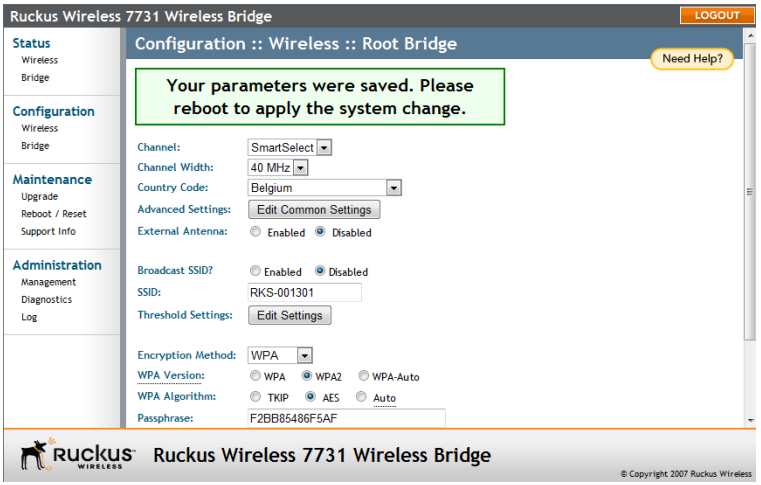
1. On the **Configuration > Wireless** page, select your location from the Country Code menu.
2. The following warning message appears:

Figure 12. Country code warning message



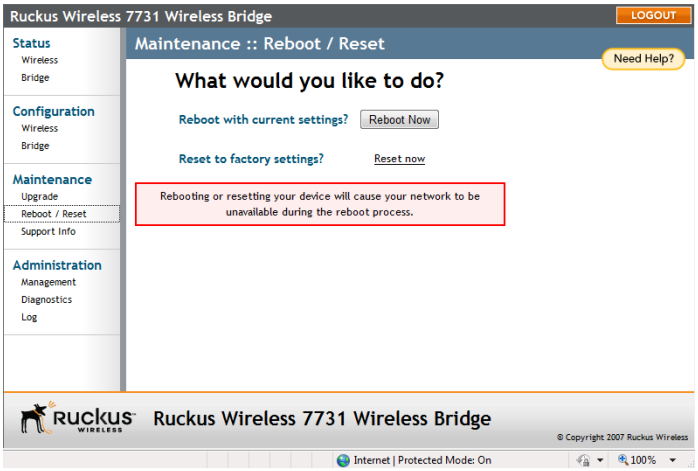
3. Click **OK** to continue.
4. Click **Update Settings** to confirm changes.
5. A message indicating that your parameters were saved and a reboot is required appears.

Figure 13. Your parameters were saved; reboot required



6. Go to **Maintenance > Reboot / Reset**, and click **Reboot Now**.

Figure 14. Reboot the wireless bridge to apply country code change



7. When the reboot is completed, log in again to continue making configuration changes.

CAUTION: Do not change the Channel setting until after the Country Code has been set for both units.

8. You have completed setting the Country Code. Continue to "Step 6: Change Optional Configuration Settings".

Step 6: Change Optional Configuration Settings

This section describes optional configuration settings that you can change prior to beginning the physical installation. These settings include:

- IP address
- Device name and location
- SSID, encryption method and passphrase
- Management VLAN
- Network management method

NOTE: Ruckus Wireless recommends leaving these settings at their default values until installation of both bridge units is complete. Note that any changes made to the root bridge settings must also be performed on the non-root bridge.

Change the IP Address

By default, the Ruckus Wireless ZoneFlex 7731 Wireless Bridge units come with DHCP enabled and will automatically acquire an IP address from a DHCP server if one is discovered on the network. If no DHCP server is found, the Root bridge and Non-Root bridge have pre-configured IP addresses assigned to prevent conflict. The default IP addresses for the two units are as follows:

Root Bridge: `192.168.2.1`

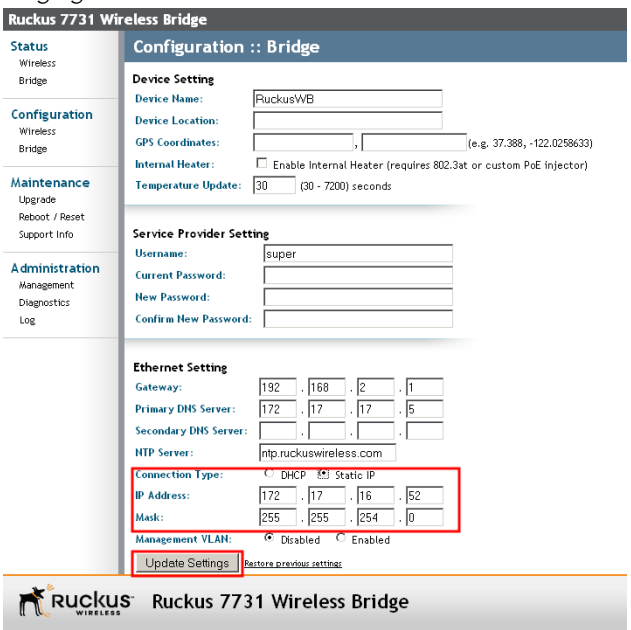
Non-Root Bridge: `192.168.2.254`

If you want to change the IP address of either or both of the pair, you can manually assign a static IP address on the **Configuration > Bridge** page in the Web interface.

CAUTION: If you assign static IP addresses, you must ensure that the IP addresses assigned are unique network-wide to prevent conflict.

