



GAI-TRONICS®
A HUBBELL COMPANY

Industrial Communications System Page/Party® Eight-Channel Speaker Monitoring/Distribution Amplifier

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Industrial Communications System

Page/Party® Eight-Channel Speaker Monitoring/Distribution Amplifier

Confidentiality Notice

This manual is provided solely as an installation, operation, and maintenance guide, which contains sensitive business and technical information, that is confidential and proprietary to GAI-Tronics. GAI-Tronics retains all intellectual property and other rights in or to the information contained herein, and such information may only be used in connection with the operation of your GAI-Tronics product or system. This manual may not be disclosed in any form, in whole or in part, directly or indirectly, to any third party.

General Information

Product Overview

The GAI-Tronics Industrial Communications System (ICS) Page/Party® is a modular industrial communications system that can include from two to possibly hundreds of stations. All stations are wired in parallel and additional stations can be added to the system at any time.

The ICS Eight-Channel Speaker Monitoring/Distribution Amplifier distributes and monitors page audio for up to eight speakers from one amplifier. It is compatible with existing GAI-Tronics 700 Series or ICS Page/Party® systems and can be added to existing systems.

The standard configuration of the ICS Eight-Channel Speaker Monitoring/Distribution Amplifier is an indoor amplifier station using 120 V ac to 230 V ac power.

Features

- Distributes one-way page announcements to up to eight speakers
- Includes a high efficiency (>80%) Class D paging amplifier capable of providing up to 1.75 watts to each of the eight 8-ohm speakers (0.85 watts to 16-ohm speakers)
- Monitors each of the eight speakers individually for fault conditions
- Communicates with ADVANCE using SmartSeries technology
- Includes universal ac power supply with power factor correction
- Durable, highly visible safety orange powder coat finish

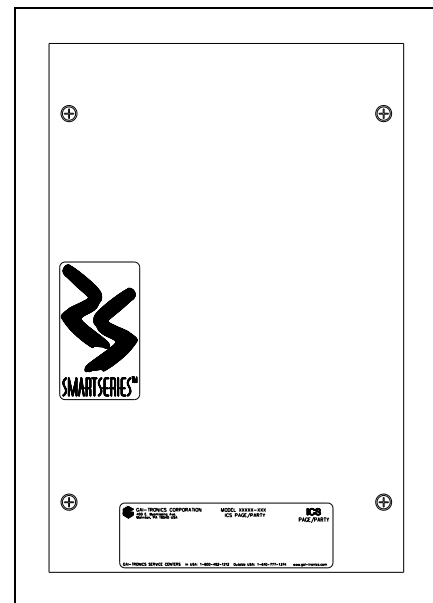


Figure 1. ICS Eight-Channel
Speaker Monitoring/Distribution
Amplifier

Options

- Gray enclosure
- 24 V dc power

Installation

Important Safety Instructions

- Read, follow, and retain instructions – All safety and operating instructions should be read and followed before operating the unit. Retain instructions for future reference.
- Heed warnings – Adhere to all warnings on the unit and in the operating instructions.
- Attachments – Attachments not recommended by the product manufacturer should not be used, as they may cause hazards.
- Servicing – Do not attempt to service this unit by yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- This permanently connected apparatus must have a UL Listed 15-amp circuit breaker incorporated in the electrical installation of the building.

USA and Canada Consult the National Electrical Code (NFPA 70), Canadian Standards Association (CSA 22.1), and local codes for specific requirements regarding your installation. Class 2 circuit wiring must be performed in accordance with NEC 725.55.

 **WARNING**  **In 24 V dc systems: Under NO condition should this equipment be operated from a battery charger without the batteries connected.**

In 24 V dc systems, most chargers have an unloaded output of 35 to 45 volts that can quickly damage the equipment designed for nominal 24 volts. The maximum battery voltage should never exceed the maximum specified input voltage.

Mounting the Enclosure

Mount the enclosure using the four 0.312-inch (8 mm) diameter holes located on the mounting flanges with ¼-inch (M6) hardware. The ICS Eight-Channel Speaker Monitoring/Distribution Amplifier is not supplied with conduit or cable openings.

Remove the front panel and drill or punch entry openings in the rear section of the enclosure. Refer to Figure 2 for the suggested locations. There must be a minimum of ½ inch (13 mm) of material between entry holes.

The station is suitable for top or bottom entry per Figure 2. However, GAI-Tronics recommends bottom entry only wherever possible.

The standard orientation (shown in Figure 2) locates the power supply housing in the upper left corner. The orientation of the enclosure can be rotated 180° to allow clear access to the top.

For specific details including mounting hole dimensions, refer to Figure 2. When mounting the enclosure, use caution to avoid damaging the internal components.

The suggested mounting height for all station enclosures is 48 inches (1219 mm) to the center of the bottom mounting holes of the enclosure.

Field Wiring

The Eight-Channel Speaker Monitoring/Distribution Amplifier provides terminal blocks for field wiring. Each connection for the system cable has two terminals for daisy-chain wiring. Attach #6 spade lugs to the wires before attachment to the terminal blocks for the most secure connection.

The terminal blocks on the Termination PCBA are labeled to coincide with the color code used on GAI-Tronics 60029 series multi-party cable or 60038 series single party cable. Refer to Figure 3 for a sample wiring diagram.

