



Installation Manual

*Digital Whole Home Audio
Distribution System*

FEATURES

- Includes 8 audio source inputs and 8 amplified audio zones
- Optional Hi-Fi2 Expansion Kit adds 8 more zones (16 total)
- Super efficient digital amplification with 50-watts per zone
- Built-in universal power supply
- Includes 8 VSC keypads with graphical display
- Includes 4 Remote Input Modules (RIM) with IR output
- Equipped with 2 variable outputs for additional amplification
- Includes a serial port and Ethernet port for control

Hi-Fi2 SYSTEM



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Precautions

Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably to noise induced hearing loss but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures:

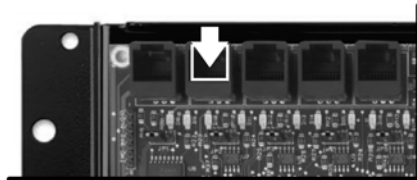
DURATION PER DAY (HOURS)	8	6	4	3	2	1
SOUND LEVEL (dB)	90	93	95	97	100	103

According to OSHA, any exposure in the above permissible limits could result in some hearing loss.

Important Safety Instructions:

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be kept for future reference.
3. Read and understand all warnings listed on the operating instructions.
4. Follow all operating instructions to operate this product.
5. This product should not be used near water (.e. bathtub, sink, swimming pool, wet basement, etc.).
6. Only use dry cloth to clean this product.
7. Do not block any ventilation openings.
8. Do not install this product near any heat sources; such as, radiators, heat registers, stove or other apparatus (including heat producing amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. The wide blade is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement.
10. Protect the power cord being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
11. Only use attachments specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation ports or any other openings.
15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way; such as, a liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.
16. **WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

hi-fi2 by HAI Wiring Diagram



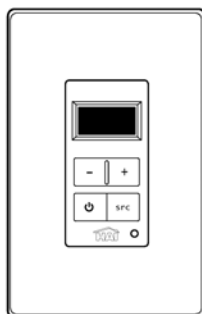
HAI CONTROLLER (OPTIONAL)

Connect to HAI controller or other serial port device. With a controller, select zone and source and control volume and power from an HAI OmniTouch Touchscreen or via controller program.



RIM

- Remote Input Modules allow any source from anywhere in the house to be listened to in any or all zones. RIMs also have an IR emitter port for routed IR commands from VSCs.
- Use Cat5 cable from the RIM to Remote Audio In on the Hi-Fi 2.
- Add a max of 8 RIMs to the main board.



VSC

- Volume-Source Controls allow selection of source and adjustment of volume, bass, treble, balance, and source gain. VSCs also feature an IR receiver.
- Use Cat5 cable from the VSC to Zone Control In on the Hi-Fi 2.
- Add a max of 8 VSCs to the main board.

A LOCAL AUDIO INPUTS

Connect local line-level audio sources to these 8 jacks.

B VARIABLE OUTPUTS

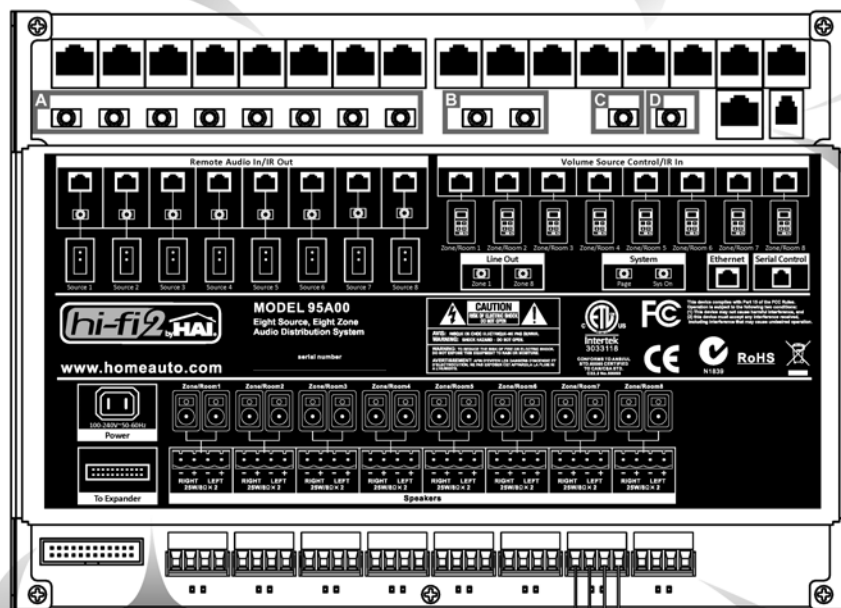
Attach additional amplification to Zone 1 and/or 8.

C PAGE INPUT

When triggered, all zones turn on at their preset paging volume and switch to Source 8.

D SYSTEM ON OUTPUT

When any audio zones turn on, this output activates an auxiliary amplifier equipped with a voltage trigger.

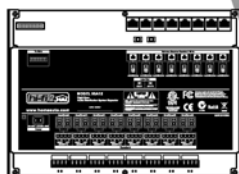


POWER SUPPLY INPUT

100–240V~50–60Hz; Power cable supplied.

