# Axia Router Control Panels

## Axia Router Control Panels

Axia Routing Control Panels put fingertip control of inputs, outputs, and routing scene changes anywhere you've got a rack space. They are typically used where hardware control of audio routes is required in a fast-paced, live environment. These panels do not have any audio connections since they control the routing of network audio streams to other devices, typically Telos Alliance xNodes. Their only connection is a Livewire Ethernet connection, and no additional software is required to use them.



Film-cap controllers with LED-backlit keys can be illuminated with a choice of colors; keycaps are film-legendable for quick function identification.

SmartSwitch panels have dynamic, backlit LCD buttons that can change color and text with user activation.

The 8-button SoftSwitch panel has high-resolution OLED buttons that can be loaded with user-created bitmaps for instant function identification.

The XY Routing Control Panel allows convenient on-the-fly routing of networked sources from anywhere in your facility; route any source to any output of your choosing with the twist of a knob.

## Axia Router Control Panel User Guide V3.0.0

## Types of Panels

## Router Control Panels

These rack mount panels are used to control audio routing in a Livewire network. They are typically used where hardware control of audio routes is required in a fast-paced, live environment. They have no audio connections since they control the routing of network audio streams to other devices, typically Telos Alliance xNodes. Their only connection is a Livewire Ethernet connection. No additional software is required to use these panels.



Figure 1 - Router control panel

The XY Router Control Panel is a full-featured XY panel that may route any input (source) to any destination (output) that you've defined.

## LCD SmartSwitch and Film Cap Switch Panels

Switch panels are usually combined with Axia's Pathfinder Core Pro. Pathfinder can perform many logic-based actions related to routing audio, alarms, console control, and much more. Pathfinder has many other uses as well, including the ability to create software router control panels and to emulate some types of hardware audio routers.

LCD SmartSwitch and Film Cap Switch Panels include:

| Description | Mount | Connection |
| --- | --- | --- |
| 17-button LCD SmartSwitch | 1U Rack | Ethernet |
| 8-button OLED SmartSwitch | 1U Rack | Ethernet |
| 5-button Film Cap | 1U Rack | GPIO |

| 10-button Film Cap | 1U Rack | GPIO |
|---|---|---|
| 15-button Film Cap | 1U Rack | GPIO |



Figure 2 - 17-button LCD SmartSwitch



Figure 3- 8-button OLED SmartSwitch



Figure 4 - 5-, 10-, and 15-button Film Cap rack panels

# Router Control Panels (Software V1.02 and Higher)

## Overview

Axia Router Control Panels such as the XY Router Control Panel are used with other equipment as a part of a Livewire network. These panels control audio routes within a Livewire network and are always used in conjunction with other Livewire equipment. The Remote Control Panels do not have any audio connections since they are simply controllers of audio streams to and from other Livewire devices.

Router Control Panels may have restrictions imposed by Access Control Lists, so users will be granted access only to those sources and destinations that have been permitted. In addition to preventing undesired or accidental route changes, this scheme ensures the privacy of users in a networked audio environment.

> ⓘ **A Word About Sources and Destinations -** It is important to remember these fundamental concepts when working with Router Control Panels.
>
> A **Source** is an audio stream that is being delivered to your Livewire network. Sources typically originate at node inputs or mixes created by StudioEngines.
>
> A **Destination** usually corresponds to an output to which a Livewire audio stream is being delivered.

# Installation

## Rack Mounting and Ventilation

The Axia Router Control Panels are designed to be used at ambient air temperatures between 0 to 40 degrees Celsius (32 to 104 degrees Fahrenheit) and a relative humidity of 0 to 98% non-condensing.

Router Control Panels are contained in a "1U" (rack unit) 19" rack-mount enclosure. The systems do not contain cooling fans, only convection cooling is available. Always leave a blank rack space above your Router Control Panels. Do not place the panels on bedding, carpet or other materials where the ventilation openings could be blocked. Do not block the ventilation openings on the top and sides of the unit.

