ADA-2x8SS
Analog Audio Distribution Amplifier

with Automatic Studio switching and StudioHub+ Connectivity

Operations Manual

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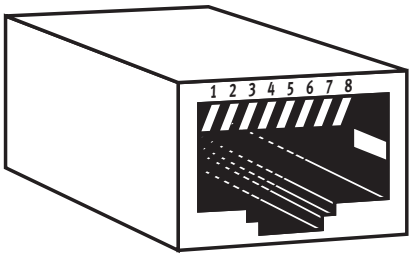
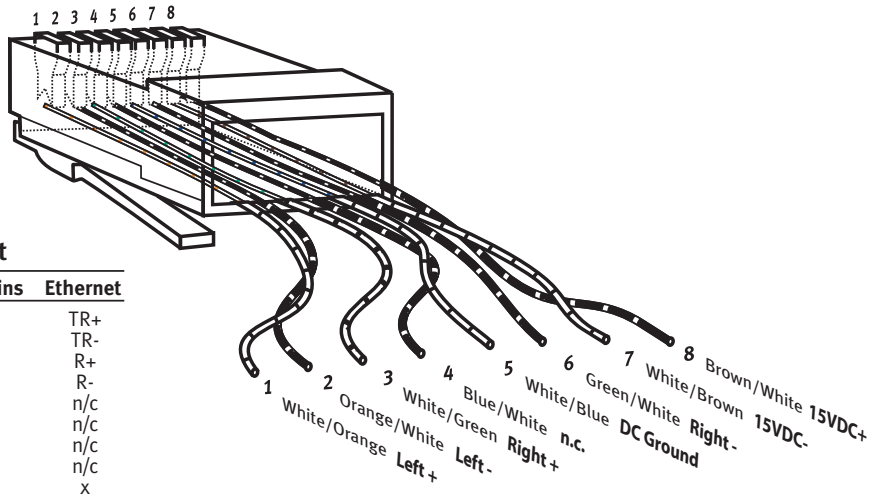


StudioHub+ RJ-45 Pinout



StudioHub+ Pinout Chart

Channel	Color Pair	RJ-45 Pins	110 Pins	Ethernet
L+ / AES+	Wht/Org	1	3	TR+
L- / AES-	Org/Wht	2	4	TR-
R+	Wht/Grn	3	5	R+
R-	Grn/Wht	6	6	R-
nc	Wht/Blu	5	1	n/c
GND	Blu/Wht	4	2	n/c
15V-	Wht/Brn	7	7	n/c
15V+	Brn/Wht	8	8	n/c
Shield	Wht/Slt	Shield	9	x
Shield	Slt/Wht	Shield	10	x

Features

- 2 stereo inputs
- 8 stereo outputs
- StudioHub+
- Universal power supply
- CE certification
- Front panel level sets
- Headphone Amplifier with level control
- Stereo VU meter
- Automatic switch over
- Full remote control
- Silence sensor
- Adjustable silence sense time
- Adjustable silence sense level
- Loop thru input connectors
- Stereo / mono input jumpers (rear panel)
- Input gain adjusts (internal)
- Pulse / hold external trigger
- Detachable IEC power cord
- Front panel LED indicators

Overview

The Radio Systems DA-4x8SS is designed to function as a super low noise, low distortion audio distribution amplifier with built-in silence sensor with auto-switch-over mode, front panel headphone amp and VU meter and individual output level set trims.

Excellent isolation is provided between outputs. Each balanced channel, regardless of level set and load, is unaffected by the other channels. The Radio Systems DA-2X8SS Distribution Amplifier allows audio sources to be routed to multiple locations with various level requirements and impedances while maintaining the integrity of signal quality throughout.

The distribution amplifier is configured with StudioHub+ / RJ-45 connectors for plug-and-play wiring via standard (568B) CAT-5&6 Ethernet-style patch cables installation and full compatibility with all StudioHub+ adapters and conforming equipment.

Mounting

The 4x4a occupies only 1 rack unit (1-3/4 inch) of height in a 19 inch EIA rack. To allow for adequate ventilation, avoid mounting the unit directly above large heat producing equipment such as power amps or power supplies.

When stacking units, it is recommended that one rack space (1-3/4 inch) remain open between every three units.

Operation

Apply an input level of approximately 0dB to the input terminals. The gain of either stage may be increased by 20dB in 10dB steps by changing the internal gain straps.

