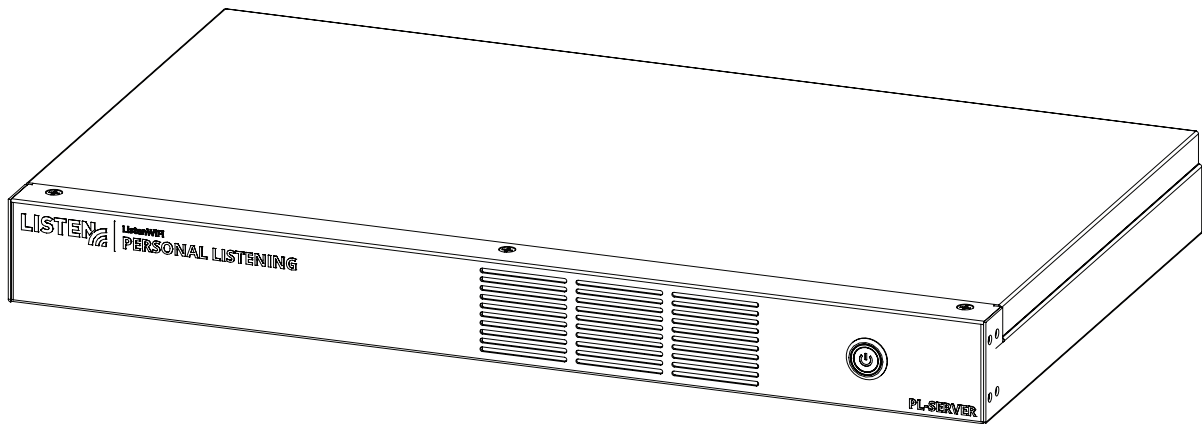


# ListenWiFi

## PLS-900 System



## USER'S MANUAL

### INSTALLATION & OPERATION

## TABLE OF CONTENTS

<b>Safety Precautions</b>	<b>4</b>
<b>Compliance Information</b>	<b>5</b>
<b>System Overview</b>	<b>6</b>
<b>PL-900 ListenWiFi Server</b>	<b>7 – 8</b>
<b>PL-400 ListenWiFi Audio Interface</b>	<b>9 – 10</b>
<b>ListenWiFi Coverage</b>	<b>11 – 12</b>
<b>Designing a System</b>	<b>13</b>
<b>Interconnection, Activation, and Configuration</b>	<b>14 – 18</b>
<b>Troubleshooting</b>	<b>19</b>
<b>Appendix A – Internet Rates by Number of Active Channels</b>	<b>20</b>
<b>Appendix B – Advanced Configuration of Access Point</b>	<b>20 – 23</b>
<b>Specifications</b>	<b>24 – 29</b>
<b>Warranty Information</b>	<b>30</b>
<b>Contact Information</b>	<b>31</b>



## Safety Precautions

### Hearing Safety:

The PL-900 is designed to amplify audio, which could potentially cause hearing damage if used improperly. To protect your hearing make sure the volume is turned down before putting on an ear speaker or headphones, then adjust the volume to the minimum setting required to hear clearly. Do not allow children or other unauthorized individuals to have access to this product without supervision.

## Recycling Instructions

### Recycling:

Help Listen Technologies protect the environment by taking the time to dispose of your equipment properly.

### Product Recycling Instructions:

Please do NOT dispose of your Listen Technologies equipment in the household trash. Please take the equipment to an electronics recycling center; OR, return the product to the factory for proper disposal.

## Compliance Information

No FCC license or radio approval is required to operate this equipment.

## Compliance Notice, FCC and Industry Canada Statements

### Compliance Notice

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:  
1. These devices may not cause harmful interference, and 2. These devices must accept any interference received, including interference that may cause undesirable operation.

### FCC Statement

This equipment has been tested and found to comply with the limits for 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 in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined 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 and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

### Industry Canada Statement

This equipment complies with ICES-003 class B.

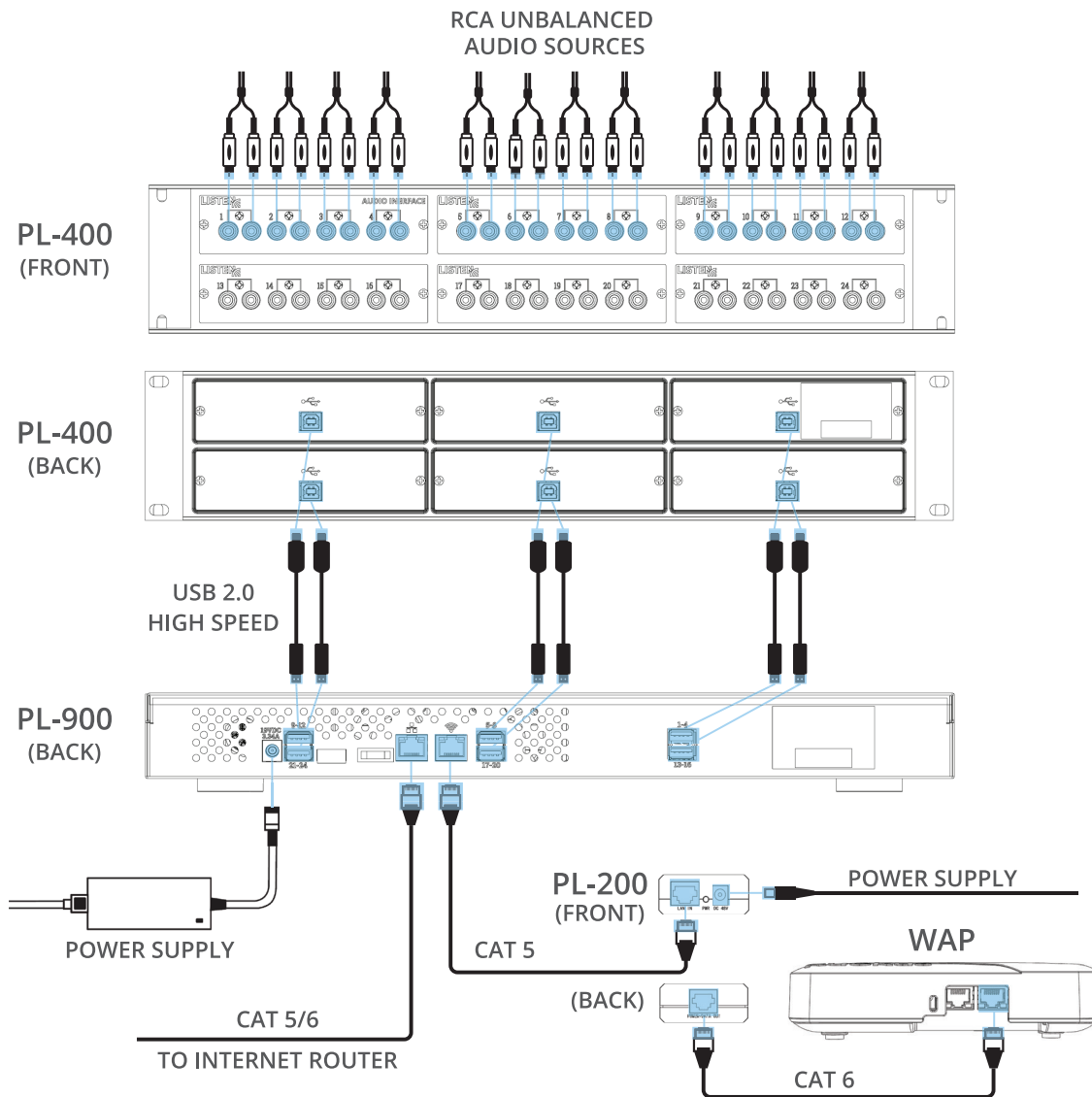
Can ICES-3 (B)/NMB-3(B)

## System Overview

The ListenWiFi Personal Listening System turns Android and iOS mobile devices into everyday audio receivers. This eliminates the need to purchase and maintain expensive equipment for guests, while providing an overall unique experience by delivering high-quality audio on an easy to use mobile app.

The system captures analog source audio from TV, Satellite, and Cable and converts it to digital audio using audio interface units. The server then manages and streams this digital audio through a local wireless access point (AP) available to Wi-Fi enabled mobile devices loaded with the free Personal Listening mobile app. The app is available on both the Apple App and Google Play stores.