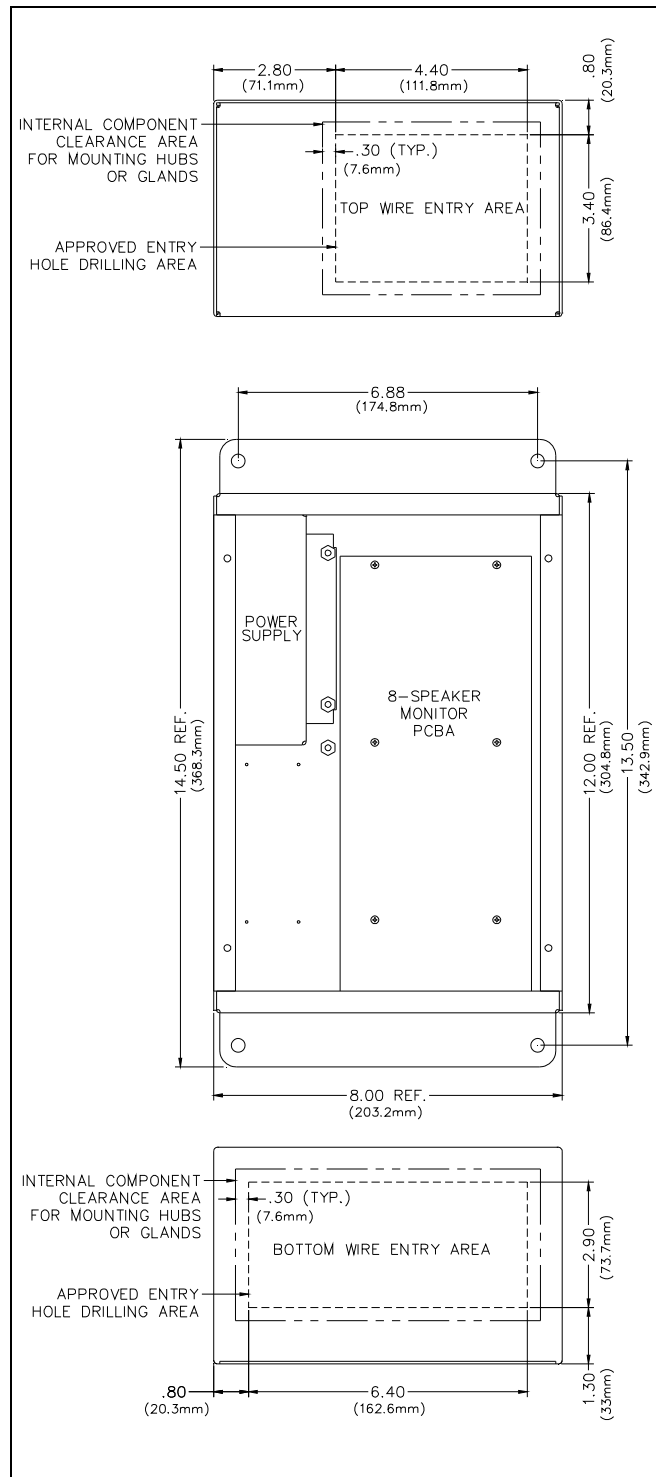


Figure 2. Suggested Wire Entry Locations

The Eight-Channel Speaker Monitoring/Distribution Amplifier can drive up to eight speakers. In the case where all eight speakers are not used in an 8-ohm system, an 8-ohm, 2-watt resistor must be connected across the unused outputs on connectors P1 and P2 on the termination board. For systems that use 16-ohm speakers, a 16-ohm, 1-watt resistor must be connected across the unused outputs.

In certain circumstances where paging audio induces feedback, muting the speakers of two or more stations during a page, referred to as mutual muting, can eliminate such feedback problems. This function is enabled by connecting the spare orange wire between stations. In standard ICS station the connection is TB4-2 or TB5-2. In Eight-Channel Speaker Monitoring/Distribution Amplifiers the connection is TB1 "MUTE" or TB2 "MUTE".

