

Crestron **Adagio**® **AAE**

Audio Expander

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Operations Guide



This document was prepared and written by the Technical Documentation department at:



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## Important Safety Instructions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 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. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your 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, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, 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.
- Disconnect power prior to connecting or disconnecting equipment.
- Do not install in direct sunlight.
- The apparatus must be installed in a way that the power cord can be removed either from the wall outlet or from the device itself in order to disconnect the mains power.
- Prevent foreign objects from entering the device.

### WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE. THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING. OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THE APPARATUS.

### WARNING:

TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE COVER. THERE ARE NO USER SERVICEABLE PARTS INSIDE. ONLY QUALIFIED SERVICE PERSONNEL SHOULD PERFORM SERVICE.



AVIS: RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

### WARNING:

THIS IS AN APPARATUS WITH CLASS I CONSTRUCTION. IT SHALL BE CONNECTED TO AN ELECTRICAL OUTLET WITH AN EARTHING GROUND TERMINAL.

### IMPORTANT:

The AAE can be used with Class 2 output wiring.

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# Audio Expander: Adagio AAE

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## Introduction

The AAE (120 VAC version) and AAEI (230 VAC version) are functionally identical, except for the power requirement. For simplicity within this guide, AAE is used except where noted.

## Features and Functions

- High performance audio distribution, multi-channel amplifier
- Out-of-the-box functionality (no programming required) if used with an Adagio® system
- 6 room audio distribution | 10 stereo line inputs
- Independent software-driven room select, room on-off, volume, bass, treble, balance, loudness, stereo/mono and mute controls available on every room output
- Integrated 45 watts x 12 channel power amplifier
- Expands Adagio systems to support up to 24 rooms
- Works with any Crestron 2-Series control system
- Built-in Cresnet® distribution and power supply
- LOOP-THRU for connection to Adagio control unit or 2-Series control system and additional AAE units

## Multi-Room Audio Routing

Built around a 10 x 6 stereo matrix switcher, the AAE delivers professional quality audio signal routing to six amplified room outputs from any of 10 stereo sources. Multiple AAE units may be combined to handle as many as 24 rooms.

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**NOTE:** Room outputs are expandable by cascading the inputs of multiple AAE units using standard RCA interconnect cables. Crestron recommends cascading no more than four (4) AAE units. Adagio® systems may utilize up to three (3) AAE units in addition to the main unit. 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 assistance.

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## Preamp Controls

Independent software driven volume, bass, treble, balance, loudness, and mute controls are available on every room output, enabling listeners in each room to tailor the sound to individual taste right from the room touchpanel or keypad. Additional features include input gain compensation to assure consistent levels between input sources, plus programmable scaling factor to define minimum and maximum levels for each room, and mono summing to accommodate monophonic speaker systems. Front panel pushbuttons are included for room selection when using the AAE in an Adagio system.

### **Multi-Channel Power Amplifier**

The AAE's built-in 12-channel power amplifier delivers a robust 45 watts per channel to support up to six separate pairs of speakers. Mute relays on every output ensure silent muting, and provide protection against "thumping" on power-up.

### **High End Performance**

An advanced Class G amplifier topology produces the great sound of a classic Class AB design with near digital efficiency. A massive MOH core toroidal power transformer directs pure, continuous power to each channel, achieving exceptional dynamic range and low distortion sound quality in every room. Gentle power-up is achieved through a "soft start" inrush current limiting circuit, and quick response output protection on each channel prevents failure caused by speaker line faults and overheating.

### **Easy, Flexible Setup**

Together with any 2-Series control system and choice of keypads and touchpanels, the AAE provides an extensively customizable audio control solution. Programming a complete audio distribution system is a quick and simple task using Crestron SystemBuilder™ software. For Adagio systems, no programming is required at all, with plug-and-play support for a single AAE, or simplified setup for up to three AAEs using Crestron Adagio Composer software.

