

INSTALLATION & OPERATION GUIDE



TVA50

STEREO AMPLIFIER/ AUTOMATED SWITCHER



BLENDING HIGH FIDELITY AND ARCHITECTURE[®]

TVA50

STEREO AMPLIFIER/
AUTOMATED SWITCHER

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IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacture's instructions.
8. Do not install near any heat source such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. 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.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.



11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storm or when unused for long periods of time.
13. 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.
14. **WARNING:** To reduce the risk of fire or electric shock, this apparatus should not be exposed to rain or moisture and objects filled with liquids, such as vases, should not be placed on this apparatus.
15. To completely disconnect this equipment from the main, disconnect the power supply cord plug from the receptacle.



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 equivalent triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

INTRODUCTION

A common challenge in designing whole-house audio/video distribution systems is allowing a local source, such as audio from a bedroom TV, to play through the main system speakers in that room. The TVA50 is the perfect solution. When activated, by either current sensing or a voltage trigger the TVA50 interrupts the main system's speaker level signal, and switches to the local source. When the device (TV) is turned OFF, the speakers are switched back to the main system's audio program.

The TVA50 delivers the quality of audio amplification needed to match the high performance amplifiers used in whole-house systems. The TVA50 is also the perfect companion for added flexibility in whole-house systems using Niles SI Series Multi-Channel Amplifiers, or ZR Series Multi-Zone Receivers.

Whatever the application, switching to a local TV, computer, portable CD or MP3 player, the TVA50 is the clear choice of professional installers who need solid, reliable performance from an automated switching amplifier.

FEATURES AND BENEFITS

- **Compact Size** - Allows installation on cabinet shelves, side walls or back panels.
- **RCA Line In Jacks** - Two gold plated RCA jacks for line level audio input from local device.
- **4 Pin Screwless Speaker Connectors**
- **Efficient Digital Technology** - TVA50 incorporates digital amplifier technology to deliver high output from a small footprint.
- **Current Sense** - The current sensing circuit provides reliable switching between the whole house and the local source.
- **Trigger In** - The presence of 3-30VAC/DC at the TRIGGER IN terminal switches the TVA50 to the local source.
- **12VDC Trigger Out** - Any time the TVA50 is switched to local source, a 12VDC 200mA trigger voltage is emitted and can be used to control other devices.
- **Volume Control** - Adjusts the TVA50 amplifier output level.
- **Multiple Speaker Pairs** - The TVA50 allows automated switching of either one or two pairs of speakers.
- **4 ohm Capability** - The TVA50 is designed to remain stable with a 4 ohm load.
- **DC, Short Circuit and Overload Protection** - An automatic protection circuit safeguards TVA50.
- **2 Year Warranty** - Two year parts and labor warranty.

TVA50 PARTS GUIDE

1. AC IN – Removable three-prong IEC compatible power cord.
2. Current Sensing AC Outlet – TVA50 will activate and switch inputs when it senses a current draw from a connected device.
3. Voltage Trigger IN – 3.5mm mini-phone jack. TVA50 will activate and switch inputs when 3-30 volts AC or DC is present.
4. 12V Trigger OUT – 3.5mm mini-phone jack. 12VDC 200mA control output for automated control of lifts, screens, drapes, etc.
5. Audio Line IN – Gold plated RCA type connectors. Local source input. TVA50 switches to this input in either current sense or 12V Trigger IN modes.
6. Volume Control – Adjusts TVA50 amplifier output level.
7. Speaker A Input/Output – Four-pin speaker connector plugs. Screwless and removable for easy installation.
8. Speaker B Input/Output – Four-pin speaker connector plugs. Screwless and removable for easy installation.

