

# *iRoute*

## IP Audio Route Selector / Monitor

### Installation and Operations Guide



Firmware version 1.2.0  
Manual Last Updated 9/27/2010



© Copyright 2010 Paravel Systems LLC. All Rights Reserved.  
No portion of this document may be copied or distributed without permission. iRoute is a trademark of Paravel Systems LLC. Axia and Livewire are trademarks of TLS Corp. StudioHub+ is a registered trademark of Radio Systems, Inc.



# TABLE OF CONTENTS

- 1 Introduction
  - 1.1 Safety Information
  - 1.2 Who to Contact for Help
  - 1.3 Product Description
- 2 Installation
  - 2.1 Physical, Electrical and Environmental Considerations
    - 2.1.1 AC Power
    - 2.1.2 Livewire Network Connection
    - 2.1.3 Audio Connections
    - 2.1.4 GPI Connections and Muting
  - 2.2 Configuring Basic Network Parameters with the Front Panel
  - 2.3 Completing Configuration with the Web Interface
    - 2.3.1 IP Settings
    - 2.3.2 Time Settings
    - 2.3.3 Display Options
    - 2.3.4 Serial Port Settings
    - 2.3.5 Administrator Password
    - 2.3.6 Saving and Restoring System Configuration
    - 2.3.7 Uploading System Firmware
- 3 Controlling Audio Routes
  - 3.1 Routing Audio Front Panel
  - 3.2 Routing Audio from the Web Interface
  - 3.3 Routing Audio from the Serial or TCP Interfaces
- 4 Salvos
  - 4.1 Overview
  - 4.2 Creating and Managing Salvos with the Web Interface
  - 4.3 Executing Salvos from the Front Panel
  - 4.4 Executing Salvos from the Web Interface
  - 4.5 Executing Salvos from the Schedule
  - 4.6 Executing Salvos from GPI
  - 4.7 Executing Salvos from the Serial or TCP Interfaces
- 5 Profiles
  - 5.1 Overview
  - 5.2 Creating and Managing Profiles with the Web Interface
  - 5.3 Logging in to an Existing Profile
- 6 Appendices
  - 6.1 The iRoute Serial/TCP Control Protocol
  - 6.2 Specifications
  - 6.3 Warranty



# 1 INTRODUCTION

Thank you for your purchase of an iRoute IP Audio Route Selector/Monitor. iRoute has been engineered to provide many years of reliable service. This manual is designed to provide all the information necessary to install and operate the unit in an audio facility.

## 1.1 Safety Information

Only qualified technical personnel should install the iRoute, as incorrect or inappropriate use could result in a hazardous situation.

## 1.2 Who to Contact for Help

Should you have any questions regarding the iRoute or require assistance, Paravel Systems technical support can be contacted at the following locations:

### **Paravel Systems LLC.**

41 W. Lee Highway, Suite 54, PMB 124  
Warrenton, VA 20186

Phone: (540) 242-4247

Web: <http://www.paravelsystems.com/>

E-Mail: [support@paravelsystems.com](mailto:support@paravelsystems.com)

## 1.3 Product Description

The iRoute IP Audio Route Selector/Monitor is an electronic appliance that allows multiple devices and sources to control and monitor a Livewire(tm) IP audio network. Methods of control include the front panel, the built-in web interface (OS independent), TCP/IP 'telnet' connection, asynchronous serial connection and opto-isolated general purpose inputs. Audio from the network can be monitored via the unit's built-in front panel speaker (mutable) and/or via rear panel balanced analog and AES3 digital output ports.

# 2 INSTALLATION

## 2.1 Physical, Electrical and Environmental Considerations

The iRoute is designed to be installed into a standard 19 inch rack. When choosing a location, be sure to allow for adequate cooling and ventilation by leaving at least one rack unit (1-3/4 inch) of space clear above and below the unit. The unit is designed to be used at ambient air temperatures between 0 and 35 degrees Celsius. Care should be taken not to obstruct the cooling vents on the sides or the top of the device.

### 2.1.1 AC Power

The unit should be connected to AC power via the IEC power cord provided. The power supply will accept a range of AC voltage, from 100 – 240 VAC, 47 – 63 Hz. Fuses are located within the IEC power module.

### 2.1.2 Network Connection

The Ethernet port should be connected to a Livewire network via a 100BaseTX switch port (configured as for use with a standard Livewire node) using a category 5/6 patch cable.

### 2.1.3 Audio Connections

Audio connections are made using the StudioHub(tm) compatible shielded RJ45 ports on the rear of the unit. See [www.studiohub.com](http://www.studiohub.com) for more details.



Both analog and AES3 digital signals are available, as follows:

#### Analog Audio Port

PIN	COLOR	SIGNAL
1	Wht/Org	Left +
2	Org/Wht	Left -
3	Wht/Grn	Right +
4	Blu/Wht	No connection
5	Wht/Blu	No connection
6	Grn/Wht	Right -
7	Wht/Brn	No connection
8	Brn/Wht	No connection
9	Wht/Sl't	Shield
10	Sl't/Wht	Shield

### AES3 Digital Audio Port

PIN	COLOR	SIGNAL
1	Wht/Org	AES3 +
2	Org/Wht	AES3 -
3	Wht/Grn	No connection
4	Blu/Wht	No connection
5	Wht/Blu	No connection
6	Grn/Wht	No connection
7	Wht/Brn	No connection
8	Brn/Wht	No connection
9	Wht/SlT	Shield
10	SlT/Wht	Shield

#### 2.1.4 GPI Connections and Muting

Eight GPI connections and one Speaker Muting connection are provided on the rear panel, each on a separate two-pin Euro-block connector. These GPI and muting inputs are self-powered, driven by a separate regulated supply, and require ONLY a contact closure to operate. They are not designed to accept an external input voltage.

If you wish to activate a GPI input or the muting input using an “open-collector” type contact-closure the right-hand pin is the PLUS(+) supply and the left-hand pin is the COMMON (-).

The function of the GPI connections is configured in Section 4.6.

The Muting contacts will mute the iRoute speaker but not the headphone jack.

## 2.2 Configuring Basic Network Parameters with the Front Panel

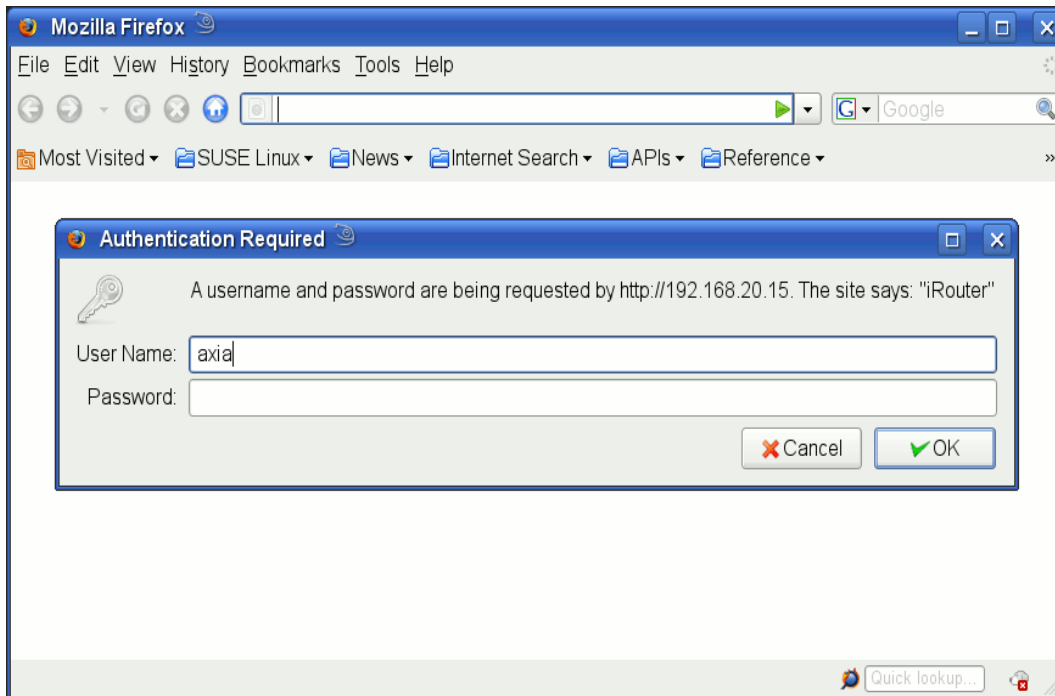
Once the unit is physically installed, connected and powered up, it will be necessary to set the basic IP network parameters from the front panel by holding down the **DESTINATION** knob until the 'iRoute Network Configuration' screen appears. Use the **DESTINATION** knob to navigate to the desired parameter and then use the **SOURCE** knob to set each digit to the desired value, pressing the **SOURCE** knob to advance to the next digit. When all the parameters are set correctly, pressing the **TAKE** button will save the values and cause the iRoute to reinitialize; pressing the **CANCEL** will abandon changes made to the configuration. Default configuration is shown below:

```
== iRoute Network Configuration ==
IP Address: 192.168.020.015
Netmask: 255.255.255.000
Gateway: 192.168.020.001
```

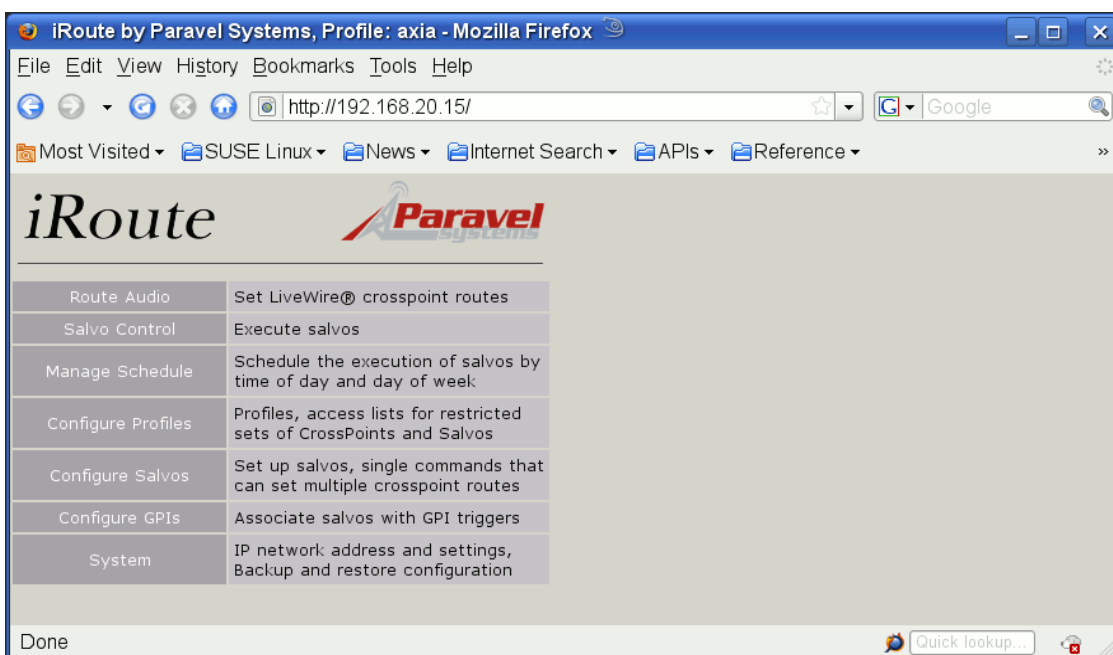
The iRoute should now be ready for use.