To assign a static IP address, select the **Static IP** radio button after "Connection Type," and enter the desired address and subnet mask as shown in Figure 15.

Figure 15. Changing the IP address



Click **Update Settings** to confirm the changes.

You will need to re-enter the new IP address in your browser and login again to continue editing configuration options. The non-root bridge will automatically detect the new IP address of the root bridge and attempt to associate with it.

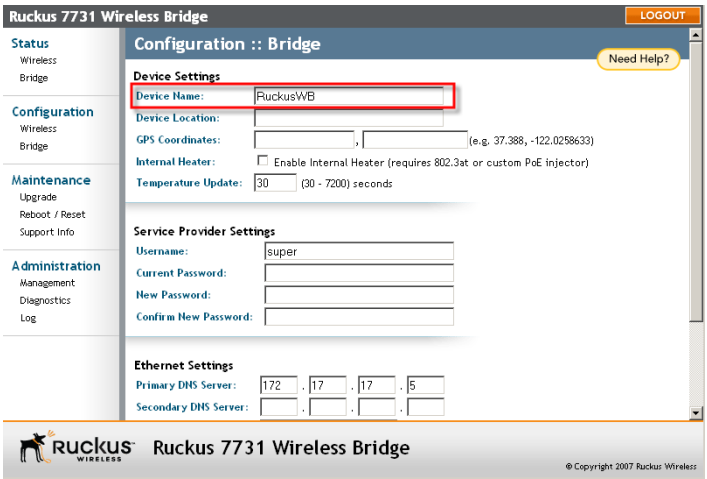
NOTE: This process may take several minutes. Do not unplug the ZoneFlex 7731 while it is updating its IP address.

Change Device Name, Location, User Name and Password

In addition to the IP address, you can also change the device name, location, login name and password on this page.

1. On the **Configuration > Bridge** page, replace the existing device name (default: "RuckusWB") with your preferred name for the device, as shown in Figure 16.

Figure 16. Changing the device name, location, user name and password

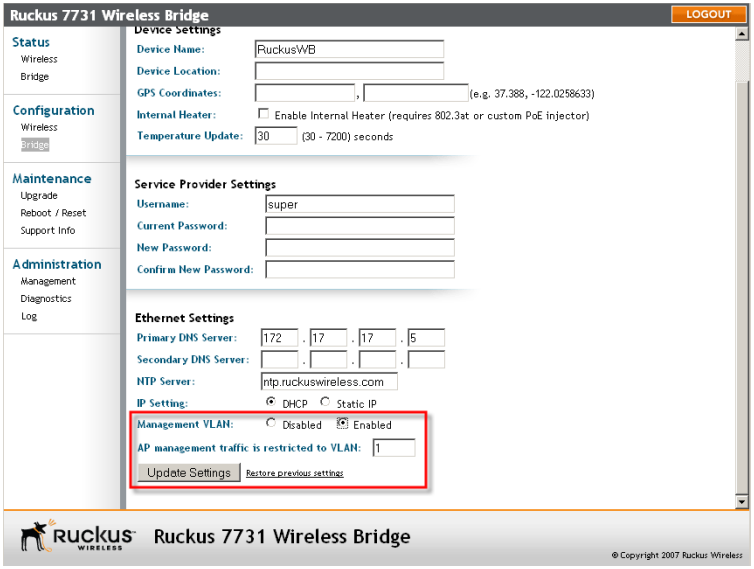


2. Enter a Device Location to easily identify the location of the unit.
3. Enter GPS coordinates for location management via FlexMaster.
4. Change the User Name and Password used to access the Web interface.
5. Click **Update Settings** to confirm changes.

Enable Management VLAN

If you would like to enable wireless bridge traffic to be part of an existing network management VLAN, you can set the Wireless Bridge's management VLAN to match your network via the **Configuration > Bridge** page, as shown in Figure 17.

Figure 17. Enable Management VLAN



Click **Enable** next to **Management VLAN** and enter the VLAN ID in the field below. Click **Update Settings** to confirm changes.

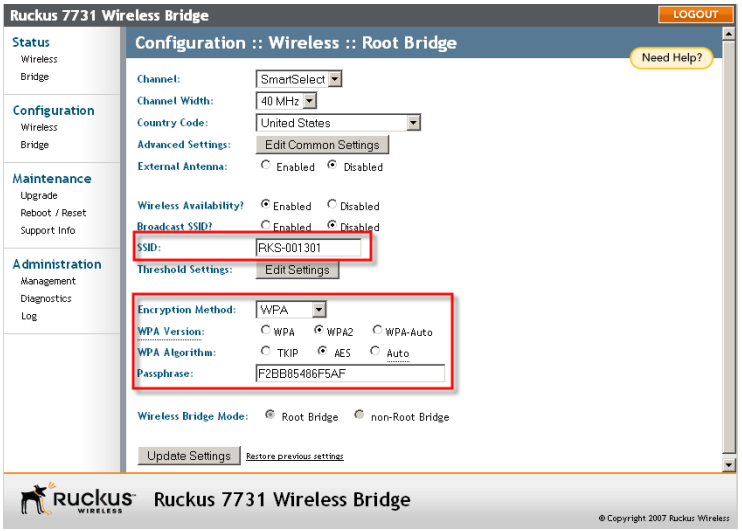
Change SSID and Encryption Method

NOTE: If these changes are made after the units are mounted, make the changes to the remote unit, whether it be Root or Non-Root, first to avoid loss of connection.

