User Manual

Model AH4
AudioHub Player and Controller
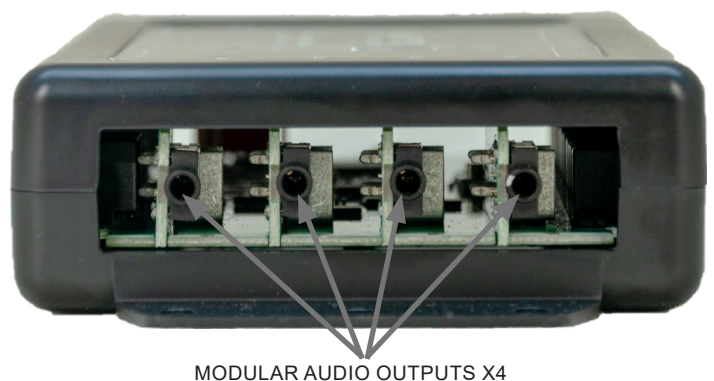

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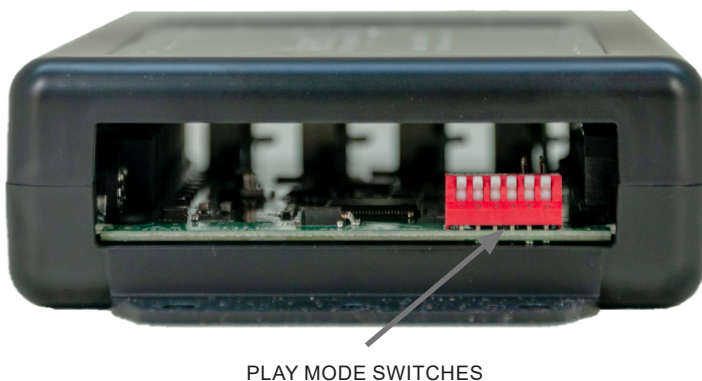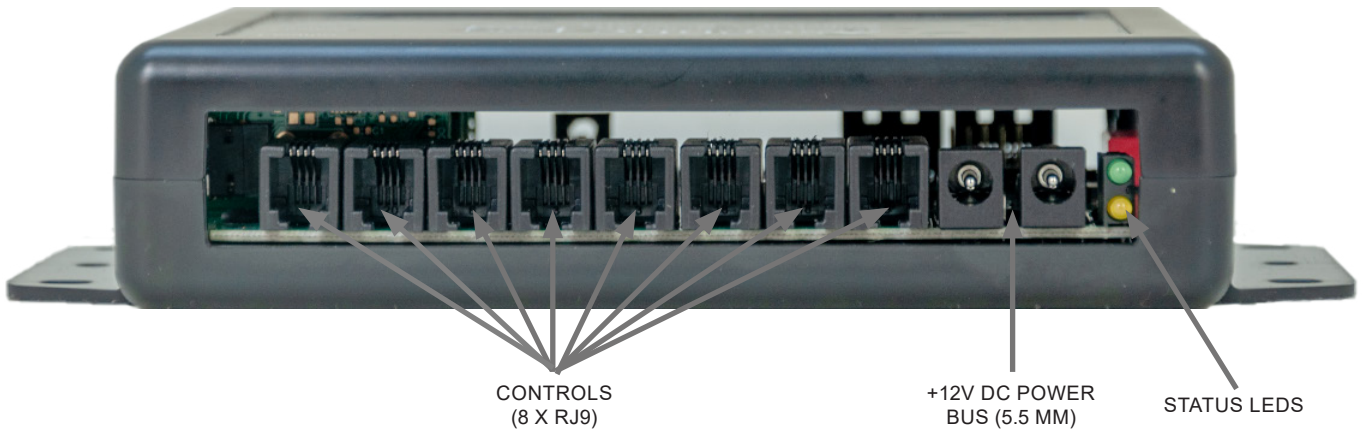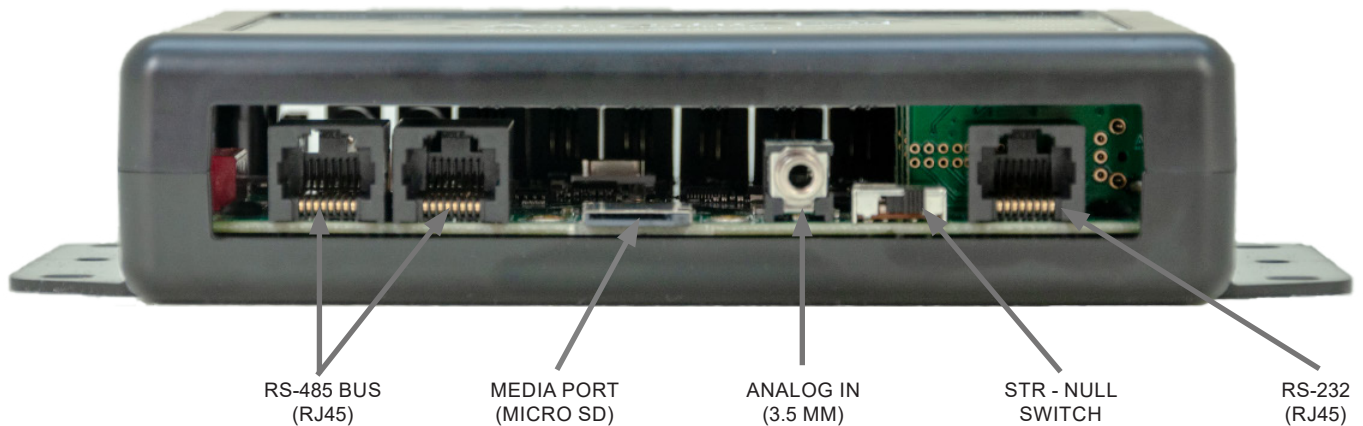**RETAIL ENGINEERING**
by Audio Authority®

