



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

Getting Started Guide

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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 Outdoor AP/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 Outdoor AP/Point to Point 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.



NOTE: The ZoneFlex 7731 Outdoor AP/Bridge standard package includes a pair of ZoneFlex 7731 devices (a root bridge and a non-root bridge). Two sets of mounting and power accessories are included, along with one set of user documentation.

Package Contents

The ZoneFlex 7731 Wireless Bridge package contains two ZoneFlex 7731 units and two sets of accessories (one for each unit). It should contain all of the items listed below:

- One ZoneFlex 7731 Outdoor Point to Point Wireless Bridge (labeled “Root Bridge”)
- One ZoneFlex 7731 Outdoor Point to Point Wireless Bridge (labeled “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*

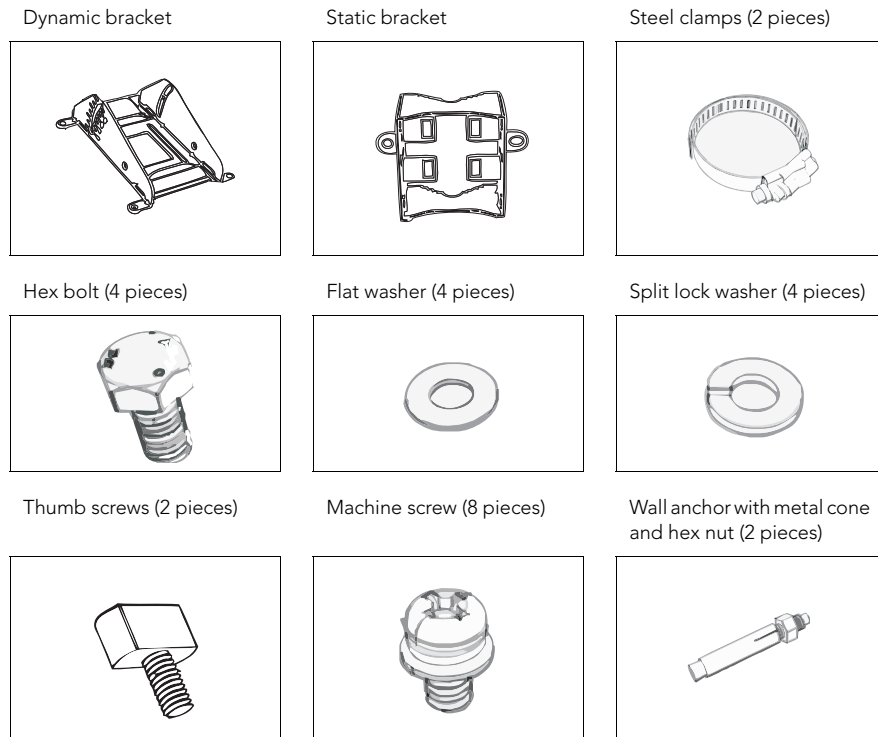


WARNING: The Ruckus Wireless PoE injector and power adapter (if supplied with your Wireless Bridge) are for indoor use only. Never mount the PoE injector and power adapter outdoors with the Wireless Bridge.

Mounting Kit Contents

- 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

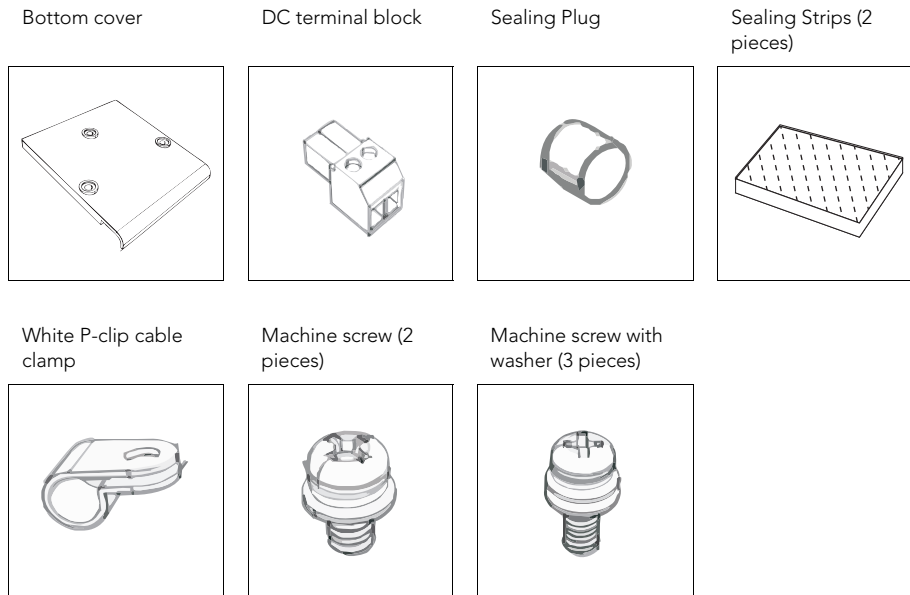


Bottom Cover and Accessories

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 clamp (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 computer running Windows 2000/XP/Vista and installed with one wireless 802.11b/g network card and 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)



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.

Before You Begin

Get to Know the Hardware Features

Figure 3. Wireless Bridge LEDs and bottom connectors

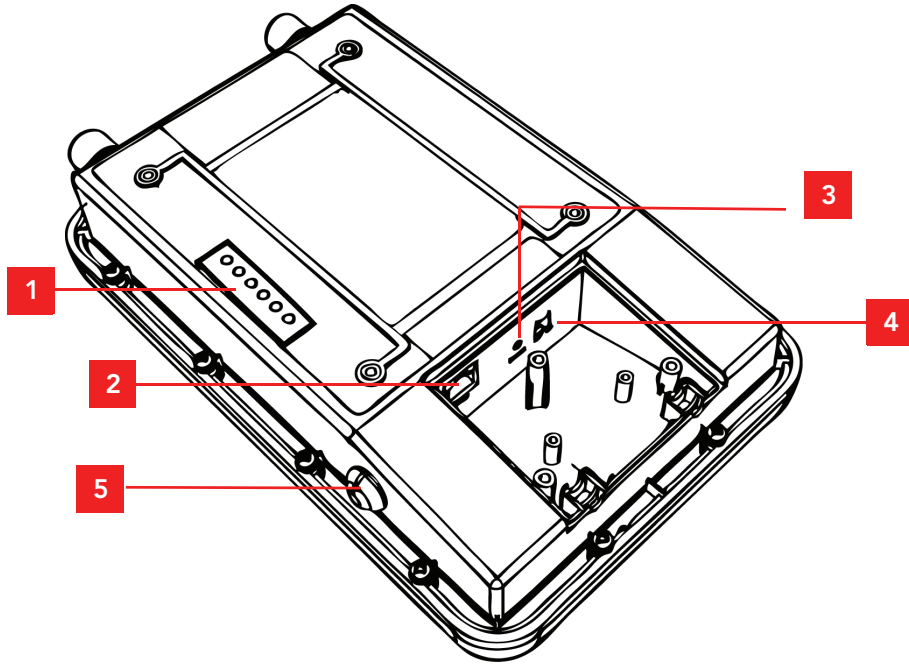


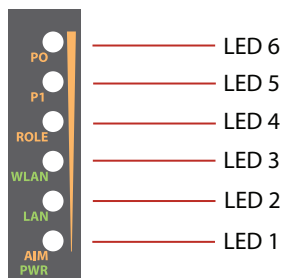
Table 1. LEDs and bottom panel connectors

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	<p>Using a pointed object (for example, a pen), press this button to restart the Wireless Bridge or to restore it to factory default settings:</p> <ul style="list-style-type: none"> • 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. <p><i>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.</i></p>
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 2](#).
- For *Aiming Mode* LED states and what they indicate, refer to [Table 3](#).

Normal Operation Mode

Table 2. 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

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

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).

Aiming Mode

Table 3. 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 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.

Push Buttons

The ZoneFlex 7731 includes two push buttons:

- A recessed factory default reset button
- A large blue Aiming Mode button that sets the bridge to Aiming Mode

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.

