

Crestron **CNAMPX-2X60**  
2 Channel Professional Audio Amplifier

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Operations Guide



**CRESTRON**

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# 2 Channel Professional Audio Amplifier: CNAMPX-2X60

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## Description

### Functional Description

The CNAMPX-2X60 is a 2-channel, 60-Watts per channel audio amplifier. As part of a Cresnet system, the unit can accept remote power on/off commands and report ambient temperature within the enclosure. Temperature is available as Fahrenheit or Celsius and the signal can be used under program control to reduce the audio volume, activate an external cooling fan, or turn the unit off.

#### *Functional Summary*

- 2 Channels of Amplification
  - 60 Watts/Channel Stereo into 8 Ohm Load (90 Watts into 4 Ohms)
  - 200 Watts Bridged into 8 Ohms
  - Flat within +0, -0.1 dB from 20 Hz to 20 KHz
- 3-Position Mode Selection Switch: Stereo, Mono (Sum L+R), and Bridged
- Can Be Used In Many Applications, Including:
  - Local Stereo Amp For Remote Room
  - Sub-Amp For Home Theater's Passive Subwoofer

All audio connectors are gold plated to minimize oxidation, and three types of wire terminations can connect to the audio outputs. A highly efficient toroid transformer provides ample power to the two-channel amplifier module. No fans are required but if the unit is placed in a rack configuration, it **must** have a minimum of one rack space above and below for adequate ventilation.

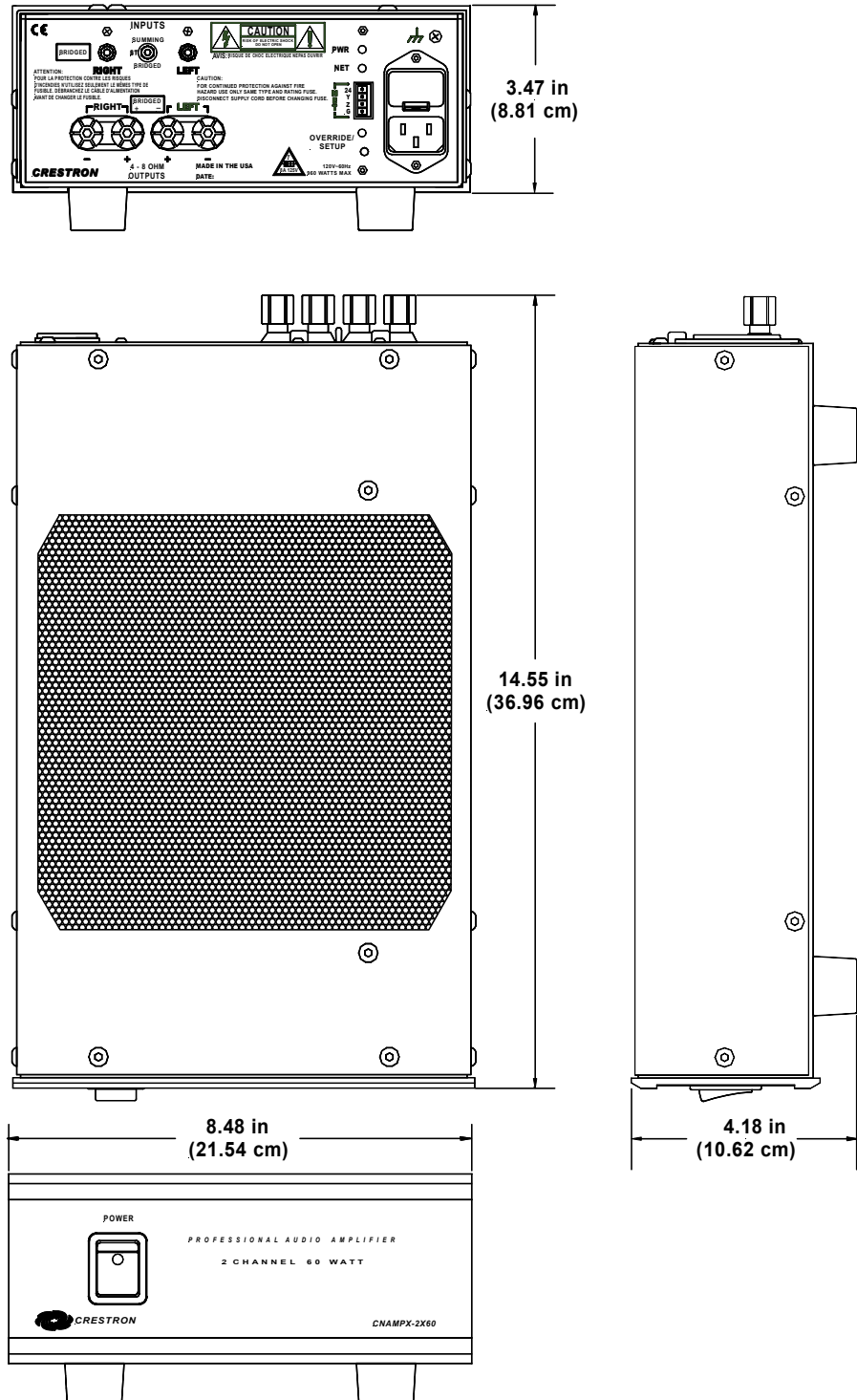
The CNAMPX-2X60 is also available as an international version. All of the features are identical with the exceptions of the international AC power requirements and power cord and the unit nomenclature of CNAMPXI-2X60. Throughout this operations guide, all references to CNAMPX-2X60 apply to both versions except where noted.

