NILES®

INSTALLATION GUIDE

ELECTRONIC STEREO VOLUME CONTROL

EVC-100

CONGRATULATIONS!

Thank you for choosing the **EVC-100 Electronic Stereo Volume Control** from Niles. With proper installation and operation, you should enjoy years of trouble-free use.

Niles manufactures the industry's most complete line of custom installation components and accessories for audio/video systems. To see the complete Niles product assortment, visit us on the internet at: **www.nilesaudio.com**.

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INTRODUCTION

The Niles EVC-100 is a wall-mount, infrared-sensing, push button-style, stereo loudspeaker electronic volume control with muting and impedance magnifying in a single, easy-to-use component. It is designed to provide volume control of a loudspeaker pair (including muting and unmuting functions) and IR control of your A/V system from a remote location. The EVC-100 adjusts the volume of connected loudspeakers by attenuating the amplified audio signals. To assure minimal dissipation of internal power with virtually no power wasted as heat, Niles volume controls use autoformers instead of L-pads as the volume-controlling element.

The EVC-100 is also an impedance-magnifying (IM) volume control. Unlike other brands, it has additional autoformer windings that magnify the impedance of connected speakers, while allowing all 12 steps to adjust the volume of the sound. A set of jumpers next to the speaker connections allows selection of the correct impedance setting.

With the volume control providing impedance protection for your amplifier, you can create systems with no additional impedance-matching devices between the volume control and the amplifier. Installed in a remote room location, the EVC-100 receives the IR commands transmitted from your existing handheld remotes in that room. The commands are carried via a Cat-5 data cable to a main system unit in another room, and instantly “repeated” to your A/V equipment.

INTRODUCTION *CONTINUED*

The EVC-100 is compatible with all current Niles infrared systems. It may be used along with, or as an alternative to, the Niles TS100, WS100, MS100, MS200, and CS100 IR sensors or the IntelliPad®.

To complete a Niles IR repeating system, you will need the following components:

- *IR Main System Unit – Model MSU140, MSU250, MSU480, or MSU440Z.*
- *IR Sensors/Keypads – Models WS100, TS100, MS100, MS200, CS100, MVC100IR, EVC-100, or the IntelliPad.*
- *IR Flashers – Models MF1, MF1VF, MF2, MF2VF, or the IRB1.*
- *(Optional) An IR sensor expansion hub, the Model IRH610, for additional sensor inputs to your system.*

FEATURES AND BENEFITS

The EVC-100 offers a number of improvements over other volume controls:

- *Fully factory-tested universal system that is compatible with virtually all brands of A/V equipment and remote controls.*
- *Push button-type electronic control that compliments Niles CI keypads and modern lighting systems.*
- *A universal impedance-magnifying design enables the EVC-100 to act as both a stereo and an impedance-magnifying volume control.*
- *Loudspeaker impedance magnification by a factor of one, two, or four, while maintaining a 12-position adjustment range, regardless of how much impedance magnification is used.*
- *Override function allows page/doorbell signals to override the music at a preset level, even with the volume turned all the way down in mute state.*
- *Default Volume feature guards against high volume un-mutes.*
- *Sleep Timer for delayed EVC-100 muting with four possible count-down time periods.*
- *Status circuit monitors voltage from the source (i.e., trigger voltage of A/V receiver) for automatic mute control when a zone or system is first turned on.*
- *Precision autoformers provide superior sonic performance, exceeding the audio quality of non-impedance magnifying volume controls.*

FEATURES AND BENEFITS *CONTINUED*

- *Isolated left- and right-channel grounds ensure safety with any amplifier*
- *May be used with 4-, 6-, or 8-ohm speaker systems*
- *UL-rated to comply with all local building codes*
- *Ideal for home and commercial sound installations*
- *Available colors: almond, black, bone, and white*
- *Fits into a standard 18-cubic-inch one-gang junction box*
- *Included remote control also provides volume control and mute and un-mute functions*
- *Power handling: 100 watts (rms) per channel*
- *Frequency response: 20 Hz to 20 kHz, ± 0.5 dB @ 8 ohms*
- *Two-year limited warranty*

TECH TIP

Some loudspeakers have a selectable impedance. Before proceeding, please confirm the selected impedance is properly set for the system being installed.

INSTALLATION CONSIDERATIONS

CALCULATING THE IMPEDANCE MAGNIFICATION SETTING

Use the following instructions and accompanying charts to select the correct switch setting for the number and type of loudspeakers in your system.

CAUTION! Every loudspeaker pair in the system must be connected to an impedance-magnifying volume control and set to the same magnification value.