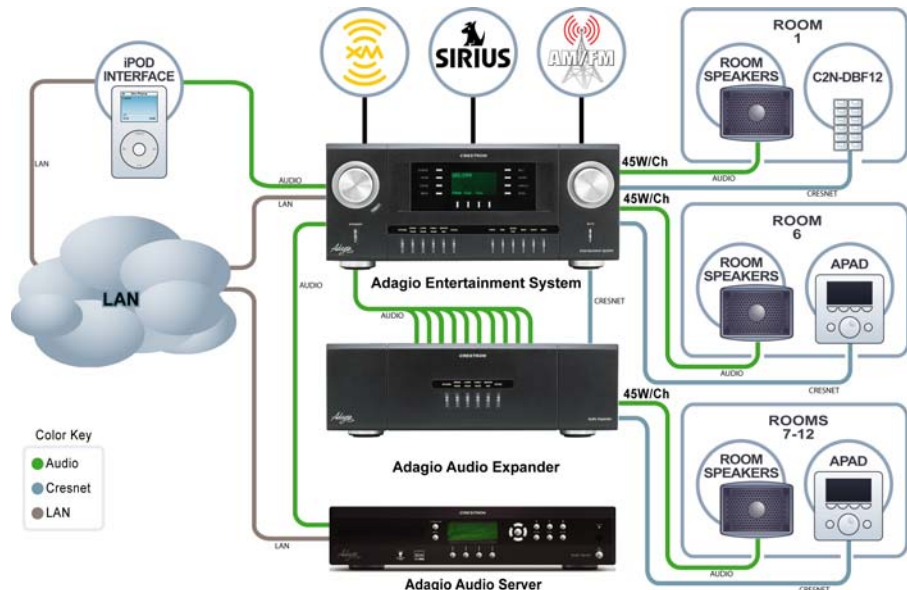
### **Built-in Cresnet Distribution**

Six powered Cresnet ports are built into the AAE, providing for the termination of keypads and other Crestron devices without necessitating an external distribution block or power supply.

## **Applications**

The following diagram shows how an Adagio home entertainment system, using out-of-the-box functionality, might be configured to include the Adagio AAE Audio Expander.

*Adagio System Showing the AAE in a Typical Application*



## Specifications

Specifications for the Adagio AAE Audio Expander are listed in the following table.

### *Adagio AAE Audio Expander Specifications*

SPECIFICATION	DETAILS
Audio	
Volume Gain	-80 dB to +20 dB in 1 dB steps
Mute	-100 dB (electronic), -120 dB (relay)
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	20 Hz to 20 kHz ±0.75 dB
S/N Ratio	100 dB, 20 Hz to 20 kHz A-weighted
THD+N	0.05%, 20 Hz to 20 kHz
Stereo Separation	>75 dB
Power	
Main Power Consumption	7 Amps @ 120 Volts AC, 50-60 Hz (AAE) 3.5 Amps @ 230 Volts AC, 50 Hz (AAEI)
Available Cresnet Power	50 Watts (2.08 Amps @ 24 Volts DC)
Default NET ID	31
Environmental	
Temperature	41° to 104°F (5° to 40°C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation (all channels loaded to 1/8 full power)	700 BTU/hr @ 8 ohms 800 BTU/hr @ 4 ohms
Enclosure	Black metal with molded ABS/PC front panel; Freestanding, side ventilation should not be restricted
Dimensions	
Height	5.64 in (14.33 cm)
Width	17.16 in (43.59 cm)
Depth	18.08 in (45.92 cm)
Weight	36.6 lbs (16.2 kg)