## Power

The Axia Router Control Panels are powered through PoE (Power over Ethernet). If you have an Ethernet switch that supplies PoE, connecting the control panel to it will power up the panel.

> ⚠ **Important -** Please visit https://docs.telosalliance.com/user-manual-safety-boilerplate/ for important information on proper grounding and other items pertaining to electrical safety.

## Front and Rear Panel Overview

## Front Panel Controls and Indicators

The Livewire Router Control Panels incorporate various front panel controls and indicators to allow the operator to perform and verify operations quickly and confidently.



Figure 1- XY Router Control Panel controls and indicators

**Controls**

Select Knob

The **Select** knob is a rotary encoder that is used to scroll through a list of sources or destinations. The knob also acts as a button. The button for the source selection knob acts as a **Preview**. Pressing the knob will route the selected source; releasing the knob will return the previous route. This control is also used in assigning an IP address, as described in the Installation Guidelines section later in this chapter.

Take Button

Pressing the **Take** button will immediately route the selected source. The selected Source will be routed to the specific selected Destination. If the highlighted source is different than the current route, the Take button will blink red.

Source/Destination Display

Router Control Panels feature OLED high resolution displays to indicate the status of the sources or destinations depending on the function of the display. The currently selected audio source is highlighted in the display by a > pointer to the left of the source name. In the case of an XY Router Control Panel, the > indicator will be displayed beside both the active source and the destination (output). Inverted video is used to highlight your selection as you scroll through the displayed list of sources or destinations.

**Status LED Indicators**

Two front-panel LEDs indicate the status of the Router Control Panel's Power Supply and Ethernet connections:

- **DC** - When illuminated, this LED indicates DC power being delivered from the PoE power supply. If this indicator is not illuminated, check the network switch supplying PoE.
- **NET** - When illuminated continuously, this LED represents the presence of a live Ethernet link to another 100Base-T Ethernet device.

# Rear Panel Connections

The rear panel of all Remote Control Panels is identical. As you might expect, there are no audio connections since the panels simply control the sources or destinations of other Livewire devices.

**Livewire (100 Base-T) Connector**

This connects the panel to an approved Ethernet switch. It has two integral LEDs:

- **The green "Link" LED** indicates the presence of a live signal (the same as the front panel "Link" LED).
- **The green "Speed" LED** indicates a 100 Mbps connection when illuminated.

Figure 2- Rear panel connections

> **Important!**  Axia Livewire devices are intended for use with an Ethernet switch that supports multicast and QOS (Quality of Service). If you attempt to use them with non-switched Ethernet hubs or a switch that is no enabled for multicast, you will experience network congestion that could disrupt other network activity.
>
> Should you wish to connect a node to a non-Livewire network (to access web configuration interfaces, etc.) you must confirm that streaming is disabled.

# Initial Setup

## Assigning an IP Address

When a new Router Control Panel is powered up for the first time, you will be presented with the setup screen shown below. It is necessary to assign an IP address to your new panel.
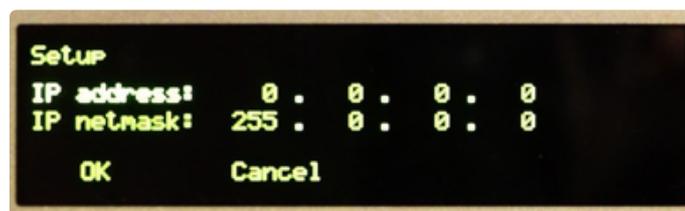


Figure 1 - Initial IP setup screen

Rotate the **Select** knob until IP Address is highlighted, then push the knob to select "IP address."

Use the knob to select each of the four address octets in the IP address and the IP netmask. Once you have selected a field, rotate the knob until the desired address is displayed, then push the knob to save and advance to the next octet.