Introduction

The AH4 plays MP3, FLAC, OGG, and WAV files for high fidelity audio demonstrations of headphones, speaker docks, and sound bars. Four audio outputs may be played and adjusted individually or together (Toslink® digital, analog, and HDMI-ARC outputs).

Features

- Plays uncompressed audio formats
- RS-232 and RS-485 control pathways
- Four audio outputs: Digital Toslink® / analog audio / HDMI-ARC
- Integrated touchless interface support
- Interactions trigger relays and LEDs on other Audio Authority devices

| RS-485 BUS (RJ45) | MEDIA PORT (MICRO SD) | ANALOG IN (3.5 MM) | STR - NULL SWITCH | RS-232 (RJ45) |

| CONTROLS (8 X RJ9) | +12V DC POWER BUS (5.5 MM) | STATUS LEDS |

PLAY MODE SWITCHES

MODULAR AUDIO OUTPUTS X4

Communication

The Model AH4 AudioHub Player and Controller has the default device ID 252. It can send and receive serial commands via RS-485 at 57600 Baud, 8-N-1, and half-duplex; and via RS-232 at 115200 Baud, 8-N-1, and full-duplex. Both configuration ports utilize a modular RJ-45 jack with the following pinouts:

RS-485 Pinout:

Pin #	Function	Pin #	Function
P1	Orange White - Ground	P5	Blue White - Power Bus (12V Devices only)
P2	Orange - Ground	P6	Green - Data B Negative
P3	Green White - Data A Positive	P7	Brown White - Ground
P4	Blue - Power Bus (12V Devices only)	P8	Brown - Ground

RS-232 Pinout:

Pin #	Function	Pin #	Function
P1	Orange White - Ground	P5	Not Connected
P2	Orange - Ground	P6	Green - RX or TX (Straight or Null)
P3	Green White - TX or RX (Straight or Null)	P7	Brown White - Ground
P4	Not Connected	P8	Brown - Ground

Command List:

Commands	Format	Response
Reboot	[DEV=252;REBOOT]	
Reset Defaults	[DEV=252;RESET;DEFAULT]	
App Version	[DEV=252;APP;VERSION?]	(DEV=252;APP;VERSION=$)
Bootloader Version	[DEV=252;BOOT;VERSION?]	(DEV=252;BOOT;VERSION=$)

Functional DIP Switches:

- DIP 1: Timeout MSB (Adds 2 minutes)
- DIP 2: Timeout LSB (Adds 1 Minute)
- DIP 3: Continuous Play Mode
- DIP 4: Default Volume MSB (Adds +20db)
- DIP 5: Default Volume LSB (Adds +10db)
- DIP 6: Output Mode (All vs Selected)

TIMEOUT: When Play Mode Switch 1 and/or 2 is on, the demo ends after a period of inactivity. The timeout interval is the time between the last button press or knob turn until the demo ends and attract mode begins. Adjust the length of the timeout interval using the settings below.
When Switch 3 is ON the demo never stops playing, but volume is reset to the default level for attract mode.

Timeout Switch Settings						
	1	2	3	**4**	**5**	**6**
1 minute	off	on				
2 minutes	on	off				
3 minutes	on	on				
No Timeout	off	off				

CONTINUOUS PLAY: When Switch 3 Continuous Play is on, the AudioHub plays and repeats all tracks on the microSD card, nonstop, at the volume last set. The Default Volume and Timeout can be used with this mode, however when the demo times out the playback continues, but at the volume level selected on the Default Volume DIP switches.

