

INTEROPERABILITY NOW

Quick Start Guide

RSP-Z2

Dual Channel Analog-IP Interface



Designed and Manufactured by:

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1 General

All of the information necessary to install, configure, and operate the RSP-Z2 Channel Bank is available within the unit. This Quick Start Guide's basic purpose is to describe how to access that information, which includes extensive context-sensitive help available on each page of the unit's browser-based Graphical User Interface. Some topics benefit from more in-depth information; applicable documents can be accessed from the GUI's Help tab pull-down menu.

The RSP-Z2 is standards-compliant and therefore supports standards-compliant web browsers, including Internet Explorer (must be at least IE 10 or Edge), Firefox, Chrome, Opera, and Safari. It's always best to use the most current version of any web browser.

A brief overview of RSP-Z2 operation is also provided in Section Two of this QSG, providing sufficient information to give a basic understanding of most RSP-Z2 functions.

1.1 Set up IP Address and Subnet Mask

As with any device with a static IP address, it will be necessary to set up the unit to operate on the LAN where it is to be deployed. The RSP-Z2's factory default IP address is 192.168.1.200, with a default subnet mask of 255.255.255.0.

To reset to an address and subnet mask that work on your LAN, connect the RSP-Z2 via CAT-5 cable (need not be a cross-over cable, though a cross-over cable will work) directly to the Ethernet Port of the computer that will be used to access and configure it.

Set the computer to a static IP address of 192.168.1.xxx (where xxx is a number between 2 and 199) and a subnet mask of 255.255.255.0. This will allow you to browse to the RSP-Z2 at its default IP address following the instructions in the next section of this guide.

Plug in the unit's power supply, and turn the unit on via its front panel power switch. The RSP-Z2's front panel LEDs will flash while the unit boots up (approximately 90 seconds). After logging in, you can access the Installation and Operations Manual and use it to change the unit's IP address and subnet mask as necessary. Be sure to remember and write down this new IP address; if you fail to do so or become otherwise unable to navigate to the login screen, see Section 1.5 of this QSG.

1.2 Log In

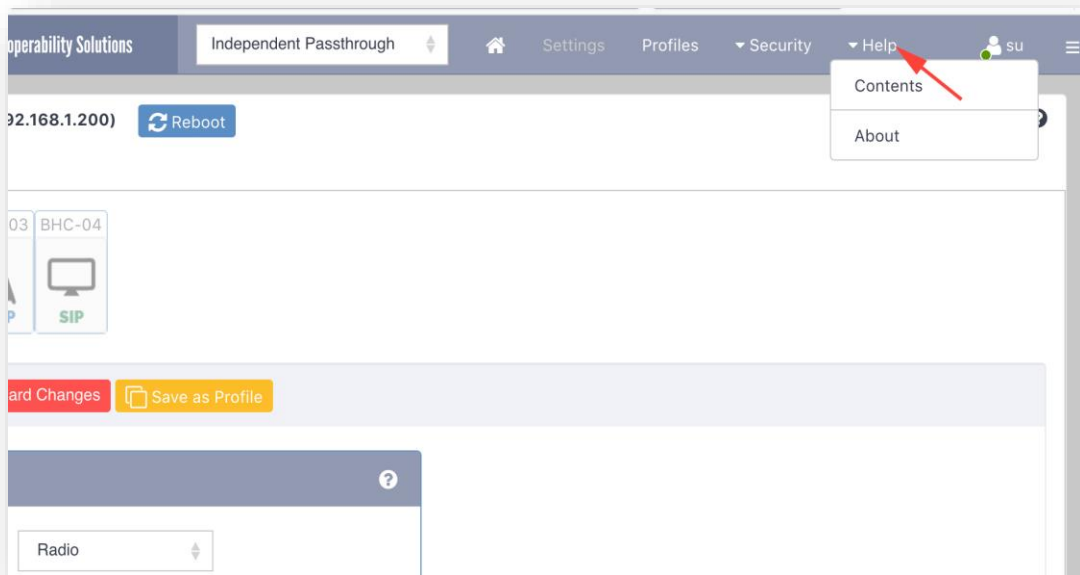


Upon browsing to the unit’s IP address, the login screen above will appear.

Default name and password are both “su” for Super User with the Super User’s full-capability permission set. Further explanation, including instructions for changing these defaults, is provided in the Help Documents.


1.3 Accessing the Help Documents

The unit’s Help Documents, in PDF format, can be downloaded from the unit. Click on the Help pull-down menu (as shown below), and select “Contents.”



