User Manual

HLS-71 Series
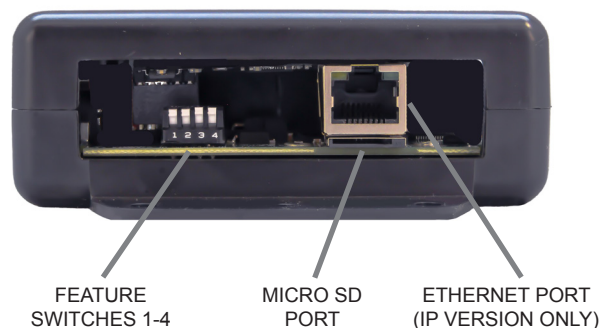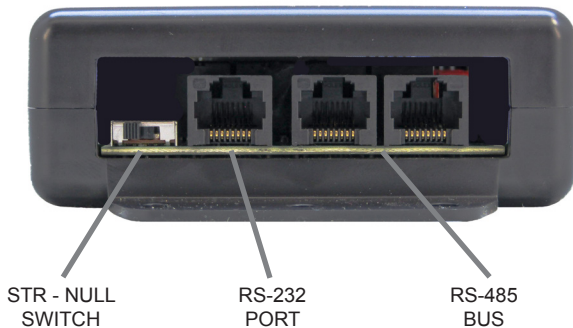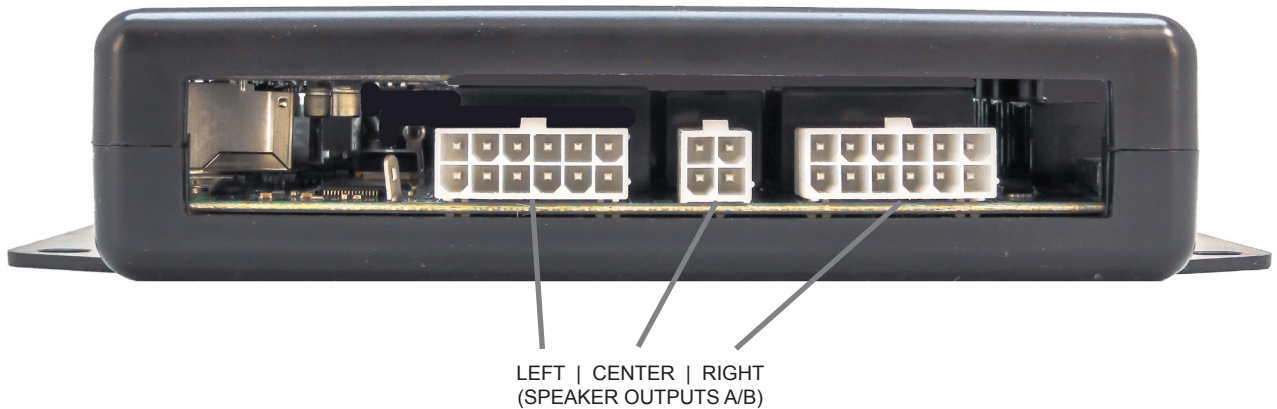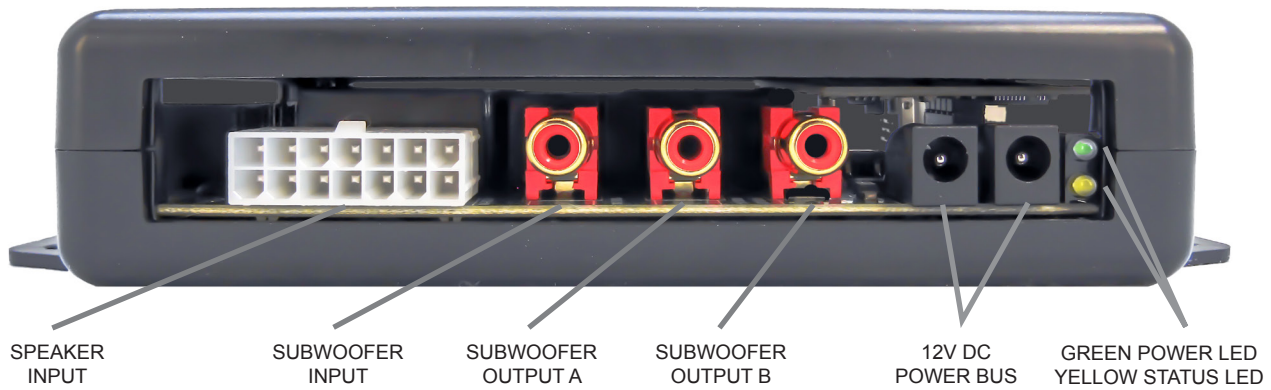## Intelligent Surround Sound Switcher

Ascentic®
RETAIL ENGINEERING
by Audio Authority®

Introduction

The HLS-71 Intelligent Audio Switcher controls multi-channel audio systems between two sets of outputs. This device also monitors system health, with optional network control and monitoring capabilities.

