

Axia GPIO Node

User's Guide



Version 2.2, December, 2008
For software versions 2.5.2q and up

IMPORTANT NOTE:

Axia nodes are intended for use with an Ethernet Switch that supports multicast and QOS (Quality of Service). On a non-switched Ethernet hub, or a switch that is not enabled for multicast, this will result in network congestion that could disrupt other network activity.

USA Class A Computing Device Information To User. Warning:

This equipment generates, uses, and can radiate radio-frequency energy. If it is not installed and used as directed by this manual, it may cause interference to radio communication. This equipment complies with the limits for a Class A computing device, as specified by FCC Rules, Part 15, Subpart J, which are designed to provide reasonable protection against such interference when this type of equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference. If it does, the user will be required to eliminate the interference at the user's expense. NOTE: Objectionable interference to TV or radio reception can occur if other devices are connected to this device without the use of shielded interconnect cables. FCC rules require the use of only shielded cables.

Canada Warning:

“This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.” “Le present appareil numerique n’emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques (de les Class A) prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.”

Important Safety Information

To reduce the risk of electrical shock, do not expose this product to rain or moisture. Keep liquids away from the ventilation openings in the top and rear of the unit. Do not shower or bathe with the unit.

Caution

The installation and servicing instructions in the manual are for use by qualified personnel only. To avoid Electric Shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified personnel.

Electrical Warning

To prevent risk of electric shock: Disconnect power cord before servicing.

This equipment is designed to be operated from a power source that includes a third “grounding” connection in addition to the power leads. Do not defeat this safety feature. In addition to creating a potentially hazardous situation, defeating this safety ground will prevent the internal line noise filter from functioning.

Ventilation Warning

The Axia GPIO node uses convection cooling. Do not block the ventilation openings in the side of the unit.

Failure to allow proper ventilation could damage the unit or create a fire hazard. Do not place the unit on a carpet, bedding, or other materials that could interfere with the rear and top panel ventilation openings.

Customer Service

We support you...

By Phone/Fax in the USA.

- Customer service is available from 9:30 AM to 6:00 PM USA Eastern Time, Monday through Friday at +1 216.241.7225. Fax: +1 216.241.4103. For 24-Hour Emergency Technical Support, call +1-216-622-0247.

By Phone/Fax in Europe.

- Service is available from Axia Europe in Germany at +49 81 61 42 467. Fax: +49 81 61 42 402.

By E-Mail.

- The address is Support@AxiaAudio.com.

Via World Wide Web.

- The Axia Web site has a variety of information which may be useful for product selection and support. The URL is <http://www.AxiaAudio.com>.

Feedback

We welcome feedback on any aspect of Axia products or this manual. In the past, many good ideas from users have made their way into software revisions or new products. Please contact us with your comments.

Updates

The operation of the Axia node is determined largely by software. Periodic updates may become available - to determine if this is the case check our web site. Contact us to determine if a newer release is more suitable to your needs.

Our electronic newsletter has announcements of major software updates for existing products, as well as keeping you up to date on the latest Axia, Telos, and Omnia product releases. To subscribe go to:

<http://www.axiaaudio.com/news/eNews.htm>

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Notice

All versions, claims of compatibility, trademarks, etc. of hardware and software products not made by Axia mentioned in this manual or accompanying material are informational only. Axia makes no endorsement of any particular product for any purpose, nor claims any responsibility for operation or accuracy.

Warranty

This product is covered by a five year limited warranty, the full text of which is included in the rear section of this manual.

Service

You must contact Axia before returning any equipment for factory service. Axia will issue a Return Authorization number, which must be written on the exterior of your shipping container. Please do not include cables or accessories unless specifically requested by the Technical Support Engineer at Axia. Be sure to adequately insure your shipment for its replacement value. Packages without proper authorization may be refused. US customers please contact Axia technical support at +1 (216) 241-7225. All other customers should contact their local representative to arrange for service.

We strongly recommend being near the unit when you call, so our Support Engineers can verify information about your configuration and the conditions under which the problem occurs. If the unit must return to Axia, we will need your serial number, located on the rear panel.

About This Manual

This manual covers the details of the Axia GPIO logic node. However it is assumed in this document that you are familiar with Livewire's basic concepts, as outlined in the companion *Introduction to Livewire: System Design Reference & Primer* manual.

If you have not done so, please review that material first. In it we explain the ideas that motivated Livewire and how you can use and benefit from it, as well as nitty-gritty details about wiring, connectors, and the like. Since Livewire is built on standard networks, we also help you to understand general network engineering so that you have the full background for Livewire's fundamentals. After reading *Introduction to Livewire: System Design Reference & Primer* you will know what's up when you are speaking with gear vendors and the network guys that are often hanging around radio stations these days.

As always, we welcome your suggestions for improvement. Contact Axia Audio with your comments:

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Thanks And Appreciation

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*Featureless paper
this page would have been empty
save for this haiku.*

A Note From The Founder/CEO of Telos

It's been a tradition since Telos' very first product, the Telos 10 digital phone system, that I share a few words with you at the beginning of each manual. So here goes.

In radio broadcast studios we're still picking up the pieces that have fallen out from the digital audio revolution. We're not using cart machines anymore because PCs are so clearly a better way to store and play audio. We're replacing our analog mixing consoles with digital ones and routing audio digitally. But we're still using decades-old analog or primitive digital methods to connect our gear. Livewire has been developed by Telos to provide a modern PC and computer network-oriented way to connect and distribute professional audio around a broadcast studio facility.

Your question may be, "Why Telos? Don't you guys make phone stuff?" Yes, we certainly do. But we've always been attracted to new and better ways to make things happen in radio facilities. And we've always looked for opportunities to make networks of all kinds work for broadcasters. When DSP was first possible, we used it to fix the ages-old phone hybrid problem. It was the first use of DSP in radio broadcasting. When ISDN and MP3 first happened, we saw the possibility to make a truly useful codec. We were the first to license and use MP3 and the first to incorporate ISDN into a codec. We were active in the early days of internet audio, and the first to use MP3 on the internet. Inventing and adapting new technologies for broadcast is what we've always been about. And we've always been marrying audio with networks. It's been our passion right from the start. In our genes, if you will. As a pioneer in broadcast digital audio and DSP, we've grown an R&D team with a lot of creative guys who are open-eyed to new ideas. So it's actually quite natural that we would be playing marriage broker to computer networks and studio audio.

What you get from this is nearly as hot as a couple on their wedding night: On one RJ-45, two-way multiple audio channels, sophisticated control and data capability, and built-in computer compatibility. You can use Livewire as a simple sound card replacement – an audio interface connecting to a PC with an RJ-45 cable. But



add an Ethernet switch and more interfaces to build a system with as many inputs and outputs as you want.

Audio may be routed directly from interface to interface or to other PCs, so you now have an audio routing system that does everything a traditional "mainframe" audio router does – but at a lot lower cost and with a lot more capability. Add real-time mixing/processing engines and control surfaces and you have a modern studio facility with many advantages over the old ways of doing things. OK, maybe this is not as thrilling as a wedding night – perhaps kissing your first lover is a better analogy. (By the way, and way off-topic, did you know that the person you were kissing was 72.8% water?)

While we're on the subject of history... you've probably been soldering XLRs for a long time, so you feel a bit, shall we say, "attached" to them. We understand. But no problem – you'll be needing them for microphones for a long while, so your withdrawal symptoms won't be serious. But your facility already has plenty of Ethernet and plenty of computers, so you probably already know your way around an RJ-45 as well. It's really not that strange to imagine live audio flowing over computer networks, and there's little question that you are going to be seeing a lot of it in the coming years.

The 20th century was remarkable for its tremendous innovation in machines of all kinds: power generators, heating and air conditioning, cars, airplanes, factory automation, radio, TV, computers. At the dawn of the 21st, it's clear that the ongoing digitization and networking of text, audio, and images will be a main technology story for decades to come, and an exciting ride for those of us fortunate to be in the thick of it.

Speaking of years, it has been a lot of them since I wrote the Zephyr manual intro, and even more since the Telos 10 – 20 years now. Amazing thing is, with all the change around us, I'm still here and Telos is still growing in new ways. As, no doubt, are you and your stations.

Steve Church

A Note From The President of Axia

20 years ago, I designed my first broadcast console for PR&E. I look back on that time with great fondness; we were building bullet-proof boards for the world's most prestigious broadcasters, making each new console design bigger and fancier to accommodate a wider variety of source equipment and programming styles. The console was the core of the studio; all other equipment was on the periphery.