1. *Count the number of pairs of 4-ohm loudspeakers and the number of pairs of 8-ohm loudspeakers to be connected. Count pairs of 6-ohm loudspeakers as 4-ohm pairs. If desired, use our online impedance calculator at: http://www.nilesaudio.com/techsupport/calculator/*
2. *Determine whether the amplifier should see a 4-ohm load or an 8-ohm load. This information is typically found in the amplifier owner's manual.*
3. *Refer to **Figures 1 and 2** to determine the impedance magnification position. Use **Figure 1 on page 7** if your amplifier can drive a 4-ohm load or Figure 2 on page 8 for an 8-ohm load.*
4. *On each EVC-100 control, set both impedance magnification jumpers to the same position (i.e., 1x, 2x, or 4x), as shown in **Figure 3 on page 9**.*

Figure 1. EVC-100 impedance magnification settings for an amplifier driving a 4-ohm load.

AMPLIFIER MINIMUM SPEAKER LOAD IS 4 OHMS

8 OHM Speaker Pairs

4 OHM Speaker Pairs

	0	1	2	3	4	5	6	7	8
0		1X	1X	4X	4X	4X	4X	4X	4X
1	1X	2X	2X	4X	4X	4X	4X		
2	2X	4X	4X	4X	4X				
3	4X	4X	4X						
4	4X								

(CONTINUED ON NEXT PAGE)

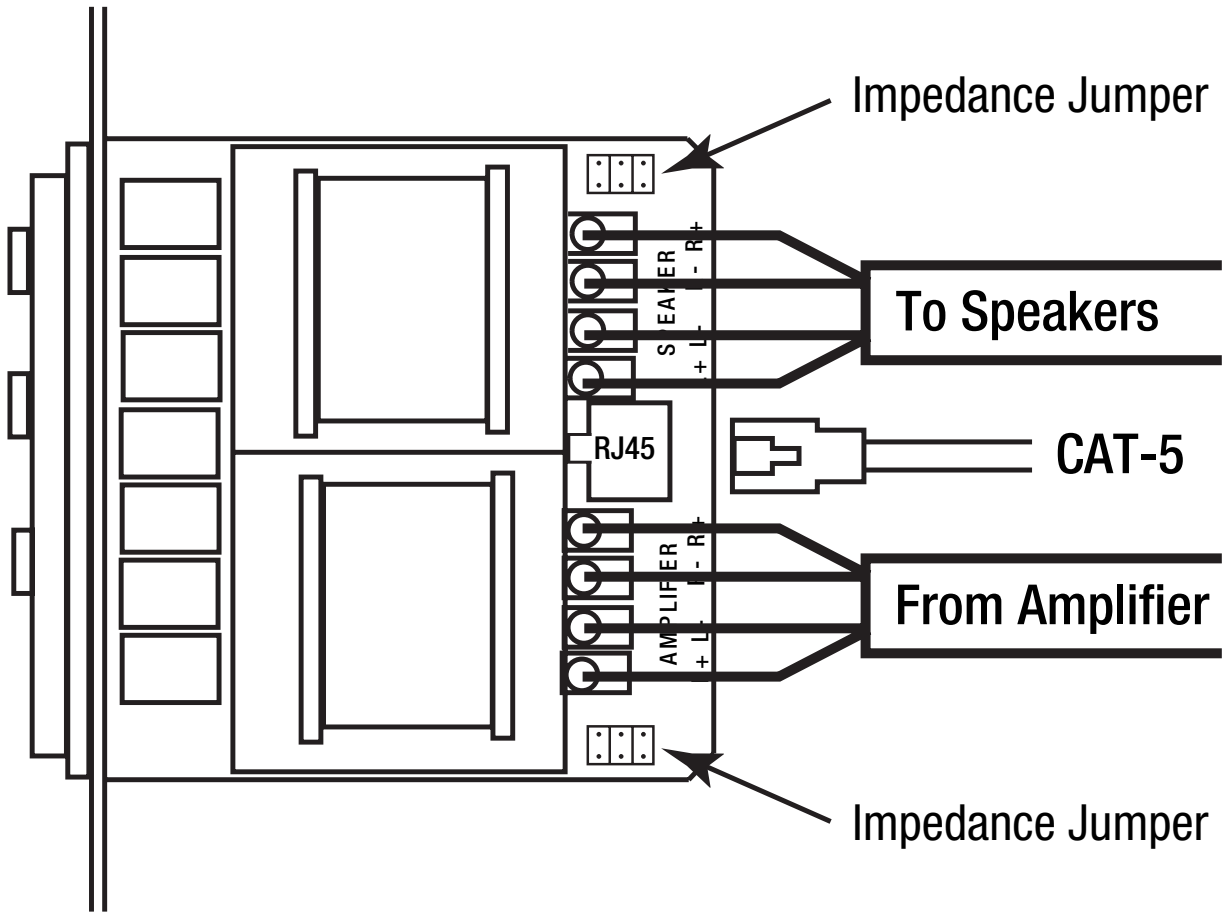
Figure 2. EVC-100 impedance magnification settings for an amplifier driving an 8-ohm load.