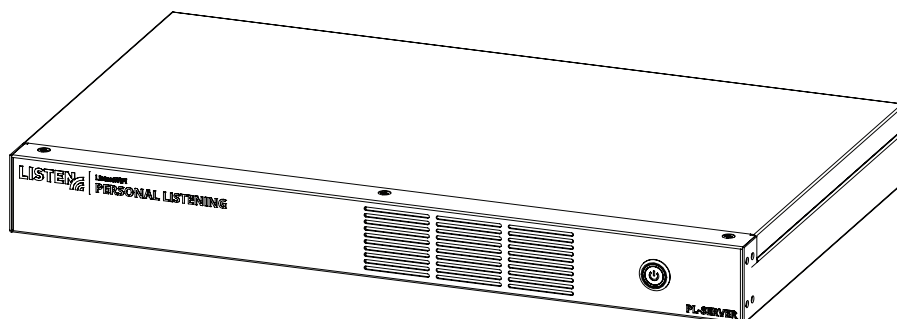
The PLS-900 is perfect for high-quality audio applications like fitness centers and other multi-screen environments.



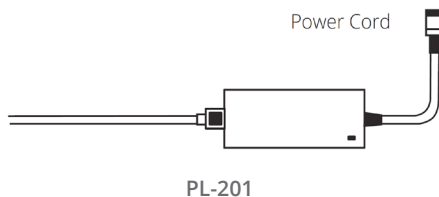
# PL-900 ListenWiFi Server

## Package Contents

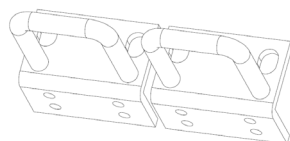
- PL-900 ListenWiFi Server
- PL-201 Power Supply
- (2) Rack Ears
- (1) Bag of rack ear screws
- Registration Card



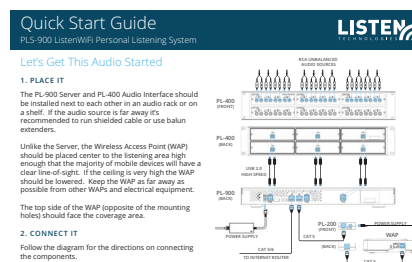
PL-900 ListenWiFi Server



PL-201



2 Rack Ears with 8 Screws



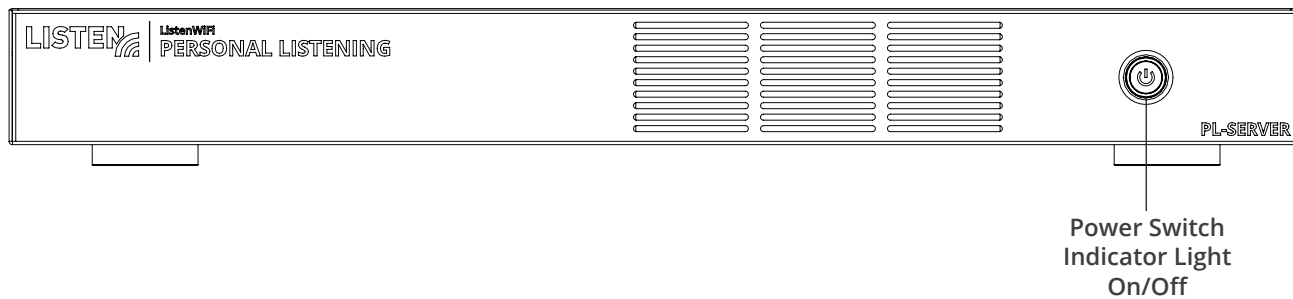
Quick-Start Guide



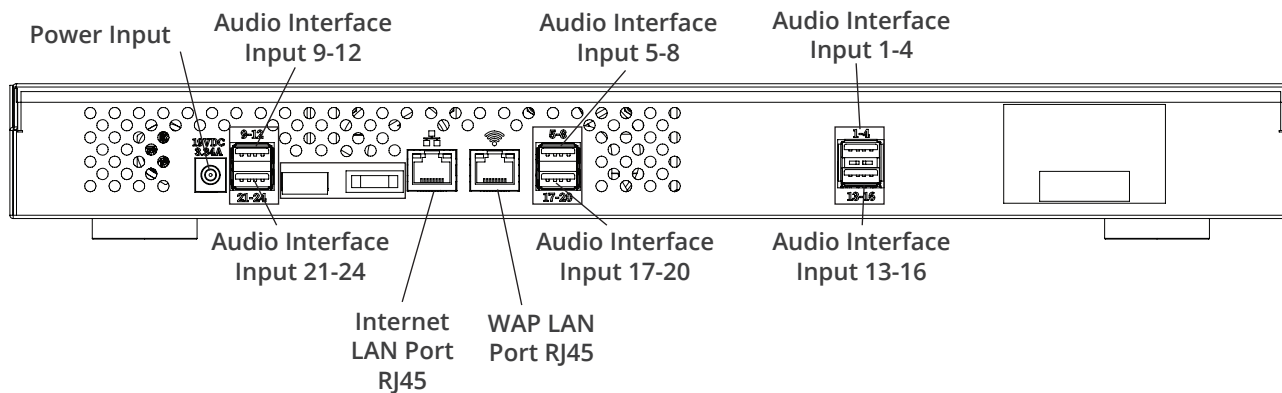
Registration Card

## PL-900 Quick Reference

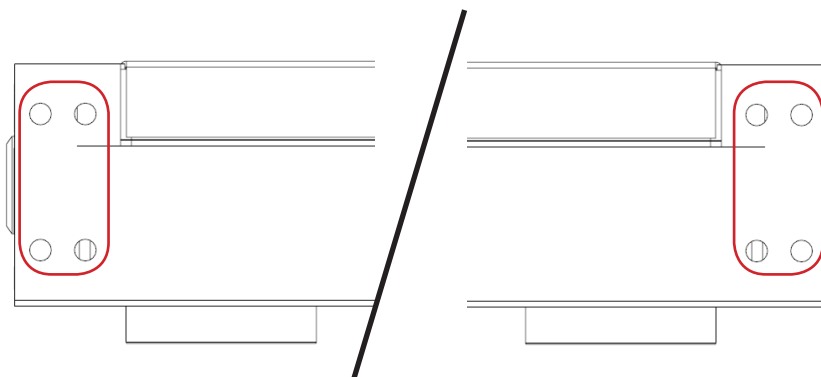
### Front View



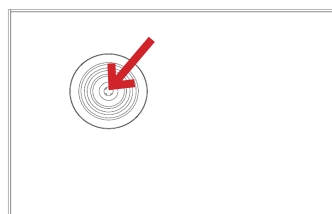
### Back View



**NOTE:** Rack ears are installed using the four open holes on both sides of the server.



**NOTE:** To remove server feet, pull out center pin on each foot.



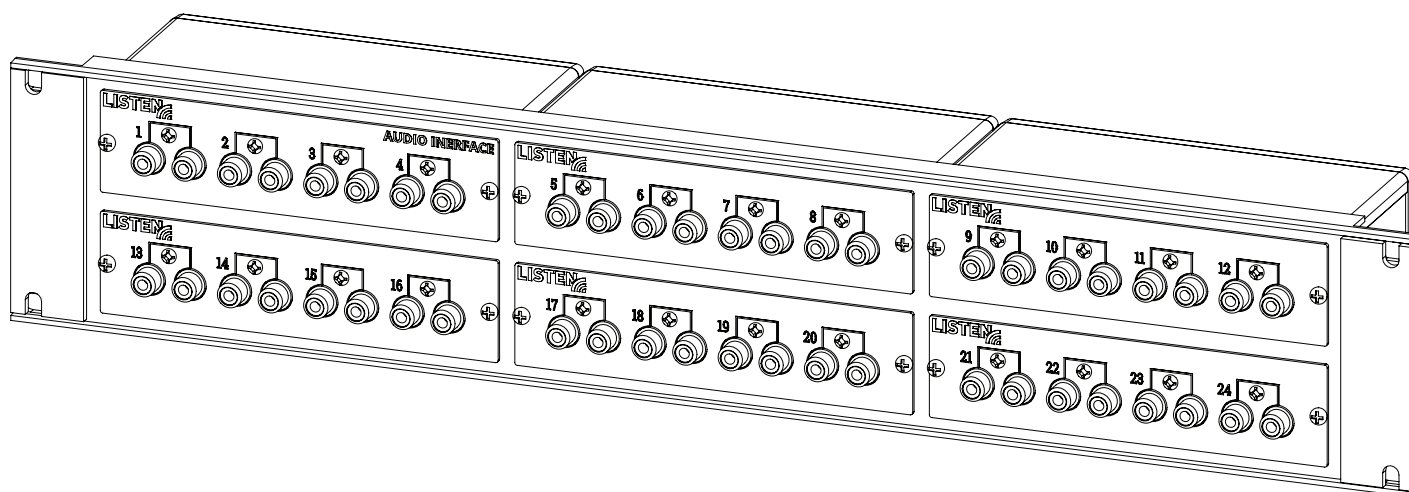


# PL-400 ListenWiFi Audio Interface

## Package Contents

- PL-400 ListenWiFi Audio Interface
- TV Channel Labels
- USB 2.0 High Speed Cables 6.6 ft (2m)
- Phono RCA to RCA Cables 6.6 ft (2m)

NOTE: There will be a RCA cable for each input and 1 USB cable per set of 4 inputs.