Then things changed: the PC found its way into broadcast audio delivery and production. At first, PC audio applications were simple, used only by budget stations to reduce operating expenses. But soon the applications evolved and were embraced by larger stations. Slowly, the PC was taking center stage in the radio studio.

Like many, I was captivated by the PC. Stations retired carts, phonographs, open-reel decks, cassettes — even more modern digital equipment such as DAT and CD players, replacing all with PC apps. Client/server systems emerged and entire facilities began using PCs to provide most — or all — of their recorded audio. Yet consoles continued to treat PCs as nothing more than audio peripherals. I knew that we console designers were going to have to rethink our designs to deal with computer-centric studios.

During this time, traditional broadcast console companies began producing digital versions. But early digital consoles were nearly identical in form and function to their analog predecessors. It took a fresh look from a European company outside broadcasting to merge two products — audio routing switchers and broadcast consoles — into a central processing engine and attached control surface. Eventually nearly every console and routing switcher company followed suit, and a wide variety of digital “engines” and control surfaces flooded the market.

But, advanced as these integrated systems were, they still handled computer-based audio sources like their analog ancestors. Sure, the router and console engine were now integrated, but the most important studio element — the PC — was stuck in the past, interfaced with 100-year-old analog technology. The PC and console couldn't communicate in a meaningful way — strange,

considering that PCs everywhere were being networked, fast becoming the world's most popular and powerful communication tool.

Then a group of Telos engineers developed a method of using Ethernet to network real-time audio devices, allowing computers and consoles, controllers and peripherals to interact smoothly and intelligently. Powerful, flexible networks had finally come to our studios. As with the transition from carts to computers, the benefits are many and impressive. A few networked components can replace routing switchers, consoles, processing peripherals, sound cards, distribution amps, selector switches and myriad related devices.

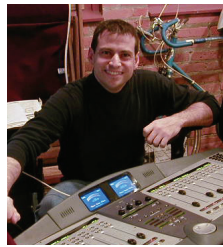
This deceptively simple networked system costs a fraction of other approaches, yet has capabilities surpassing anything else. The system is modular and can be used to perform discrete functions in a traditional environment. Concurrently, it easily scales to serve both the humblest and the very largest of facilities. Console, router, and computer work in harmony.

So, equipped with this new technology and countless ideas, we launch *Axia*, the newest division of Telos. *Axia* is all about delivering innovative networked audio products to future-minded broadcasters. On behalf of our

entire team, I welcome you as a charter client. *Axia* is the culmination of nearly 40 man-years of some of the most ambitious R&D ever applied to the radio industry. And this is only the beginning. We have more products, innovations, and partnerships in the pipeline.

You already know your *Axia* system is unlike anything else. So it shouldn't be surprising that your new system is loaded with new thinking, new approaches, and new ideas in virtually every conceivable area. Some concepts will challenge your traditional ideas of studio audio systems, but we're certain that once you have experienced the pleasures of the networked studio, you'll never want to go back. And now, for something completely different...

Michael “Catfish” Dosch



Chapter One:

Introducing the GPIO node

This section will allow you to get to know the GPIO node and describes the unit's features, connectors, and installation requirements.

This manual is written with the assumption that you have read the Introduction to Livewire – System Design Guide & Primer document. While the Axia Livewire technology is easy to use in powerful ways, it does represent a radical new way of thinking for broadcasters. That document will serve to get your feet wet and to orient you. We highly recommend you review that document first, before building a Livewire audio system.

Description

The GPIO Node provides the ability for logic (closure) inputs and outputs to be sent via Livewire streams. The GPIO node has 8 groups of inputs and outputs. Each group of Livewire closure inputs and outputs is on a separate connector and each must be assigned a Livewire "channel". Since GPIO closures are often associated with specific audio stream(s) the GPIO closure channels may, or may not, be the same as the channel number for an audio stream.

The function of the GPIO Node is to provide 40 optically-isolated "General-Purpose I/O" ports to interface to customer equipment, like CD players, tape decks, etc (40 input and 40 output ports total). Any GPIO enabled

device can send commands to the GPIO node over a 100 Base-TX Ethernet interface. Using these input/output ports, it can control, or convey the status of, connected equipment.

Front Panel Controls and Indicators

The Livewire GPIO node incorporates front panel indicators to allow the operator to verify proper operation quickly and confidently.

Status LED indicators

Three LEDs indicate the status of the Ethernet connection, as well as system synchronization as follows:

POWER

Indicates that the unit is connected to AC Mains power and operating.

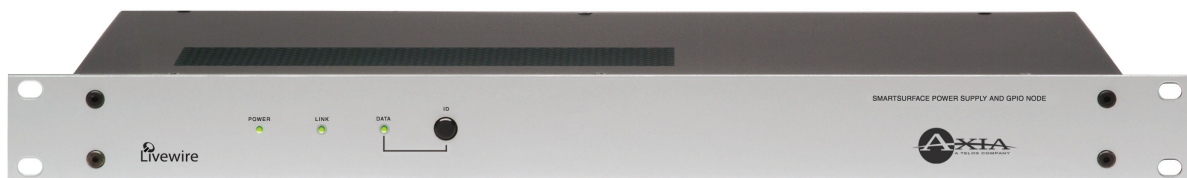
LINK

Indicates that the Ethernet LINK is connected correctly, and that Ethernet "Link Active" pulses are being correctly received. This does NOT mean that the unit is transferring any data, nor is it an indicator of the quality of the connection; simply that the Ethernet link is OK from a hardware point of view. If no Ethernet link is present, it will flash slowly.

DATA

This tally can indicate several different states depending on whether the ID button has been pressed in the previous 10 seconds:

- OFF – Unit is booting up, or the processor has stopped functioning



- ON – Processor and system are operating normally.

DATA (After pressing ID button)

- BLINKING (slowly) – Unit in configuration process.
- ON – Unit configured, but idle.
- ON (flickering) – Unit configured and data being transferred. The unit is operating normally.

ID Button

The I.D. button is used as part of the configuration process. If the DATA status LED indicates that the unit has not been configured, this button is used as part of the configuration process. When button is pressed, it triggers the GPIO node to identify itself and request an IP address from a BootP server on the Ethernet network (more on this later).

Rear Panel

The rear panel of the GPIO node is pictured below:

AC (Mains) Power

The AC receptacle connects mains power to the unit with a standard IEC power cord. The power supply has a “universal” AC input, accepting a range from 85 to 265 VAC, 47-63 Hz. A fuse is located inside on the power supply circuit board.

Livewire (100 Base-T) Connector

This connector is for connection to another Livewire node, or an approved Ethernet switch. It has two integral LEDs. The green “Link” LED indicates the presence of a live signal (same as the front panel “Link” LED). The “Activity” LED indicates that Ethernet packets are being sent or received over the link.

IMPORTANT! As with any piece of modern electronic gear, it is advisable that precautions be taken to prevent damage caused by power surges. Standard line surge protectors can be used to offer some degree of protection. It is the user’s responsibility to ensure protection adequate for their conditions is provided. This equipment is designed to be operated from a power source, which includes a third “grounding” connection in addition to the power leads. Do not defeat this safety feature. In addition to creating a potentially hazardous situation, defeating this safety ground will prevent the internal line noise filter from functioning. If fuse replacement is required, please note: For continued protection against fire, replace fuse only with same type and value. See the DETAILED TECHNICAL INFORMATION section for information and cautions. Axia nodes are intended for use with an Ethernet Switch that supports multicast and QOS (Quality of Service). On a non-switched Ethernet hub, or a switch that is not enabled for multicast, this will result in network congestion that could disrupt other network activity.

I/O Port Connectors

These are 15-pin D-Sub connectors, used to provide I/O drivers for customer devices. Eight of these connectors are available; each one providing 5 optically-isolated inputs and 5 optically-isolated outputs for interfacing to customer equipment.

Installation Guidelines

AC Mains Requirements

The Axia GPIO Node has an auto-configuring AC power supply that will work with a power source between 85 to 265 volts at 47 to 63 Hz.