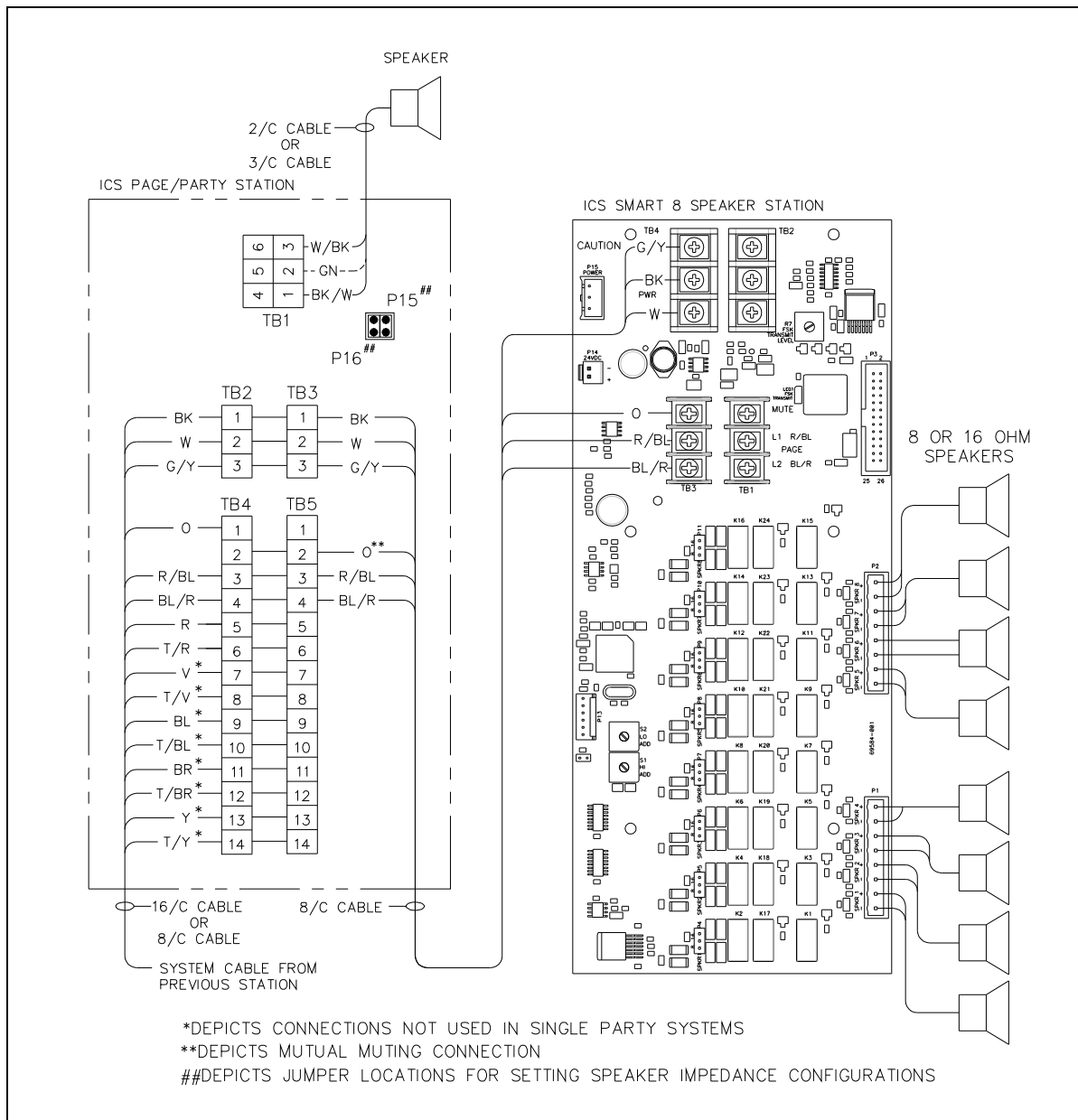


Figure 3. Typical ICS Eight-Channel Speaker Monitoring/Distribution Amplifier Wiring Diagram

After all wiring and cable connections have been completed, place the front cover on the rear enclosure, being careful not to pinch any cables. Secure the front cover using the four screws and washers provided. Torque the screws to 10 to 12 lbf-in (1.13 to 1.36 N-m).

Settings and Adjustments

Opening the Station

Remove the four screws from the front panel and turn it to the right so that the interior surface faces you. Allow the wiring and ribbon cables to remain connected. Using two of the screws just removed, mount the front panel to the back box's right-side mounting holes. The front panel interior surface and the back box interior now face you. This configuration presents the easiest access for troubleshooting and setting adjustments.