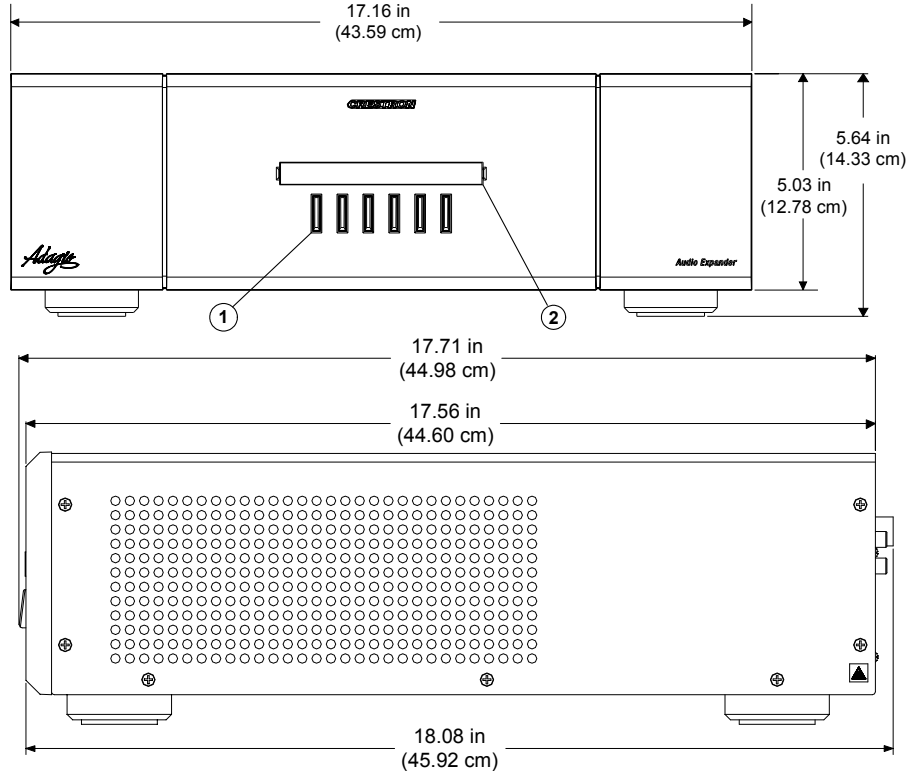
### Physical Description

This section provides information on the connections, controls, and indicators available on your Adagio AAE Audio Expander.

#### Adagio AAE Audio Expander Physical View



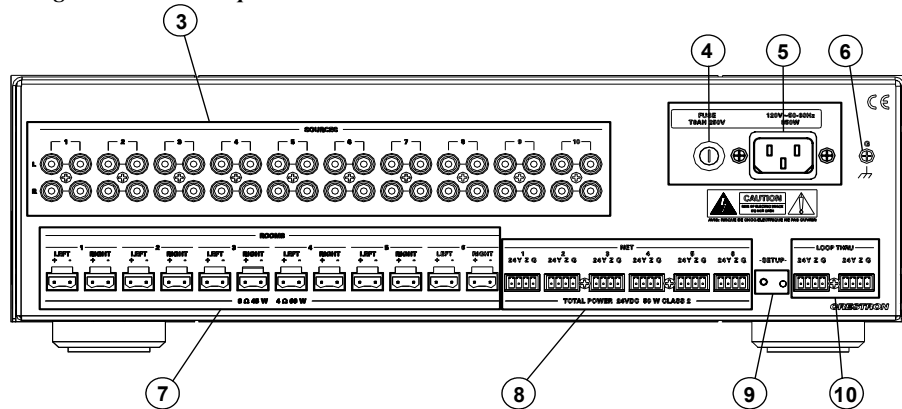
#### Adagio AAE Audio Expander Overall Dimensions




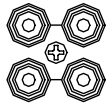

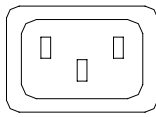

**NOTE:** Cable connections can extend the overall depth of the AAE by approximately two to three inches.



Adagio AAE Audio Expander-Rear View

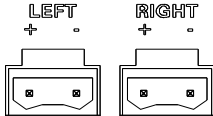
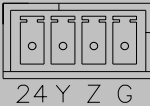
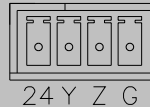