### Physical Description

The CNAMPX-2X60, shown below, is housed in a black enclosure with labeling on the front and rear panels. The enclosure consists of 13-gauge powder-coated steel

with stainless steel screws. The front panel contains the main power switch with built-in light-emitting diode (LED). All audio input and output, Cresnet system, and power connections are made on the rear panel. Four rubber feet on the base of the unit provide stability and prevent slippage.

*CNAMPX-2X60 Physical Views*



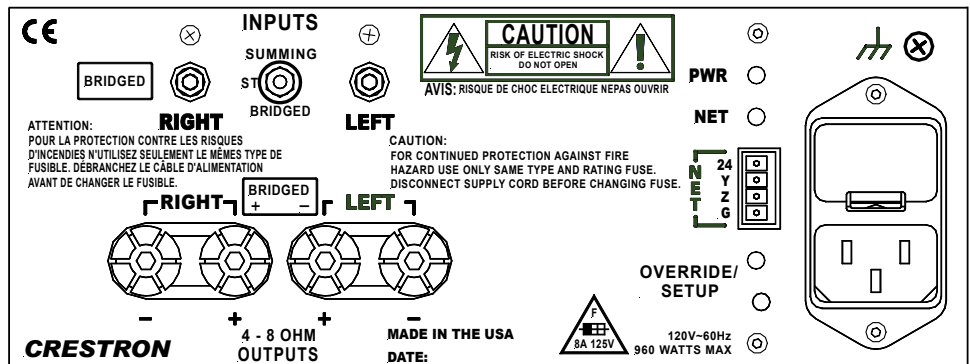
General Safety Precautions

- Read all information and instructions provided in this operations guide.
- Retain this operations guide.
- Heed all warnings and cautions printed in this operations guide.
- Follow all instructions in the order that they are provided.
- Do not use this unit near water.
- Clean only with a damp cloth.
- Do not block any of the ventilation openings. Install in accordance with the instructions in this operations guide.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
- Do not defeat the safety purpose of the polarized or ground-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. When the provided plug does not fit into an outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles (if provided), and the point where they exit the unit.
- Use only attachments/accessories specified in this operations guide.
- When an equipment rack is used, use caution when moving the rack/unit combination to avoid injury or tip-over.
- Unplug this unit during lightning storms or when unused for long periods of time.
- Refer all service to certified Crestron service personnel. Servicing is required when the unit has been damaged in a way, such as power cord or plug is damaged, liquid has been spilled or objects have fallen into the unit, the unit has been exposed to rain or moisture, does not operate normally, or has been dropped.

**CNAMPX-2X60 Rear Ports and Indicators**

A number of ports and indicators are provided on the rear of the CNAMPX-2X60. Refer to the illustration below and the descriptions on the next page.

