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GAI-TRONICS® CORPORATION
A HUBBELL COMPANY

Industrial Communications System
Hazardous Area Page/Party® Station

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Industrial Communications System Hazardous Area Page/Party® Station

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 standard configuration of the ICS Hazardous Area Page/Party® station is an outdoor, multi-party, handset/speaker amplifier station using ac power. They are constructed of cast aluminum and are extremely weatherproof and corrosion-resistant. A number of options are available to add to station capabilities. See Features and Options below for more details.

The ICS Page/Party® Hazardous Area station is similar to and compatible with existing GAI-Tronics 700 series Page/Party® systems. ICS hazardous area Page/Party® stations can replace or be added to existing Page/Party® systems.

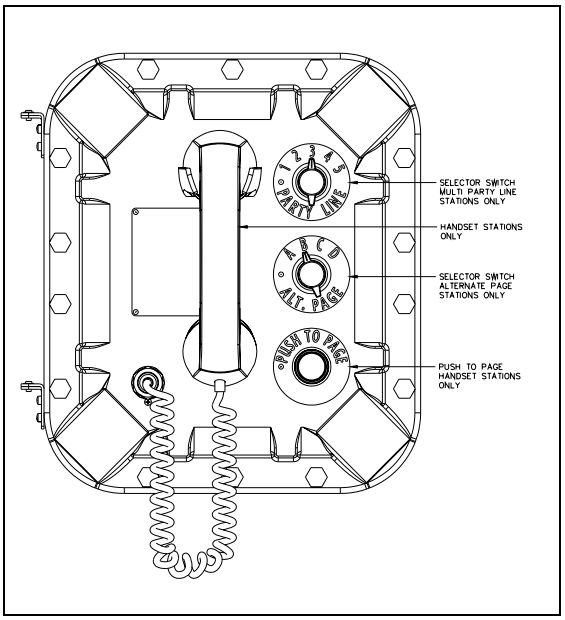

Figure 1. ICS Hazardous Area Station Front Panel with all options

Features

- Provides one-way page announcements over system speakers
- Includes a high efficiency (>80%) Class D paging amplifier to provide up to 30 watts of speaker output
- Provides full-duplex party line communication
- Includes universal ac power supply with power factor correction
- Field upgradeable options
- Durable cast aluminum enclosure

Options

- Single party line operation
- Speaker amplifier only (no handset)
- Alternate page destination
- Multiple hazardous area approvals
- PVC or Hytrel handset cords in 6-, 15-, or 25-foot lengths
- Conformal coating for PCBA
- 24 V dc power
- Volume Level Control (VLC) technology for alternate page volume
- SmartSeries technology featuring Ambient Level Sensing (ALS) and available remote monitoring
- Remote Terminal Unit (RTU) operation

Installation

Important Safety Instructions

1. Read, follow, and retain instructions – All safety and operating instructions should be read and followed before operating the unit. Retain instructions for future reference.

2. Heed warnings – Adhere to all warnings on the unit and in the operating instructions.

3. Attachments – Attachments not recommended by the product manufacturer should not be used, as they may cause hazards.

4. 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.

5. 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.

These enclosures must be installed by trained, qualified and competent personnel. Installation must comply with state and national regulations, as well as safety practices for this type of equipment.

⚠ WARNING ⚠ Do not install this equipment in hazardous areas other than those indicated on the approval listing in the Specifications section of this manual. Such installation may cause a safety hazard and consequent injury or property damage.

The mounting location must be flat and provide proper clearance, rigidity and strength to support the enclosure and all contained devices. The enclosures are equipped with factory-installed hinges. The enclosures should be mounted with hinges on the left.

⚠ WARNING ⚠ **<u>Do not</u>** mount the enclosure with hinges on the top or bottom side.

Securely fasten the enclosure to the mounting location, using 3/8-inch (10mm) diameter steel mounting bolts and washers, or washer head bolts.

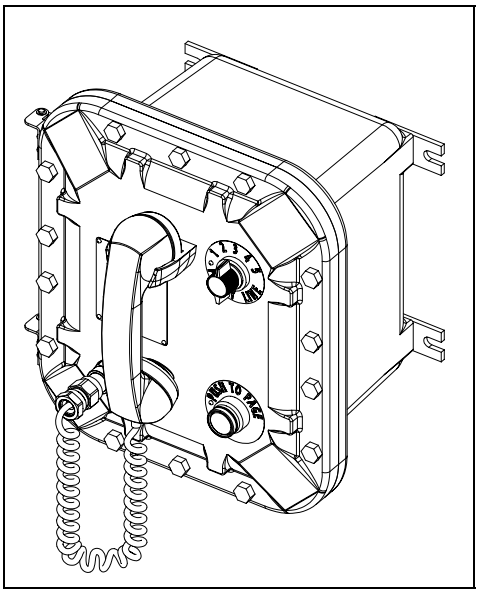

Figure 2. ICS Hazardous Area Multi-Party Station

⚠ WARNING ⚠

Do not disconnect equipment while energized.

Insure proper grounding to protective earthing.

Inspect and clean the machined flange flame joint surfaces of both the cover and box. Surfaces must be smooth, free of nicks, scratches, dirt or any foreign particle build-up that would prevent a proper seal. Surfaces must seat fully against each other to provide a proper explosion-proof joint. Clean surfaces by wiping with a clean lint-free cloth.

Apply a light coat of Killark "LUBG" lubricant to flange surfaces and close the cover. Install and tighten all cover bolts to 30 ft.-lbs. Make certain no cover bolts are omitted. Use only those bolts supplied with the enclosure.

When installing an add-on station, consult the appropriate system layout diagrams. These figures, when used in conjunction with the station installation information and cable layout guide, should provide all the information necessary to install additional Page/Party® stations.

Mounting the Enclosure

NOTE: The mounting surface must be able to support the weight of the aluminum enclosure. See the Specification section for the weights and dimensions of the unit.

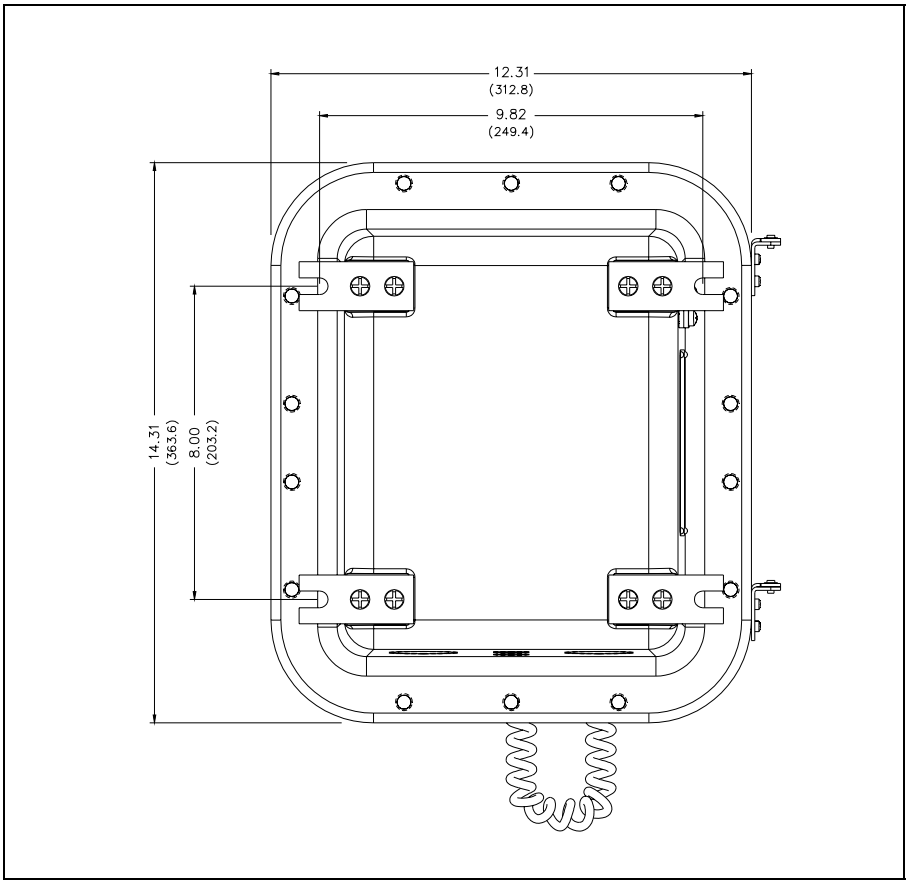

Figure 3. Enclosure Mounting Details

The enclosure must be securely fastened with 3/8-inch (10mm) diameter steel mounting bolts located on all four mounting feet. Stainless steel hardware is recommended in outdoor applications.