It is essential that the third “grounding” pin not be defeated on the power cord and that the power cord be connected to a properly grounded receptacle. If a grounded receptacle is not available, a qualified electrical contractor familiar with the regulations in your area should be



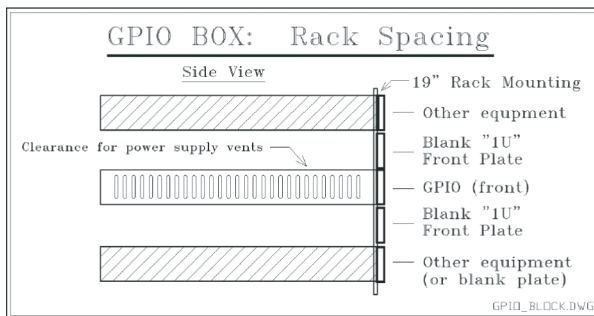
contracted to install one.

Rack Mounting and Ventilation

The Axia Livewire GPIO Node is 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.

The GPIO node should not be placed on bedding, carpet or other materials where the side-panel ventilation openings could be blocked. Do not block the ventilation openings on the top and sides of the unit.

The GPIO node is contained in a "1U" (rack unit) 19" rack-mount enclosure. The system does not contain a cooling fan, so only convection cooling is available.



What's Next

Now that you know about all the GPIO Node's controls, indicators and connections, turn to Chapter Two and let's hook some stuff up. 🌀

*GPIO is
eminently logical.
Get it? Get it? Yes?*

Chapter Two:

Input/Output Connections & Basic Configuration

This chapter covers the nitty gritty: the I/O connections, and how to program the IP address

Optically Isolated I/O Ports

The rear panel of the Axia Livewire GPIO terminal has eight 15 pin connectors labeled 1 to 8. Each connector has 5 opto-isolated inputs and 5 solid state relay outputs. Each port can be assigned to a Livewire channel (see the “Introduction to Livewire: System Design Reference & Primer” reference for more on Livewire channels). For convenience, a port can be assigned to the same channel used for related audio, or they can be assigned a unique channel if desired.

GPIOs can be used independently. By entering <ip address>/<port number> of each port on GPIO “A” will be mapped to the outputs of the matching port on GPIO “B”. This permits easy extension of contact closures throughout the facility over the Livewire network. Just as with audio nodes, two GPIO nodes may be connected with an Ethernet crossover cable rather than a switch to form a “GPIO snake” See Chapter 3 for more details.

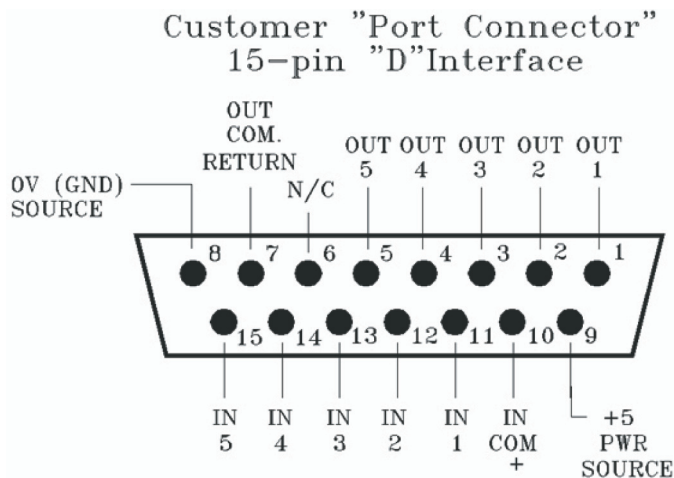
The illustration shows the port connector pinouts and functions; 5 inputs and associated common return, 5 output relays and associated common return, a +5 volt power source, and power source ground. The 5V and ground are connected through “solid state fuses,” which limit the current used to less than 0.9 amp. These “solid state fuses” go to a high-resistance state during over current conditions, and return to a low resistance state when circuit faults are removed.

Input Connections

Current on these inputs must be limited to 20 mA, or less, through the use of a current-limiting resistor. Recommended current-limiting resistors are as follows:

Input Voltage (VDC)	External Series Resistor Required
5 - 6	None
12	680 Ohm @ _ Watt
24	1.8K Ohm @ _ Watt

An external power source (24 volts DC maximum) is recommended for all inputs and outputs, to prevent ground loops between equipment. However, if customer equipment is completely isolated (see below for more on this), then using power from the GPIO Port connectors is acceptable. See Figure 2-1 (next page) for details of both types of connections.