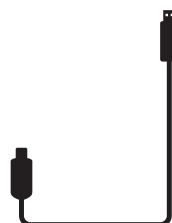


PL-400 ListenWiFi Audio Interface

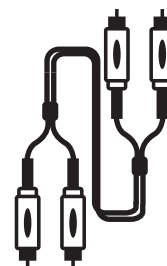
NOTE: Actual size will vary based on model ordered.



TV Channel Labels



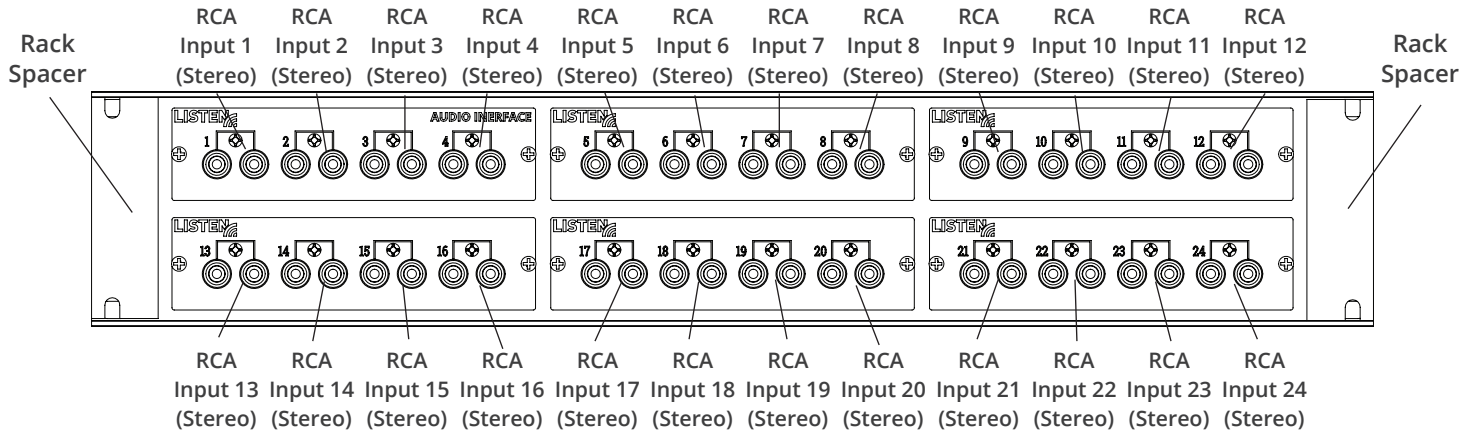
USB 2.0 High Speed  
Cables 6.6 ft (2m)



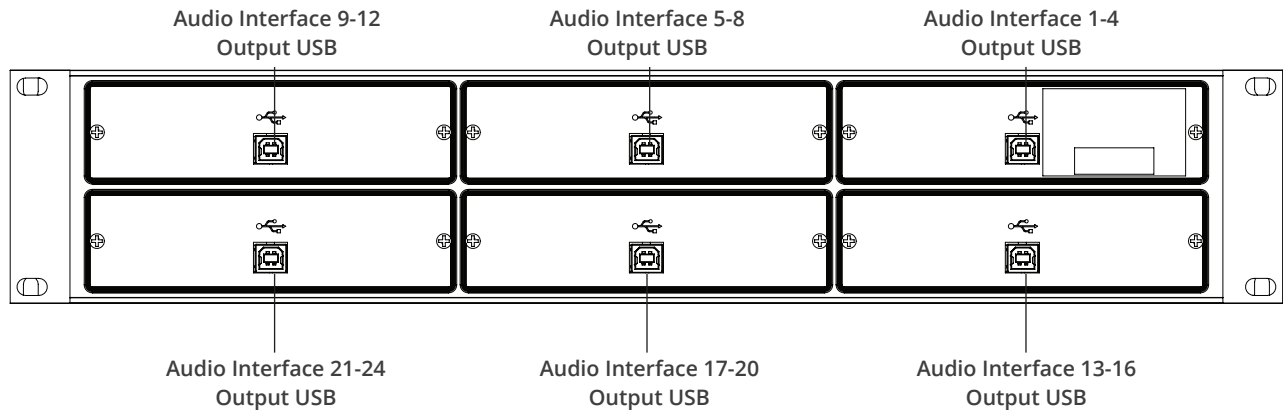
Phono RCA to RCA  
Cables 6.6 ft (2m)

## PL-400 Quick Reference

### Front View



### Back View



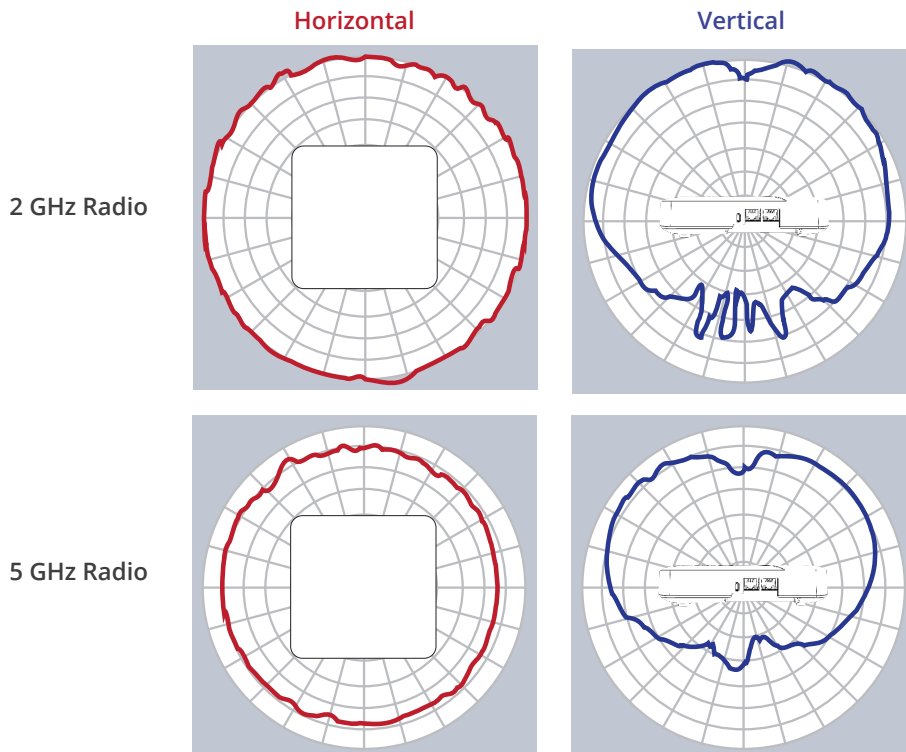
## Listen WiFi Coverage

The PL-900 ListenWiFi system coverage is determined by the PL-301 AP, network traffic and environmental conditions. It is recommended to perform a site survey to understand interference, bandwidth usage and reception strength within the facility before and after the installation.

The table and graphs below roughly estimates general coverage distance and pattern at the recommended signal strength for the audio stream (>-65dB). Please note that each facility may greatly vary based upon network and environmental conditions.

Frequency	Line-of-sight		Physical Obstructions*	
	Radius	Sq. Ft.	Radius	Sq. Ft.
2.4 GHz	300 ft (91 m)	282,000 ft <sup>2</sup> (26,200 m <sup>2</sup> )	150 ft. (45m)	70,000 ft <sup>2</sup> (6,500 m <sup>2</sup> )
5 GHz	100 ft (30 m)	31,400 ft <sup>2</sup> (2,900 m <sup>2</sup> )	50 ft (15m)	7,800 ft <sup>2</sup> (724 m <sup>2</sup> )

\*Physical obstructions includes two walls and furniture.



As visible from the coverage patterns, the location and orientation of the AP plays a critical role in performance. Ensure that the top of the AP points in the general direction of wireless clients, as the signal strength is stronger in the front.