AMPLIFIER MINIMUM SPEAKER LOAD IS 8 OHMS

4 OHM Speaker Pairs \ 8 OHM Speaker Pairs	0	1	2	3	4
0		1X	2X	4X	4X
1	2X	4X	4X		
2	4X				

INSTALLATION CONSIDERATIONS *CONTINUED*

Figure 3. EVC-100 impedance magnification jumpers.



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INSTALLATION CONSIDERATIONS *CONTINUED*

VOLUME LIMITATIONS WITH HIGH MAGNIFICATION SETTINGS

CAUTION! USING AN 4X SETTING WILL LIMIT THE POWER BEING DELIVERED TO EACH LOUDSPEAKER PAIR TO ONE-FOURTH OF THE AMPLIFIER'S OUTPUT.

In a typical EVC-100 application, a system will have four pairs of 8-ohm loudspeakers placed throughout the house and in adjacent outdoor locations. Each pair of loudspeakers will be connected to an EVC-100 volume control with its jumpers set for 4x.

However, with four pairs of loudspeakers, only one-fourth of the amplifier's power is available to drive any pair. Therefore, an amplifier rated at 100 watts per channel into 8 ohms will only deliver up to 25 watts to each of the four loudspeaker pairs, no matter how many pairs are on at a given time. This translates into a drop in the maximum volume capability of about 6 dB at the 4x setting.

IR RECEIVING RANGE AND PICKUP ANGLE

The receiving range of the EVC-100 will vary according to the IR output strength of the remote control being used, depending on the number and size of the batteries and the number of IR emitters in the unit. For example, a remote control that operates on two small AAA batteries and has only one IR emitter is generally not as strong as a unit that uses the larger AA size batteries and has two emitters. Tests with various manufacturers' remote controls have shown that the operating range can vary from a minimum of 18 feet to a maximum of about 30 feet.

INSTALLATION CONSIDERATIONS *CONTINUED*

Infrared signals travel essentially line-of-sight. They will not pass through or around solid objects. As a result, do not rely on an IR signal being able to "bounce" off a wall or object to the EVC-100.

USING LOUDSPEAKER SELECTORS

Although an EVC-100 provides volume and on/off functions at its location, it does not provide central control of other loudspeakers playing throughout the house. Adding a loudspeaker-selection system will provide this desired feature, but it may also have a non-defeatable impedance-protection circuit that reduces the maximum volume substantially.

To avoid this problem, specify a loudspeaker selector that has a defeatable protection circuit, such as Niles model HPS4, HPS6, SS-4, or SS-6, and set the protection circuit to off at all times.

JUNCTION BOXES

Use a standard 18-cubic-inch (or larger) junction box. Suitable junction boxes are available from your Niles dealer or local electrical-supply company. The mounting depth of the EVC-100 is 2-9/16" and, after installation, will extend 2-1/16" behind the 1/2" sheetrock wall.

TYPE OF LOUDSPEAKER WIRE

We recommend using 16-gauge, stranded-copper, two-conductor loudspeaker wire for most connections, and 14-gauge wire for runs longer than 80 feet. Do not use loudspeaker wire larger than 14 gauge, because

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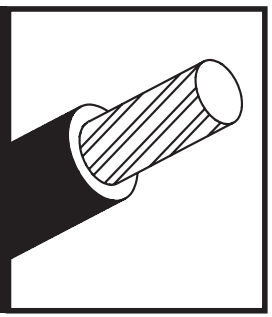
larger wire may not fit into the connectors. Never use solid-core, aluminum, or Romex wire with the EVC-100 volume control.

For wire runs within walls, most U.S. states and municipalities require using a special type of loudspeaker wire with a specific CL fire rating, such as CL-2 or CL-3. Consult your Niles dealer, building contractor, or local building inspection department if you aren't sure what kind of wire is best for your application.

TECH TIP

Wire size is expressed by its AWG (American Wire Gauge) number – the lower the number, the larger the wire. For example, 12 AWG is physically larger than 14 AWG.