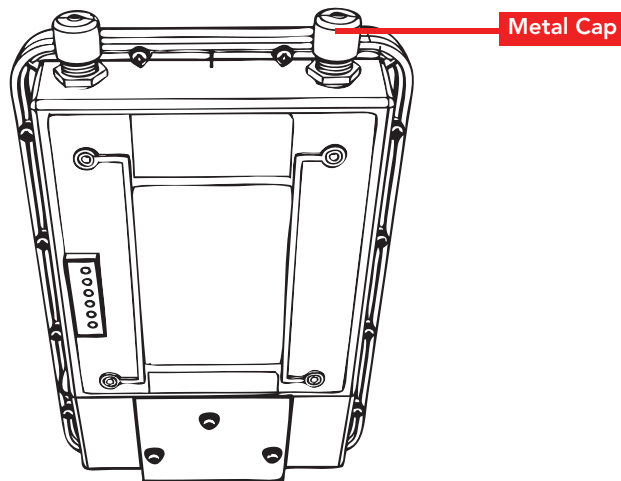


CAUTION: Resetting the ZoneFlex 7731 to its factory defaults will result in loss of all configuration settings, including the pre-provisioning (pairing of the root and non-root bridge) settings that were enabled prior to shipping. If you do need to reset to defaults, you will need to re-provision the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

External Antennas

The ZoneFlex 7731 Outdoor Wireless Bridge includes one purpose designed internal directional antenna. If you want to extend the range of your wireless network, you can connect two external high gain antennas to the standard N-type external antenna connectors on the top panel of the Wireless Bridge. The antennas 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 Antennas \(Optional\)”](#) on [page 44](#).

Figure 5. The antenna connectors are protected by metal caps



4 Preparing the Wireless Bridge Pair for Installation

This section describes the procedures for setting up the bridge pair before you begin the physical installation.

ZoneFlex 7731 Outdoor Point to Point Bridges come in pre-provisioned pairs. One is designated as the “*Root Bridge*” and one is designated the “*Non-Root Bridge*.” Therefore, in most situations, you should not need to manually provision the pair. If you do need to provision (after restoring factory default settings, for example), see the *ZoneFlex 7731 User Guide* available on the Ruckus Wireless Support Web site for detailed instructions.

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

If you want to assign different IP addresses for either or both units, see [“Step 4: Change the IP Address \(Optional\)”](#) on [page 19](#).

A summary of the steps in this section is below:

1. Connect Ethernet and power to both units.
2. Access the units using an administration computer.
3. Ensure network and wireless settings are correct.
4. Change the IP address (optional).
5. Use the SpeedFlex tool built into the Web interface to test the link between the units.

What You Will Need

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

- An administrative computer (notebook computer) running Microsoft Windows Vista/XP/2000
- Mozilla Firefox 2.0 (or later) or Microsoft Internet Explorer 6.0 (or later) installed on the administrative computer
- One 5.6mm-6.0mm (outside diameter) Cat5e foil screened twisted pair (FTP) solid cable
- 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

Configure the Root Bridge

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](#)

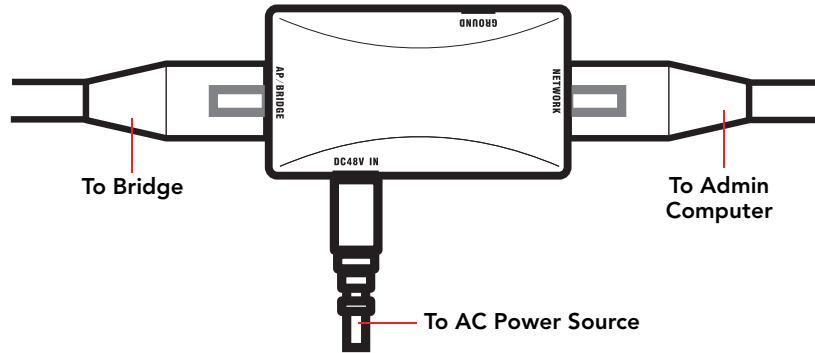


NOTE: You only need to connect one type of power source at this point, even if you are planning to use both PoE and DC power in your final deployment.

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



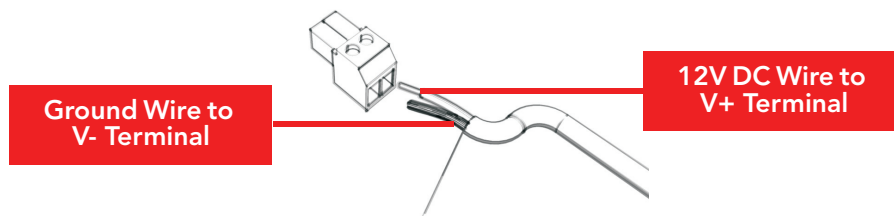
You have completed connecting the Wireless Bridge to a PoE power source.

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

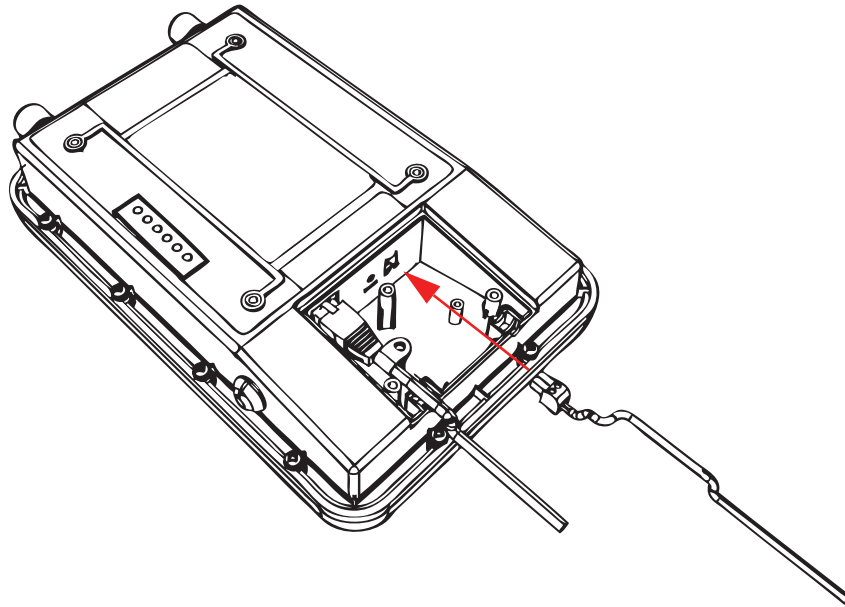


Preparing the Wireless Bridge Pair for Installation

Configure the Root Bridge

- Using a 3mm Phillips screw, tighten the wiring terminal screws. Screw torque value must be 4kg-5kg.
- 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



- 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.

- 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 4](#). For a sample configuration, refer to [Figure 9](#).

Table 4. 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, which is already used by the bridge)
Subnet mask	255 . 255 . 255 . 0
Default gateway	192 . 168 . 2 . 1
Preferred DNS server	192 . 168 . 2 . 1

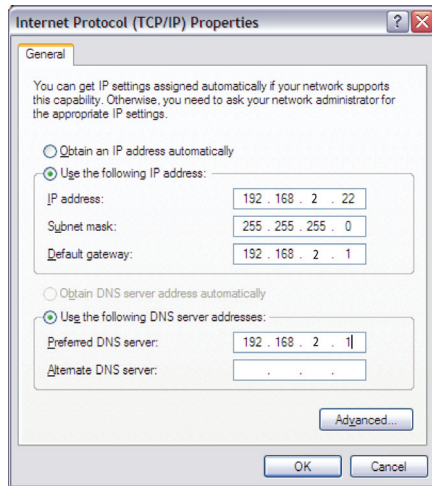
You can leave the **Alternate DNS server** box blank.

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.

Preparing the Wireless Bridge Pair for Installation

Configure the Root Bridge

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



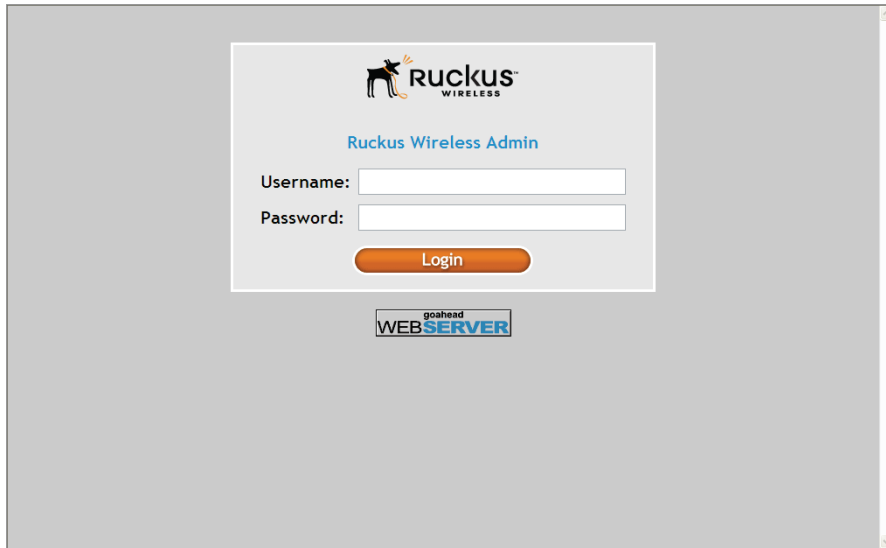
Step 3: Connect the Wireless Bridge to the Admin Computer

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 13](#)).