Once you have configured the IP address and Netmask, your display should look something like this:
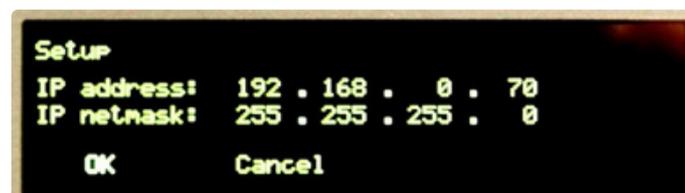
Figure 2 - Typical IP configuration

Rotate the knob until "OK" is highlighted. Press the knob to save the new settings and reboot the Router Control Panel.

If your panel is connected to a Livewire network, the source display should now show the available sources in your network. Further adjustments to this list are discussed in the following section.

## Performing a Factory Reset

If for any reason, you find it necessary to reset the Router Control Panel, you can do so by powering up the panel while simultaneously pressing the **Scroll** knob and **Take** button on the right hand side of the panel. Hold these buttons until you see the words "Factory Reset" displayed. This will take approximately 20 seconds. Once you see "Factory Reset", you may release the buttons.

After the unit has rebooted, you will see the same setup screen that is displayed when a new unit is powered up for the first time. Follow the steps in the previous section to assign an IP address to the panel.

## Advanced Setup

Once you have assigned an IP address to your panel and connected it to your Livewire network, the panel is configured by using your web browser in a manner very similar to your other Axia devices.

The Home screen is shown in Figure 1 below:



### Getting Started

**Configure XY Routing**
Define controlled destinations
Map remote destination ports to control

**Configure System**
Edit network settings
Perform software updates and maintenance

### System Status

**Software Version:** 1.1.0e

**System Uptime:** 0 day(s), 0 hr, 7 min, 11 sec
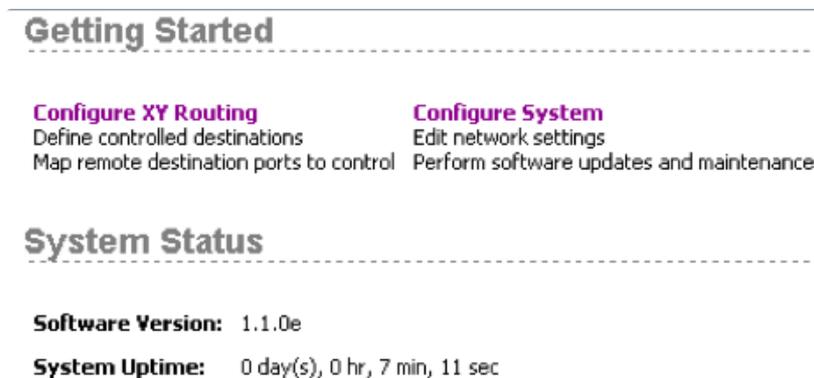
Figure 1 - Router control panel home page

When you select a link to one of the configuration pages, you will be prompted for a user name and password. By default, the user name is "user" and there is no password.

## XY Routing

Sources and destinations are set up using the XY Routing Configuration Page.

**XY Destinations**

The destination configuration for an X1 panel consists of a single destination.  Selecting a destination is done by entering the IP address and the port of each device using the format show below in Figure 2 (IPAddress/Port):



Figure 2 - XYR Destinations for X1 panel



Figure 3 - XYR Destinations for X2 panel

The XY Panel will have control over as many destinations as you wish. Each must be added individually in the configuration page.  In the example shown below in Figure 4, the XY Panel is controlling three destinations on a node.

Figure 4 - XYR controlling three destinations

An option is available to add password access to the destination device providing the device has been configured with one.  By default, there is no password.

**Source Channel Filter**

The Source Channel Filter imposes restrictions on the source channels that this Router Control Panel is permitted to route.  A "wide open" panel will have a channel range of 1 through 32767 specified as shown in Figure 4 above.  A smaller range may be imposed if desired.

In addition to the Channel Range parameter, you may also specify more restrictions in the Channel List. In the example shown in Figure 4,  we have left the Channel Range wide open, but the Channel List includes only two small ranges plus another single channel. This Router Control Panel will have access only to the channels specified within the Channel List.