STEREO AMPLIFIER / AUTOMATED SWITCHER

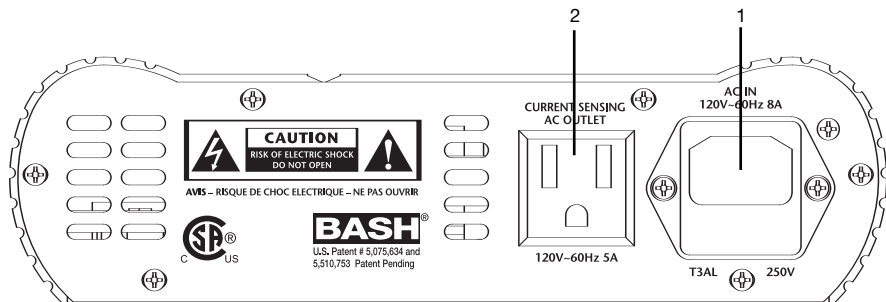


Figure 1

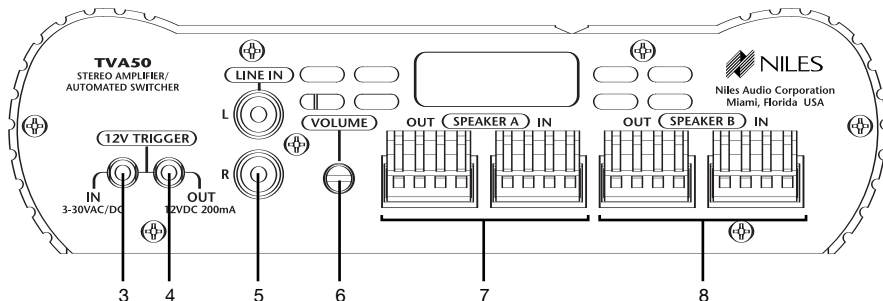


Figure 2

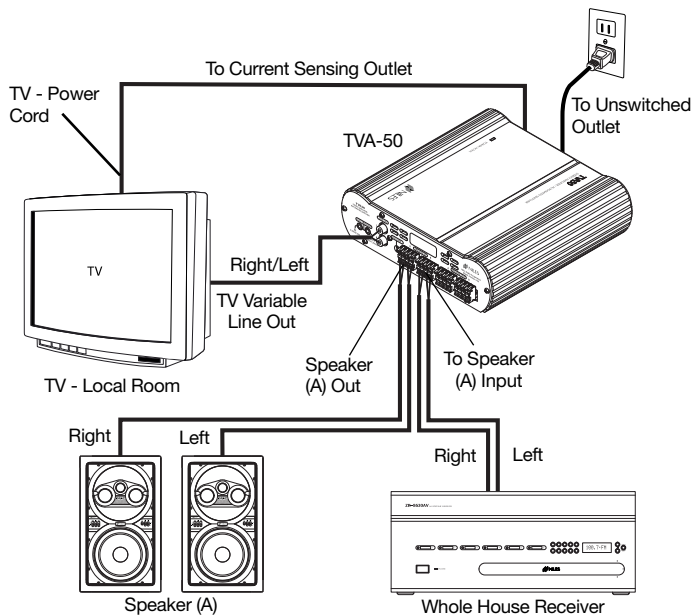


Figure 3
TV current sense with one speaker pair

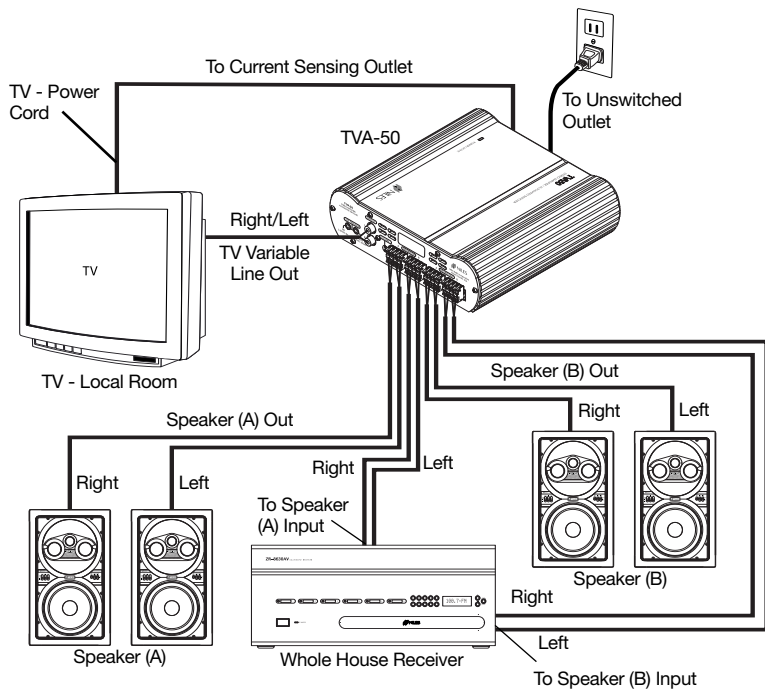


Figure 4
TV current sense with two pair of 8 ohm speakers

STEREO AMPLIFIER / AUTOMATED SWITCHER

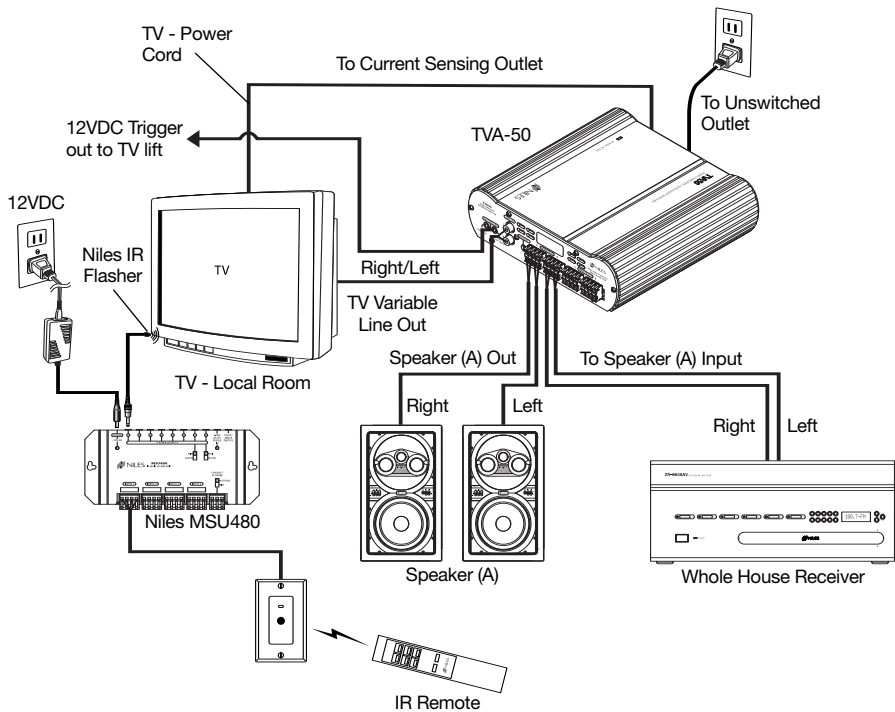


Figure 5
TV current sense with one speaker pair and a TV lift

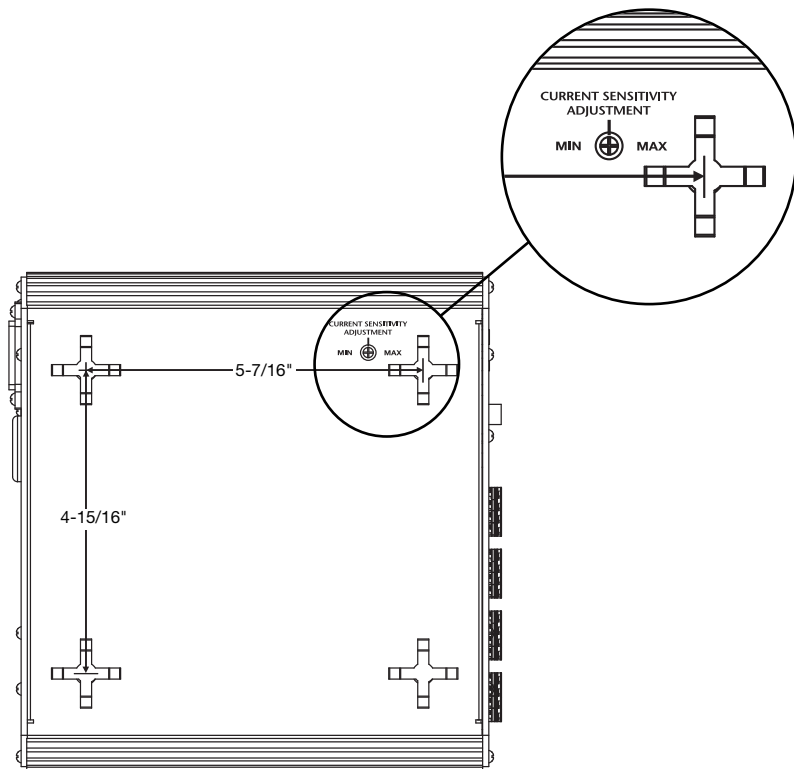
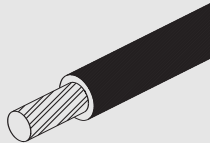


Figure 6:
Bottom of the unit with measurements for wall mounting

“TECH TIP”

Wire size is expressed by its AWG (American Wire Gauge) number. The lower the AWG number, the larger the wire, i.e., 20 AWG wire is physically larger than 22 AWG.

INSTALLATION CONSIDERATIONS**Location**

The TVA50 should be installed near the device to be switched, ideally within 15 feet, to avoid signal loss and degradation over long runs of wire. Access to the speaker wires, from the whole-house system and to the local speakers, is also necessary. Installation on a cabinet shelf, sidewall or back panel are all acceptable.

Type of Speaker Wire