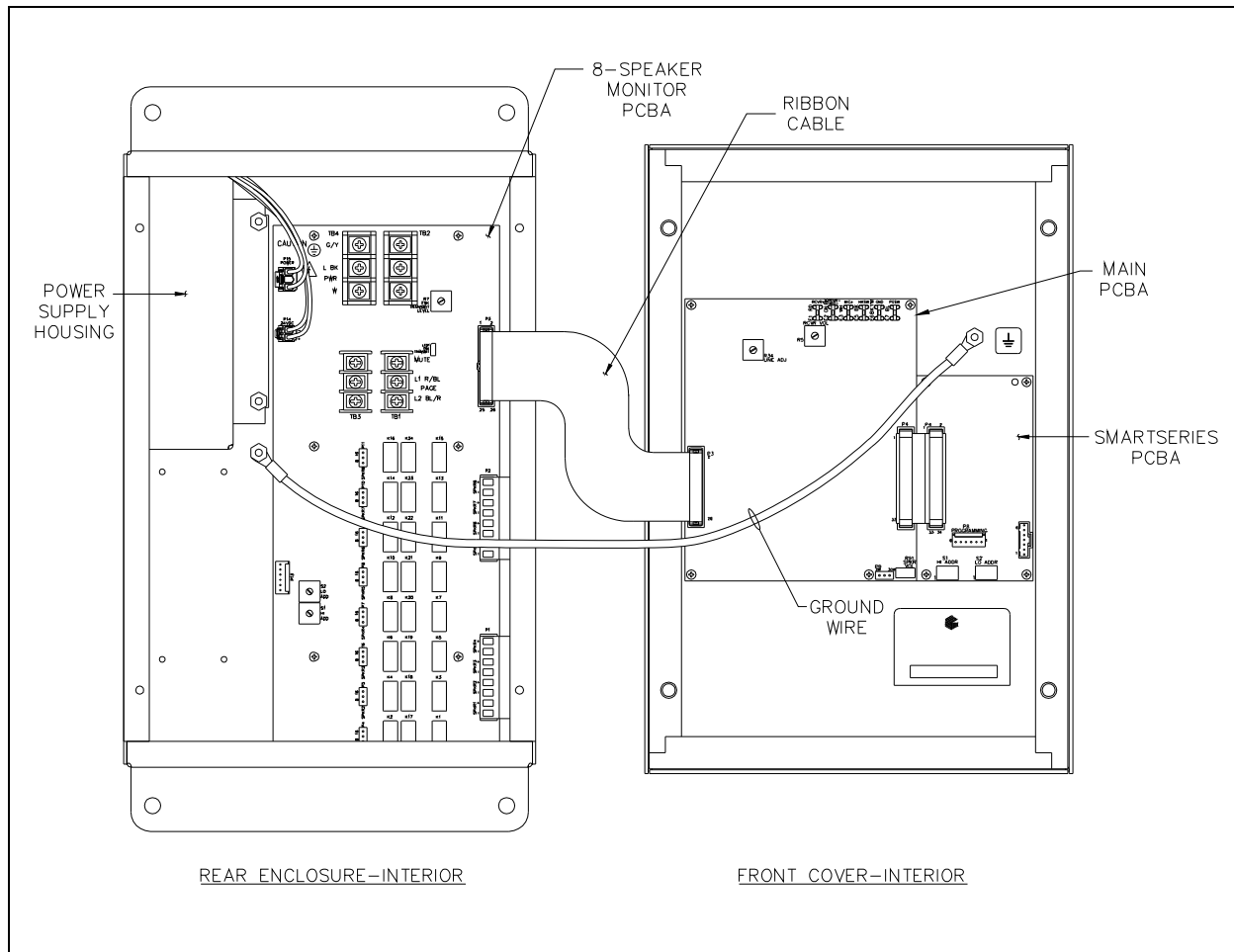


Figure 4. ICS Eight-Channel Speaker Monitoring/Distribution Amplifier Interior View

69557 Series Main PCBA

Speaker Gain Jumper Setting

P9 can limit the maximum speaker output level. P9 in the HI position (default) represents a 15-watt total maximum output. P9 in the LO position represents a 1-watt total maximum output. To achieve the maximum 1.75 watts into each of the eight 8-ohm speakers the default HI position must be used. Refer to Figure 5.

Speaker Volume Level Adjustments

As part of a SmartSeries system this station communicates with an ADVANCE system to set the speaker volume. The volume may be adjusted manually by using the Speaker Volume potentiometer, R91. Refer to Figure 5.

To set the speaker volume level, turn R91 fully counterclockwise. Listen for a single beep from the speaker indicating the speaker amplifier is in the Speaker Level Adjustment mode. If the page line is in use, immediately after the beep tone, the page signal should be used to make the level adjustment. If the page line is inactive following the beep tone, a continuous tone is activated to make the level adjustment. After the tone is activated, all page line activity is ignored until completion of the adjustment.

This test tone is used as a reference to adjust the speaker amplifier output level to the desired volume. Adjust R91 to the desired output. The test tone automatically shuts off 5 seconds after the last adjustment.

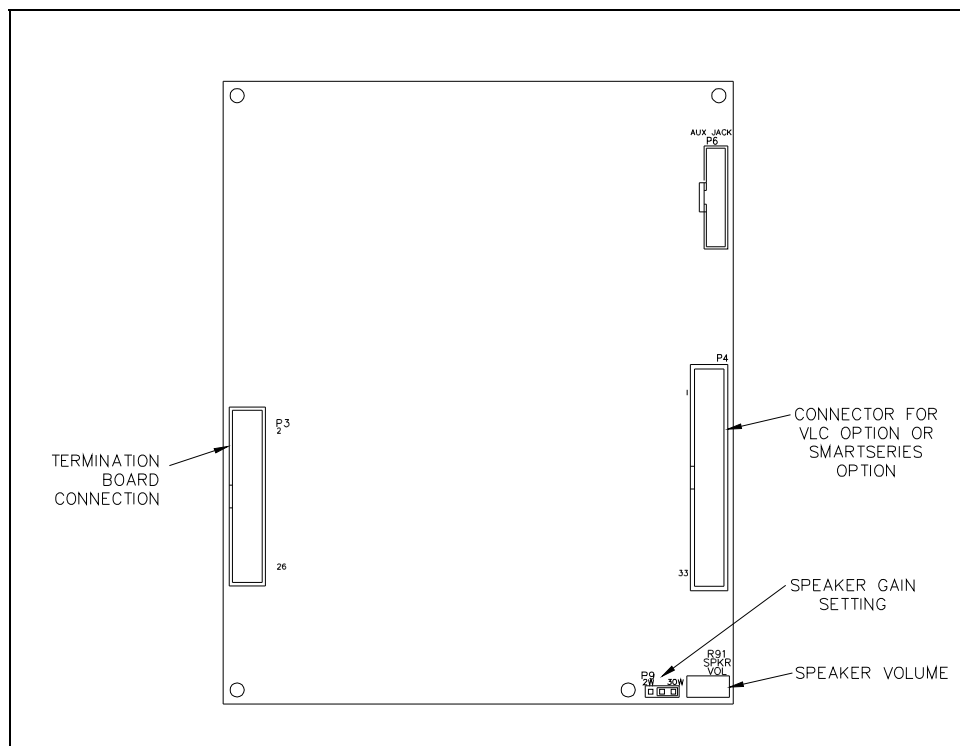


Figure 5. 69557 Series Main PCBA

69552 SmartSeries PCBA

Address Setting

For the SmartSeries option to function properly, each station in an ADVANCE system zone must be given a unique address using the hexadecimal switches, S1 (Hi Address) and S2 (Lo Address). Each switch contains 16 settings, labeled 0–F. A small arrow on each switch indicates the setting. Refer to Figure 6.