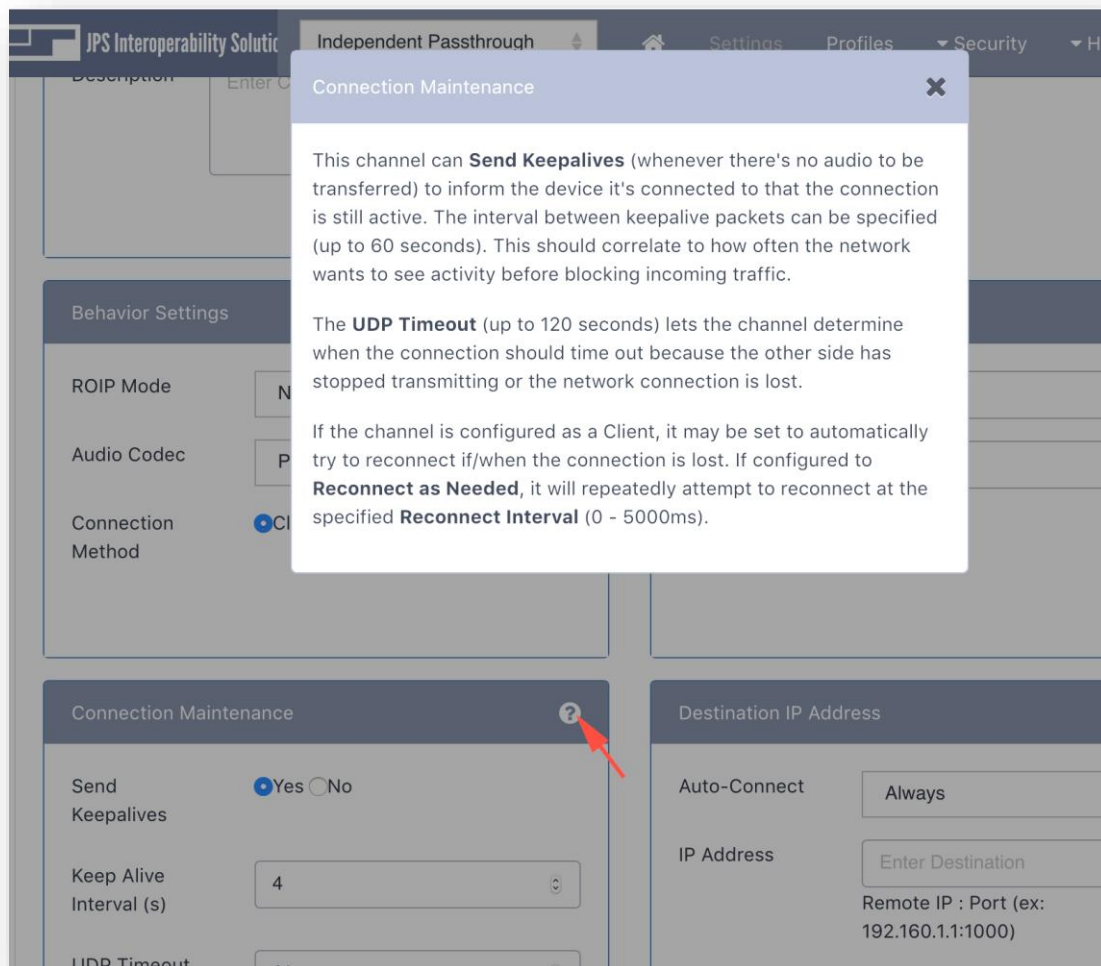
Among the topics available are this Quick Start Guide, an Installation and Operations Manual, and some helpful specific instructions on basic topics such as Channel Profiles, how the RSP-Z2’s SIP Channels handle COR & PTT, and tips for basic system optimization and troubleshooting.

1.4 Context-Sensitive Help

The RSP-Z2 also makes extensive use of context-sensitive help. On the upper right corner of each of the unit's web pages, click on the circular question mark  to bring up page-specific help text.

Further specific help is also available wherever appropriate. For example, the channel configuration pages include context-sensitive help for each settings box.

The image below shows the pop-up window for the "Connection Maintenance" settings. Note how the rest of the screen is darkened while the help text is being viewed.