We recommend 16-gauge stranded copper speaker wire for most connections, and 14-gauge wire for runs longer than 80'. Don't use wire larger than 14-gauge, because larger wire may not fit into the connectors.

Type of Audio Cable

Shielded stereo audio cables with quality gold-plated connectors are recommended. Use low capacitance cables for runs that exceed 15' to minimize signal loss. Wire runs greater than 50' are recommended only with cable that has been specifically designed for such applications. Contact your cable manufacturer for a specific cable recommendation when wire runs exceed 50'.

Power Requirement

Power the TVA50 with an unswitched AC 120V, 60Hz outlet. There is no power ON/OFF switch. The unit will automatically activate when a switching condition (current sense or 12V Trigger IN) is detected.

Speakers

The TVA50 will remain stable when driving a 4 ohm load. If only one pair of speakers is being driven, 4, 6 or 8 ohm speakers systems can be used. If switching two pairs, 8 ohm speakers must be used.

Fixed/Variable Line Level Outputs

To control the TV volume through the speakers, the variable output on the TV must be connected to the TVA50 Line IN.

Using Volume Controls

Depending on your installation in-wall volume controls may be used to control the speaker level. Connect the in-wall volume control to the TVA50 speaker output. This requires use of the fixed output on the TV. In this application, volume for all sources is controlled with the in-wall volume control.

INSTALLATION

Preparing for Installation

1. Figure 3 shows a typical application for switching one pair of speakers to a local source using current sensing. Refer to the other system applications for switching multiple speaker pairs, and use of the Trigger IN/OUT. If your application is different from those diagrams, use appropriate system design software or draw it out on paper. Make note of all parts and components needed for installation, TVA50, speakers, wire, etc.
2. Once the system has been designed, test the system design prior to installation to assure performance and eliminate time wasted running around shopping for parts not specified or missing.
3. Run all necessary wiring to the TVA50, local source, and speakers. Label the wires for future reference.

Adjusting Current Sensitivity

The current sensing capability of the TVA50 is adjustable via a recessed screw located on the bottom of the unit (Figure 6). This allows for the adjustment of the current sensing outlet based on the amount of current draw from the local source component.

