

Crestron **CNX-BIPAD8**
CAT5 Audio Distribution Processor

Operations Guide



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CAT5 Audio Distribution Processor: CNX-BIPAD8

Introduction

Among the wave of multi-room audio products on the market, Crestron® audio distribution processors are set apart for their unmatched flexibility and no-compromise performance. Features like independent software-driven preamp-style controls on every room output enable the most demanding user to tailor the listening experience to individual taste in every room. Any audio parameter or device function can be controlled using keypads, handheld remotes, touchpanels, or computers, putting just the right amount of control right where it is needed.

Features and Functions

- High-performance stereo audio switcher and preamp
- Distributes 16 stereo audio sources to eight line outputs
- RCA and RJ-45 CAT5 outputs
- Combinable for up to 32 rooms
- Eight additional room return inputs via CAT5
- Volume, bass, treble, balance, loudness, and mute controls
- Programmable input gain compensation
- Selectable mono summing on each output
- Protective output mute relays
- Fully configurable in SystemBuilder™ software
- Controllable via Cresnet® communications

Up to 24 Stereo Sources x Up to 32 Rooms

The CNX-BIPAD8 is a high performance 24 x 8 stereo audio switcher and preamplifier, providing distribution of 16 stereo audio sources and eight room inputs to any of eight room outputs. Up to four CNX-BIPAD8s may be combined to handle as many as 32 rooms*. Every room output includes independent control over volume, bass, treble, balance, loudness, and mute. Mono summing is also built in to facilitate distribution to non-stereo zones.

*Room outputs are expandable by cascading the inputs of multiple units using standard RCA interconnect cables. Crestron recommends cascading no more than four units. The actual number of possible units in a system is virtually unlimited, although additional equipment may be necessary to maintain signal integrity. Contact Crestron for additional assistance.

Crestron Home[®] CAT5 Balanced Audio

The CNX-BIPAD8 is designed to provide maximum flexibility for audio distribution through the use of Crestron's bidirectional CAT5 balanced technology. The CNX-BIPAD8 supports a versatile combination of balanced line level and speaker-level audio, featuring both balanced and unbalanced connections on each room output. The RCA-type unbalanced connections may be used to directly drive a multi-channel amplifier, while the RJ-45 CAT5 connections enable distribution of line level signals to remote room locations up to 1000 feet (305 meters) away.

Room Solution Boxes

At each remote room location, one of Crestron's "Room Solution Boxes" is connected to the television or local amplifier to receive the CAT5 signal and serve as a local preamp and switcher. Audio-capable models include the CNXRMCLV, C2N-DAP8, and C2N-DAP8RC. These models also support a "return" audio signal over the same CAT5E cable allowing the signal from a local audio source to be routed to the head-end for redistribution to other rooms. A single CNX-BIPAD8 can receive and redistribute return signals from up to eight rooms without additional equipment. For systems utilizing multiple CNX-BIPAD8s, one CNX-PBAR4 balanced audio receiver must be added for every four room returns.

Advanced Features

Additional features make the CNX-BIPAD8 a truly refined audio component. Programmable input gain compensation assures a consistent level when switching between input sources. Scaling factor settings allow minimum and maximum levels to be defined for each room output. Protective relays on each output prevent "thumps" during power-up and provide total attenuation when any room is turned off.

A Complete System Solution

Together with any 2-Series control system, Crestron's audio distribution processors provide an extensively customizable audio control solution. For the ultimate in audio performance, just add a CNAMPX-series multi-room amplifier to form a total, intelligent audio head-end. Crestron keypads and touchpanels complete the system, putting essential control access within arm's reach throughout the home, office, restaurant, etc.

SystemBuilder[™] Programming

Crestron's SystemBuilder software can make audio distribution programming a quick and simple task, providing easy drag-and-drop system configuration with extensive support for interfacing to hundreds of AV devices through Crestron's vast database of third-party codes and drivers. Hi-tech or bare necessity, for all tastes and technical

abilities, SystemBuilder allows the discerning AV system designer to deliver a tailor-made audio distribution solution every time.

Preamplifier Circuits

The CNX-BIPAD8 preamplifier circuits provide the following controls for each of the eight RCA outputs:

- Loudness - Activates the loudness function, commonly found on stereo amplifiers, to boost low- and high-frequency signals at low volume settings to compensate for natural hearing limitations at lower volume levels.
- Volume - Sets minimum and maximum volume levels and controls the relative audio level within that range.
- Balance, Bass, and Treble - Specifies levels for these settings relative to a 50% neutral or balanced signal.
- Mono - Changes the audio setting from stereo to mono (monaural) mode.
- Compensation - Source gain compensation that normalizes input levels from different sources; for example, setting the volume range of a VCR equal to that of a CD player.
- Mute - Electronically attenuates signal to silence.
- On/Off - Activates electronic relays that cut sound to a room.

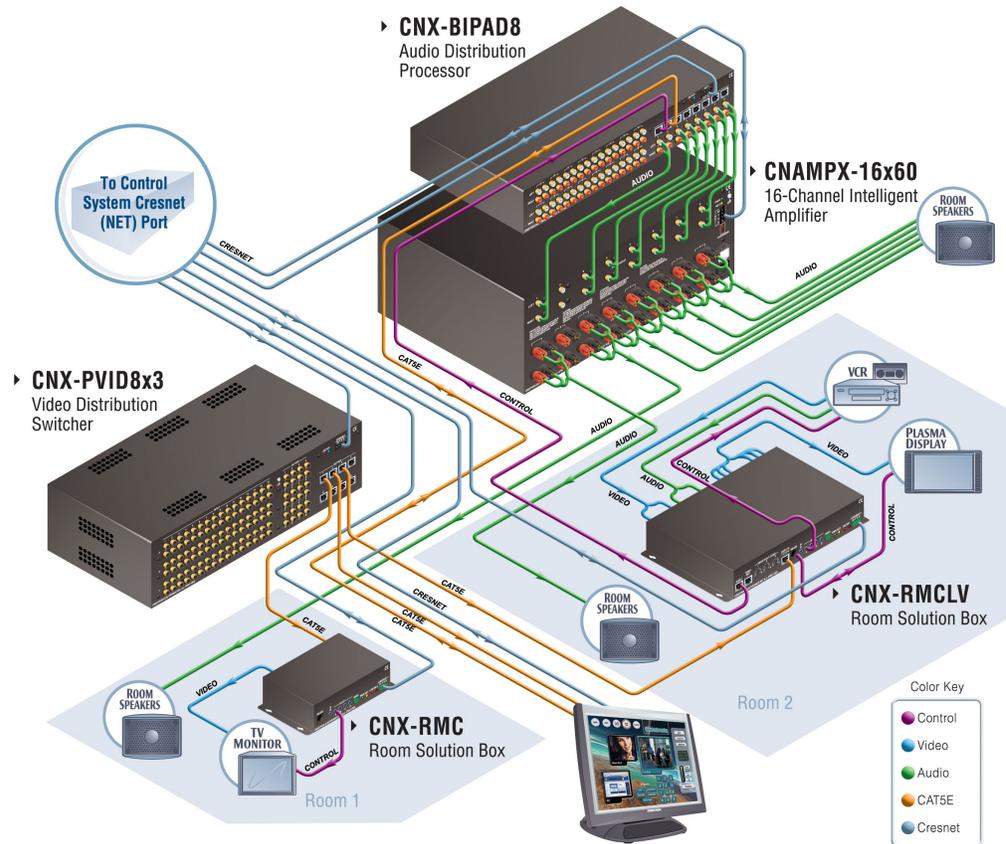
Optional source and numeric keypads or any other Crestron network panel or touchpanel may be added to the individual rooms to interface with the CNX-BIPAD8. For more information regarding these devices, refer to the Product Manuals section of the Crestron website (<http://www.crestron.com/manuals>).