1.5 IP Address Determination

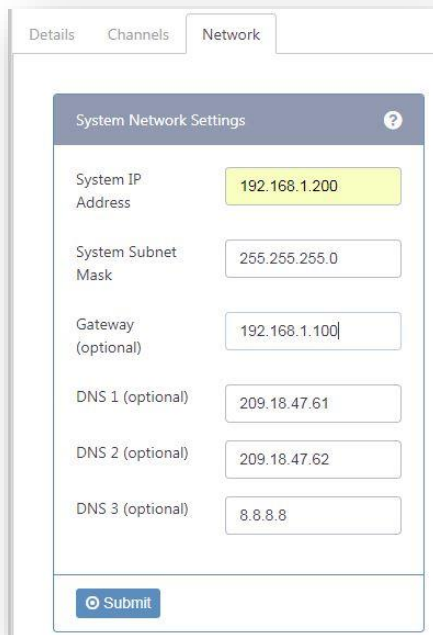
If unable to access the RSP-Z2 because you’ve forgotten its IP address and other network settings, the front panel USB port can be used to retrieve the needed information. Plug a thumb drive into the port and cycle the power. After power-up, the unit will store several files on the drive; these include diagnostic log files plus a short text file that lists the unit’s network information. Most important will be its IP address and subnet mask. After the unit is fully rebooted the USB drive will be unmounted and can be unplugged. Use the USB drive’s LED to determine when it has completed downloading the log files.

On the USB drive, open the file named “networkinfo.txt”

It contains the desired information in this format:

```
address: 192.168.1.200
netmask: 255.255.255.0
gateway: 192.168.1.100
dns-nameservers: 209.18.47.61 209.18.47.62 8.8.8.8
broadcast: 192.168.1.255
```

Note this matches the unit’s Network Settings information that can be viewed or changed via the web browser:



See Section 3 of the Installation and Operations Manual (located under the *Help* tab on the GUI) for instructions related to changing these settings.

2 RSP-Z2 Basic Overview

2.1 Basic Information

This section provides some essential background information that will assist in understanding the capabilities of the RSP-Z2.

JPS Interoperability Solutions has several decades of experience with voice communications interoperability, fielding their first devices in 1989. Over this time the company has encountered and resolved a wide array of problems that can hamper or complicate communications when disparate devices are patched together into interoperability nets.

The RSP-Z2 incorporates all this experience, in the form of a suite of sophisticated DSP algorithms that operate at its interfaces with any connected communications devices, as well as many custom radio interface cables, covering well over 300 different radio makes and models.

JPS interoperability devices are also known for simplicity and ease-of-use. The RSP-Z2's browser-based Graphical User Interface is carefully designed to make these sophisticated capabilities available when necessary. When the simple setup and configuration works well, an installer and operator need only be concerned with these elements. However, if the communications system includes any problematic elements, a JPS interoperability device (such as this RSP-Z2) has the features necessary to resolve the problems and optimize communications.

2.2 Important definitions:

COR: A signal that indicates when a radio (or other type of communications device, such as an RSP-Z2) is receiving a valid audio signal.

PTT: A signal that tells a radio (or other communications device) to transmit the audio signal being sent to it.

Full Duplex Communication System: Users can simultaneously talk to and listen (for example, a standard telephone call).

Simplex or Half Duplex Communication System: Only one system user can be heard at a time.