1. Plug the power cord of the local source component (i.e. TV) into the current sensing outlet of the TVA50.
2. Turn the local source component on.

3. Gradually turn the sensitivity adjustment screw located on the bottom of the TVA50 (Figure 6) until you hear the internal relay of TVA50 switch. This is indicated by a clicking sound inside the unit. The Power/Active LED on the front panel of the TVA50 (Figure 7) provides a visual indication of the local switching. When the TVA50 switches to the local input the Power/Active LED will change from red to green.
4. Cycle the power of the local source component on and off. Adjust the sensitivity setting of the TVA50 until the internal relay switches reliably.

NOTE: *The TVA50 may be set to operate continuously by turning the sensitivity screw fully counterclockwise. This will bypass the internal sensing mechanism.*

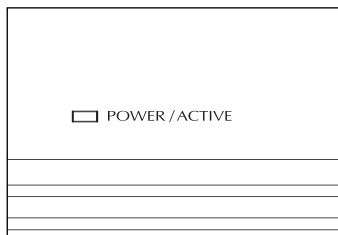


Figure 7:
TVA50 Power/Active LED

Installation

Caution: Turn the power OFF to all components in the system to prevent accidental shorting or electrical shock.

Mounting the TVA50

When possible, the TVA50 should be installed near the device to be switched. An unswitched 120VAC outlet is required to power the TVA50. (Unit should remain unplugged during installation.) Care should be taken to provide adequate space for access and connections.

Horizontal (Shelf) Mount.

Install the supplied self adhesive rubber feet to the bottom of the TVA50. The unit can be placed on top of a shelf in a wall unit or equipment cabinet. Nothing should be placed on top of the unit.

Vertical (Wall) Mounting.

The unit can also be attached to the side wall or back panel of a wall unit or equipment cabinet using the keyholes on the back of the TVA50.

1. Using a level and tape measure, install four drywall screws according to the measurements shown in Figure 6.
2. Align the keyholes on the back of the TVA50 with the mounting screws and slide the unit down until it locks.

Connect Whole-House System

1. Locate the 4 pin speaker connector plug for SPEAKER A IN (and remove if plugged in).
2. Strip 1/4" of insulation from the end of each wire for SPEAKER A IN, coming from the speaker level output of the whole-house system amplifier. Tightly twist the end of each wire until no frayed ends remain.
3. Use a small flathead screwdriver or your thumbnail to raise the locking tabs, exposing the holes on the removable connector plug.
4. Insert each wire into the appropriate hole on the removable connector plug, and snap the locking tab down.

NOTE 1: *If switching two speaker pairs, (Figure 4), repeat steps 1-4 above for SPEAKER B IN.*

NOTE 2: *Maintain proper polarity. Connect the positive terminals on the TVAS0 to the positive terminals on the whole-house amplifier. Connect the negative terminals on the TVAS0 to the negative terminals on the whole-house amplifier. To help you avoid improper phasing, the connector plug is keyed. Insert the smooth side of the connector plug into the smooth side of the socket. Don't force the scalloped side of the connector plug into the smooth side of the socket.*

Connect Speakers

1. Locate the 4 pin speaker connector plug for SPEAKER A OUT (and remove if plugged in).
2. Strip 1/4" of insulation from the end of each wire for SPEAKER A OUT, that will connect to the local room speakers. Tightly twist the end of each wire until no frayed ends remain.

3. Use a small flathead screwdriver or your thumbnail to raise the locking tabs, exposing the holes on the removable connector plug.
4. Insert each wire into the appropriate hole on the removable connector plug, and snap the locking tab down.

NOTE 1: *If switching two speaker pairs, repeat steps 1-4 above for SPEAKER B OUT. When switching two pairs, 8 ohm speakers must be used.*

Connect Local Source

A common application for the TVA50 is to be able to switch the speakers used in a whole-house audio system to a TV in a local room. In order to be able to adjust the volume when switched to a local TV, it is necessary to use the variable line level output of the TV when connecting to the TVA50. Doing so will allow the user to adjust the volume using the TV's remote control, as if the TV speakers were being used.