Connectors, Controls and Indicators

#	CONNECTORS <sup>1</sup> , CONTROLS, & INDICATORS	DESCRIPTION
1	ROOM BUTTONS 	(6) Pushbuttons with green LEDs and backlit labeling strip, select room(s) to adjust.
2	ROOM NAME LABEL	Indicates the rooms controlled by the room buttons. White, LED backlighting, adjustable via control system. Use Crestron Engraver software to print custom labels or use the included labels.
3	SOURCES (1-10) 	(40) RCA female providing (10) unbalanced stereo line level audio inputs, and (10) parallel loop-thrus; Maximum input: 3.2 V <sub>rms</sub> (flat); Input impedance: 47 kΩ; Connect to audio loop-thru from an Adagio system or other source devices, with loop-thru to additional AAE units.
4	FUSE 	Main fuse, T8AH (for AAE); (1/4" x 1-1/4", 250V, 8A, time-lag, high-rupture rated) <sup>2</sup> ; Main fuse: T4AH (for AAEI); (5mm x 20mm, 250V, 4A, time-lag, high-rupture rated) <sup>2</sup> .
5	120V~50-60Hz <sup>3</sup> 	(1) IEC Male; mates with removable power cord (included) <sup>4</sup> .
6	Ground 	6-32 screw, chassis ground lug.

(Continued on following page)

Connectors, Controls and Indicators (continued)

#	CONNECTORS <sup>1</sup> , CONTROLS, & INDICATORS	DESCRIPTION
7	<p>ROOMS (1-6)</p> 	<p>(12) 2-pin 7.62 mm detachable terminal blocks, power amplifier outputs; Wire size: 12 AWG maximum; Output power (per channel): 45 Watts @ 8 ohms, 60 Watts @ 4 ohms.</p>
8	<p>NET (1-6)</p> 	<p>(6) 4-pin 3.5 mm detachable terminal blocks; Cresnet distribution ports, provide data and power for keypads and other Cresnet devices. Pin 1 (24) Power 24VDC Cresnet Pin 2 (Y) Data Pin 3 (Z) Data Pin 4 (G) Ground</p>
9	<p>SETUP</p>	<p>(1) Miniature pushbutton and red LED for touch-settable ID (TSID).</p>
10	<p>LOOP THRU</p> 	<p>(2) 4-pin 3.5mm detachable terminal blocks; Cresnet loop-thru ports; Y, Z, and G paralleled with <b>NET</b> ports 1 through 6; Connect to an Adagio system or other 2-Series control system, and additional AAE units. Pin 1 No Connection Pin 2 (Y) Data Pin 3 (Z) Data Pin 4 (G) Ground</p>

1. Interface connectors for **NET**, **LOOP THRU**, and **ROOMS** ports are provided with the unit.
2. Refer to "Fuse Replacement" on page 9 for additional details.
3. The AAEI requires 3.5 Amps @ 230 Volts AC, 50 Hz.
4. Refer to "Hardware Hookup", which begins on page 8 for additional cord details.

## Industry Compliance

This product is Listed to applicable UL Standards and requirements by Underwriters Laboratories Inc.



As of the date of manufacture, the Adagio AAE Audio Expander has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labeling.



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**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.

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.
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## Setup

### Network Wiring

When wiring the network, consider the following:

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

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**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 (<http://www.crestron.com/calculators>).

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- For larger networks, Use a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality.

For more details, refer to “Check Network Wiring” on page 16.

### Identity Code

The Net ID of the Adagio AAE Audio Expander has been factory set to 31. The Net IDs of multiple Audio Expanders in the same system must be unique. Net IDs are changed from a personal computer (PC) via the Crestron Toolbox™ (refer to “Establishing Communication” on page 14).

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.