NOTE: Refer to the Killark Installation, Operation, and Maintenance Data Sheet enclosed with the unit for additional information.

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

Cable Entries

Refer to Figure 4 for the standard NPT conduit entries, and Figure 5 for the standard metric cable gland entries. Ensure any unused openings are sealed with proper fittings per local standards. All metric cable entry devices and blanking elements shall be certified in type of explosion protection flameproof enclosure "d" with an IP66 rating, suitable for conditions of use and correctly installed. Use field wiring suitable for the ambient temperature. Any conduit NPT plugs (blanking elements) will need to be explosion-proof with a Type 4X rating.

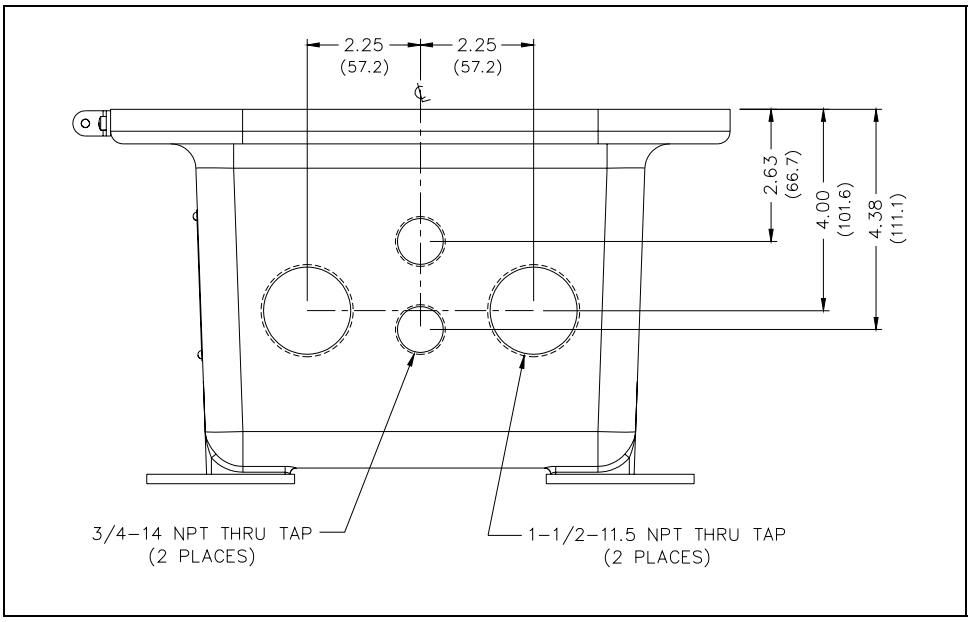

Figure 4. Standard NPT Conduit Entries

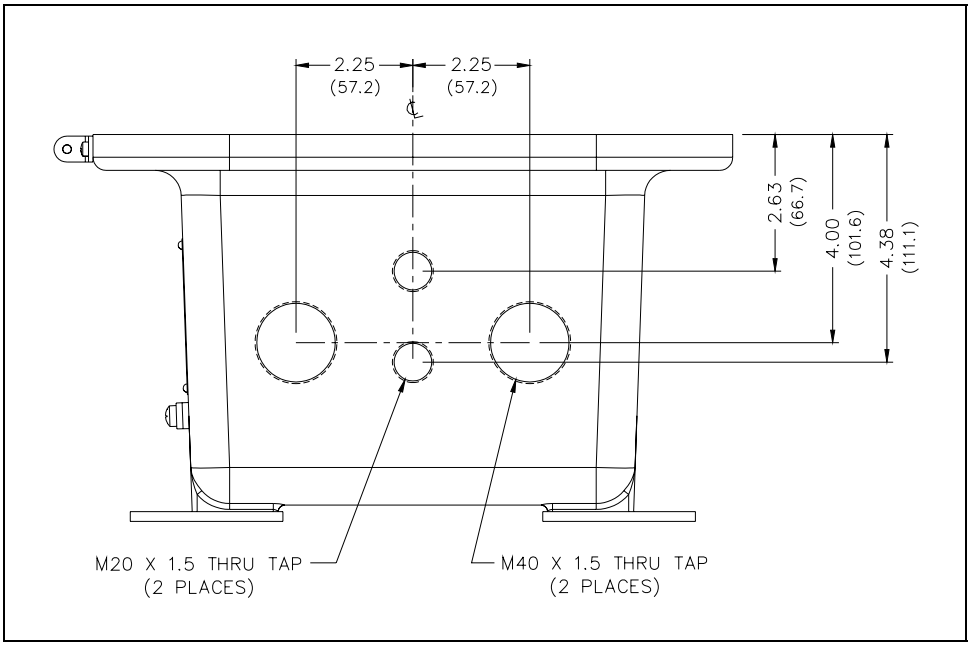

Figure 5. Standard Metric Cable Gland Entries

Field Wiring

The ICS Page/Party® Station 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 6 for a sample wiring diagram.

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 to terminal block TB4-2 or TB5-2.

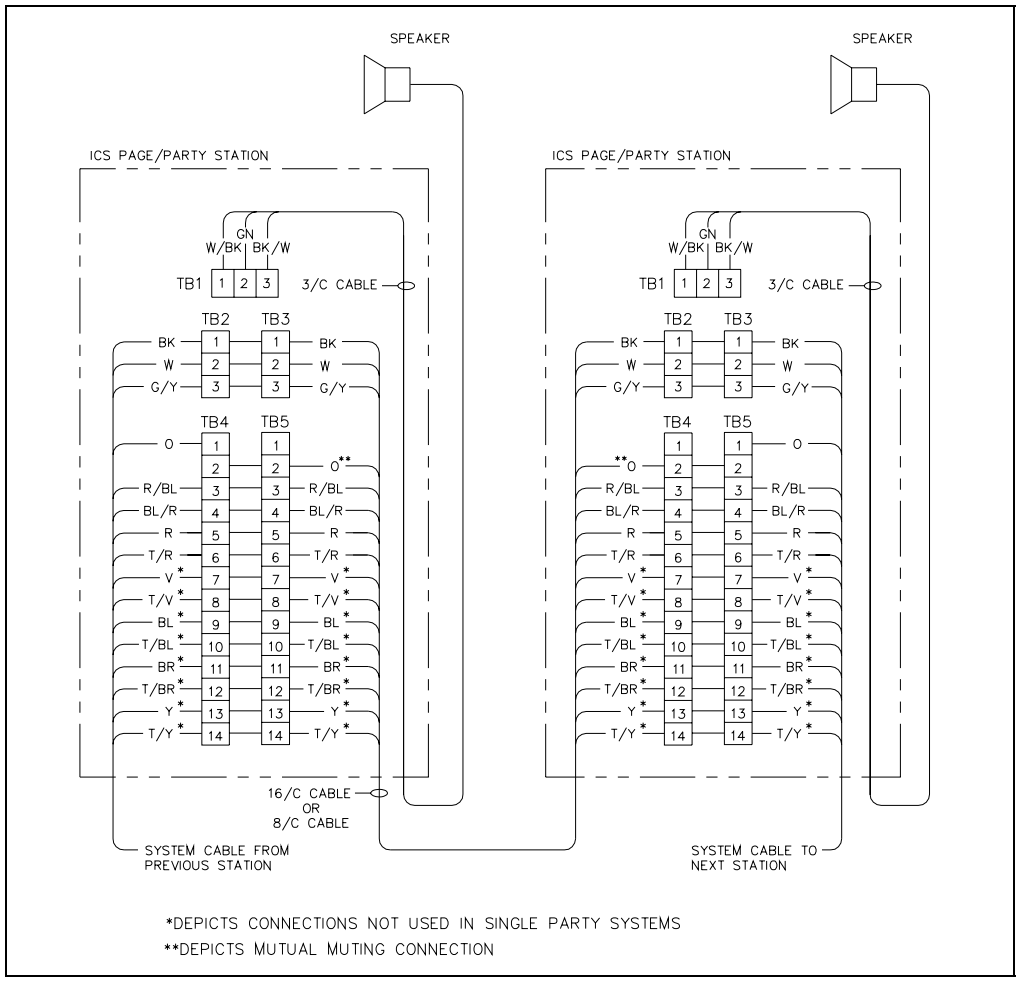

Figure 6. Typical Page/Party® ICS Station Wiring Diagram

After all adjustments have been completed, inspect and clean the machined flange joint surfaces of both the cover and box. Surfaces must be smooth, free of nicks, scratches, dirt or any foreign particle build-up that would prevent a proper seal. Surfaces must seat fully against each other to provide a proper explosion-proof joint. Clean surfaces by wiping with a clean lint-free cloth.