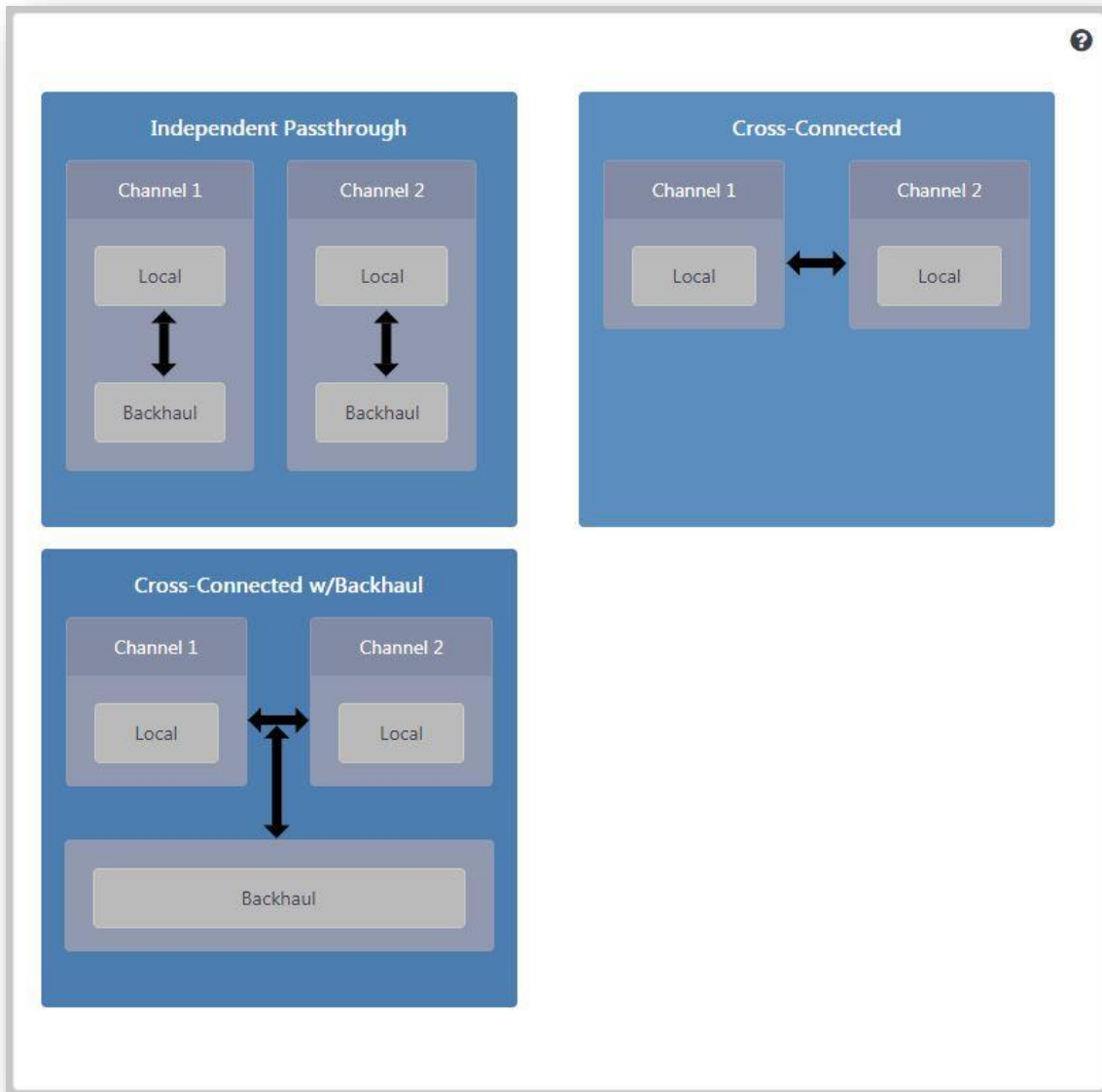
Interoperability Net: Communications link consisting of disparate devices (such as radios of different frequencies, telephones, VoIP phones, etc.) connected together, similar to a conference call.

These definitions are essential in understanding the basic operation of an interoperability device, such as a JPS ACU Gateway or this RSP-Z2. That is: If multiple communications devices are engaged in an interoperability net, whenever one device detects active COR (valid audio input), that audio, along with a PTT signal, is sent to all other devices in the net to be transmitted. Also, if any device in an interoperability net is half duplex (such as are almost all radio systems), then all communications must be half-duplex. For this reason, the RSP-Z2 is a half-duplex device.

Among the unit's sophisticated features are various methods for determining active COR (such as VOX or VMR, which are optimal or necessary for some types of devices), and adjustable audio delays to meet the timing requirements of the connected communications systems.

2.3 Possible RSP-Z2 Configurations

This RSP-Z2 provides a pair of analog-to-IP channels, along with a Headset Channel. The non-headset channels can be configured in multiple ways, best illustrated below by this partial screen shot from the Configuration Page of the unit’s browser-based Graphical User Interface. It shows the three basic configurations; the first step in setting up the unit is selecting one. All three are explained in the following sections.



2.3.1 Independent Passthrough

This configuration provides two separate Analog to IP converters. For each, active COR on the analog side will send incoming audio out the IP backhaul interface, and vice-versa. Active COR occurs when the channel determines that “Valid” audio input has been detected. Available COR types (methods of determining valid audio) vary by channel type.

Note that four separate channels are depicted for this configuration – two local audio channels each tied to its own IP backhaul channel. A USB Headset can also be included, and connected to any communications channel.

