GAI-TRONICS®

A HUBBELL COMPANY

69609-001
Dual Page/Party® Interface PCBA

Confidentiality Notice

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General Information

NOTE: If the 69609-001 Dual Page/Party® Interface (Dual PPI) is being added to an existing installed system, the GAI-Tronics Service Department must be contacted to modify the system configuration. If the Dual PPI is being used as a replacement part, proceed as described herein.

The 69609-001 Dual PPI is a printed circuit board assembly (PCBA) used to interface Page/Party® field equipment to the 69254 Series or 69440 Series Master Control Unit (MCU). The Dual PPI PCBA is housed in a 10457 Series Card Rack with the MCU and other associated PCBAs. The Dual PPI will support up to two Page/Party® zones, referred to as "Zone A" and "Zone B."

How to Use the Assembly

The 69609-001 Dual PPI includes the following features and capabilities:

- Communication with external GAI-Tronics field devices via FSK over the 33-ohm page line
- Supports party line 1 and party line 2 on/off hook detection
- Provides ground fault detection on the page line and party line 1
- Provides for fail-safe path
- Self check path diagnostics
- Performs audio switching to transmit from the 33-ohm page line to one of two 1000-ohm differential backplane page resources
- Allows page line audio to drive a differential page monitor bus on the backplane
- Allows party line switching from the 33-ohm party lines to the 33-ohm backplane
- Receives one external dry contact closure input for each Page/Party® zone
- Provides one output to drive an external relay at each Page/Party® zone for special applications

IMPORTANT NOTE:

The Dual PPI does NOT support the following legacy features contained in the 69255-001 Page/Party® Interface (PPI) PCBA:

- "Control Area PPI" Board Type. The Dual PPI may only report as a "Field Area PPI" or as a "Dual PPI"
- RS-485 communication line
- Party line 1 supervision via DTMF tone detection

Hardware Configuration

Switch and Jumper Settings

Overview

Several switch and jumper settings are required for proper operation of the Dual PPI. The following settings are set during the system commissioning and programming and should not be changed. If replacing an existing Dual PPI for maintenance purposes, be sure to replicate the switch and jumper setting of the card being replaced. Refer to Figure 1 on page 10 for the switch and jumper locations.

Board Address Rotary Switch (SW1) Settings

This switch is used in conjunction with SW4 Position 1 to determine the board addresses used by the MCU to access the Dual PPI. Since the Dual PPI provides access to two distinct Page/Party® zones, the Dual PPI occupies two separate board addresses – one for Zone A and one for Zone B (assuming that Zone B is enabled). The board addresses for Zone A and Zone B are defined below (expressed as hexadecimal values):

Zone A Board Address

Board Address Example: **2   A   0**

                                                     /   /   /----------Always zero

Equals 2 when SW4 Position 1 is OPEN--------------/   /

Equals 0 when SW4 Position 1 is CLOSED----------/   /

                                                            /

Set by SW1---/

Zone B Board Address

Board Address Example: **3   A   0**

                                                     /   /   /----------Always zero

Equals 3 when SW4 Position 1 is OPEN--------------/   /

Equals 1 when SW4 Position 1 is CLOSED----------/   /

                                                            /

Set by SW1---/

Please note that if Zone B is disabled (SW4 Position 2 is CLOSED), then the Dual PPI will only occupy the Zone A board address (the Zone B board address would then be available for use by other cards in the card rack).

Board ID Rotary Switches (SW2 and SW3) Settings

These switches are used in conjunction with SW4 Positions 4 and 6 to determine the Board ID values for Zone A and Zone B. Since the Dual PPI provides access to two distinct Page/Party® zones, the Dual PPI provides two separate Board ID values – one for Zone A and one for Zone B (assuming that Zone B is enabled). The Board ID values for Zone A and Zone B are defined below (expressed as hexadecimal values):

Zone A Board ID

Board ID Example: **0**   **1**

                                                             /   /

Equals 0 when SW4 Position 4 is OPEN--------------/   /

Equals 1 when SW4 Position 4 is CLOSED----------/   /

                                                                          /

Set by SW2--/

Zone B Board ID

Board ID Example: **0**   **3**

                                                             /   /

Equals 0 when SW4 Position 6 is OPEN--------------/   /

Equals 1 when SW4 Position 6 is CLOSED----------/   /

                                                                          /

Set by SW3--/

Please note that SW4 Positions 4 and 6 (Extended Board ID A/Extended Board ID B) will only function when SW4 Position 3 (Board Type Select) is in the OPEN position ("Dual PPI" Board Type is selected.) Otherwise, the upper hexadecimal digit of the Board ID values for Zone A and Zone B will be forced to be "0". Also, note that each Page/Party® zone associated with a given card rack must be assigned a unique Board ID value to allow it to be clearly identified by the MCU. For sake of simplicity, the Board ID values are typically set to match the zone numbers as defined in the system.