At factory default, the Root bridge will have a unique SSID and WPA-PSK passphrase which matches that of the Non-Root bridge. Changing these values will cause the two bridge units to be unable to communicate with one another unless the values match. To change the SSID, encryption method and passphrase, open the **Configuration > Wireless** page. Enter a unique SSID in the SSID field and click **Update Settings**, as shown in Figure 18.

NOTE: Write down all the entries made in this step, as you will need to reenter them later when you configure the non-root bridge.

Figure 18. Change SSID, encryption method and passphrase

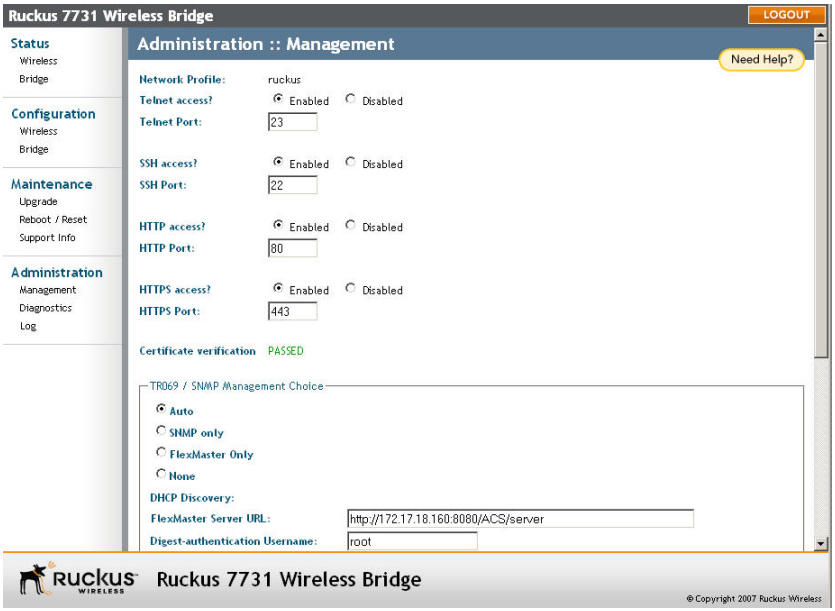


Configure Network Management Settings

The ZoneFlex 7731 Wireless Bridge can be managed remotely using either SNMP or Ruckus Wireless FlexMaster (TR069 protocol) server. To access the network management settings, click on **Administration > Management**.

By default, the network management method is set to **Auto**, meaning that the ZoneFlex 7731 will be managed by FlexMaster server if available, and by SNMP if no FlexMaster server is found on the network.

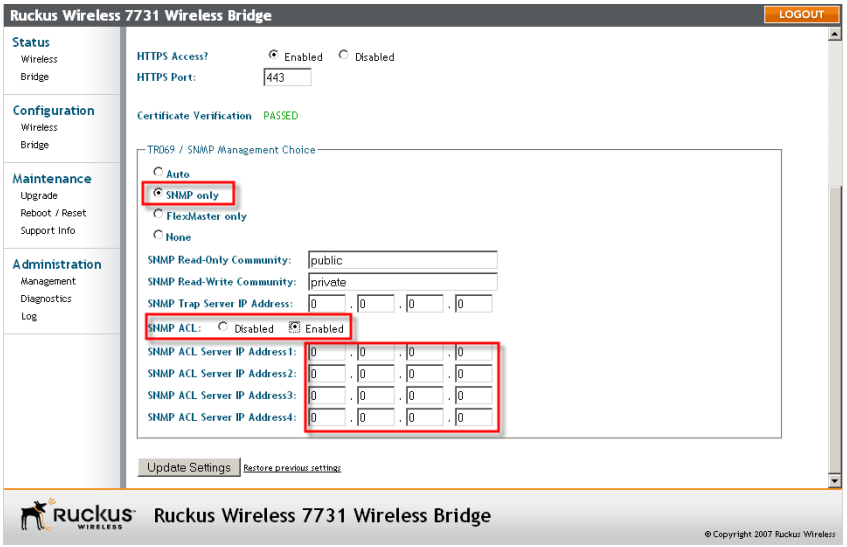
Figure 19. Administration :: Management page



If you want to manage the Wireless Bridge using SNMP even when a FlexMaster server is available, select **SNMP only** under "TR069/SNMP Management Choice," then enter the Read-Only/Read-Write Community information, along with the SNMP Trap server IP address in the appropriate spaces. Click **Update Settings** to confirm changes.

The **SNMP ACL** option allows you to restrict the number of devices that can access the Wireless Bridge for management purposes. If the SNMP ACL (access control list) is disabled, then any device on the network will be able to access the Wireless Bridge using SNMP commands.

Figure 20. Enable SNMP Access Control List



To restrict SNMP access to the Wireless Bridge:

1. On the **Administration > Management** page, click on **SNMP Only** under the heading "TR069 / SNMP Management Choice."
2. Select **Enabled** next to the "SNMP ACL" line.
3. Enter the IP addresses of up to 4 SNMP servers.
4. Click **Update Settings** to confirm changes.

For Flexmaster server management, refer to "(Optional) Set the FlexMaster Server Address" on page 60.

Step 7: Change Non-Root Bridge Configuration Settings

Repeat steps 1-6 for the Non-Root bridge for any changes you made to the Root bridge settings. If you did not make any changes, you only need to repeat step 1 to provide power and Ethernet to the non-root bridge, then proceed to Step 8: Test the Link Between the Bridges. Note that setting the Country Code for the Root Bridge requires that the same setting be made for the Non-Root Bridge.