### Hardware Hookup

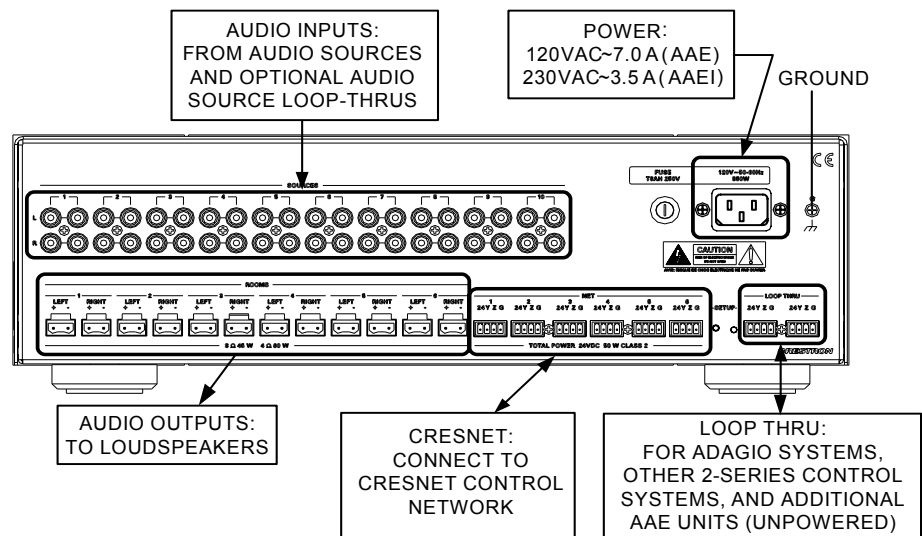
#### *Connect the Device*

Make the necessary connections as called out in the illustration that follows this paragraph. Refer to “Network Wiring” on page 8 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

When making connections to the Adagio AAE Audio Expander, consider the following:

- Use Crestron power supplies for Crestron equipment.
- The included cable cannot be extended.

*Hardware Connections for the Adagio AAE Audio Expander*



**NOTE:** The Adagio AAE Audio Expander is capable of distributing audio to a maximum of six rooms. It is possible to expand your system to a maximum of twenty-four rooms by adding multiple Audio Expanders.

**NOTE:** External audio sources should be connected to the AAE and looped through to your Adagio system.

**NOTE:** The AAEI (International version) requires a power cord that is in compliance with the country’s national and local electrical code. Each inner wire in the cord should be at least 16 AWG or 1.5 mm<sup>2</sup> and rated for at least 500V. The temperature rating of the cord should be at least 60°C. The cord length should be 1.5 meters to 2 meters.

**NOTE:** Ensure the unit is properly grounded.

**Fuse Replacement**

If the AAE does not power up when it is plugged into an AC outlet, the fuse may need to be replaced. The fuse holder is located on the top-right of the rear panel (next to the power cord connector). To replace the fuse:

- Disconnect power to the AAE.
- Use a flat head screwdriver to push in the fuse holder.
- While pushing in the fuse holder, turn screwdriver counterclockwise until the fuse holder pops out.
- Remove the fuse from the fuse holder and insert a new fuse.

**CAUTION:** Only use the specified type of fuse when replacing a blown fuse. Failure to do so may cause damage to the AAE.

AAE MODEL	REQUIRED FUSE TYPE
AAE (US & Canada)	T8AH (1/4" x 1/4", 250V, 8A, time-lag, high-rupture rated)
AAEI (International/230VAC)	T4AH (5mm x 20mm, 250V, 4A, time-lag, high-rupture rated)

- Insert the fuse holder into the AAE.
- Push in the fuse holder with a flat head screwdriver. While pushing in the fuse holder, turn the screwdriver clockwise until the fuse holder sets into place.
- Push in the fuse holder a little further and turn the screwdriver clockwise until the fuse holder locks in place.
- Connect power to the AAE.

### **Label the Buttons**

Use Crestron Engraver software to create and print custom labels for the Adagio AAE Audio Expander's front panel room buttons. Crestron recommends printing on 100-pound paper. Paper less than 100 pounds will tend to crumple while sliding in, while paper more than 100 pounds may not fit.