## 2.3 Completing Configuration with the Web Interface

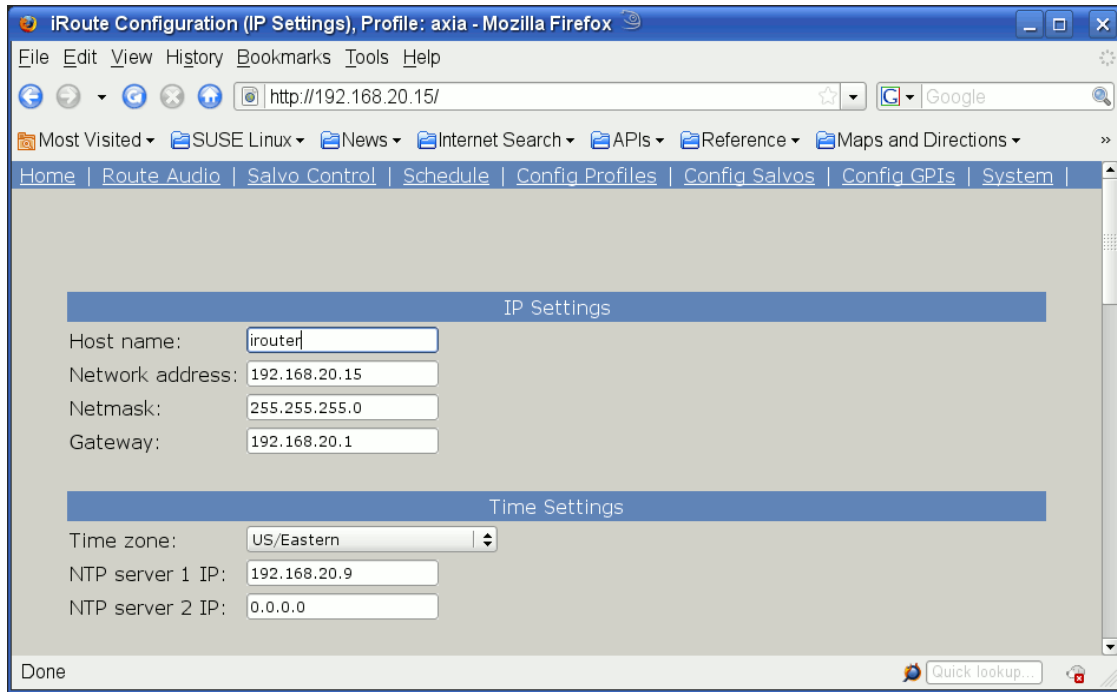
Once the basic IP parameters have been set from the front panel, log into the iRoute's web interface by entering the configured IP address into a web browser. The login name for the administrative profile is 'axia'. If this is the first time logging into the system, leave the **Password** field blank.



Once logged in, the main web menu will be displayed:



To configure system settings, click the **System** link to open the System Configuration page. The following parameters can be set:

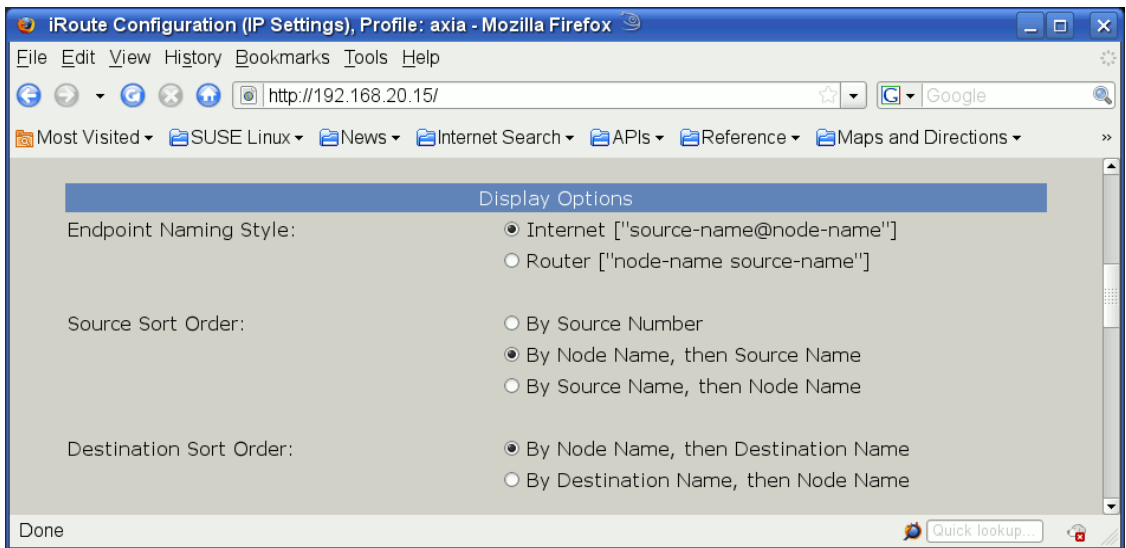


### 2.3.1 IP Settings

PARAMETER	MEANING
Host Name	The device name that the iRoute will advertise itself as on the Livewire network.
Network Address Netmask Gateway	TCP/IP parameters. These values can also be set on the front panel.

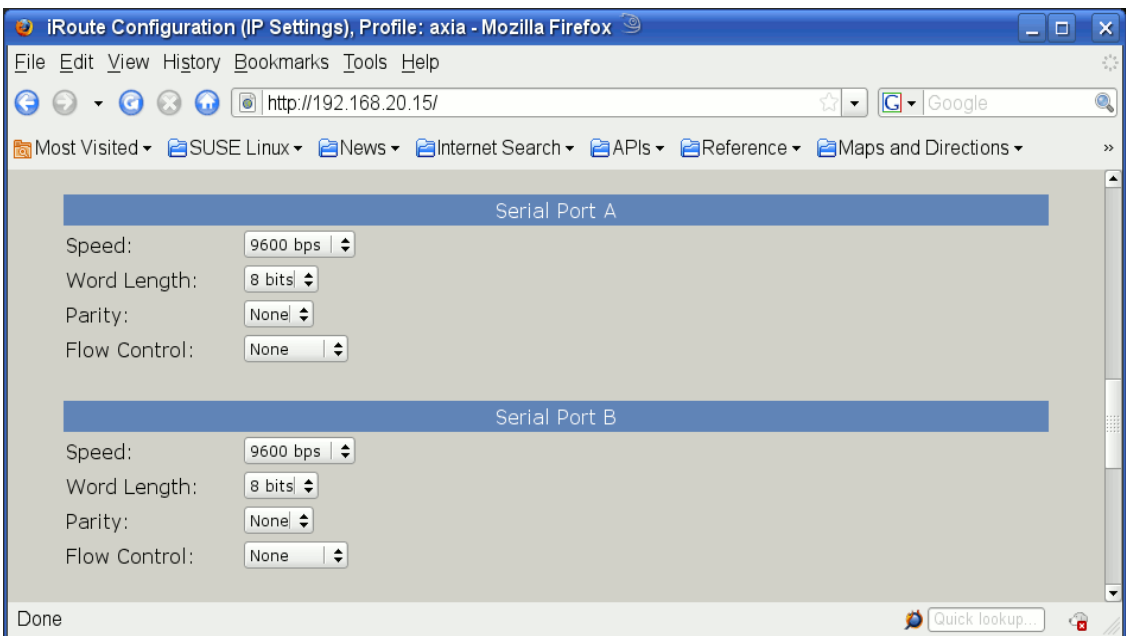
### 2.3.2 Time Settings

PARAMETER	MEANING
Time zone	The time zone for the iRoute. This will be used to interpret the times used on the salvo schedule.
NTP server 1 IP NTP server 2 IP	The IP address of one or more Network Time Protocol (NTP) server(s). The iRoute will sync its internal clock to these servers automatically.



### 2.3.3 Display Options

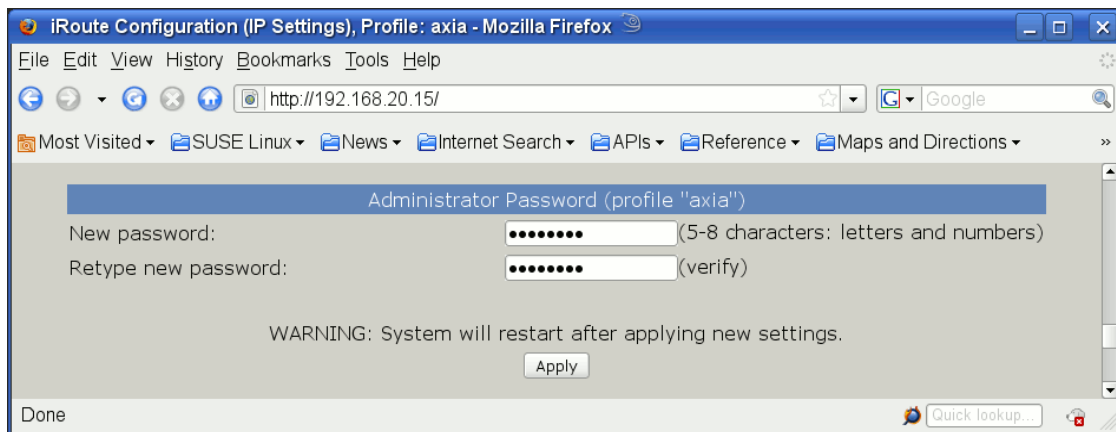
PARAMETER	MEANING
Endpoint Naming Style	Controls how Source and Destination names will be formatted on the iRoute front panel and web interface.
Source Sort Order Destination Sort Order	Controls how Sources and Destinations will be sorted in the iRoute front panel and web interface.



### 2.3.4 Serial Port Settings

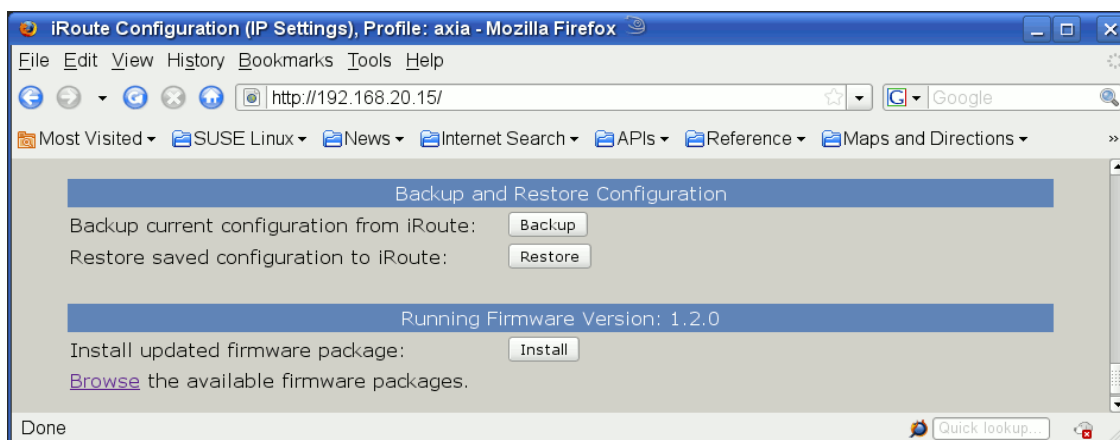
PARAMETER	MEANING
Speed	The speed of the specified rear-panel RS-232C serial port, in bits per second. Supported speeds are 300, 600, 1200, 1800, 2400, 4800, 9600, 19200 and 38400.
Word Length	The number of data bits per character. Supported values are 7 and 8.
Parity	The value of the parity bit in each character. Supported values are even, odd or none.
Flow Control	The style of flow control used on the interface. Supported values are hardware [RTS/CTS], software [Xon/Xoff] or none.

Default serial port settings are 9600 baud, 8 data bits, 1 stop bit, no parity.



### 2.3.5 Administrator Password

The password for the Administrator Profile (user name 'axia') can be set here. To save all of the above settings, click the **Apply** button.



### 2.3.6 Saving and Restoring System Configuration

The iRoute's settings (including all programmed salvos and profiles) can be downloaded to a client computer by clicking the **Backup** button. If it becomes necessary at a later time to upload those settings to this or another iRoute, this can be done by clicking the **Restore** button.

### 2.3.7 Uploading System Firmware

After downloading a revised iRoute firmware file from the Paravel Systems FTP archive, it can be uploaded to the iRoute by clicking the **Install** button.

## 3 CONTROLLING AUDIO ROUTES

### 3.1 Front Panel Control

By default the iRoute will display a *crosspoint information* screen on its front panel, such as is shown below:

DST	Rack Monitor@axia-mnode0							
SRC	Test Tone@CR-A							
	.42	.36	.30	.24	.18	.12	.6	0
LT	████████████████████							
RT	████████████████████							

The **DST** section shows the name of the Audio Destination selected for monitoring. This value can be changed by rotating the **DESTINATION** knob. The **SRC** section will show the name of the audio source currently routed into the selected destination, or [off] if no source is routed or the source node is offline. Rotating the **SOURCE** knob will scroll through the list of available sources, while playing the corresponding audio on the front panel speaker. To actually route a selected source to the selected destination, press the **TAKE** button; pressing the **CANCEL** will return the display to the currently routed source.