1. Connect the variable line level output of the TV to the RCA type Line IN jacks on the TVA50.

NOTE: *Some TVs have separate fixed (non-adjustable) and variable line outs. Some need to be switched using the TV's on-screen menu. Refer to the TV manual for additional information.*

Source Switching

The TVA50 has two switching modes. Current Sensing and AC or DC voltage trigger. In current sense mode, the TV power cord gets plugged into the Current Sensing AC outlet on the TVA50. When the TV is turned ON, the TVA50 can detect an increase in current draw and will switch to the stereo Line IN. The TVA50 will also switch to Line IN when 3-30VAC/DC is applied to the Trigger IN.

Current Sensing

Plug the AC power cord of the TV into the Current Sensing AC outlet on the TVA50.

Volume Calibration

The volume control on the TVA50 adjusts the amplifier output level when switched to the local device, (Line IN). Turning the volume control clockwise will increase volume, turning counterclockwise will reduce volume.

NOTE: *The internal speakers of the TV should be switched off before proceeding. Refer to the owner's manual for your TV for instructions.*

BEFORE PROCEEDING SET THE VOLUME CONTROL ON THE TVA50 TO THE MINIMUM POSITION (FULLY COUNTERCLOCKWISE).

1. Play a source (CD, Tuner) on the whole-house system. Set the volume to a normal listening level.
2. Turn the TV on. The TVA50 will sense the TV power, activate and switch to the local source (TV).
3. Using the remote control for the TV or the volume control on the TV, turn the volume on the TV all the way up. (Use the on-screen volume bar or numeric display for reference).
4. Slowly turn the volume control on the TVA50 clockwise, until the audio from the TV is coming out of the speakers at the loudest level that will ever be used. (If the sound is distorted, reduce TV volume.) This will be the maximum level the TV will play through the TVA50 and speakers.
5. Reduce TV volume to a normal listening level.
6. Turn the TV off. The system should switch back to the whole-house system. Properly tuned, the speaker level from the whole-house system and TV should be about the same at a normal listening level.

NOTE: *The speaker level, when switched from the whole-house system to the TV will not always be the same. If the whole-house system was set to CD with the volume turned up and the TV gets turned on to its normal listening level, the speaker level might drop when the system switches to TV. This is normal performance and the user can adjust whole-house speaker level and TV speaker level as needed depending upon the source selected and the users preference.*

Using In-Wall Volume Controls

In a whole-house audio distribution system, an in-wall volume control, such as the Niles VCS100R or MVC100R, can be used to adjust the speaker level in a given room. There are two options for using volume controls with the TVA50. Both of these examples assume use of a multi-channel audio distribution amplifier such as the Niles SI-1260.

Example1: In-Wall Volume Control With a Variable Output Device

When switching to a variable output device such as a TV with the TVA50, the volume control for the whole-house system should be installed between the whole-house amplifier and the TVA50. In whole-house mode, the TVA50 will pass the speaker level output of the whole-house system straight through to the speakers. A volume control, installed between the whole-house system and the TVA50, provides speaker level control of the whole-house sources. (CD, Tuner, etc). When switched to TV, speaker level can be controlled using the TV remote control volume commands or the volume Up/Down controls on the front of the TV.

Example 2: In-Wall Volume Control With a Fixed Output Device

In some applications, it may be desirable to control speaker level of both the whole-house sources and the TV, or perhaps a local CD or DVD player that might not have a variable output, with the in-wall volume control. In this application, the volume control would be connected to the output (SPEAKER OUT) of the TVA50 and the fixed line level output of the TV or local device would be used.