Apply a light coat of Killark "LUBG" lubricant to flange surfaces and close the cover. Install and tighten all cover bolts to 30 ft.-lbs. Make certain no cover bolts are omitted. Use only those bolts supplied with the enclosure.

Settings and Adjustments

Opening the Station

⚠**WARNING**⚠ **Before performing any of the following settings and adjustments, remove all power from the station.**

⚠**WARNING**⚠ **To reduce the risk of hazardous atmospheres, disconnect the equipment from the supply circuit before making any adjustments to the amplifier's handset level.**

Remove all cover bolts from the enclosure. Swing the front door open to access the internal PCBAs.

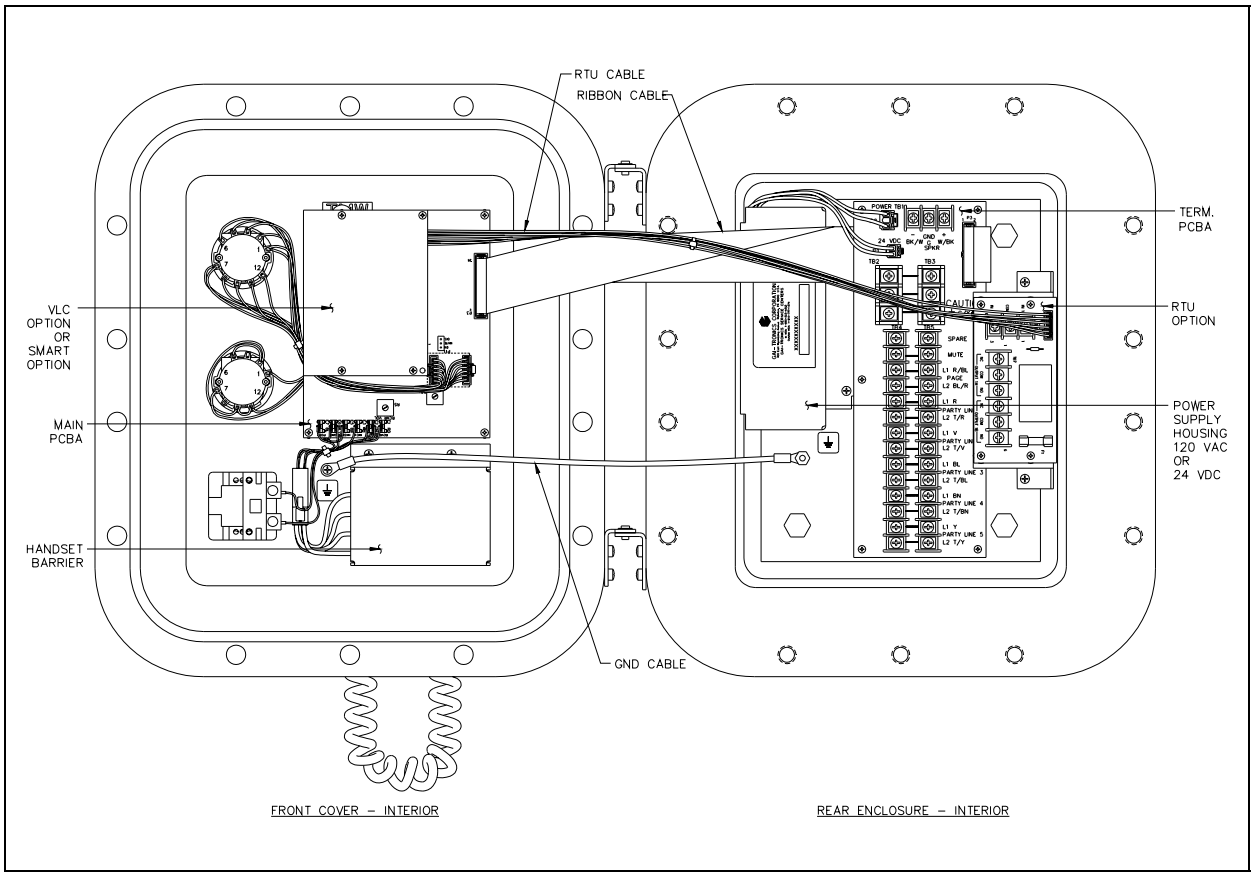

Figure 7. ICS Hazardous Area Station – Interior View

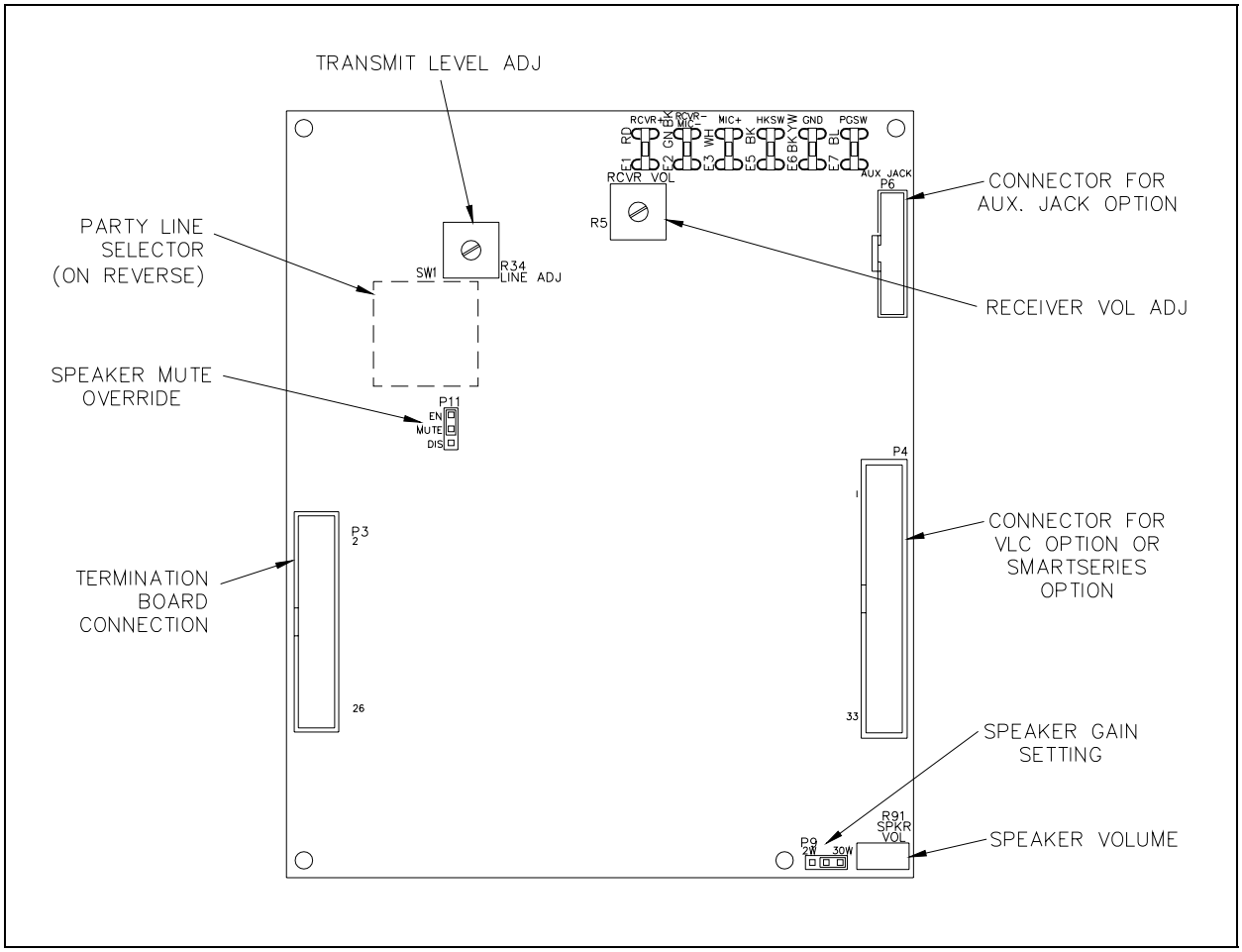

Figure 8. 69557 Series Main PCBA

Jumper Settings

Speaker Mute

The station can mute the speaker amplifier during page operation to eliminate feedback. P11 in the EN position (default) mutes the speaker during page activation. P11 in the DIS position allows broadcast to the speaker during paging.