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

Ruckus 7731 Wireless Bridge

Status :: Wireless Enable Auto-update

Status
Wireless
Bridge

Configuration
Wireless
Bridge

Maintenance
Upgrade
Reboot / Reset
Support Info

Administration
Management
Diagnostics
Log

Wireless Mode: 11na -- Operates with 802.11n and 802.11a devices in 5 GHz spectrum only

Channel: Channel 52 [SmartSelect]

Channel Width: 40 Mhz

Country Code: US

SSID: RKS-001301

BSSID: 00:13:92:00:13:08

Wireless Status: Up

Broadcast SSID? Disabled

Encryption Mode: WPA

Wireless Bridge Mode: Root Bridge

Aiming Action: [Start Aiming](#)

Link Status: Up

Connected Device:

IP Address	MAC Address	SSID	Rx RSSI	SpeedFlex	Ack RSSI	Signal Strength
172.17.16.96	00:13:92:00:19:08	RKS-001301	46		34	

RUCKUS WIRELESS Ruckus 7731 Wireless Bridge

- Continue to [“Step 3: Ensure Network and Wireless Settings are Correct”](#).

Step 3: Ensure Network and Wireless Settings are Correct

On the **Configuration > Wireless** page, ensure that the following settings are correct:

- Channel:** SmartSelect
- Country Code:** If your location is other than the United States, change the country code to the correct location.
- Wireless Availability:** Enabled
- Broadcast SSID:** Disabled



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.

Step 4: Change the IP Address (Optional)

The Ruckus Wireless ZoneFlex 7731 Wireless Bridge pair comes with IP addresses pre-assigned. 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, or allow dynamic IP assignment using a DHCP server.

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 12](#).

Figure 12. Changing the IP address

Ruckus 7731 Wireless Bridge

Configuration :: Bridge

Device Setting

Device Name:

Device Location:

GPS Coordinates: , (e.g. 37.368, -122.0258633)

Internal Heater: Enable Internal Heater (requires 802.3at or custom PoE injector)

Temperature Update: (30 - 7200) seconds

Service Provider Setting

Username:

Current Password:

New Password:

Confirm New Password:

Ethernet Setting

Gateway: . . .

Primary DNS Server: . . .

Secondary DNS Server: . . .

NTP Server:

Connection Type: DHCP Static IP

IP Address: . . .

Mask: . . .

Management VLAN: Disabled Enabled

Ruckus WIRELESS Ruckus 7731 Wireless Bridge

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.

Configure the Non-Root Bridge (Optional)

If you want to change the IP address or other wireless settings for the non-root bridge, repeat steps 1-4. If not, you only need to repeat step 1 to provide power to the non-root bridge, then proceed to [Step 5: Test the Link Between the Bridges](#).

Step 5: 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 13. Launch the SpeedFlex utility to test the link between bridges

The screenshot shows the configuration page for a Ruckus 7731 Wireless Bridge. The page is divided into several sections: Status, Configuration, Maintenance, and Administration. The 'Status :: Wireless' section is active, displaying various settings and a table of connected devices. A red box highlights the 'SpeedFlex' column in the 'Connected Device' table, which shows a status icon for the device at IP 172.17.16.96.

Ruckus 7731 Wireless Bridge

Status :: Wireless Enable Auto-update

Wireless Mode: 11na -- Operates with 802.11n and 802.11a devices in 5 GHz spectrum only
Channel: Channel 52 [SmartSelect]
Channel Width: 40 Mhz
Country Code: US
SSID: RKS-001301
BSSID: 00:13:92:00:13:08
Wireless Status: Up
Broadcast SSID? Disabled
Encryption Mode: WPA

Wireless Bridge Mode: Root Bridge
Aiming Action: Start Aiming
Link Status: Up

Connected Device:

IP Address	MAC Address	SSID	Rx RSSI	SpeedFlex	Ack RSSI	Signal Strength
172.17.16.96	<u>00:13:92:00:19:08</u>	RKS-001301	41		29	

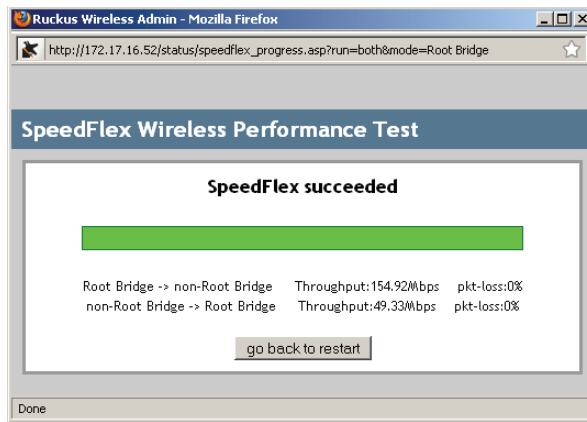
Ruckus WIRELESS Ruckus 7731 Wireless Bridge

The SpeedFlex utility opens in another window. Performing both tests may take several minutes. When the test is finished, throughput and packet loss results are displayed, as shown in [Figure 14](#).

Preparing the Wireless Bridge Pair for Installation

Configure the Non-Root Bridge (Optional)

Figure 14. SpeedFlex Results page



You have finished configuring and testing the ZoneFlex 7731 Wireless Outdoor Point to Point Bridge pair.

Step 6: 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 7: 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 Physical Installation

Prepare the Required Hardware and Tools

You must supply the following tools and equipment:

- A notebook computer running Windows XP/2000 and installed with one wireless 802.11b/g/n network card and 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)

Perform a Site Survey

Before installing the Wireless Bridge, perform a site survey to determine the optimal Wireless Bridge placement or maximum range, coverage, and network performance.

When performing a site survey, consider the following factors:

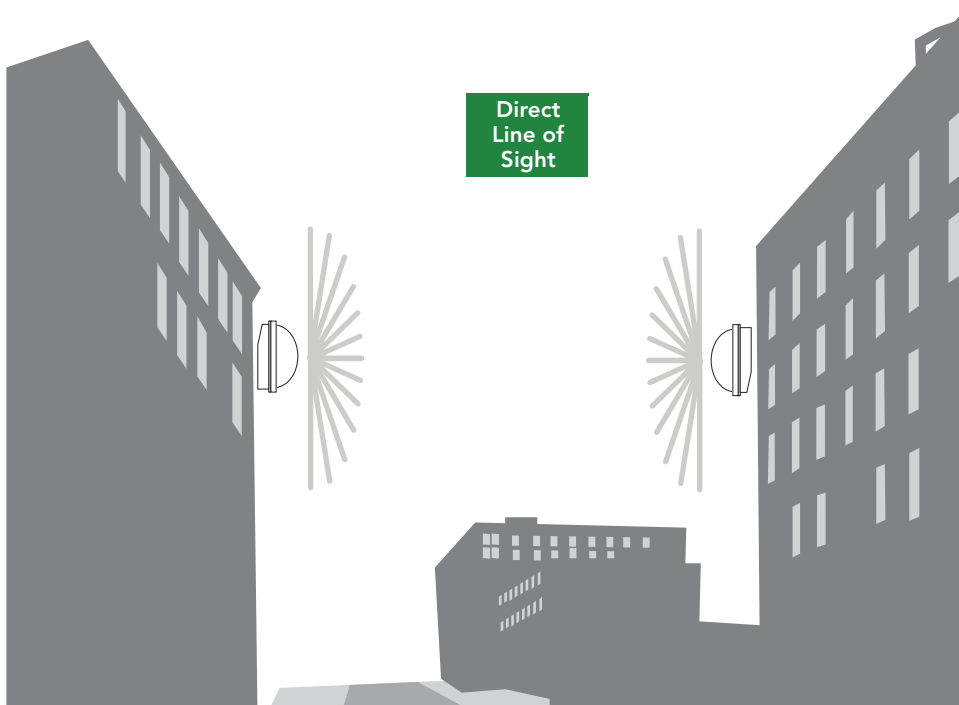
- *Data rates:* Range is generally inversely proportional to data rates. The maximum radio range is achieved at the lowest workable data rate. Higher data rates will generally be achieved at closer distances.
- *Line of sight:* Bridging two networks together with Ruckus Wireless Bridges requires direct line of sight between the two bridges for best results. Physical obstructions, such as concrete pillars, steel beams, trees or other buildings can block or hinder wireless communication. Wherever possible, ensure that there is direct line of sight between the two Wireless Bridges and that obstructions are unlikely to break line of sight.
- *Antenna configuration:* Proper antenna configuration is a critical factor in maximizing radio range. As a general rule, radio range is increased by mounting the radio higher off of the ground (for recommended orientation examples, refer to [Figure 15](#) on page 25).
- *Physical environment:* Clear or open areas provide better radio range than closed or filled areas. The less cluttered the operating environment, the greater the wireless range.
- *Signal interference:* A number of machines and electronic devices that emit radio waves – cranes, wireless phones, microwave ovens, satellite dishes – interfere with and block wireless signals. Building materials used in construction also influence radio signal penetration. For example, drywall construction permits greater range than concrete blocks.