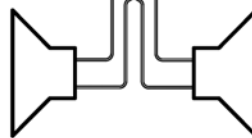
HI-FI 2 EXPANSION BOARD

Connect the Hi-Fi 2 Expansion Board to add an additional 8 zones to your Hi-Fi 2 home audio system.



ETHERNET NETWORK PORT

Communicate with IP devices on the network. Compatible with the HAI Music Gateway which can connect to and control the Hi-Fi 2.



ZONE SPEAKERS

Total of 8 on the main board. Use 8–Ohm speakers and 16–gauge speaker wire (4–conductor stranded suggested for neat installation).

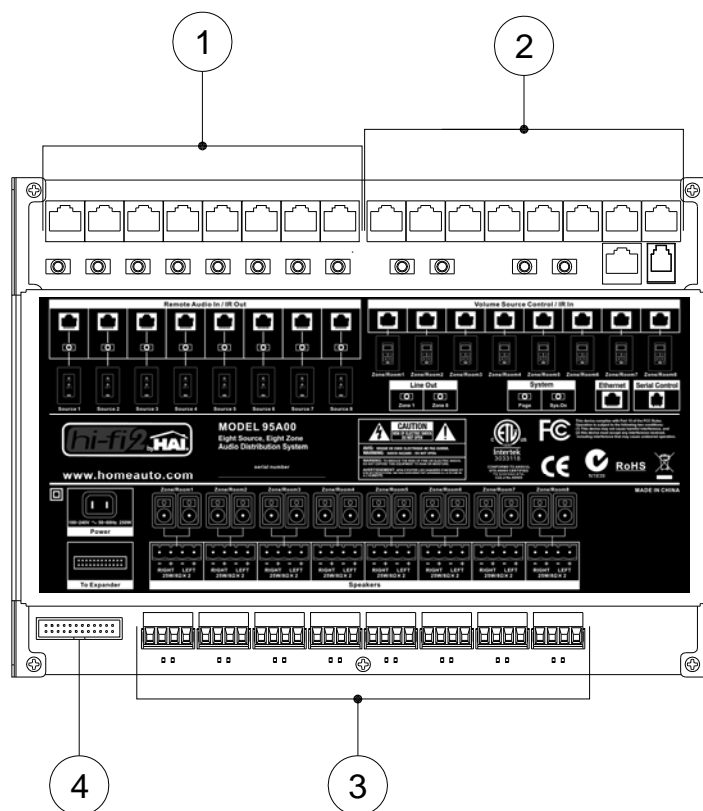
Introduction

Thank you for choosing the Hi-Fi2 by HAI audio distribution system. Hi-Fi2 is an affordable high fidelity Central Controller Distributed Audio System that powers speakers through digital amplification.

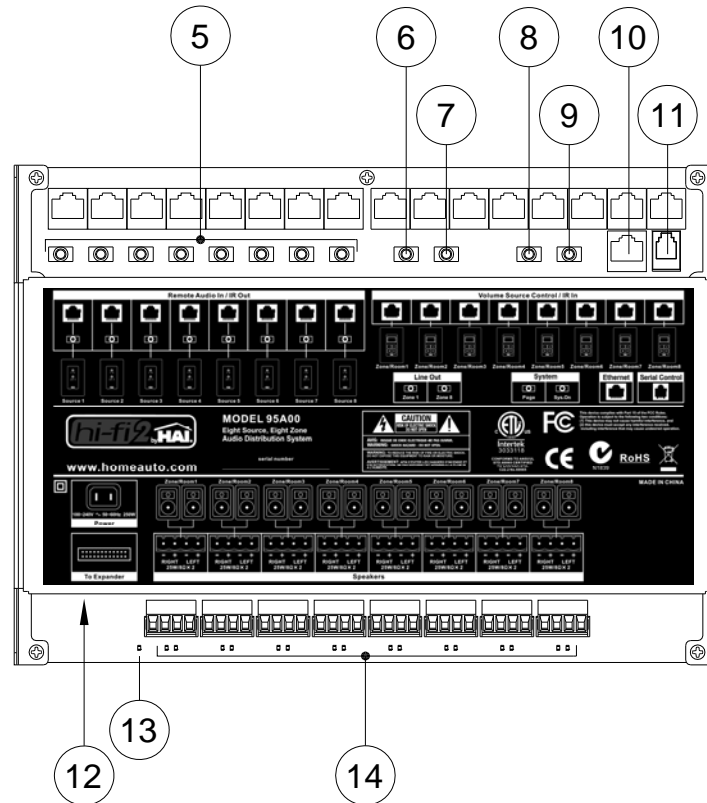
This installation guide is intended as an aid to installing the Hi-Fi2 Eight Zone, Eight Source Kit. The installer should also have thoroughly reviewed and understood the Hi-Fi2 User's Guide which has important information regarding operation and configuration of the system.