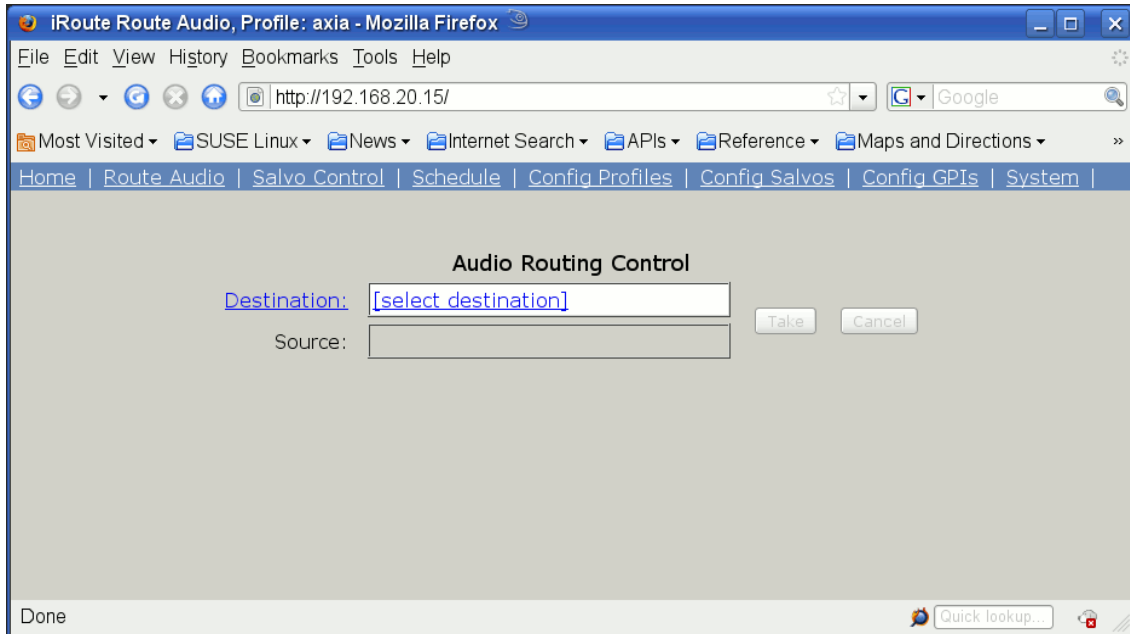
The bottom two-thirds of the screen displays information about the currently selected audio source. By default, this consists of a level meter, but pressing the **SOURCE** button will scroll through a set of screens display a variety of source stream parameters:

DST	Rack Monitor@axia-mnode0		
SRC	Test Tone@CR-A		
	Source Stream Type: Live Stereo		
	Livewire Node: CR-A:1		
	Livewire Channel: 1008		

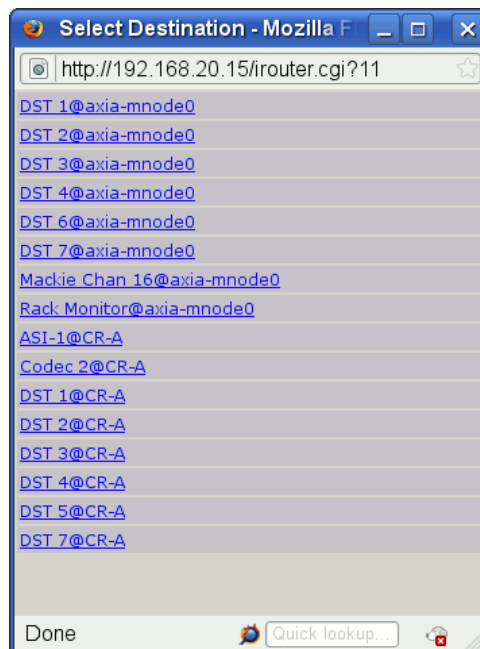
DST	Rack Monitor@axia-mnode0		
SRC	Test Tone@CR-A		
	Packets Received: 429978		
	Late/Lost Packets: 0		
	Sequence Errors: 0		

### 3.2 Web Interface Control

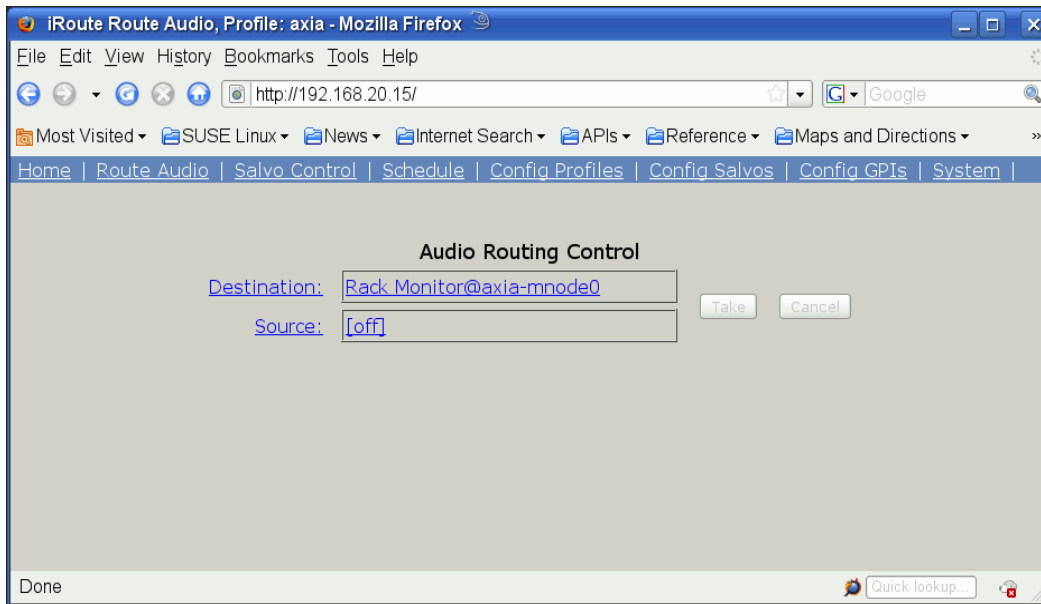
When logged into the web interface, clicking on the **Route Audio** link will bring up the Route Audio Screen:



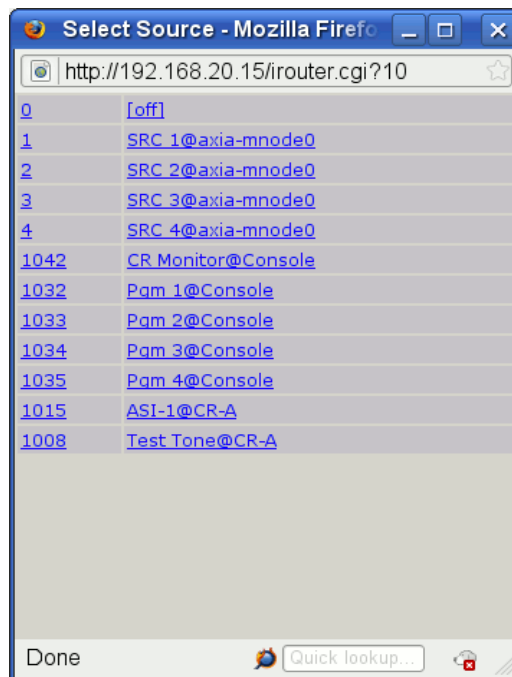
Click the [select destination] link to bring up the Select Destination dialog:



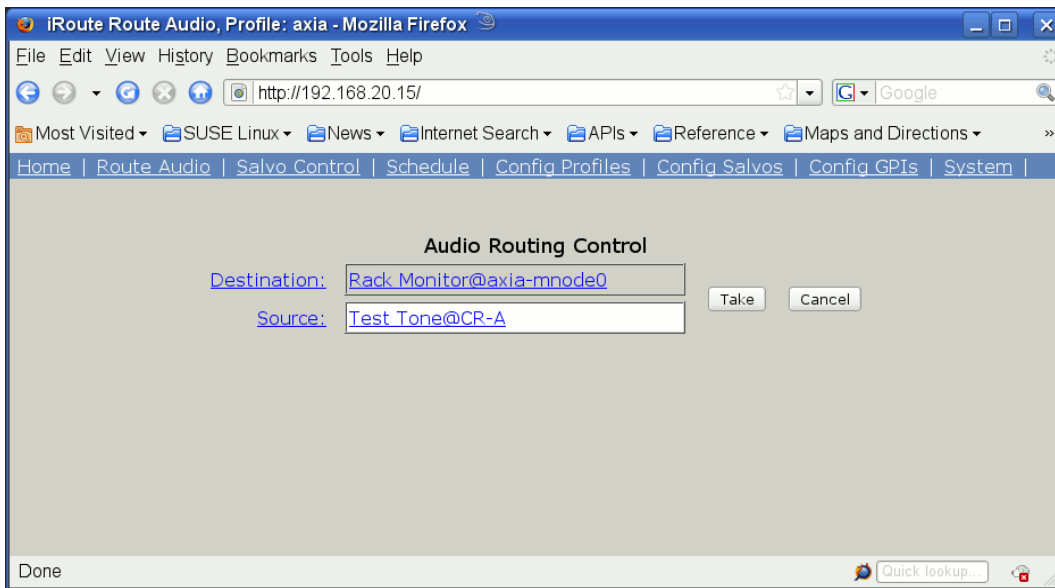
Click on the desired destination. The screen will now display the source currently selected for that destination, or **[off]** if no source is assigned or the host node for the assigned source is offline.



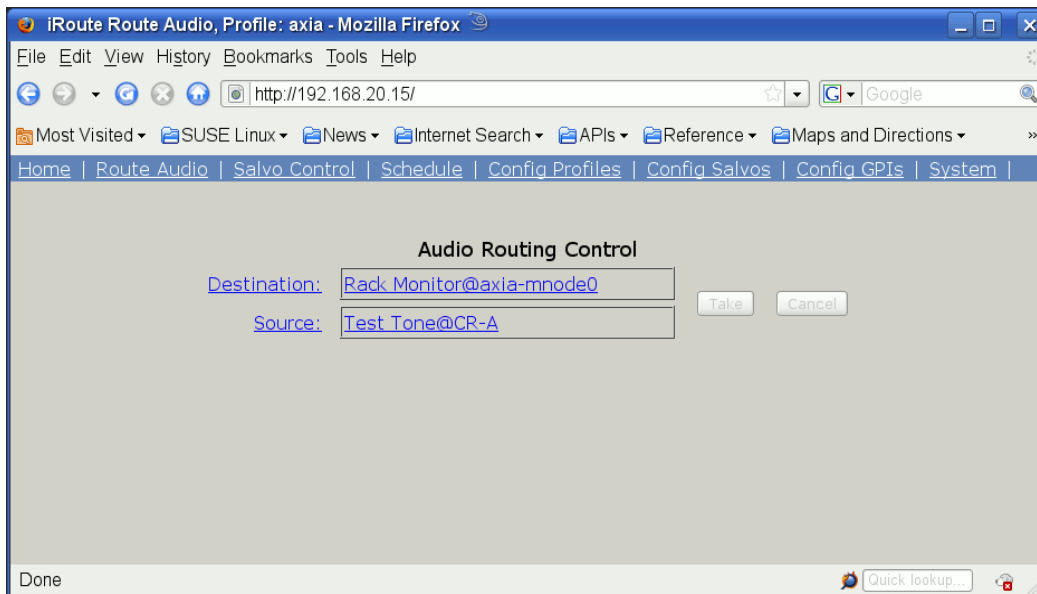
Click on the **Source** link to bring up the Select Source Dialog:



Click on the desired source.



Finally, to make the route change actually take effect, click the **Take** button, or click **Cancel** to abort the pending change.