Speaker Gain Setting

P9 can limit the maximum speaker output level. P9 in the HI position (default) represents a 30-watt maximum output. P9 in the LO position represents a 2-watt maximum output.

⚠ **WARNING** ⚠ **Maximum output power may exceed rated speaker wattage resulting in speaker damage.**

Level Adjustments

Transmit Level

The Transmit Level potentiometer, R34, adjusts the signal level from the handset or optional auxiliary headset microphone to the page or party lines.

Receiver Volume

The Receiver Volume potentiometer, R5, adjusts the signal level to the handset receiver from the page or party lines. It does not adjust the signal level to the optional auxiliary headset.

Speaker Volume

The Speaker Volume potentiometer, R91, adjusts the signal level to the speaker from the page line. The default setting is 4 watts for an 8-ohm speaker and 2 watts for a 16-ohm speaker.

Warning – Maximum output power may exceed rated speaker wattage resulting in speaker damage.

Attach the Front Cover

After all adjustments have been completed, inspect and clean the machined flange joint surfaces of both the cover and box. Surfaces must be smooth, free of nicks, scratches, dirt or any foreign particle build-up that would prevent a proper seal. Surfaces must seat fully against each other to provide a proper explosion-proof joint. Clean surfaces by wiping with a clean lint-free cloth.

Apply a light coat of Killark "LUBG" lubricant to flange surfaces and close the cover. Install and tighten all cover bolts to 30 ft.-lbs. Make certain no cover bolts are omitted. Use only those bolts supplied with the enclosure.

It may become necessary to re-terminate some or all of the enclosures in a system. If so, strip the wires back to clean copper and connect only one wire to each connector to allow for easier future troubleshooting.

NOTE: Refer to the Killark Installation, Operation, and Maintenance Data Sheet enclosed with the unit for additional information.

Operation

For paging and subsequent party line conversation, the station operator lifts the handset, selects a free party line using the five-position rotary selector switch (if equipped), and presses the handset pressbar or headset page switch. The station operator pages the desired individual and designates the party line on which that individual should respond. The individual then responds by approaching the nearest ICS Page/Party® station, selecting the appropriate party line and lifting the handset or connecting a headset. Full-duplex communication can then be held on the party line without broadcasting over the speakers. After the conversation is complete, all parties should place the handset back on hook.

NOTES:

1. For stations with the alternate page destination option, additional programmed page zones can be utilized with the alternate page selector switch. These alternate page destinations must be software configured in the central control cabinet of a GAI-Tronics ADVANCE system.
2. The ICS Page/Party® station incorporates a noise-canceling microphone to reduce transmitted ambient noise. This requires the user to place the microphone as close as possible to their mouth.

Options

The ICS Page/Party® Station options are factory installed.

ICS SmartSeries

General

The 69552 SmartSeries PCBA adds microprocessor control to the ICS Page/Party® station, providing additional sensor and monitoring capabilities. SmartSeries and VLC PCBAs cannot be installed in the same station.

Features

When used with or without ADVANCE head-end equipment:

- Ambient Level Sensing (ALS) circuitry automatically changes the local speaker's paging volume in response to varying background noise
- Off-hook timeout prevents noise being introduced to a party line by electronically placing the handset "on-hook" after 8 minutes
- Page timeout limits a single page broadcast to two minutes, freeing the page line for emergencies

When used with ADVANCE head-end equipment:

- Station monitoring of key components (including handset, amplifier and local speaker) provides fast notification of any faults
- Ability to accept supervised contact closure inputs and provide a supervised relay output (requires RTU option)

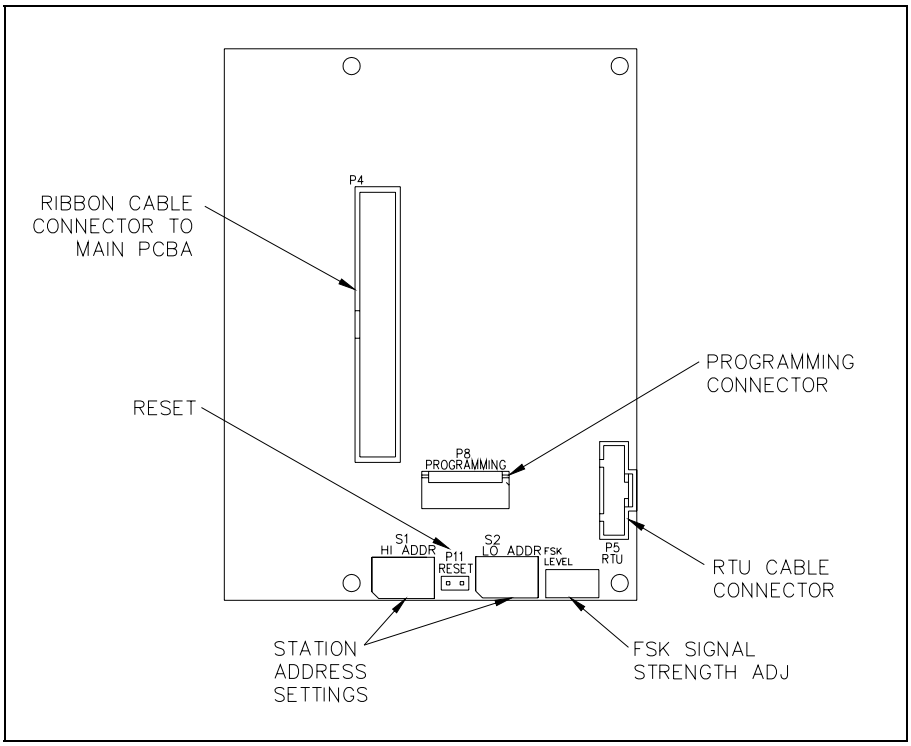

Figure 9. 69552 SmartSeries PCBA

Adjustments

Opening the Station

⚠WARNING⚠ Before performing any of the following settings and adjustments, remove all power from the station.

⚠WARNING⚠ To reduce the risk of hazardous atmospheres, disconnect the equipment from the supply circuit before making any adjustments to the amplifier's handset level.

Remove all cover bolts from the enclosure. Swing the front door open to access the internal PCBAs.

Setting the Address

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.

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. If the SmartSeries PCBA is installed in a system without an ADVANCE head end, set the address to 04 (default).

ALS Minimum Level

The ALS minimum level is the lowest speaker output level that the station will maintain. To set the ALS minimum level, turn R91 fully counterclockwise. Listen for a single beep from the speaker indicating the speaker amplifier is in the Minimum Level Adjustment mode. If the page line is in use immediately after the beep tone, the page signal should be used to make the minimum level adjustment. If the page line is inactive following the beep tone, a continuous tone is activated to make the minimum 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. The factory default setting for minimum level is 4.0 watts nominal into an 8-ohm load.

ALS Offset Level

The ALS offset level allows the output of the speaker amplifier to maintain a set difference or "offset" between the ambient noise level and the speaker output level. To set the ALS offset level, turn R91 fully clockwise and listen for the two beep tones indicating that the station is in the Offset Adjustment mode. If the page line is in use immediately after the two beep tones are heard, the page signal should be used to make the offset level adjustment. If the page line is inactive immediately following the beep tones, a continuous tone is activated to make the offset level adjustment. After the tone is activated, all page line activity is ignored until completion of the adjustment. Adjust R91 to the desired offset level.

NOTE: This adjustment should be made under maximum ambient noise level conditions. The ALS offset level must always be set higher than the ALS minimum level setting.

SmartSeries VLC Level

When activated, the VLC overrides the ALS minimum level setting allowing the speaker volume to change to a preset level during an emergency page. To adjust the VLC Level, force the station into the VLC mode by having someone execute a page from a station programmed by the MCU to activate the VLC function. During the page, turn the R91 control fully counterclockwise, and listen for two beep tones through the page speaker indicating the VLC Adjustment mode has been activated. After the two beep tones, turn the R91 control to the desired speaker level using the live paging signal to adjust the level. The station automatically exits the VLC Adjustment mode and reverts to normal operation 5 seconds after the last pot adjustment.