For more Wireless Bridge placement guidelines, refer to [“Determine the Optimal Mounting Location and Orientation”](#).

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.

Figure 15. 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 16](#) for the components involved in a typical installation.

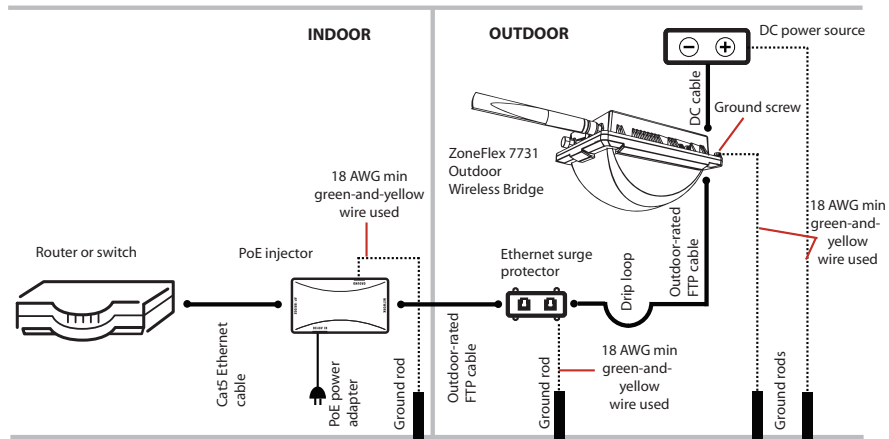
Physical Installation

Become Familiar with the Installation Components

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 16. 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.

6 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

The Wireless Bridge supports both PoE and DC power and it can be connected to both power sources at the same time. 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.



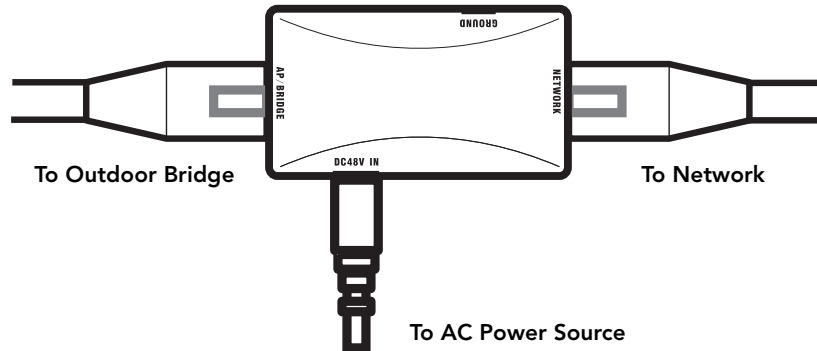
NOTE: Install the Ethernet surge protector between the Wireless Bridge and the PoE injector and use two outdoor-rated Ethernet cables for the connections. See [Figure 16](#) for an example.

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.
-



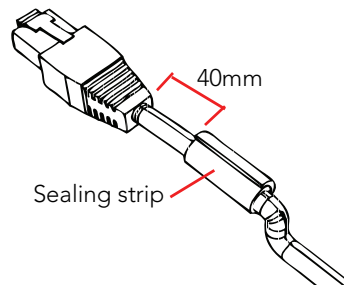
WARNING: Do not apply power to the Wireless Bridge at this point. You should connect the Wireless Bridge to a power source only after you finish connecting all other components in "[Step 3: Connect the Wireless Bridge to the Network](#)" on [page 33](#).

Figure 17. 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 40mm from the Ethernet connector.

Figure 18. Wrap the sealing strip around the Ethernet cable, 40mm from the Ethernet connector

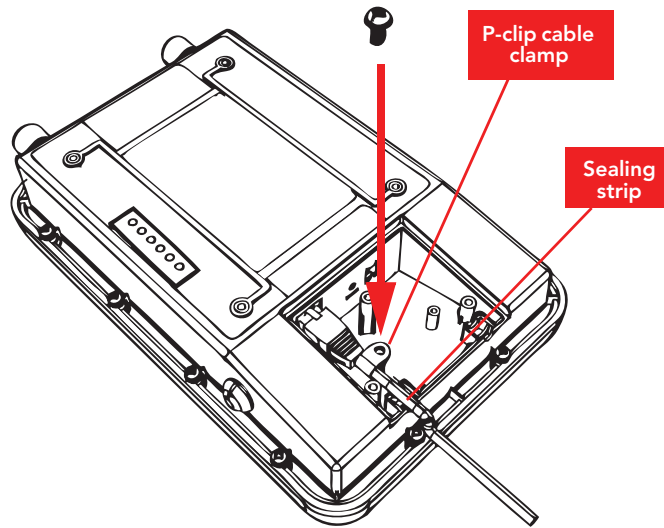


10. Place the Ethernet cable in the cavity on the enclosure, and then press it into position. Make sure the sealing strip protrudes beyond the entry and exit points.
11. Wrap the white P-clip cable clamp around the Ethernet cable, and then fasten it to the Wireless Bridge chassis using one of the short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

Deploying the Wireless Bridge

Step 1: Complete the Power Connections

Figure 19. Install the white P-clip clamp



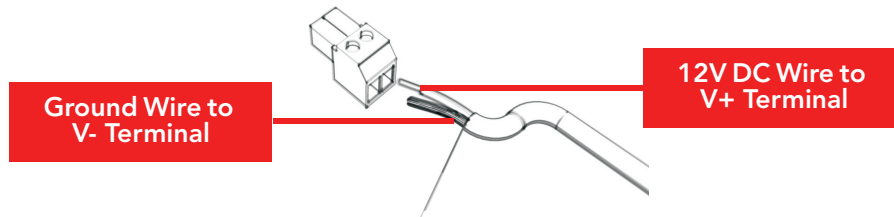
You have completed setting up the PoE power connection.

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.

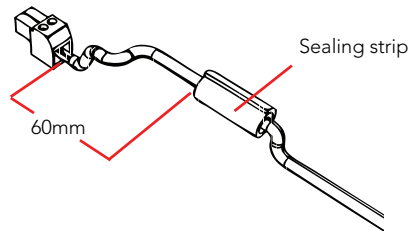
1. Take out the DC terminal block from the small plastic bag that contains the bottom cover of the Wireless Bridge.
2. Connect the DC cable's ground wire to V- terminal. If you are looking at the terminal block with the wiring terminal screws on top, the V- terminal is on the *left side*.
3. Connect 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 20. 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 4kg-5kg.
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 21. 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.

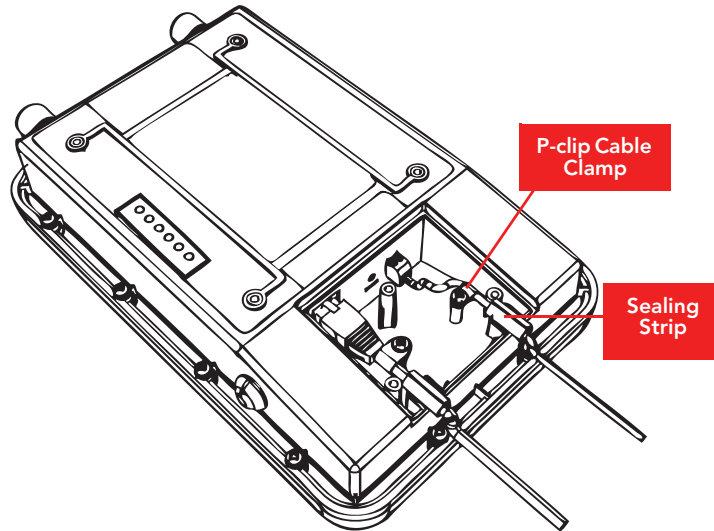
Deploying the Wireless Bridge

Step 2: Install the Back Panel Cover



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 33](#).

Figure 22. Install the white P-clip cable clamp



CAUTION: If you are not connecting the DC cable to the DC terminal block, make sure you cover the right cable groove with the supplied sealing plug.