NOTE: Unit does not ship with default parameters for adjustable values (bass, treble, or compensation). These values must be set in the program for the unit to operate correctly.

Applications

The diagram below shows a CNX-BIPAD8 in a typical application.

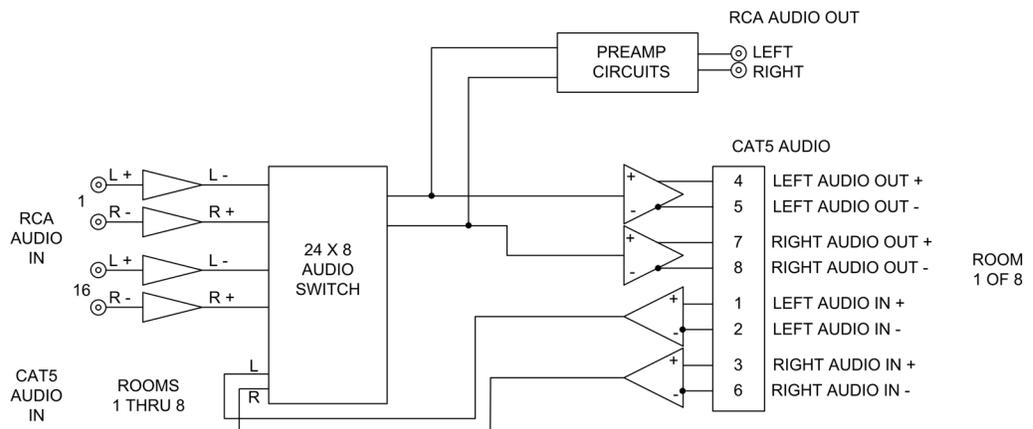
CNX-BIPAD8 in a Typical Application



Internal Block Diagram

The following diagram represents the audio distribution abilities of the CNX-BIPAD8. For more information refer to “Typical Room Configurations” which starts on page 13.

Internal Block Diagram of the CNX-BIPAD8



Specifications

Specifications for the CNX-BIPAD8 are listed in the following table.

CNX-BIPAD8 Specifications

SPECIFICATION	DETAILS
Audio Controls	Volume, Balance, Bass, Treble, Loudness, Mute, Mono, Input Compensation
Volume Gain Range	-80 dB to +20 dB, 1 dB steps
Mute	-100 dB electronic, -120 dB relay (room enable off)
Input Compensation	±10 dB
Bass Gain Range	±12 dB @ 100 Hz, 2 dB steps
Treble Gain Range	±12 dB @ 10 kHz, 2 dB steps
Frequency Response	8 Hz to 60 kHz ±0.2 dB
S/N Ratio	>100 dB
THD+N	<0.02 %
Stereo Separation	>90 dB
Power Requirements	
Cresnet Power Usage	20 Watts (0.83 Amps @ 24 Volts DC)
Default Net ID	44
Minimum 2-Series Control System Update File ^{1,2}	Version 2.004.CUZ or later
Environmental	
Temperature	41° to 122° F (5° to 50° C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	68 BTU/Hr
Enclosure	Black metal, 2U 19-inch rack-mountable (rack ears included)
Dimensions	
Height	3.56 in (9.04 cm) 3.47 in (8.81 cm) without feet
Width	17.03 in (43.26 cm) 19.00 in (48.26 cm) with ears
Depth	8.67 in (22.02 cm)
Weight	6.2 lbs (2.8 kg)
Available Accessories	
C2N-DAP8	7.1 Surround Sound Processor
C2N-DAP8RC	7.1 Surround Sound Processor and Room Solution Box
CNAMPX-12X60	12 Channel Multi-Room Amplifier
CNAMPX-16X60	16 Channel Multi-Room Amplifier
CNX-PBAR4	CAT5 Balanced Audio Receiver
CNXBRMO	Bridging Module
CNXRMCLV	Enhanced Room Solution Box

1. The latest software versions can be obtained from the Crestron website. Refer to the NOTE following these footnotes.

2. Crestron 2-Series control systems include the AV2 and PRO2. Consult the latest Crestron Product Catalog for a complete list of 2-Series control systems.

NOTE: Crestron software and any files on the website are for authorized Crestron dealers and Crestron Authorized Independent Programmers (CAIP) only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

Physical Description

This section provides information on the connections, controls and indicators available on your CNX-BIPAD8.