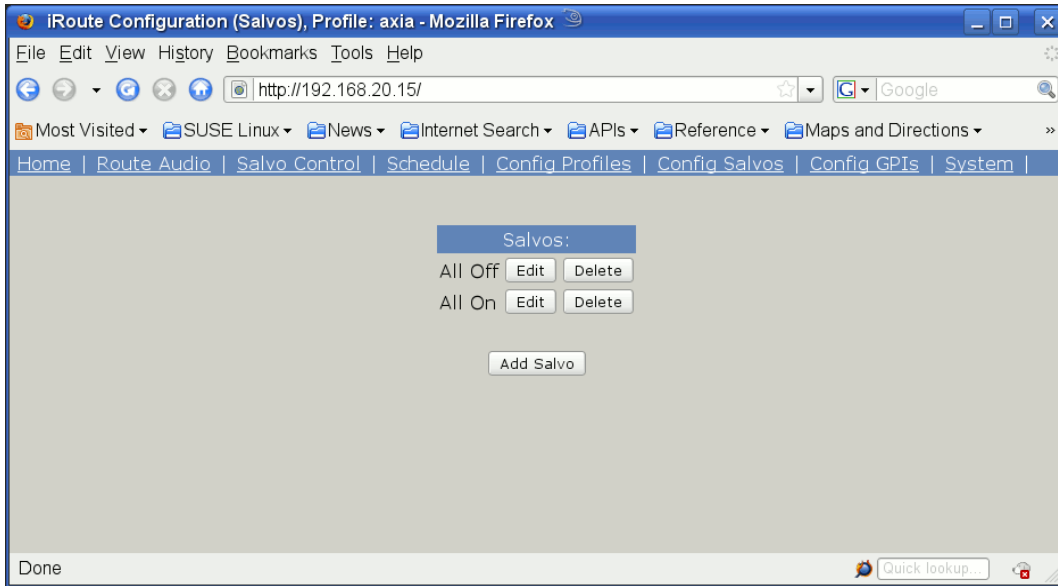
## 4 SALVOS

### 4.1 Overview

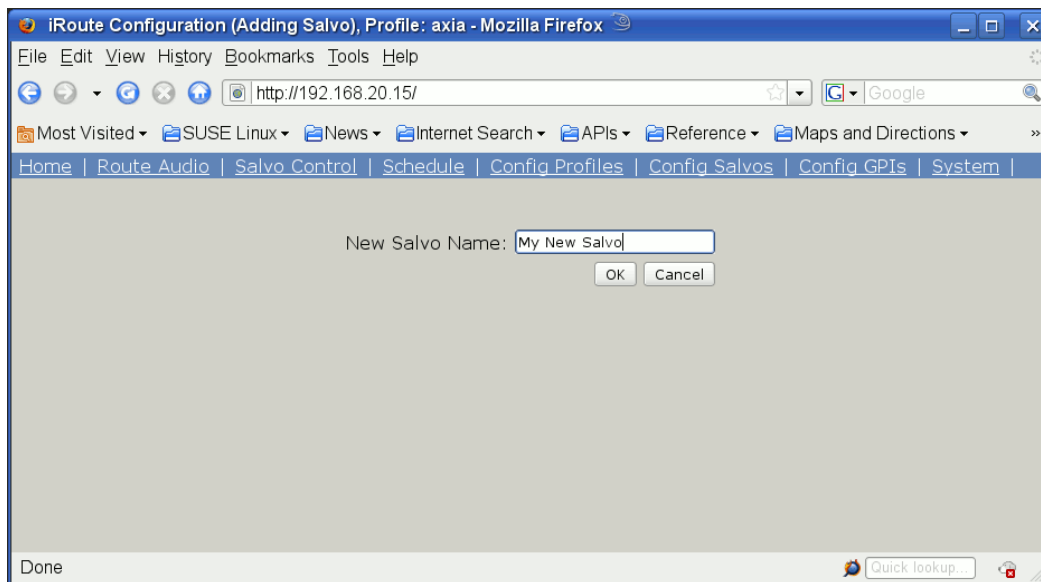
Salvos are sets of audio routes that are given a name and can be executed as a single operation. Salvos can be executed from the front panel, the web interface, the TCP or serial interfaces, in response to a closure received at one of the rear panel GPI inputs or even as part of a schedule of events based on clock time and day of the week.

## 4.2 Creating and Managing Salvos with the Web Interface

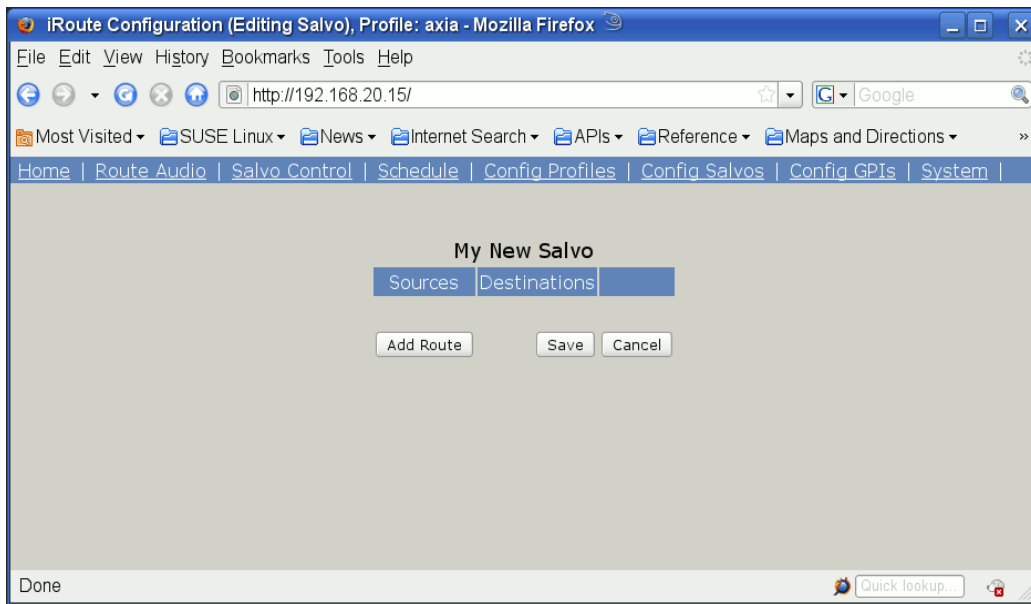
Salvos are managed in the Salvos Configuration screen, reached by clicking the **Config Salvos** entry in the menu.



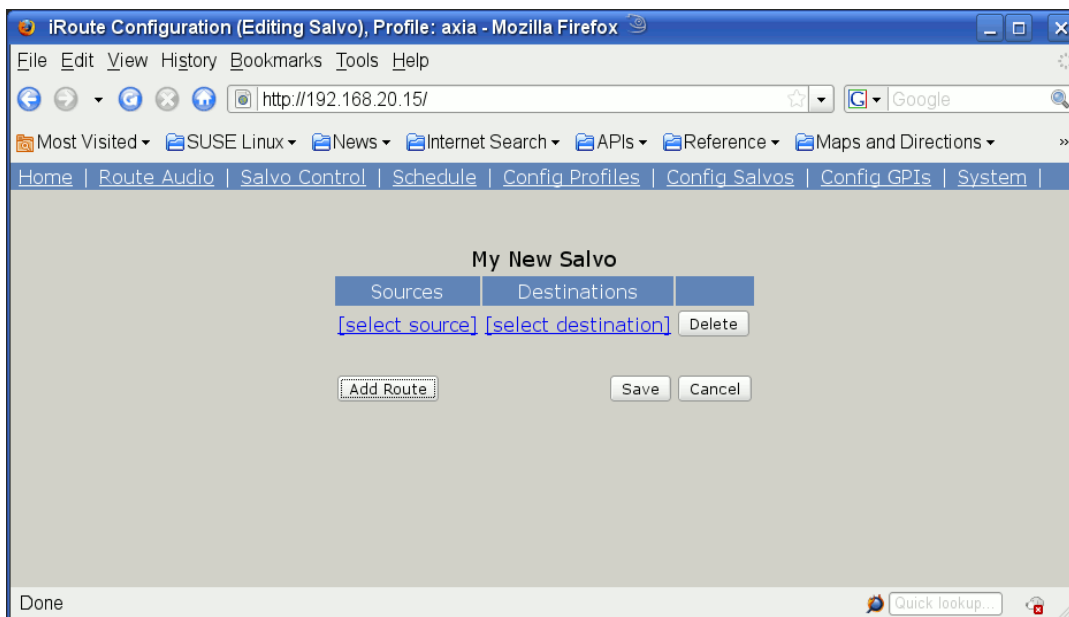
This screen shows the list of salvos that currently exist on the iRoute. To create a new one, click the **Add Salvo** button. The system will prompt for a name for the new salvo:



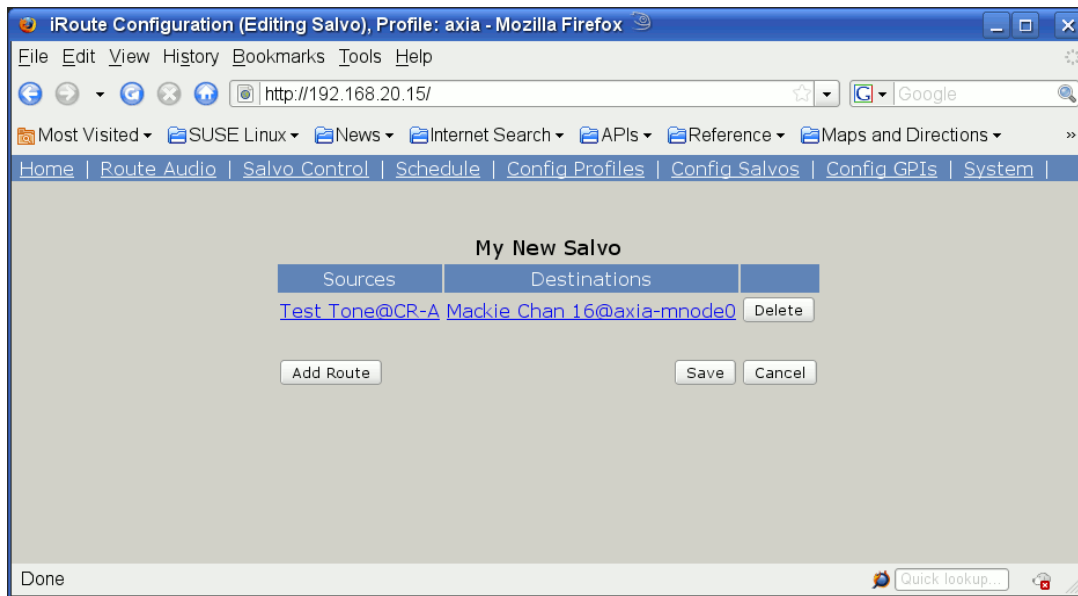
Fill in the name of the salvo to be created and click the **Ok** button. The system will then display the Edit Salvo screen, containing the newly created (but otherwise empty) salvo:



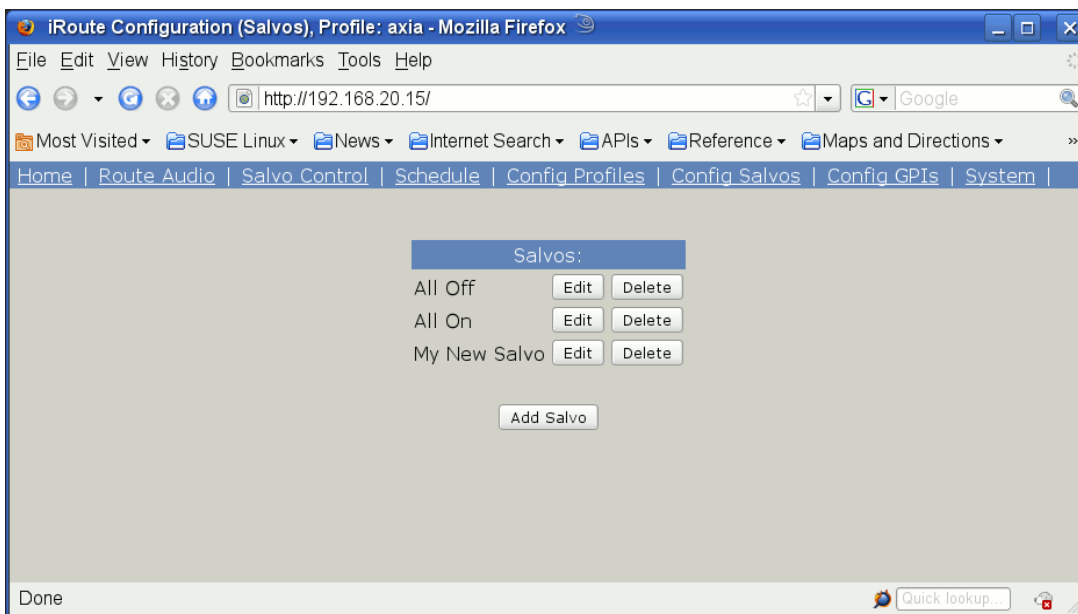
Click the **Add Route** to add a new route to the newly created salvo:



Click the **[select source]** and **[select destination]** links on the newly created route to assign the desired source and destination respectively.



Add more routes as desired to the salvo. A salvo may contain an unlimited number of route entries. To delete a route, click the **Delete** button associated with the route to be removed. To save the changes made to the salvo, click the **Save** button.



To delete an entire salvo from the system, click the **Delete** button associated with the salvo to be removed.

### 4.3 Executing Salvos from the Front Panel

In addition to displaying information about audio sources and displaying and changing routes, the front panel interface can be used to execute salvos. To do so, press the **DESTINATION** knob once to display the *salvo selector* screen.