*CNAMPX-2X60 Rear Panel*



**PWR Indicator**

This LED (green) is illuminated when 24VDC via the Cresnet connector is supplied to the CNAMPX-2X60.

**NET Indicator**

This LED (yellow) indicates that the SIMPL program currently loaded in the control system has a network device defined at the same NET ID code as the CNAMPX-2X60. The LED flashes when communication with the Cresnet system and the CNAMPX-2X60 is occurring.

 **(Chassis Ground)**

Use this chassis screw to connect the audio device(s) common ground(s) to the CNAMPX-2X60.

**NET**

The 4-pin network connector is used to connect the CNAMPX-2X60 to the Cresnet system. Refer to “Network Wiring” on Page 6 when making connections to the ports labeled NET.

**OVERRIDE/SETUP Button and Indicator**

The OVERRIDE/SETUP button is used to activate AC power to the CNAMPX-2X60 and activate the room outputs. This button functions only when 24VDC is applied to the NET connector. The LED (red) illuminates when the OVERRIDE is activated.

**Power Connector and Fuse Compartment**

The power connector provides AC operating power to the CNAMPX-2X60 via the supplied power cord. The fuse electrically protects the internal circuitry from power overloads and is located (a spare fuse is included) within the compartment above the power connector.

**INPUTS**

The two RCA connectors are typically used to connect unbalanced pre-amplified audio to the CNAMPX-2X60. The left channel audio is input to the LEFT connector (with the **white** center insulator); the right channel audio to the RIGHT connector (with the **red** center insulator).

**4 – 8 OHM OUTPUTS**

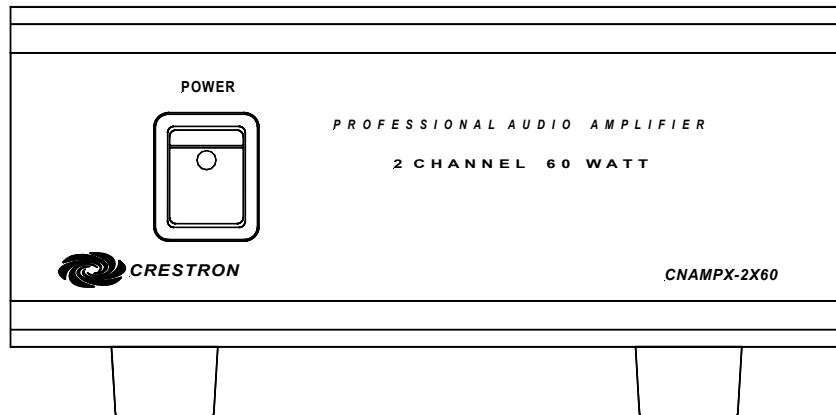
These two pairs of speaker dual-binding posts output the left and right amplified audio to the corresponding speakers. The audio positive posts have **red** screw-on caps and the audio negative posts have **black** screw-on caps. Each post is gold-plated and accepts bare wire, or spade lugs.



**CNAMPX-2X60 Front Panel Power Switch**

As shown below, the front panel of the CNAMPX-2X60 contains a power switch with an LED indicator. This two-position (ON/OFF) switch enables operating power to the CNAMPX-2X60 circuitry. It must be positioned to ON when the unit is to be controlled by the control system. When the Cresnet system 24VDC is applied to the NET connector on the rear panel and the switch is set to ON, AC power is applied to the unit and the LED (green) illuminates.

*CNAMPX-2X60 Front Panel*



**Leading Specifications**

The table below and continued on the next page provides a summary of leading specifications for the CNAMPX-2X60.