Hi-Fi2 Inputs and Outputs

The Hi-Fi2 is equipped with the following inputs and outputs:



1. Remote Audio Inputs / IR Outputs	These jacks are where Remote Input Modules (RIM) are connected using a network cable.
2. Zone Control / IR Inputs	These jacks are where Volume-Source Control (VSC) keypads are connected using a network cable.
3. Speaker Connectors	These terminals are where all zone speakers are connected.
4. Expander Connector	This connector is used to connect an 8-Zone Expander unit.



5. Local Audio Inputs	These jacks are where local line-level audio inputs are connected.
6. Variable Output for Zone 1	This is a variable audio output used for attaching additional amplification to Zone 1.
7. Variable Output for Zone 8	This is a variable audio output used for attaching additional amplification to Zone 8.
8. Page Input	When this input is triggered, all audio zones are turned on at their preset paging volume (or muted) and switched to Source 8.
9. “System On” Output	This output is energized when any audio zones are turned on. Used to turn on an auxiliary amplifier that is equipped with a voltage trigger.
10. Ethernet Port	This port allows a device to connect to, configure, and control the Hi-Fi2 via a network. Used to interface with the HAI Music Gateway.
11. Serial Control	This jack is where an HAI controller or other device with a serial interface is connected for configuration and control of the Hi-Fi2.
12. Power Supply Input	This is where the supplied power cable connects to the power supply.
13. Standby LED indicator	This LED is illuminated green when power is connected to the unit. This LED is off when any of the audio zones are turned on.
13. Power On / Fault LED Indicators	The right LED under the respective audio zone illuminates green when the audio zone is on. The left LED under the respective audio zone illuminates red when there is a fault with the zone amplifier.

Installation

The Hi-Fi2 Main Assembly houses the Hi-Fi2 processor, power supply, and amplifiers. It is also the termination point for all components and connections to Hi-Fi2. The Hi-Fi2 Main Assembly can be installed in a Vented Enclosure (HAI Part Number: 95A09-1) that can be tucked away in a closet or basement or can be installed in a Leviton, OnQ, Channel Vision, Siemon, or other "open house" type structured wiring enclosure using an HAI Universal Mounting Plate (HAI Part Number: 20A07-2).

The Hi-Fi2 Main Assembly should be mounted in a location that is protected from high humidity levels and temperature extremes. An AC power outlet should be located within 5 feet.

Installing Remote Input Modules (RIM)

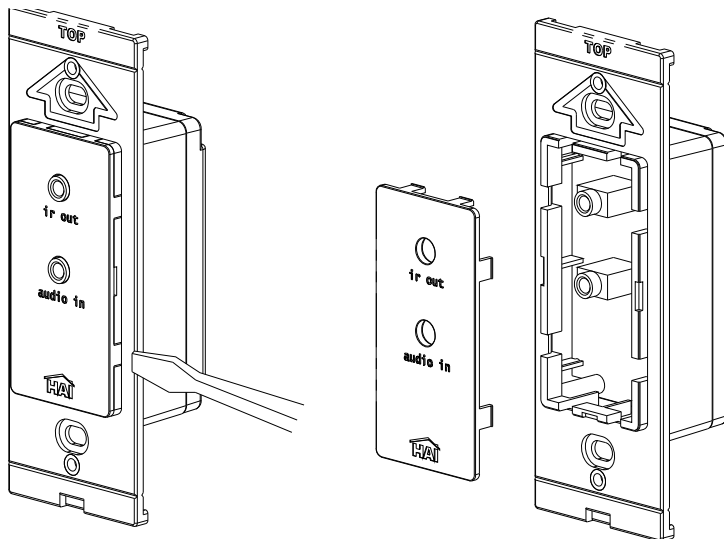
Audio sources can be connected directly to Remote Input Modules (RIM) in rooms that will have music sources. Remote Input Modules connect directly to the Hi-Fi2 Main Assembly using Cat 5, unshielded, twisted pair (UTP) for communications. Each end of the wire is terminated with an RJ45 connector. The correct wiring scheme for the Cat 5 cable is standard EIA/TIA 568A. Properly terminating the Cat 5 cable is crucial for the operation of the system.

It is best that no single run of Cat 5 exceeds 500 feet.

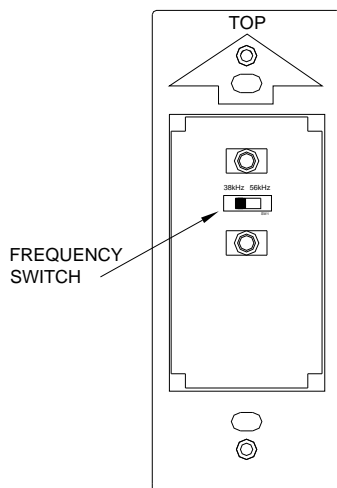
Insert the RJ45 connector on one end of the cable to the respective source input jack (1-8) under "Remote Audio In / IR Out" on the Hi-Fi2 Main Assembly. Insert the RJ45 connector on the other end of the cable to the jack labeled "Remote Audio" on the RIM.