DST	SALVO SELECTOR
SRC	All Off

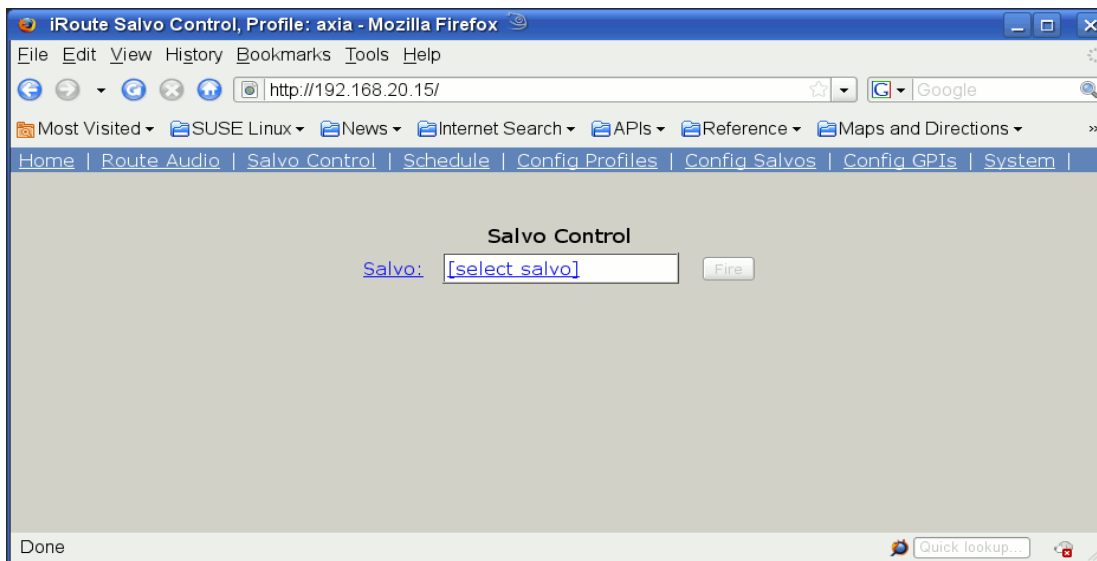
*Illustration 1: Salvo Selector Screen*

Turn the **SOURCE** knob to scroll through the list of available salvos. Once the desired salvo is displayed, press the **TAKE** button to execute it.

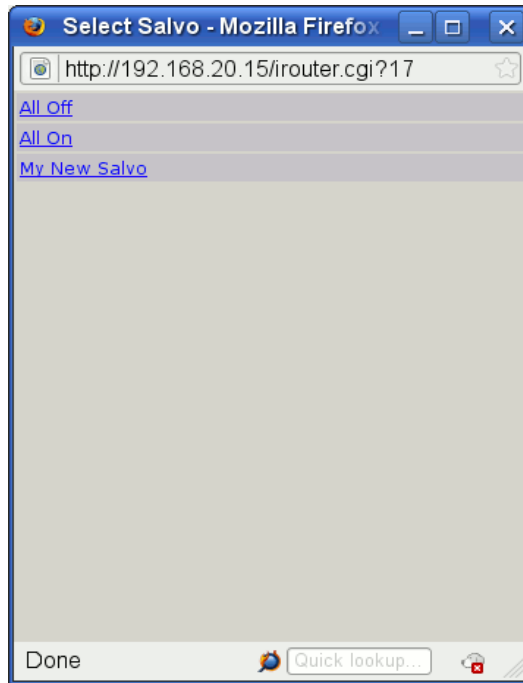
When finished executing salvos, press the **DESTINATION** knob once again to return to the crosspoint information screen.

### 4.4 Executing Salvos from the Web Interface

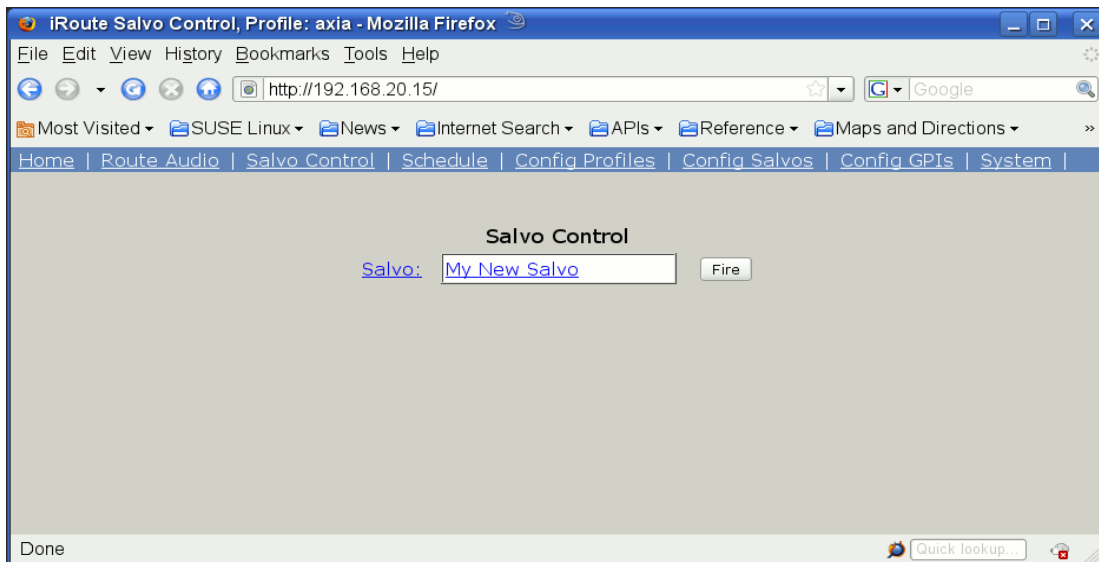
To execute a salvo from the web interface, click the **Salvo Control** link to bring up the Salvo Control screen:



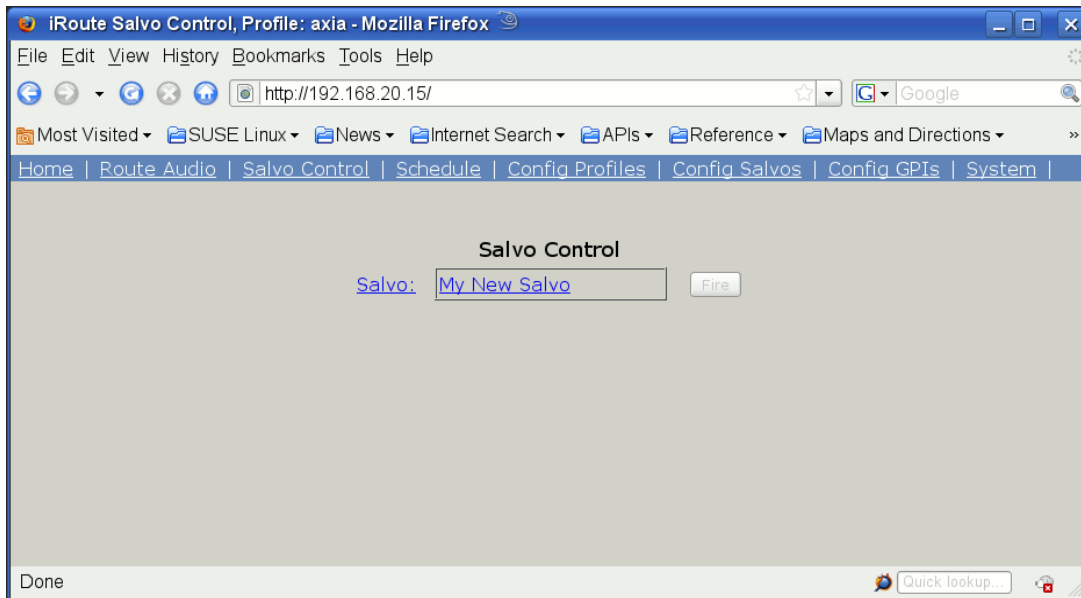
Click on the **[select salvo]** link to bring up the Select Salvo dialog



Click on the desired salvo:

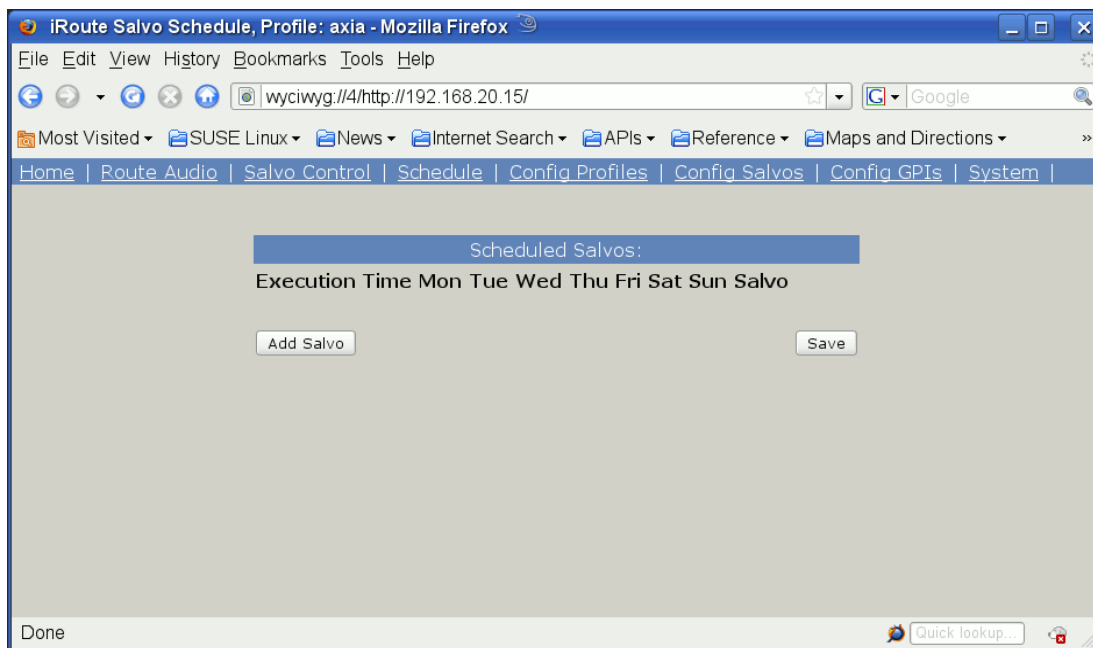


Finally, to execute the salvo, click the **Fire** button.