TYPE OF POWER/CONTROL WIRE

The EVC-100 also requires a CAT-5 data cable to receive 12 Vdc Power and Override, Status, IR In, and IR Out control signals at its RJ45 connector. For best results, use a high-quality, shielded data cable for this connection.

CHOOSING A MOUNTING LOCATION

Convenient EVC-100 mounting locations include:

- *Near a doorway*
- *Near a desk*
- *At your bedside*
- *Close to a telephone*
- *Near other wall-mounted controls*

Avoid locating the EVC-100 near any potential sources of electrical or optical noise, such as light dimmers, low-voltage lights, and neon lights. Doing so may cause the loudspeakers to emit a popping or buzzing sound.

Some states or municipalities allow installation of volume control devices like the EVC-100 in the same junction box with 110-volt devices, as long as a low-voltage partition is used between the devices. We do not recommend this practice, since loudspeaker wire can act as an antenna for electrical noise.

If you must locate the EVC-100 near a 110-volt electrical device, install it in a separate metal junction box, ground the box to the electrical system ground, and route the loudspeaker wires several feet away from the electrical wiring.

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INSTALLATION CONSIDERATIONS *CONTINUED*

AVOIDING OPTICAL FEEDBACK

If an EVC-100 will be installed in the same room as an IR flasher, it may pick up the flasher's IR output. This effect, known as an optical feedback loop, can cause erratic operation and is similar to acoustical feedback – the howling or whistling sound heard in a P.A. system when a microphone is too close to a loudspeaker.

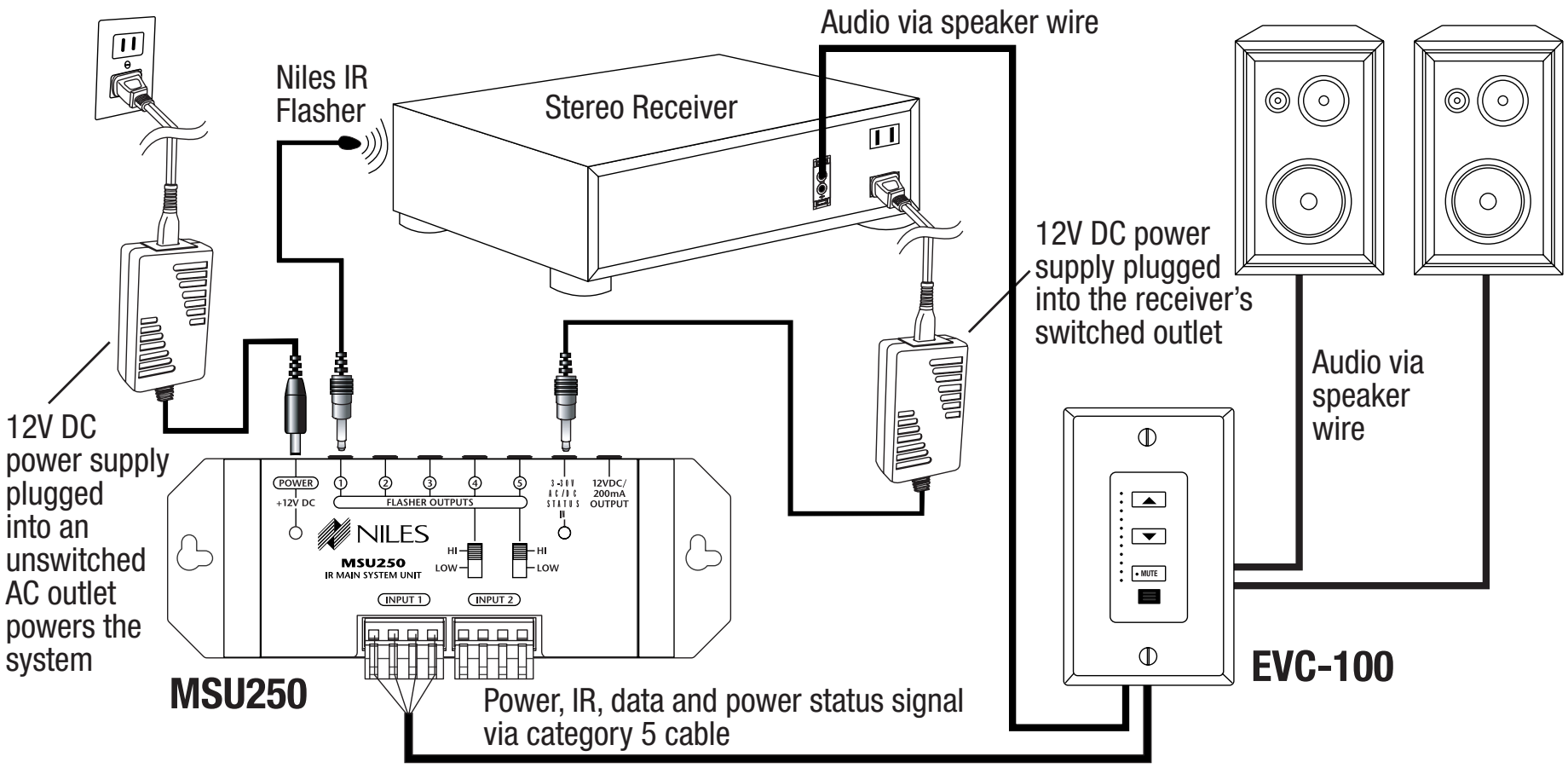
To avoid optical feedback:

1. *Re-position the flasher(s) and/or the sensor.*
2. *Use Niles MF1or MF2 MicroFlashers and cover them with the supplied IR blockers.*

INSTALLATION

RUNNING THE EVC-100 WIRES

Figure 4. Wiring diagram shows a Niles system with an EVC-100 Electronic Volume Control.



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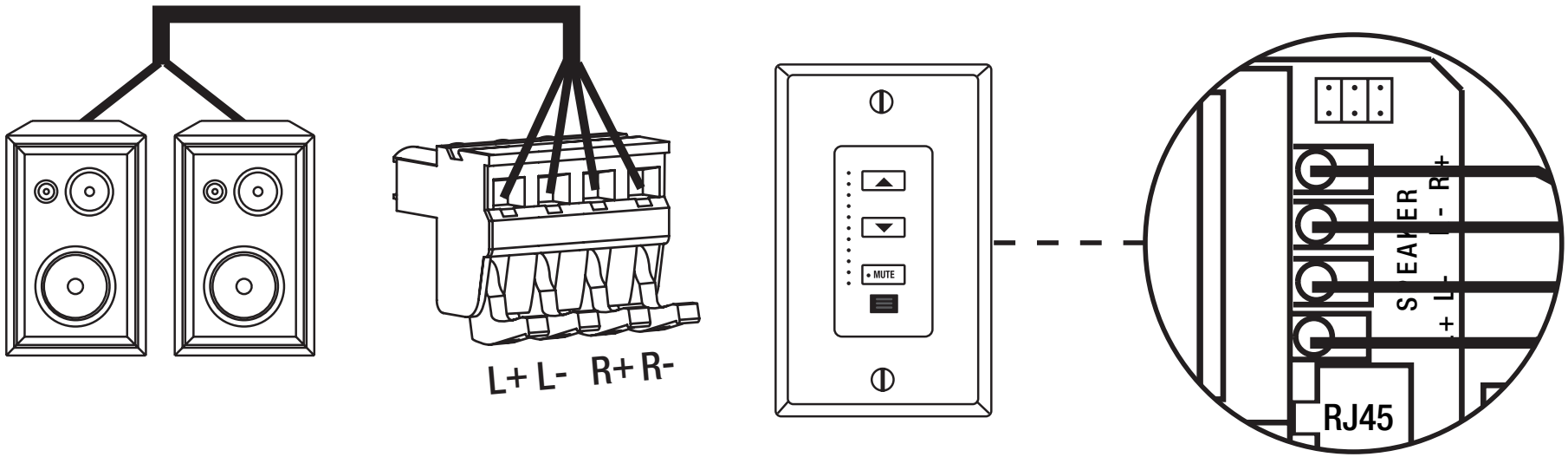
INSTALLATION *CONTINUED*

Before installing the EVC-100 into an existing wall, consider the possibility of hidden obstructions inside the wall, such as wood and metal studs, electrical, telephone, or other wiring, plumbing, or other unseen obstacles.

1. *Install the junction box in the usual manner.*
2. *Run all necessary wiring to each EVC-100. Label the wires for future reference.*

CONNECTING AND INSTALLING THE EVC-100

Figure 5. The EVC-100's amplifier and loudspeaker connector plugs.