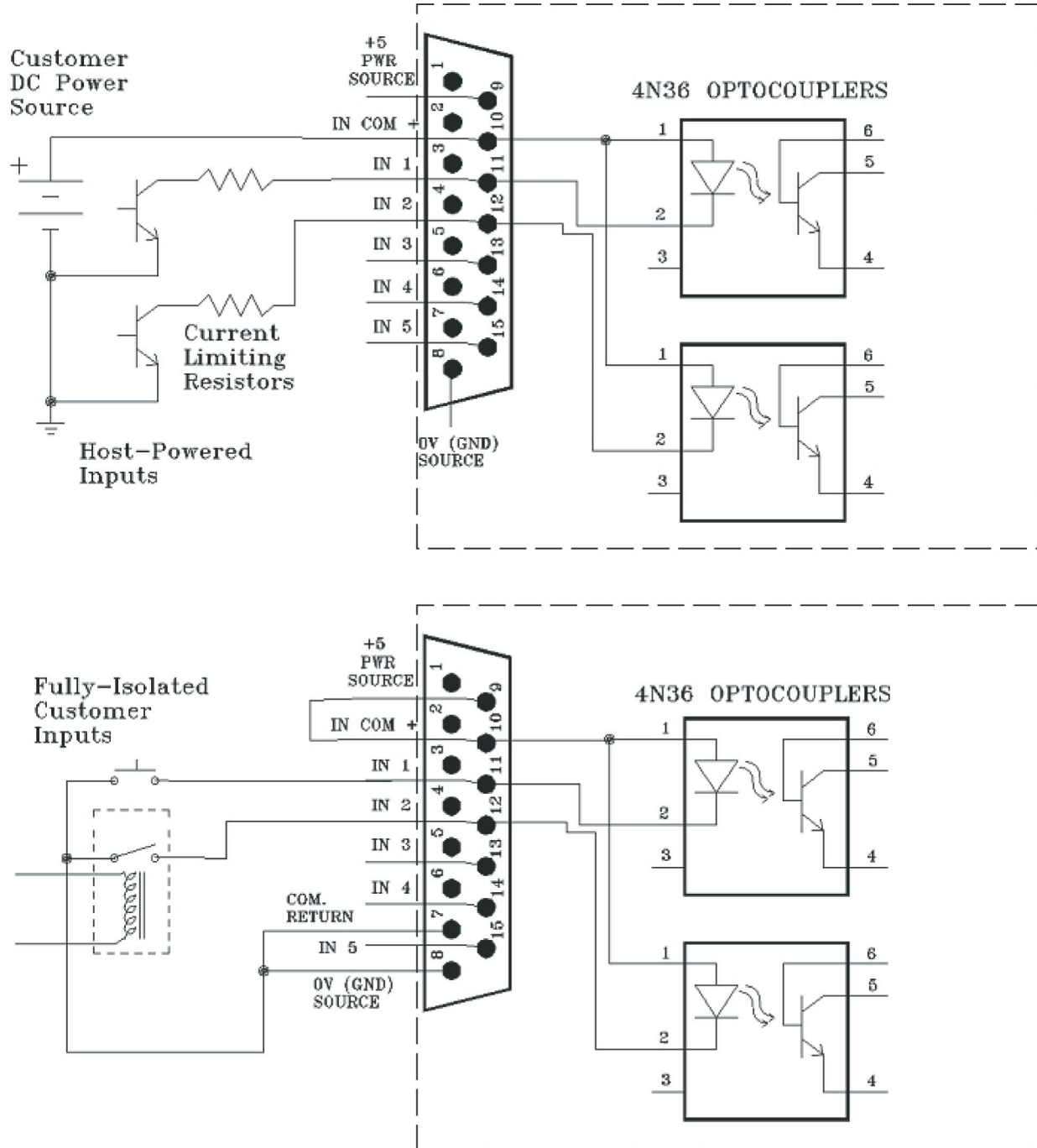


Figure 2-1: GPIO Input Connections

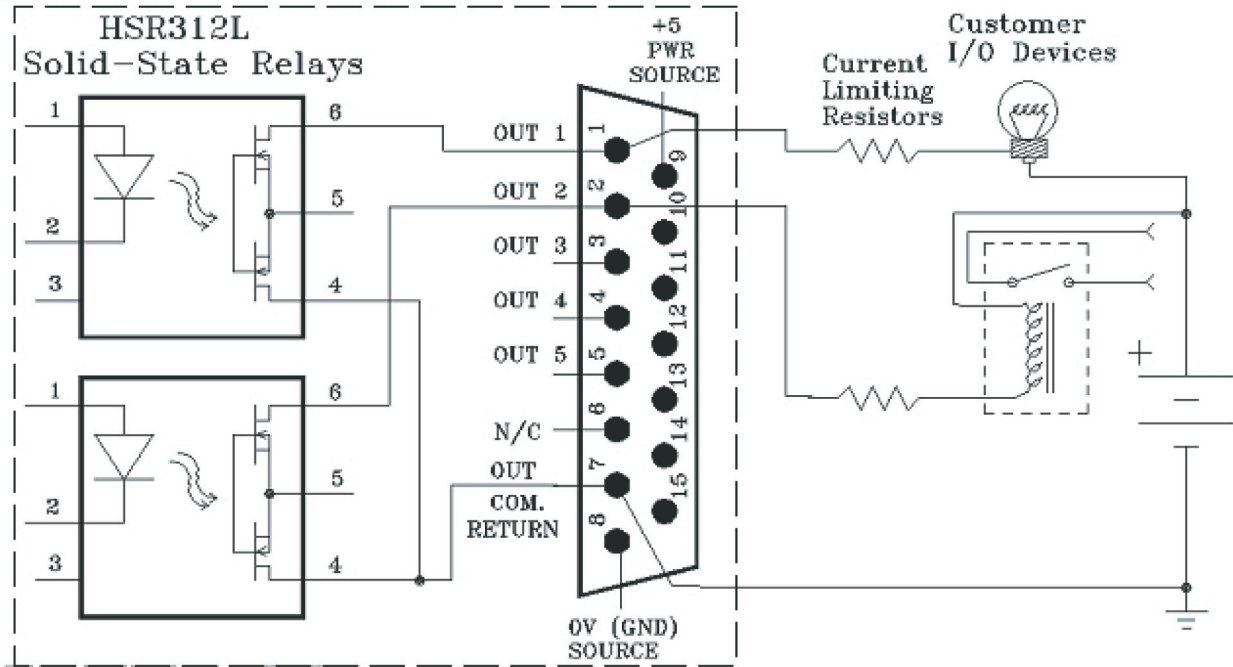
Output Connections

The Axia Livewire terminal's outputs are opto-isolated. Current should be limited 100 mA through each output, with the total current draw from the +5 Volt supply not to exceed 3 amps.

See Figure 2-2 for recommended connections for outputs. The drawing shows only DC connections, and as with the inputs, it is strongly recommended that customers provide the power (24 Volts DC maximum) for these output devices. Only if the controlled devices are Completely Electrically Isolated can they be powered by the internal 5V power source (read on for details).

6 to 24 Volt Outputs

(Host powered, isolated)



5 Volt Outputs

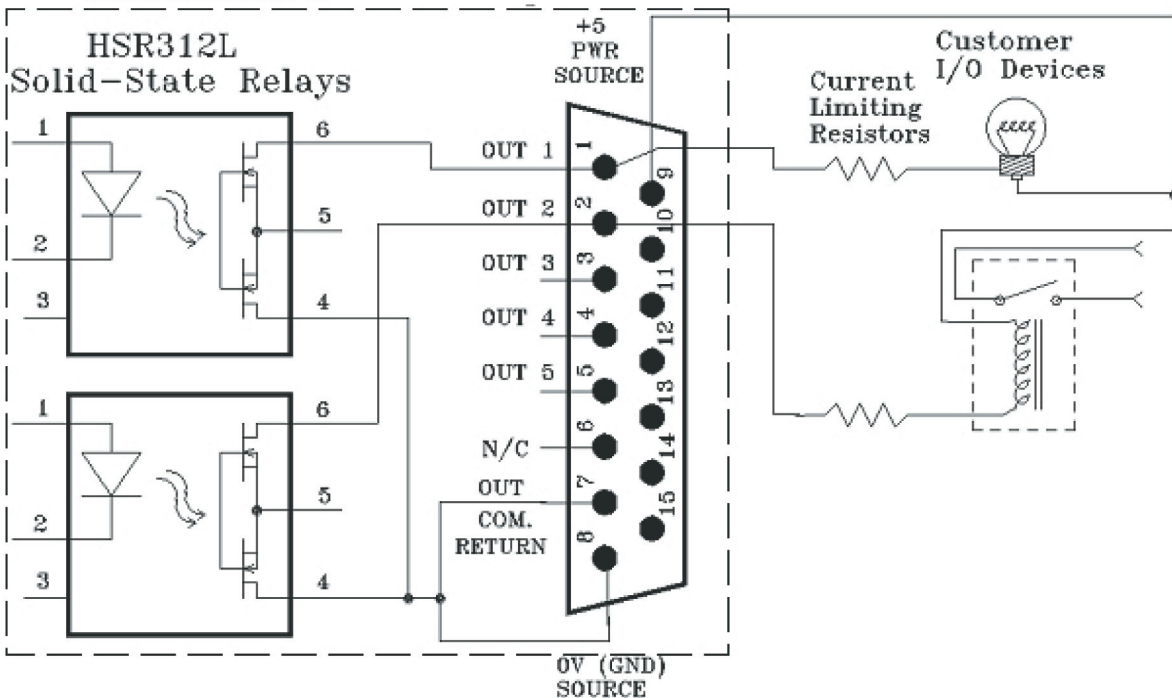


Figure 2-2: GPIO CPU Output Connections

A few words on equipment isolation & ground loops. The diagrams in the previous two pages illustrate how users can connect their remotely-controlled devices to

the GPIO's I/O connectors. However, a bit of explanation is needed here about the concept of "isolation".

The fact that the GPIO node has opto-isolators on all of its input and output pins does not necessarily mean that the customers' equipment is actually "isolated" from the GPIO node. "Grounds loops" and "fault currents" can still exist, depending on how the installer powers these I/O connections. (Refer back to the drawing for details.) On both the "Input" and the "Output" drawings, the top half of the diagram shows the I/O interfaces being powered from the customer's equipment. This is the preferred approach as there is no connection between the "ground" on the GPIO node and the user-equipment "ground" of the remotely-controlled device. This is the ideal situation, and is the one that Axia recommends.

IMPORTANT NOTE! If the +5V and "Ground" connections on the GPIO 15-pin connector are used to power I/O devices (as shown on the bottom half of the drawings in the previous two sections), the grounds of the GPIO node and the customer's equipment will be connected together. Therefore, if the GPIO node and the remotely-controlled equipment do not share the same ground (i.e. if they are not powered off of the same outlet strip, for example), a ground loop will be created, and ground loop currents will be created. Therefore, using the GPIO's +5V power for I/O connections is only recommended if the user's remotely controlled equipment and the GPIO node are certain to have the same ground potential.

The GPIO's +5V power and "GROUND" (pins 8 and 9 on the 15-pin connectors) are current limited through solid-state resettable fuses to less than 0.9 Amps. This protects both the GPIO node and customer equipment from potentially hazardous currents if severe ground loops are accidentally created between the two units. The GPIO 5 Volt power supply is rated to deliver a maximum 3 amps total for user purposes. The installer should keep this limit in mind and use external power supplies if necessary.

IMPORTANT NOTE! All of the inputs and outputs on a specific GPIO I/O port are "grouped together". The 5 "Outputs" are on 5 separate output pins, however, they share the same "Common Return" connection on Pin #7. Similarly, the 5 "Inputs" pins are pulled to ground to activate them, and they share a common high-side rail, in common, on Pin #10. If more than one remotely-controlled device is to be connected a

single 15-pin I/O port, you must make sure that the two units in question have the same ground potential or ground loops will occur. Therefore, it is recommended that only one remotely device be connected to each I/O port connector to assure complete electrical isolation. If multiple devices are connected to a single I/O port there is no over current protection. If it is necessary to more than one device to a single I/O port, then you must ensure that the two units share a common ground before the interconnections are made.

Assigning an IP Address

The node's IP address can be remotely assigned over the network using a program included with your node called BootP. To do so follow these steps:

1. From the CD-Rom that came with your Node, start **bootps.exe** on any Windows 2000/XP PC.
2. Press the ID button on GPIO front panel. You will be prompted for a new IP address entry:
3. Enter new IP address and press ENTER:

Make note of the IP address you have entered, so that you can access the Node using a Web browser (as described in Chapter 3). You may continue to assign additional Node IP addresses, or shut down the BootP program.