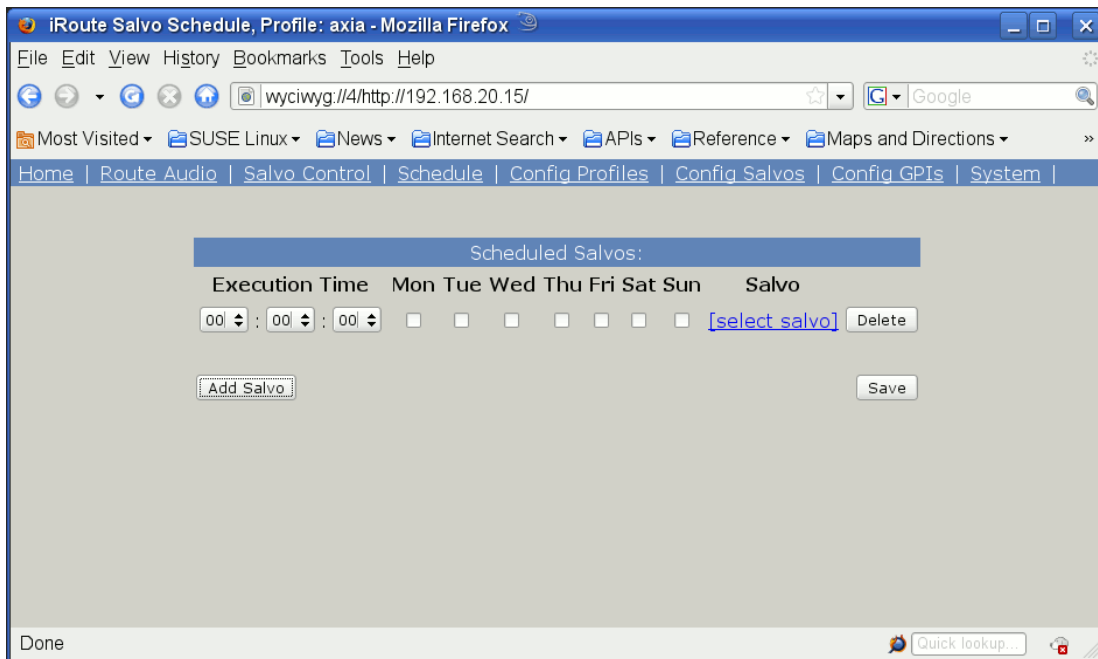


## 4.5 Executing Salvos from the Schedule

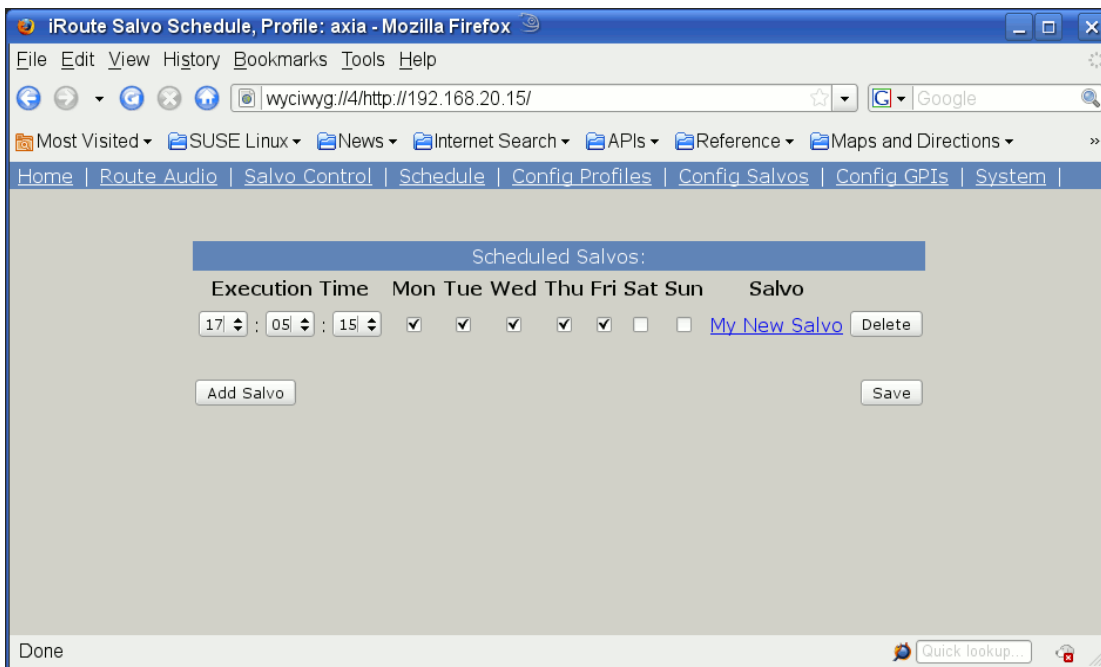
To access the salvo execution schedule, click the **Schedule** link.



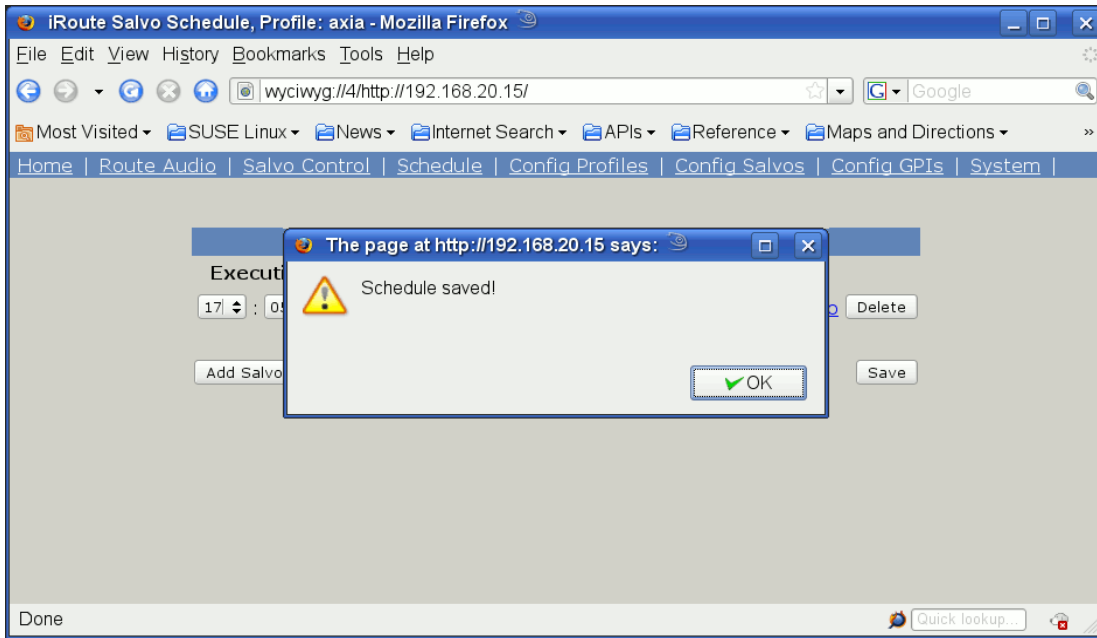
To add a salvo to the schedule, click the **Add Salvo** button.



The desired execution parameters can now be entered.

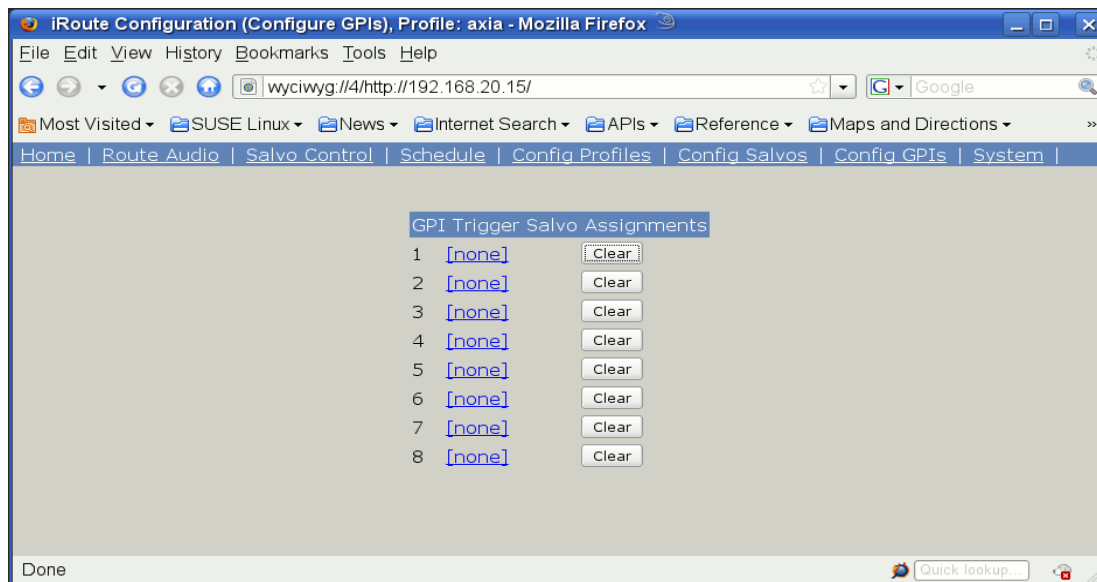


An existing salvo can be removed from the schedule by clicking the entry's respective **Delete** button. Once all the desired changes are made, save the modified schedule by clicking the **Save** button.

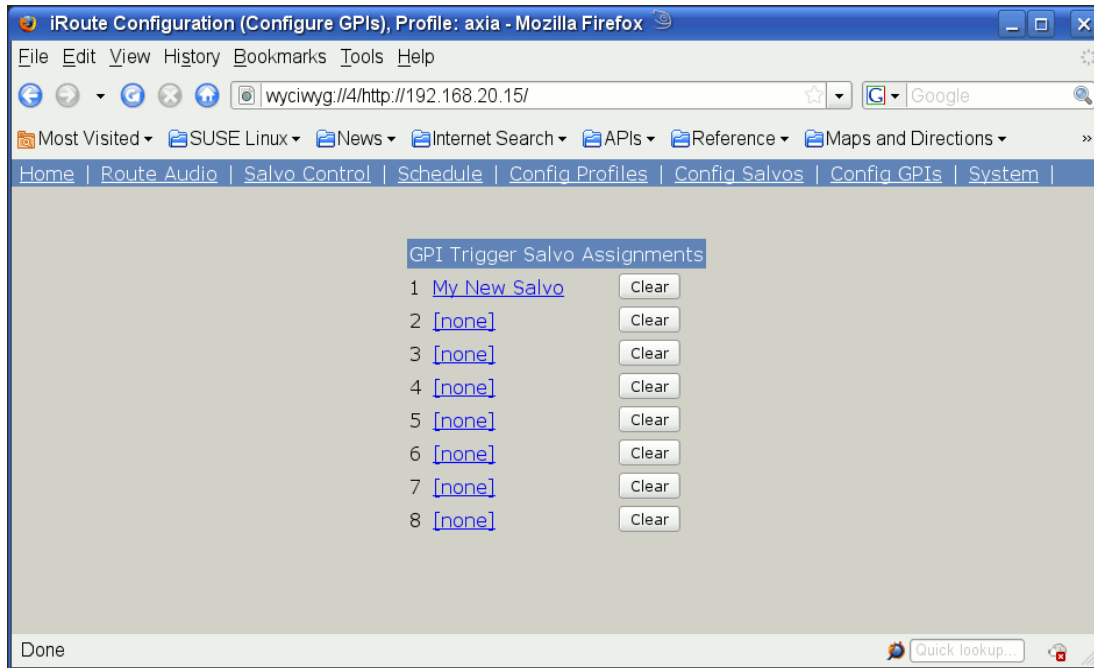


## 4.6 Executing Salvos from GPI

To associate a salvo with one of the eight rear-panel general purpose inputs, click the **Config GPI** link:



Click the link for the desired GPI to bring up the Salvo Selector screen and choose the desired salvo.



To clear a GPI input –i.e. configure it so that it does nothing – press the **Clear** button for the respective input.

## 4.7 Executing Salvos from the Serial/TCP Interface

The iRoute features a pair of RS-232 serial interfaces on the rear panel as well as a TCP control interface located on port 9090 that can be used to monitor and control the iRoute and, through it, the entire Livewire network. Audio routes may be set and any iRoute salvos executed by use of this interface. Full details of the protocol may be found in Appendix 1, *The iRoute Serial/TCP Control Protocol*.