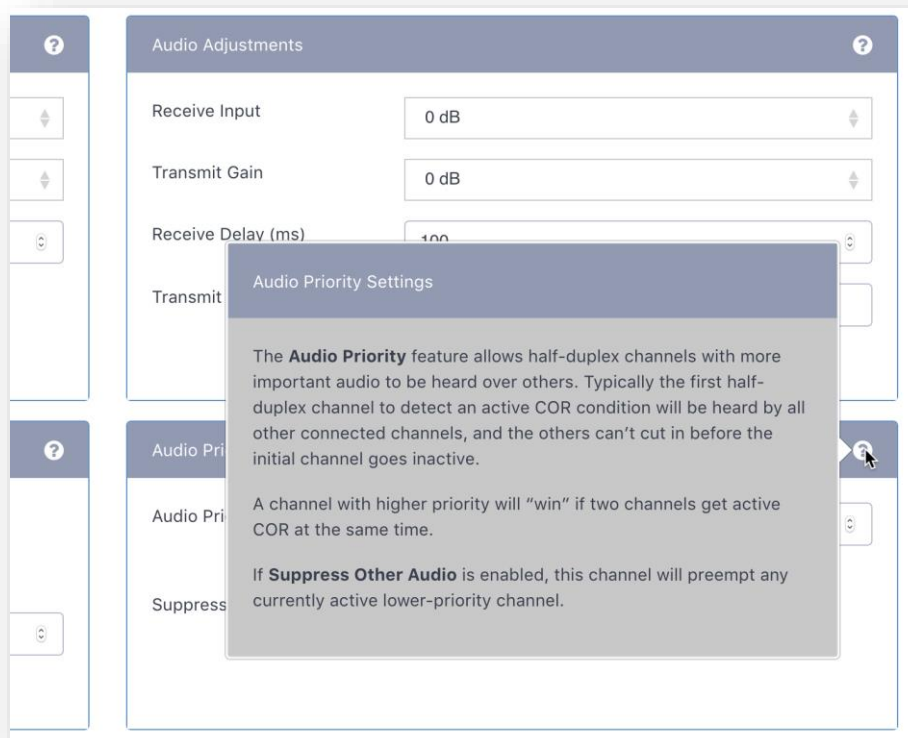
Once a configuration is selected, right-clicking on any channel icon will bring up the *Settings Page* for that channel; this allows the channel to be set to a variety of Channel Types, with appropriate settings options for the selected type.

For this RSP-Z2, the analog options are *Radio* (appropriate also for other types of four-wire devices), and *Headset* (among other applications, the headset allows the unit to be used as a small IP dispatch station). Future versions will include a PSTN analog channel.

Backhaul options include RTP, SIP (BSI compliant), RoIP (the JPS-proprietary Radio over IP protocol), VIA (for connection to the JPS VIA Smartphone PoC app), and Bridge Channels (for future applications when used in a system with other JPS devices).

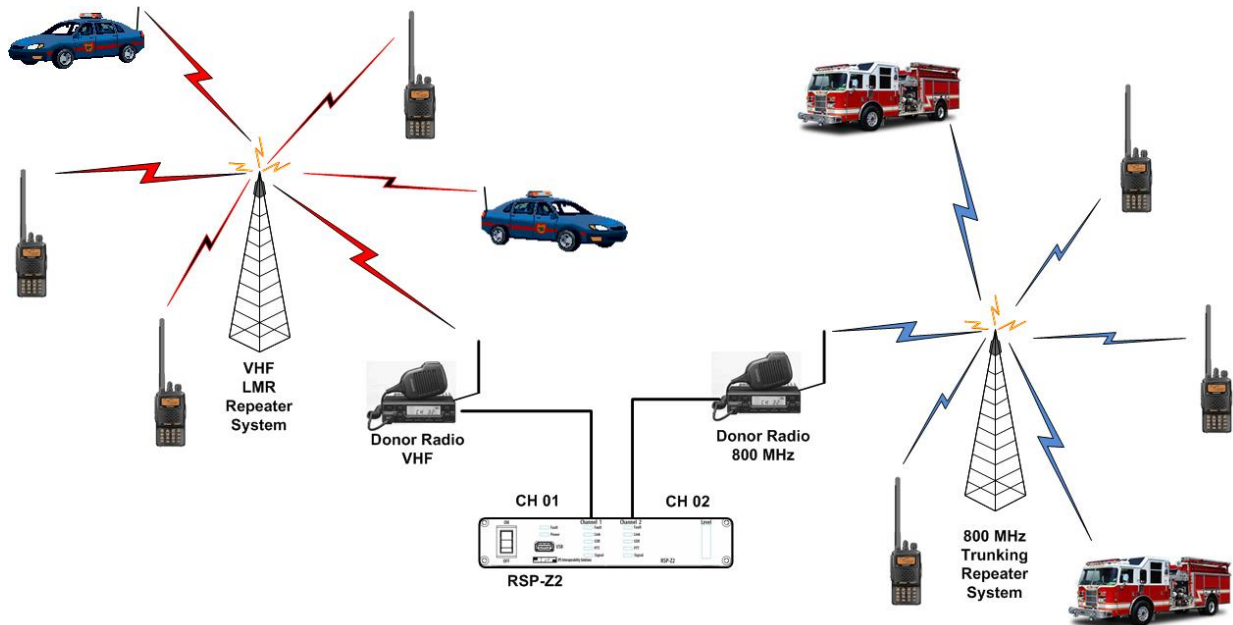
Note that, if desired, the analog channels can also be configured as either of the RoIP, RTP, or SIP channel types.