Ceiling Mount



Table Mount



Wall Mount

# Designing a System

Use the following steps when designing a ListenWiFi system:

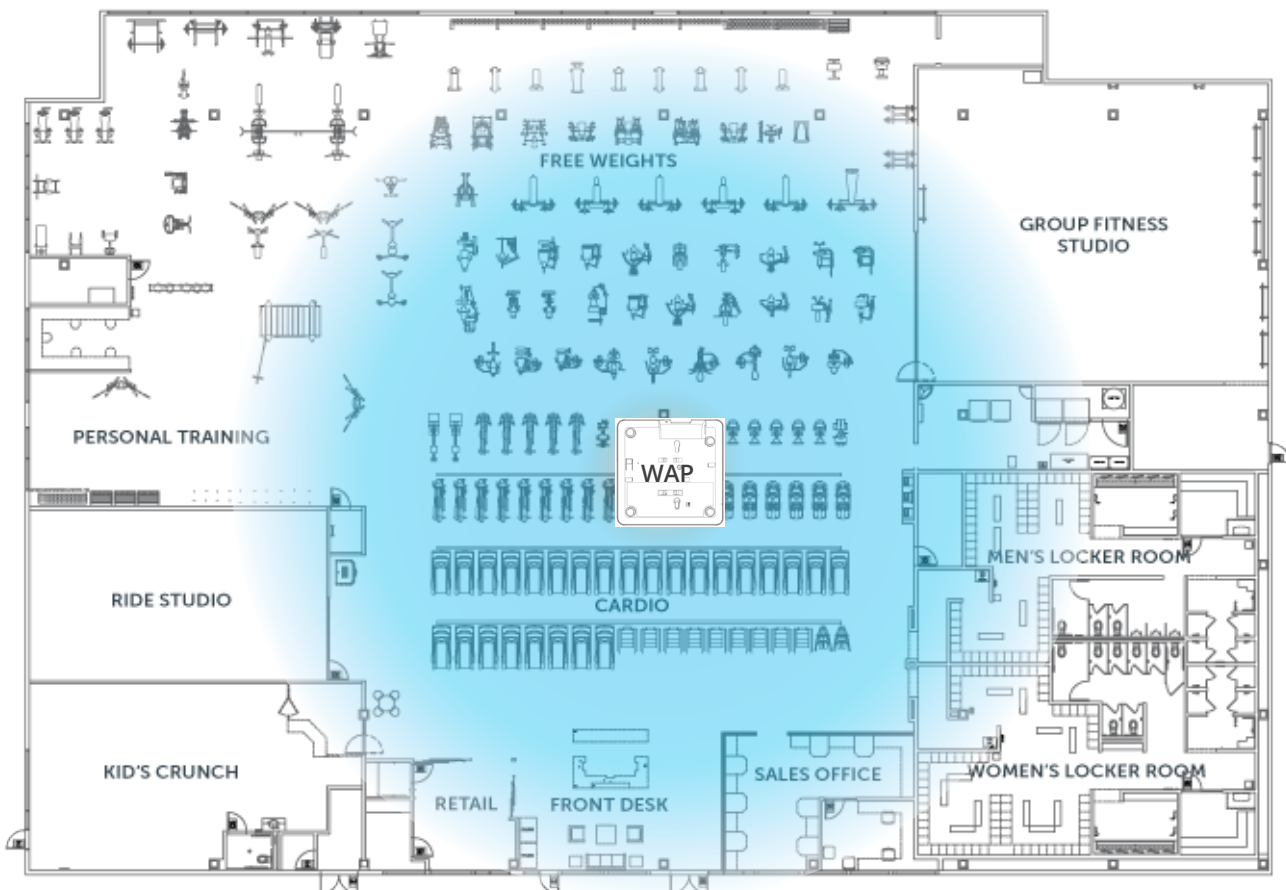
1. Determine the number of unique audio channels needed (1 to 24 channels).
2. Determine the max number of users (PL-301 AP supports a maximum of 60 clients).
3. Determine room size, shape and RF conditions of facility.

Best performance is achieved:

- When there is an unused wi-fi channel including unused adjacent channels.
- When the AP is in the center of and close to the area requiring coverage.
- When the top of the AP is facing the coverage area without obstructions.
- When the ListenWifi AP is installed away from other APs and is away from electrical equipment

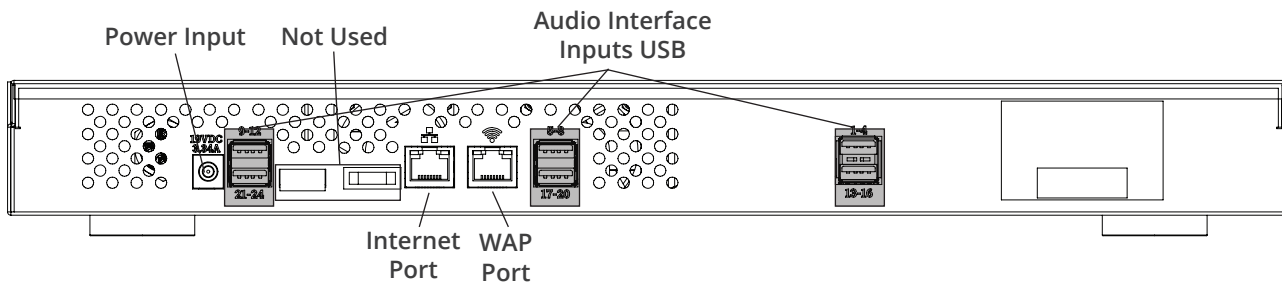
*The example below is provided for design concept only and does not represent the actual PL-301 coverage.*

Example: Center/direct line-of-sight coverage above cardio area.

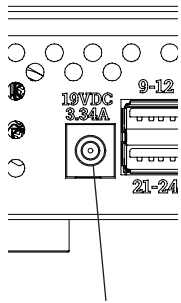


## Interconnection, Activation and Configuration

The PL-900 supports up to 24 channels of stereo audio depending on the PL-400 audio interface used with the server. Refer to the diagram below for location of these inputs, power input, network link and AP link. Two ports in the middle are not used and are therefore covered.



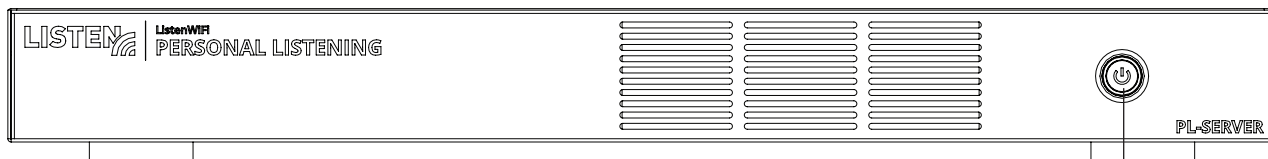
### Connection of the server's external power adaptor



Power for the PL-900 is provided by a 19 VDC 3.34A universal switching power supply.

1. The supplied power adaptor is an in-line universal switching power supply that can be used with an AC power source from 100-240 VAC 50/60Hz. The overall length of the line cord and DC power cable is 10 ft. (3 m).

Power Input Barrel Connector

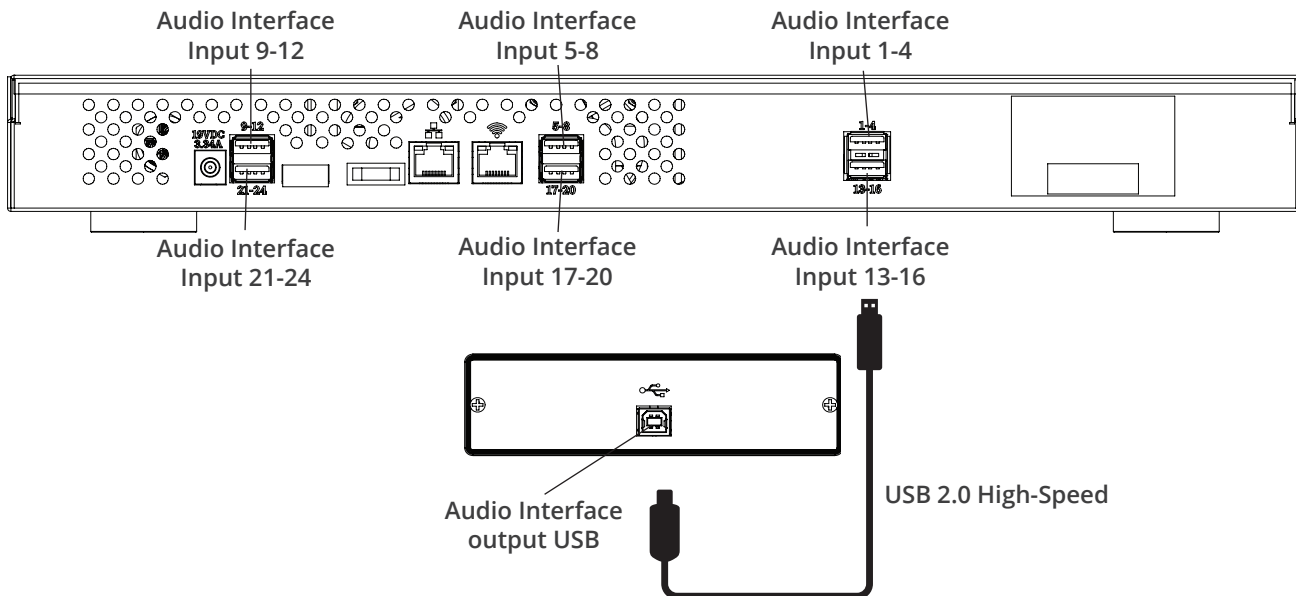


2. The Power Switch / Indicator is a momentary switch located on the front of the server. The blue light indicates that the server is powered.