The station address is determined by the high address setting followed by the low address setting. For example, to assign an address of 05, the high station address is set to 0 and the low address is set to 5.

Valid address settings are 05 to FE. Record the address assigned for each station in the system for your records.

There are two different addresses that need to be set. The first address is set on the front panel SmartSeries PCBA and the second address is set on the Speaker Termination PCBA in the enclosure.

FSK Signal Gain Level Adjustment

The FSK Signal Gain, R13, adjusts the FSK transmit signal strength. It is set at the factory and should not be adjusted by the installer.

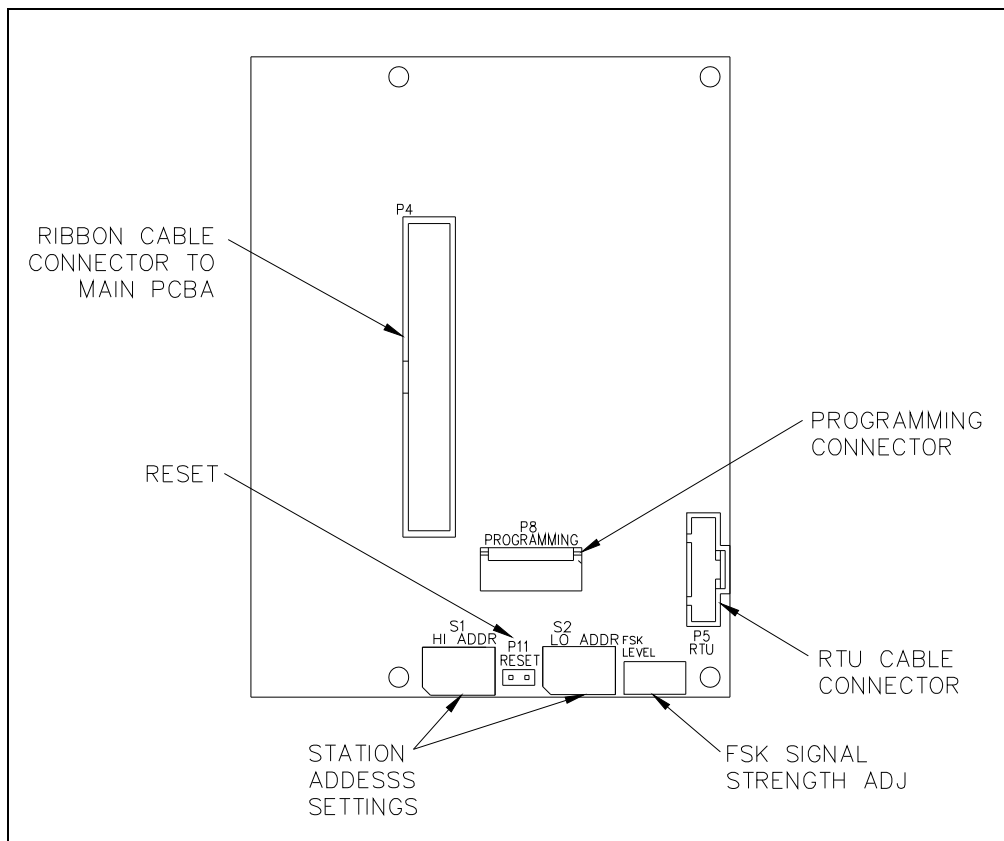


Figure 6. 69552 SmartSeries PCBA

69584 Speaker Termination PCBA

Speaker Impedance Jumper Settings

Each connected speaker needs to have its corresponding jumper set to either 8 ohms or 16 ohms. Use jumpers P4 (Speaker one) thru P11 (Speaker eight) to make these settings. The default setting is 8 ohms.

Table 1. Speaker Jumper Settings

Speaker	Jumper No.	8Ω or 16Ω
1	P4	8Ω = 1+2 16Ω = 2 + 3
2	P5	8Ω = 1+2 16Ω = 2 + 3
3	P6	8Ω = 1+2 16Ω = 2 + 3
4	P7	8Ω = 1+2 16Ω = 2 + 3
5	P8	8Ω = 1+2 16Ω = 2 + 3
6	P9	8Ω = 1+2 16Ω = 2 + 3
7	P10	8Ω = 1+2 16Ω = 2 + 3
8	P11	8Ω = 1+2 16Ω = 2 + 3

Address Setting

For the SmartSeries option to function properly, each station in an ADVANCE system zone must be given a unique address using the hexadecimal switches, S1 (Hi Address) and S2 (Lo Address). Each switch contains 16 settings, labeled 0–F. A small arrow on each switch indicates the setting. See Figure 7.

The station address is determined by the high address setting followed by the low address setting. For example, to assign an address of 05, the high station address is set to 0 and the low address is set to 5.

Valid address settings are 05 to FE. Record the address assigned for each station in the system for your records.

There are two different addresses that need to be set. The first address is set on the front panel Smart Series PCBA and the second address is set on the termination PCBA in the enclosure.

FSK Signal Gain Level Adjustment

The FSK Signal Gain, R7, adjusts the FSK transmit signal strength. It is set at the factory and should not be adjusted by the installer.