What's Next

In the next chapter, we'll learn about how to use your Web browser to program the GPIO Node. 🗑️

Chapter Three:

Advanced Programming

A number of parameters may be configured using the Livewire GPIO node's built in web pages. To access the built in web server from a computer, the computer and node must be connected to the same LAN (or the computer and node can be connected using a "crossover 10/100 Base-T" Ethernet cable).

To connect: enter the following in your browser:

http://123.456.789.101

where "123.456.789.101 is the IP address of the node to be configured.

Your browser should now display the login window to allow you to access the node:

Enter a valid user name and password and click on "OK" to log in.

- The default user name for all Axia nodes is: **user**
- The default password for all Axia nodes is: **<enter>**

NOTE: The IP range (e.g. the first three numbers of the four numbers of the IP address of

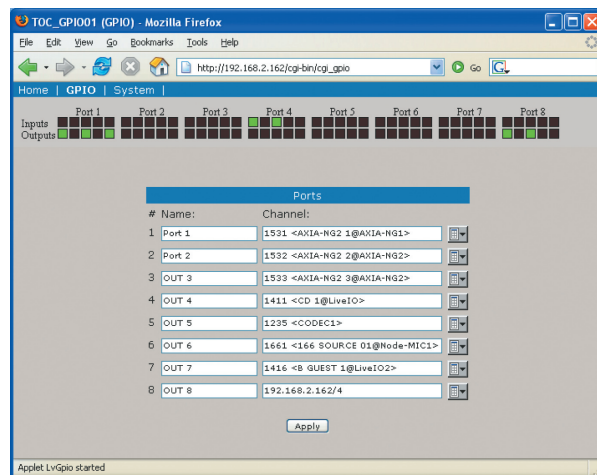


Figure 3-1: The GPIO HTTP Screen

the computer and the node must match, or additional configuration will be required. Microsoft Internet Explorer versions 5 and later, and Firefox version 1 and higher have been tested with the Livewire GPIO Node. Other browsers may work, however they have not been tested. Your browser must have Java enabled and must allow "pop up" windows.

The GPIO Node Home Page

Once you have logged in you will see the Axia GPIO node home page. The home page simply acts as an access point, to permit access to each of the other configuration pages. We describe each of those pages in detail.

The GPIO Page

The GPIO web screen, shown above, is used to configure each of the 8 input/output ports. Each port must be assigned a name and a Livewire channel. These are two-way channels. (For more about Livewire channels see the *Introduction to Livewire: System Design Reference & Primer* manual available for download at AxiaAudio.com.)

An alternative syntax is also supported in the "Channel" field:

<ip address>/<port number>

It allows creating "GPIO snakes". The ip address indicates source GPIO unit. Port number determines port on the source unit (1 through 8). Communication established this way is unidirectional. As it is shown on the screenshot above, port 8 outputs mimic input port (number 4) on 192.168.2.162/4. Careful readers noticed that the connection had been made within the same unit; although any unit on the network can be specified as a GPIO source this way.

To create a two-way "Snake", in addition to the one-way configuration we made, enter the destination unit's IP address and port number in the source unit's configuration.

The System Parameters Page

The Systems Parameters page, shown on the next page, allows configuring the node's IP address and related settings. It also permits choosing between a primary and secondary bank of software, and downloading new software into the secondary bank. The currently running software version is displayed here as well. You must click the Apply button for changes to take place.

IP Settings

These are the usual IP-related settings. Your network administrator should be able to provide the needed values. Each unit must have a unique IP address. For more detail on these see *Introduction to Livewire*.

Host name

The alphanumeric name for this node, spaces are NOT allowed. This is used to identify the node on the network. You may wish to include the location of the node (studio and rack) in the name for future reference.

Network address (IP Address)

The IP address of the node is entered here. Each Livewire node must have a unique IP address. The only exception is when two nodes are connected in the point-to-point (snake) configuration. This is set using the BootP program (see section 2, above), but it can be checked or changed here, if needed.

NOTE: If you change this setting 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. Normally this would be set using the front panel or using the BootP

program, but it can be changed here, if needed. The setting in most cases is 255.255.255.0 .

NOTE: If you change this setting you may lose your browser connection when you click Apply, and will need to reconfigure the computer's subnet mask to a proper value.

Gateway (Router)

If this node is connecting to an outside network enter the gateway IP address. This is not typically used.

The screenshot shows the 'System' page with a navigation bar (Home | GPIO | System) and a main content area. The 'IP settings:' section includes fields for Host name (TOC_GPIO), Network address (192.168.100.6), Netmask (255.255.255.0), Gateway (0.0.0.0), Syslog server (0.0.0.0), and Syslog severity level filter (Debug: debug-level messages). The 'User password:' section has fields for New password and Retype new password. The 'Firmware version:' section shows Hardware revision (rev. 1), Bank 0 (ver. 2.3.3b), and Bank 1 (empty). A warning message states 'System will reboot after changing current bank.' and an 'Apply' button is at the bottom.

Figure 3-1: The *System* HTTP Screen

Syslog Server (IP address)

Various services generate syslog (RFC 3164) messages, which can be forwarded to remote daemon. Remote syslog daemon IP address can be entered on System WEB page.

Syslog severity level filter

User can customize logging by choosing log detail level:

- Emergency: system is unusable
- Alert: action must be taken immediately
- Critical: critical condition
- Error: error conditions
- Warning: warning conditions
- Notice: normal but significant condition
- Informational: informational messages

- Debug: debug-level messages

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

Firmware version

An Axia node has two internal memory “banks”. Each bank contains room for a complete version of operating software. This approach allows a software update download to be completed and checked without danger of making the unit inoperable if the download were to be incomplete or corrupted. It also provides an easy way to try a new software version and still return to the old version.

The software version in each bank is displayed here. To change banks simply click in the “radio button” for the desired bank and then click on **Apply**.

IMPORTANT! The node will reboot after you click Apply if you change the software version. This will result in loss of GPIO locally, and at any unit using the local sources.

Saving Bank 1 Software

Software is always downloaded to bank 1 (the secondary bank). Downloading software to the Node will overwrite the software currently in this bank, if any. If you wish to save the software currently residing in bank 1, you can save it by moving it to bank 0 as follows:

- Click on Commit this version to Bank 0” box (see below).
- Click on **Apply**. The node will now reboot. Your browser will reconnect automatically when boot is complete.

IMPORTANT! The node will reboot after you click Apply if you change the software version. This will result in loss of GPIO locally, and at any unit using the local sources.

Downloading new software

To download new software to Bank 1, follow these steps:

- Go to www.AxiaAudio.com/downloads/ and down-

load the desired software update for your node to your computer (this should be the computer that you will use to access the node’s web page).

- Your local computer operating system should display a prompt to permit you to choose where you wish to locate the downloaded file. You can choose any convenient location; just be sure to note the drive and location where the file is to be saved.
- Open a web browser and connect to the node to be updated. Click on the Browse button to locate the file you downloaded. Once the proper path and filename are displayed, click on **Apply** to upload the file to the GPIO node.

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

To run the new software, click on Bank 1 and then click **Apply** to reboot the node.

IMPORTANT! The node will reboot after you click Apply if you change the software version. This will result in loss of GPIO locally, and at any unit using the local sources.

*Whiting haikus for
engineers is not quite as
simple as you think.*

Appendix A:

GPIO Profiles

Device Profiles

When configuring your Element or SmartSurface system, you can assign a Source type that then creates a standard I/O profile for inputs and outputs on the associated GPIO node. For more on this, consult documentation appropriate to your audio console. We list the available profiles on the following pages for your reference while installing the GPIO node.

Troubleshooting

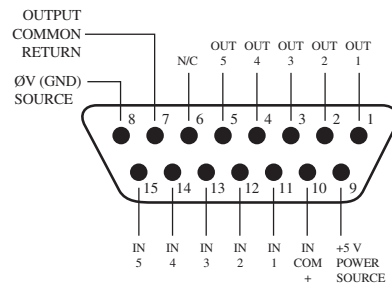
Here are some basic troubleshooting tips that might prove useful. Don't forget that the manual Introduction to Livewire; System Design Reference & Primer should be your companion and has many useful tips. If you don't find the answer here Axia support is available at support@axiaaudio.com, forums.axiaaudio.com or Monday through Friday 8am to 5pm EST at (216) 241-7225 or 24/7 at (216) 622-0247.

Problem: No GPIO "pin active" tallies are displayed on the "GPIO" HTTP page – just blank boxes.