Changing the Color of the RIM

The color of the RIM may be changed to complement the interior décor. The RIM is supplied with a white faceplate and insert. Additional colors are available; contact your HAI distributor for more information. Change the color of the RIM as follows:



1. Remove the faceplate.
2. The insert attaches to the RIM with two latches on the right and two on the left. Using a small-blade screwdriver, gently depress each latch on one side while lifting up on the insert. Once the latches are released on one side, remove the insert from the other side.
3. Align the latches of the new insert to the openings on the RIM and gently snap into place.
4. Attach the new faceplate.



Setting the Frequency of the IR Output

When using the RIM to send IR data to source equipment, there are two different IR carrier frequencies in which the RIM can transmit the IR signal. The default setting of 38 kHz is used for most audio sources. However, most cable and satellite converter boxes operate at a higher IR carrier frequency closer to 56 kHz. Each RIM has a switch that allows you to change the frequency of the IR output when using such devices.

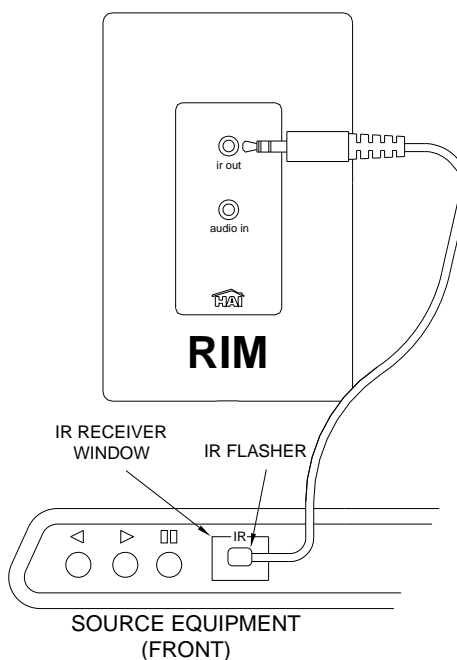
To change the frequency setting, remove the faceplate and insert from the RIM as described under “Changing the Color of the RIM”.

Once the insert has been removed, move the frequency switch (SW1) from the “38kHz” position to the “56kHz” position.

IR Output

Each RIM ships with an IR flasher (62A08-1). The IR flasher is used for sending IR data to the source equipment.

When you point your source equipment remote control at the IR receiver in the VSC and send a signal, the IR data is routed to the appropriate RIM (to which the source equipment is connected), which then sends the IR signal through the IR flasher to the source equipment.



Installing Local Sources

The Hi-Fi2 is equipped with 8 local source inputs. This is useful if your audio sources are in the same location as the Hi-Fi2 system. Instead of connecting a RIM for each source, the audio source can be connected directly to the local source input using 3.5mm male stereo patch cable.

Each local source input is in parallel with the corresponding input for a RIM. Therefore, only a single audio source should be connected to the same source input, whether it is a local source input or a RIM.

Installing Volume-Source Control (VSC) Keypads

The audio sources can be selected and controlled by any Volume-Source Control (VSC). Additionally, each VSC includes an IR receiver that allows you to remotely control the Hi-Fi2 system and/or audio sources from any audio zone in the house. Volume-Source Control (VSC) Keypads connect directly to the Hi-Fi2 Main Assembly using Cat 5, unshielded, twisted pair (UTP) for communications. Each end of the wire is terminated with an RJ45 connector. The correct wiring scheme for the Cat 5 cable is standard EIA/TIA 568A. Properly terminating the Cat 5 cable is crucial for the operation of the system.

The total distance of Cat 5 between the Hi-Fi2 Main Assembly and the VSC units must not exceed 2000 feet. It is best that no single run of Cat 5 exceeds 250 feet.

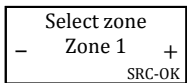
Insert the RJ45 connector on one end of the cable to audio zone input jack (1-8) under “Volume Source Control / IR In” on the Hi-Fi2 Main Assembly. Insert the RJ45 connector on the other end of the cable to the jack labeled “Zone Control” on the VSC.

Turning a VSC on for the First Time

When you turn a VSC on for the first time, you will need to configure which audio zone the VSC will control. The following screen is displayed:



To configure the audio zone that the VSC will control, press the **src** button on the VSC.



To select the audio zone that the VSC will control, press the + button to increase the zone number and press the – button to decrease the zone number.

Audio zone settings range from 1 to 16.

If space is available, more than one VSC can be configured to a given audio zone. This is useful if multiple VSC keypads are installed in a large room to control a single audio zone. When multiple VSC keypads are configured to an audio zone, all VSC keypads will mimic one another.