Features

- Switches up to seven channels of High-Level audio and one LFE audio channel between two outputs.
- Measures input voltage, current draw, and peak current draw for device health monitoring.
- Optional IP version (HLS-71-IP) enables remote access to device functions, configuration, and event logs.
- Firmware updated via microSD.

| SPEAKER INPUT | SUBWOOFER INPUT | SUBWOOFER OUTPUT A | SUBWOOFER OUTPUT B | 12V DC POWER BUS | GREEN POWER LED YELLOW STATUS LED |

LEFT | CENTER | RIGHT
(SPEAKER OUTPUTS A/B)

| STR - NULL SWITCH | RS-232 PORT | RS-485 BUS | FEATURE SWITCHES 1-4 | MICRO SD PORT | ETHERNET PORT (IP VERSION ONLY) |

Communication

The HLS-71 Intelligent Audio Switcher has the default device ID 7. 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 = switched power bus (12V dev only)
P2	Orange = ground	P6	Green = Data B negative
P3	Green White = data A positive	P7	Brown White = ground
P4	Blue = switched power bus (12V devices only)	P8	Brown = ground

RS-232 Pinout:

Pin #	Function	Pin #	Function
P1	Orange White = ground	P5	
P2	Orange = ground	P6	Green = RX or TX
P3	Green White = TX or RX	P7	Brown White = ground
P4		P8	Brown = ground

RS-232 Commands

Commands	Command Format	Response
REBOOT	[DEV=7;REBOOT]	
ANALOG ON	[DEV=7;ANALOG=#;ON]	
ANALOG OFF	[DEV=7;ANALOG=#;OFF]	
RESET DEFAULTS	[DEV=7;RESET;DEFAULT]	
GET CURRENT	[DEV=7;CURRENT=1;NOW?]	(DEV=7;CURRENT=1;NOW=$)
GET MAX CURRENT	[DEV=7;CURRENT=1;MAX?]	(DEV=7;CURRENT=1;MAX=$)
GET MIN CURRENT	[DEV=7;CURRENT=1;MIN?]	(DEV=7;CURRENT=1;MIN=$)
RESET CURRENT	[DEV=7;CURRENT=1;RESET]	
GET VOLTAGE	[DEV=7;VOLTAGE=1;NOW?]	(DEV=7;VOLTAGE=1;NOW=$)
GET MAX VOLTAGE	[DEV=7;VOLTAGE=1;MAX?]	(DEV=7;VOLTAGE=1;MAX=$)
GET MIN VOLTAGE	[DEV=7;VOLTAGE=1;MIN?]	(DEV=7;VOLTAGE=1;MIN=$)
RESET VOLTAGE	[DEV=7;VOLTAGE=1;RESET]	
APP VERSION	[DEV=7;APP;VERSION?]	(DEV=7;APP;VERSION=$)
BOOTLOADER VER	[DEV=7;BOOT;VERSION?]	(DEV=7;BOOT;VERSION=$)
Front A Enable	[ANALOG=1]	
Front B Enable	[ANALOG=2]	
Rear A Enable	[ANALOG=3]	
Rear B Enable	[ANALOG=4]	
Sub A Enable	[ANALOG=5]	
Sub B Enable	[ANALOG=6]	
Surround/Height A Enable	[ANALOG=7]	
Surround/Height B Enable	[ANALOG=8]	
Center A Enable	[ANALOG=9]	
Center B Enable	[ANALOG=10]	

Tips and Guidelines

- Enable or disable multiple outputs with one command. Example: [DEV+7;ANALOG=1,3,5,7,9;ON]
- Only one speaker pair per channel can be active at one time, and switching between pairs will disable the previous pair. For example, if Front A speakers are enabled, and then the Front B speakers are selected, the HLS-71 automatically disables the Front A speakers before switching.
- Left and Right channels are enabled simultaneously for Front, Rear, and Surround speaker channels.
- To provide stereo audio from any channel, enable multi-channel stereo output on the amplifier or bridge your inputs. The HLS-71 does not distribute stereo audio to multiple outputs on-board.
- Follow all commands with a carriage return.