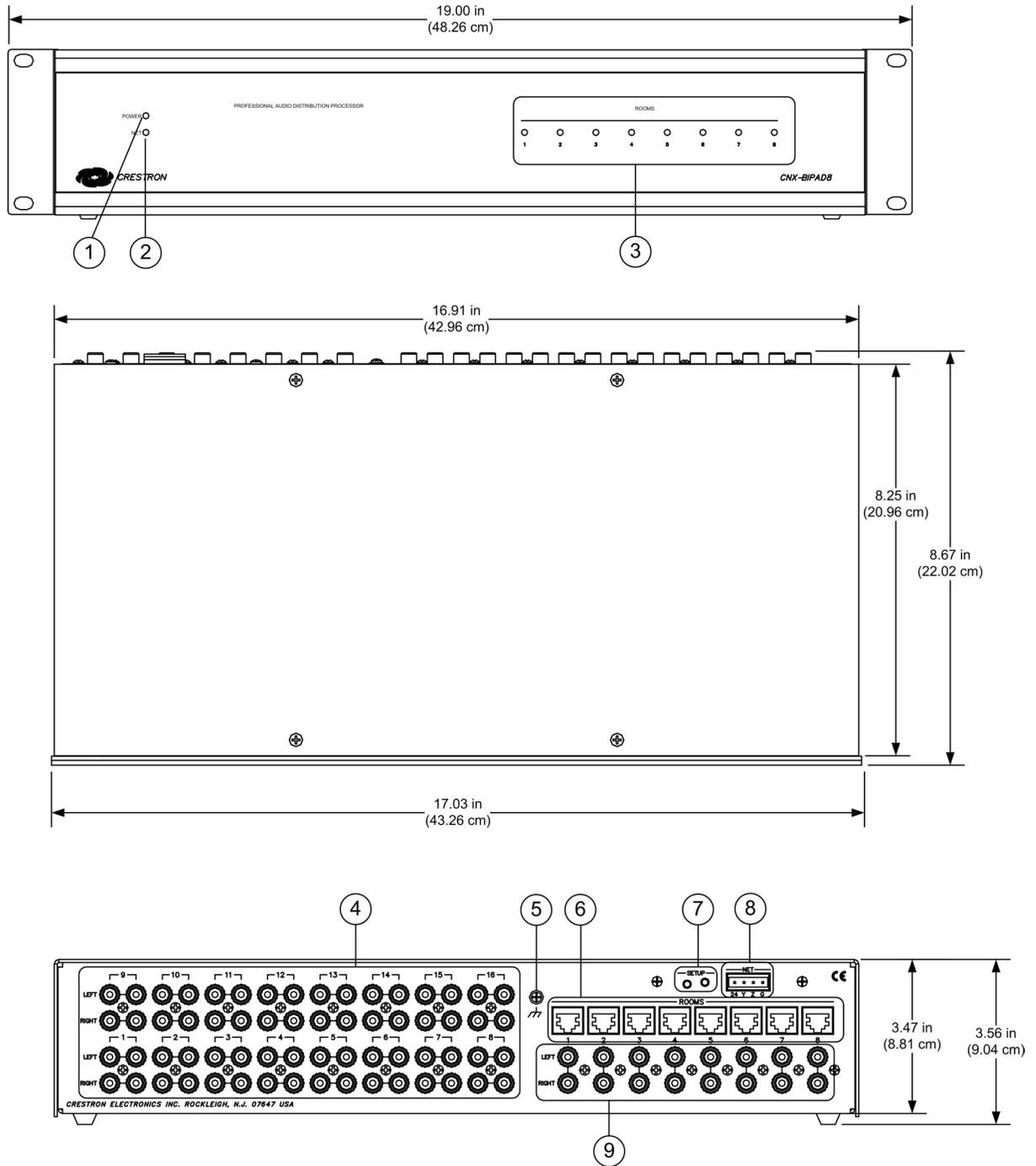
CNX-BIPAD8 Physical View (Front)



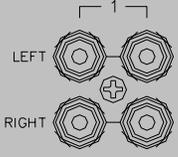
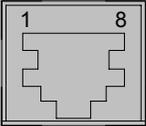
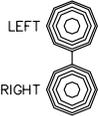
CNX-BIPAD8 Physical View (Rear)



CNX-BIPAD8 Overall Dimensions



Connectors, Controls & Indicators

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION																				
1	PWR LED	(1) Green LED, indicates 24 Volts DC power supplied from Cresnet control network																				
2	NET LED	(1) Yellow LED, indicates communication with Cresnet system																				
3	ROOMS 1-8 LEDs	(8) Red LEDs, indicate room outputs are enabled																				
4	SOURCES 1 – 16 	(64) RCA female comprising (16) unbalanced stereo line level audio inputs, and (16) parallel loop-throughs; Maximum Input Level: 3.2 V _{rms} (flat); Input Impedance: 47k ohms; Connect to outputs of source devices or CNX-PBAR4, with loop-through to additional CNX-BIPAD8 ²																				
5	Ground	(1) 6-32 Screw, chassis ground lug																				
6	ROOMS 1 – 8 (CAT5) 	(8) 8-pin RJ-45 female, shielded; Bidirectional CAT5 balanced audio ports ³ ; Maximum Input/Output Levels: 4 V _{rms} ; Input/Output Impedances: 600 ohms; Connect to room solution boxes, touchpanels, CNX-PBAR4, or any “CH” CAT5 audio ports ⁴																				
		<table border="1"> <thead> <tr> <th>PIN #</th> <th>SIGNAL</th> <th>PIN #</th> <th>SIGNAL</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Audio In L +</td> <td>5</td> <td>Audio Out L -</td> </tr> <tr> <td>2</td> <td>Audio In L -</td> <td>6</td> <td>Audio In R -</td> </tr> <tr> <td>3</td> <td>Audio In R +</td> <td>7</td> <td>Audio Out R +</td> </tr> <tr> <td>4</td> <td>Audio Out L +</td> <td>8</td> <td>Audio Out R -</td> </tr> </tbody> </table>	PIN #	SIGNAL	PIN #	SIGNAL	1	Audio In L +	5	Audio Out L -	2	Audio In L -	6	Audio In R -	3	Audio In R +	7	Audio Out R +	4	Audio Out L +	8	Audio Out R -
PIN #	SIGNAL	PIN #	SIGNAL																			
1	Audio In L +	5	Audio Out L -																			
2	Audio In L -	6	Audio In R -																			
3	Audio In R +	7	Audio Out R +																			
4	Audio Out L +	8	Audio Out R -																			
7	SETUP (Button and LED) 	(1) Miniature pushbutton and (1) red LED, used for touch-settable ID (TSID)																				
8	NET 	(1) 4-pin 5 mm detachable terminal block; Cresnet slave port, connects to Cresnet control network 24: Power (24 Volts DC) Y: Data Z: Data G: Ground																				
9	ROOMS 1 – 8 (RCA) 	(16) RCA female comprising (8) unbalanced stereo line level audio outputs; Maximum Output Level: 2.5 V _{rms} ; Output Impedance: 37.5 ohms; Connect to inputs of CNAMPX-series amplifier																				

1. An interface connector for the **NET** port is provided with the unit.
2. Room outputs are expandable by cascading the inputs of multiple units using standard RCA interconnect cables. Crestron recommends cascading no more than four units. The actual number of possible units in a system is virtually unlimited, although additional equipment may be necessary to maintain signal integrity. Contact Crestron for additional assistance.
3. To determine which is pin 1 on the cable, hold the cable so the end of the eight pin modular jack is facing away from you, with the clip down and copper side up. Pin 1 is on the far left.
4. Maximum CAT5 distance for audio is 1000 feet (305 meters)

Industry Compliance

As of the date of manufacture, the CNX-BIPAD8 has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.



Federal Communications Commission (FCC) Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
 - Increase the separation between the equipment and receiver.
 - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
 - Consult the dealer or an experienced radio/TV technician for help.
-

Setup

Network Wiring

When wiring the Cresnet[®] network, consider the following:

- Use Crestron Certified Wire.
- Use Crestron power supplies for Crestron equipment.
- Provide sufficient power to the system.

CAUTION: Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

- For networks with 20 or more devices, use a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality.

For more details, refer to “Check Network Wiring” on page 23.

CAT5 Wiring

Category 5 (CAT5) wiring is a twisted pair cable designed for Ethernet networks. These networks operate at speeds of up to 100 Megabits per second (Mbps) using the 100BASE-T standard. Crestron takes advantage of this specification for a variety of audio and video applications.

When using CAT5 wire for balanced signal distribution, audio can be transmitted up to 1000 feet (305 meters).

For more information, refer to the latest version of the Crestron CAT5 Wiring Reference Guide (Doc. 6137), which is available for download from the Crestron website (www.crestron.com/manuals).

Identity Code

The Net ID of the CNX-BIPAD8 has been factory set to **44**. The Net IDs of multiple CNX-BIPAD8 devices in the same system must be unique. Net IDs are changed from a personal computer (PC) via Crestron Toolbox[™] (refer to “Establishing Communication” on page 20).

