



GAI-TRONICS®
A HUBBELL COMPANY

Model 12593-001

Redundant PPI Switching Module

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General Information

The Model 12593-001 Redundant PPI Switching Module is designed to provide connection for a primary and a secondary PPI card when redundant circuits are required in GAI-Tronics ADVANCE cabinets. The module controls audio line switching from the PPI cards to SmartSeries Page/Party® stations. Each module is capable of switching one zone. The switching action is controlled by an external contact closure.

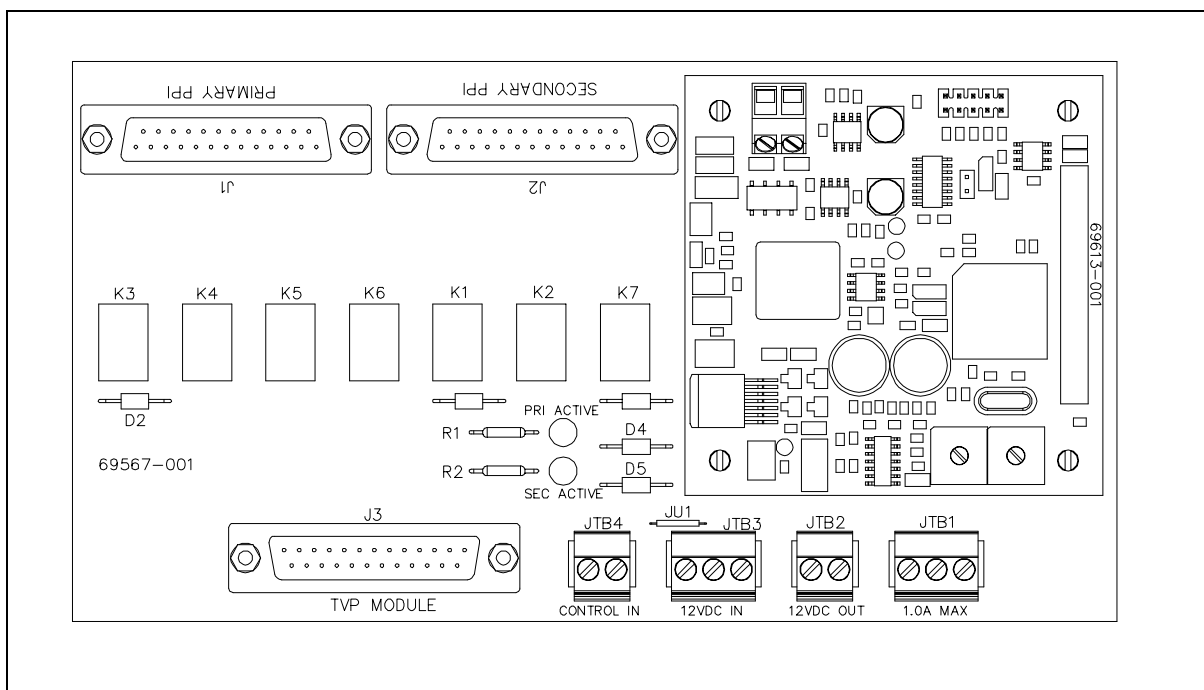


Figure 1. Model 12593-001 Redundant PPI Switching Module

Hardware Configuration

The Model 12593-001 Redundant PPI Switching Module is comprised of two printed circuit board assemblies (PCBAs). The lower base board contains the lower switching relays and measures 7.5 L × 4 W inches (190.5 × 102 mm). The relay switching PCBA is equipped with seven small DPDT relays, two LEDs, three 25-pin “D” connectors and four modular (plug-in type) terminal blocks.

The upper CPU PCBA employs a micro-controller and has two address switches (S1 and S2). The small terminal block located on the opposite side is for external power when used in other applications when power is not available via the 34-pin DIP connector (J1).

Installation

 **CAUTION**  **When installing or replacing this module, be sure power is not applied to avoid damage to the module circuits.**

The Model 12593-001 Redundant PPI Switching Module is designed for mounting in 4-inch Snap Trak[®]. When inserting the module in SnapTrak[®], exercise care when pressing the module edges into the SnapTrak[®] to avoid damage to the module’s printed circuit board and components.

Once installed in the SnapTrak[®], be sure the module edges are secured in the channels so that the module does not dislodge during transport or operation if subjected to vibration. Also, if this module is used with other modules in the SnapTrak[®], be sure to leave spacing between modules to facilitate wiring at any edge-mounted terminal blocks.

Terminations

The Model 12593-001 Redundant PPI Switching Module is equipped with three 25-pin “D” connectors, and four modular (plug-in type) terminal blocks, which simplify external connections during installation, and provide quick disconnect if replacement is ever required.

The following is a breakdown of each connector and terminal block and its function(s):

J1 – is the primary PPI card connection; a cable with a 25-pin “D-Sub” connector is required.

J2 – is the secondary PPI card connection; a cable with a 25-pin “D-Sub” connector is required.

J3 – is the output connection to the Page/Party[®] TVP connection module; a cable with a 25-pin “D-Sub” connector is required.

JTB1 – is the form “C” dry contact output, which can be used to activate additional switching modules, or for remote status indication. The maximum switching capacity for the contact is 30 V dc @ 1 amp.