**Security**

If you want to restrict front panel controls to authorized users, a 4 digit PIN can be configured. Once the PIN is correctly entered, access to the route control functions are shown. After 60 seconds of no operation, the front panel will return to the PIN request screen.

# System Parameters

This page has the network settings that you created when the panel booted up for the first time. You will now have the option of making changes to these settings from the web interface.

Additionally, you can also assign the panel a "friendly" name, choose between a primary and secondary bank of software, and download new software into the secondary bank. Click the Apply button for changes to take effect.

Figure 5 - System parameters

**IP Settings**

These are the usual IP-related settings. If you are unsure of the required values, please consult with your network administrator. Each unit must be assigned a unique IP address. DHCP is intentionally not supported.

Host Name

The Host Name is a unique 12-character, alphanumeric name for this panel. The name may include hyphens but NOT spaces, will be converted to hyphens. This name is used to identify the device on the network, and you may wish to include the location of the panel ("Studio" or "Rack") in the name for ease of reference.

Network Address (IP Address)

This is the IP address of the device. Each Router Control Panel must have a unique IP address. Normally this would be set using the front panel at first-time power-up, but it can be checked or changed from this web page if needed.

> ℹ **Note -** If you change the IP address, you will lose your browser connection when you click Apply and will need to reconnect using the new IP address.

Netmask (Subnet Mask)

This is the IP subnet mask of the local unit. The typical setting in most cases is 255.255.255.0.

Gateway (Router)

This is usually the IP address of the IP Router connecting the local IP network with some other IP network. It is not used or required in most cases.

Syslog Server (IP Address)

Various services generate syslog (RFC 3164) messages which can be forwarded to a remote syslog daemon. The remote syslog daemon IP address can be entered here.

Syslog Severity Level Filter

You can customize syslog logging by choosing log detail level:

- **Emergency:** System is unusable
- **Alert:** Action must be taken immediately
- **Critical:** Critical condition
- **Error:** Error condition

- **Warning:** Warning condition
- **Notice:** Normal but significant condition
- **Informational:** Forwards informational messages and all other message levels
- **Debug:** Debug-level message

Other messages with a severity higher than that specified by the filter will be forwarded to the remote logger.

**User Password**

This is the password required to connect to the unit. It must be at least 5 characters long and may be as long as 8 characters. Only alphanumeric characters are permitted. To change the password you must enter the new and old passwords, then click "Apply".

> ℹ **Note -** If you changed the IP or Firmware settings, the unit will reboot. If you have only entered a new password, the unit will NOT reboot.

> ⓘ **Note -** When logging into the panel, any of the following "user names" may be used: user, USER, axia, Axia, or AXIA. The default password for any of these names is blank (no password required).

**Firmware Version**

Each Router Control Panel has two internal memory banks. Each bank contains a complete version of operating software. This approach allows a software update to be completed and checked without danger of making the unit inoperable if the download were to be incomplete or corrupted. It also provides and easy way to try a new software version and still return to the old version if necessary.

To change banks, click in the radio button for the desired bank, then click "Apply."

> ⚠ **Important -** The Router Panel will reboot after you click "Apply" if you change the software version. This will result in loss of control while the panel reboots, however, existing audio routes will continue uninterrupted.

Downloading New Software

Visit www.AxiaAudio.com/downloads/ and download the desired software update for your Router Panel to the computer that you will use to access the panel's web page configuration). Choose the destination drive and folder and make a note of the location where the file will be saved.

Next, open a web browser and connect to the device to be updated. Enter the complete path and file name for the software file (e.g. the file downloaded from the Axia site) or click the "Browse" button to locate the file. Once the proper path and filename are displayed, click on "Apply" to upload the file.

A successful upload will be indicated by the new version being displayed in the Bank 1 field. If the upload is unsuccessful, the field for Bank 1 will be blank.

To run the new software, click on Bank 1 radio button, then click "Apply" to reboot the panel which will take approximately 20-30 seconds.