To locate and reset these jumpers, remove the top cover and place the jumper across the center and rear pin to increase input gain by 10dB. Place a shorting strap across the center and forward pin to increase input gain by 20dB.

Output level is factory set for unity gain. Each output can be individually set via its front panel recessed level pot over a range from -60 to +18dBm. Nominal operating levels are 0dBm input and +10dBm output. Higher operating levels can cut dynamic range by operating too close to the clipping point. Adjust each output to the desired level, keeping clipping in mind. The front panel V.U. meter faithfully reports output levels and may be used as a confidence monitor and accurate level indicator.

Two identical inputs are provided to switch between studios or any main and back-up audio source. Manual switching is available via front panel switches or remote terminals or automatically triggered via the time and level-adjustable internal silence sensor.

Connections

The units are primarily designed for balanced inputs and outputs. The input ground is connected to the chassis and power supply at a single point. If unbalanced lines are used, tie the unused input terminal to ground. However, do not tie any unused output terminals to ground. Wire an unbalanced output between one output terminal and the input ground terminal. For further details, see the section on using active balanced circuitry in this manual.

Although the outputs are short circuit protected, operating into less than a 600 ohm load is not recommended. The input is bridging (high impedance) and will not load down any source.

AC line voltage is auto-selected via the internal universal (switching) power supply.

Front Panel Controls and Indicators

A.Audio LED
Flashes to indicate “A” audio pressence

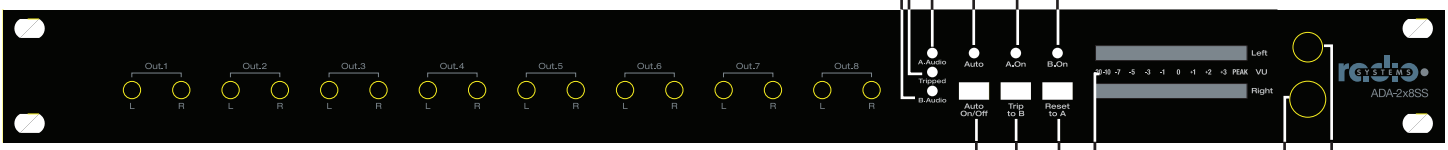
Tripped LED
Illuminates to indicate that audio has automatically (via the silence sensor) switched audio inputs. LED resets on pressing the “Reset to A” button.

B.Audio LED
Flashes to indicate “B” audio pressence

Auto
Elluminates when auto switching function is engaged via lower push button.

A.On
Elluminates when input A selected

B.On
Elluminates when input B selected



Ouptut Channels 1 - 8 Level L/R Trim Pots.
Access with a miniture flat blade screw driver.
Fully CCW is off, and full CW is +36dB.
Factory preset is +4 dB (approximately 1 o’clock).

Headphone 1/4” Stereo Phone Jack.
Follows VU meter (selected audio input).

Headphone Volume Control

Stereo VU Meter.
Indicates full time output level of selected audio input.

Reset to A.
Push to select “A” audio input.

Trip to B.
Push to select or emulate an auto trip to the “B” audio input.

Auto On/Off
Push to enable auto switching via the internal silence sensing.

Rear Panel Connections and Settings

Locate jumper by removing top cover. Jumper is in upper right hand corner of board by remote control connector.

Internal Holding Jumper

Jumper removed (factory default) for pulse (for use in starting a remote backup emergency program playback device). Install jumper for holding control.

Remote Control RJ-45 GPIO Connector

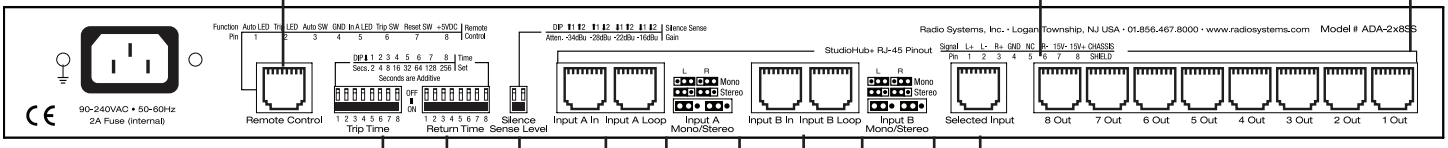
Pin-1	Auto LED
Pin-2	Trip LED
Pin-3	Auto Switch
Pin-4	Ground
Pin-5	Input A LED
Pin-6	Trip Switch
Pin-7	Reset Switch
Pin-8	+5VDC

LED outputs are pull-to-ground and follow front panel LEDs. Switches are pull-to-ground to activate.