INSTALLATION *CONTINUED*

1. *Locate the AMPLIFIER and SPEAKER connector plugs and remove them from their headers, as shown in* ***Figure 5****.*
2. *Strip 1/4" of insulation from each end of the loudspeaker and amplifier wires. Tightly twist each stripped wire end until no frayed strands remain.*
3. *Observing correct polarity, connect the L+, L-, R+, and R- conductors from the amplifier to the appropriate terminals on the AMPLIFIER connector.*
4. *In a similar manner, connect the wires from the loudspeakers to the appropriate terminals on the SPEAKER connector.*
5. *Insert the AMPLIFIER and SPEAKER connector plugs back into their respective headers.*
6. *Insert the CAT-5 cable into the EVC-100's RJ45 jack.*
7. *Using the supplied long device screws, carefully secure the EVC-100 to the junction box without over-tightening the screws, so the volume control fits flush with the faceplate.*
8. *Using the supplied short plate screws, fasten the Decora faceplate to the EVC-100.*
9. *Align all the screws in the same direction for a clean, finished look.*

OPERATION

BASIC OPERATION

The EVC-100 is equipped with status detection circuits that monitor the absence of voltage for automatic mute control when a zone or system is first turned on. With this safety feature, each zone will remain muted until individually activated (in step 4).

1. *With the power off, set the volume control on the amplifier or receiver to its minimum position.*

   NOTE: IF A NILES LOUDSPEAKER-SELECTION SYSTEM IS ALSO BEING USED, LOCATE THE ON/OFF BUTTON FOR EACH DESIRED LOUDSPEAKER PAIR AND SET IT TO ON. MAKE SURE THE DEFEATABLE PROTECTION CIRCUIT IS NOT ENABLED. SEE USING LOUDSPEAKER SELECTORS ON PAGE 11.

2. *Power on the amplifier or receiver and select a source.*

3. *Slowly turn up the amplifier or receiver volume and set it to a comfortable listening level.*

   NOTE: DO NOT OVERDRIVE THE AMPLIFIER OR RECEIVER. IF THE SOUND BECOMES MUDDY OR DISTORTED, YOU HAVE REACHED THE LIMIT OF YOUR AMPLIFIER'S VOLUME CAPABILITY. REDUCE THE VOLUME AT ONCE TO AVOID DAMAGING THE LOUDSPEAKERS.

4. *On each EVC-100, perform the following steps to activate a desired function:*

- *To turn on an EVC-100, press MUTE once on the EVC-100, or press ON once on the supplied EVCR remote control.*
- *To adjust the volume, press VOLUME UP or VOLUME DOWN (on the EVC-100 or EVCR remote control) one or more times to a desired level.*

  NOTE: THE EVC-100 WILL RESPOND TO VOLUME UP/DOWN COMMANDS FOUND IN THE NILES IR LIBRARY AT WWW.NILESAUDIO.COM. THE EVCR REMOTE CAN BE USED TO TEACH OTHER LEARNING REMOTES WHEN NECESSARY. REMEMBER, THE EVCR'S VOLUME UP/DOWN IR COMMANDS WILL CONTROL THE EVC-100, BUT THE EVC-100'S VOLUME UP/DOWN COMMANDS WILL NOT CONTROL OTHER NILES EQUIPMENT.

- *To turn off an EVC-100, press MUTE once on the EVC-100, or press OFF once on the EVCR remote control. The EVC-100 will remember the last volume setting for the next time the volume control is turned on.*

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SETTING THE DEFAULT VOLUME

From the factory, the EVC-100 is set to a default volume of 6 to guard against high-volume un-mutes. If desired, Default Volume can be changed to a different setting by performing the following steps:

1. *On an EVC-100, adjust VOLUME UP or VOLUME DOWN to a desired level for Default Volume.*
2. *Press and hold MUTE. At the same time, press and hold VOLUME DOWN.*
3. *Watch the Power Sense LED. When it starts to blink, the Default Level is set.*

ACTIVATING SLEEP MODE

If desired, an EVC-100 can be automatically set to mute itself after an elapsed sleep time of 10 or 30 minutes, or 1 or 2 hours. During sleep time the Power Sense LED will blink every second to indicate the mode is active. Press the mute button to cancel the sleep mode.