Quick Start Instructions

- Connect the receiver harness from "Speaker Level Input" on HLS device to AVR outputs.
- Connect the speaker harness from the "Left/Right/Center Speaker Output A/B" connections
- on the HLS device to the appropriate speakers.
- Open a serial terminal - 115200 8-N-1. Toggle Null/Straight switch if needed to correct signal polarity.
- Send analog switch commands to device 7 (default) to enable or disable a position.
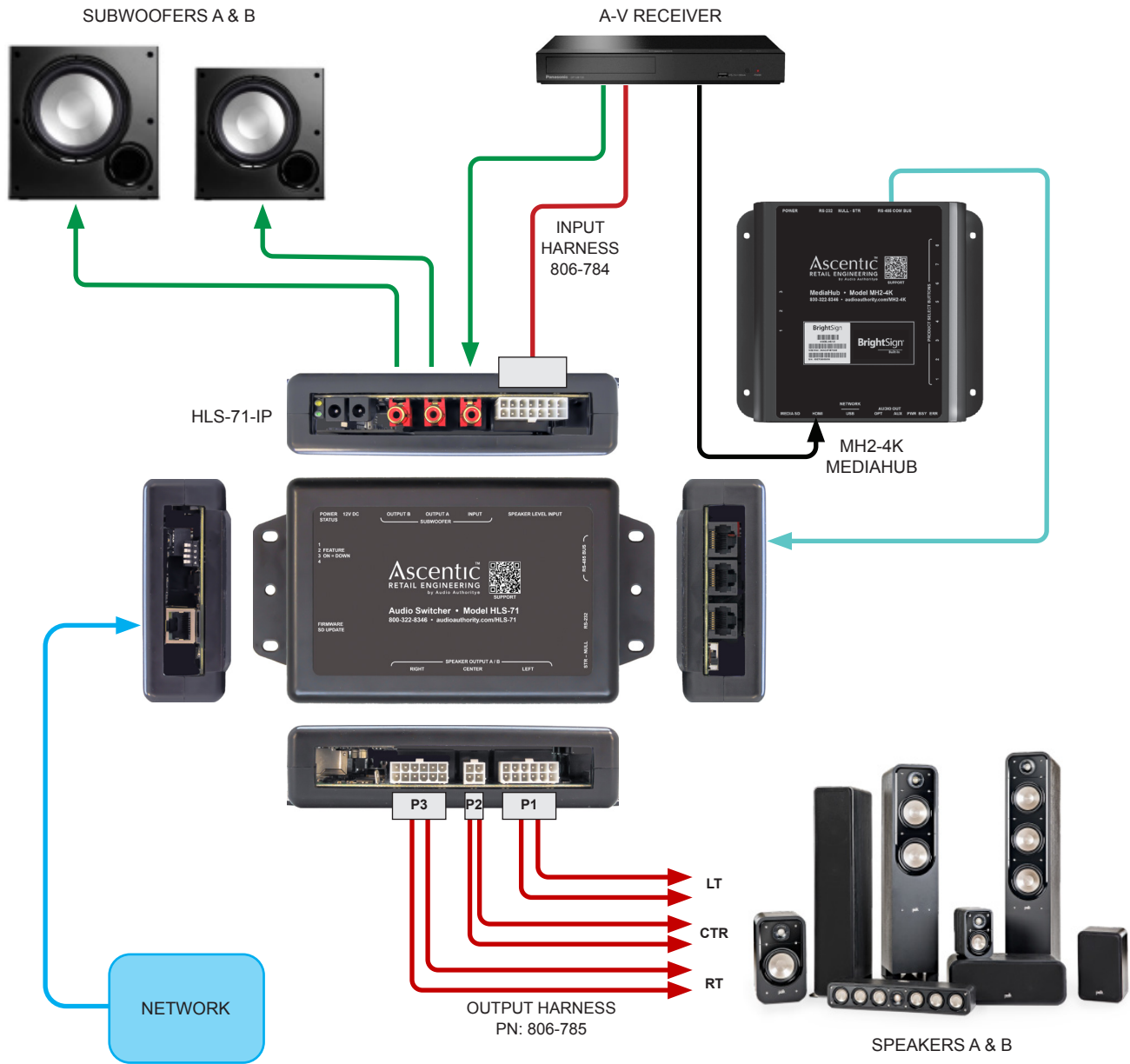
Troubleshooting

No RS-232 Communication:

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

No Ethernet Connectivity (IP version only)

- Connections fully seated.
- The end device is powered on, with Ethernet enabled.
- Power cycle all devices to clear out previous TCP connections.

Example System: HLS-71-IP With Speakers and Subwoofers

This display uses audio to attract and communicate. It leverages the HLS-71-IP module's high level audio output options to demonstrate two different products. All audio outputs can play either digital or analog audio, depending on the requirements of the device. The Ethernet port interfaces with the network to receive commands and output analytics; with the added capability to control and monitor the system remotely. The HLS-71-IP receives power via an MH2-4K media hub.