Power Switch Indicator Light On/Off

## Connection of the Audio Interface with Server

Audio is provided to the server through the PL-400 audio interface via a USB connection. There are six USB ports on the server, each port labeled for a set of four specific channels. The USB port on the server determines the set of channels the audio interface inherits

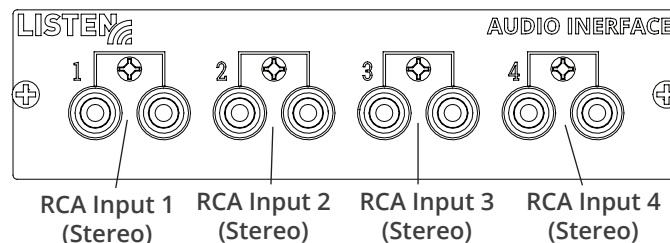


1. The Audio Interface 1-4 input USB on the server connects to the back of the audio interface unit with inputs 1-4 using the provided USB 2.0 High Speed cables. Repeat for each audio interface unit.

## Connection of External Audio Sources

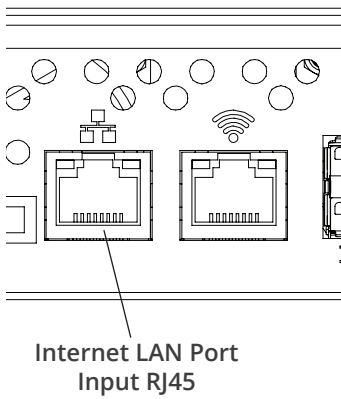
Each audio interface unit contains four pairs of stereo phono RCA inputs that are to be connected with analog audio sources. These can be paired up to provide up to 24 stereo inputs depending on the number of audio interface units purchased.

1. Phono RCA unbalanced stereo audio input is provided through each pair of red and white connectors.



connectors. These are a typical -10 dBu nominal level unbalanced inputs.

2. If the audio source is greater than 6.6 ft (2 m) feet away from the server a third party balun extender is recommended. Keeping audio signal cables away from power leads, transformers and other sources of interference is important to avoid audio signal degradation.



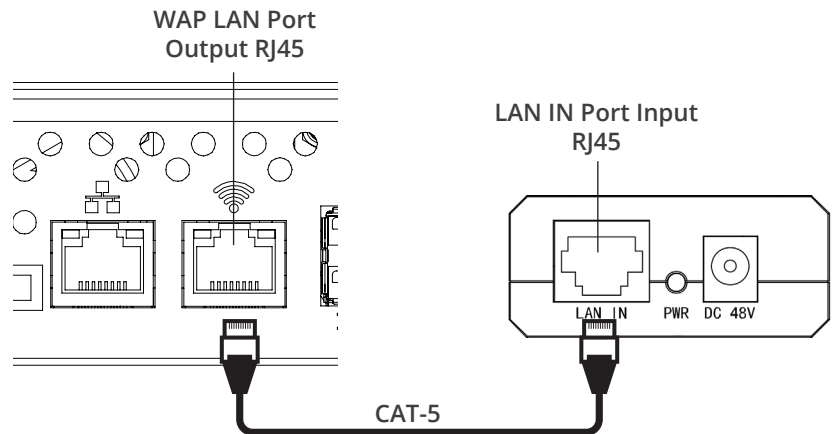
## Internet LAN Port RJ45 Connection

The server links up to the internet for the required initial activation as well as remote configuration and updates via the Internet RJ45 connection. It also shares the internet connection to clients listening to the stream but can be disabled. (See PL-900 server configuration)

1. Internet RJ45 LAN Port is to be connected using CAT5e/6 to an internet router.
2. This port operates as a DHCP client and receives its IP address from the DHCP server coming from your router.

## AP LAN Port RJ45 Connection

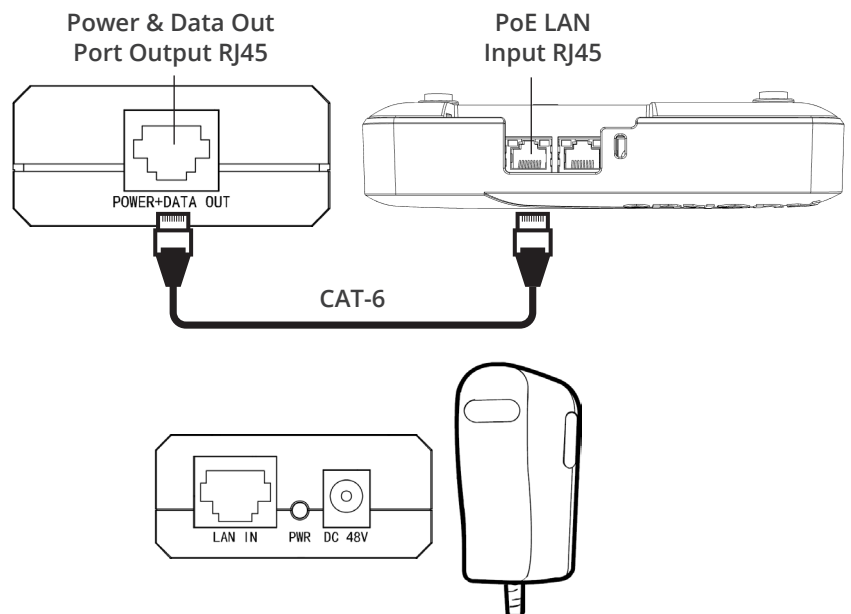
Audio data and internet is transmitted from the server via the AP RJ45 connection. The PL-200 PoE connects directly to this port to provide both power and data to the PL-301 AP. This allows the AP to be placed in remote locations without the need of a local power outlet.



1. The AP RJ45 LAN port on the server is to be connected to the LAN IN RJ45 port on the PoE using the provided 3.5 ft. (1 m) CAT5 cable found in the PoE packaging.
2. This server port operates as a DHCP server and assigns IP addresses to clients connecting through the AP. The server has the address of 172.30.0.1 and a subnet of 255.255.0.0.

**WARNING! Do not plug the AP Link RJ45 into an existing network as the server will try to assign IP addresses and may cause network interruption.**

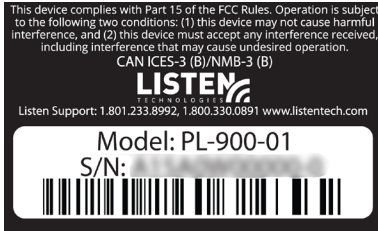
3. The PoE POWER + DATA OUT RJ45 port is to be connected to the AP's POE RJ45 LAN port using the 50 ft. CAT6 provided in the system packaging. In case a longer cable is needed, please note that the max distance between the PoE and AP is 328 ft. (100 meters).
4. Power for the PoE is provided by a 48VDC, 0.5A universal switching power supply and is connected to the PoE via the DC 48V power input connector. The overall length of the cord is 5 ft. (1.5 m).





## PL-900 Server Activation

The ListenWiFi system must be activated online before the system will stream audio. This requires that the server initially be connected to the internet. Once registered the system can be removed from the internet, however remote configuration, automatic updates, and remote support will not be available.



1. Locate and write down the serial number on the back of the server.
2. Ensure the server's Internet RJ45 Port is connected to an internet connection that requires no authentication to access it.
3. Power on the server by pressing the front power button. A blue light will indicate that it is powered on.
4. Using a computer open a web browser and go to **www.ListenWiFi.com/register**.
5. Enter in the entire serial number (i.e. A01B2C34567-8) and complete the online registration.
6. The server will automatically activate and audio will begin streaming within 5 minutes.

## PL-900 Server Configuration

The server is designed to start streaming audio with no additional configuration after the system has been activated. Additional configuration changes can be made by accessing the online account at [www.ListenWiFi.com](http://www.ListenWiFi.com) that was established when activating the server.