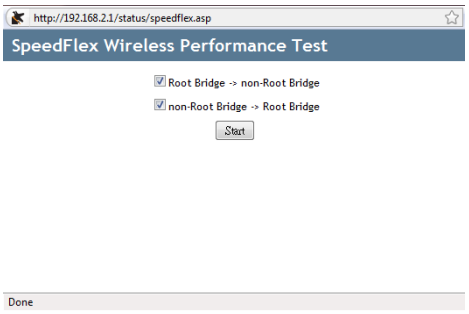
Step 8: Test the Link Between the Bridges

The SpeedFlex utility lets you test the data transfer speeds between the two bridge units. Click the SpeedFlex icon on the home page (**Status > Wireless**) to begin testing.

Figure 21. Launch the SpeedFlex utility to test the link between bridges

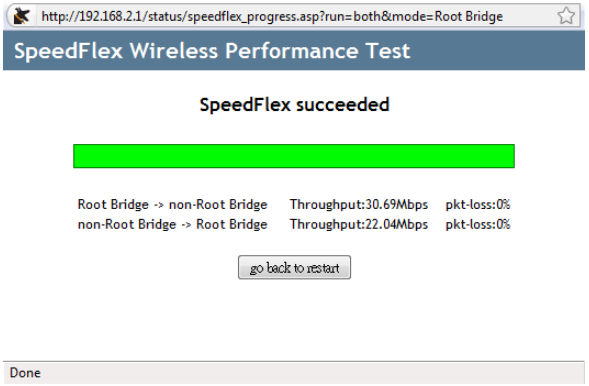
The SpeedFlex utility opens in another window. Press **Start** to begin testing both uplink and downlink performance, or deselect one of the check boxes to test only one direction.

Figure 22. SpeedFlex Wireless Performance Test



Performing both tests may take several minutes. When the test is finished, throughput and packet loss results are displayed, as shown in Figure 23.

Figure 23. SpeedFlex Results page



You have finished accessing and testing the link between the ZoneFlex 7731 Wireless Point to Point Bridge pair.

Step 9: Disconnect the Wireless Bridge from the Administrative Computer

1. Disconnect the Wireless Bridge from the power source (either from the PoE injector or DC power source).
2. Verify that the **PWR** LED on the back of the Wireless Bridge is off.
3. Disconnect the Ethernet cable from the administrative computer's Ethernet port.

Step 10: Restore the Administrative Computer's Network Settings

1. On your Windows XP or Windows 2000 computer, open the **Network Connections** (or **Network and Dial-up Connections**) control panel according to how the Start menu is set up:
   - On Windows XP, click **Start** > **Control Panel** > **Network Connections.**
   - On Windows 2000, click **Start** > **Settings** > **Network Connections**.
2. When the Network Connections window appears, right-click the icon for **Local Area Connection**, and then click **Properties**.
3. When the **Local Area Connection Properties** dialog box appears, select **Internet Protocol (TCP/IP)** from the scrolling list, and then click **Properties**. The **TCP/IP Properties** dialog box appears.
4. Restore the computer's network settings by typing the original IP address settings in the **TCP/IP Properties** dialog box.
5. On the **TCP/IP Properties** dialog box, click **OK** to close it.

6. Click **OK** again to close the **Local Area Connection Properties** dialog box.

You are now ready to begin the physical installation.

5 Provisioning and Associating the Wireless Bridge Pair (Optional)

Ruckus Wireless ZoneFlex 7731 Wireless Bridge units come in pre-provisioned pairs, and they will automatically associate with one another as soon as they are powered on. Therefore in most situations, you will not need to provision or associate the Root and Non-Root bridge.

However, if you need to reset either unit to its factory defaults, replace one of the units, or decide to switch which unit acts as the Root and the Non-Root bridge, you can use the following procedure to re-provision (re-assign one unit as the Root and one as the Non-Root bridge), and re-associate the link between the pair.

Auto Provisioning

The auto provisioning process is used to automatically designate one of the ZoneFlex 7731 units as the Root bridge and the other as the Non-Root bridge.

NOTE: The ZoneFlex 7731 Wireless Bridge units are shipped already paired so auto provisioning will not be needed in the field unless it becomes necessary to restore factory default settings.

Conduct the following procedure to automatically provision the root and non-root bridge:

1. Reset both units to their factory defaults, by either:

- Pressing and holding the **Reset** button in the bottom panel for at least 6 seconds
- Click **Reset Now** next to *"Reset to factory settings?"* on the **Maintenance > Reboot/ Reset** page in the Web interface

CAUTION: Do not reset the units to factory defaults once they are mounted in their permanent locations.

2. Connect two units together directly via an Ethernet cable and provide power to both units (you can power up and then connect OR connect and then power up both units).
3. The **LAN** LED on both units (LED 2) should be solid green, indicating that the units are connected to each other. At this point, if both units have been reset to factory defaults, neither has yet been specified as Root or Non-Root.