Possible Solution: This page requires that Java be installed on the PC being used to display the Node's Web pages. Install the Java runtime from www.java.com on your PC, then open the page again.

GPIO Operator's Microphone Logic

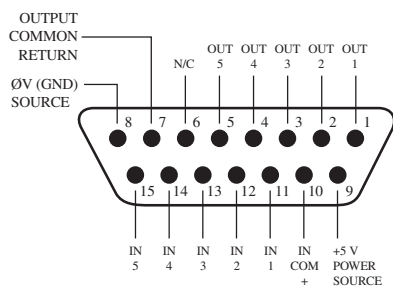
Name	Pin	Type	Notes
INPUTS			
ON Command	11	Active Low Input	Turns channel ON
OFF Command	12	Active Low Input	Turn channel OFF
TALK (to Monitor 2) Command	13	Active Low Input	Activates the Element TALK TO MON2 function and routes mic audio to the Talkback bus.
MUTE Command	14	Active Low Input	Mutes channel outputs
TALK (to PREVIEWED SOURCE) Command	15	Active Low Input	Activates the TALK button on every source currently in preview and routes mic audio to the Talkback bus.
OUTPUTS			
ON Lamp	1	Open Collector to Logic Common Return	Illuminates when channel is ON unless TALK or MUTE is active
OFF Lamp	2	Open Collector to Logic Common Return	Illuminates when channel is OFF
TALK (to Monitor 2) Lamp	3	Open Collector to Logic Common Return	Illuminates when TALK TO MON2 is active
MUTE Lamp	4	Open Collector to Logic Common Return	Illuminates when MUTE is active
TALK (to PREVIEWED SOURCE) Lamp	5	Open Collector to Logic Common Return	Illuminates when TALK to PREVIEWED SOURCE is active.
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic +5 Volt Supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Input Common	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



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GPIO Control Room Guest Microphone Logic

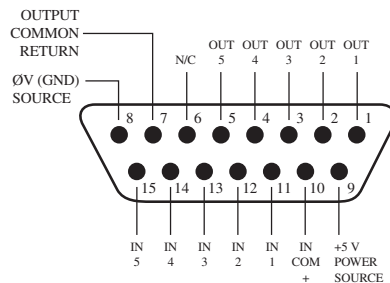
Name	Pin	Type	Notes
INPUTS			
ON Command	11	Active Low Input	Turns channel ON
OFF Command	12	Active Low Input	Turn channel OFF
TALK (to CR) Command	13	Active Low Input	Mutes channel outputs and routes source audio to PVW speakers
MUTE Command	14	Active Low Input	Mutes channel outputs
TALK (to SOURCE) Command	15	Active Low Input	Allows an external button to activate channel TALK TO SOURCE function. (Element only; SmartSurface not used)
OUTPUTS			
ON Lamp	1	Open Collector to Logic Common Return	Illuminates when channel is ON unless TALK or MUTE is active
OFF Lamp	2	Open Collector to Logic Common Return	Illuminates when channel is OFF
TALK (to CR) Lamp	3	Open Collector to Logic Common Return	Illuminates when TALK is active
MUTE Lamp	4	Open Collector to Logic Common Return	Illuminates when MUTE is active
TALK (to SOURCE) Lamp	5	Open Collector to Logic Common Return	Illuminates when the channel TALK TO SOURCE function is active. (Element only; SmartSurface not used)
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



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GPIO Studio (Monitor 2) Guest Microphone Logic

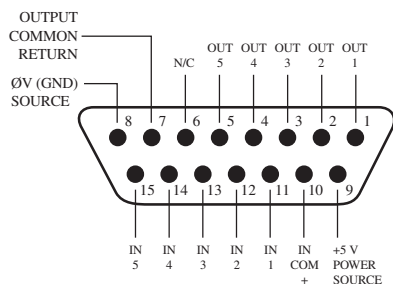
Name	Pin	Type	Notes
INPUTS			
ON Command	11	Active Low Input	Turns channel ON
OFF Command	12	Active Low Input	Turn channel OFF
TALK (to CR) Command	13	Active Low Input	Mutes channel outputs and routes source audio to PVW speakers
MUTE Command	14	Active Low Input	Mutes channel outputs
TALK (to SOURCE) Command	15	Active Low Input	Allows an external button to activate channel TALK TO SOURCE function. (Element only; SmartSurface not used)
OUTPUTS			
ON Lamp	1	Open Collector to Logic Common Return	Illuminates when channel is ON unless TALK or MUTE is active
OFF Lamp	2	Open Collector to Logic Common Return	Illuminates when channel is OFF
TALK (to CR) Lamp	3	Open Collector to Logic Common Return	Illuminates when TALK is active
MUTE Lamp	4	Open Collector to Logic Common Return	Illuminates when MUTE is active
TALK (to SOURCE) Lamp	5	Open Collector to Logic Common Return	Illuminates when the channel TALK TO SOURCE function is active. (Element only; SmartSurface not used)
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



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GPIO Producer's Microphone Logic

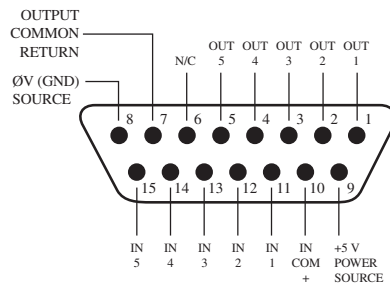
Name	Pin	Type	Notes
INPUTS			
ON Command	11	Active Low Input	Turns channel ON
OFF Command	12	Active Low Input	Turn channel OFF
TALK (to MONITOR 2) Command	13	Active Low Input	Activates the Element TALK to MON2 function and routes mic audio to the Talkback bus.
MUTE Command	14	Active Low Input	Mutes channel outputs
TALK (to PREVIEWED SOURCE) Command	15	Active Low Input	Activates the TALK button on every source currently in Preview and routes mic audio to the Talkback bus.
OUTPUTS			
ON Lamp	1	Open Collector to Logic Common Return	Illuminates when channel is ON unless TALK or MUTE is active
OFF Lamp	2	Open Collector to Logic Common Return	Illuminates when channel is OFF
TALK (to MONITOR 2) Lamp	3	Open Collector to Logic Common Return	Illuminates when TALK to MON2 is active.
MUTE Lamp	4	Open Collector to Logic Common Return	Illuminates when MUTE is active
TALK (to PREVIEWED SOURCE) Lamp	5	Open Collector to Logic Common Return	Illuminates when TALK to PREVIEWED SOURCE is active.
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



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GPIO Line Input Logic

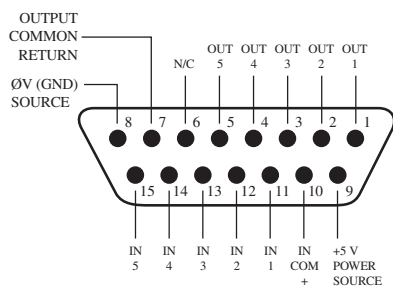
Name	Pin	Type	Notes
INPUTS			
ON Command	11	Active Low Input	Turns channel ON
OFF Command	12	Active Low Input	Turns channel OFF & sends 100 msec STOP pulse
PREVIEW Command	13	Active Low Input	Turns preview ON
RESET Command	14	Active Low Input	Turns channel OFF, while not sending a STOP pulse
READY Command	15	Active Low Input	Illuminates OFF lamp to indicate source's readiness
OUTPUTS			
ON Lamp	1	Open Collector to Logic Common Return	Illuminates when channel is ON
OFF Lamp	2	Open Collector to Logic Common Return	Illuminates when channel is OFF and READY is active
PREVIEW Lamp	3	Open Collector to Logic Common Return	Illuminates when PREVIEW is ON
START Pulse	4	Open Collector to Logic Common Return	A 100 msec pulse when the channel status changes from OFF to ON
STOP Pulse	5	Open Collector to Logic Common Return	A 100 msec pulse when the channel status changes from ON to OFF
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