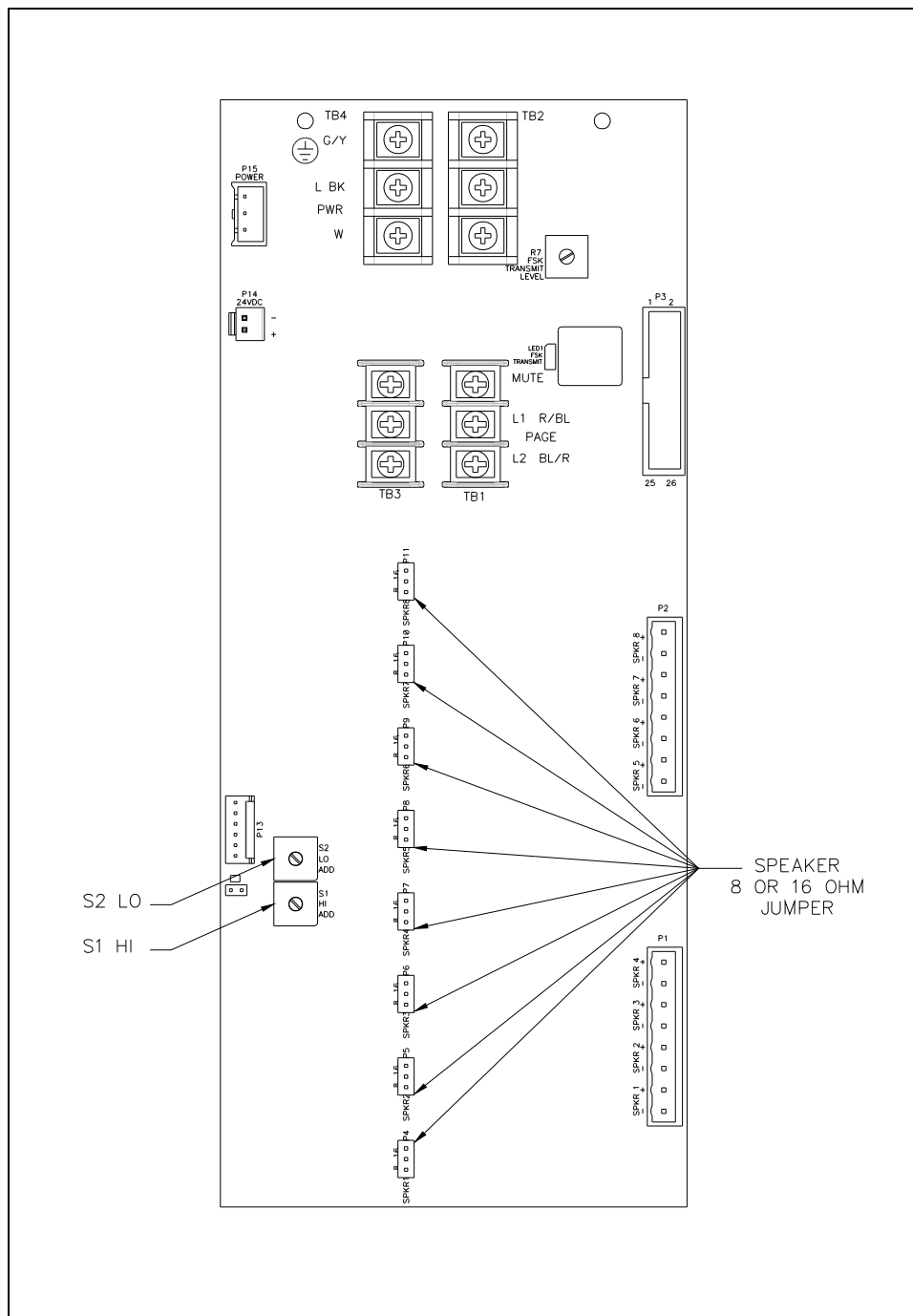


Figure 7. 69584 Speaker Termination PCBA

Attaching the Front Panel

After all adjustments have been completed, place the front cover on the rear enclosure, being careful not to pinch any cables. Secure the front cover using the four screws and washers provided. Torque the screws to 10 to 12 lbf·in (1.13 to 1.36 N·m).

Configuring the Station

The System Manager can change the system's software configuration by using the *ADVANCE Console* and *WinSCP3* software packages. The ADVANCE Console creates and maintains the software configuration file by methodically setting data values. Graphical representations of the system components are used along with various data entry forms and settings.