8 Identical and Isolated Stereo, Balanced Line-Level Outputs with StudioHub+ connectivity and "DC-Link" Power Outputs

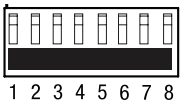
(outputs follow selected audio input)

Pin-1	Left +
Pin-2	Left -
Pin-3	Right +
Pin-4	Ground
Pin-5	NC
Pin-6	Right -
Pin-7	-15VDC
Pin-8	+15VDC



Silence Sense Auto Trip Time to Input A

Silence Sense Auto Return Time to Input A



Down is On

1 2 3 4 5 6 7 8

DIP-1	Adds 2 Seconds
DIP-2	Adds 4 Seconds
DIP-3	Adds 8 Seconds
DIP-4	Adds 16 Seconds
DIP-5	Adds 32 Seconds
DIP-6	Adds 64 Seconds
DIP-7	Adds 128 Seconds
DIP-8	Adds 256 Seconds

Multiple DIP switched may be selected to add seconds (ie. switches 1, 2 & 3 selected down together = 14 seconds).

Selected Input

Follows inputs selected and indicated on front panel as active.

Strap for Stereo Input

Factory default.

Strap for Mono Input

Mono input configuration applies the left channel to both left and right inputs (any signal on the right input does not sum).

Input Connectors

Loop thru connectors are in parallel

Silence Sense Trigger Level

(Applies to both "Trip" and "Return")

Down is On

DIP-1 Up / DIP-2 Up	-34dBu
DIP-1 Up / DIP-2 Down	-28dBu
DIP-1 Down / DIP-2 Up	-22dBu
DIP-1 Down / DIP-2 Down	-16dBu

Internal Gain Jumpers

Locate jumpers by removing top cover. Jumper are in center of board.

0 dB Gain | +10 dB Gain | +20 dB Gain

No jumpers installed for 0dB gain (factory default).
Jump top two pins for +10dB gain, jump bottom two pins for +20dB gain.
Duplicate for second channel.

Specifications

Frequency Response	+0, -.1dB 20Kz 20kHz
Distortion THD + N	.002% over 20Hz 20kHz, any output level from +4dBm to +24dBm (with 600 ohm load)
Distortion IMD SMPTE	.003% any output level from +4dBmto +24dBm (with 600 ohm load)
Distortion DIM	.002% any output level from +4dBm to +24dBm (with 600 ohm load)
Crosstalk	-105dB over 20Hz 20kHz
Noise	102dB below +4dBm output level unity gain measurement bandwidth 20 Hz - 20kHz with 600 ohm input and output termination
Maximum input	+28dBm
Maximum output	+25dBm (with 600 ohm load)
Headroom	21dB above +4dBm output (with 600 ohm load)
Dynamic Range	123dB
Maximum Gain	jumper selectable for: 16dB, 26dB, or 36dB
CMRR	-50dB over 20Hz 20kHz
Input Impedance	40k ohms
Output Impedance	60 ohms
LED Audio VU Indicators	2 x 20 segments: 10 green / 5 yellow / 3 red / 2 red (peak) -20db to +3db + peak
Physical	19 in. x 1.75” high(1 ru) x 10” deep Shipping weight: 7lbs.

Declaration of Conformity

We: Radio Systems, Inc.
601 Heron Drive
Logan Township, NJ 08085 USA

Declare under our sole responsibility that the product listed below:

Audio Amplifier model ADA-2x8SS

To which this declaration relates to is in accordance with the following product standards:

EN55013 Emission
EN55020 Immunity
EN61000 Harmonic/Voltage Fluctuations
EN60065 Product Safety

_____
Date Issued

_____
Signature

Following the provisions of:
89/336/EEC EMC Directive
92/031/EEC Amendment Directive of 89/336/EEC
73/023/EEC Low Voltage Directive
93/068/EEC Amendment Directive of 73/023/EEC

Using Actve Balanced Circuitry

Balanced lines have been used for many years and are in continuing use today because of their immunity to stray pickup. Induced signals appear on both sides of the balanced line. The receiving end of the balanced line responds only to the difference voltage between the lines which is the desired signal. Induced signals are common to both and are balanced out. Transformers have been the mainstay of balanced circuitry for decades. Unfortunately, transformers cause distortion and ringing, and are susceptible to magnetic flux pickup. Further, good quality audio transformers are very expensive.