NOTE: The system must be equipped with an ADVANCE head end to activate the VLC function.

FSK Signal Gain

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.

Attaching the Front Cover

After all adjustments have been completed, inspect and clean the machined flange joint surfaces of both the cover and box. Surfaces must be smooth, free of nicks, scratches, dirt or any foreign particle build-up that would prevent a proper seal. Surfaces must seat fully against each other to provide a proper explosion-proof joint. Clean surfaces by wiping with a clean lint-free cloth.

Apply a light coat of Killark "LUBG" lubricant to flange surfaces and close the cover. Install and tighten all cover bolts to 30 ft.-lbs. Make certain no cover bolts are omitted. Use only those bolts supplied with the enclosure.

It may become necessary to re-terminate some or all of the enclosures in a system. If so, strip the wires back to clean copper and connect only one wire to each connector to allow for easier future troubleshooting.

NOTE: Refer to the Killark Installation, Operation, and Maintenance Data Sheet enclosed with the unit for additional information.

Operation

Paging with ADVANCE Head End

Paging and party line operation with the ICS SmartSeries option is similar to standard station operation. The main differences are that when the handset pressbar or the headset page switch is pressed, a steady "wait" tone will be heard in the handset/headset earpiece. When the "wait" tone ends, a pre-announcement tone, if programmed, will sound, and the operator may place their page. If the system is busy and the page is denied, the user will hear a busy tone in the handset/headset earpiece.

Paging without ADVANCE Head End

Paging and party line operation will be similar to standard station operation with the addition of an optional pre-announcement tone being generated by the station at the beginning of each page.

Station Time-out Features

The ICS SmartSeries option supports a page duration limit that sets the maximum duration of each page. If the page is still active when the page duration limit is reached, the page will be terminated. When used without an ADVANCE head end, the page duration limit is fixed at 2 minutes.

The ICS SmartSeries option supports an off-hook limit that sets the maximum duration that the station may be kept off hook. If the off-hook limit is reached, the station will be placed electrically on hook. To reset the timeout condition, the handset must be physically placed on hook momentarily. When used without an ADVANCE head end, the off-hook limit is fixed at 8 minutes.

VLC

General

The 69553 Volume Level Control (VLC) PCBA adds the capability of remotely controlling the local speaker volume level. When VLC is activated, a remote device transmits a 50 kHz signal over the page line. The station detects the 50 kHz signal and switches to an alternate speaker volume setting.

VLC and SmartSeries options cannot be used in the same station.

Features

- Provides an “alternate” speaker volume setting that is activated by receiving a 50 kHz signal on the page line.
- Allows office or crew quarters speakers to be muted until a high priority message or alarm is broadcast.
- Enables outdoor speaker volume to be reduced at night.
- Prevents local handset paging during emergency conditions.
- Adds the ability to provide a relay output (requires RTU option)

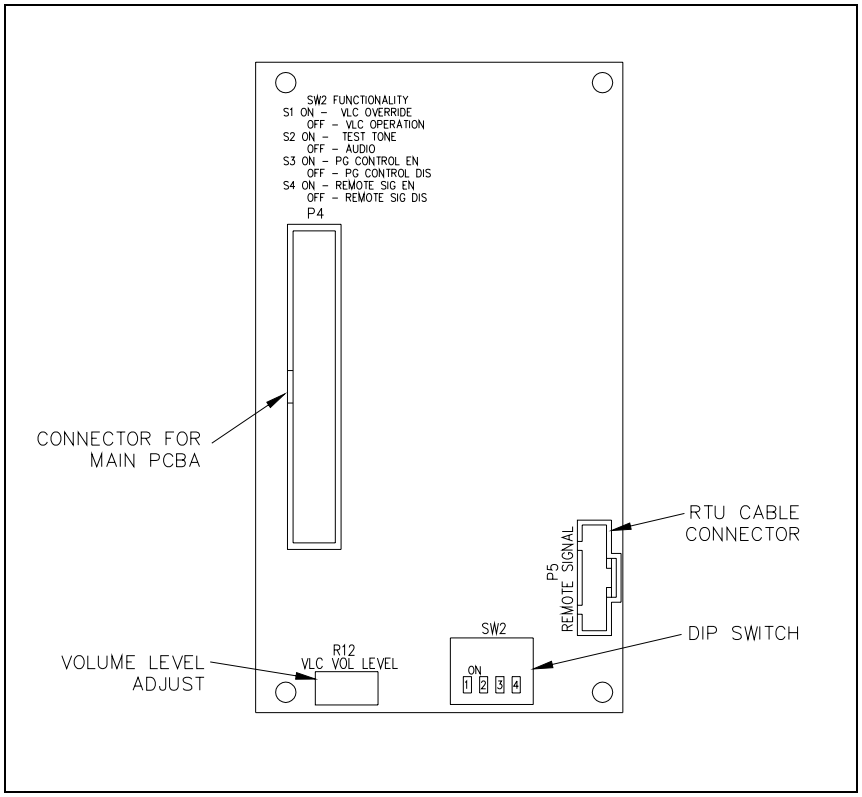

Figure 10. 69553 Series VLC PCBA

Installation and Adjustments

Opening the Station

⚠WARNING⚠ Before performing any of the following settings and adjustments, remove all power from the station.

⚠WARNING⚠ To reduce the risk of hazardous atmospheres, disconnect the equipment from the supply circuit before making any adjustments to the amplifier's handset level.

Remove all cover bolts from the enclosure. Swing the front door open to access the internal PCBAs.

Audio Alignment

To set the normal speaker output level, set DIP switch SW2-1 to the "off" position. Set SW2-2 to the "on" position to enable a reference test tone. Adjust R91 on the Main PCBA to the desired audio level. To mute the audio, turn R91 fully counterclockwise.

NOTE: If LED2 on the VLC PCBA is on, indicating the system VLC tone is present, this adjustment cannot be made.

To set the VLC controlled speaker output level, set SW2-1 to the "on" position. Set SW2-2 to the "on" position to enable a reference test tone. Adjust R12 on the VLC PCBA to the desired audio level. To mute the audio, turn R12 fully counterclockwise.

Set SW2-1 and SW2-2 to the "off" position to return to normal system operation.

Page Disable Control

To disable local paging when the system VLC tone is present, set SW2-3 to the “on” position.

Remote Output Switching (Available with RTU Only)

To activate the RTU relay when the system VLC tone is present, set SW2-4 to the “on” position.

Attaching the Front Cover

After all adjustments have been completed, inspect and clean the machined flange joint surfaces of both the cover and box. Surfaces must be smooth, free of nicks, scratches, dirt or any foreign particle build-up that would prevent a proper seal. Surfaces must seat fully against each other to provide a proper explosion-proof joint. Clean surfaces by wiping with a clean lint-free cloth.

Apply a light coat of Killark “LUBG” lubricant to flange surfaces and close the cover. Install and tighten all cover bolts to 30 ft.-lbs. Make certain no cover bolts are omitted. Use only those bolts supplied with the enclosure.

It may become necessary to re-terminate some or all of the enclosures in a system. If so, strip the wires back to clean copper and connect only one wire to each connector to allow for easier future troubleshooting.

NOTE: Refer to the Killark Installation, Operation, and Maintenance Data Sheet enclosed with the unit for additional information.

RTU

General

The 69556 Remote Terminal Unit (RTU) PCBA adds remotely controlled dry relay contacts to an ICS Page/Party® station equipped with either a VLC PCBA or a SmartSeries PCBA in conjunction with an ADVANCE head end. When used with the SmartSeries PCBA in conjunction with ADVANCE head end, two supervised inputs are also available.