You have completed setting up the DC power connection.

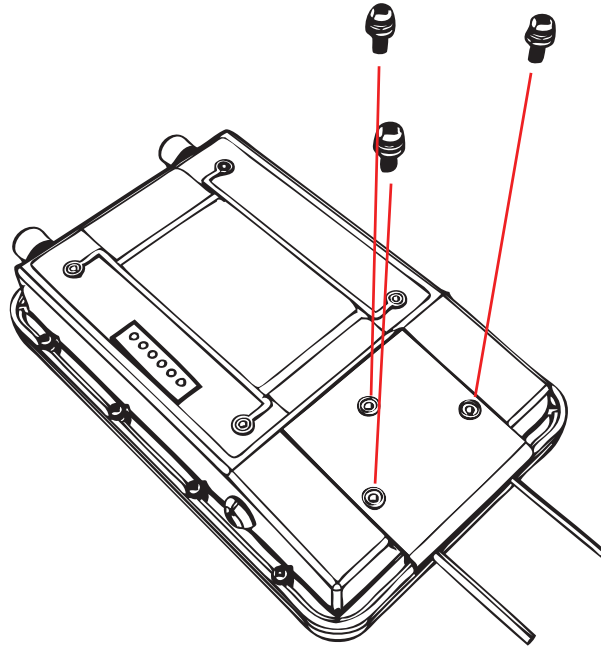
Step 2: Install the Back Panel Cover

Place the bottom cover of the Wireless Bridge onto the bottom section, and then fasten it using the three machine screws that are supplied with the Wireless Bridge.



CAUTION: Before installing the bottom cover, verify that the perimeter rubber gasket on the underside of the cover is clear of debris.

Figure 23. Fasten the bottom cover using three machine screws



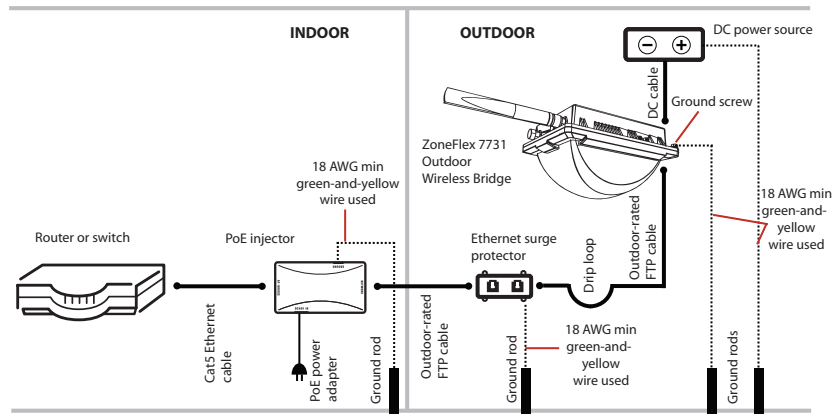
Step 3: Connect the Wireless Bridge to the Network

In this step, you will connect the Wireless Bridge from its mounting location to the network. Follow the steps below for a typical installation that uses both PoE and DC power as power sources. [Figure 24](#) shows an example of the connections required for a typical installation that uses both PoE and DC power.

Deploying the Wireless Bridge

Step 3: Connect the Wireless Bridge to the Network

Figure 24. Typical installation components using both PoE and DC power sources



WARNING: Do not apply power to the Wireless Bridge until you finish connecting all other components.

1. Take the *root bridge* to its mounting location.
2. Verify that the Cat5e FTP cable (outdoor-rated) from the Wireless Bridge is long enough to reach the PoE injector that is installed indoors.
3. Create a drip loop in any cable installed outdoors. This will prevent water from running along the cable and entering the Wireless Bridge or the building where the cable terminates.
4. Verify that the **RJ45** port on the Wireless Bridge is connected to the **AP/BRIDGE** port on the PoE injector.
5. Connect the Ethernet cable from the **NETWORK** port on the PoE injector to your network router or switch.
6. Apply power to the Wireless Bridge.
 - If you are using PoE, plug the power adapter in to an AC power source.
 - If you are using DC power, connect the DC cable to a DC power source.
7. Verify that the **PWR** LED on the back of the Wireless Bridge is steady green.
8. Repeat steps 1-7 for the non-root bridge.
9. Continue to [“Attaching the Mounting Brackets”](#).

7 Attaching the Mounting Brackets

What You Will Need

To complete this procedure, you will need the following items:

- Static bracket
- Dynamic bracket
- Wall anchors
- Flat washers
- Hex nuts
- 10mm ratchet wrench

If you are mounting the Wireless Bridge on a flat surface, you will also need an electric drill with an 8mm drill bit.

If you are mounting the Wireless Bridge on a pipe or pole, you will also need the following:

- A 30mm to 60 mm (1.18 in. to 2.36 in.) pipe or pole
- Steel clamp
- 10mm flathead screwdriver

Step 1: Attach the Static Bracket to the Mounting Surface

The procedure for attaching the bracket to the mounting surface depends on whether you are mounting the Wireless Bridge to a flat surface or a pole.

- [Attaching the Bracket to a Flat Surface](#)
- [Attaching the Bracket to a Pole](#)

Attaching the Bracket to a Flat Surface



WARNING: Ruckus Wireless strongly recommends that you wear eye protection before drilling holes on the mounting surface.



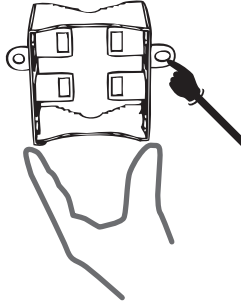
NOTE: The wall anchors that are supplied with the Wireless Bridge are for mounting on *solid masonry walls* only. If you are mounting the Wireless Bridge on other materials (for example, drywall, wood, or hollow cinder block), you will need the appropriate types of wall anchors. Check your local hardware store for options.

Attaching the Mounting Brackets

Step 1: Attach the Static Bracket to the Mounting Surface

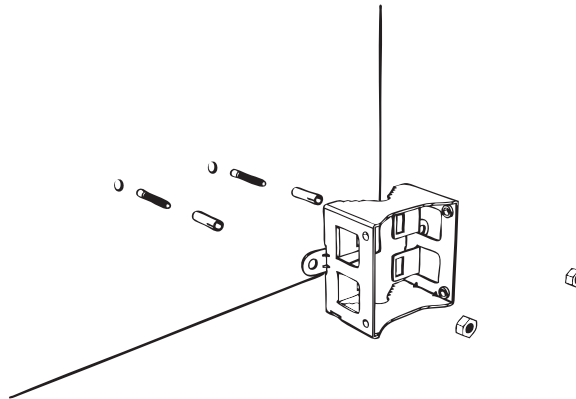
1. Place the static bracket at the exact location on the mounting surface where you want to mount it.
2. Use the static bracket as a template to mark the locations of the mounting holes on the two mounting tabs.

Figure 25. Mark the locations of the mounting holes



3. Remove the static bracket from the mounting surface.
4. Drill an 8mm-diameter hole with a depth of 36mm-38mm into each of the markings that you made on the mounting surface.
5. Insert a wall anchor (with the unthreaded part first) into each of the holes that you drilled.
6. Place a metal cone on each wall anchor, and then place a flat washer on top of the metal cone.

Figure 26. Insert a wall anchor into each hole that you drilled, and then place a metal cone and a flat washer on top

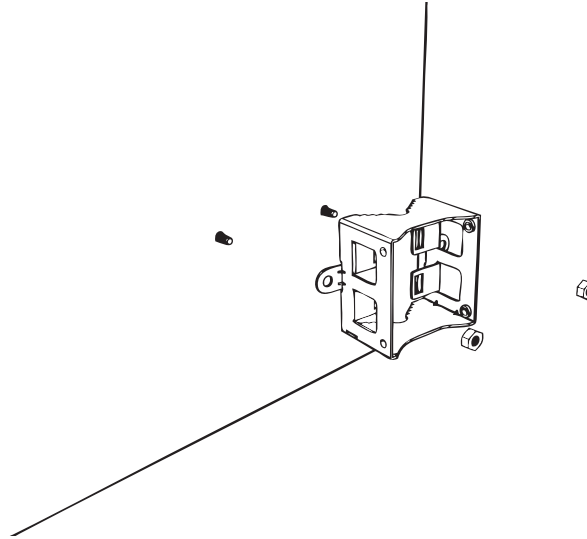


Attaching the Mounting Brackets

Step 1: Attach the Static Bracket to the Mounting Surface

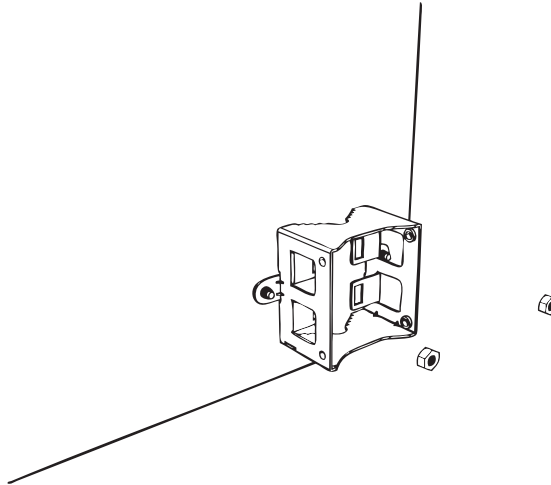
7. Align the two screw holes on the bracket with the wall anchors that you inserted earlier.