SUBWOOFERS A & B

A-V RECEIVER

INPUT
HARNESS
806-784

HLS-71-IP

MH2-4K
MEDIAHUB

NETWORK

P3   P2   P1

LT

CTR

RT

OUTPUT HARNESS
PN: 806-785

SPEAKERS A & B

—— LOW LEVEL AUDIO (RCA CABLE)

—— SPEAKER LEVEL AUDIO (SPEAKER WIRE HARNESS - SEE PAGE 6, 7)

—— NETWORK (CAT 5/6)

—— SERIAL (CAT 5/6)

Firmware Updates

- The HLS-71 series is updatable through the microSD port utilizing a card with FAT-32 formatting (preferred). Below are the steps outlining the firmware update process:

- Copy new firmware ".FWU" file onto a blank microSD card (FAT-32 format preferred). Insert Firmware Update SD into the device with device power disconnected.

- Apply power to device, monitoring the power LED Indicator.

- When power LED indicator returns to a slow blink, update is complete.

- To verify the firmware update, send the firmware version query listed in the Commands List (see above) and ensure response matches the firmware version expected.
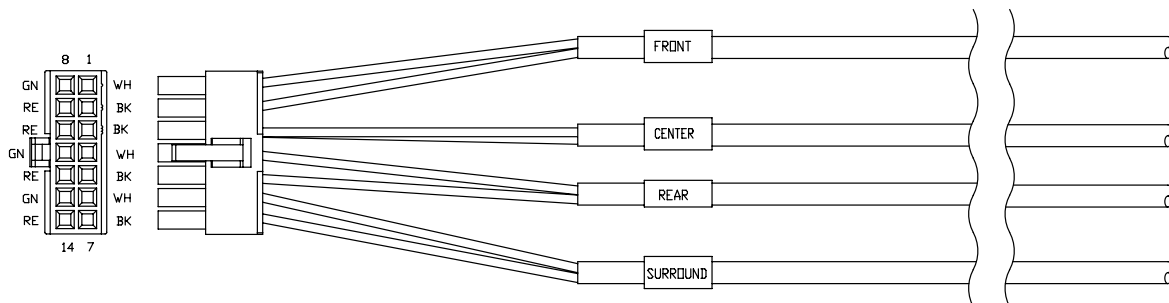
Specifications

Power Entry Port:	2x barrel jack connectors (5.5 x 2.1mm, bussed, center positive)	
Voltage:	+12V DC	
No-Load Current:	HLS-71: 16mA	HLS-71-IP: 145mA
Maximum Load Current:	HLS-71: 175mA	HLS-71-IP: 350 mA
Maximum Current Output:	RS-485 Bus: 1.25 A @ 12.0VDC	
Case Type:	Ascentic universal case, molded ABS	
Case Dimensions: W x L x H	7.5" x 4.1" x 1.5"	190mm x 104mm x 38mm
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.

Input Harness (AVR to HLS-71) PN 806-784

Fabricate harness from 16GA speaker wire. Finish the speaker connections with banana plugs or similar.

MOLEX PN: 39-01-2140
RECEPTICLE 14P 2-ROW CABLE MINI-FIT JR

FINISH WITH BANANA PLUGS OR SIMILAR

Output Harness 806-785 (HLS-71 to Speakers)

Fabricate harness from 16GA speaker wire. Finish the speaker connections with banana plugs or similar.

P1 AND P3 = MOLEX PN: 39-01-2120
RECEPTACLE 12P 2-ROW CABLE MINI-FIT JR

P2 = MOLEX PN: 39-01-2040
RECEPTACLE 4P 2-ROW CABLE MINI-FIT JR

FINISH WITH BANANA
PLUGS OR SIMILAR

P1

SL B-	1		SL B-
SL B+	7		SL B+
SL A-	2		SL A-
SL A+	8		SL A+
RL B-	3		RL B-
RL B+	9		RL B+
RL A-	4		RL A-
RL A+	10		RL A+
FL B-	5		FL B-
FL B+	11		FL B+
FL A-	6		FL A-
FL A+	12		FL A+

LEFT SPEAKER

P2

C B-	1		C B-
C B+	3		C B+
C A-	2		C A-
C A+	4		C A+

CENTER SPEAKER

P3

SR B-	1		SR B-
SR B+	7		SR B+
SR A-	2		SR A-
SR A+	8		SR A+
RR B-	3		RR B-
RR B+	9		RR B+
RR A-	4		RR A-
RR A+	10		RR A+
FR B-	5		FR B-
FR B+	11		FR B+
FR A-	6		FR A-
FR A+	12		FR A+

RIGHT SPEAKER