4. Once both units are powered on and physically connected, LED 5 and 6 (labeled **P0** and **P1**) on both units begin alternately blinking, indicating that provisioning is in process. This process takes about 10 to 20 seconds.
5. Simultaneous rapid blinking of these two LEDs indicates that provisioning is complete.
6. After provisioning is complete, LED 4 (**ROLE**) indicates which unit is the Root and Non-Root unit. The **ROLE** LED is solid yellow for the Root bridge while the Non-Root bridge's **ROLE** LED is OFF.
7. Take note of which unit is the Root bridge and which is the Non-Root bridge.
8. When the auto provisioning process completes, a reboot is triggered by disconnecting the Ethernet cable. During the reboot only the bottom LED, **PWR** is lit. Once the reboot completes you will see activity on the **WLAN** LED, indicating wireless communication between the pair.
9. Because the units were reset to factory defaults before provisioning, you will need to re-set the Country Code to your location on both units (unless purchased in the United States). See "Step 5: Change the Country Code" on page 2-20.

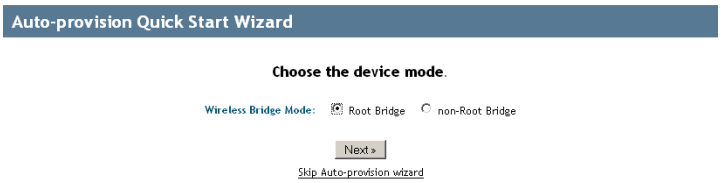
Manual Provisioning Using the Web Interface

The ZoneFlex 7731 Wireless Bridge units can also be manually provisioned using the Web interface.

The procedure for Web based provisioning is as follows:

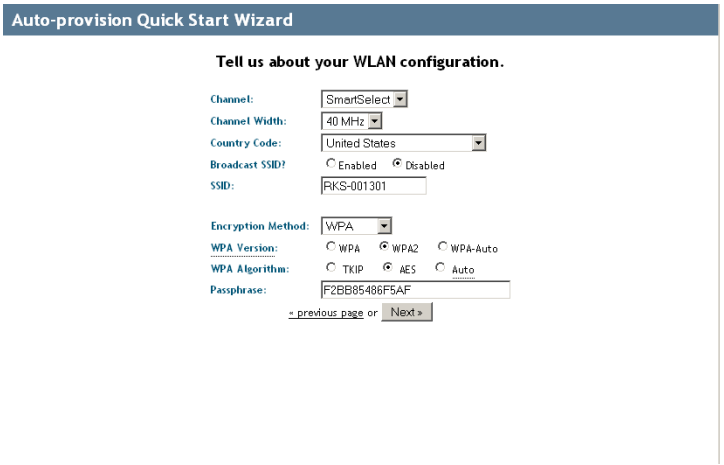
1. Log in to the Web interface of the unit that you will designate as the Root bridge.
2. If the unit has been reset to factory defaults, the Provisioning Quick Start Wizard will launch automatically immediately after login, as shown in Figure 24.

Figure 24. Provisioning Quick Start Wizard



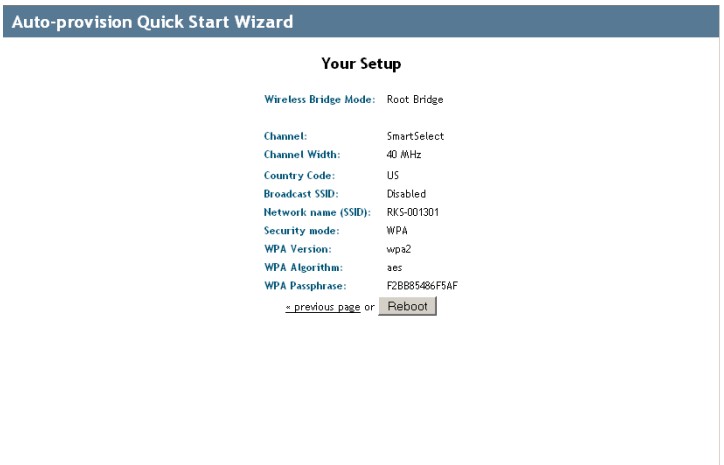
3. Select **Root Bridge** and click **Next** to continue.
4. Adjust settings on the WLAN configuration page if necessary, and click **Next** to continue.

Figure 25. WLAN Configuration options



5. Set the Country Code to your location. Do not change any of the settings under Channel, Channel Width, or Broadcast SSID at this time.
6. Write down the SSID, encryption settings and Passphrase, as you will need to enter these values when you provision the Non-Root bridge.

Figure 26. Reboot after completing the Provisioning Wizard



7. Click **Reboot** to confirm changes and reboot the bridge.

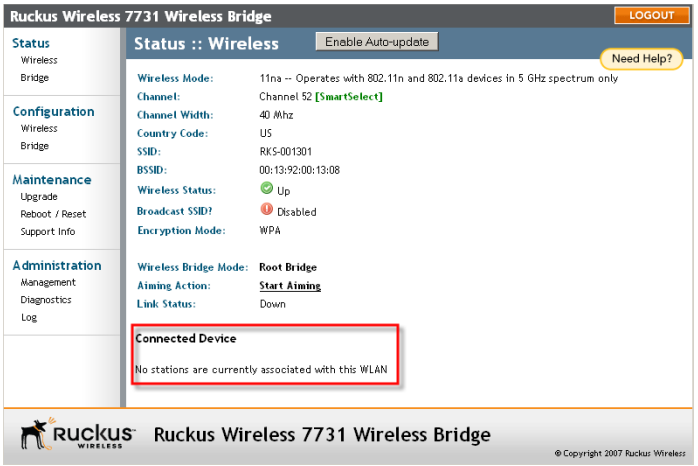
8. Repeat steps 2-7 for the non-root bridge, selecting **Non-Root Bridge** on Step 3, and making sure you enter the same values on the **WLAN Configuration** page as those of the root bridge.

You have finished manually provisioning the wireless bridge pair.