*Leading Specifications of the CNAMPX-2X60*

SPECIFICATION	DETAILS
Power Input Requirements: US version	120VAC +/-10%, 50-60Hz, 960 Watts
International version	230VAC +/-10%, 50-60Hz, 960 Watts
Cresnet Power Requirements	3 Watts (24VDC @ 0.125A)
Default NET ID	3F
Channels	2 Unbridged; 1 Bridged
Output Power - All channels driven, 20Hz to 20KHz, at rated Total Harmonic Distortion (THD).	60 Watts/Channel into 8-ohm loads 90 Watts/Channel into 4-ohm loads 200 Watts/Channel Bridged into 8-ohms
Input Impedance	28Kohms
Power Bandwidth - 3dB	3Hz to 50KHz
Frequency Response @ 1W 8ohm	Flat +0, -0.1dB from 20Hz to 20KHz
THD @ full power	0.03% or less
SMPTE I.M. Distortion	0.03% or less
Signal to Noise Ratio (S/N) "A" Weighted	>110dB
Gain	28dB
Damping Factor	>400
Channel Separation over full bandwidth	>100dB

Leading Specifications of the CNAMPX-2X60 (continued)

SPECIFICATION	DETAILS
Crestron Application Builder™	Version 1.1 or later <sup>1</sup>
SIMPL™ Windows®	Version 2.00 or later <sup>2&amp;3</sup>
2-Series Control System Update	Version C2-1001.CUZ or later <sup>4</sup>
CEN/CN-TVAV Update File	Version 51013V.UPZ or later <sup>5</sup>
CNMSX-AV/Pro Update File	Version 51011X.UPZ or later <sup>5</sup>
CNRACKX/-DP Update File	Version 51011W.UPZ or later <sup>5</sup>
ST-CP Update File	Version 40104S.UPZ or later <sup>5</sup>
Rack Space Required	2U
Environmental Temperature Range	41° to 104°F (5° to 40°C)
Environmental Humidity	10% to 90% RH (non-condensing)
Dimensions & Weight	Height: 4.18 in (10.62 cm) Width: 8.48 in (21.54 cm) Depth: 14.55 in (36.96 cm) Weight: 20 lb (9 kg) [approx.]

1. This device is supported in the Crestron Application Builder software, both in the Residential and Commercial versions. Contact Crestron Customer Service for licensing details.
2. The latest software versions can be obtained from the What's New page (SIMPL Windows and Crestron Application Builder) or Downloads page (SIMPLWIN and CNHOME Libraries) of Crestron's website ([www.crestron.com](http://www.crestron.com)). New users are required to register in order to obtain access to the FTP site. For further information, contact Crestron customer service.
3. Any software that uses the CNAMPX-16X60 symbol, including SIMPL Windows (version 2.00 or later) and the Crestron Application Builder (version 1.1 or later), may be used to program the CNAMPX-2X60. If used, only 2 audio channels will be utilized.
4. Filenames for 2-Series control system update files have a CUZ extension and can be obtained from the What's New page (Control Systems Update Files section) or Downloads page (OPSYS Library) of the Crestron website.
5. CNX update files are required for either CNMSX-AV/Pro or CNRACKX/-DP. Filenames for CNX update files have a UPZ extension and ST-CP files are in one EXE or zipped UPZ file. All can be obtained from the What's New page (Control Systems Update Files section) or Downloads page (OPSYS Library) of Crestron's website.

As of the date of manufacture, this unit has been tested and found to comply with specifications for CE marking.



**NOTE:** 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.

## Setup

### Network Wiring

**NOTE:** When making category 5 wire connections, refer to the latest revision of the Cresnet Mini network Cat 5 Interconnection Drawing (Doc. 5819). The document can be obtained from the Downloads page (CABLES and MANUAL Libraries) of Crestron's website ([www.crestron.com](http://www.crestron.com)). Search for CAT5.PDF files.

When calculating the wire gauge for a particular Cresnet run, the length of the run and the power factor of each network unit to be connected must be taken into

consideration. If Cresnet units are to be daisy-chained on the run, the power factor of each unit to be daisy-chained must be added together to determine the power factor of the entire chain. If the unit is a home-run from a Creston system power supply network port, the power factor of that unit is the power factor of the entire run. The length of the run in feet and the power factor of the run should be used in the following resistance equation to calculate the value on the right side of the equation.

*Resistance Equation*

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

Where: R = Resistance (refer to table below).  
 L = Length of run (or chain) in feet.  
 PF = Power factor of entire run (or chain).