1. The most common configuration changes can be implemented via the online account. These include:
  - a. Adding venue logo for mobile app
  - b. Editing the location name in mobile app
  - c. Changing channel names
  - d. Deactivating channels not used
2. More advanced settings can be configured directly via the server's Web Admin page. These include:
  - a. Setting the channel type to mono
  - b. Increasing the audio delay
  - c. Reviewing audio levels
  - d. Adjusting gain of individual inputs
  - e. Configuring internet pass-through for listeners
3. The Web Admin page is accessible by connecting to the AP and typing in 172.30.0.1 in a web browser. Once the Web Admin loads use the following credentials to login:
  - a. Username: administrator
  - b. Password: admin

## PL-301 AP Configuration

The AP comes preconfigured and is ready to operate in the majority of WiFi environments. The AP can be accessed if specific channels need to be set or if other access point features need to be configured. Please note that the AP will not work if reset to factory defaults unless it is reconfigured.

1. The AP has a static IP address of 172.30.255.0 and can be accessed using a web browser (Internet Explorer recommended).
2. Credentials to log into the AP are as follows:
  - a. Username: super
  - b. Password: sp-admin
3. For more details configuring the AP please see Appendix B

# Troubleshooting

## Mobile device does not see the Personal Listening signal:

- Make sure that the AP is powered on by checking if the PWR light is green.
- Make sure that the AP 2.4G and 5G lights are either amber or green.
- Make sure that the SSID has not been modified from Personal Listening.

## Mobile device sees the Personal Listening signal but it won't connect:

- Make sure that the AP is connected to the server's AP LAN port.
- Make sure that the server is powered on by ensuring the power light is blue on the front.
- Make sure that are no more than 60 devices are connected to the AP including just internet users and audio streams users.

## Mobile device is connected but there are no channels to select:

- Make sure that you have activated the server via online registration at ListenWiFi.com.
- Make sure that the mobile device is still connected to Personal Listening.
- Make sure that the audio interface is connected to the server via USB 2.0 High Speed cable.
- Make sure that the channels are enabled in the software.

## Mobile device displays channels to select from but when selected there is no audio:

- Make sure that the audio source is still live and has sufficient gain.
- Make sure that the mobile device volume is turned up.
- Make sure that the mobile device headphones/loudspeaker are working properly.

## Mobile device produces audio but it is choppy or goes in and out:

- Make sure to check the audio source that there is not any interference.
- Make sure that Bluetooth is not adding any interference on the mobile device.
- Make sure that the WiFi settings page on the mobile device is closed.
- Make sure there is no WiFi interference coming from another AP or electronic device.
- Make sure you are using USB 2.0 High Speed USB cables between server and audio interface.

## Audio latency is more than expected:

- Make sure the source is not already delayed.
- Make sure it is not just one particular phone – some phones may have more latency than others.
- Make sure there is not any unnecessary WiFi interference.

## Audio is ahead of the video:

- Make sure to check the source to ensure it isn't already ahead of audio. If there is no way to change the source you can add delay through web admin portal. (See PL-900 server configuration)

## Appendix A – Internet Rates by Number of Active Channels

Below provides the expected internet speeds available to listeners connected to the system. It is assumed that the internet is allowed to pass through the server to end users without any throttling and that it has a speed greater than 50 Mbps. The audio data takes precedence over internet data, and therefore, the more channels that are actively streaming, the less is the internet bandwidth available.

### Max Internet Upload/Download Speeds

Number of Channels	2.4GHz	5GHz
4 (Stereo)	38 Mbps	> 50 Mbps
8 (Stereo)	30 Mbps	> 50 Mbps
12 (Stereo)	24 Mbps	> 50 Mbps
16 (Stereo)	18 Mbps	> 50 Mbps
20 (Stereo)	13 Mbps	> 50 Mbps
24 (Stereo)	7 Mbps	> 50 Mbps

## Appendix B – Advanced Access Point Configuration

The PL-301 AP is configured to support most customer environments. The following guide is provided, should additional configuration be needed. This section begins with an explanation of the most common configuration options and then provides a guide for making those changes.

### Common Configuration Options

Below are some of the configuration changes that may be needed. Please note that this is not an extensive list of all settings that can be configured.

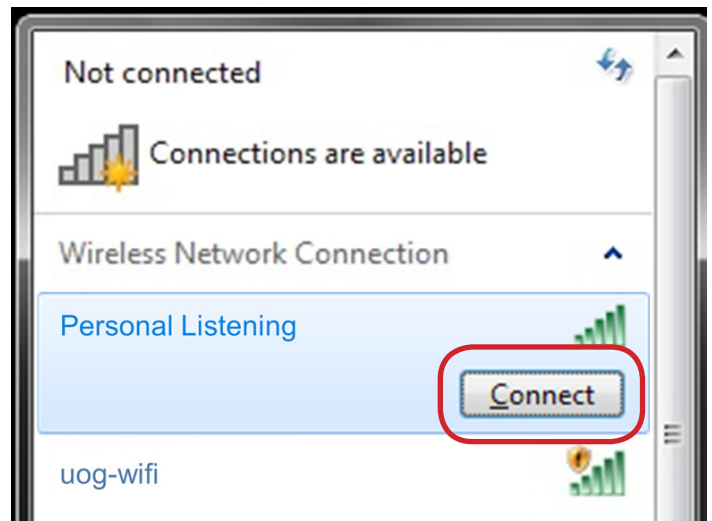
**Channel:** By default, the AP is set to Channel 1 and Channel 36 for 2.4 GHz and 5 GHz respectively. However, some Wi-Fi environments may already have too much traffic or interference on these channels and thus may need to be changed.

**SSID:** It is recommended to let the SSID read “Personal Listening,” as all instructions mention that this is the SSID for the system. However, if a different SSID is needed, a name change will not have any impact on the system.

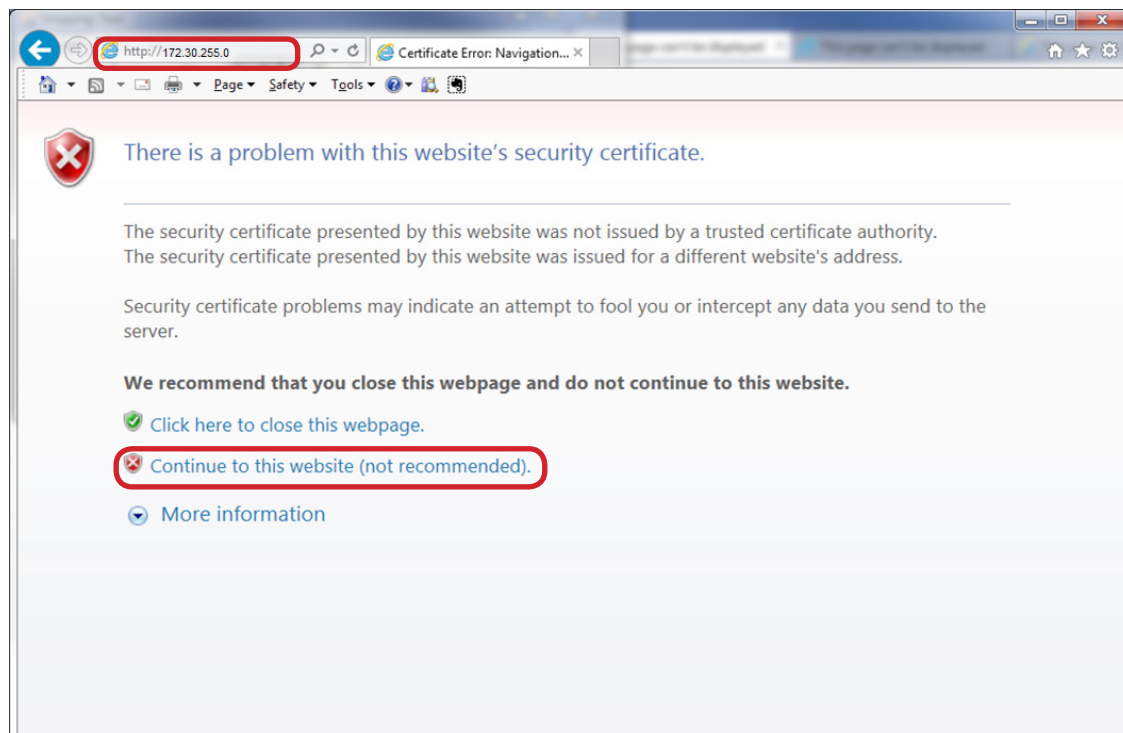
**Encryption:** To ensure that either the audio data or the internet traffic is only available to those with a password, encryption can be enabled. However, encryption can add minimal audio delay and reduce the total number of mobile devices that can be supported.

## Configuring the AP

To attach to the AP, simply use a computer with Wi-Fi capabilities and connect it to the "Personal Listening" Wi-Fi network.