When setting the Net ID, consider the following:

- The Net ID of each unit must match an ID code specified in the SIMPL[™] Windows[®] program.
- Each network device must have a unique Net ID.

For more details, refer to the Crestron Toolbox help file.

Installation

Rack Mounting

The CNX-BIPAD8 can be mounted in a rack or stacked with other equipment. Two “ears” are provided with the CNX-BIPAD8 so that the unit can be rack mounted. These ears must be installed prior to mounting. Complete the following procedure to attach the ears to the unit. The only tool required is a #2 Phillips screwdriver.

WARNING: To prevent bodily injury when mounting or servicing this unit in a rack, take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

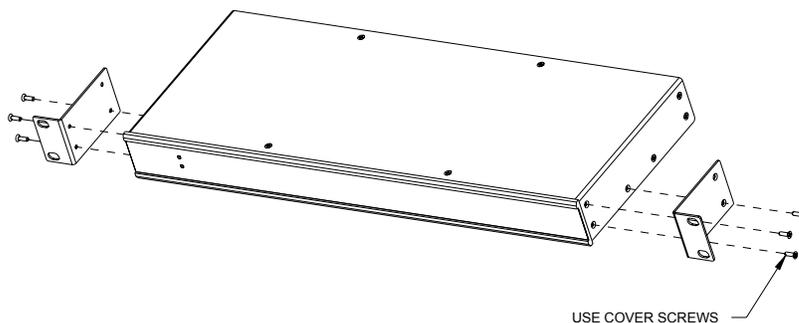
NOTE: If rack mounting is not required, rubber feet are provided for tabletop mounting or stacking. Apply the feet near the corner edges on the underside of the unit.

NOTE: Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

To install the ears:

1. There are screws that secure each side of the CNX-BIPAD8 top cover. Using a #2 Phillips screwdriver, remove the three screws closest to the front panel from one side of the unit. Refer to the diagram following step 3 for a detailed view.
2. Position a rack ear so that its mounting holes align with the holes vacated by the screws in step 1.
3. Secure the ear to the unit with three screws from step 1, as shown in the following diagram.

Ear Attachment for Rack Mounting (this image shows a IRU device)

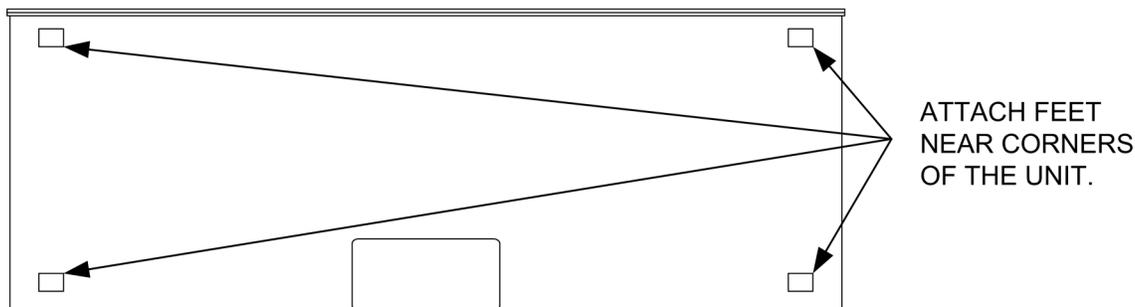


4. Repeat procedure (steps 1 through 3) to attach the remaining ear to the opposite side.

Stacking

Four “feet” are provided with the CNX-BIPAD8 so that if the unit is not rack mounted, the rubber feet can provide stability when the unit is placed on a flat surface or stacked. These feet should be attached prior to the hookup procedure. Refer to the following illustration for placement of the feet.

Foot Placement for the CNX-BIPAD8



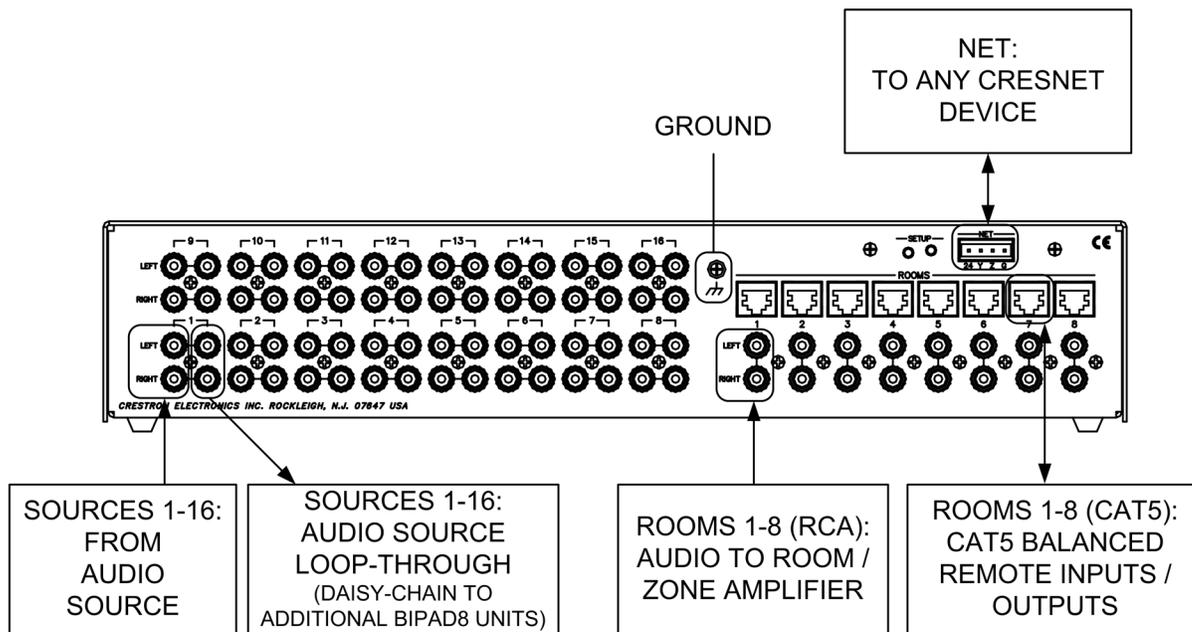
NOTE: No more than two CNX-BIPAD8 units should be stacked.

Hardware Hookup

Make the necessary connections as called out in the illustration that follows this paragraph. Refer to “Network Wiring” on page 10 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

When making connections to the CNX-BIPAD8, remember to use Crestron power supplies for Crestron equipment.

Hardware Connections for the CNX-BIPAD8



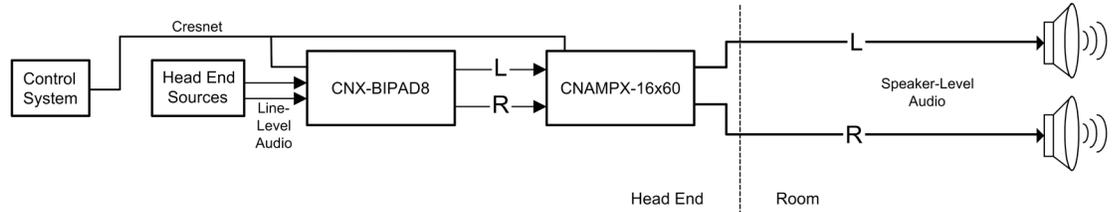
NOTE: Ensure the unit is properly grounded.

