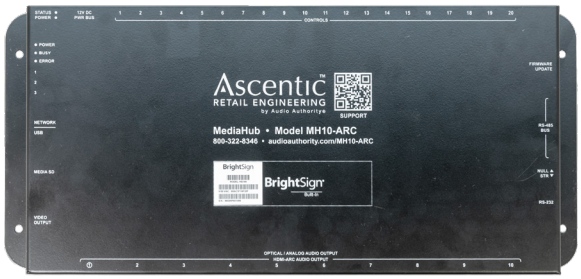
User Manual

MH10-ARC
Intelligent Audio MediaHubs
Including MH10-ARC-OPT-4K and MH10-ARC-S5

Ascentic®
RETAIL ENGINEERING
by Audio Authority®

Introduction

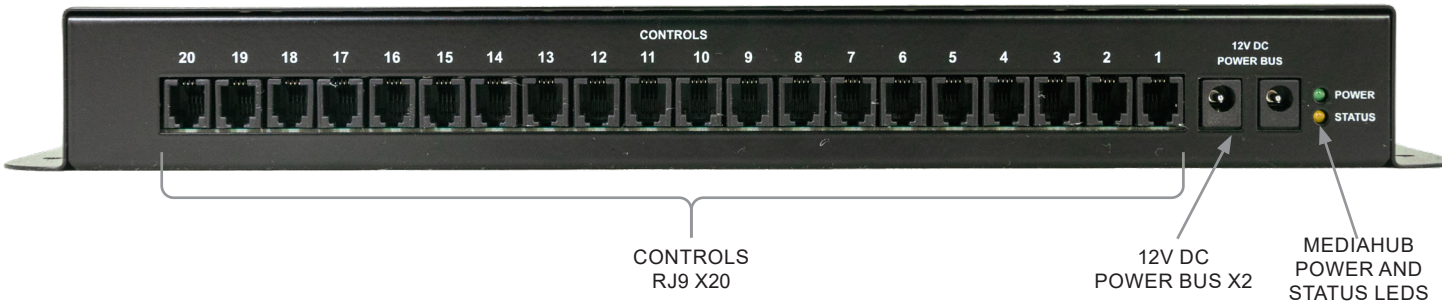
The MH10-ARC Intelligent Audio MediaHub uses audio return channel to demonstrate multiple different sound bars. This device also features 4K video from its dedicated video output. The MH10-ARC has 10 HDMI audio ports and 20 interface control ports for presentations of all sizes.