Associating

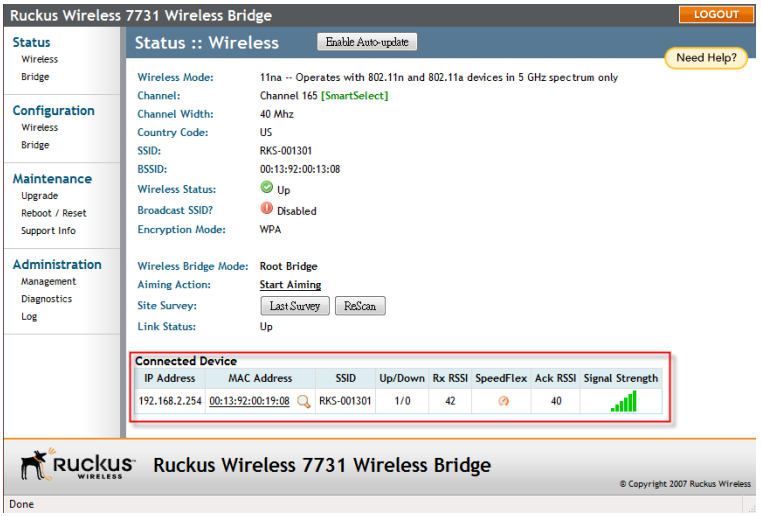
Once the bridge pair has been provisioned, verify that they have associated with one another. If no association between the two bridge units has been established, the following will be displayed:

Figure 27. No association established



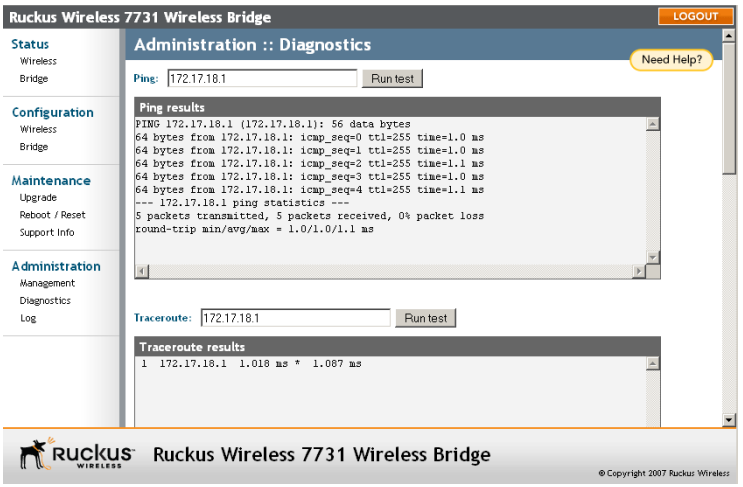
The units will automatically associate with one another after about 1 to 2 minutes. Once the association is complete, the page will refresh and the **Connected Device** information will be displayed, as shown:

Figure 28. Association established



If no association is established after a few minutes, the Web interface provides several tools for diagnosing the problem, which can be found on the **Administration > Diagnostics** page. Tools include Ping, Traceroute, Show ARP Table and Show FDB Table.

Figure 29. Administration :: Diagnostics page



6 Physical Installation

Prepare the Required Hardware and Tools

You must supply the following tools and equipment:

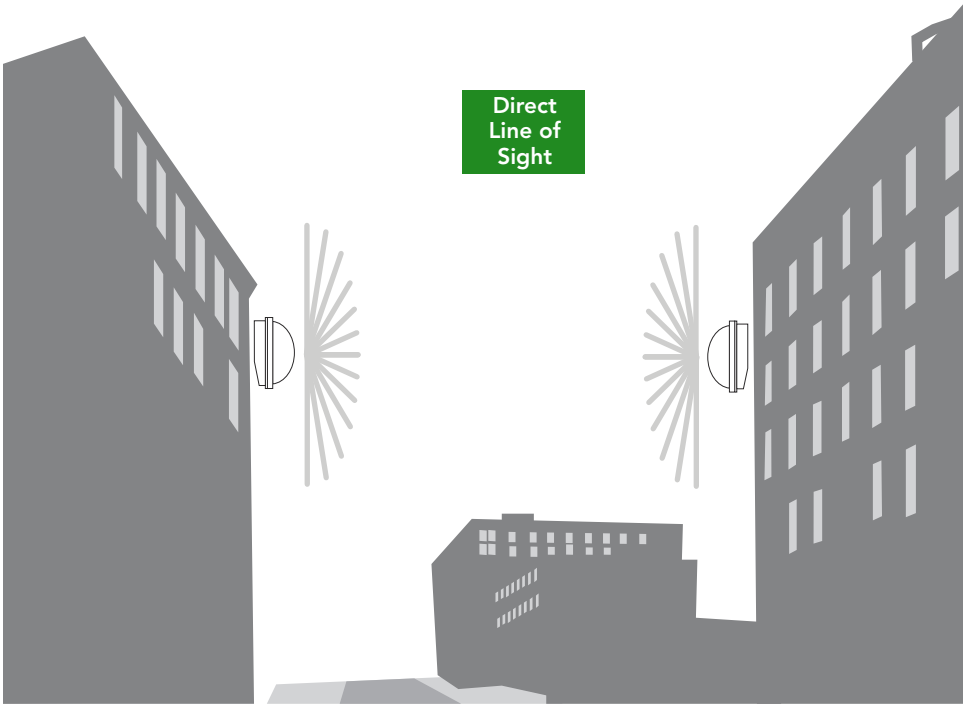
- A notebook or desktop computer running Windows XP/2000/Vista and installed with one Ethernet card
- 6mm flathead screwdriver
- 6mm Phillips screwdriver
- 10mm ratchet wrench
- 3mm Phillips screwdriver (if you will be using DC power)
- Electric drill with 8mm drill bit (if mounting on a flat surface)

Determine the Optimal Mounting Location and Orientation

The location and orientation that you choose for the Wireless Bridge play a critical role in the performance of your wireless network. In general, Ruckus Wireless recommends installing Wireless Bridges away from obstructions and sources of interference and ensuring that the Wireless Bridges are in direct line of sight of one another.