Board Configuration DIP Switch (SW4) Settings

Board Configuration DIP Switch SW4 contains eight positions that control various aspects of board operation in the associated system. The function of each position is detailed below.

Position 1: Board Address Range Select

This switch is used in conjunction with rotary switch SW1 to determine the board addresses used by the MCU to access the Dual PPI. Refer to the "Board Address Rotary Switch (SW1) Settings" section on page 2 for more information.

Position 2: Zone B Disable

This switch may be used to "hide" Zone B from the MCU. This feature may be desirable in cases where only one of the two available zones on the Dual PPI will be utilized by the system. Set the switch according to the following table:

OPEN	Zone B is Enabled.
CLOSED	Zone B is Disabled (not visible to the MCU)

Position 3: Board Type Select

This switch determines the Board Type that the Dual PPI will report to the MCU by both Zone A and Zone B. The Dual PPI has the ability to either report as a Page/Party® Interface (PPI), or as a Dual Page/Party® Interface (Dual PPI). Set the switch according to the following table:

OPEN	"Dual PPI" Board Type is selected.
CLOSED	"PPI" Board Type is selected.

NOTE: Upon initial release of the Dual PPI Card, always set switch position 3 to the **closed** position for "PPI" board type. The "Dual PPI" board type is reserved for future use pending release of compatible MCU firmware.

Position 4: Extended Board ID A

This switch is used in conjunction with rotary switch SW2 to determine the Board ID value for Zone A. Refer to the "Board ID Rotary Switches (SW2 and SW3) Settings" section on page 3 for more information.

Position 5: FSK Test Mode Enable A

This switch may be used to force activation of the FSK carrier signal at Zone A. A continuous alternating 1-0 data pattern at 2400 bps is produced. This switch **must** be left in the OPEN position for normal system operation. The following table defines the operation of this switch:

OPEN	FSK Test Mode for Zone A is Disabled (Must be left in this position for normal operation.)
CLOSED	FSK Test Mode for Zone A is Enabled.

Position 6: Extended Board ID B

This switch is used in conjunction with rotary switch SW3 to determine the Board ID value for Zone B. Refer to the "Board ID Rotary Switches (SW2 and SW3) Settings" section on page 3 for more information.

Position 7: FSK Test Mode Enable B

This switch may be used to force activation of the FSK carrier signal at Zone B. A continuous alternating 1-0 data pattern at 2400 bps is produced. This switch **must** be left in the OPEN position for normal system operation. The following table defines the operation of this switch:

OPEN	FSK Test Mode for Zone B is Disabled (Must be left in this position for normal operation.)
CLOSED	FSK Test Mode for Zone B is Enabled.

Position 8: Reserved

This switch is currently unused by the Dual PPI and should be left in the OPEN position.

Page Balance Select (Zone A) Jumper (P6) Settings

This jumper allows the Dual PPI's internal page balance for Zone A to be disabled in cases where use of a page balance external to the Dual PPI is desired. Note that if an external page balance is used, however, it **must** be located in proximity to the card rack. In general, this jumper should be left in the "EN" position (internal page balance enabled). Set the jumper according to the following table:

EN	Internal Page Balance is Enabled (Should be left in this position for most installations.)
DIS	Internal Page Balance is Disabled.

NOTE: If this jumper is set to the "DIS" position, then the Page Balance adjustment for Zone A will have no effect.

Page Balance Select (Zone B) Jumper (P7) Settings

This jumper allows the Dual PPI's internal page balance for Zone B to be disabled in cases where use of a page balance external to the Dual PPI is desired. Note that if an external page balance is used, however, it **must** be located in proximity to the card rack. In general, this jumper should be left in the "EN" position (internal page balance enabled). Set the jumper according to the following table:

EN	Internal Page Balance is Enabled (Should be left in this position for most installations.)
DIS	Internal Page Balance is Disabled.