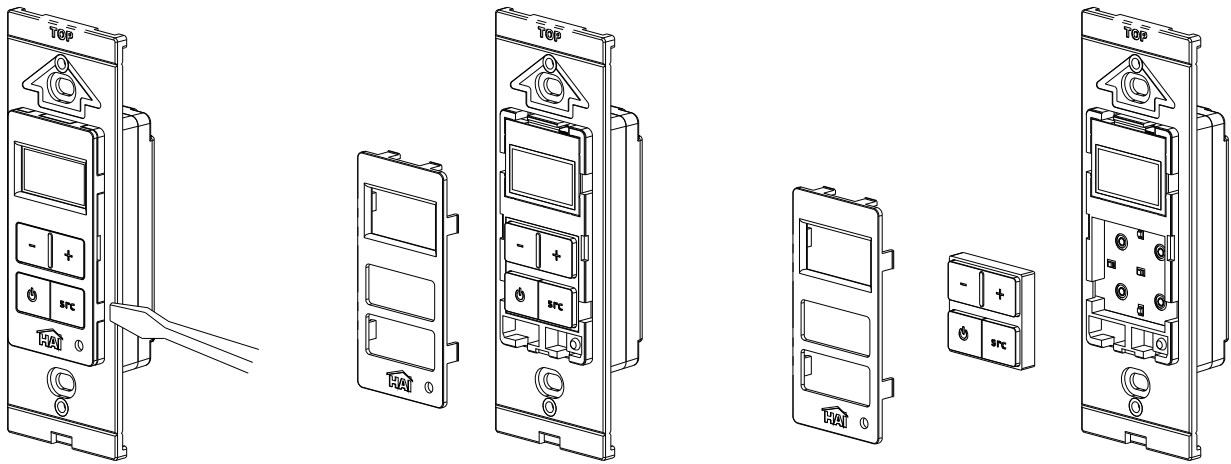
A maximum number of 16 VSC keypads can be installed on a Hi-Fi2 system.

Changing the Color of the VSC

The color of the VSC may be changed to complement the interior décor. The VSC is supplied with a white faceplate, rubber keypad, and insert. Additional colors are available; contact your HAI distributor for more information. Change the color of the RIM as follows:

1. Remove the faceplate.
2. The insert attaches to the VSC with two latches on the right and two on the left. Using a small-blade screwdriver, gently depress each latch on one side while lifting up on the insert. Once the latches are released on one side, remove the insert from the other side.

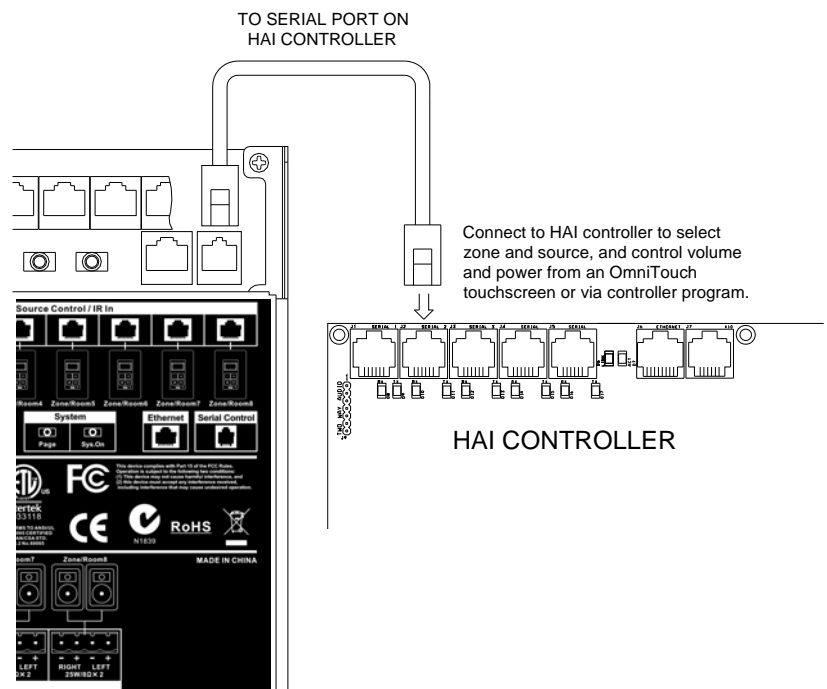
3. Remove the rubber keypad.
4. Insert the new rubber keypad. Align the latches of the new insert to the openings on the VSC and gently snap into place.
5. Attach the new faceplate.



Serial Control

Hi-Fi2 can be remotely controlled through an HAI controller or by a device with a serial interface. When connected, the remote device can select an audio zone and change its power state, source, volume setting, and mute setting, completely configure the Hi-Fi2 system, and issue transport controls to compatible sources.

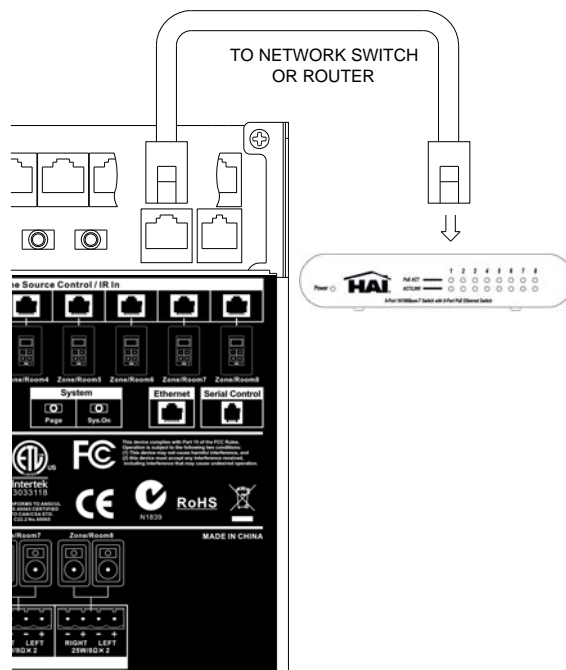
Connect Hi-Fi2 to an HAI Omni or Lumina series Home Control System by inserting the supplied straight-through, 4-position modular cable between an available serial interface connector on the HAI controller and the modular connector labeled “Serial Control” on the Hi-Fi2 Main Assembly.