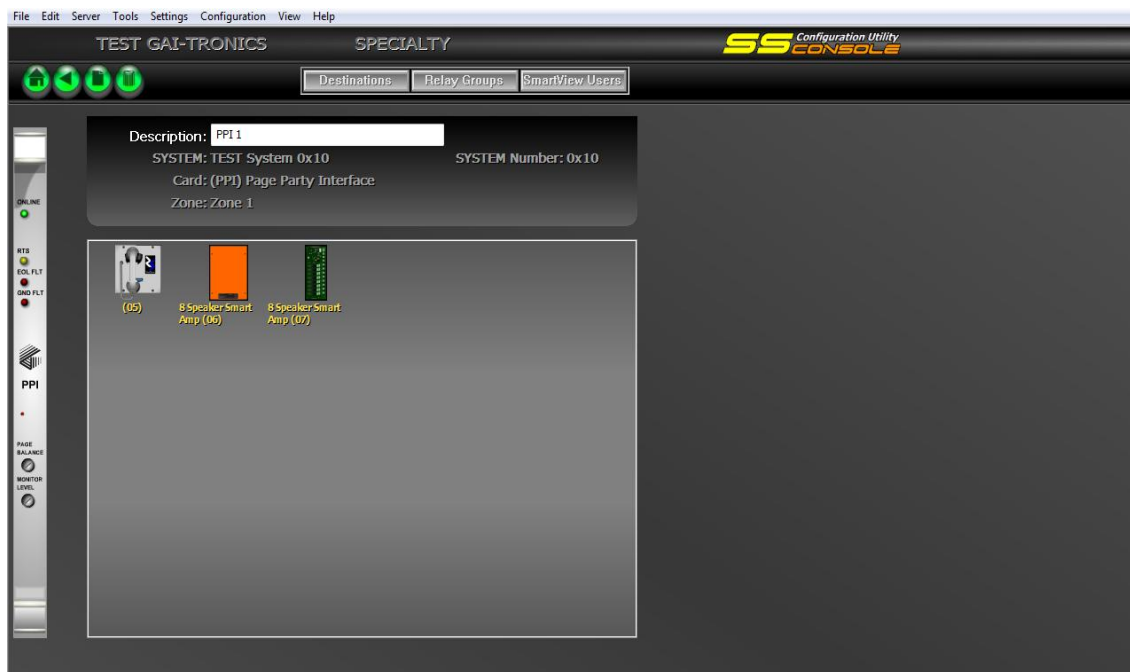
Using the ADVANCE Console does not require a connection to the MCU. The System Manager can work on a configuration at any pace on a PC. There is no need to set all of the parameter data values in one session. The System Manager is simply working on a configuration that is independent of any other configuration that may exist or be active in a functioning system.

When the System Manager is finished entering all the data, the ADVANCE Console file is translated (or compiled). The resulting file is called the system configuration file. To save the configuration file onto the MCU, the System Manager's computer is connected to the MCU using an Ethernet network connection. The connection can be made using a network patch cable or can be established remotely via a dial-up modem connection.

The file is loaded onto the MCU using the WinSCP3 application. The purpose of the WinSCP3 program is to provide a means of accessing the MCU's hard drive for file transfer from the System Manager's computer. The WinSCP3 program *does not* have the configuration capabilities of the *ADVANCE Console*.

Refer to the ADVANCE System Programming Manual to configure the station when using ADVANCE Console version 2.0.2 or newer. For older versions of Console, use the instructions below for configuring the station.

There are two stations that must be added to the configuration in ADVANCE Console when configuring the Eight-Channel Speaker Monitoring/Distribution Amplifier. The first is the ICS Smart Amplifier, and the second is a MRM. Both must be configured so the address set on the station matches the address in the configuration. The ICS Eight-Channel Speaker Monitoring/Distribution address is set on the 69552 SmartSeries PCBA and the MRM address is set on the 69584 Speaker Termination PCBA.



File Edit Server Tools Settings Configuration View Help

TEST GAI-TRONICS SPECIALTY **SS** Configuration Utility CONSOLE

Destinations Relay Groups SmartView Users

Description: 8 Speaker Smart Amp Station Number: 0x07
 SYSTEM: TEST System 0x10 SYSTEM Number: 0x10
 Card: (PPI) Page Party Interface Station Scroll
 Zone: Zone 1 (PPI 1)

Station Type: MRM
 RTU Select: NONE
 End of Line:
 Disable Polling:

Input	Description	Alarm	Type	Mode
Input 1		NONE	Normal	Relay Supervision
Input 2		NONE	Normal	Relay Supervision
Input 3		NONE	Normal	Relay Supervision
Input 4		NONE	Normal	Relay Supervision
Input 5		NONE	Normal	Relay Supervision
Input 6		NONE	Normal	Relay Supervision
Input 7		NONE	Normal	Relay Supervision
Input 8		NONE	Normal	Relay Supervision

Output	Description	Relay	Type
Output 1		Relay #1	Normal
Output 2		Relay #1	Normal
Output 3		Relay #1	Normal
Output 4		Relay #1	Normal
Output 5		Relay #2	Normal
Output 6		Relay #2	Normal
Output 7		Relay #2	Normal
Output 8		Relay #2	Normal

In addition, the MRM inputs and outputs also must be configured. Configure the MRM inputs for Relay Supervision for each connected speaker: Input 1 for speaker 1, Input 2 for speaker 2 and so on. If the speaker is not used, select “Input Disabled”.

The MRM outputs must be configured to a relay group. Output 1 is used to activate speaker 1, so this is where you would choose which alarms would play to speaker 1 by selecting the appropriate relay group: Output 2 is for speaker 2; output 3 is for speaker 3 and so on. If the speaker is not used, select “None”.

Troubleshooting

Opening the Station

Remove the four screws from the front panel and turn it to the right so that the interior surface faces you. Allow the wiring and ribbon cables to remain connected. Using two of the screws just removed, mount the front panel to the back box's right-side mounting holes. The front panel interior surface and the back box interior now face you. This configuration presents the easiest access for troubleshooting and setting adjustments.

The following tables are provided to aid qualified service personnel in troubleshooting problems with the ICS Smart Eight-Speaker Station.