NOTE: If this jumper is set to the "DIS" position, then the Page Balance adjustment for Zone B will have no effect.

Monitor Bus Transmit/Receive (Zone A) Jumper (P8, P9, P12) Settings

These three jumpers may allow Zone A page line audio to drive the monitor bus. Alternatively, these jumpers may allow audio on the monitor bus to drive the Zone A page line. A third option that these jumpers provide is complete isolation between the monitor bus and the Zone A page line. These three options are summarized in the following table:

Option	P8 Setting	P9 Setting	P12 Setting
Isolation	DIS	DIS	DIS
Zone A Page Audio → Monitor Bus	EN	EN	DIS
Monitor Bus → Zone A Page line	DIS	DIS	EN

Monitor Bus Transmit/Receive (Zone B) Jumper (P10, P11, P13) Settings

These three jumpers may allow Zone B page line audio to drive the monitor bus. Alternatively, these jumpers may allow audio on the monitor bus to drive the Zone B page line. A third option that these jumpers provide is complete isolation between the monitor bus and the Zone B page line. These three options are summarized in the following table:

Option	P10 Setting	P11 Setting	P13 Setting
Isolation	DIS	DIS	DIS
Zone B Page Audio → Monitor Bus	EN	EN	DIS
Monitor Bus → Zone B Page line	DIS	DIS	EN

Tips on Using a Dual PPI to Replace a Single 69255-001 PPI Board

- When using a Dual PPI to replace a single 69255-001 PPI board, the Zone A portion of the Dual PPI should be used (Zone B of the Dual PPI will be disabled.)

- When setting the board address for the Dual PPI, use the following conversion table as a guide:

Switch on Dual PPI	Equivalent Switch on PPI	Notes
SW1	S1	Assigns middle nibble of board address

Refer to the "Board Address Rotary Switch (SW1) Settings" section on page 2 for more information regarding Dual PPI board address assignment.

- When setting the Board ID values for the Dual PPI, use the following conversion table as a guide:

Switch on Dual PPI	Equivalent Switch on PPI	Notes
SW2	S2	Assigns Board ID for Zone A
SW3	None	Assigns Board ID for Zone B

Note that in this case, the position of SW3 is unimportant and will be ignored by the system. Refer to the "Board ID Rotary Switches (SW2 and SW3) Settings" section on page 3 for more information regarding Dual PPI Board ID values assignment.

- The following settings for SW4 are recommended for most installations:

Switch (SW4)	Setting
Position 1	OPEN
Position 2	**CLOSED**
Position 3	CLOSED
Position 4	OPEN
Position 5	OPEN
Position 6	OPEN
Position 7	OPEN
Position 8	OPEN

Note that Position 2 of SW4 must be CLOSED in order to disable Zone B. Refer to the "Board Configuration DIP Switch (SW4) Settings" section on page 4 for more information on these settings.

- For most installations, the Page Balance Select (P6 and P7) jumpers should be set to the "EN" position (internal page balance enabled.)

- When setting the Monitor Bus Transmit/Receive jumpers for the Dual PPI, use the following conversion table as a guide:

Jumper(s) on Dual PPI	Equivalent Jumper(s) on PPI	Notes
P8/P9	J6/J8/J11/J12	Zone A Page Audio → Monitor Bus
P12	J9/J10	Monitor Bus → Zone A Page Line

NOTE: Jumpers P10, P11, and P13 should all be placed in the "DIS" position in this case.

Tips on Using a Dual PPI to Replace Two 69255-001 PPI Boards

- The first step that should be performed when using a Dual PPI to replace two 69255-001 PPI boards is to decide which 69255-001 PPI board will be mapped to Zone A of the Dual PPI and which will be mapped to Zone B. Hereafter, based on this mapping, the two 69255-001 PPI boards will be referred to as the "Zone A PPI" and "Zone B PPI."

- When setting the board address for the Dual PPI, use the following conversion table as a guide:

Switch on Dual PPI	Equivalent Switch on PPI	Notes
SW1	S1 on either Zone A PPI or Zone B PPI	Assigns middle nibble of board address

It is important to note that the Dual PPI occupies two distinct board addresses. Therefore, the installer must ensure that these two board addresses do not conflict with any other cards installed in the card rack. To prevent this, it may be necessary to change the board address of another card in the card rack. Refer to the "Board Address Rotary Switch (SW1) Settings" section on page 2 for more information regarding Dual PPI board address assignment.