Ethernet Control

Hi-Fi2 is equipped with an Ethernet port which makes it network accessible. When connected to the local network, the Hi-Fi2 can be completely controlled and configured by other compatible IP devices on the network. Furthermore, when used in conjunction with an HAI Music Gateway (HAI Part Number: 84A00-1) or other compatible audio source, the Hi-Fi2 VSC can display metadata (album, artist, and track) from the source and is able to control the source using transport control commands.

To access the Hi-Fi2 from the network, connect the port labeled “Ethernet” to a network switch or router using Cat 5, unshielded, twisted pair (UTP). Each end of the wire is terminated with an RJ45 connector. The wiring scheme for the Cat 5 cable is standard EIA/TIA 568A.



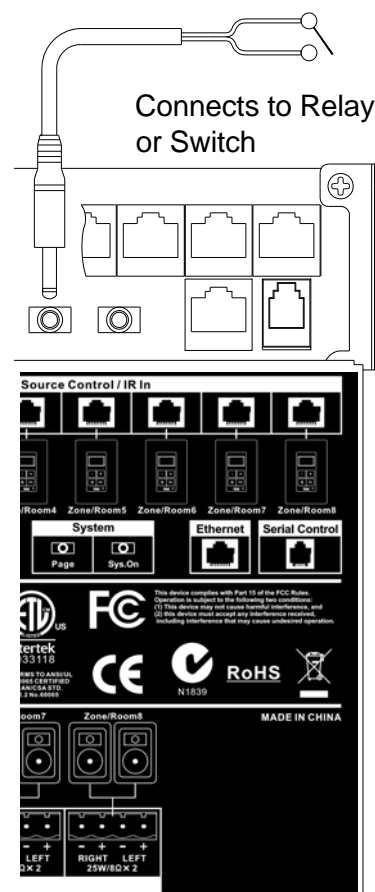
Page / Mute Input

The Hi-Fi2 paging feature offers the capability of playing a single audio source over all zone speakers. If paging is used, the paging audio source will be connected as audio Source 8. Hi-Fi2 is also equipped with a Page Input which will, when activated, turn all zones on at the preset paging volume and switch all zones to Source 8. When the input is deactivated, all audio zones will be returned to their previous source selection, power state, and volume setting.

When used with an HAI controller and Two-Way Voice Module with Line-Level output and Mute/Page Control, custom announcements can be made over all zone speakers when certain events take place.

If desired, the Page function can be used to mute all zones instead of making an announcement. For example, you may simply want all of the zones on the Hi-Fi2 systems to be muted when someone is at the door or when the telephone is ringing. To configure Hi-Fi2 to mute all zones, set the Paging Volume for each zone to “0” as described under “Setting Paging Volume” in the Hi-Fi2 User’s Guide.

To activate the Page / Mute function, short the two wires on a mono patch cord. When activated, all zones are turned on at the preset paging volume (or muted) and switched to Source 8. The wires on the patch cord may be shorted through relay contacts or a switch. If a solid state switch is used, Tip is positive relative to Ring.



Speaker Wiring

When running the cables for speakers, use 16-gauge two-conductor or four-conductor (four-conductor stranded is recommended for neater installation) speaker wire. Speaker cable is homerun from the speaker location to the location of the Hi-Fi2 Main Assembly.

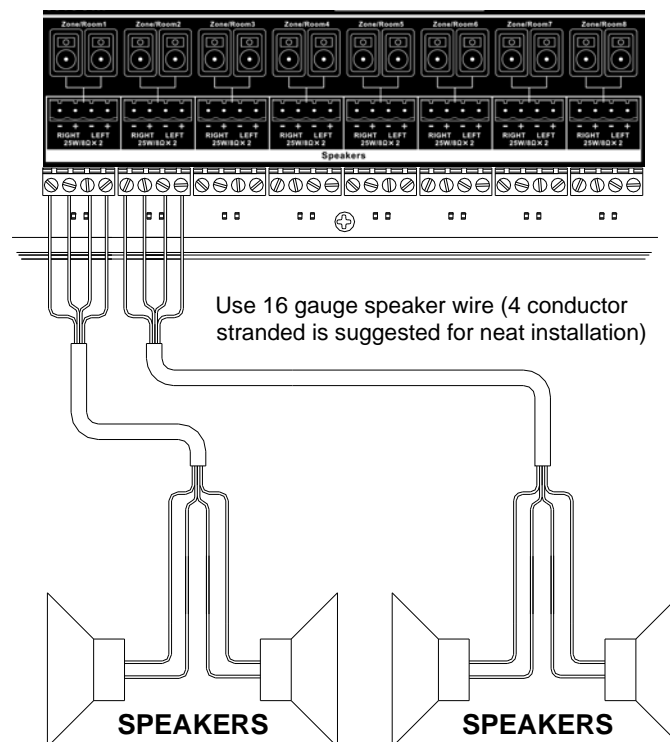
The Hi-Fi2 System is designed to work with one pair of 8-ohm speakers per audio zone. If additional speakers are required in an audio zone, HAI recommends: a) use the Zone Grouping feature of Hi-Fi2 where two or more audio zones control the same source, volume, and/or power state so that any or all of these items are controlled together; or b) use the variable output(s) and an external power amplifier.