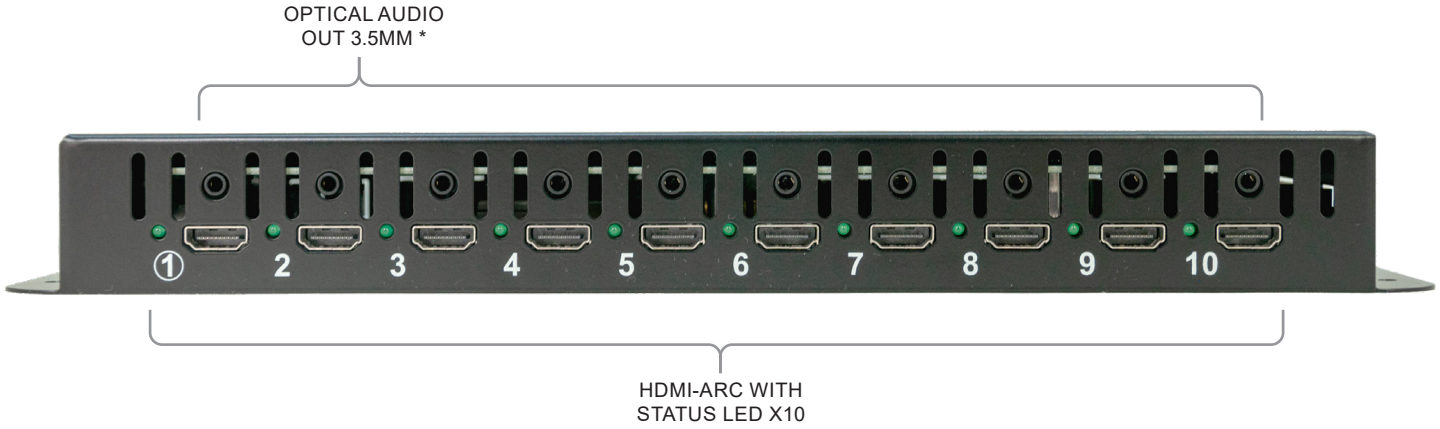


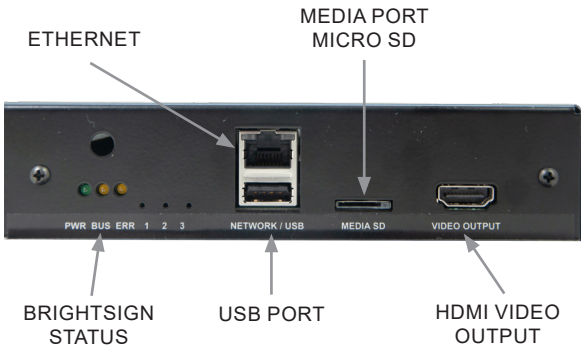
Features

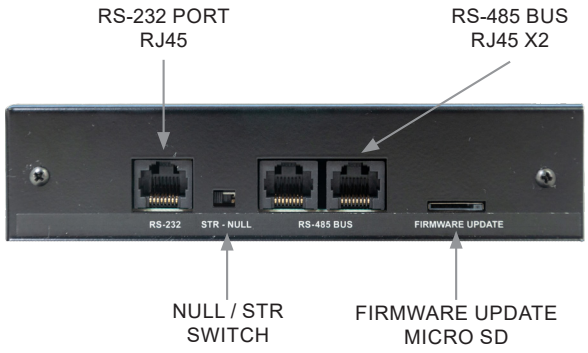
- Switches HDMI-ARC audio signals across 10 outputs
- Produces video content with 4K video resolution*
- MH10-ARC-OPT-4K variant also offers optical digital outputs x10
- Interface options include push-buttons and AirSelect proximity sensors, to control an interactive presentation
- Customizes intuitively with the power of BrightAuthor firmware by BrightSign

*Audio Authority/Ascentic Media products incorporating Brightsign SOM cores do not support metadata-centric content (HDR) Contact BrightSign support for further information.









* Available on MH10-ARC-OPT-4K only.

Communication

The MH10-ARC Intelligent Audio MediaHub has the default device ID 253. 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 RJ45 jack with the following pinouts:

RS-485 Pinout:

Pin	Function	Pin	Function
P1	Orange White (ground)	P5	Blue White (+12V power)
P2	Orange (ground)	P6	Green (data B-)
P3	Green White (data A+)	P7	Brown White (ground)
P4	Blue (+12V power)	P8	Brown (ground)

RS-232 Pinout:

Pin	Function	Pin	Function
P1	Orange White (ground)	P5	not connected
P2	Orange (ground)	P6	Green White (RX/TX)
P3	Green White (TX/RX)	P7	Brown White (ground)
P4	not connected	P8	Brown (ground)

Command List:

Commands	Format	Response
REBOOT	[DEV=253;REBOOT]	
RESET DEFAULTS	[DEV=253;RESET;DEFAULT]	
BUTTON LED ON	[DEV=253;LED=#;ON]	
BUTTON LED OFF	[DEV=253;LED=#;OFF]	
BUTTON LED BLINK	[DEV=253;LED=#;BLNK]	
BUTTON PRESS		(DEV=253;BTN=#;PRESS)
BUTTON RELEASE		(DEV=253;BTN=#;RELEASE)
CEC ENABLE	[DEV=253;HDMI=#;CEC=ON]	
CEC DISABLE ALL	[DEV=253;HDMI=*;CEC=OFF]	
CEC PRESENT QUERY	[DEV=253;CEC;DEV=#;PRESENT?]	(DEV=263;CEC;DEV=#;PRESENT=YES/NO)
CEC VOLUME QUERY	[DEV=253;CEC;DEV=#;VOLUME?]	(DEV=263;CEC;DEV=#;VOLUME=##)
CEC MUTE QUERY	[DEV=263;CEC;DEV=#;MUTE?]	(DEV=263;CEC;DEV=#;MUTE=YES/NO)
CEC SEND RAW	[DEV=253;CEC;SENDRAW=05:C3]	(DEV=253;CEC;RECVDRAW=05:C0)
ARC AUDIO ENABLE	[DEV=253;HDMI=#;ARC=ON]	
ARC AUDIO DISABLE ALL	[DEV=253;HDMI=*;ARC=OFF]	
HDMI-ARC HPD ENABLE	[DEV=253;HDMI=#;HPD=ON]	
HDMI-ARC HPD DISABLE	[DEV=253;HDMI=#;HPD=OFF]	
APP VERSION	[DEV=253;APP;VERSION?]	(DEV=253;APP;VERSION=$)
BOOTLOADER VER	[DEV=253;BOOT;VERSION?]	(DEV=253;BOOT;VERSION=$)

CEC Communication

The MH10 series manages CEC (Consumer Electronics Control) communication between the BrightSign host and any of the 10 HDMI outputs. The MediaHub employs a separate micro-controller to manage CEC and correct discrepencies between the protocol of different connected devices.

HDMI-ARC

HDMI Audio Return Channels (ARC), controlled by the MH10-ARC, support from 2.0 up to 5.1 channel PCM. The number of PCM channels is decided during programming. Control your presentation via the media microSD card. Content played via PCM can be played in conjunction with embedded audio on the video output port.