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**NOTE:** When printing custom labels, some experimentation may be required for optimum results.

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To install the label:

- Remove the label cover with a small, flat-head screwdriver. The label cover is magnetically attached to the front panel of the AAE.
- Slide out any existing labels from the label cover.
- Slide the new labels into the holders on the label cover.
- Install label cover on to AAE.

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## Programming Software

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### 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.

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### 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.

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Crestron has developed an assortment of Windows®-based software tools to develop a Cresnet system. The following are the minimum recommended software versions for the PC:

#### Software

TASK	REQUIRED SOFTWARE VERSION
Simplified programming with wizards for Adagio systems (optional but recommended)	Adagio Composer; part of Crestron SystemBuilder™ version 3.0 or later with SystemBuilder Templates version 3.0 or later. Refer to software release notes or Crestron website for other required Crestron software packages.
Program control system to operate Adagio AAE Audio Expander	SIMPL Windows version 2.07.12 or later with SIMPL+ Cross Compiler version 1.1. Also requires Crestron Database version 18.0.1 or later.
Upload program and firmware	Crestron Toolbox 1.02.17.005 or later.
Create labels for front panel buttons	Crestron Engraver 2.7.0.1 or later. Requires Crestron Database version 18.0.1 or later.

**NOTE:** Your Adagio System should be operating with the latest software in order to ensure correct functionality with the AAE.

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### Programming with Adagio Composer

To add additional Crestron sources, third party sources, and interfaces use Adagio Composer. Adagio Composer is part of the Crestron SystemBuilder application which can be downloaded from the Crestron website.

Adagio Composer provides a quick method of configuring a custom audio distribution system without prior programming knowledge. For additional details, download Adagio Composer from the Crestron website and examine the extensive help file.

To create more advanced systems that include non-audio distribution devices such as lighting and HVAC, use Crestron SystemBuilder or SIMPL Windows.

## 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 Adagio AAE Audio Expander, it is recommended to use SystemBuilder for configuring the system.

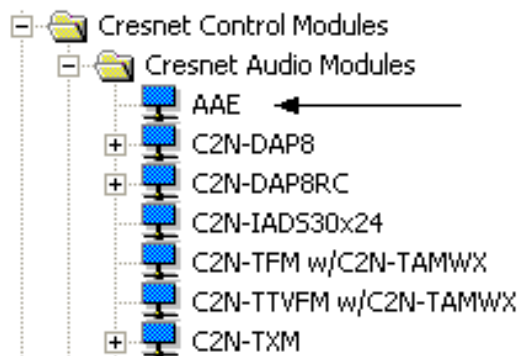
SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate, but equally important "Managers".

### Configuration Manager

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

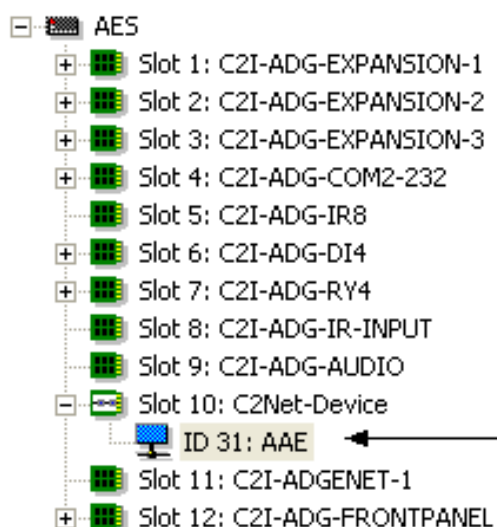
- To incorporate the Adagio AAE Audio Expander into the system, drag the Audio Expander from the Cresnet Control Modules | Cresnet Audio Modules folder of the *Device Library* and drop it in the *System Views*.