The use of op-amp balanced circuitry has the advantage of transformers without the disadvantages. The only caveat is that careful wiring practices are more important with active balanced than with transformers.

Active balanced outputs and inputs use three wires: +, -, and ground. The + and - terminals are both driven and neither should ever be connected to ground. For best performance, a three-conductor shielded wire should be used. The third wire completes the ground circuit. The shield should be connected to the ground at one end of the wire only. If a two-wire shielded cable is used, it is important that a ground connection be made between the sending and receiving units. A ground circuit through equipment chassis or through three-prong AC cord ground is also acceptable.

Single-ended audio interconnections lack the interference immunity of balanced hook-ups. For the reason, keep unbalanced connections short, direct, and well separated from AC power wires. To drive a single-ended load from an active balanced source, use coaxial wire: + to center conductor and ground to shield, leaving the - output unconnected. To feed an active balanced input from a single-ended source, use coaxial wire, connecting the hot center conductor to +. Connect the shield to ground and put a jumper from ground to -.

When driving an active balanced input from a transformer balanced floating source, use two conductor shielded wire. Ground the shield at the source end. Establish good ground between the chassis either directly or though AC plug ground prongs. At the load, connect the + lead to the + input and the - lead to the - input. Put two 300 ohm resistors in series between the + input and the - input and connect their mid-point to the load ground. This correctly terminates the source output transformer for optimum frequency and transient response (freedom from ringing) and provides a low impedance return path for leakage and induced hum. If more than one active balanced load is to be placed across a floating balanced transformer source, install this resistive termination once only. From that location to the active balanced loads, run three-conductor shielded wire, shield continued from the sources chassis, + from +, - from -, and ground from the mid-point of the terminating resistors.

To drive a balanced floating transformer load from an active balanced source, use shielded wire. Connect the shield to source ground and leave the shield open at the load end. Connect + to + and - to -, and establish a good source ground to load chassis connection, either through a third wire in the interconnect cable or through chassis contact or AC cord third wire ground.

Interconnections between pieces of stereo equipment require doubling the connections described above without duplicating the ground connection. Between pieces of active balanced stereo equipment, then, 5 shielded conductors should be run.

When testing active balanced equipment with single ended test equipment, do not connect the - to test equipment ground. Most modern test equipment provides balanced inputs. In many dual-trace oscilloscopes, balanced signals may be displayed by running the two inputs in the “add” mode with one input switched to invert. To perform a test with single-ended equipment, + and - outputs must be tested independently and their results added. Testing only a single output results in a 6 db loss in output level.

The active balanced equipment interconnection format makes possible state of the art fidelity. Careful attention to detail and conservative practice will be rewarded with outstanding flat frequency response, low distortion, and wide dynamic range.

Warranty

Radio Systems warrants this equipment to be free from defects in materials and workmanship for a period of one (1) year. This warranty extends to first users of the product and future owners who purchase the product within the warranty period. The terms of this warranty are null and void if this product is stored or operated in an environment not conducive to electronic equipment, or shows signs of misuse or modifications which affect the proper functioning of the product. This warranty does not apply to damage caused by fire, smoke, flood, lightning, or acts of nature and physical abuse.

Radio Systems, and its associated companies, authorized distributors, and personnel are not liable for loss of revenues or other damages or effects to the broadcast signal quality or coverage which may result from the improper functioning of this product.

Repair Policy

Technical assistance is available at any time, at nor charge, by phone or correspondence.

During the warranty period, there will be no charge for parts or service made to units which show no sign of misuse by customer or lightning caused damage. The customer is responsible for the cost of shipping their unit back to Radio Systems for repair.

During the warranty period, shipment of small parts and assemblies may also be made at a charge to the user. Emergency shipments of replacement parts and circuits will be made at the user's request for an extra shipping and service charge. Chargeable services will be made COD or on Net-30 day terms to users with established accounts.

During the warranty period, full credit or return of COD charges (less any service and expedited shipping charges) will be made to users who return the defective parts or circuits within 30 days, if the damage is covered under the terms of the warranty.

Return Instructions

Contact Radio Systems at 856-467-8000 for a return authorization number.

Pack all items carefully and ship pre-paid, via UPS insured, to:

Radio Systems
601 Heron Drive
Logan Township, NJ 08085
Attn: R.A.#_____

Enclose a note which includes your name, company, phone number, the serial number, return address (no box numbers), and a complete description of the problem.