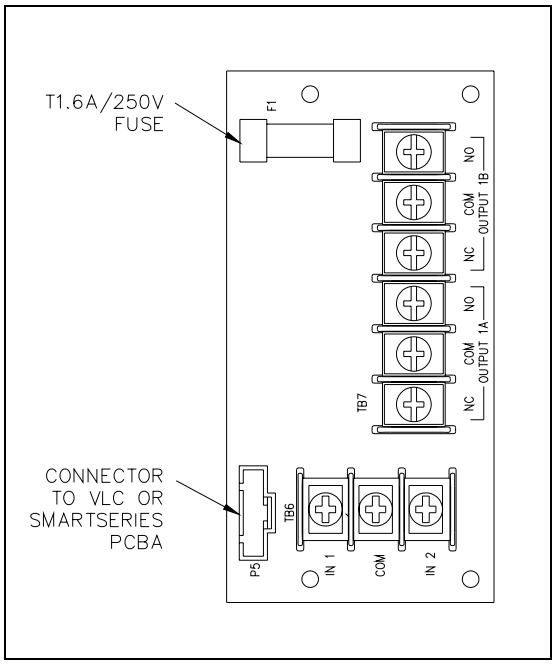

Figure 11. 69556 Series RTU PCBA

Features

With SmartSeries PCBA and ADVANCE Head End

- Two dry-contact input circuits (input cable supervision is optional)
- Input status is monitored to trigger action in the ADVANCE head end.
- Double pole, Form “C” relay contact (output cable supervision is optional)
- One fuse-protected contact

With VLC PCBA

- Double-pole, Form “C” relay
- One fuse-protected contact

Installation

Opening the Station

⚠ **WARNING** ⚠ **Before performing any of the following settings and adjustments, remove all power from the station.**

⚠ **WARNING** ⚠ **To reduce the risk of hazardous atmospheres, disconnect the equipment from the supply circuit before making any adjustments to the amplifier's handset level.**

Remove all cover bolts from the enclosure. Swing the front door open to access the internal PCBAs.

Field Wiring

The RTU PCBA provides terminal blocks for field wiring. Attach spade lugs to the wires before attachment to the terminal blocks for the most secure connection.

OUTPUT 1A and OUTPUT 1B are activated by either the VLC or SmartSeries PCBA. OUTPUT 1B is fused on the normally open (N. O.) contact with a T1.6 amp fuse.

Attaching the Front Panel

After all connections have been completed, inspect and clean the machined flange joint surfaces of both the cover and box. Surfaces must be smooth, free of nicks, scratches, dirt or any foreign particle build-up that would prevent a proper seal. Surfaces must seat fully against each other to provide a proper explosion-proof joint. Clean surfaces by wiping with a clean lint-free cloth.

Apply a light coat of Killark "LUBG" lubricant to flange surfaces and close the cover. Install and tighten all cover bolts to 30 ft.-lbs. Make certain no cover bolts are omitted. Use only those bolts supplied with the enclosure.

It may become necessary to re-terminate some or all of the enclosures in a system. If so, strip the wires back to clean copper and connect only one wire to each connector to allow for easier future troubleshooting.

NOTE: Refer to the Killark Installation, Operation, and Maintenance Data Sheet enclosed with the unit for additional information.