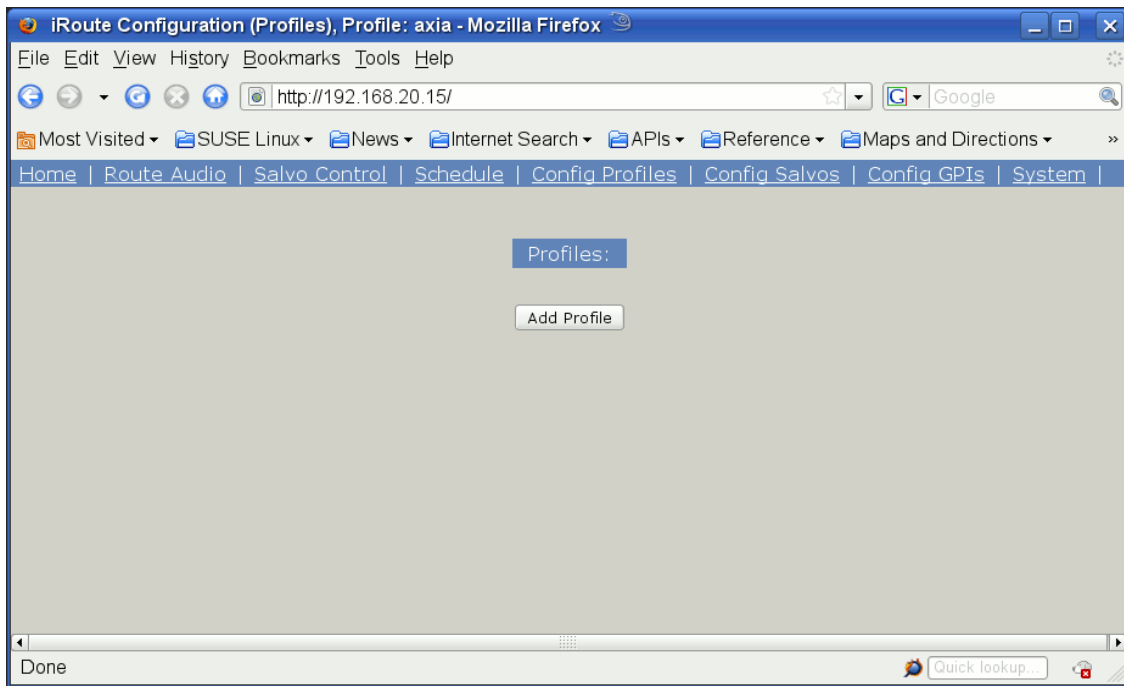
## 5 PROFILES

### 5.1 Overview

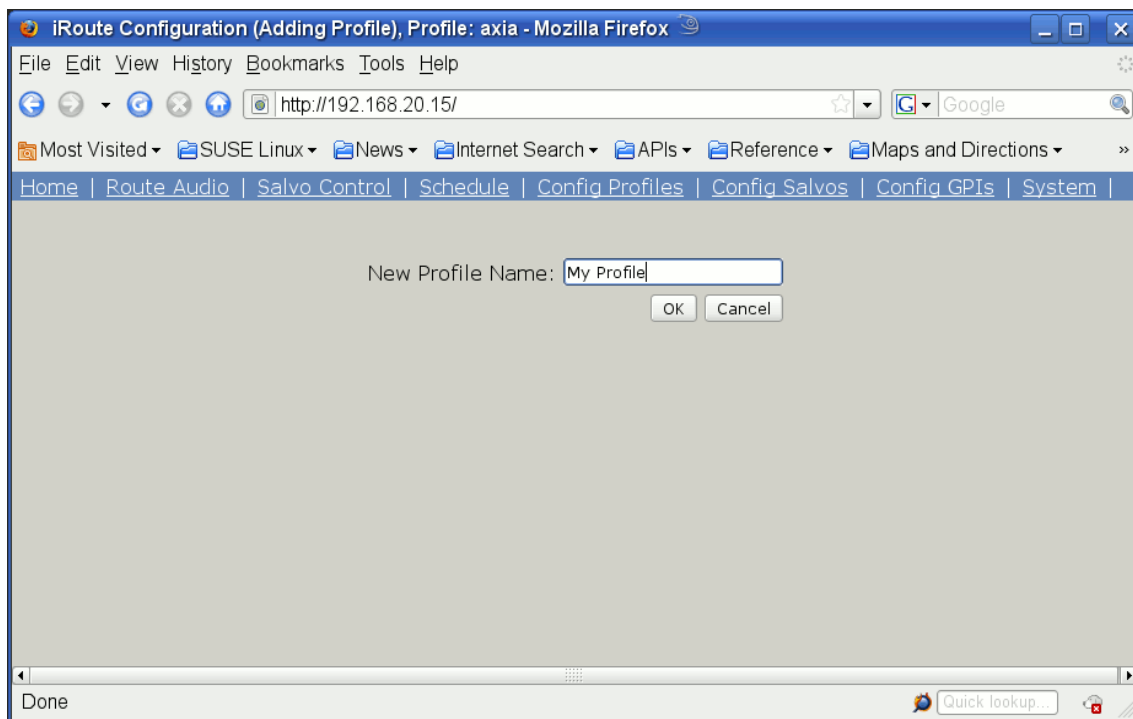
Profiles are an advanced feature of the iRoute that can be used to provide web interface users with multiple sets of specific Sources, Destinations and Salvos. Each configured profile is accessed by means of a unique User Name and Password. As such, Profiles can be used to configure the iRoute for a variety of specific 'roles' to ensure that only the precise resources required for a given task are available and no others.

### 5.2 Creating and Managing Profiles with the Web Interface

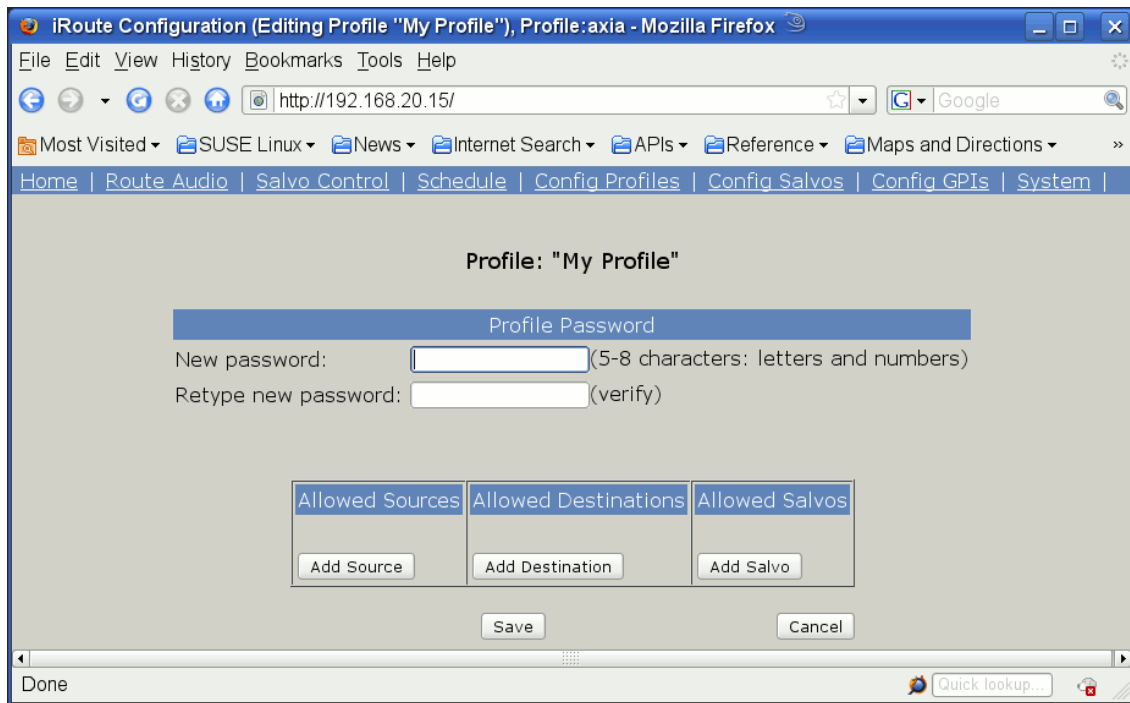
To manage user profiles in the web interface, click the **Configure Profiles** link.



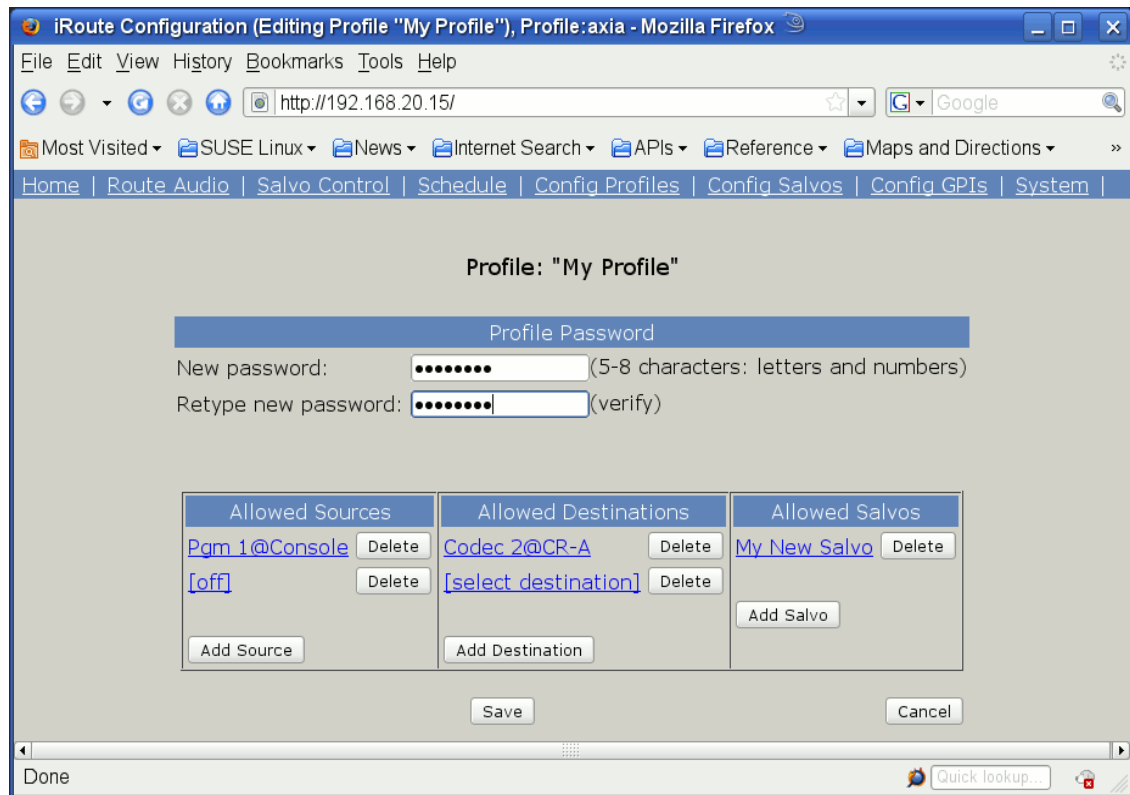
To add a new profile, click the **Add Profile** button.



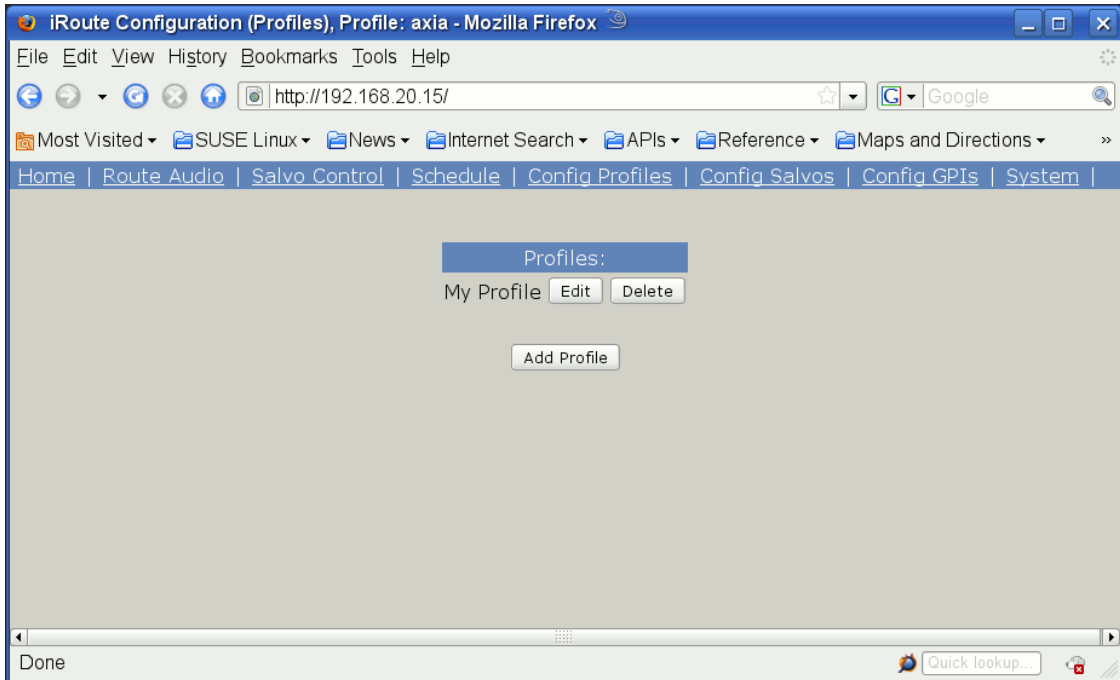
Enter a name for the new profile and then click the **Ok** button.



A password for the new profile can be entered in the appropriate fields. Using the **Add Source**, **Add Destination** and **Add Salvo** buttons to add the resources that this profile should be able to access.



When all desired resources have been added, save the profile by clicking the **Save** button.



Existing profiles can be edited or deleted by clicking their respective **Edit** or **Delete** buttons.

### **5.3 Logging in to an Existing Profile**

To use a created profile, open a new instance of the web browser and log into the iRoute using the configured profile name and password.



## **6 APPENDICES**

## 6.1 The iRoute Serial/TCP Control Protocol

All commands are ASCII text, terminated CR/LF (ASCII 13/10). Protocol can be accessed either through the iRoute's rear-panel RS-232C ports or via a TCP connection to port 9090.