NOTE: *If driving speakers and using volume controls on both SPEAKER OUT A and B, minimum acceptable impedance is 4 ohms. Be sure to check speaker specifications and impedance magnifying settings on the volume controls to assure proper performance. Exceeding this load will cause the TVA50 to go into protection and shut down.*

12V Trigger Out

The TVA50 has a 12VDC 200mA Trigger OUT that will be activated in the current sense mode or when 3-30V AC/DC is detected on the Trigger IN terminal. This Trigger OUT voltage can be used to control 12VDC controlled devices such as drapes, screens and TV lifts.

12V Trigger Out and a TV lift

In certain exotic applications, it is desirable to keep all components hidden from sight when not in use. A TV mounted in a lift cabinet is a perfect example. When not in use, the TV is hidden away in an attractive furniture quality cabinet. A motorized lift mechanism will raise the TV up out of the cabinet for use when activated by voltage, IR or RF commands.

Integrating a Niles IR repeater system with a TV plugged into the current sensed outlet of a TVA50, and a 12VDC controlled lift mechanism, provides an inexpensive, yet elegant solution to system automation. (Figure 5) When the system is in whole-house mode, music from the main system plays through the in-wall speakers in a room. The TV is hidden away in the lift cabinet. With a Niles MS100 Microsensor™ inconspicuously mounted in the lift cabinet, and properly configured for control of the TV hidden inside, the TV power ON command from an IR remote control, will turn the TV on. The TVA50 current sensing outlet will detect the change in current draw, switch the local room speakers to TV and send a 12VDC Trigger OUT to the lift and automatically raise the TV out of the cabinet...all from just the ON command for the TV! Turn the TV OFF, the TVA50 current sensed outlet detects the change, switches the speakers back to the whole-house system and cuts the 12VDC Trigger OUT causing the lift to lower the TV back into the cabinet.

TROUBLESHOOTING

TVA50 will not power up

Is TVA50 plugged in to an unswitched outlet?

Is the POWER/ACTIVE LED Red?

120VAC measured from outlet with voltmeter?

Try another unswitched outlet.

TVA50 will not activate (Current Sense Mode)

Is the TV plugged in to the sensed outlet on the TVA50?

Is the TV turned ON?

TVA50 will not activate (12V Trigger Mode)

Is the voltage on the TRIGGER IN terminal 3-30 VAC/DC?

Is polarity of 3.5mm miniplug correct? (tip=+12VDC; sleeve=ground. DC only. Polarity non-critical for AC voltage trigger.)

No audio output A pair/B pair (whole-house/nonswitched mode)

Is the POWER/ACTIVE LED Red?

Are the speakers connected to the TVA50?

Are the 4 pin speaker connector plugs (IN/OUT; A/B) properly seated?

Is the speaker wire properly stripped?

Are the lock tabs snapped down?

Is the whole-house audio source ON and playing?

Is the volume up on the whole-house system?

If using an in-wall volume control, is it turned up?

No audio output A pair/B pair (local/switched mode)

Is the POWER/ACTIVE LED on the TVA50 Green?

Is the TV/source line out connected to the LINE IN on the TVA50?

Is the volume up on the TV?

Is the volume control on the TVA50 properly adjusted?

Audio level in local/switched mode too high/low

See "Volume Control" section, page 15.

SPECIFICATIONS

Power: 50 watts per channel RMS into 4/8 ohms.

S/N Ratio: >94dB

THD: .05% at rated power.

Mounting: Horizontal or vertical mounting. Keyholes in back panel for vertical mount.

Connectors:

12V Trigger IN/OUT: 3.5mm mini phone jack.

LINE IN: Gold plated RCA

SPEAKER (All): Screwless 4 pin plug-in.

AC IN: IEC type three prong.

Current Sensing Outlet

Wire requirements: 14-16 gauge two-conductor speaker wire for all speaker level connections.

Trigger voltage: IN: 3-30VAC/DC

Trigger voltage OUT: 12VDC/200mA

AC requirement: 120V – 60Hz

Input sensitivity: 500mV @ full output

Dimensions: 2-1/4"H x 8"W x 7-1/2"D

Weight: 3-1/2" lbs

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Notes

Notes



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