Table 2. General Troubleshooting

Problem	Potential Cause
Station not functional	<ul style="list-style-type: none">• Refer to the Field Wiring section on Page 3 for proper terminations.• Verify incoming supply voltage at TB2 or TB3 on the Termination PCBA.• Verify regulated 24 V dc at P1 of Termination PCBA. Caution! Supply voltage present at P2.
Excessive hum or buzz during station operation.	Inspect the Page/Party [®] lines for proper line terminations, shorts, and grounds.
Feedback occurs during page.	Check location and orientation of speakers in the area.

Specifications

Power Requirements

AC/DC Input

AC Power Supply

Input voltage 90 to 264 V ac (operating), 50/60 Hz

Power factor @ nominal 120 V ac 0.98

DC Power Supply

Input voltage 24 V dc +/-20%

Current/Power requirements (+/-10%)

Power Consumed (8-ohm equivalent load)	24 V DC	120 V AC	230 V AC
Idle	200 mA / 4.8 W	120 mA / 14.4 VA	110 mA / 25.3 VA
Maximum output	1.95 A / 46.8 W	400 mA / 48.0 VA	220 mA / 50.6 VA
Maximum Current Consumption (8-ohm load)	19.2 V DC	90 V AC	253 V AC
Maximum output	2.44 A / 58.6 W	520 mA / 46.5 VA	230 mA / 61.0 VA

Speaker Amplifier

Maximum output 1.75 W into each 8-Ω load with 1.5 V_(RMS) input page level

Frequency response 250 to 6,500 Hz, +0/-3 dB ref. to 1 kHz

Distortion <1% THD @ 1 kHz to 24 W
<3% THD @ 1 kHz to 30 W

Input impedance 16 kΩ
16,000 Ω with SmartSeries option

SmartSeries offset level adjustment range 0 to 30 dB

Speaker Monitoring Limitations

Maximum line length for short detection 3.5 Ω series resistance

No. 16 AWG 425 ft

No. 18 AWG 275 ft

No. 20 AWG 170 ft

Enclosure Specifications

Construction/finish 16-gauge cold-rolled steel; safety orange polyurethane

Mounting Wall or column, four 0.31-in (7.8 mm) mounting holes

Termination connections Screw-type barrier terminal blocks

Enclosure dimensions 12.0 H × 8.0 W × 5.0 D in (304.8 × 203.2 × 127.0 mm)

Shipping weight 12 lb (5.44 kg)

Net weight 11 lb (4.99 kg)

Environmental

Temperature range (operation and storage) -22 °F to 158 °F (-30 °C to 70 °C)

Humidity 95% non-condensing

Warranty

Equipment. GAI-Tronics warrants for a period of one (1) year from the date of shipment, that any GAI-Tronics equipment supplied hereunder shall be free of defects in material and workmanship, shall comply with the then-current product specifications and product literature, and if applicable, shall be fit for the purpose specified in the agreed-upon quotation or proposal document. If (a) Seller's goods prove to be defective in workmanship and/or material under normal and proper usage, or unfit for the purpose specified and agreed upon, and (b) Buyer's claim is made within the warranty period set forth above, Buyer may return such goods to GAI-Tronics' nearest depot repair facility, freight prepaid, at which time they will be repaired or replaced, at Seller's option, without charge to Buyer. Repair or replacement shall be Buyer's sole and exclusive remedy. The warranty period on any repaired or replacement equipment shall be the greater of the ninety (90) day repair warranty or one (1) year from the date the original equipment was shipped. In no event shall GAI-Tronics warranty obligations with respect to equipment exceed 100% of the total cost of the equipment supplied hereunder. Buyer may also be entitled to the manufacturer's warranty on any third-party goods supplied by GAI-Tronics hereunder. The applicability of any such third-party warranty will be determined by GAI-Tronics.

Services. Any services GAI-Tronics provides hereunder, whether directly or through subcontractors, shall be performed in accordance with the standard of care with which such services are normally provided in the industry. If the services fail to meet the applicable industry standard, GAI-Tronics will re-perform such services at no cost to buyer to correct said deficiency to Company's satisfaction provided any and all issues are identified prior to the demobilization of the Contractor's personnel from the work site. Re-performance of services shall be Buyer's sole and exclusive remedy, and in no event shall GAI-Tronics warranty obligations with respect to services exceed 100% of the total cost of the services provided hereunder.

Warranty Periods. Every claim by Buyer alleging a defect in the goods and/or services provided hereunder shall be deemed waived unless such claim is made in writing within the applicable warranty periods as set forth above. Provided, however, that if the defect complained of is latent and not discoverable within the above warranty periods, every claim arising on account of such latent defect shall be deemed waived unless it is made in writing within a reasonable time after such latent defect is or should have been discovered by Buyer.

Limitations / Exclusions. The warranties herein shall not apply to, and GAI-Tronics shall not be responsible for, any damage to the goods or failure of the services supplied hereunder, to the extent caused by Buyer's neglect, failure to follow operational and maintenance procedures provided with the equipment, or the use of technicians not specifically authorized by GAI-Tronics to maintain or service the equipment. **THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES AND REMEDIES, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

Return Policy

If the equipment requires service, contact your Regional Service Center for a return authorization number (RA#). Equipment should be shipped prepaid to GAI-Tronics with a return authorization number and a purchase order number. If the equipment is under warranty, repairs or a replacement will be made in accordance with the warranty policy set forth above. Please include a written explanation of all defects to assist our technicians in their troubleshooting efforts.

Call 800-492-1212 (inside the USA) or 610-777-1374 (outside the USA) for help identifying the Regional Service Center closest to you.