Terminating Speaker Wires

Always observe proper orientation of the positive and negative signal for each speaker connection.

Typically, when using two-conductor speaker wire, the red wire indicates positive (+) and black wire indicates negative (-). Another indication of positive is a dark line running through the insulation.

Four-conductor wire can also be used and makes for a neater installation. Four-conductor wire has four separate wires in one outer jacket, making it possible to run a single speaker wire for a pair of zone speakers. This type of wire typically uses red and black for one speaker and white as positive and green as negative for the second speaker.



Variable Outputs

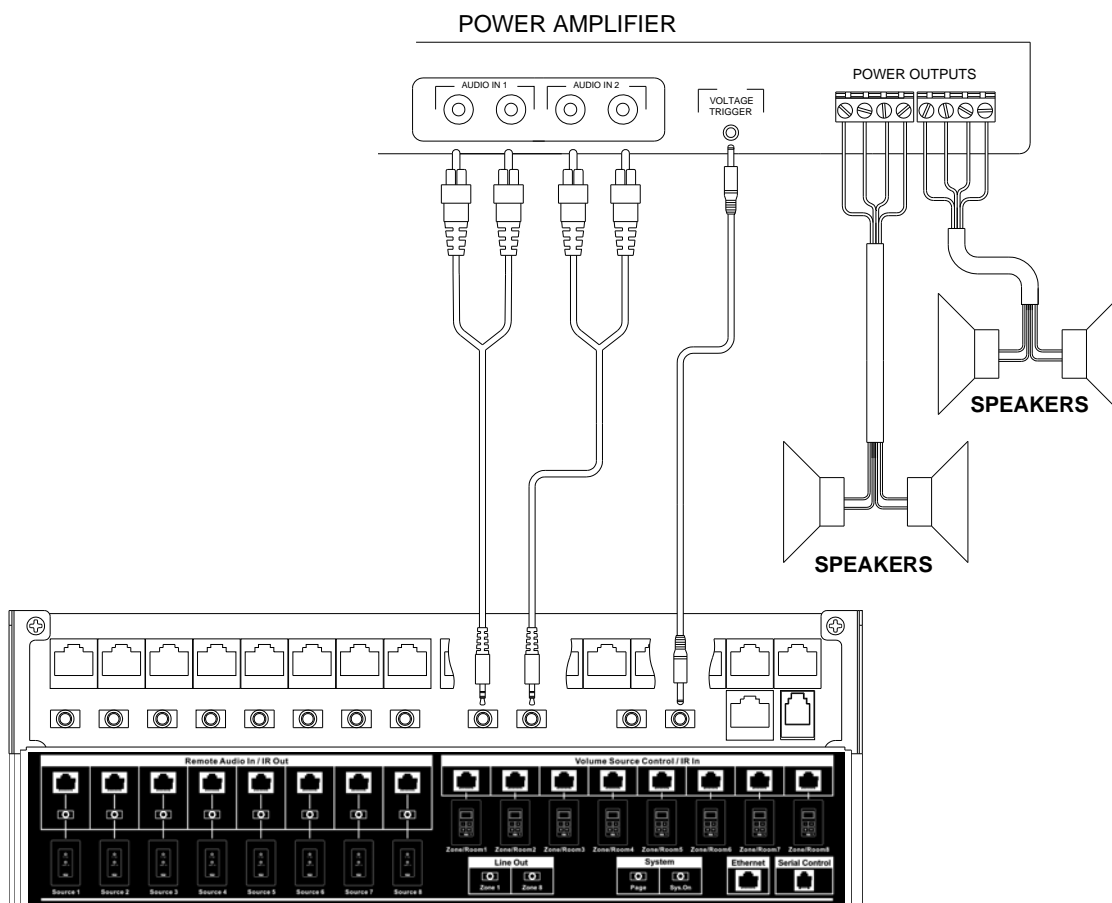
Zone 1 and Zone 8 are equipped with a pre-amp variable output for use with an optional power amplifier that allows you to deliver more power to the zone speakers. This is ideal for outdoor areas or a large living room where more power and/or additional speakers are desirable.

To connect Zone 1 and/or Zone 8 to an optional power amplifier using a stereo patch cable:

- 1) Connect the power amplifier to the Hi-Fi2 Main Assembly by inserting a 3.5mm stereo connector into the 3.5mm jack labeled “Line Out Zone 1” or “Line Out Zone 8” (HAI 62A14-1, 3.5mm male to 2 RCA male retractable patch cable may be used).