Because the RSP-Z2 is a half-duplex device, the first channel with active COR is in control until its COR status goes back to inactive - unless another channel is configured to allow preemption. If so, that channel's incoming audio will take over. See the related context-sensitive help below, from the *Settings Page* for a Radio channel:



2.3.2 Cross-Connected

This configuration patches the two analog interfaces together, with no IP backhaul. When one of the two channels detects a valid audio input, the other will transmit this audio. See block diagram below. RSP-Z2 Channel 01 is connected to a VHF repeater system for the State Highway Patrol, and Channel 02 to the local Fire Department’s 800 MHz trunked system. A channel/talkgroup on each system is set aside for emergencies when the two agencies need to talk to each other.



Whenever any user from either system transmits on the designated channel/talkgroup, all other users on both channels can hear. Because the donor radios interface the radio systems identically to all other radios in either system, the RSP-Z2 installation has minimal impact.

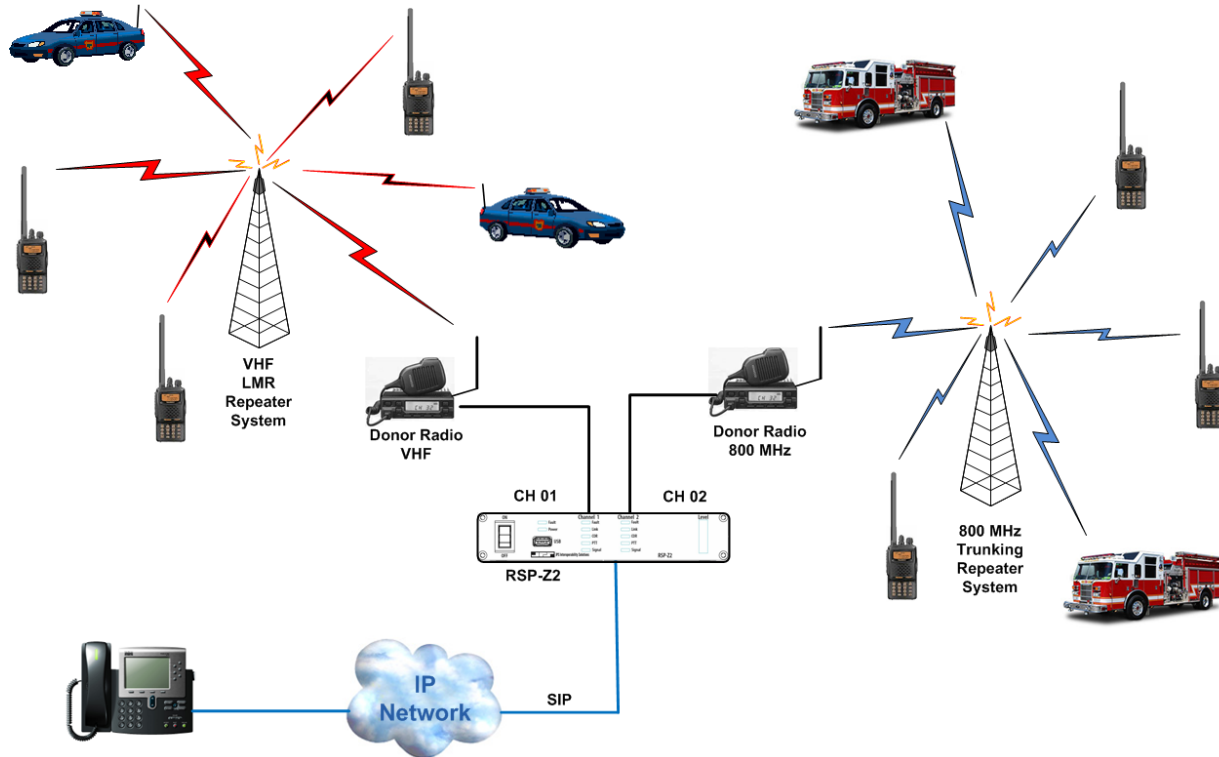
A note about the need for sophisticated radio interface algorithms: Any time a handheld radio on the 800 MHz trunked system keys up, that user needs to wait until a channel acquisition confirmation tone is heard before speaking; only then is the trunked system ready to transmit that user’s audio.