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GPIO Codec Logic

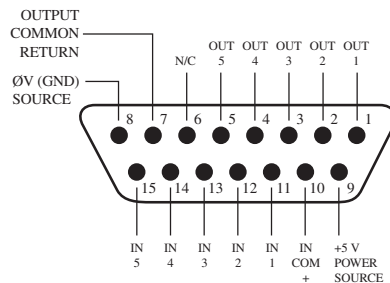
Name	Pin	Type	Notes
INPUTS			
ON Command	11	Active Low Input	Turns channel ON
OFF Command	12	Active Low Input	Turns channel OFF
TALK (to CR) Command	13	Active Low Input	Mutes channel outputs and routes source audio to PVW speakers
MUTE Command	14	Active Low Input	Mutes channel outputs
TALK (to SOURCE) Command	15	Active Low Input	Allows an external button to activate channel TALK TO SOURCE function.
OUTPUTS			
ON Lamp	1	Open Collector to Logic Common Return	Illuminates when channel is ON unless TALK or MUTE are active
OFF Lamp	2	Open Collector to Logic Common Return	Illuminates when channel is OFF.
TALK (to CR) Lamp	3	Open Collector to Logic Common Return	Illuminates when TALK is active
MUTE Lamp	4	Open Collector to Logic Common Return	Illuminates when MUTE is active
TALK (to SOURCE) Lamp	5	Open Collector to Logic Common Return	Illuminates when the channel TALK TO SOURCE function is active.
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



GPIO v."Z" 12/2007

GPIO Telephone Hybrid Logic

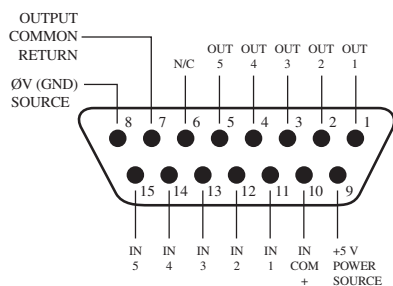
Name	Pin	Type	Notes
INPUTS			
ON Command	11	Active Low Input	Turns channel ON
OFF Command	12	Active Low Input	Turns channel OFF
PREVIEW Command	13	Active Low Input	Turns preview ON
RESET Command	14	Active Low Input	Turns channel off while not sending a STOP pulse
READY Command	15	Active Low Input	Illuminates OFF lamp to indicate source's readiness
OUTPUTS			
ON Lamp	1	Open Collector to Logic Common Return	Illuminates when channel is ON
OFF Lamp	2	Open Collector to Logic Common Return	Illuminates when channel is OFF
PREVIEW Lamp	3	Open Collector to Logic Common Return	Illuminates when PREVIEW is ON
START Pulse	4	Open Collector to Logic Common Return	A 100 mS PULSE is sent when channel is first turned ON or when PVW is first selected (if "PVW answers" option is selected).
STOP Pulse	5	Open Collector to Logic Common Return	A 100 mS PULSE sent when channel is turned OFF.
POWER & COMMAND			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



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GPIO Control Room Monitor Logic

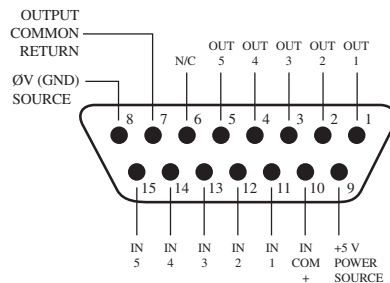
Name	Pin	Type	Notes
INPUTS			
MUTE CR Command	11	Active Low Input	Mutes CR monitors and Pre-view speakers
DIM CR Command	12	Active Low Input	Allows external dimming of CR monitor speakers.
Enable EXT PREVIEW Com-mand	13	Active Low Input	Feeds External Audio Input to PREVIEW
Not Used	14	Active Low Input	
TALK TO EXT Command (Element only).	15	Active Low Input	Turns on Talk to External Audio on Element.
OUTPUTS			
CR ON AIR Lamp	1	Open Collector to Logic Com-mon Return	Illuminates whenever CR monitors are muted
DIM CR Lamp	2	Open Collector to Logic Com-mon Return	Illuminates whenever control room monitors are DIMMED
PREVIEW Lamp	3	Open Collector to Logic Com-mon Return	Illuminates when PREVIEW is active.
Not Used	4	Open Collector to Logic Com-mon Return	
TALK (to CR) Active Lamp	5	Open Collector to Logic Com-mon Return	Active whenever a source has activated its TALK (to CR) function
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



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GPIO Studio Monitor Logic

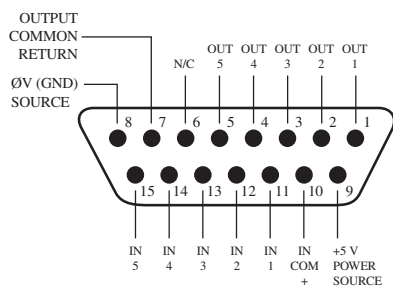
Name	Pin	Type	Notes
INPUTS			
MUTE Studio Command	11	Active Low Input	Allows external muting of Studio monitor speakers.
DIM Studio/Monitor 2 Command	12	Active Low Input	Allows external dimming of Studio monitor speakers.
Remote Event Timer Trigger Command	13	Active Low Input	Resets Countup Event Timer to zero and starts timer.
Remote Countdown Timer Trigger Command	14	Active Low Input	Resets Countdown timer to preset max time and starts timer (Element only).
Not Used	15	Active Low Input	
OUTPUTS			
Studio ON AIR Lamp	1	Open Collector to Logic Common Return	Illuminates whenever Studio monitors are muted
DIM Studio/Monitor 2 Lamp	2	Open Collector to Logic Common Return	Illuminates whenever Studio monitors are DIMMED
Event Timer Trigger Output	3	Open Collector to Logic Common Return	A 100 ms PULSE sent when event timer is started from zero.
Countdown Timer Trigger Output	4	Open Collector to Logic Common Return	A 100 mS PULSE sent when countdown timer is started from preset max (Element only).
TALK TO STUDIO/MONITOR 2 Active Lamp	5	Open Collector to Logic Common Return	Illuminates whenever the TALK TO STUDIO/MON2 function is active.
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



GPIO v."Z" 12/2007

GPIO Computer Playback Device Logic

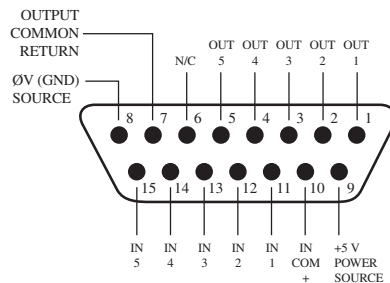
Name	Pin	Type	Notes
INPUTS			
ON Command	11	Active Low Input	Turns channel ON
OFF Command	12	Active Low Input	Turns channel OFF & sends 100 msec STOP pulse
PREVIEW Command	13	Active Low Input	Turns preview ON
Not Used	14	Active Low Input	
READY Command	15	Active Low Input	Illuminates OFF lamp to indicate source's readiness
OUTPUTS			
NEXT Pulse	1	Open Collector to Logic Common Return	A 100 mS PULSE sent when ON button is depressed, except when initially turned ON.
OFF Lamp	2	Open Collector to Logic Common Return	Illuminates when channel is OFF and READY is active
PREVIEW Lamp	3	Open Collector to Logic Common Return	Illuminates when PREVIEW is ON
START Pulse	4	Open Collector to Logic Common Return	A 100 mS PULSE sent when channel is first turned ON.
STOP Pulse	5	Open Collector to Logic Common Return	A 100 mS PULSE sent when channel is turned OFF.
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



GPIO v."Z" 12/2007

GPIO External Profanity Delay Logic

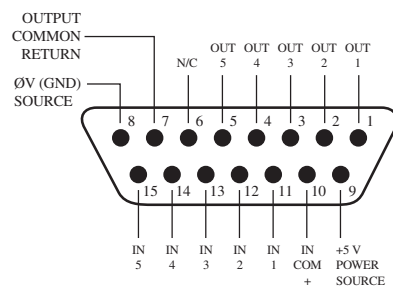
Name	Pin	Type	Notes
INPUTS			
DUMP Lamp	11	Active Low Input	Illuminates DUMP lamp (located on Element Monitor Module).
EXIT Lamp	12	Active Low Input	Illuminates EXIT lamp.
PAUSE Lamp	13	Active Low Input	Illuminates PAUSE lamp.
ENGAGE Lamp	14	Active Low Input	Illuminates ENGAGE lamp.
DELAY ANNUNCIATOR Command	15	Active Low Input	Illuminates the DELAY annunciator on the Element main screen.
OUTPUTS			
DUMP Switch	1	Open Collector to Logic Common Return	Active when DUMP button is depressed.
EXIT Switch	2	Open Collector to Logic Common Return	Active when EXIT button is depressed.
PAUSE Switch	3	Open Collector to Logic Common Return	Active when PAUSE button is depressed.
ENGAGE Switch	4	Open Collector to Logic Common Return	Active when ENGAGE button is depressed.
Not Used	5	Open Collector to Logic Common Return	
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