The required wire gauge should be chosen such that the resistance value is less than the value calculated in the resistance equation. Refer to the table below.

*Wire Gauge Values*

RESISTANCE (R)	WIRE GAUGE
4	16
6	18
10	20
15	22
13	Doubled CAT5
8.7	Tripled CAT5

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**NOTE:** All 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.

**NOTE:** 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.

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## Rack Mounting

To install the CNAMPX-2X60 in a rack configuration, contact Middle Atlantic or an equivalent supplier for appropriate mounting hardware.

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

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



**CAUTION:** Due to the heat dissipation of the CNAMPX-2X60 (and all audio amplifiers in general), allow at least one free rack space above and below the CNAMPX-2X60 for proper circulation.

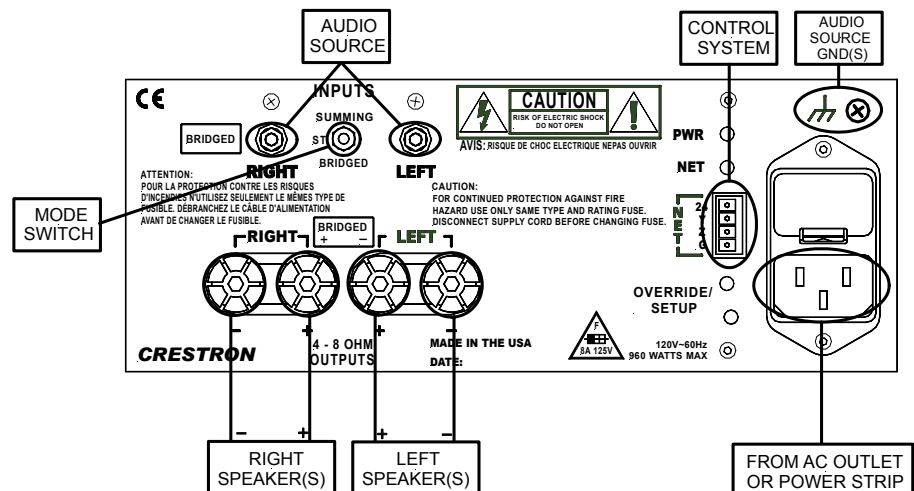
**NOTE:** Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit. (e.g., use of power strips).

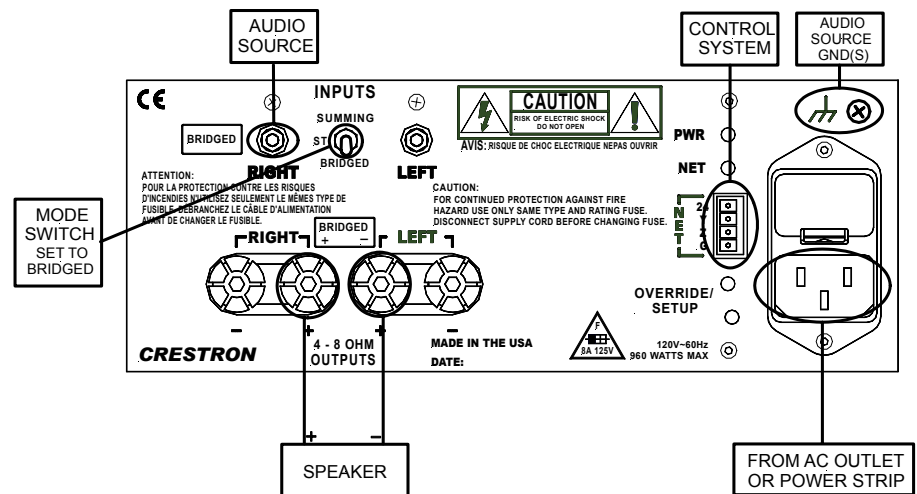
## Hookup

Refer to the hookup diagrams after this paragraph, and make the connections appropriate for the intended operating mode of the unit (stereo/mono or bridged). Other than making the power connection last, complete the connections in any order. The power cord is supplied, but RCA audio cables, speaker wire, or Cresnet cables are **not** provided.