> ⓘ **Note:** Software is always uploaded to Bank 1. Each time a new version is uploaded, it will overwrite the existing version. You can save the existing version by "parking" it in Bank 0 by clicking on "Commit this version to Bank 0", then clicking "Apply".

# Switch Panels

# Overview

The power of Pathfinder Core Pro provides endless flexibility and advanced features for the switch panels. Pathfinder can perform many logic-based actions related to routing audio, alarms, console control and much more. Pathfinder has many other uses as well including the ability to create software router control panels and to emulate some types of hardware audio routers.

The different types of LCD SmartSwitch and Film Cap switch panels include:

| Description | Mount | Connection |
| --- | --- | --- |
| 17-button LCD SmartSwitch | 1U Rack | Ethernet |
| 8-button OLED SmartSwitch | 1U Rack | Ethernet |
| 5-button Film Cap | 1U Rack | GPIO |
| 10-button Film Cap | 1U Rack | GPIO |
| 15-button Film Cap | 1U Rack | GPIO |

# Installation

# Installing a GPIO Switch Panel

### Connections

Switch panels using GPIO connections are a straight- forward installation using standard multiple-conductor cable with DB-15M connectors. You can fabricate this cable or purchase one, such as the Cables To Go #02639, a 10-foot version available from Provantage, Best Buy or online from CablesToGo.com.



Figure 1 - 5-, 10-, and 15-button Switch Panels

Cables between the GPIO switch panels and the Axia GPIO Node are pin-for-pin (thru cables), with male gender connectors on both ends. Each group of 5 buttons will be associated with a single GPIO port and will require a connection as described above.

### Testing and Using the Panels

In order to verify basic connectivity of a GPIO panel, you may simply use your web browser to view the GPIO

configuration page of the Axia console or GPIO node to which your GPIO panel is connected. When you press a button on the panel, you will see the corresponding activity indicator turn Green. If you associate your panel with a Livewire channel such as a microphone source, you will be able to see the outputs change as well when the ON/OFF status of the channel changes.

In the example shown in Figure 2, we have associated GPIO port one with a control room guest microphone. We can see that GPO pin 2 is illuminated which indicates channel OFF status for a CR guest microphone. Refer to your Axia console manual or Appendix A of the GPIO node manual for a complete listing of GPIO profiles.
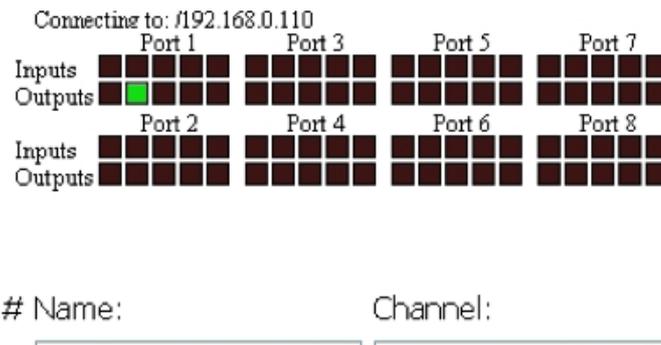


Figure 2- GPIO configuration

GPIO panels can be used to monitor and control the logic functions of a Livewire source, or they may be monitored and controlled by Pathfinder. Please refer to the manual for your Axia console or GPIO node for more information on the built-in functions associated with GPIO ports.

# Installing an Ethernet Switch Panel



Figure 3 - 8-button OLED and 17-button panels

**Connections**

Ethernet panels require only a network connection to your PoE enabled Ethernet switch.

Once you have connected a new Ethernet accessory panel to your network, it will need an IP address. These panels support the standard Axia "manual BOOTP" configuration. A new address can be configured using Axia's iProbe management software or the bootps.exe utility.