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GPIO Film Legenable User Button Module / Accessory Panel / Rack Panel

Name	Pin	Type	Notes
INPUTS			
User Button 1 Lamp	11	Active Low Input	Illuminates User Button 1 Lamp
User Button 2 Lamp	12	Active Low Input	Illuminates User Button 2 Lamp
User Button 3 Lamp	13	Active Low Input	Illuminates User Button 3 Lamp
User Button 4 Lamp	14	Active Low Input	Illuminates User Button 4 Lamp
User Button 5 Lamp	15	Active Low Input	Illuminates User Button 5 Lamp
OUTPUTS			
User Button 1 Switch	1	Open Collector to Logic Common Return	Active when User Button 1 is pushed
User Button 2 Switch	2	Open Collector to Logic Common Return	Active when User Button 2 is pushed
User Button 3 Switch	3	Open Collector to Logic Common Return	Active when User Button 3 is pushed
User Button 4 Switch	4	Open Collector to Logic Common Return	Active when User Button 4 is pushed
User Button 5 Switch	5	Open Collector to Logic Common Return	Active when User Button 5 is pushed
POWER & COMMON			
Source Common	7	Logic Common	Connect to ground of source device or to Pin 8
Logic Common	8	Internal 5 Volt return	Can be connected to Pin 7 if source is not providing common
Logic + 5 Volt supply	9	Logic Supply, Individually Fused	Can be connected to Pin 10 if source is not providing voltage; active only when source has been assigned to channel.
Source Supply	10	Common for all 5 inputs	Connect to power supply of source device or to Pin 9
NOT CONNECTED	6		



GPIO v."Z" 12/2007

TCP/IP,

How did we live without thee?

Analogicly.

Specifications and Warranty

Axia GPIO Node Specifications

Environment

- Ambient Temperature: 0 to 40 degrees C, with recommended ventilation requirements.
- Temperature rise: 20 degrees C above ambient at full load, maximum.
- Atmosphere: 5 to 95% Relative Humidity, Non-condensing, non-corrosive atmosphere.
- Elevation: Up to 15,000 feet above sea level, without special cooling.

Power Supply

- Output: Smart Surface Power Supply: +48V at 120 Watts continuous (180 Watt maximum peak load).
Livewire I/O Node: +48V at 35 Watts continuous (80 Watt maximum peak load).
- Output regulation: 48V + or - .5% over expected operating load range.
- AC Mains Input: “Universal” AC input
- Voltage 90 to 264 VAC
- Input Frequency: 47-63 Hz.
- Harmonic Content: Complies with EN61000-3-2 Amendment 14
- Inrush Current: 75A max, 4 cycles.
- Power Consumption:
- Smart Surface Power Supply: <125 Watts typ. 165 Watts max peak GPIO Node: < 30 Watts typ. 50 Watts max peak

5 Volt User Power

- 3 amps total (each port limited to 0.9 amps by solid state fuse)

Input Ports

- Isolation: 4,000 VRMS minimum.
- Nominal input drive: 5V at 10 mA. to activate input.
- Input voltage can be raised as high as 24VDC, with appropriate external current limiting resistors

Output Ports (Isolated)

- Isolation: 4,000 VRMS minimum.
- Output drive capability: 100mA current Max, at up to 24 volts AC or DC.

AXIA System Specifications

Microphone Preamplifiers

- Source Impedance: 150 ohms
- Input Impedance: 4 k ohms minimum, balanced
- Nominal Level Range: Adjustable, -75 dBu to -28 dBu
- Input Headroom: >20 dB above nominal input
- Output Level: +4 dBu, nominal

Analog Line Inputs

- Input Impedance: >40 k ohms, balanced
- Nominal Level Range: Selectable, +4 dBu or -10dBv
- Input Headroom: 20 dB above nominal input

Analog Line Outputs

- Output Source Impedance: <50 ohms balanced
- Output Load Impedance: 600 ohms, minimum
- Nominal Output Level: +4 dBu
- Maximum Output Level: +24 dBu

Digital Audio Inputs and Outputs

- Reference Level: +4 dBu (-20 dB FSD)
- Impedance: 110 Ohm, balanced (XLR)
- Signal Format: AES-3 (AES/EBU)
- ES-3 Input Compliance: 24-bit with selectable sample rate conversion, 32 kHz to 96kHz input sample rate capable.
- AES-3 Output Compliance: 24-bit
- Digital Reference: Internal (network timebase) or external reference 48 kHz, +/- 2 ppm
- Internal Sampling Rate: 48 kHz
- Output Sample Rate: 44.1 kHz or 48 kHz
- A/D Conversions: 24-bit, Delta-Sigma, 256x oversampling
- D/A Conversions: 24-bit, Delta-Sigma, 256x oversampling
- Latency <3 ms, mic in to monitor out, including network and processor loop

Frequency Response

- Any input to any output: +0.5 / -0.5 dB, 20 Hz to 20 kHz

Dynamic Range

- Analog Input to Analog Output: 102 dB referenced to 0 dBfs, 105 dB "A" weighted to 0 dBfs
- Analog Input to Digital Output: 105 dB referenced to 0 dBfs
- Digital Input to Analog Output: 103 dB referenced to 0 dBfs, 106 dB "A" weighted
- Digital Input to Digital Output: 138 dB

Equivalent Input Noise

- Microphone Preamp: -128 dBu, 150 ohm source, reference -50 dBu input level

Total Harmonic Distortion + Noise

- Mic Pre Input to Analog Line Output: <0.005%, 1 kHz, -38 dBu input, +18 dBu output
- Analog Input to Analog Output: <0.008%, 1 kHz, +18 dBu input, +18 dBu output
- Digital Input to Digital Output: <0.0003%, 1 kHz, -20 dBFS
- Digital Input to Analog Output: <0.005%, 1 kHz, -6 dBfs input, +18 dBu output

Crosstalk Isolation and Stereo Separation and CMRR

- Analog Line channel to channel isolation: 90 dB isolation minimum, 20 Hz to 20 kHz
- Microphone channel to channel isolation: 80 dB isolation minimum, 20 Hz to 20 kHz
- Analog Line Stereo separation: 85 dB isolation minimum, 20Hz to 20 kHz
- Analog Line Input CMRR: >60 dB, 20 Hz to 20 kHz
- Microphone Input CMRR: >55 dB, 20 Hz to 20 kHz

Power Supply AC Input

- Auto-sensing supply, 90VAC to 240VAC, 50 Hz to 60 Hz, IEC receptacle, internal fuse
- Power consumption: 35 Watts

Operating Temperatures

- -10 degree C to +50 degree C, <90% humidity, no condensation

Dimensions and Weight

- Microphone node: 1.75 inches x 17 inches x 10 inches, 6 pounds
- Analog Line node: 1.75 inches x 17 inches x 10 inches, 6 pounds
- AES/EBU node: 1.75 inches x 17 inches x 10 inches, 6 pounds
- Router Selector node: 1.75 inches x 17 inches x 10 inches, 6 pounds
- GPIO node: 1.75 inches x 17 inches x 13 inches, 8 pounds
- Studio Mix Engine 3.5 inches x 17 inches x 15 inches, 10 pounds

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Axia Limited Warranty

This Warranty covers “the Products,” which are defined as the various audio equipment, parts, software and accessories manufactured, sold and/or distributed by TLS Corp., d/b/a Axia Audio (hereinafter “Axia Audio”).

With the exception of software-only items, the Products are warranted to be free from defects in material and workmanship for a period of five (5) years from the date of receipt by the end-user. Software-only items are warranted to be free from defects in material and workmanship for a period of 90 days 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 telephone and power line surge protection devices; accident; neglect or damage.

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

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In order to invoke this Warranty, notice of a warranty claim must be received by Axia Audio within the above-stated warranty period and warranty coverage must be authorized by Axia Audio. If Axia Audio authorizes the performance of warranty service, the defective Product must be delivered, shipping prepaid, to: Axia Audio, 2101 Superior Avenue, Cleveland, Ohio 44114.

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

Axia Audio’s authorized dealers are not authorized to assume for Axia Audio any additional obligations or liabilities in connection with the dealers’ sale of the Products.

Axia Audio’s products are to be used with registered protective interface devices which satisfy regulatory requirements in their country of use.

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