NOTE: Ruckus Wireless recommends installing the Root bridge on the network side of the bridged link and the Non-Root bridge on the remote side.

Figure 30. Recommended orientation for optimal performance



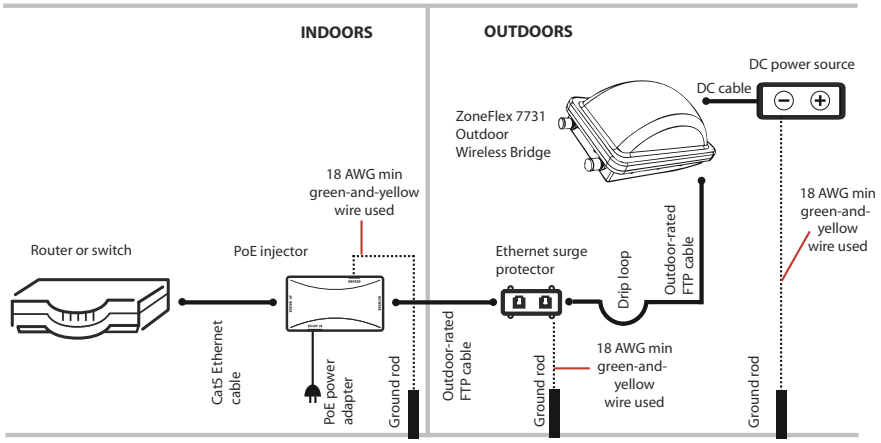
Become Familiar with the Installation Components

The ZoneFlex 7731 Wireless Bridge is designed for installation in an outdoor environment, such as an exterior wall, or the roof overhang of a building, or a streetlight pole. Refer to Figure 31 for the components involved in a typical installation.

Take note of the components that must be installed indoors and outdoors. The PoE injector and power adapter that are shipped with the Wireless Bridge are for indoor use only.

Ruckus Wireless also strongly recommends that you form a drip loop on any cable that is connected to devices that are installed outdoors (for example, the Wireless Bridge and the Ethernet surge protector).

Figure 31. Typical installation components using both PoE and DC power sources



WARNING: Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

WARNING: Installation of this equipment must comply with local and national electrical codes.

CAUTION: Make sure that you form a 3”-5” drip loop in any cable that will be placed outdoors. This will prevent water from running along the cable and entering the Wireless Bridge, the surge protector or the building where the cable terminates.

CAUTION: Be sure that grounding is available and that it meets local and national electrical codes. For additional lightning protection, use lightning rods and lightning arrestors.

WARNING: The Ruckus Wireless PoE injector (if supplied with your Wireless Bridge) is for indoor use only. Never mount the PoE injector outdoors with the Wireless Bridge.

Decide How You Will Supply Power to the Wireless Bridge

The Wireless Bridge supports Power over Ethernet (PoE) and 12 VC DC power and can be connected to both power sources at the same time. If you connect the Wireless Bridge to both PoE and DC power sources at the same time, it will use PoE as the primary power source and DC power as the backup power source.

Deploying the Wireless Bridge

In this step, you will connect the Wireless Bridge to the network from its mounting location.

Step 1: Complete the Power Connections

Ruckus Wireless recommends using both PoE and DC power for backup in a typical outdoor installation. For instructions on completing the power connection that you need to make, refer to the procedures below:

- Use Power Over Ethernet
- Use DC Power

Use Power Over Ethernet

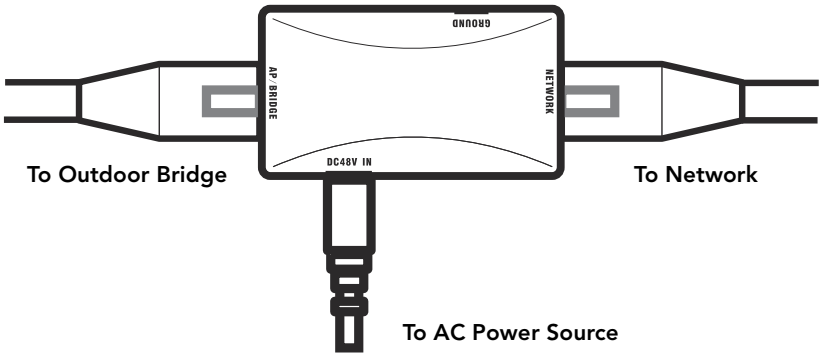
1. Take out the PoE injector and the power adapter from the Wireless Bridge package.
2. Obtain three Ethernet cables. Two of these Ethernet cables must be outdoor-rated.
3. Connect one end of the *outdoor-rated* Ethernet cable to the **RJ45** port on the Wireless Bridge, and then connect the other end to the Ethernet surge protector.
4. Connect one end of another Ethernet cable to another port on the Ethernet surge protector, and then connect the other end to the **AP/BRIDGE** port on the PoE injector.