If your power amplifier is equipped with a voltage trigger that will turn on the amplifier when energized:

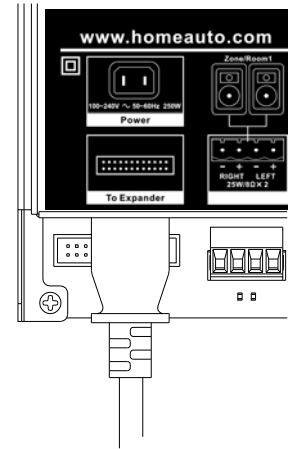
- a) Connect the voltage trigger of the power amplifier to the Hi-Fi2 Main Assembly by inserting a 3.5mm mono connector into the jack labeled “System Sys. On”.
- b) When any audio zone is turned on, Hi-Fi2 supplies 5 VDC to the “System Sys. On” output.
- c) When all audio zones are turned off, Hi-Fi2 supplies 0 VDC to the “System Sys. On” output.



Powering the Hi-Fi2 System

The built-in power supply powers the entire system including the Hi-Fi2 processor, zone amplifiers, Remote Input Modules, and Volume-Source Control keypads.

- 1) Insert the supplied IEC Power Cord into the power jack (above the Expander connector) under the section labeled “Power” on the Hi-Fi2 Main Assembly.
- 2) Plug the power cord into a 120 VAC outlet. The “Standby” LED indicator will flash for several seconds as the Hi-Fi2 system starts. Once operational, the “Standby” LED indicator will remain illuminated. Follow the instructions in the User’s Guide for operation.



Expanding the Hi-Fi2 System

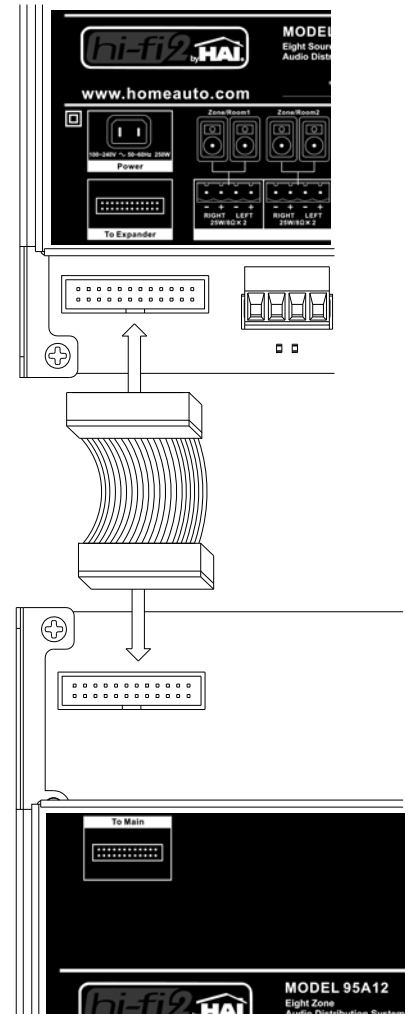
The Hi-Fi2 System can be expanded to 16 audio zones by adding a Hi-Fi2 8-Zone Expander (HAI Part Number: 95A12).

The Hi-Fi2 Expansion Assembly must be mounted below the Hi-Fi2 Main Assembly, within 6 inches.

To connect the Expander, insert the supplied ribbon cable into the Expander connector under the section labeled “To Expander” on the Hi-Fi2 Main Assembly.

Connect the other end of the ribbon cable to the connector on the Hi-Fi2 Expander under the section labeled “To Main”.

Refer to the instructions in the Hi-Fi2 Expander Installation Manual.



Specifications

Zones 1-8 Power Amplifier Outputs

Continuous Average Output Power:	50W (25W x 2) Two channels driven 20-20kHz @ 1% THD
Rated Distortion (1/2 power):	0.20%
Rated Impedance:	8 Ohms
Damping Factor:	50+
Frequency Response (20-20kHz):	±1dB

Preamplifier Section

Variable output:	0-600mV
Impedance:	100 Ohms

Source Inputs 1-8

Input Impedance:	10K (minimum)
Input Sensitivity for rated power:	300mV RMS
Input Overload:	1.7V RMS

Emitter Outputs

Output Drive Current:	100mA
Output Drive Voltage:	5V

System

System On:	5V @ 50mA (Ring = Ground)
Page / Mute input:	Normally open (close to activate)

Power

Power Input:	DC25V=== 3.0A Each
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Power Supply

Power Supply Input:	100-240VAC, 50/60Hz, 120W
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Power Consumption

All channels driven to full-rated power:	400W
Average operating conditions:	50W
No signal:	Less than 10W

Physical Specifications

Unit Size (in enclosure):	13" W x 13" H x 4.5" D
Unit Size (on mounting plate):	13.25" W x 8.5" H x 3.75" D
Unit Weight (in enclosure):	14 lb.
Unit Weight (on mounting plate):	8 lb.



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