DEFAULT VOLUME: Switch 4 and 5 selects the level of Default Volume at initial power up and between demonstrations when Timeout is active.

Default Volume Switch Settings						
	1	2	3	4	5	6
Soft (-30dB)				off	off	
Med (-20dB)				off	on	
Loud (-10dB)				on	off	
Full (0dB)				on	on	

VOLUME RESET: When Continuous Play and Timeout are on, the AudioHub returns to the chosen volume after a timeout, then continues to play at the default volume.

SWITCHING MODE: Turn 6 on to alternate between two analog outputs using push-buttons. Adjusting Volume A or B up/down via push-buttons selects one output and deselects the other.

Consumer Electronics Control:

The Model AH4 is capable of routing CEC communication between the MCU and any of the 4 HDMI-ARC outputs.

Quick Start Instructions

1. Connect any peripheral devices
2. Set DIP positions for functional requirements
3. Insert properly formatted MicroSD card into device
4. Power on device

Example System

Model AH4 with Subwoofers and Speakers

This display uses high fidelity sound to attract and entertain customers. It leverages the Model AH4 module's four audio output options to demonstrate different products. All high fidelity sound outputs can play digital, analog, and/or Dolby audio depending on the requirements of the device. The Model AH4 receives power via an external power supply.

Troubleshooting

No audio, check the following:

- Connections are fully seated
- Correct position is selected via software
- Audio is playing from source device
- Switched audio type is available and desired
- DIP Positions are set correctly
- PSB/SNS positions are mapped correctly

No RS-232 communication, check the following:

- Connections are fully seated.
- Devices are using the correct protocol settings
- Null/Straight selector is set correctly

MicroSD Configuration File

1. Create an empty text file in the root directory of a MicroSD Card titled 'AacConfig.txt'
2. In the AacConfig file, add any configuration commands you would normally send via RS-232 in Configuration mode as a new line.
3. Insert the MicroSD Card into the unpowered device, then apply power. The configuration will then be loaded into flash memory on boot until the MicroSD is removed.

Firmware Update Process

The **M**odel AH4 is updatable through the MicroSD port. Below are the steps outlining the firmware update process:

1. Copy new firmware ".FWU" file onto a blank MicroSD Card (FAT)
2. Insert firmware update SD into the device with device power disconnected
3. Apply power to device, monitoring the power LED indicator
4. When power LED indicator returns to a slow blink, update is complete
5. To verify the firmware update, send the firmware version query listed in the Commands List and ensure response matches the firmware version expected

Supported Audio Formats

Important: Filenames must begin with a two-digit number (**01, 02, 03 .. 99**) or they will not play.
Example: "03 Never Forget - Fleetwood Mac.wav"

To convert raw audio files use recommended encoders (**see audioauthority.com/AH4**)

- Audio files must be placed in the root directory of a compatible and properly formatted microSD card.
- File name maximum length is 32 characters.
- File extensions must be .WAV, .FLAC, .OGG, or .MP3. (MP3 files may be variable or constant bit rate.)

Format	Max Bit Rate	Max Sample Rate
FLAC	24 bit	48 kHz
MP3	320 KBps	48 kHz
OGG	32 bit	48 kHz
WAV	24 bit	48 kHz
HDMI-ARC	24 bit	48 kHz

Power Specifications

Power Entry Port: 2x barrel jack connectors
(5.5 x 2.1mm, bussed)

Voltage: +12V DC

No-Load Current:
No Cards: 40 mA
Fully Loaded: 60 mA
(4x Analog/Optical Cards muted)

Maximum Load Current: 110 mA

Maximum Current Output: 1.5 A @ 12.0VDC

Mechanical Details

Case Type: Ascentic universal case, molded ABS

Case Dimensions: W x L x H
7.5 x 4.1 x 1.5 in
190 x 104 x 38 mm

Mounting Locations: molded flanges
Centerline Holes: 2x 0.165" (4.5mm) diameter
Slots: 4x 0.165" x 0.28" (4.5mm x 7mm)
1.0" (25.4mm) above/below center line holes.

Standard Inputs:
1x microSD card slots (Firmware update, Configuration, & Content)
1x 3.5mm Analog Audio Input
1x 6P DIP Function Switch

Standard Outputs: 4x Modular audio output cards

Standard In/Out:
1x RS232 port w/ Null/Straight Switch (**RJ45**)
2x RS485 Bus Ports (**RJ45**)
8x RJ9 Illuminated PSB/SNS ports

Indicators:
Up to 4x Green Daughter Card Status (The associated LED is on when output is enabled)
1x Green MCU Power Indicator
MCU Bootloader Activity at start-up = fast blink
Normal MCU Activity = steady blink
Firmware Update = off until reboot
1x Yellow MCU Status Indicator (LED on while reading SD)