NOTE: Install the Ethernet surge protector between the Wireless Bridge and the PoE injector and use two outdoor-rated Ethernet cables for the connections. See Figure 31 for an example.

5. Connect one end of the other Ethernet cable to the **NETWORK** port on the PoE injector, and then connect the other end to your network.
6. Connect the power jack to the **DC 48V IN** connector on the PoE injector.

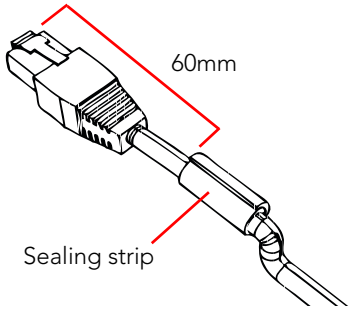
WARNING: Do not apply power to the Wireless Bridge at this point. You should connect the Wireless Bridge to a power source only after you finish connecting all other components in "Step 3: Connect the Wireless Bridge to the Network" on page 44.

Figure 32. Connect the Ethernet cables and power adapter to the PoE injector



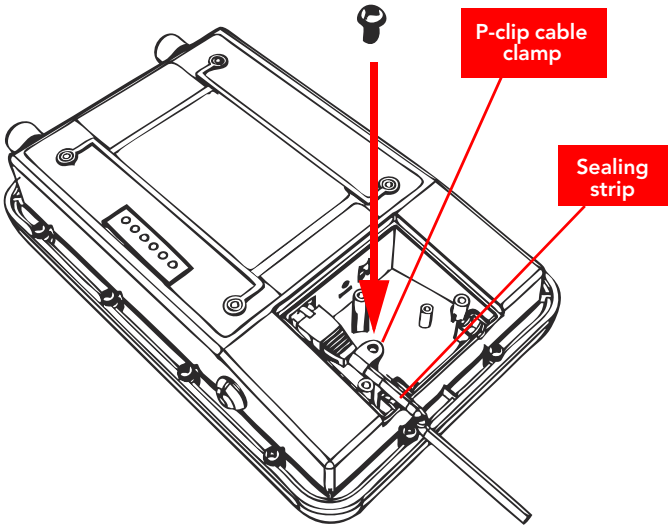
7. Take out one of the 20mm x 30mm sealing strips from the accessories bag.
8. Remove the adhesive backing from the sealing strip.
9. Wrap the sealing strip around the Ethernet cable, about 60mm from the Ethernet connector.

Figure 33. Wrap the sealing strip around the Ethernet cable, 60mm from the Ethernet connector



10. Place the Ethernet cable in the cavity on the enclosure, and then press it into position. Make sure the sealing strip protrudes beyond the entry and exit points.
11. Wrap the white P-clip cable clamp around the Ethernet cable, and then fasten it to the Wireless Bridge chassis using one of the short machine screws supplied.

Figure 34. Install the white P-clip clamp



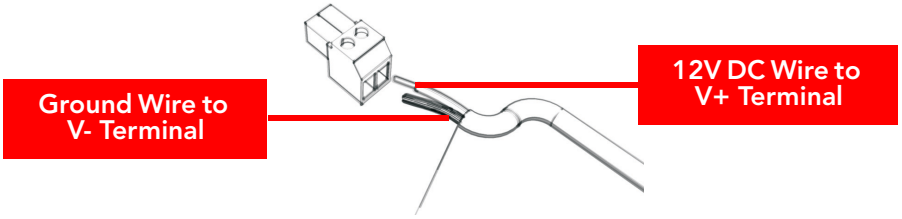
You have completed setting up the PoE power connection.

Use DC Power

To use DC to power the Wireless Bridge, you need to connect a DC cable (not supplied with the Wireless Bridge) to the DC terminal block.

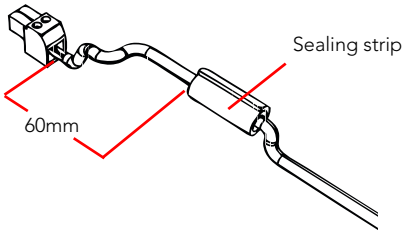
1. Take out the DC terminal block from the small plastic bag that contains the bottom cover of the Wireless Bridge.
2. Connect the DC cable's ground wire to V- terminal. If you are looking at the terminal block with the wiring terminal screws on top, the V- terminal is on the *left side*.
3. Connect the DC cable's +12V DC wire to the V+ terminal. If you are looking at the terminal block with the wiring terminal screws on top, the V+ terminal is on the *right side*.

Figure 35. Connect the ground wire to the V- terminal and the +12V DC wire to the V+ terminal



4. Using a 3mm Phillips screw, tighten the wiring terminal screws. Screw torque value must be 20.5 mN-m ± 2 mN-m.
5. Take out one of the 20mm x 30mm sealing strips from the accessories bag.
6. Remove the adhesive backing from the sealing strip.
7. Wrap the sealing strip around the DC cable, about 60mm from the DC terminal block.

Figure 36. Wrap the sealing strip around the DC cable, 60mm from the DC terminal block



8. Connect the DC terminal block to the **12V DC** port on the Wireless Bridge.
9. Place the DC cable into the right cable groove on the enclosure, and then press it into position. Make sure the sealing strip protrudes beyond the entry and exit points.
10. Wrap the white P-clip cable clamp around the DC cable, and then fasten it to the Wireless Bridge chassis using one of the short machine screws supplied with the Wireless Bridge.