**NOTE:** Refer to “Network Wiring” on page 6 when making connections to the ports labeled NET.

*Hookup Connections for the CNAMPX-2X60 in Stereo or Mono (Summed) Modes*



*Hookup Connections for the CNAMPX-2X60 in Bridged Mode***Identity Code**

Every equipment and user interface within the Cresnet system requires a unique NET ID. These codes are recognized by a two-digit hexadecimal number from 03 to FE. The NET ID of the unit must match an ID code specified in the SIMPL Windows program. The NET ID of the CNAMPX-2X60 is factory set to **3F**. The NET IDs of multiple CNAMPX-2X60 must all be unique and changed from a personal computer (PC) via SIMPL Windows or VisionTools™ Pro-e (VT Pro-e).

**NOTE:** VT Pro-e is a Windows compatible software package for creating Crestron touchpanel screen designs.

The method for changing the unit's NET ID is identical regardless of the software chosen. Complete the following steps to change the NET ID.

1. Attach only one of the CNAMPX-2X60s to the control system (verify that the software is running).
2. From the SIMPL Windows or VT Pro-e menu, select **Tools | Viewport** to open the Crestron Viewport.
3. From the Viewport menu, select **Functions | Set Network ID**. The software checks the baud rate and then opens the "Set Network ID" dialog box.
4. In the "Set Network ID" dialog box, select the CNAMPX-2X60 from the *Current Network Devices* text window.
5. From the *Choose the new network ID for the selected device (Hex):* text box, select the new Net ID for the CNAMPX-2X60.
6. Click **Set ID** to initiate the change. This will display the "ID command has been sent" dialog box.
7. In the "Command Complete" dialog box, click **OK**.
8. In the *Current Network Devices* text window, verify the new NET ID code.
9. In the "Set Network ID" dialog box, click **Close**.

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**NOTE:** The new NET ID code may also be verified by selecting **Diagnostic | Report Network Devices** in the Viewport.

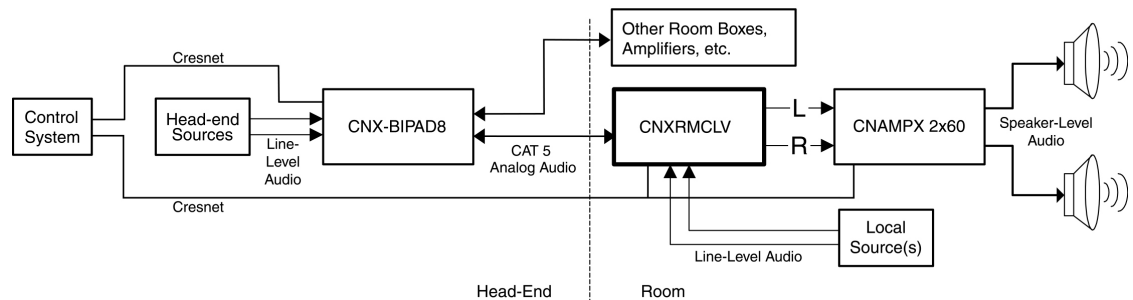
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10. Repeat this procedure for each CNAMPX-2X60 to be added to the Cresnet system.

## Typical Room Configuration

The following figure shows a typical head-end/room audio configuration using the CNAMPX-2X60.

**Bi-Directional CAT 5 Audio Distribution with In-Room Amplification**




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## Programming with SIMPL Windows

SIMPL (Symbol Intensive Master Programming Language) is an easy-to-use programming language that is completely integrated and compatible with all Crestron system hardware. The objects that are used in SIMPL are called symbols. SIMPL Windows offers drag and drop functionality in a familiar Windows® environment.

SIMPL Windows is Crestron's software for programming Crestron control systems. It provides a well-designed graphical environment with a number of workspaces (i.e., windows) in which a programmer can select, configure, program, test, and monitor a Crestron control system.

The next three sections describe a CNAMPX-2X60 within a SIMPL Windows program. The first section provides initial configuration information, the second section details the SIMPL symbol and the third section provides the location of the example program.

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**NOTE:** The following descriptions assume that the reader has knowledge of SIMPL Windows. If not, refer to the extensive help information provided with the software.