Non-supervised Output Wiring Configuration

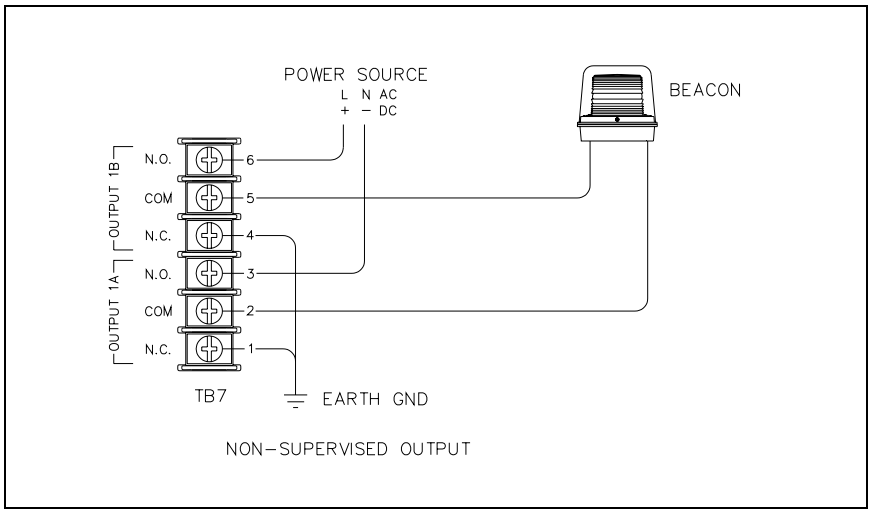

Figure 12. Non-supervised Output with the VLC or SmartSeries Option

Supervised Output Wiring Configurations with SmartSeries Option

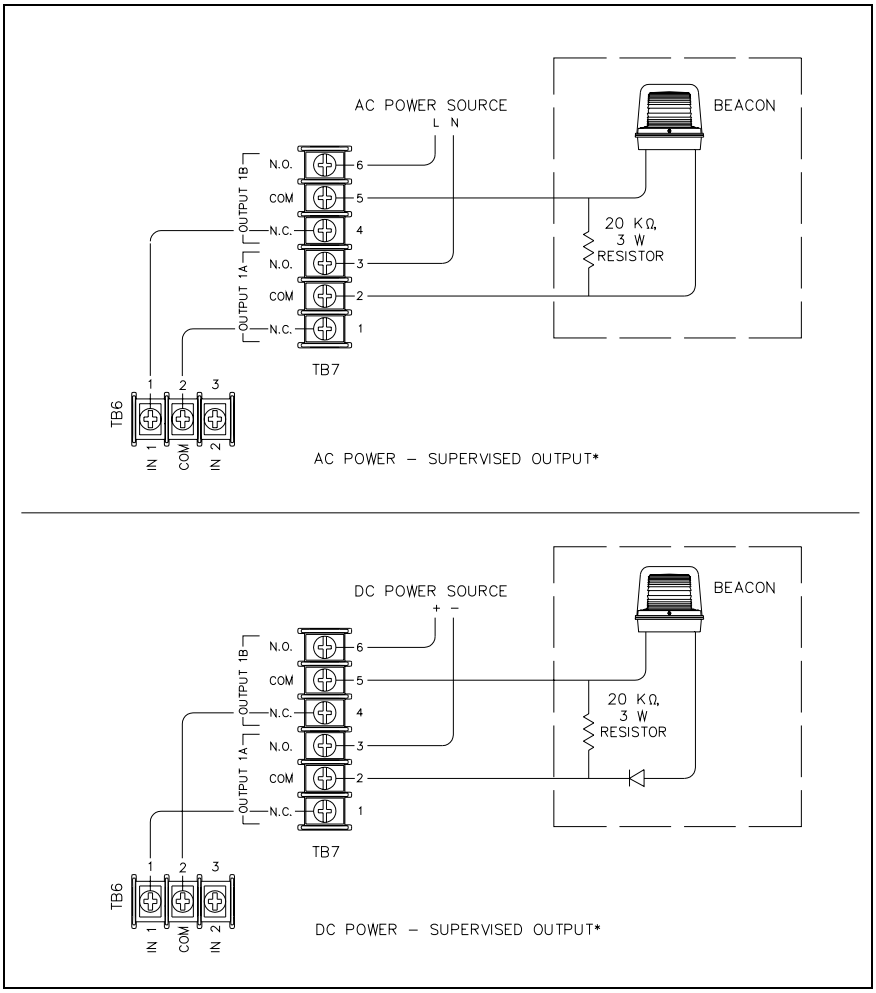

Figure 13. Supervised Output Wiring with SmartSeries Option

***NOTE:** Input 1 is used to monitor Output 1 and is not available for other functions.

Input 1 or 2 Wiring Configuration with the SmartSeries Option

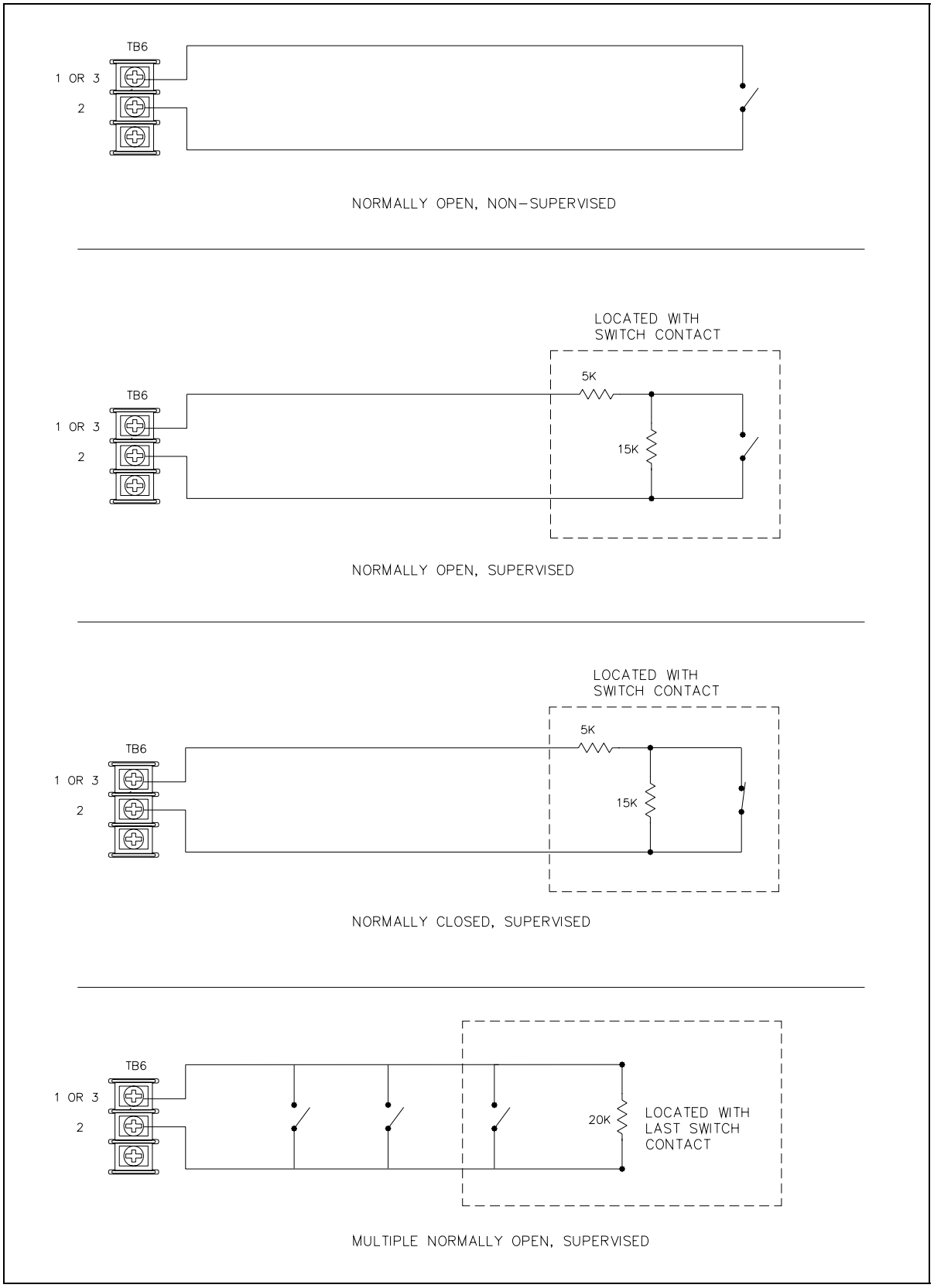

Figure 14. Input 1 or 2 Wiring Configuration with the SmartSeries Option

Troubleshooting

Opening the Station

⚠**WARNING**⚠ **Before performing any of the following settings and adjustments, remove all power from the station.**

⚠**WARNING**⚠ **To reduce the risk of hazardous atmospheres, disconnect the equipment from the supply circuit before making any adjustments to the amplifier's handset level.**

Remove all cover bolts from the enclosure. Swing the front door open to access the internal PCBAs.

Jumper Settings

P4 Standard Jumper Configuration

For standard operation, without options, P4 requires jumper installation for proper operation. See Figure 15 for jumper locations.

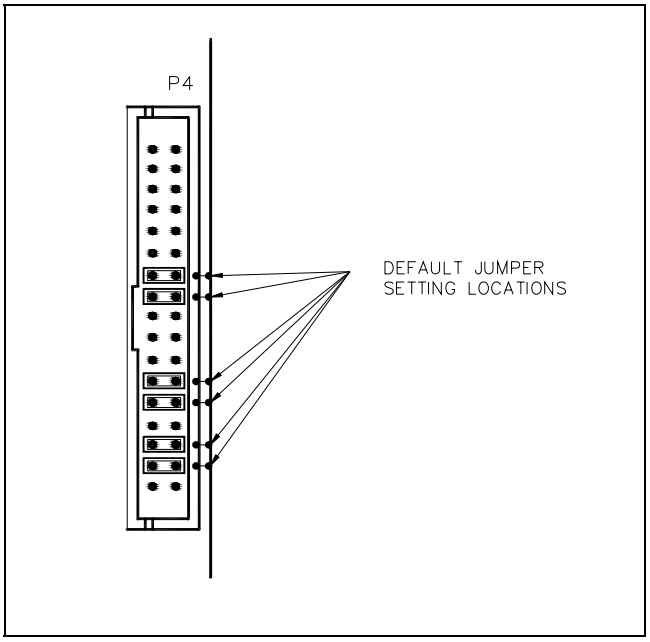

Figure 15. P4 Jumper Default Settings

The following tables are provided to aid qualified service personnel in troubleshooting problems with the ICS Page/Party® Station.

Table 1. **General Troubleshooting**

Problem	Potential Cause
Station not functional	• Refer to the Field Wiring section on page 6 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.
Crosstalk occurs between Page/Party® lines.	• Inspect the Page/Party® lines for proper line terminations, shorts, and grounds. • Inspect the Page/Party® party line connections for crossing of the cable pairs.
Feedback occurs during page.	• Check location and orientation of speakers in the area. • Refer to the Field Wiring section related to mutual muting on page 6. • Refer to Speaker Mute on page 8.
Squeal in handset receiver.	• Ensure proper termination on Page/Party® lines. • Ensure system line balance is connected.
Handset microphone audio is too low/loud.	• Disconnect headset, if connected. • Refer to the Transmit Level section on page 9. • Check jumper settings or cable connections at P4. • Ensure proper termination on Page/Party® lines. • Check handset connections. • Check proper cable terminations between Termination and Main PCBAs. • Check operation of hookswitch. • Replace handset.
Handset receiver audio is too low/loud.	• Refer to Receiver Volume on page 9. • Check jumper settings or cable connections at P4. • Ensure proper termination on Page/Party® lines. • Check handset connections. • Check proper cable terminations between Termination and Main PCBAs. • Check operation of hookswitch. • Replace handset.

Table 2. **Troubleshooting Standard/VLC Configurations**

Problem	Potential Cause
Speaker volume is too low/loud.	• Refer to Speaker Volume on page 9; or for VLC, Audio Alignment on page 16. • Ensure the nominal page line level is correct. • Replace the speaker or driver.
Cannot place a page.	• For VLC, refer to Audio Alignment on page 16, and Page Disable Control on page 17. • Check handset connections. • Check proper cable terminations between Termination and Main PCBAs. • Check jumper settings or cable connection at P4. • Replace handset.
RTU output is not functional.	• Ensure the VLC PCBA is installed and operational. Refer to Remote Output Switching (Available with RTU Only) on page 17. • Check fuse F1 on RTU PCBA. • Check the cable connection at P5 on the RTU and VLC PCBA. • Check RTU terminal connections on TB7. Refer to Figure 12. • Check operation of connected device.
RTU input does not function.	Inputs are only available with SmartSeries option.

Table 3. **Troubleshooting SmartSeries Configurations**

Problem	Potential Cause
Speaker volume is too low/loud.	• Refer to the ADVANCE System Programming manual, Pub. 42004-700L2 for station configuration. • Refer to the ALS Minimum Level, ALS Offset Level, and SmartSeries VLC Level sections. • Check cable connection at P4. • Ensure the nominal page line level is correct. • Replace the speaker or driver.
Page/Party® operation does not function.	• Refer to the ADVANCE System Programming manual, Pub. 42004-700L2 to ensure station address matches ADVANCE configuration. • Refer to Setting the Address on page 12. • Check cable connection at P4. • Check proper cable terminations between Termination and Main PCBAs. • Ensure proper termination on Page/Party® lines.
RTU output is not functional.	• Refer to the ADVANCE System Programming manual, Pub. 42004-700L2 for station configuration. • For supervised output, ensure no monitored output faults exist. • Check fuse F1 on RTU PCBA. • Check the cable connection at P5 on the RTU and SmartSeries PCBA. • Check RTU terminal connections on TB6 and TB7. Refer to Figure 12 and Figure 13. • Check operation of connected device.
RTU input does not function.	• Refer to the ADVANCE System Programming manual, Pub. 42004-700L2 for station configuration. • For supervised input, ensure no monitored input faults exist. • Check the cable connection at P5 on the RTU and SmartSeries PCBA. • Check RTU terminal connections on TB6. Refer to Figure 14. • Check operation of connected device.