Each unit has a "paper clip" button at the back near the Ethernet controller. Pressing this button puts the unit into IP configuration mode whereby a BOOTP request is sent, triggering an iProbe pop-up as shown in Figure 4. Enter the desired IP address and network mask in the appropriate boxes, then click "OK."  The

panel will now acquire the desired IP address. Once the panel has an IP address, it may be used as an logic control device on a Livewire network.
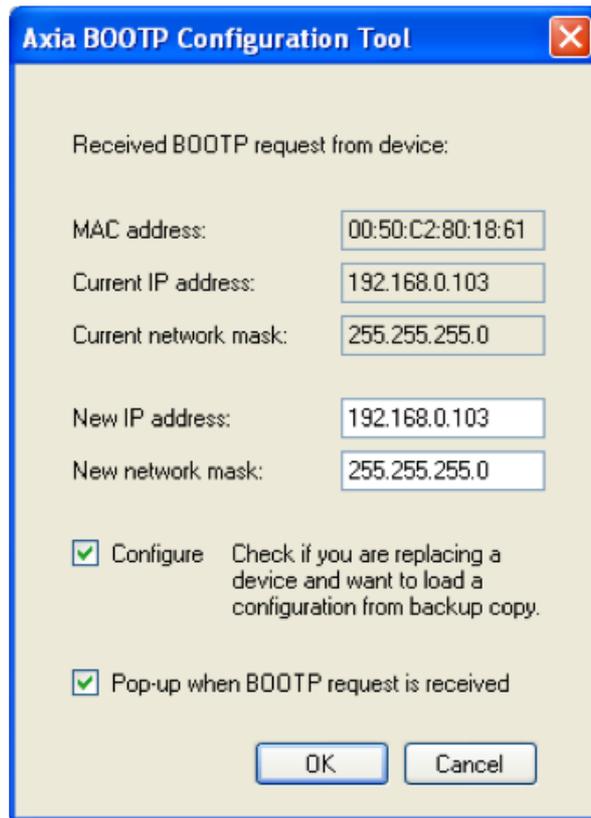


Figure 4- iProbe BOOTP configuration screen

The 8-Button OLED panel has a slightly different setup than other panels, and a single press of the **ID** button will enter setup mode. The front panel displays will indicate IP ADDR CHANGE and the BOOTP server will prompt you for a new IP address. Once the desired address has been entered, press the ID switch a second time to exit setup mode.

**Testing and Using the Panels**

Once you have your Ethernet panel connected, you can run a simple test to be sure it is properly configured by using Telnet or other communication software such as PuTTY to communicate directly with the panel.

If using Telnet, open up a command prompt. Then use Telnet directed at either the IP address of the Axia console or the Ethernet panel and specify port 4010. The Telnet syntax from a command prompt for the example shown in Figure 5 is: telnet 192.168.0.110 4010

Figure 5 shows the results for one press on four buttons. In addition to the button activity, you will also note the type of panel and the button numbers. In this example, we see the device identified as a Accessory Panel #2 showing Buttons 1 through 4.
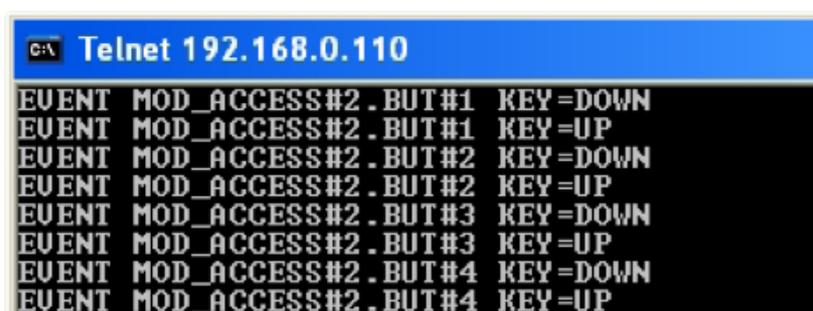
Figure 5 - Telnet monitor

The primary tool used to monitor and control switches and indicators on an Ethernet Switch Panel is Axia's Pathfinder Core Pro. Each button is programmed in a manner similar to other LCD panels. Please refer to the Pathfinder Core Pro manual for detailed uses and programming instructions.