NOTE: The CNX-BIPAD8 can only be powered by the 4-position terminal block connector labeled **NET**.

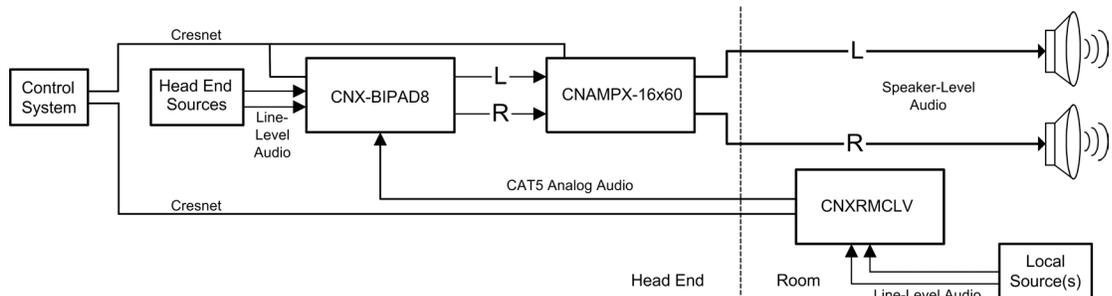
Typical Room Configurations

The following figures show typical room/head end audio configurations using the CNX-BIPAD8.

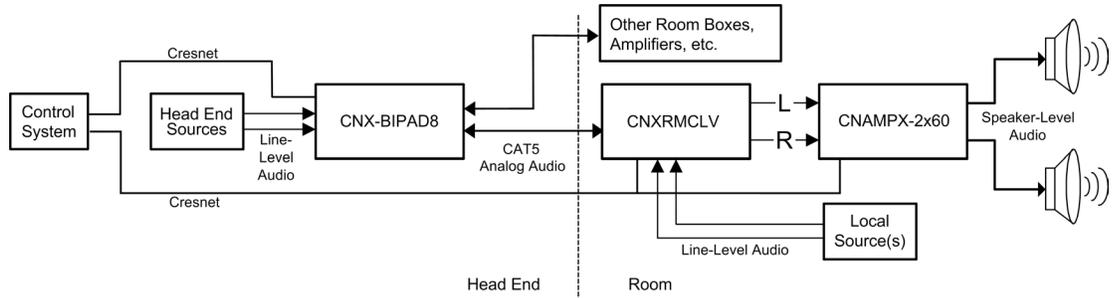
Head End Amplification with Speaker-Level Distribution



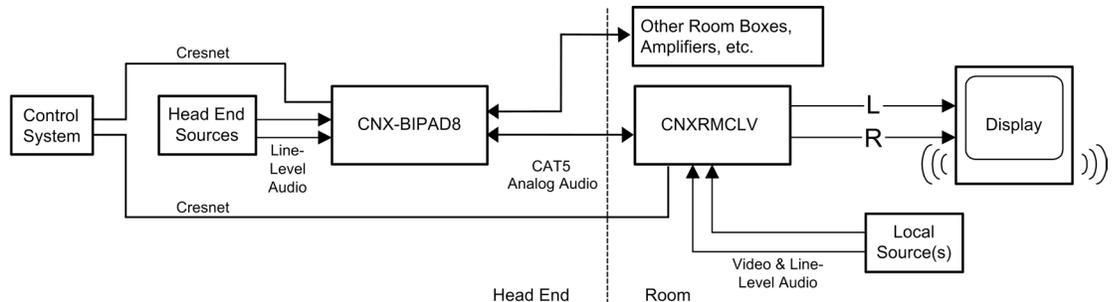
Head End Amplification with Speaker-Level Distribution and CAT5 Audio Return



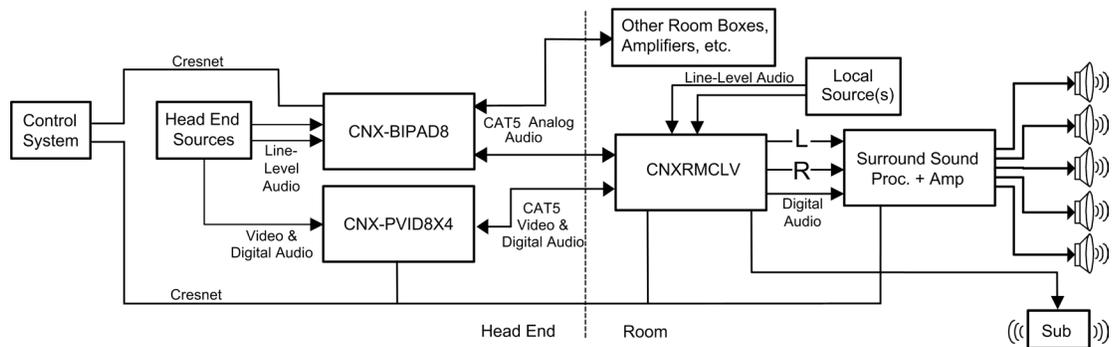
Bi-Directional CAT5 Audio Distribution with In-Room Amplification



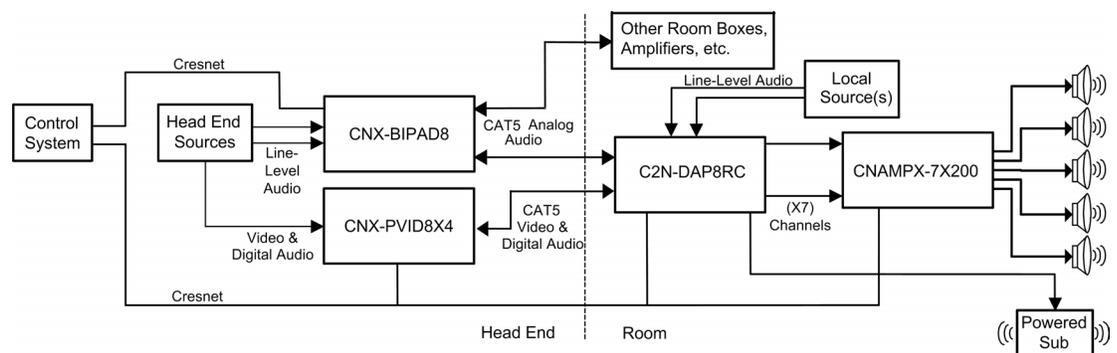
Bi-Directional CAT5 Audio Distribution with Integrated Display Device Sound System



Bi-Directional CAT5 Audio/Video Distribution with In-Room Third-Party Surround Sound System



Bi-Directional CAT5 Audio and Digital Audio Distribution with In-Room Crestron Controller, Digital Audio Surround Sound Processor, and Surround Sound Amplifier