- When setting the Board ID values for the Dual PPI, use the following conversion table as a guide:

Switch on Dual PPI	Equivalent Switch on PPI	Notes
SW2	S2 on "Zone A PPI"	Assigns Board ID for Zone A
SW3	S2 on "Zone B PPI"	Assigns Board ID for Zone B

Refer to the "Board ID Rotary Switches (SW2 and SW3) Settings" section on page 3 for more information regarding Dual PPI Board ID values assignment.

- The following settings for SW4 are recommended for most installations:

Switch (SW4)	Setting
Position 1	OPEN
Position 2	OPEN
Position 3	CLOSED
Position 4	OPEN
Position 5	OPEN
Position 6	OPEN
Position 7	OPEN
Position 8	OPEN

Refer to the "Board Configuration DIP Switch (SW4) Settings" section on page 4 for more information on these settings.

- For most installations, the Page Balance Select (P6 and P7) jumpers should be set to the "EN" position (internal page balance enabled.)

- When setting the Monitor Bus Transmit/Receive jumpers for the Dual PPI, use the following conversion table as a guide:

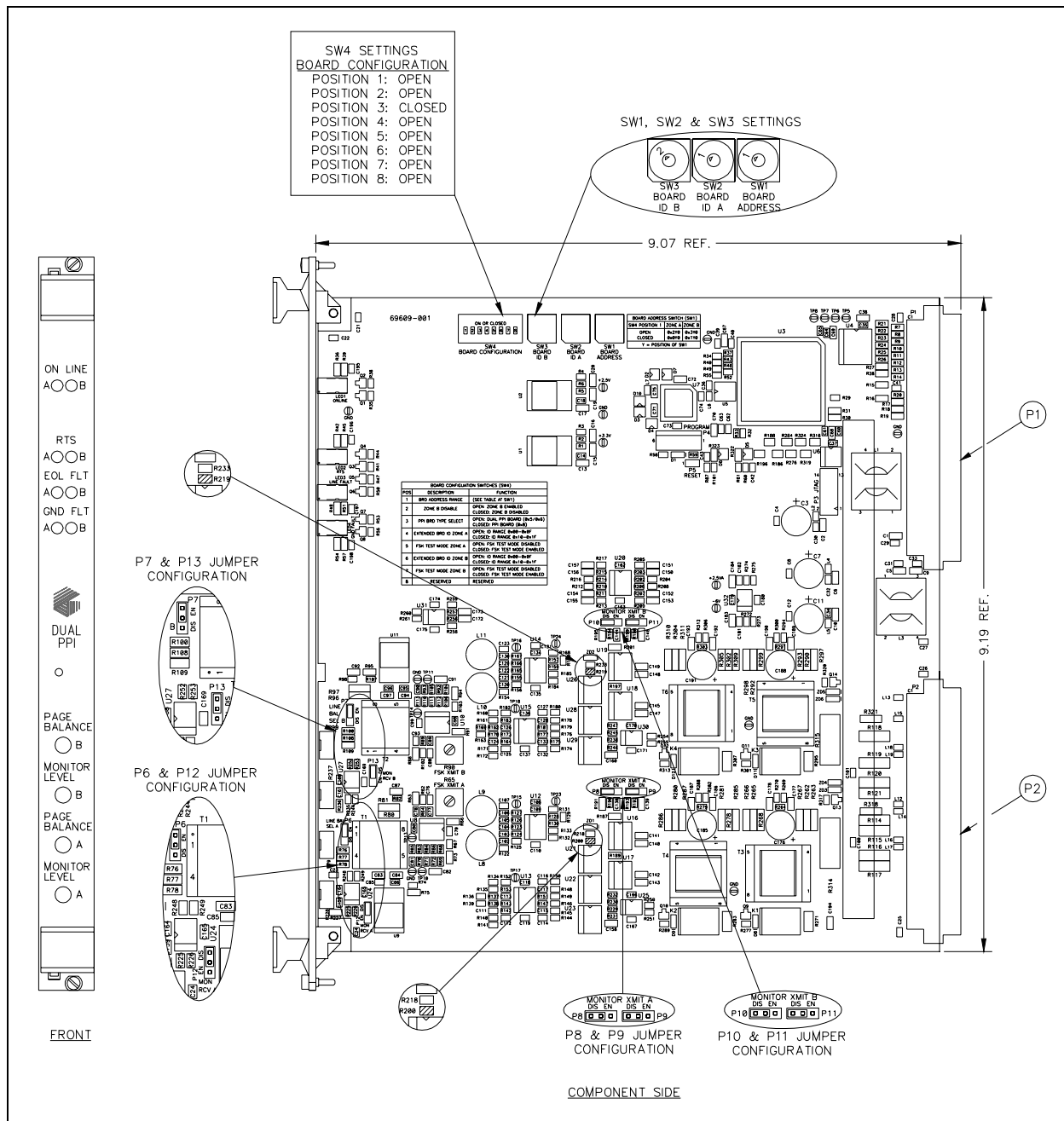| Jumper(s) on Dual PPI	Equivalent Jumper(s) on PPI	Notes
P8/P9	J6/J8/J11/J12 on Zone A PPI	Zone A Page Audio → Monitor Bus
P12	J9/J10 on Zone A PPI	Monitor Bus → Zone A Page Line
P10/P11	J6/J8/J11/J12 on Zone B PPI	Zone B Page Audio → Monitor Bus
P13	J9/J10 on Zone B PPI	Monitor Bus → Zone B Page Line