After connecting to the AP, open the Internet Explorer web browser (other browsers may be very slow), type 172.30.255.0 into the address bar, and hit enter. A security alert dialog box will appear. Click on "Continue to this website (not recommended)." You will then be redirected to the login page.

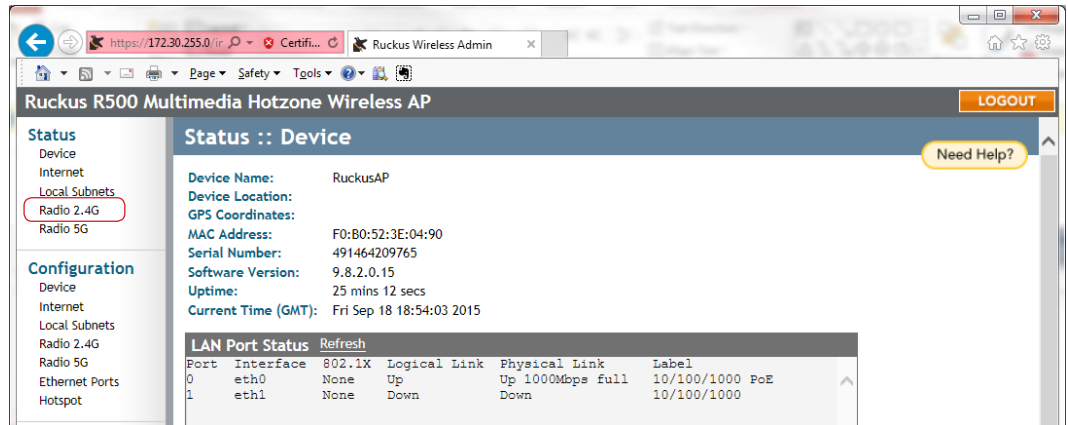


A login screen will appear. Enter the following credentials and press Login to gain access.

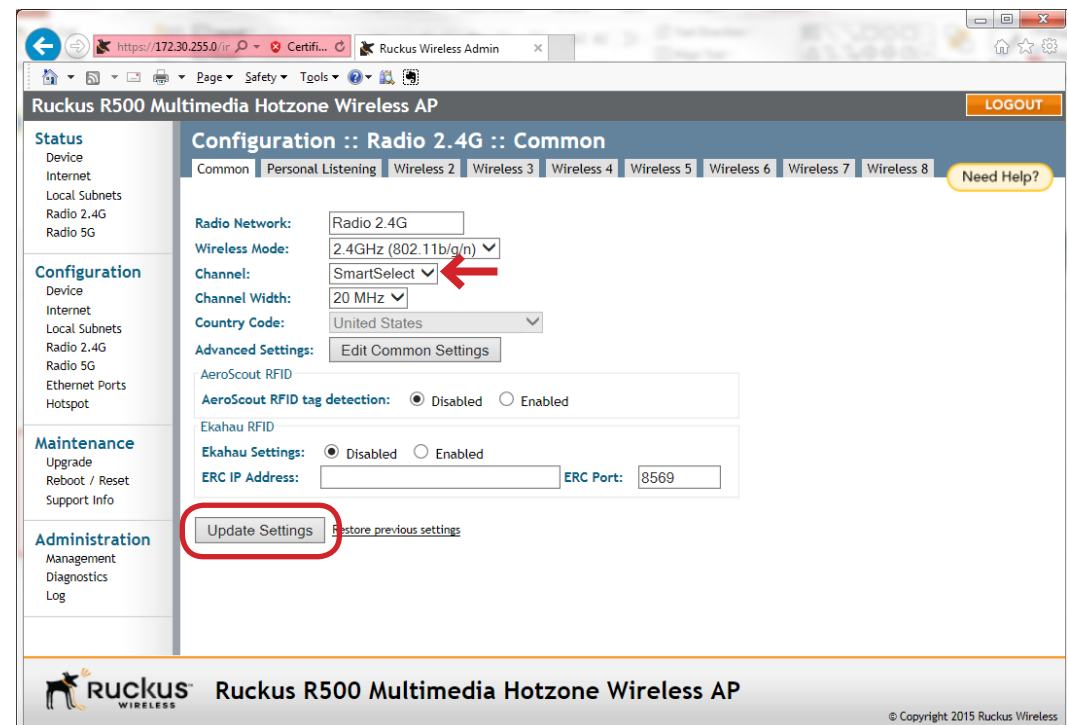
- Username: super
- Password: sp-admin



After logging in, click on either Radio 2.4G or Radio 5G under Configuration on the side menu.



Configuration pages look exactly the same, so only 2.4G is shown here. From this screen, a specific channel can be selected from a list in the drop-down menu. Make sure to click on "Update Settings" if changes are made.



To change SSID and encryption settings, click on the tab labeled “Personal Listening.”

**Ruckus R500 Multimedia Hotzone Wireless AP**

**Configuration :: Radio 2.4G :: Common**

Common | **Personal Listening** | Wireless 2 | Wireless 3 | Wireless 4 | Wireless 5 | Wireless 6 | Wireless 7 | Wireless 8 | **Need Help?**

**Radio Network:** Radio 2.4G

**Wireless Mode:** 2.4GHz (802.11b/g/n)

**Channel:** SmartSelect

**Channel Width:** 20 MHz

**Country Code:** United States

**Advanced Settings:** Edit Common Settings

**AeroScout RFID**

**AeroScout RFID tag detection:** ☒ Disabled ☐ Enabled

**Ekahau RFID**

**Ekahau Settings:** ☒ Disabled ☐ Enabled

**ERC IP Address:**  **ERC Port:** 8569

**Update Settings** [Restore previous settings](#)

**Ruckus WIRELESS** **Ruckus R500 Multimedia Hotzone Wireless AP**

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If you want to change the SSID, click in the edit box, clear old contents, and then enter the new SSID. If you want to add encryption, click on the drop-down box and select the option that best suits your needs. Again, if changes have been made, make sure to click on “Update Settings.”

Click on the “Need Help?” button to get more details about these configuration options.

**Ruckus R500 Multimedia Hotzone Wireless AP**

**Configuration :: Radio 2.4G :: Personal Listening**

Common | Personal Listening | Wireless 2 | Wireless 3 | Wireless 4 | Wireless 5 | Wireless 6 | Wireless 7 | Wireless 8 | **Need Help?**

**Wireless Network:** Personal Listening

**Wireless Availability?** ☒ Enabled ☐ Disabled

**Broadcast SSID?** ☒ Enabled ☐ Disabled

**SSID:** Personal Listening

**Threshold Settings:** Edit Settings

**Rate Limiting:** Edit Settings

**Access Control:** Edit Settings

**Packet Forward:** Bridge to WAN

**Hotspot Service:** None

**Access VLAN:** 1

**Dynamic VLAN:** ☐ Enabled ☒ Disabled

**Insert DHCP option 82?** ☐ Enabled ☒ Disabled

**Client Fingerprinting?** ☐ Enabled ☒ Disabled

**Encryption Method:** Disabled

**Update Settings** [Restore previous settings](#)

**Ruckus WIRELESS** **Ruckus R500 Multimedia Hotzone Wireless AP**

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## PLS-900 System Specifications

Audio	Audio Quality	44.1 kHz 16 bit audio
	Gain Adjustment Controls	Up to 30dB increase
	Frequency Response	20 – 20 kHz +/- .5db
	Line Input	Stereo/Mono Input. Two (2) RCA Phono connectors, unbalanced,  -10 dBu nominal input, +12 dB headroom, impedance 10k
	Total Harmonic Distortion	<0.2% (THD) System Specification (wireless end-to-end with mobile device)
	Signal-to-Noise Ratio	>84 db (SNR) System Specification (wireless end-to-end with mobile device)
Network	Data Per Channel	Stereo: 0.2 mbps Mono: 0.1 mbps
	Audio Data Transmission	Native Multicast
	Quality of Service (QoS)	Voice - Expedited Forwarding
	Network Protocol	UDP ports 42000 through 42048
Configuration	Venue Logo	600 x 600 dpi GIF, PNG, JPEG
	Max Channels	24 stereo channels (determined by audio interface units)
	Venue Name	Editable venue name up to 30 characters
	Channels Name	Editable channel names up to 20 characters
	Dynamic Input Ordering	Ability to change the order of inputs through web admin
Supported Receivers	Smartphones and Tablets	Apple iOS 7.0+ and Google Android 4.0.1+ (Jelly Bean)