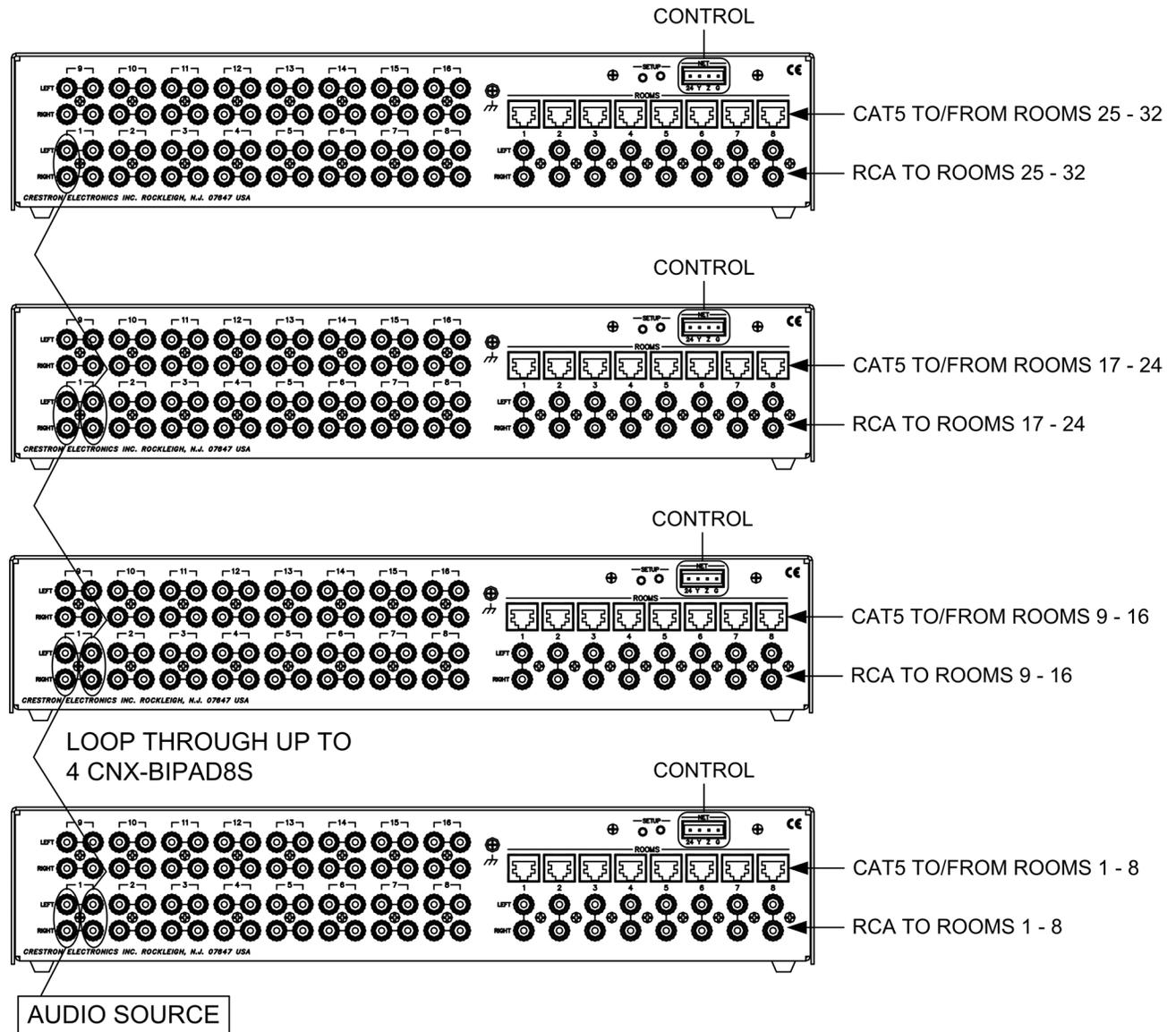
Signal Distribution to More than Eight Rooms

Each CNX-BIPAD8 is capable of distributing audio to eight rooms, maximum. It is possible to expand distribution to more rooms if additional CNX-BIPAD8s are introduced to the system. Crestron recommends a maximum of four CNX-BIPAD8s per system. Therefore, audio can be distributed to a maximum of 32 rooms.

NOTE: Connecting more than four CNX-BIPAD8s via loop-through may result in diminished audio quality and signal degradation.

The sixteen sets of four RCA jacks connect independent audio sources to the CNX-BIPAD8. Of each set, two of the connectors are used for left and right audio channels; the other two are parallel stereo loop-throughs. The loop-through jacks can be used for daisy-chaining additional CNX-BIPAD8s, as shown in the following figure.