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## Configure CNAMPX-2X60 Program

To create a program with a CNAMPX-2X60 in the Configuration Manager of SIMPL Windows, refer to the table below for initial configuration information.

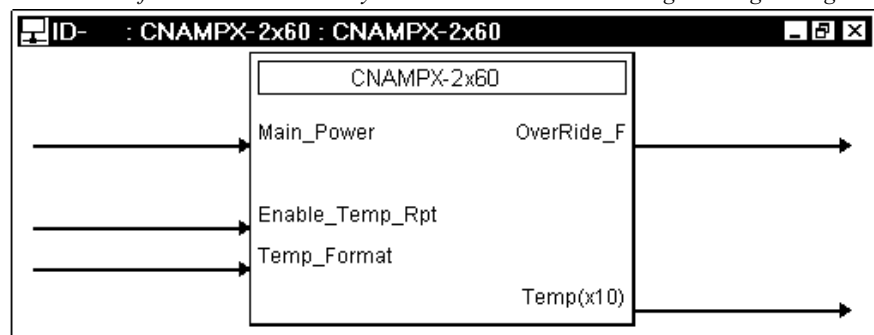
*Configure CNAMPX-2X60 Program*

DEVICE LIBRARY	SYMBOL REQUIRED	DROP WHERE	ADDITIONAL SETUP
Control Systems	Desired control system	System Views	Refer to the documentation supplied with the specific control system for additional setup information.
Cresnet Control Modules / Cresnet Audio Modules	CNAMPX-2X60	System Views, Cresnet Units	CHANGE NET ID (OPTIONAL) - Double-click on CNAMPX-2X60 (or single-click then right mouse-click) on CNAMPX-2X60. Select Configure. Select NET ID then select desired hexadecimal ID.

### CNAMPX-2X60 Symbol

The diagram below shows the CNAMPX-2X60 symbol in the SIMPL Windows Programming Manager. The two tables on the next page list the input and outputs, respectively, and their functional descriptions.

*Detail View of the CNAMPX-2X60 Symbol in SIMPL Windows' Programming Manager*



**NOTE:** Any software that uses the CNAMPX-16X60 symbol, including SIMPL Windows and Crestron AppBuilder, may be used to program the CNAMPX-2X60. If used, only 2 audio channels will be utilized and the following inputs and outputs of the CNAMPX-16X60 symbol are ignored; Rm\*\_En, Rm\_To\_Monitor, Rm\*\_Amp\_Fault, Rm\*\_Wire\_Fault, LeftSigLevel, and RightSigLevel.

**NOTE:** All signals listed in the following tables are *DIGITAL* signals unless noted otherwise. A digital signal can be high (logic level of 1), low (logic level of 0), and also have rising edge (when it goes from low to high) and falling edge (from high to low) transitions. Depending upon how the symbol was created, symbol inputs may work at the logic levels or on transitions.

*CNAMPX-2X60 Symbol Input Signal Descriptions*

INPUT	DESCRIPTION
Main_Power	This signal activates the main operating power to the CNAMPX-2X60 circuitry. High/1=power on Low/0=power off
Enable_Temp_Rpt	This signal selects whether or not the <b>Temp(x10)</b> analog output described in the next table is updated with the CNAMPX-2X60 enclosure temperature. High/1 = update temperature Low/0/default = temperature not updated
Temp_Format	This signal selects the format of the temperature to be High/1 = Celsius Low/0/default = Fahrenheit

*CNAMPX-2X60 Symbol Output Signal Descriptions*

OUTPUT	DESCRIPTION
OverRide_F	This signal indicates that the audio output override function is activated. High/1 = override active Low/0 = override not active
Temp(x10)	This <b>analog</b> signal corresponds to the ambient temperature within the CNAMPX-2X60 enclosure. The temperature reports approximately once every 2-seconds. (The <b>Enable_Temp_Rpt</b> entry in previous table must be driven high/1 for this to update.) The temperature reports in tenths of a degree (eg, 725 corresponds to 72.5 degrees).

## Example Program

An example program for the CNAMPX-2X60 is available from the Downloads page (EXAMPLES Library) of Crestron's website ([www.crestron.com](http://www.crestron.com)). Search for CNAMPXE1.ZIP that contains the example program, associated files and a README.TXT file that describes the program. New users are required to register in order to obtain access to the FTP site.