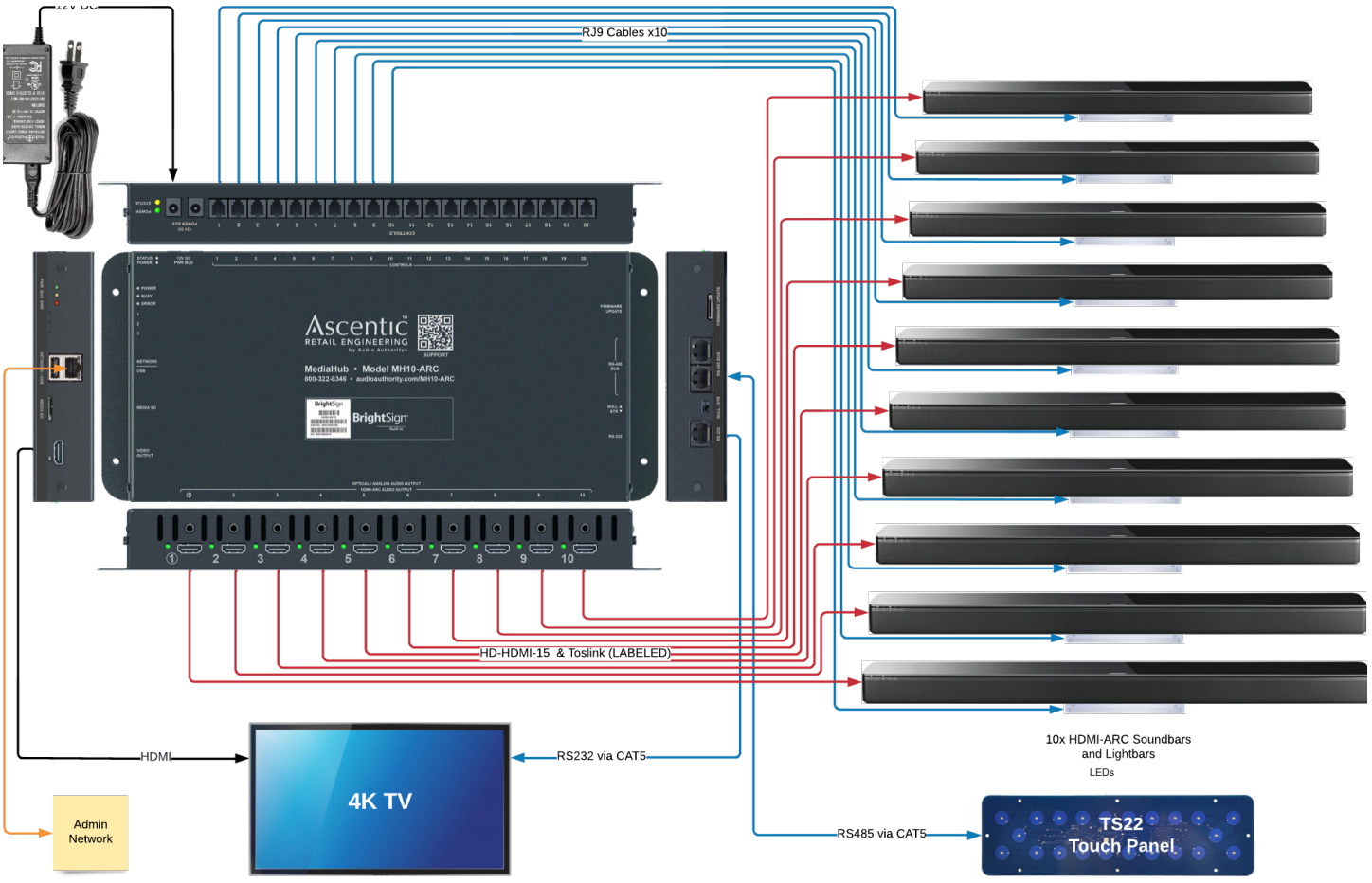
Quick Start Instructions

1. Create a new BrightAuthor experience for the HS123/124/144 (depending on the module installed in the MediaHub).
2. In BrightAuthor's presentation properties on the interactive tab, ensure "port 0" is configured to a baud rate 115200 8-N-1, ASCII, with "CR" for send and receive EOL.
3. Create your presentation. Note that any built-in serial or GPIO port is treated as a serial device, following the applicable MediaHub serial protocol.
4. Export your presentation to a microSD card and insert it into the mediaSD port.
5. Connect any peripheral devices, followed by the power supply. Note that HDMI port 1 will set the EDID information for all other connected HDMI devices.

Example System

MH10-ARC-OPT-4K with 10 Sound Bars and Indicator LEDs

This configuration uses HDMI audio return channel to demonstrate sound bars. Ten audio outputs can play either HDMI-ARC, or optical digital and analog audio, depending on the requirements of the device. It leverages the MH10-ARC-OPT-4K module's dedicated 4K display output to invite and attract customers. The Ethernet port interfaces with the network to receive commands and output analytics; with the added capability to control and monitor the system remotely.



Power Specification

Power Bus Port: 2x barrel jack connectors (5.5 x 2.1mm)

Voltage: +12V DC

No-Load Current:
PCAs Only: TBD
MH10-ARC: TBD

Maximum Load Current:
MH10-ARC: TBD

Maximum Current Output:
RS-485 Bus: 1.5A @ +12.0V DC
USB A: 500mA @ +5.0V DC

Mechanical Details

Case Type: Custom metal enclosure - full surround

Case Dimensions: W x L x H
13.7” x 6.2” x 1.5”
348mm x 158mm x 38mm

Mounting Locations: Metal 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

Troubleshooting

No Ethernet connectivity, check the following:

- Connections are fully seated
- The correct position is selected via software
- Audio is playing from source device

No RS-232 communication, check the following:

- Connections are fully seated
- Devices are using the correct protocol settings
- The null/straight selector is set correctly

No audio, check the following:

- Connections are fully seated
- The correct position is selected via software
- Audio is playing from source device
- Switched audio type is connected

No HDMI-ARC audio, check the following:

- The HDMI HPD is enabled for the position (toggle if necessary)
- CEC is routed, and applicable ARC initiation commands are sent
- ARC audio is routed to the position
- BrightSign experience is sending compatible audio via the SPDIF interface
- HDMI-ARC device is turned on and connected to the appropriate port

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