#### Locating the Adagio AAE Audio Expander 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.

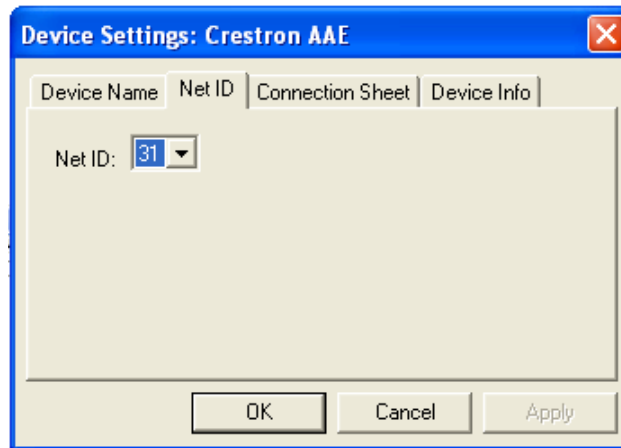
#### C2Net Device, Slot 10





- Additional AAE 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.

“AAE Device Settings” Window



- The ID code specified in the SIMPL Windows program must match the Net ID of each unit. Refer to “Identity Code” on page 8.

### Programming Manager

Programming 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*. A description for each signal in the symbol is described in the SIMPL Windows help file (F1).

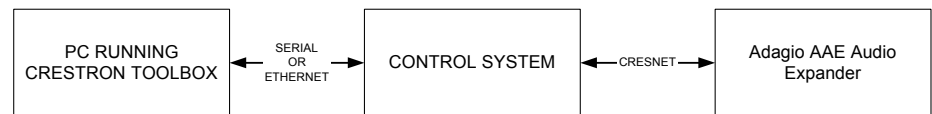
## Uploading and Upgrading


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 Adagio AAE Audio Expander; refer to the Crestron Toolbox help file for details. There is a single method of communication: indirect communication.

#### *Indirect Communication*



- Adagio AAE Audio Expander connects to control system via Cresnet.
- Establish communication between the PC and the control system as described in the latest version of the 2-Series Reference Guide (Doc. 6256), which is available from the Crestron website (<http://www.crestron.com/manuals>).
- Use the Address Book in Crestron Toolbox to create an entry for the AAE using the expected communication protocol (Indirect). Select the Cresnet ID of the AAE and the address book entry of the control system that is connected to the AAE.
- Display the AAE'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 AAE firmware via Crestron Toolbox.

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

## Program Checks

For Cresnet connections, 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 AAE to display actions that can be performed on the AAE.

## 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.

#### *Adagio AAE Audio Expander Troubleshooting*

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
AAE 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 the provided 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.
AAE does not respond to remote devices	Remote device is not receiving power from AAE.	Verify connections.
No audio signal detected.	Room or group is muted or disabled.	Turn off mute function or enable the room/group.
	Volume is turned down.	Raise volume to an audible level.
	Speakers are not properly connected.	Verify speaker connections.
	Source is not selected/properly connected.	Verify that source is selected and properly connected.

### 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 (<http://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 a 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 MM<sup>2</sup>))  
 or 1.6 Ohms (Cresnet HP: 12 AWG (4 MM<sup>2</sup>))  
 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. If Cresnet HP is used for the same run, its length could extend to 1250 feet.

**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**

For larger networks (i.e., greater than 28 network devices), it may become necessary to add a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality throughout the network. Also, for networks with lengthy cable runs it may be necessary to add a Hub/Repeater after only 20 devices.

**Reference Documents**

The latest version of all documents mentioned within the guide can be obtained from the Crestron website (<http://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

**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 the Crestron corporate headquarters at 1-888-CRESTRON [1-888-273-7876]. For assistance in your local time zone, refer to the Crestron website ([www.crestron.com/offices](http://www.crestron.com/offices)) for a listing of Crestron worldwide offices.

You can also log onto the online help section of the Crestron website ([www.crestron.com/onlinehelp](http://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 AAE, 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.

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## 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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