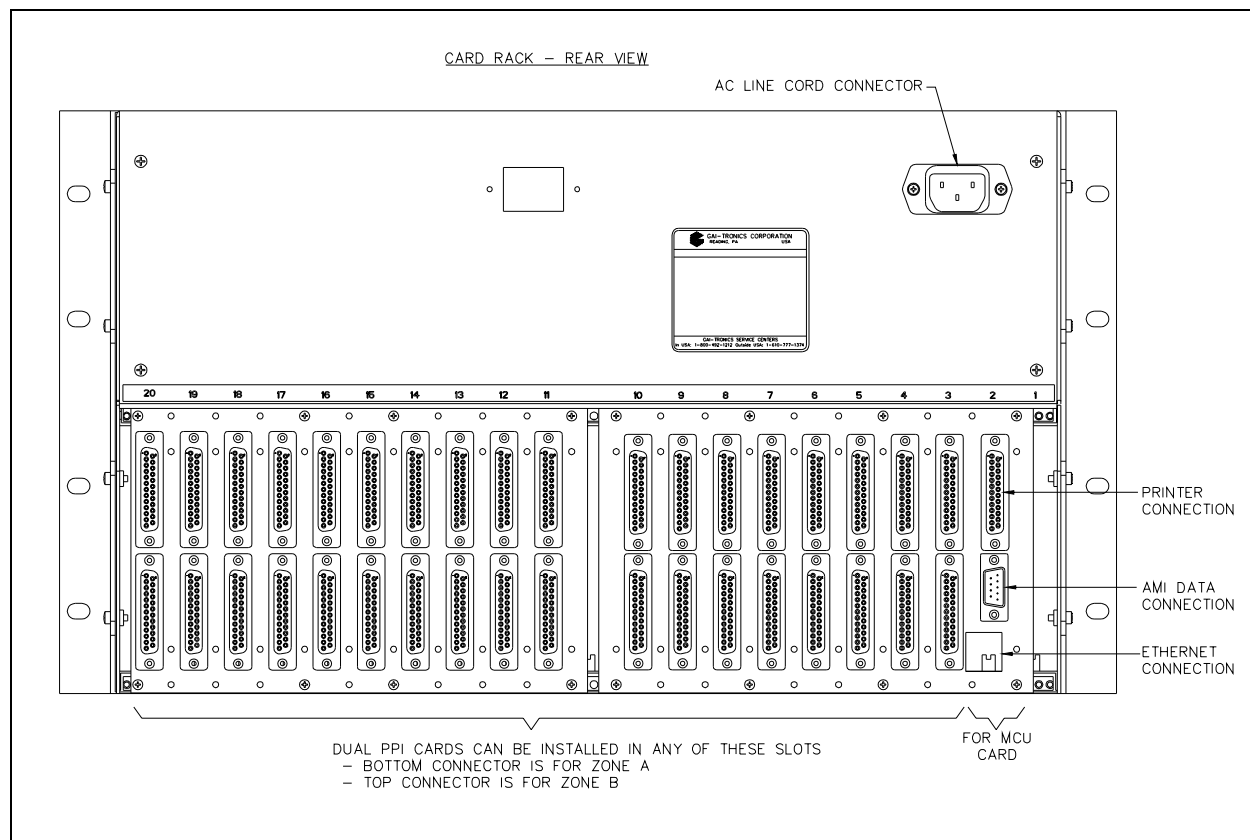Figure 1. 69609-001 PCBA

Interfaces

Figure 2. 69609-001 Interfaces

All field device interfaces are provided through P2 on the 69609-001 Dual PPI PCBA and include the following connections for each of the two available Page/Party® zones:

- Page line

- Party line 1

- Party line 2

- Contact closure input

- External relay control output

NOTE: Field connections for Zone A are provided at the card rack's lower D-subminiature connector, while field connections for Zone B are provided at the card rack's upper D-subminiature connector.

Installation/Replacement

WARNING: Failure to observe warnings may result in equipment damage.

WARNING: Observe Precautions For Handling Electrostatic Sensitive Devices

WARNING: Disconnect power to the card rack prior to installation

1. Remove the 69609-001 Dual PPI from its carton. Be sure to check that power is disconnected to the card rack assembly prior to replacement.

2. Verify that the switch and jumper settings described in the Switch and Jumper Settings section are set in accordance with the instructions in your system manual.

3. Remove existing Dual PPI from card rack assembly.

4. Install the replacement Dual PPI as described below.

   Align the PCBA into the upper and lower tracks of the assigned slot. Slide the PCBA towards the rear of the card rack until it comes in contact with the backplane connector. Firmly press on the front bezel until the PCBA is seated. Secure to the card rack by tightening the two screws located on the front bezel (See Figure 1).

5. Apply power to card rack assembly.

6. After a brief delay, the On Line LEDs on the Dual PPI will illuminate for all configured zones.

7. The RTS LEDs flash continuously if SmartSeries stations are configured to communicate with the Dual PPI.

8. The EOL FAULT LEDs should NOT illuminate. These LEDs only illuminate when an End-of-Line (EOL) device is not responding to the Dual PPI.