Attaching the Front Cover

After all troubleshooting has been completed, inspect and clean the machined flange joint surfaces of both the cover and box. Surfaces must be smooth, free of nicks, scratches, dirt or any foreign particle build-up that would prevent a proper seal. Surfaces must seat fully against each other to provide a proper explosion-proof joint. Clean surfaces by wiping with a clean lint-free cloth.

Apply a light coat of Killark "LUBG" lubricant to flange surfaces and close the cover. Install and tighten all cover bolts to 30 ft.-lbs. Make certain no cover bolts are omitted. Use only those bolts supplied with the enclosure.

It may become necessary to re-terminate some or all of the enclosures in a system. If so, strip the wires back to clean copper and connect only one wire to each connector to allow for easier future troubleshooting.

NOTE: Refer to the Killark Installation, Operation, and Maintenance Data Sheet enclosed with the unit for additional information.

Specifications

Power Requirements

AC/DC Input

AC Power Supply

Input voltage ..... 120/230 V ac (nominal), 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 load)	24 V DC	120 V AC	230 V AC
Idle	165 mA/4.0 W	70 mA/8.4 VA	90 mA/20.7 VA
4-watt output (default setting)	460 mA/11.0 W	120 mA/14.4 VA	110 mA/25.3 VA
12-watt output	900 mA/21.6 W	200 mA/24.0 VA	160 mA/36.8 VA
30-watt 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	108 V AC	253 V AC
30-watt output	2.44 A/46.8 W	450 mA/48.6 VA	260 mA/65.8 VA

Handset

Microphone ..... Dynamic, noise-canceling
Receiver ..... Dynamic, hearing aid compatible
Cord ..... Retractile, 6-foot extended, PVC
Material ..... ABS
External control ..... Push-to-page handset pressbar

Handset Amplifier

Output level (compression controlled) ..... 1.5 V_{RMS} nominal into 33-ohm load
Adjustable 0–2.1 V_{RMS}
Frequency response ..... 250–6,500 Hz, +0/-3 dB ref. to 1 kHz
Distortion ..... <1.5% THD @ 1 kHz (below compression level)
Receiver level ..... 200 mV_{RMS}, nominal
Adjustable 150–400 mV_{RMS}

Speaker Amplifier

Maximum output* ..... 30 watts into 8-ohm load with 1.5 V_{RMS} input page level
Adjustable to 30 watts; default: 4 watts @ 8 ohms
Frequency response ..... 250–6,500 Hz, +0/-3 dB ref. to 1 kHz
Distortion ..... <1% THD @1 kHz to 24 watts
<3% THD @ 1 kHz to 30 watts
Input impedance ..... 50,000 ohms
16 kilohms with SmartSeries option

SmartSeries offset level adjustment range ..... 0 to 30 dB

*See Figure 16 on page 28.

Enclosure Specifications

Construction/finish ..... Cast aluminum/gray polyurethane
Mounting ..... Wall or column, four 3/8-inch (10mm) mounting feet with slots
Connections ..... Internal screw-type barrier terminal blocks
Dimensions ..... 14.31 H × 13.06 W × 11.68 D inches (363.6 × 331.8 × 296.6 mm)
Temperature range (operating and storage) ..... (-4º F to +140º F) -20º C to +60º C
Shipping weight ..... 49 lbs. (22.2 kg)
Net weight ..... 47 lbs. (21.3 kg)
Enclosure IP66/Type 4X

VLC Option Specifications

VLC minimum input level ..... 50 mV_{RMS}
VLC tolerance ..... 50 kHz +/-4%

RTU Option Specifications

Output Relay

Maximum load current ..... 8 amps OUTPUT 1A (unfused)
1.6 amps OUTPUT 1B (fused)
Maximum voltage ..... 250 V ac

RTU Input Control (with SmartSeries Option)

Switch type ..... Normally open (N.O.) or normally closed (N.C.) dry contacts
End-of-line termination..... 20 kilohms, or 15 kilohms + 5.1 kilohms
Cable resistance .....100 ohms maximum loop resistance
Contact closure resistance.....1 kilohm maximum
Open fault detection..... >65 kilohms
Short fault detection..... <200 ohms

Approvals

NRTL listed .....Hazardous locations Class I, Div. 1, Groups B, C & D;
(USA and Canada) Class II, Div. 1, Groups F & G;
Class III, Div. 1
T6, Type 4X

CE Mark..... Complies with Low Voltage Directive 2006/95/EC, and the EMC Directive 89/336/EEC amended by the Directive 93/68/EEC.

Certificate No.
Notified Body Id No. 0539
UL International DEMKO A/S
Lyskear 8
DK-2730 Herlev
Denmark

DEMKO 09 ATEX 0909372 (ATEX)..... II 2 G Ex d [ib] IIB + H_2 T6

IECEx UL 09.0009 (IECEx).....II 2 G Ex d [ib] IIB + H_2 T6

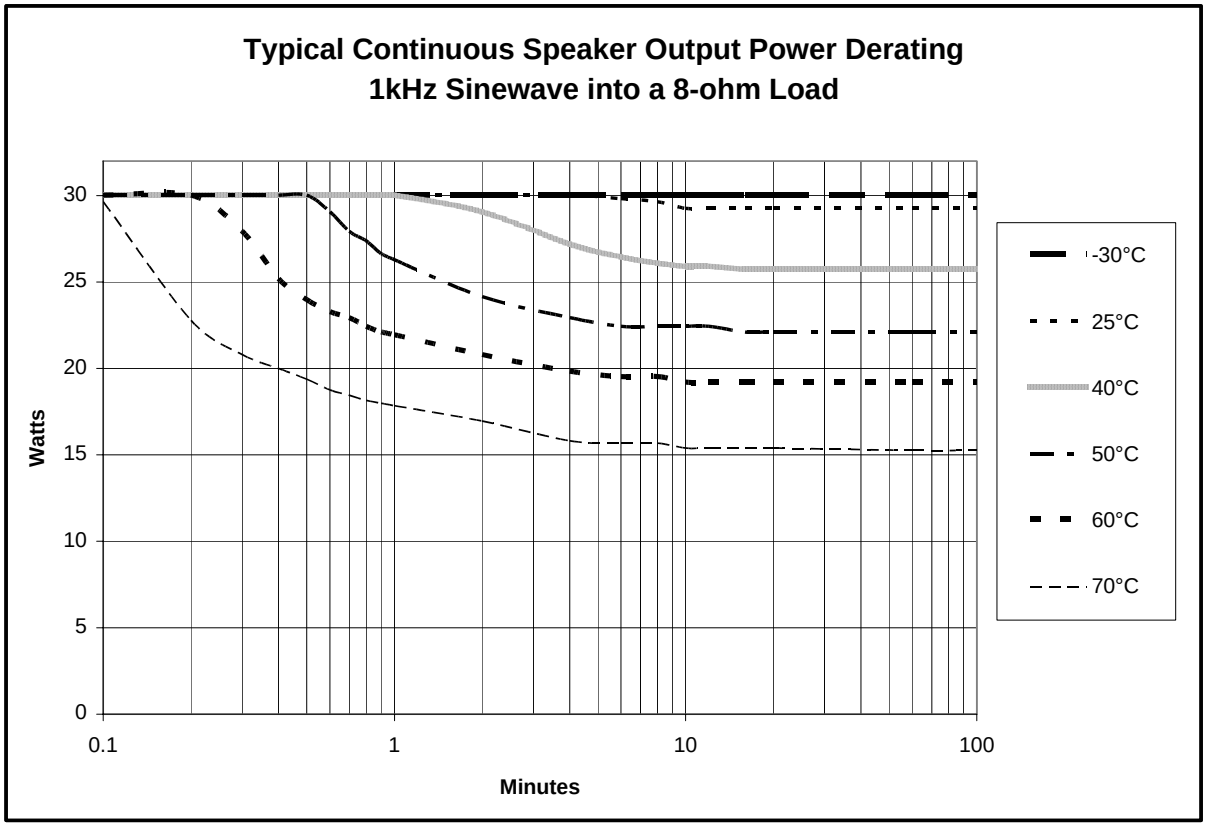

Figure 16. Typical Continuous Speaker Output Power Derating
1 kHz Sine Wave into an 8-ohm Load