Expanded Audio Distribution

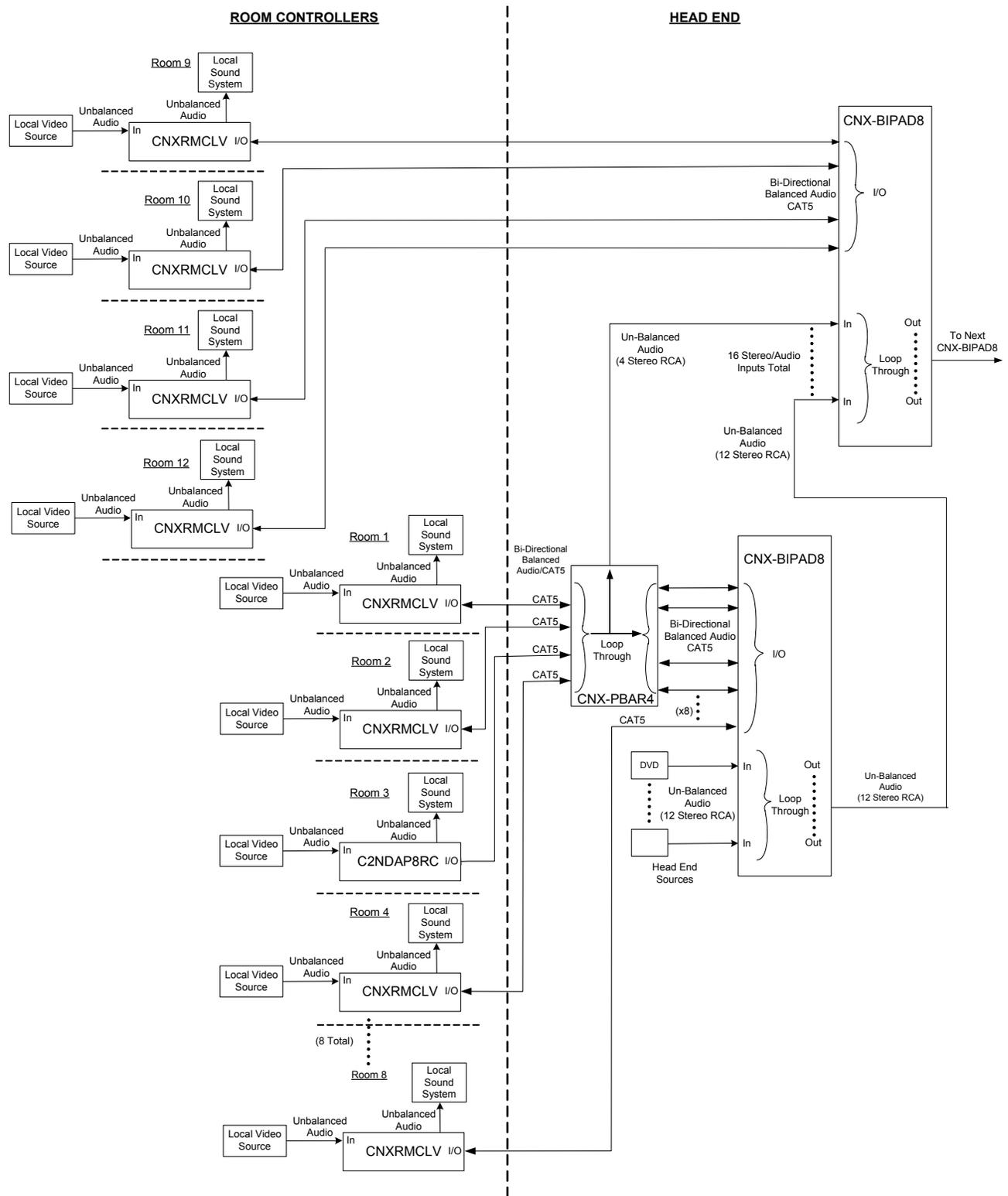


Expanded Distribution of Local Audio Sources

Using the unbalanced (RCA) loop-through I/O connections between the CNX-BIPAD8s, you can ensure that the head end source inputs on the first CNX-BIPAD8 can be distributed to the rooms connected to the balanced audio CAT5 I/Os on other CNX-BIPAD8s.

However, if you wish to distribute local room source audio from rooms connected to the first CNX-BIPAD8 to rooms connected to a second CNX-BIPAD8, you need to use the CNX-PBAR4 as shown in the diagram on the next page. The CNX-PBAR4 allows you to maintain the balanced CAT5 I/O connection to/from rooms 1-4 on the first CNX-BIPAD8, then, via its internal balanced to unbalanced audio converter, to loop through the return audio coming back from the rooms to the RCA unbalanced inputs on the second CNX-BIPAD8. As shown in the diagram, the CNX-PBAR4 will enable Rooms 9-12 to listen to audio being routed from rooms 1-4.

Expanded Distribution of Local Audio Sources



Programming Software

Have a question or comment about Crestron software?

Answers to frequently asked questions (FAQs) can be viewed in the Online Help section of the Crestron website. To post a question or view questions you have submitted to Crestron's True Blue Support, log in at <http://support.crestron.com>. First-time users will need to establish a user account.

Earliest Version Software Requirements for the PC

NOTE: Crestron recommends that you use the latest software to take advantage of the most recently released features. The latest software is available from the Crestron website.

Crestron has developed an assortment of Windows®-based software tools to develop a Cresnet system. You can create a program to control the CNX-BIPAD8 control system using the Crestron programming tools Crestron SystemBuilder™ or SIMPL Windows. For the minimum recommended software versions, visit the Version Tracker page of the Crestron website (www.crestron.com/versiontracker).

Programming with Crestron SystemBuilder

Crestron SystemBuilder is the easiest method of programming but does not offer as much flexibility as SIMPL Windows. For additional details, download SystemBuilder from the Crestron website and examine the extensive help file.

Programming with SIMPL Windows

NOTE: While SIMPL Windows can be used to program the CNX-BIPAD8, it is recommended to use SystemBuilder for configuring a system.

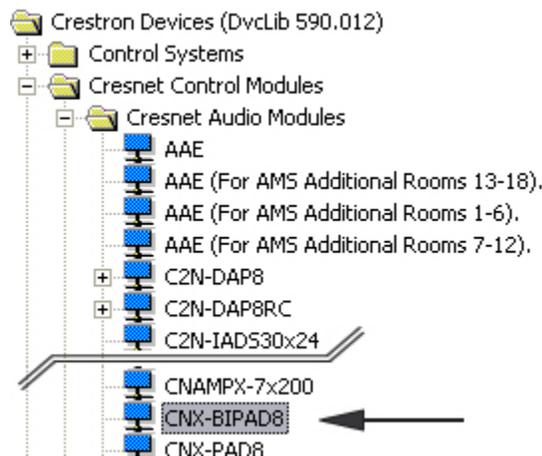
SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate but equally important "Managers".

Configuration Manager

Configuration Manager is the view where programmers "build" a Crestron control system by selecting hardware from the *Device Library*.

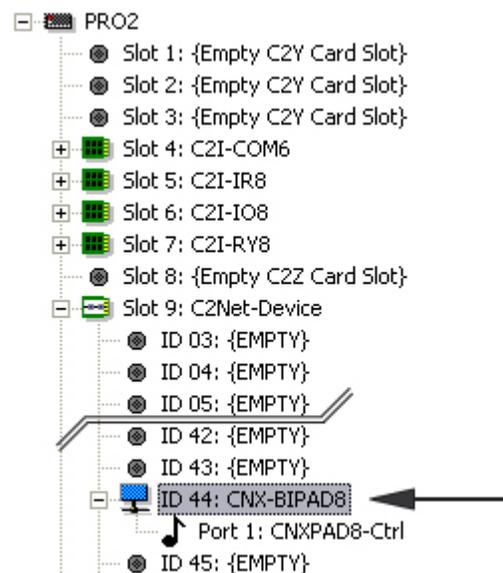
- To incorporate the CNX-BIPAD8 into the system, drag the CNX-BIPAD8 from the Cresnet Control Modules | Cresnet Audio Modules folder of the *Device Library* and drop it in the *System Views*.

Locating the CNX-BIPAD8 in the Device Library

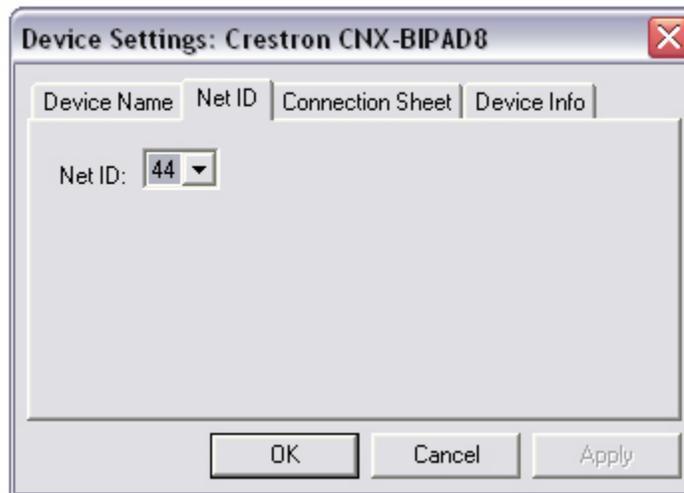


- The system tree of the control system displays the device in the appropriate slot with a default Net ID as shown in the following illustration.