Figure 27. Align the screw holes on the bracket with the wall anchors



8. Use two hex nuts to attach the bracket to the mounting surface.

Figure 28. Use two hex nuts to attach the bracket to the surface



Attaching the Mounting Brackets

Step 1: Attach the Static Bracket to the Mounting Surface

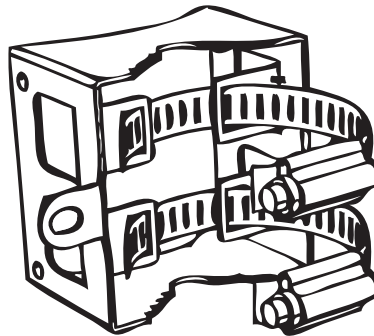
9. Using a 10mm open-end wrench, tighten the nuts to secure the bracket to the mounting surface. Screw torque value must be 4kg-5kg. As you tighten the nuts, the metal cones that are built into the wall anchors will expand and lock the wall anchors into place.
10. Continue to [“Step 2: Attach the Dynamic Bracket to the Wireless Bridge”](#).

Attaching the Bracket to a Pole

The Wireless Bridge can be mounted vertically on a 30mm to 60mm (1.18 in. to 2.36 in.) pole.

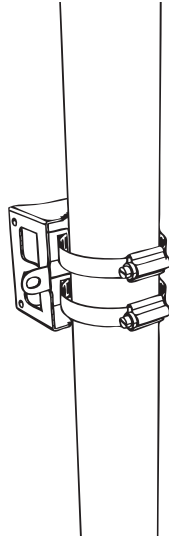
1. Insert the open end of the steel clamps into the two tabs on the bracket.

Figure 29. Insert the steel clamps into the two tabs on the bracket



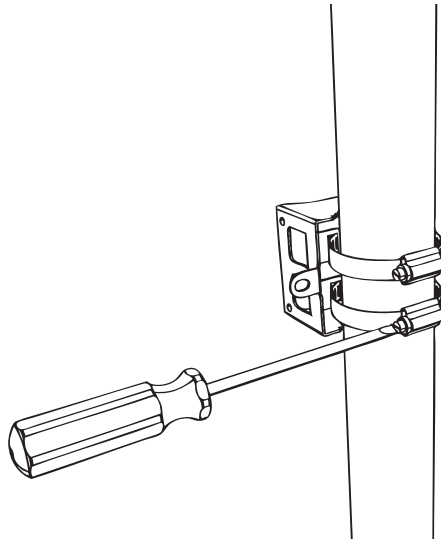
2. Use the clamps to attach the bracket to the pole.

Figure 30. Use the clamps to attach the bracket to the pole



3. Using a 10mm flathead screwdriver, tighten the clamp locks to secure the bracket to the pole. Screw torque value must be 4kg-5kg.

Figure 31. Tighten the clamp locks to secure the bracket



4. Continue to ["Step 2: Attach the Dynamic Bracket to the Wireless Bridge"](#).

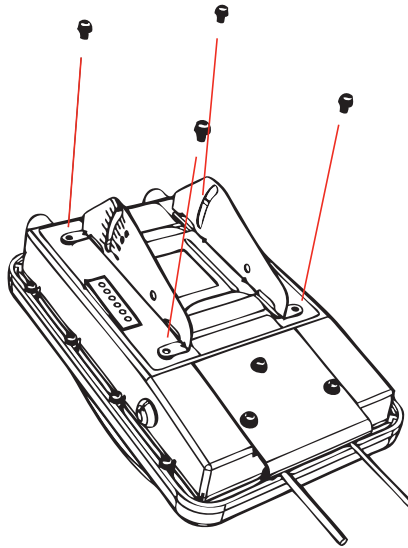
Attaching the Mounting Brackets

Step 2: Attach the Dynamic Bracket to the Wireless Bridge

Step 2: Attach the Dynamic Bracket to the Wireless Bridge

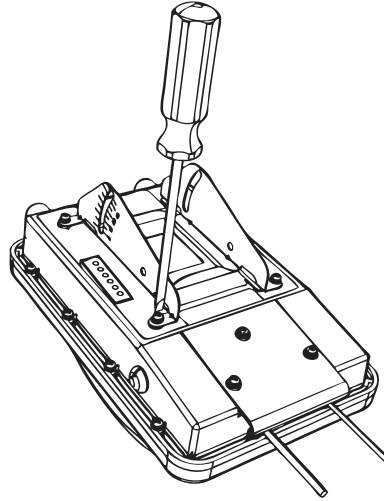
1. Place the dynamic bracket onto the flat side of the Wireless Bridge so that the four screw holes on the bracket align with the four screw holes on the Wireless Bridge. Make sure that the shorter end of the mounting bracket is on the same side as the antenna connector.
2. Insert four machine screws (supplied with mounting kit) into the screw holes on the bracket.

Figure 32. *Insert four machines screws into the screw holes*



3. Using a 6mm Phillips screwdriver, tighten the four machine screws to fasten the bracket to the Wireless Bridge. Screw torque value must be 4kg-5kg.

Figure 33. Fasten bracket to the Wireless Bridge



4. Continue to ["Mounting the Wireless Bridge"](#) in the next section.

8 Mounting the Wireless Bridge

To mount the Wireless Bridge, you will need to join the two mounting brackets that you attached earlier to the device and the mounting surface. For this procedure, you will need the following items:

- Hex bolts
- Thumb screws
- 10mm ratchet wrench

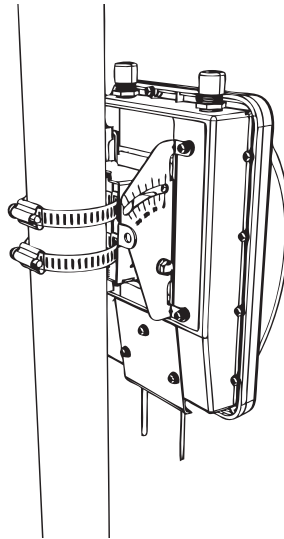


NOTE: Figures in this section show mounting on a vertical pole. Procedures for mounting on a flat surface are similar.

To join the two mounting brackets together:

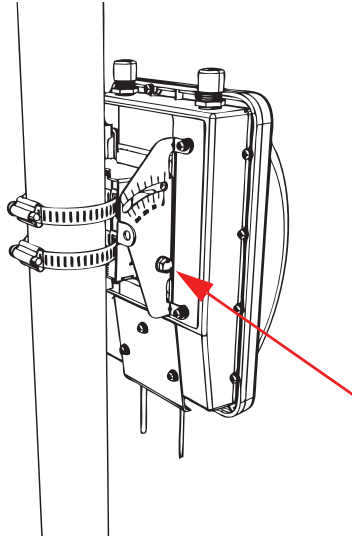
1. Join the two brackets as shown in [Figure 34](#). Make sure that:
 - The dynamic bracket (attached to the Wireless Bridge) encloses the static bracket (attached to the mounting surface).
 - (For mounting on a vertical pole) The side of the Wireless Bridge with the antenna connectors is at the top, especially if you are planning to install external antennas.

Figure 34. Joining the two brackets in a vertical pole installation



2. Align the mounting holes on the dynamic bracket with the mounting holes on the static bracket.
3. Place a split lock washer, and then a flat washer onto a hex bolt. Then insert the hex bolt into one of the lower mounting holes.