When a patrolman in the vehicle in the upper left keys up, he will begin talking without any concern for a tone.

Now consider the two systems cross-connected. When that VHF user keys up, his radio will of course be in transmit mode, so there is no way to provide any feedback regarding the channel acquisition tone that the 800 MHz donor radio will receive. Further, the interoperability system doesn’t want to alter normal operation of either system in any way. Instead, the RSP-Z2 deals with this through the TX audio Delay feature in the Radio Channel Settings. The RSP-2 stores the audio temporarily in an internal buffer and sends it out after the trunked system is ready to receive and retransmit it.

2.3.3 Cross-Connected with Backhaul

This is a combination of the Independent Passthrough and Cross-Connected configurations. Only a single backhaul interface is needed, because it is interfaced to the combined (cross-connected) audio of the two local channels.



The diagram above shows one of the many ways the backhaul channel can be used, as a SIP channel allowing a supervisor to dial in by a VoIP phone. All three channels are connected together, so the caller will hear anything on either channel, and the supervisor's speech will be retransmitted in both radio systems.

2.4 Front Panel Level Indicator

The RSP-Z2 has a set of audio level indicating LEDs on the front panel; the LEDs can be applied to any one of the unit's channels. The level is measured after the channel's audio adjustment, that is, the measurement point includes the changes made by the channel's "Receive Input" audio adjustment. This allows the level indicator to give visual evidence of optimal adjustment. When properly set, a standard voice signal (a person on this channel speaking at a typical volume level) will flash red on occasional voice peaks.

Click on the icon with the rising bars in the upper right of each interface to select (only visible after configuration is set, see figures that follow). After selection, the level icon will turn green.

See the Field Setup Guide, available via the Help pulldown menu, for further tips on proper use of the Level Meter.

2.5 USB Headset

If a JPS-approved USB headset is plug in at power-up, an icon will appear in the upper right corner of CH1 and CH2. Click on one of these headset icons to select what audio source it will be connected to. This selection makes a difference only for the Independent Passthrough configuration, because with all other configurations, all the channels are tied together.