TO ACTIVATE THE SLEEP MODE:

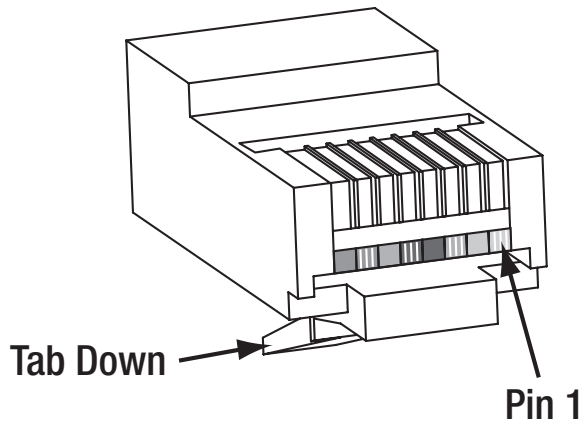
- *For 10 minutes of sleep, press and hold MUTE for 2 seconds. The Power Sense LED will blink once.*
- *For 30 minutes of sleep, press and hold MUTE for 3 seconds. The Power Sense LED will blink twice.*
- *For 1 hour of sleep, press and hold MUTE for 4 seconds. The Power Sense LED will blink three times.*
- *For 2 hours of sleep, press and hold MUTE for 5 seconds. The Power Sense LED will blink four times.*

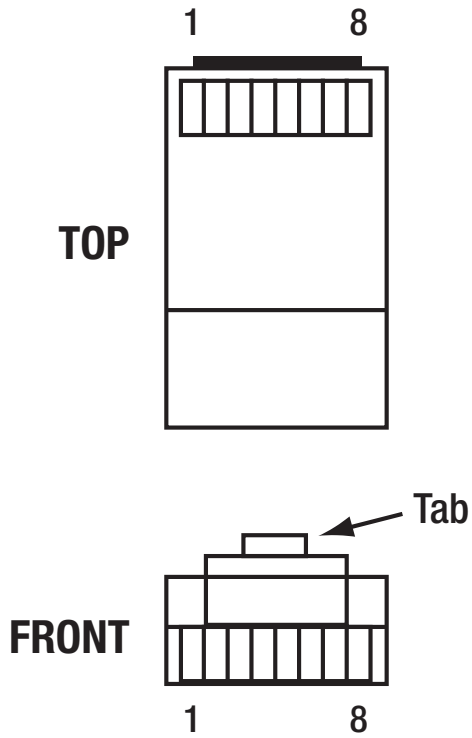
CONFIGURING THE OVERRIDE

If applicable, use this feature to set a suitable volume level for the Page and Doorbell override signals. Override will be activated when a 9 to 12 Vdc voltage is present across pins 1 and 7 of the RJ45 connector on the EVC-100, as shown in **Figure 6**.

Figure 6. RJ45 pin outs on EVC-100.

RJ45	EVC-100
1	Override
2	IR-OUT
3	IR-IN
4	NC
5	NC
6	12V
7	GND
8	Status





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OPERATION *CONTINUED*

1. *On an EVC-100, adjust VOLUME UP or VOLUME DOWN to a desired level for the Page and Doorbell override signals.*
2. *Press and hold MUTE. At the same time, press and hold VOLUME UP.*
3. *Watch the Power Sense LED. When it starts to blink, the Override level is set.*
4. *Use the Page and Doorbell functions in your system to test the Override level. If needed, repeat steps 1 through 3 to set a different level.*

RESETTING TO FACTORY SETTINGS

To reset the EVC-100 to its original factory settings, perform the following steps:

1. *Turn off system power.*
2. *On the EVC-100, press and hold VOLUME UP and VOLUME DOWN at the same time.*
3. *Turn on system power and after a few seconds release both VOLUME UP and VOLUME DOWN.*

MAINTENANCE

Niles volume controls do not require any regular maintenance other than occasional cleaning. Use a damp soft cloth and simply wipe clean. Do not use an abrasive cleanser, as this might scratch the surface of the wallplate.

SPECIFICATIONS

Power Rating (Nominal):	20 Hz to 20 kHz; +/- 0.5 dB @ 8 ohms
Total Harmonic Distortion:	<1.0 %
Impedance Settings:	1X, 2X, or 4X Jumpers
Minimum Speaker Load:	4 ohms
Dynamic Range:	49 dB (max. to min. audible)
Override Current Draw:	0.75 mA (logic only)
Status Current Draw:	25 mA
Maximum Current Draw:	40 mA
Operating Voltage:	12 Vdc
Sense Voltage	9 to 12 Vdc
Override Voltage:	9 to 12 Vdc
Colors:	White, Bone, Almond, Black
Unit Dimensions:	1-5/8" wide x 2-5/8" high x 2-9/16" deep (behind faceplate)
Faceplate Dimensions:	2-3/4" wide x 4-1/2" high

LIMITED WARRANTY

Niles Audio Corporation ("NILES") warrants its active products (those requiring AC or battery power) to the original purchaser to be free of manufacturing defects in material and workmanship for a period of two years from date of purchase.