Figure 35. Insert hex bolts into lower mounting holes



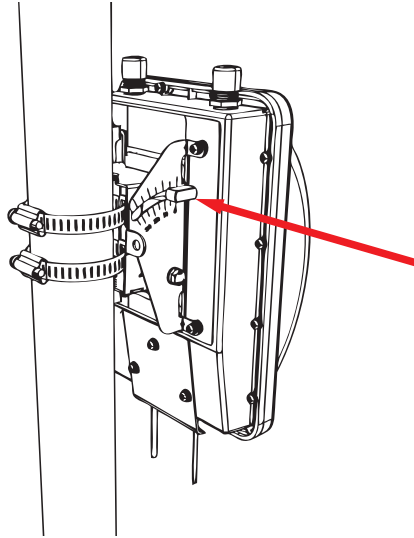
NOTE: Make sure the screw-washer assembly is in correct order. The split-lock washer should be in the middle and the flat washer should touch the bracket.

4. Repeat Step 3 for the lower mounting hole on the other side.
5. Finger tighten the hex bolts.
6. Insert the two thumb screws into the upper mounting holes as shown in [Figure 36](#).

Mounting and Connecting the External Antennas (Optional)

Step 2: Attach the Dynamic Bracket to the Wireless Bridge

Figure 36. Insert thumb screws into the upper mounting holes



7. Finger tighten the thumb screws.
8. Adjust the Wireless Bridge to your desired orientation.



NOTE: If you have not yet determined the optimal orientation for your Wireless Bridge, refer to [“Determine the Optimal Mounting Location and Orientation”](#) on [page 25](#) for orientation guidelines.

9. Using a 10mm ratchet wrench, tighten the hex bolts to fix the Wireless Bridge’s orientation. Screw torque value must be 4kg-5kg.

You have completed mounting the root bridge. Perform the same procedure for mounting the non-root bridge.

9 Mounting and Connecting the External Antennas (Optional)

If you want to extend the range of your wireless network, you can connect two N-type external antennas to the standard N-type female connectors on the Wireless Bridge.



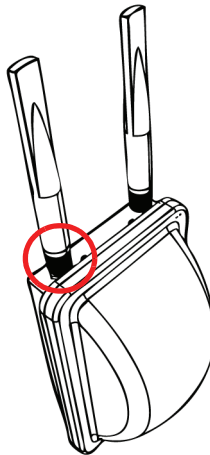
WARNING: Only trained and qualified personnel should be allowed to install, replace, or service this equipment.



WARNING: Before connecting the antennas to the Wireless Bridge, make sure that you disconnect the Wireless Bridge from the power source.

1. Disconnect the Wireless Bridge from the power source.
2. Unscrew the metal caps that protect the antenna connectors. Place the metal caps in a safe place, in case you need them later.
3. Connect the antennas to the standard N-type female antenna connectors.

Figure 37. Connect the external antennas to the standard N-type female connectors on the Wireless Bridge.



4. Apply weatherproofing tape to the antenna connector to help prevent water from entering the connector.
5. Reconnect the Wireless Bridge to the power source.



CAUTION: If you are not connecting external antennas to the Wireless Bridge, make sure that the metal caps remain installed and securely fastened to protect the interface from elements, such as water or dirt.

You have completed connecting the external antennas to the Wireless Bridge.

10 Aiming the Bridge Pair

Once both units are installed in their permanent locations, press the **Aiming Button** on the outside of either unit to begin aiming. Alternatively, you can start the aiming process via the Web browser, by clicking **Start Aiming** on the **Status > Wireless** page.

1. Press the blue button on the side of either bridge and hold it for 4 seconds.
 - The bottom LED turns yellow, indicating that the unit is in Aiming Mode.
 - If the unit is in Aiming mode but there is no association between the two bridge units, all LEDs will cycle yellow until the two ZoneFlex 7731 units have associated.
2. Adjust the azimuth and elevation of the first unit to maximize the Aiming LED indicators (see "[Aiming Mode](#)" on [page 9](#)).
3. After one unit is at its maximum link level, adjust the second unit to increase the link performance.
4. If the unit's elevation adjustment needs to be reversed, remove the 4 bolts mating the two mounting bracket pieces together. Remove the 4 mounting screws attaching the bracket to the ZoneFlex 7731 enclosure, rotate the bracket 180° and reattach the bracket to the enclosure. Repeat steps 2 through 7. Adjust the ZoneFlex 7731 to your desired orientation.



NOTE: The cable end of the ZoneFlex 7731 should always be pointing down.

5. Once the ZoneFlex 7731 is in the proper orientation, tighten the thumb screws flush to the bracket.
6. Using a 10mm ratchet wrench, tighten the two hex bolts to fix the unit's orientation. The bolt torque value must be 0.6-0.8 Newton meter (Nm).
7. Verify that the ZoneFlex 7731 link performance has not changed.



NOTE: If the unit is mounted in a position that does not allow the user to view the LEDs, the Web UI can be used for Aiming. On the **Status > Wireless** page, pressing the "Start Aiming" link is the same as pressing the blue Aiming button. The Signal Strength is shown on the Web page. More green bars indicate higher signal strength.

11 Verifying the Connection

Once you have completed the hardware installation and network configuration for both Wireless Bridges, verify the connection and signal integrity between the bridge pair using the following procedure:

1. Access the root bridge Web interface by entering its IP address into a Web browser on a computer connected to the same switch that the root bridge is connected to.
2. On the **Status > Wireless** page, check to make sure the non-root bridge is listed under the **Connected Device** section.

Figure 38. Viewing connected device from the Web interface

Ruckus 7731 Wireless Bridge

Status
Wireless
Bridge

Configuration
Wireless
Bridge

Maintenance
Upgrade
Reboot / Reset
Support Info

Administration
Management
Diagnostics
Log

Status :: Wireless Enable Auto-update

Wireless Mode: 11na -- Operates with 802.11n and 802.11a devices in 5 GHz spectrum only
Channel: Channel 52 [SmartSelect]
Channel Width: 40 Mhz
Country Code: US
SSID: RK5-001301
BSSID: 00:13:92:00:13:08
Wireless Status: Up
Broadcast SSID? Disabled
Encryption Mode: WPA

Wireless Bridge Mode: Root Bridge
Aiming Action: [Start Aiming](#)
Link Status: Up

Connected Device:

IP Address	MAC Address	SSID	Rx RSSI	SpeedFlex	Ack RSSI	Signal Strength
172.17.16.96	00:13:92:00:19:08	RK5-001301	46	SpeedFlex icon	34	Signal Strength icon

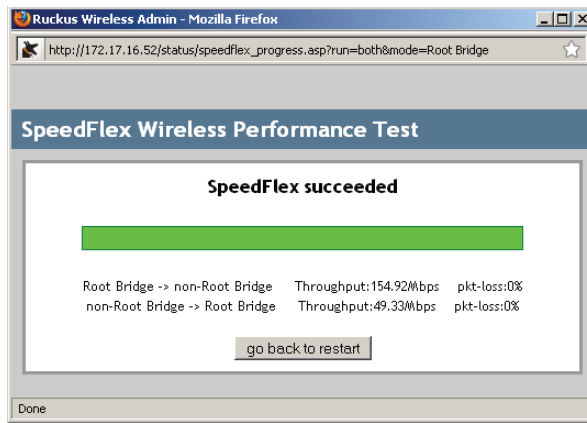
Ruckus WIRELESS Ruckus 7731 Wireless Bridge

3. On the **Status > Wireless** page, click the SpeedFlex icon SpeedFlex icon to launch the SpeedFlex Wireless Performance Test.
4. Click Start to begin testing
5. Once the test is completed, the following result page is displayed.

What to Do Next

Change the Administrative Password

Figure 39. SpeedFlex Performance Test succeeded



12 What to Do Next

The following are some of the post-installation tasks that Ruckus Wireless recommends. Refer to the *ZoneFlex 7731 802.11n Outdoor Point to Point Bridge User Guide* for more information on configuring and managing the Wireless Bridge.

Change the Administrative Password

Management access to the Web interface of the Wireless Bridge is controlled through administrative user name and password. As soon as you complete the Wireless Bridge setup, make sure you log on to the Wireless Bridge's Web interface and change the default administrative user name and password. This will help prevent unauthorized users from logging in to the Wireless Bridge's Web interface and changing the Wireless Bridge settings to compromise your network.

Configure the Security Settings

Unlike wired networks, anyone with a compatible wireless adapter can receive wireless data transmissions from your network well beyond your walls. To prevent unauthorized users from entering your wireless network and accessing your computers and files, Ruckus Wireless strongly recommends enabling and configuring wireless security on the Wireless Bridge. The Wireless Bridge supports several types of encryption and authentication methods to help prevent unauthorized access to your wireless network.

Using FlexMaster to Manage the Wireless Bridge

If you are planning to use Ruckus Wireless FlexMaster to manage the ZoneFlex 7731, this guide describes the required steps that will enable the Wireless Bridge to report to and communicate with FlexMaster successfully.