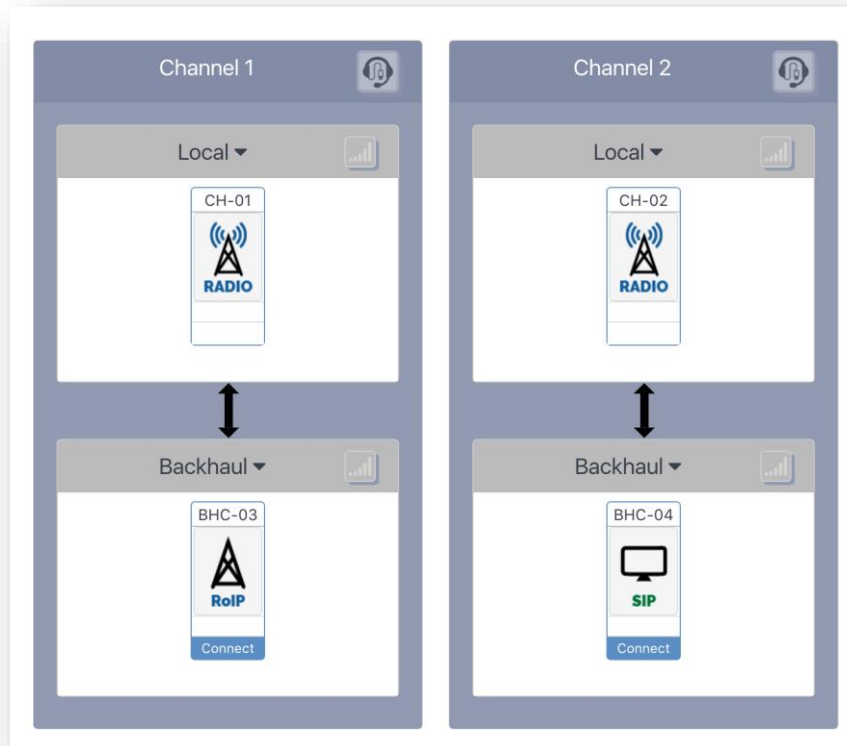
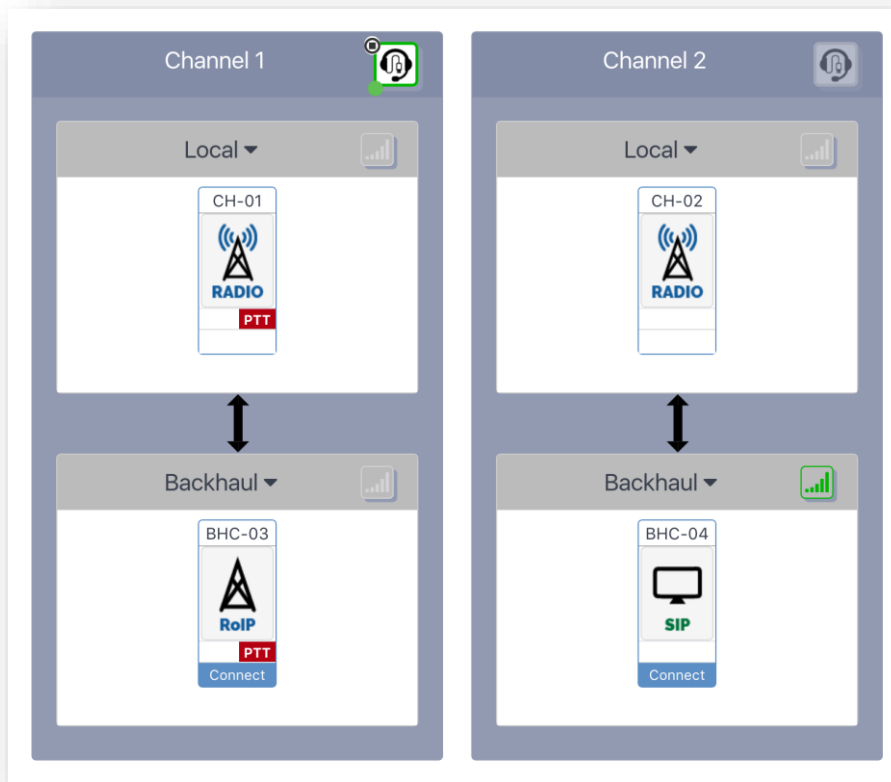


Figure above: Home Screen – a Headset was plugged in at power up but has not yet been associated with either channel. Level Indicator association also not yet selected.

In the next screen shot, the operator has connected the headset to the interoperability net made up of Channel One and its RoIP backhaul channel. The operator has also connected the RSP-Z2’s front panel audio level meter to Channel 2’s backhaul channel. These selections are made clear by the green shading.

Also, the operator is currently talking into the headset. Active COR by the headset is indicated by the green circle at the lower left corner of the headset icon. Because this is an active interoperability net, this active COR causes the headset operator’s speech to be retransmitted by the radio channel and also the RoIP backhaul channel.



More about Headsets:

- If the headset becomes unplugged, a red exclamation point will be displayed on its icon.
- If none of the channels is selected to use the front panel level meter, it will indicate the headset audio level.
- When installed, the headset has its own settings page. Settings options include VOX sensitivity, changing to COR rather than VOX (useful in noisy environments) and applying higher priority to the headset channel relative to other system channels.
- The system can also be configured so that the USB Headset acts as one of the local analog channels, rather than being connected to the local/backhaul pair. See the Installation and Operations manual for further instructions.

2.6 Configuration and Control Methodology

The unit is configured via its web-based GUI. There are no physical potentiometers or switches related to the analog interface configuration.

To allow a lower price when only a single radio is needed, the RSP-Z2 may be purchased with a single active analog channel. If the second analog channel is desired later, it may be purchased from JPS Interoperability Solutions and activated via a firmware update.

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