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**NOTE:** Any software that uses the CNAMPX-12X60 symbol, including SIMPL Windows and Crestron AppBuilder, may be used to program the CNAMPX-2X60. If used, only 2 audio channels will be utilized.

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## Problem Solving

### Troubleshooting

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

#### *CNAMPX-2X60 Troubleshooting*

<b>TROUBLE</b>	<b>POSSIBLE CAUSE(S)</b>	<b>CORRECTIVE ACTION</b>
No functions and no indicators illuminate.	CNAMPX-2X60 is not receiving VAC power.	Verify that POWER switch is positioned to ON, AC power cord is plugged into CNAMPX-2X60 power port and cord is plugged into a good power source. Check and replace defective AC Power Fuse.
	CNAMPX-2X60 is not receiving 24VDC Cresnet power.	Verify that 24VDC is present at cable plugged into NET port.
Green PWR LED does not illuminate.	CNAMPX-2X60 in SIMPL Windows program not properly configured.	Verify SIMPL Windows CNAMPX-2X60 program.
	CNAMPX-2X60 is not receiving 24VDC Cresnet power.	Verify that 24VDC is present at cable plugged into NET port.
Yellow NET LED does not illuminate.	Improper NET ID.	Verify that CNAMPX-2X60 NET ID matches NET ID in software program.
Hum on audio.	Grounding problem.	Either connect or remove chassis ground wire.
Audio is supplied to room regardless of programming.	Override/Setup function selected.	Press OVERRIDE/SETUP button on rear panel of CNAMPX-2X60.
Audio distorted or not present at room output.	Audio input cable(s) loose or not connected.	Verify that audio input cables plugged into INPUTS ports are secure.
	Room output (speaker) wire(s) loose or not connected.	Verify that speaker wires connected to OUTPUTS terminals are secure.

## AC Power Fuse Replacement

The AC power fuse replacement of the CNAMPX-2X60 does **not** require cover removal and can be performed with the unit installed in an equipment rack.

CAUTION: Refer to the table below. Use only the listed fuse for each corresponding CNAMPX model and version to replace a defective fuse. The fuse is available commercially but if a replacement fuse cannot be obtained, contact Crestron customer service.

CNAMPX MODEL	FUSE SIZE	CURRENT RATING	VOLTAGE RATING
	DIAM. X LENGTH		
CNAMPX-2X60 <sup>1</sup>	1/4 in x 1-1/4 in	8A	125V (or 250V)
CNAMPXI –2X60 <sup>2</sup>	5mm x 20mm	5A	250V
The characteristics of all listed fuses are FAST-ACTING.			
<sup>1</sup> The fuse holder of non-international versions contains a spare fuse. Verify that the spare fuse is the same type, size and rating as the defective and use as the replacement. If the spare fuse is used as the replacement, obtain the same type, size and rating fuse to be used as the spare as soon as possible.			
<sup>2</sup> The fuse holder of international versions contains two active fuses. Verify the defective fuse(s) and replace as necessary.			

## Further Inquiries

If after reviewing this Operations Guide for the CNAMPX-2X60, you cannot locate specific information or have questions, please take advantage of Crestron's award winning customer service team by calling:

- In the US and Canada, call Crestron's corporate headquarters at 1-888-CRESTRON [1-888-273-7876] or 1-201-767-3400.
- In Europe, call Crestron International at +32-15-50-99-50.
- In Asia, call Crestron Asia at +852-2341-2016.
- In Latin America, call Crestron Latin America at +5255-5093-2160.
- In Australia, call Crestron Pacific at +613-9480-2999.

For local support from exclusive Crestron factory-trained personnel in New Zealand, call Amber Technologies at +649-410-8382.

## Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the CNAMPX-2X60, additional information and programming examples 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.

The Downloads page of the Crestron website ([www.crestron.com](http://www.crestron.com)) directs the reader to the location and description of each update. Check the site periodically for update availability and its subjective value. New users are required to register in order to obtain access to the FTP site.

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