### ADD DST

Subscribe to destination changes. The system will send messages in the format described in the "LIST DST" command when destination configuration changes. Additionally, the following message will be sent in the event of a destination becoming unavailable:

DROPDST <node-addr>:<slot>

where:

<node-addr> - IP address of receiving node in dotted-quad notation  
<slot> - Identifier of receiving slot

### ADD GPI

Subscribe to GPI changes. The system will send messages in the format described in the "LIST GPI" command when GPI state changes. Additionally, the following message will be sent in the event of a GPI device becoming unavailable:

DROPGPI <node-addr>:<slot>

where:

<node-addr> - IP address of host node in dotted-quad notation  
<slot> - Identifier of host slot

### ADD GPIO

Subscribe to GPIO route changes. The system will send messages in the following format:

GPIO <gpo-node-addr>:<gpo-slot> <gpi-node-addr>:<gpi-slot>

where:

<gpo-node-addr> - IP address of GPO host node in dotted-quad notation  
<gpo-slot> - Identifier of GPO host slot  
<gpi-node-addr> - IP address of GPI host node in dotted-quad notation  
<gpi-slot> - Identifier of GPI host slot

### ADD GPO

Subscribe to GPO changes. The system will send messages in the format described in the "LIST GPO" command when GPO state changes. Additionally, the following message will be sent in the event of a GPO device becoming unavailable:

DROPGPO <node-addr>:<slot>

where:

<node-addr> - IP address of host node in dotted-quad notation  
<slot> - Identifier of host slot

#### ADD NODE

Subscribe to node changes. The system will send messages in the format described in the "LIST NODE" command when a new node joins the network or an existing node changes configuration. The following message will be sent in the event of a node becoming unavailable:

DROPNODE <node-addr>

where:

<node-addr> - IP address of receiving node in dotted-quad notation

#### ADD PLAYOUT

Subscribe to statistics updates for active RTP stream playouts. The system will periodically send messages in the format described in "LIST PLAYOUT" for each active playout.

#### ADD SALVO

Subscribe to salvo additions and deletions. The system will send messages in the format described in the "LIST SALVO" command when a new salvo is added. Additionally, the following message will be sent in the event of a salvo being removed:

DROPSALVO NAME:<salvo-name>

where:

<salvo-name> - Name of salvo being removed.

#### ADD SRC

Subscribe to source changes. The system will send messages in the format described in the "LIST SRC" command when source configuration changes. Additionally, the following message will be sent in the event of a source becoming unavailable:

DROPSRC <node-addr>:<slot>

where:

<node-addr> - IP address of originating node in dotted-quad notation  
<slot> - Identifier of originating slot

## DEL DST

Unsubscribe to source changes.

## DEL GPI

Unsubscribe to GPI state changes.

## DEL GPO

Unsubscribe to GPO state changes.

## DEL PLAYOUT

Unsubscribe to statistics updates for active RTP stream playouts.

## DEL SALVO

Unsubscribe to salvo additions and deletions.

## DEL SRC

Unsubscribe to destination changes.

## LIST DST

List Destinations

System responds with:

BEGIN

DST <node-addr>:<slot> <tag>:<value> [...]

[...]

END

where:

<node-addr> - IP address of receiving node in dotted-quad notation

<slot> - Identifier of receiving slot

<tag> - Four-letter tag indicating meaning of following value.

Valid tags are:

ADDR - Address of RTP stream being received,  
in dotted-quad notation.

LOAD - Output termination type. 0=Hi Z, -125=-10 dBv,  
600=600 ohm

NAME - Slot text label.

NDNM - Name of parent node.

NCHN - Number of audio channels in stream.

OUGN - Output gain, in 1/10 dB

TYPE - Type of destination. Possible values are:

- 1 - Unknown
- 2 - Line-level output.
- 3 - Computer-capture (AoIP).
- 4 - Telephone send/audio on hold.
- 5 - Headset output.
- 6 - Mix Engine Input.

<value> - Parameter value. String values will be enclosed in double-quotes (ASCII 34).

## LIST GPI

List current GPI states.

System responds with:

BEGIN

GPI <node-addr>:<slot> <pin1><pin2><pin2><pin4><pin5>

[...]

END

where:

<node-addr> - IP address of host node in dotted-quad notation

<slot> - Identifier of host slot

<pinN> - A single ASCII character indicating the state of the pin. Possible values are:

'h' - Steady high state

'H' - Low to high transition

'l' - Steady low state

'L' - High to low transition

## LIST GPO

List current GPO states.

System responds with:

BEGIN

GPO <node-addr>:<slot> <pin1><pin2><pin2><pin4><pin5>

[...]

END

where:

<node-addr> - IP address of host node in dotted-quad notation

<slot> - Identifier of host slot

<pinN> - A single ASCII character indicating the state of the pin. Possible values are:

'h' - Steady high state

'H' - Low to high transition

'l' - Steady low state

'L' - High to low transition

## LIST IP

List the current IP configuration

System responds with:

IP <tag>:<value> [...]

where:

<tag> - Four-letter tag indicating meaning of following value.

Valid tags are:

NAME - Hostname

ADDR - IP address in dotted-quad notation

MASK - IP netmask in dotted-quad notation

GATE - IP default gateway in dotted-quad notation

NSTY - Default system name style.

Valid values are:

0 - Internet format, e.g. 'source@node'

1 - Router format, e.g. 'node source'

SSRT - Default system source sorting order.

Valid values are:

0 - Sort by node name, then source name

1 - Sort by source name, then node name

2 - Sort by source number

DSRT - Default system destination sorting order.

Valid values are:

0 - Sort by node name, then destination name

1 - Sort by destination name, then node name

ZONE - Timezone definition string, as defined by  
POSIX.

NTP1 - IP address of NTP server in dotted-quad  
notation.

NTP2 - IP address of NTP server in dotted-quad  
notation.

## LIST NODE

List Livewire Devices

System responds with:

BEGIN

NODE <node-addr> <tag>:<value> [...]

[...]

END

where:

<node-addr> - IP address of device in dotted-quad notation.  
<tag> - Four-letter tag indicating meaning of following value.  
Valid tags are:  
DEVN - Device type string. Known values are:  
    "axiaalsa" - Axia ALSA AoIP driver  
    "Element" - Axia Element Control Surface  
    "Engine" - Axia Mix Engine  
    "GPIO" - Axia GPIO Node  
    "iceio" - Axia PowerStation Internal Node  
    "LiveAES" - Axia AES Node  
    "LiveIO" - Axia Analog Node  
    "LiveMic" - Axia Microphone Node  
    "LiveRt" - Axia Router Node  
    "Nx12" - Telos Nx12 Telephone Interface  
    "PS\_Engine" - Axia PowerStation Mix Engine  
LWRP - Livewire protocol version.  
NDNM - Name of node.  
NDST - Number of destinations.  
NGPI - Number of GPIs.  
NGPO - Number of GPOs.  
NSRC - Number of sources.  
SYSV - Device system version.

## LIST PLAYOUT

List statistics for active RTP stream playouts

System responds with:

```
BEGIN  
PLAYOUT <dev-num> <tag>:<value> [...]  
[...]  
END
```

where:

<dev-num> - Playout device number.  
<tag> - Four-letter tag indicating meaning of following value.  
Valid tags are:  
LVLS - Levels in -dBFS in format  
    FL:FR:CC:LF:RL:RR:LT:RT  
LTCY - Playout latency, in PCM frames.  
NCHN - Number of audio channels in stream.  
    PKTS - Total number of RTP packets received.  
    PLLO - PLL offset value.  
RTPA - Multicast address of playing RTP stream, in  
    dotted-quad notation.  
RTPP - Number of audio frames per RTP packet.  
    SQER - Total number of sequence errors.  
    XRUN - Total number of xruns.

## LIST SALVO

List defined salvos

System responds with:

BEGIN

SALVO <tag>:<value> [...]

where:

<tag> - Four-letter tag indicating meaning of following value.

Valid tags are:

NAME - Name of salvo, used for the SET SALVO command.

## LIST SRC

List Sources

System responds with:

BEGIN

SRC <node-addr>:<slot> <tag>:<value> [...]

[...]

END

where:

<node-addr> - IP address of originating node in dotted-quad notation.

<slot> - Identifier of originating slot

<tag> - Four-letter tag indicating meaning of following value.

Valid tags are:

INGN - Input gain, in 1/10 dB.

NCHN - Number of audio channels in stream.

NDNM - Name of parent node.

PSNM - Slot text label.

RTPA - Multicast address of RTP stream, in dotted-quad notation.

RTPE - RTP stream enabled, 0=no, 1=yes

RTPP - Number of audio frames per RTP packet.

SHAB - Shareable, 0=no, 1=yes

TYPE - Type of source. Possible values are:

1 - Unknown

2 - Line-level source.

3 - Computer-generated source (AoIP).

4 - Telephone caller source.

5 - Microphone source.

6 - Mix Engine output.

<value> - Parameter value. String values will be enclosed in double-quotes (ASCII 34).

## LIST TTY

List Serial Port Parameters

System responds with:

BEGIN

TTY <dev-num> <speed> <tag>:<value> [...]

[...]

END

where:

<dev-num> - Device number of serial port, 0 = /dev/ttyS0,  
1 = /dev/ttyS1

<tag> - Four-letter tag indicating meaning of following value.

Valid tags are:

SPED - Baud rate, in bits/sec

WLEN - Word lengths, in bits

PARY - Parity, 0 = None, 1 = Even, 2 = Odd

FLOW - Flow control, 0=None, 1=RTS/CTS, 2=Xon/Xoff

## PING

Test Connectivity

System responds with:

PING

SET GPI <node-addr>:<slot> <pin1><pin2><pin2><pin4><pin5>

Set the state of a virtual GPI device. "Virtual" GPI devices are those that have no physical input pins (e.g. those associated with AoIP drivers).

where:

<node-addr> - IP address of host node in dotted-quad notation

<slot> - Identifier of host slot

<pinN> - A single ASCII character indicating the state of the pin. Possible values are:

'h' - Steady high state

'l' - Steady low state

'x' - Leave current state unchanged

SET GPIO <gpo-node-addr>:<gpo-slot> [<gpi-node-addr>:<gpi-slot>]

Set a GPIO route, where the GPO device follows the state of the GPI

device. To clear a route, omit the GPI parameters.

where:

<gpo-node-addr> - IP address of GPO host node in dotted-quad notation

<gpo-slot> - Identifier of GPO host slot

<gpi-node-addr> - IP address of GPI host node in dotted-quad notation

<gpi-slot> - Identifier of GPI host slot

SET GPO <node-addr>:<slot> <pin1><pin2><pin2><pin4><pin5>

Set the state of a GPO device.

where:

<node-addr> - IP address of host node in dotted-quad notation

<slot> - Identifier of host slot

<pinN> - A single ASCII character indicating the state of the pin. Possible values are:

'h' - Steady high state

'l' - Steady low state

'x' - Leave current state unchanged

SET ROUTE <dest-node-addr>:<dest-slot> <src-mcast-addr>

Set a Livewire Audio Route

where:

<dest-node-addr> - IP address of destination node, in dotted-quad notation.

<dest-slot> - Identifier of destination slot.

<src-mcast-addr> - Multicast address of source stream, in dotted-quad notation (from RTPA parameter in SRC update).

## **6.2 Specifications**

### **Environment**

0 - 35 degrees Celcius, < 90% humidity, no condensation

### **Electrical**

Auto-sensing supply, 100 – 240 VAC, 47 – 63Hz, IEC receptacle, dual fuses

Power consumption: less than 150 watts

### **Network Interface**

Ethernet 10/100/1000 Mbit/sec

Active TCP Ports:

22

80

9090

Active UDP Ports:

123

4001

5004

## **6.3 Warranty**

Products are warranted to be free from defects in material and workmanship for a period of two (2) years from the date of receipt by the end-user.

This warranty is void if the Product is subject to Acts of God, including (without limitation) lightning; improper installation or misuse, including (without limitation) the failure to use surge protection devices; accident; neglect or damage.

EXCEPT FOR THE ABOVE-STATED WARRANTY, PARAVEL SYSTEMS MAKES NO WARRANTIES, EXPRESS OR IMPLIED (INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE).

In no event will Paravel Systems, its employees, agents or authorized dealers be liable for incidental or consequential damages, or for loss, damage, or expense directly or indirectly arising from the use of any Product or the inability to use any Product either separately or in combination with other equipment or materials, or from any other cause.

Paravel Systems at its option will either repair or replace the Product and such action shall be the full extent of Paravel Systems' obligation under this Warranty. After the Product is repaired or replaced, Paravel Systems will return it to the party that sent the Product and Paravel Systems will pay for the cost of shipping.