This Warranty is subject to the following additional conditions and limitations. The Warranty is void and inapplicable if NILES deems that the product has been used or handled other than in accordance with the instructions provided by the manufacturer, including but not limited to damage caused by accident, mishandling, improper installation, abuse, negligence, or normal wear and tear, or any defect caused by repair to the product by anyone other than NILES or an authorized NILES dealer.

To obtain warranty service, take the unit to the nearest authorized NILES dealer, who will test the product and if necessary, forward it to NILES for service. If there are no authorized NILES dealers in your area, you must write to NILES and include your name, model and serial number of your unit, along with a brief description of the problem. A factory Return Authorization Number will be sent to you. DO NOT RETURN ANY UNIT WITHOUT FIRST RECEIVING WRITTEN AUTHORIZATION AND SHIPPING INSTRUCTIONS FROM NILES.

If the above conditions are met, the purchaser's sole remedy shall be to return the product to NILES, in which case NILES will repair or replace, at its sole option, the defective product without charge for parts or labor. NILES will return a unit repaired or replaced under warranty by shipping same by its usual shipping method from the factory (only) at its expense within the United States of America. THERE ARE NO OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION, EITHER EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT.

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER/PURCHASER. NILES SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES EXCEPT TO THE EXTENT PROVIDED (OR PROHIBITED) BY APPLICABLE LAW.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

For the name of your nearest authorized NILES dealer, contact:
NILES AUDIO CORPORATION, P.O. BOX 160818, Miami, Florida 33116.

Please fill in your product information and retain for your records.

Model _____ Serial No. _____ Purchase Date _____

Detach here and return to: Niles Audio Corporation Warranty Registration Dept. P.O. Box 160818 Miami, Florida 33116-0818

WARRANTY REGISTRATION CARD

Model Purchased _____ Serial Number _____

Date Purchased (month/day/year) _____ Dealer Name and Location _____

❍ Dr. ❍ Miss ❍ Mr. ❍ Mrs. ❍ Ms.

Name _____ Address _____

City _____ State _____ Zip _____ Tel ( ) _____

Age:
- ❍ *Under 25*
- ❍ *25-34*
- ❍ *35-44*
- ❍ *45-54*
- ❍ *55 & over*

Income:
- ❍ *Under $24,999*
- ❍ *$25,000-$44,999*
- ❍ *$45,000-$74,999*
- ❍ *$75,000-$99,999*
- ❍ *$100,000-$129,999*
- ❍ *Over $130,000*

Occupation:
- ❍ *Arts/Entertainment*
- ❍ *Business Owner*
- ❍ *Engineer*
- ❍ *Finance/Accounting*
- ❍ *General Office*
- ❍ *Management*
- ❍ *Professional*
- ❍ *Sales/Marketing*
- ❍ *Student*
- ❍ *Tradesperson*

Musical tastes: (Please check all that apply)
- ❍ *Alternative*
- ❍ *Classical*
- ❍ *Country*
- ❍ *Jazz*
- ❍ *New Age*
- ❍ *Popular*
- ❍ *R&B*
- ❍ *Rock*
- ❍ *Other* _____

How did you hear about Niles?
- ❍ *Architect/Developer*
- ❍ *Custom Installer*
- ❍ *Direct Mail*
- ❍ *Friend/Family*
- ❍ *In-Store Display*
- ❍ *Interior Designer*
- ❍ *Magazine Ad*
- ❍ *Mail-Order Catalog*
- ❍ *Newspaper Ad*
- ❍ *Product Brochure*
- ❍ *Product Review*
- ❍ *Retail Salesperson*
- ❍ *E-Tailer*

What magazines do you read?

1. _____

2. _____

3. _____

Who will install the product?
- ❍ *Custom Installer*
- ❍ *Electrician*
- ❍ *Friend*
- ❍ *Myself*

Which factor(s) influenced the purchase of your Niles product? (Please check all that apply)
- ❍ *Ease of Use*
- ❍ *Price/Value*
- ❍ *Product Features*
- ❍ *Quality/Durability*
- ❍ *Reputation*
- ❍ *Style/Appearance*
- ❍ *Warranty*

Do you . . . ?
- ❍ *Own a House. If yes, how many square feet?* _____
- ❍ *Own a Town House/ Condominium/Co-op*
- ❍ *Rent an Apartment*
- ❍ *Rent a House*

Are you interested in receiving literature on other Niles products?
- ❍ *Yes* ❍ *No*

Are there products/capabilities that you would like to see introduced?

_____

_____

_____

_____

BLENDING HIGH FIDELITY AND ARCHITECTURE®

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