(Optional) Set the FlexMaster Server Address

If you have a FlexMaster server installed on the network and you intend to use FlexMaster to manage the Wireless Bridge, you can set the FlexMaster server address at this point. Before starting this procedure, make sure you obtain the correct FlexMaster server URL.



NOTE: In addition to setting the FlexMaster server URL manually on the Wireless Bridge, you can also use DHCP Option 43 or DNS to point the Wireless Bridge to the FlexMaster server. For more information, refer to the *FlexMaster User Guide*.

1. On the menu, click **Administration > Management**.
2. Scroll down the page to the **TR069 / SNMP Management Choice** section.
3. Verify that the **Auto** option is selected.
4. In **FlexMaster Server URL**, type the URL of the FlexMaster server on the network. You can use either `http` or `https` to connect to the URL and include either the host name or IP address of the FlexMaster server in the URL. The following are examples of valid FlexMaster server URLs:

```
http://flexmaster/intune/server
```

```
https://flexmaster/intune/server
```

```
http://192.168.20.1/intune/server
```

```
https://192.168.20.1/intune/server
```

5. Click **Update Settings** to save your changes.

You have completed setting the FlexMaster server address on the Wireless Bridge.

Figure 40. Type the FlexMaster server URL

The screenshot shows the configuration page for a Ruckus 7731 Wireless Bridge. The page is divided into a left sidebar with navigation tabs and a main content area. The sidebar includes sections for Status, Configuration, Maintenance, and Administration. The main content area is titled 'Ruckus 7731 Wireless Bridge' and contains several configuration options. The 'DHCP Discovery' section is highlighted with a red box, and the 'FlexMaster Server URL' field is also highlighted with a red box, containing the text 'https://flexmaster/intune/server'. Below this, there are fields for 'Digest-authentication Username' (001392-ZF10000088), 'Digest-authentication Password' (ZF10000088-001392), and 'Periodic FlexMaster Inform Interval' (15 minutes). A 'TR069 Status' section provides details on the current and last attempted connections, including a 'Last Attempted' contact on 2009-08-26 and a 'Last Contact Result' of 'sendInform failed: No Inform done (9890) SOAP 1.1 fault: SOAP-ENV:Client [(none)] "Host not found"'. At the bottom of the page, there is a footer with the Ruckus logo and the text 'Ruckus 7731 Wireless Bridge'.

Read Related Documentation

If you are using FlexMaster to manage the Wireless Bridge, make sure you read the accompanying documentation to learn how to configure and manage the Wireless Bridge from the FlexMaster Web interface.

The latest versions of Ruckus Wireless product documentation are available for download on the Ruckus Wireless Support Web site at:

<http://support.ruckuswireless.com/documents>

Professional installation instruction

1. Installation personal: This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.
2. Installation location: The product shall be installed at a location where the radiating antenna can be kept 20 cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.
3. External antenna: Use only the antennas which have been approved by Ruckus Wireless. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC limit and is prohibited.
4. Installation procedure: Please refer to user's manual for the detail.
5. Warning: Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in US Rule CFR 47 part 15 section 6. 15.247 & 15.407. The violation of the rule could lead to serious federal penalty.

Federal Communications Commission Notices

This product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. This equipment shall not be colocated with any other transmitter.

Harmful Interference Notice

This product has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment 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 equipment or devices
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

Changes or modifications to this equipment that have not been approved by Ruckus Wireless may void the user's authority to operate this equipment. For operation within 5.15 – 5.25GHz and 5.47 – 5.725GHz frequency ranges, it is restricted to indoor environment.

External Antenna

This device has been designed to operate with a patch antenna, and having a maximum gain of 23 dBi. Other antenna types or having a gain greater than 23 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Industry Canada Statement

This device complies with Industry Canada ICES-003 and RSS210 rules. Operation is subject to the following two conditions:

1. This device may not cause interference and
 2. This device must accept any interference, including interference that may cause undesired operation of the device.
- Cet appareil est conforme aux normes NMB003 et RSS210 d'Industrie Canada. Le fonctionnement est soumis aux conditions suivantes :
1. Ce périphérique ne doit pas causer d'interférences;
 2. Ce périphérique doit accepter toutes les interférences reçues, y compris celles qui risquent d'entraîner un fonctionnement indésirable.

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Caution:

The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems. High power radars are allocated as primary users (meaning they have priority) of 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to LE-LAN devices.

This device has been designed to operate with an antenna having a maximum gain of 23 dBm. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

Australia Statement

This device complies with the ACMA requirements for a Wi-Fi device namely Radio Communications (Low Impact Potential Devices) Class Licence 2000 Amd. 1:2007 and Radiocommunications (Compliance Labelling – Electromagnetic Radiation) Notice 2003. The equipment complies with the ACMA requirements for radiation exposure for a "general user/non-aware user". This equipment should be installed and operated with a minimum distance of 50 cm between the radiator and your body. This equipment complies with the Australian safety requirements if connected to an approved power supply. The frequency band 5150 – 5350 MHz is restricted to indoor use.

European Union Notices

This product only supplied by Limited Power sources (sub-clause 2.5 of standard EN 60950-1).



Compliance Information for 5-GHz Wireless Products

The following standards were applied during the assessment of the product against the requirements of the Directive 1999/5/EC:

- EN 301 893
- EMC: EN 301 489-1, EN 301 489-17
- Safety: EN 60950, EN 50385

The frequency band 5150 – 5350 MHz is restricted to indoor use.

National Restrictions

This product may be used in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Ce produit peut être utilisé dans tous les pays de l'UE (et dans tous les pays ayant transposés la directive 1999/5/CE) sans aucune limitation, excepté pour les pays mentionnés ci-dessous:

Questo prodotto è utilizzabile in tutte i paesi EU (ed in tutti gli altri paesi che seguono le direttive EU 1999/5/EC) senza nessuna limitazione, eccetto per i paesi menzionati di seguito:

Das Produkt kann in allen EU Staaten ohne Einschränkungen eingesetzt werden (sowie in anderen Staaten die der EU Direktive 1999/5/CE folgen) mit Ausnahme der folgenden aufgeführten Staaten:

Belgium

The Belgian Institute for Postal Services and Telecommunications (BIPT) must be notified of any outdoor wireless link having a range exceeding 300 meters. Please check <http://www.bipt.be> for more details.

Draadloze verbindingen voor buitengebruik en met een reikwijdte van meer dan 300 meter dienen aangemeld te worden bij het Belgisch Instituut voor postdiensten en telecommunicatie (BIPT). Zie <http://www.bipt.be> voor meer gegevens.

Les liaisons sans fil pour une utilisation en extérieur d'une distance supérieure à 300 mètres doivent être notifiées à l'Institut Belge des services Postaux et des Télécommunications (IBPT). Visitez <http://www.ibpt.be> pour de plus amples détails.

Česky [Czech]	Ruckus Wireless tímto prohlašuje, že tento Radio LAN je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede Ruckus Wireless erklærer herved, at følgende udstyr Radio LAN overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erkläre Ruckus Wireless, dass sich das Gerät Radio LAN in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab Ruckus Wireless seadme Radio LAN vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, Ruckus Wireless declares that this Radio LAN is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente Ruckus Wireless declara que el Radio LAN cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ Ruckus Wireless ΔΗΛΩΝΕΙ ΟΤΙ Radio LAN ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.
Français [French]	Par la présente Ruckus Wireless déclare que l'appareil Radio LAN est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente Ruckus Wireless dichiara che questo Radio LAN è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo Ruckus Wireless deklarē, ka Radio LAN atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo Ruckus Wireless deklaruoja, kad šis Radio LAN atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart Ruckus Wireless dat het toestel Radio LAN in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, Ruckus Wireless, jiddikjara li dan Radio LAN jikkonforma mal-htigijiet essenzjali u ma provvedimenti oħrajn rilevanti li hemm fid-Direttiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, Ruckus Wireless nyilatkozom, hogy a Radio LAN megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
Polski [Polish]	Niniejszym Ruckus Wireless oświadcza, że Radio LAN jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
Português [Portuguese]	Ruckus Wireless declara que este Radio LAN está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	Ruckus Wireless izjavlja, da je ta Radio LAN v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	Ruckus Wireless týmto vyhlasuje, že Radio LAN spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	Ruckus Wireless vakuuttaa täten että Radio LAN tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar Ruckus Wireless att denna Radio LAN står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Íslenska [Icelandic]	Hér með lýsir Ruckus Wireless yfir því að Radio LAN er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.
Norsk [Norwegian]	Ruckus Wireless erklærer herved at utstyret Radio LAN er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.