9. The GND FAULT LEDs should NOT illuminate. These LEDs only illuminate when a ground fault is present on the page line or party line 1.

Zone A or Zone B LED	Condition
EOL Fault	An end-of-line station is not responding
Ground Fault	One conductor of either the page line or Party Line 1 is grounded
On Line	Page/Party® zone is recognized by the MCU
RTS	Data Communication request to send

10. Set the page line balance adjustments for Zone A and Zone B as described below:

   Page Balance

   The Page Balance is used to set the line loading of the page zones page line. After all stations are connected to the card, the Page Balance is set. Use a station connected directly to the Dual PPI. Squeeze the pressbar on the handset and blow steadily into the mouth piece. Listen to the sidetone in the receiver. Adjust the Page Balance until a minimal side tone is obtained in the receiver. The Page Balance does not require readjustment unless 10 or more stations are added to the zone.

   NOTE: If a handset station is not available for use as indicated above, perform the following steps:

   - Connect a true impedance meter to the page line of the appropriate Dual PPI.
   - Adjust the line balance potentiometer to a reading as close to 33 ohms as possible

11. Set the monitor level adjustments for Zone A and Zone B, if used:

   Monitor Level

   The Monitor Level can be adjusted during system start-up. This is required <u>only</u> if the Monitor Receive has been selected for the corresponding zone during the jumper configuration. Have an individual go to the nearest Page/Party® station and talk on the page line. Adjust the Page Monitor until the desired level is achieved.

12. Verify that the Dual PPI properly routes audio and communicates with the external devices as indicated in the system manual.

Operation

The operation of the Dual PPI is controlled by the MCU. See the MCU configuration details in the system manual for all Dual PPI operational information.