C2Net Device, Slot 9



- Additional CNX-BIPAD8 devices are assigned different Net ID numbers as they are added.
- If necessary, double click a device to open the “Device Settings” window and change the Net ID, as shown in the following figure.

“Device Settings: Crestron CNX-BIPAD8” Window

- The ID code specified in the SIMPL Windows program must match the Net ID of each unit. Refer to “Identity Code” on page 10.

Program Manager

Program Manager is the view where programmers “program” a Crestron control system by assigning signals to symbols.

The symbol can be viewed by double clicking on the icon or dragging it into *Detail View*. Each signal in the symbol is described in the SIMPL Windows help file (**F1**).

Example Program

An example program for the CNX-BIPAD8 is available from the Crestron website (www.crestron.com/exampleprograms).

Uploading and Upgrading

Crestron recommends using the latest programming software and that each device contains the latest firmware to take advantage of the most recently released features. However, before attempting to upload or upgrade it is necessary to establish communication. Once communication has been established, files (for example, programs or firmware) can be transferred to the control system (and/or device). Finally, program checks can be performed (such as changing the device ID or creating an IP table) to ensure proper functioning.

Establishing Communication

Use Crestron Toolbox for communicating with the CNX-BIPAD8; refer to the Crestron Toolbox help file for details. There is a single method of communication: indirect communication.

Indirect Communication



CNX-BIPAD8 connects to control system via Cresnet:

1. Establish communication between the PC and the control system as described in the latest version of the 2-Series Control Systems Reference Guide (Doc. 6256).
2. Use the Address Book in Crestron Toolbox to create an entry for the CNX-BIPAD8 using the expected communication protocol (Indirect). Select the Cresnet ID of the CNX-BIPAD8 and the address book entry of the control system that is connected to the CNX-BIPAD8.
3. Display the CNX-BIPAD8's "System Info" window (click the  icon); communications are confirmed when the device information is displayed.

Programs and Firmware

Program or firmware files may be distributed from programmers to installers or from Crestron to dealers. Firmware upgrades are available from the Crestron website as new features are developed after product releases. One has the option to upload programs via the programming software or to upload and upgrade via the Crestron Toolbox. For details on uploading and upgrading, refer to the SIMPL Windows help file or the Crestron Toolbox help file.

SIMPL Windows

If a SIMPL Windows program is provided, it can be uploaded to the control system using SIMPL Windows or Crestron Toolbox.

Firmware

Check the Crestron website to find the latest firmware. (New users may be required to register to obtain access to certain areas of the site, including the FTP site.)

Upgrade CNX-BIPAD8 firmware via Crestron Toolbox.

1. Establish communication with the CNX-BIPAD8 and display the “System Info” window.
2. Select **Functions | Firmware...** to upgrade the CNX-BIPAD8 firmware.

Program Checks

Using Crestron Toolbox, display the network device tree (**Tools | Network Device Tree**) to show all network devices connected to the control system. Right-click on the CNX-BIPAD8 to display actions that can be performed on the CNX-BIPAD8.

Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

CNX-BIPAD8 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Device does not function.	Device is not communicating with the network.	Use Crestron Toolbox to poll the network. Verify network connection to the device.
	Device is not receiving power from a Crestron power source.	Use a Crestron power source. Verify connections.
	Device is not receiving sufficient power.	Use the Crestron Power Calculator to help calculate how much power is needed for the system.
NET LED does not illuminate.	Loose network connection.	Verify that cable plugged into NET port is secure.
	Improper Net ID.	Verify that the device Net ID matches Net ID software program. Refer to "Identity Code" on page 10 of this operations guide.
PWR LED does not illuminate.	Device is not receiving power.	Verify NET connection.
ROOM 1-8 LEDs do not illuminate.	Improper programming.	Confirm signal names and programming logic so that LEDs respond when functions are activated.
Audio not balanced or poor sound quality.	Room not set up.	Room must be set up from a touchpanel to adjust bass, treble, balance, etc.
Hum on audio.	Grounding problem.	Connect chassis ground wire.
Loss of functionality due to electrostatic discharge.	Improper grounding.	Check that all ground connections have been made properly.

Check Network Wiring

Use the Right Wire

In order to ensure optimum performance over the full range of your installation topology, Crestron Certified Wire and only Crestron Certified Wire may be used. Failure to do so may incur additional charges if support is required to identify performance deficiencies because of using improper wire.

Calculate Power

CAUTION: Use only Crestron power supplies for Crestron equipment. Failure to do so could cause equipment damage or void the Crestron warranty.

CAUTION: Provide sufficient power to the system. Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

When calculating the length of wire for a particular Cresnet run, the wire gauge and the Cresnet power usage of each network unit to be connected must be taken into consideration. Use Crestron Certified Wire only. If Cresnet units are to be daisy-chained on the run, the Cresnet power usage of each network unit to be daisy-chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is home-run from a Crestron system power supply network port, the Cresnet power usage of that unit is the Cresnet power usage of the entire run. The wire gauge and the Cresnet power usage of the run should be used in the following equation to calculate the cable length value on the equation's left side.

Cable Length Equation

$$L < \frac{40,000}{R \times P}$$

Where: L = Length of run (or chain) in feet
 R = 6 Ohms (Crestron Certified Wire: 18 AWG (0.75 MM²))
 or 1.6 Ohms (Cresnet HP: 12 AWG (4 MM²))
 P = Cresnet power usage of entire run (or chain)

Make sure the cable length value is less than the value calculated on the right side of the equation. For example, a Cresnet run using 18 AWG Crestron Certified Wire and drawing 20 watts should not have a length of run more than 333 feet (101 meters). If Cresnet HP is used for the same run, its length could extend to 1250 feet (381 meters).

NOTE: All Crestron certified Cresnet wiring must consist of two twisted pairs. One twisted pair is the +24V conductor and the GND conductor and the other twisted pair is the Y conductor and the Z conductor.

Strip and Tin Wire

When daisy-chaining Cresnet units, strip the ends of the wires carefully to avoid nicking the conductors. Twist together the ends of the wires that share a pin on the network connector and tin the twisted connection. Apply solder only to the ends of the twisted wires. Avoid tinning too far up the wires or the end becomes brittle. Insert the tinned connection into the Cresnet connector and tighten the retaining screw. Repeat the procedure for the other three conductors.

Add Hubs

Use of a Cresnet Hub/Repeater (CNXHUB) is advised whenever the number of Cresnet devices on a network exceeds 20 or when the combined total length of Cresnet cable exceeds 3000 feet (914 meters).

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron website (www.crestron.com/manuals). This link will provide a list of product manuals arranged in alphabetical order by model number.

List of Related Reference Documents

DOCUMENT TITLE
2-Series Control Systems Reference Guide
CAT5 Wiring Reference Guide

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876].

You can also log onto the online help section of the Crestron website (www.crestron.com/onlinehelp) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the CNX-BIPAD8, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an “Addendum” in the Download column.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact an authorized CRESTRON dealer. Only authorized CRESTRON dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.
2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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Operations Guide – DOC. 8160B
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