## PL-900 Server Specifications

Power	Power Supply Type	In-line switching supply, Listen part PL-201
	Power Supply Input	100-240 VAC, 50-60 Hz
	Power Supply Output	19 VDC, 3.34A, 65W, 7.5 mm barrel connector, center positive
	Power Line Cord	North American Type B
	Boot Time	< 50 Seconds
Ports	USB Ports	Six USB 2.0 High Speed type A inputs to connect to the audio interface
	LAN Port - Internet	Auto-sensing 10/100/1000 Mbps, RJ-45, DHCP client
	Lan Port - AP	Auto-sensing 10/100/1000 Mbps, RJ-45, DHCP server, 172.30.0.1
Indicators	Power Switch Indicator Light	Indicator light: off indicates not powered, on indicates powered up
	LAN Ports	Activity LED (left): off indicates not linked, on indicates linked, blinking indicates data activity  Speed LED (right): off indicates 10 Mbps, orange indicates 100 Mbps, green indicates 1 Gbps
Physical	Dimensions (H x W x D)	1RU rack mountable, 1.75 x 19 x 11.25 in. (4.5 x 48.3 x 28.6 cm) - excludes feet
	Weight	7.4 lbs. (3.4 kg)
	Ambient Noise	30 dB(a)
Environmental	Color	Black
	Operation Temperature	41°F to 104°F (0°C to 40°C)
	Storage Temperature	23°F to 122°F (-5°C to 50°C)
	Relative Humidity	5% to 85% non-condensing
Compliance	Standards	FCC Part 15, Industry Canada, CE, RoHS

## PL-400 Audio Interface Specifications

<b>Power</b>	<b>USB</b>	Powered via USB data cable connected to server
<b>Ports</b>	<b>USB</b>	USB 2.0 High Speed (type B female)
	<b>Line Input</b>	Stereo Input. Up to twenty-four (24) RCA Phono connectors, unbalanced, -10dBu nominal input, +12 dB headroom, impedance 10k
<b>Physical</b>	<b>Dimensions (H x W x D)</b>	1U rack mountable, 1.75 x 19 x 3.25 in. (4.5 x 48.3 x 8.3 cm)  2U rack mountable, 3.5 x 19 x 3.25 in. (8.9 x 48.3 x 8.3 cm)
	<b>Weight</b>	12 channel 1RU: 1.8 lbs (0.8 Kg)  24 channel 2 RU: 3.6 lbs (1.6 Kg)
	<b>Color</b>	Black
<b>Environmental</b>	<b>Temperature Operation</b>	41°F to 104°F (0°C to 40°C)
	<b>Temperature Storage</b>	23°F to 122°F (-5°C to 50°C)
	<b>Relative Humidity</b>	5% to 85% non-condensing
<b>Compliance</b>	<b>Standards</b>	FCC Part 15, Industry Canada, CE, RoHS

## PL-301 AP Specifications

Power	Via-PoE	Idle - 4W Typical - 5.95W Peak - 10W
RF	Antenna	Adaptive antenna that provides up to 64 unique antenna patterns per radio  Full omnidirectional polarization diversity
	Physical Antenna Gain	3dB
	SINR TX Gain	Up to 4 dB
	SINR RX Gain	3-5 dB (PD-MRC)
	RF Power Output (Aggregate)	25 dBm for 2.4GHz and 5GHz
	Interference Mitigation	Up to 10 dB
	Minimum RX Sensitivity	Up to -100 dBm
	Coverage Area	Open space: 2.4 GHz range of 300 feet (91 m); 5 GHz range of 100 feet (30 m)  Physical obstructions: 2.4 GHz 150 feet (45 m); 5 GHz range of 50 feet (15 m)
	Power Save Mode	Supported
WiFi	Capacity	60 clients
	Standards	IEEE 802.11a/b/g/n/ac
	Frequency	2.4GHz and 5GHz
	Frequency Bands	IEEE 802.11 b/g/n: 2.4 – 2.484 GHz IEEE 802.11a/ac: 5.15 – 5.25 GHz; 5.25 – 5.35 GHz; 5.47 – 5.725 GHz; 5.725 – 5.85 GHz
	Operating Channels (US/ Canada)	2.4 GHz channels: 1-11  5 GHz channels: 35, 40, 44, 48, 149, 153, 157, 161, 165
	Configuration	Two-stream MIMO 2x2:2
	Wireless Security	WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i
Ports	LAN Port – PoE	MDX, auto-sensing 10/100/1000 Mbps, RJ-45, POE port 802.3 af
	LAN Port – no label	MDX, auto-sensing 10/100/1000 Mbps, RJ-45 (not used)
Controls	Reset	Quick press reboots the AP. Press and hold for six seconds resets AP back to factory defaults.

## PL-301 AP Specifications

Indicators	PWR	Off indicates off  Red indicates bootup in process  Green indicates on
	DIR	(not used) Indicates if the AP is being manage by a controller
	AIR	(not used) Indicates AP is connected using a mesh network
	2.4G & 5G	Off indicates the WLAN service is down.  Amber indicates the WLAN is up, but no clients are associated.  Green indicates the WLAN is up and at least one client is associated.
	LAN Ports	Off indicates link down and flashing light indicates activity.  Amber + green indicates connected to 10 Mbps device  Amber indicates connected to 100 Mbps device  Green indicates connected to 1 Gbps device
Environmental	Temperature Operation	32°F to 122°F (0°C to 50°C)
	Temperature Storage	-40°F to 176°C (-40°C to 80°C)
	Relative Humidity	10% to 95% non-condensing
Physical	Dimensions (H x W x D)	1.57 x 6.2 x 6.2 in. (4 x 15.8 x 15.8 cm)
	Weight	0.77 lbs. (0.35 kg)
	Color	White
Compliance	Standards	FCC Part 15, Industry Canada, CE, RoHS, UL 2043 Plenum rated

## PL-200 PoE Specifications

Ports	LAN Port - POWER + DATA OUT	Auto MDI/MDIX, Auto-sensing 10/100/1000 Mbps, RJ-45 supporting CAT5/5e/6 UTP
	LAN Port - LAN IN	Auto MDI/MDIX, Auto-sensing 10/100/1000 Mbps, RJ-45 supporting CAT5/5e/6 UTP
Performance	Range	Delivers power up to 328 ft. (100 meters)
Indicators	PWR (Power LED)	<p>Red and yellow blend indicates that the power adapter is working properly.</p> <p>Green indicates that the PoE system has detected the AP and is supplying power normally.</p> <p>Flashing LED indicates abnormal power supply.</p>
Power	Power Supply Type	In-line switching supply
	Power Supply Input	100-240 VAC, 50-60 Hz
	Power Supply Output	48 VDC, 0.5A, 15.4W, (EIAJ-03) 4.75mm (OD), 1.7mm (ID), 8mm (Shaft)
Environmental	Temperature Operation	32°F to 104°F (0°C to 40°C)
	Temperature Storage	-40°F to 158°F (-40°C to 70°C)
	Relative Humidity	5% to 90% non-condensing
Physical	Dimensions (WxDxH)	0.9 x 3.2 x 2.1 in. (2.4 x 8.08 x 5.4 cm)
	Weight	0.22 lbs. (0.1 kg)
	Color	Black
Compliance	Standards	IEEE 802.3af, FCC, CE, RoHS

## Warranty Information

Listen Technologies Corporation (Listen) warrants its ListenWiFi System (PL-900, PL-400, PL-301) to be free from defects in workmanship and material under normal use and conditions for 2 years from the date of purchase. All other products and accessories are warranted for 1 year from date of purchase.

This warranty is only available to the original end purchaser of the product and cannot be transferred.

Warranty is only valid if warranty card has been returned within 90 days of purchase. This warranty is void if damage occurred because of misuse or if the product has been repaired or modified by anyone other than a factory authorized service technician.

Warranty does not cover normal wear and tear on the product or any other physical damage unless the damage was the result of a manufacturing defect. Listen is not liable for consequential damages due to any failure of equipment to perform as intended.

Listen shall bear no responsibility or obligation with respect to the manner of use of any equipment sold by it. Listen specifically disclaims and negates any warranty of merchantability or fitness of use of such equipment including, without limitation, any warranty that the use of such equipment for any purpose will comply with applicable laws and regulations. The terms of the warranty are governed by the laws of the state of Utah.

In the first ninety days after purchase, any defective product will be replaced with a new unit. After ninety days, Listen will at its own discretion either repair or replace with a new unit or a unit of similar type and condition. Product that is not covered under warranty shall be repaired or replaced with a unit of similar type and condition based on a flat fee. Contact Listen for details.

This limited warranty, prices, and the specifications of products are subject to change without notice.

## Technical Support Contact

If technical service is needed, please contact Listen. Pre-authorization is required before returning Listen products. If products were damaged in shipment, please contact the carrier, then contact Listen for replacement or repair requirements payable by the carrier. Listen's corporate headquarters are located in Bluffdale, Utah U.S.A. and are open Monday through Friday, 8am to 5pm Mountain Time.

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