Troubleshooting

Status/Message	Meaning	Suggested Action
One or both On-Line LEDs do not illuminate	1. Power is not applied to the card	• Verify power is applied to the card rack. • Verify the Dual PPI is properly seated in the card rack. • Call for service.
	2. A component failure has occurred	• Replace the Dual PPI with a spare. • Call for service.
	3. Zone is not in the configuration	• Verify the proper Board Address and Board ID settings on the Dual PPI. • Verify proper Board Configuration DIP Switch (SW4) settings • Verify proper MCU configuration. • Call for service.
One or both RTS LEDs do not flash	1. Card is not configured properly.	• Verify FSK Test Mode switches (SW4 Positions 5 and 7) are in the OPEN position.
	2. No external devices are configured	• Verify proper MCU configuration. • Call for service.
	3. A component failure has occurred	• Replace the Dual PPI with a spare. • Call for service.
One or both EOL Fault LEDs are illuminated	An End-of-Line (EOL) station is not reporting	• Verify the connection between the Dual PPI and the P2 connector. • Verify the connection between the P2 connector and the external module. • Verify power is applied to the external module. • Verify the EOL station is installed. • Verify the proper MCU configuration. • Call for service.
One or both GND Fault LEDs are illuminated	A conductor on the page line or Party Line 1 is grounded	• Identify which conductor is grounded, by measuring the resistance to ground of each conductor. Then, remove ground from the associated conductor. • Call for service.

Status/Message	Meaning	Suggested Action
No audio in the zone	1. The audio path is impaired.	• Verify the connection between the Dual PPI and the P2 connector. • Verify the connection between the P2 connector and the affected zones. • Call for service.
	2. MCU configuration is not correct.	• Verify the proper MCU configuration. • Call for service.
Receiver sidetone is high.	The page line balance needs adjustment	• Check the Page Balance Select jumper settings (P6 and P7). • Adjust the Page Balance for the affected zone. • Call for service.
Monitored audio levels are low.	The monitor level needs adjustment.	• Check the Monitor Receive jumper settings (P12 and P13). • Increase the Monitor Level adjustment for the affected zone. • Call for service.

Specifications

Electrical

Power requirements .... +5 V dc from backplane
+12 V dc from backplane
-12 V dc from backplane

Current draw ....Nominal +5 V, 80 mA
+12 V, 110 mA
-12 V, 70 mA

Connections.. Two (P1, P2) × 64-pin DIN connectors

Inputs/outputs (× 2 zones)....................................... Page line, 33 ohms, 250–6000 Hz, 1.5 V_{RMS} nominal
Party line 1, 33 ohms, 250–3500 Hz, 1.5 V_{RMS} nominal
Party line 2, 33 ohms, 250–3500 Hz, 1.5 V_{RMS} nominal
Dry contact closure input, normally open, maintained
External relay control output, 105 mA short circuit current

Data communications... 2400 baud FSK modem

Off hook detection ....Less than 120 ohms across party lines 1 & 2

Ground fault detection .... Less than 5000 ohms to ground for page line and party line 1

Output .... 1.5 V_{RMS} nominal into 33-ohm load

Distortion .... 1.5% max. THD @ 1 kHz

FSK output to line... 0.7 V_{RMS}, 2 Vp-p into 33-ohm load

FSK frequencies.. 30.720 kHz (Mark)
32.914 kHz (Space)

Front Bezel Controls .... Monitor Speaker Level Adjustment (Zone A/Zone B)
Page Line Balance Adjustment (Zone A/Zone B)

Front Bezel LED Indicators

On Line Zone A/Zone B (green - on/off)... Lit when operational

RTS Zone A/Zone B (green - flashes) ....Indicates FSK transmission

EOL Fault Zone A/Zone B (red - on/off)....................................Indicates no response from EOL station

Ground Fault Zone A/Zone B (red - on/off) ....Indicates ground fault

Front Bezel Controls

Monitor Level Zone A/Zone B ....Volume adjust for the Monitor Receive
 0.5–1.8 V_{RMS} into 33Ω useable adjustment range (with 1.5 V_{RMS} across backplane)

Page Balance Zone A/Zone B.. Sets page line loading
 16 to 116-ohm adjustment range

Environmental

Temperature range (operating/storage)... +32° F to +122° F (0° C to +50° C)

Humidity .... 95% non-condensing relative humidity

Mechanical

Unit dimensions .... 10.30 H × 0.78 W × 9.07 D inches

Unit weight... 1.3 lbs.

Reference to Assembly/Model Drawings

Published by	Title	GAI Tronics Ref. No.
GAI-Tronics	Dual Page/Party® Interface PCBA Assembly Drawing	73760

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.