JTB2 – is a feed-through 12 V dc power output to additional switching modules.

JTB3 – is the 12 V dc power input to the module.

JTB4 – are the control inputs to the module to activate the relays to switch between primary and secondary PPI cards, when a fault occurs. Activation at either input requires dc ground control.

The following is a summary of each connector and terminal block function(s):

J1 – Primary PPI Card (25-pin D-Sub)	
Pin No.	Function
1 & 2	Page Line
3 & 4	Party Line 1
5 & 6	Party Line 2
7 & 8	Party Line 3
9 & 10	Party Line 4
11 & 12	Party Line 5
13	Earth ground
15 & 17	Output control (RLY)
20 & 21	Control input (CLS)
14, 16, 18, 19, 22-25	Spare – No connection

J2 – Secondary PPI Card (25-pin D-Sub)	
Pin No.	Function
1 & 2	Page Line
3 & 4	Party Line 1
5 & 6	Party Line 2
7 & 8	Party Line 3
9 & 10	Party Line 4
11 & 12	Party Line 5
13	Earth ground
15 & 17	Output control (RLY)
20 & 21	Control input (CLS)
14, 16, 18, 19, 22-25	Spare – No connection

J3 – Page/Party® Output (25-pin D-Sub)	
Pin No.	Function
1 & 2	Page Line
3 & 4	Party Line 1
5 & 6	Party Line 2
7 & 8	Party Line 3
9 & 10	Party Line 4
11 & 12	Party Line 5
13	Earth ground
15 & 17	Output control (RLY)
20 & 21	Control input (CLS)
14, 16, 18, 19, 22-25	Spare – No connection

JTB1 – Relay Contact Output	
Terminal No.	Function
1	Normally open
2	Common
3	Normally closed

JTB2 - 12 V dc Power Output	
Terminal No.	Function
1	12 V (+)
2	12 V (-)

JTB3 – 12 V dc Power Input	
Terminal No.	Function
1	12 V (+)
2	12 V (-)
3	GND

JTB4 – Switching Control Inputs	
Terminal No.	Function
1	Primary control line
2	Secondary control line

Address Switch Settings

Address switches **S1** and **S2** on the upper CPU PCBA must each be set to position **F** for a board address of **FF**. When using multiple modules, address **FF** must be set on ALL modules. Address **FF** allows the module to operate as a Multi-Station Simulator (MSS), with its designated PPI cards. Refer to the operation section for information on the MSS feature.

Operation

The module switches the SmartSeries Page/Party[®] Stations between the Page/Party[®] Interface (PPI) cards in the primary and secondary card racks. The switching action is initiated whenever a primary MCU or primary AMI fault occurs in the system. The signals being switched are the page line, party lines 1 and 2, the relay control output (RLY) and the control input (CLS).

The module has essentially two modes of operation, normal and fault. Each mode is described in detail below.

Normal Condition

All relays on the module are de-energized. The SmartSeries Page/Party[®] stations (J3) are connected to the Primary PPI card (J1) via relays K2-K6.

The module's CPU PCBA, is connected to the page line of the Secondary PPI card (P2) via relay K7. The CPU PCBA simulates all the SmartSeries Page/Party[®] stations by responding to all station polling requests from the Secondary Master Control Unit (MCU). This action prevents SmartSeries station faults from occurring in the secondary system.

Fault Condition

A fault condition is signaled by connecting either terminal of JTB4 to dc ground. LED1 (Pri-Active) or LED2 (Sec-Active) illuminate to indicate the active input. In an ADVANCE system application, these inputs are active if a primary MCU or primary AMI fault occurs. The control signal input is supplied by an external relay contact.

When activated, relays K1-K7 are energized. Relay K1 contacts are wired to JTB1 and will change state for the duration of the active condition. Relays K2-K6 switch the SmartSeries Page/Party[®] stations (J3) to the Secondary PPI card (J2). The CPU PCBA, is connected to the page line of the Primary PPI card (P1).

Maintenance

If the module requires service, contact your Regional Service Center for a return authorization number (RA#). The module should be shipped prepaid to GAI-Tronics with a return authorization number and a purchase order number. If the module is under warranty, repairs or a replacement will be made in accordance with GAI-Tronics' warranty policy. 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.

Troubleshooting

Problem	Solution
SmartSeries station faults are present in the secondary system.	<ul style="list-style-type: none"> • Verify 12 V dc power is applied to the module. • Verify CPU PCBA address is set to FF. • Verify cables are properly inserted into connectors J1, J2, J3. • Ensure J1 pins of CPU PCBA are correctly inserted into J4 of lower relay switching PCBA.
SmartSeries stations squeal when party line 1 or 2 are accessed.	<ul style="list-style-type: none"> • Verify connectors J1, J2, J3 are properly inserted. If disconnected, the page, and party lines 1 and 2 will be unloaded resulting in oscillation of the SmartSeries handset amplifier.
Module LEDs do not illuminate and relays do not switch when input control is provided.	<ul style="list-style-type: none"> • Verify 12 V dc (-) is being switched to the PRI and/or SEC inputs at JTB4
Module still does not function after all checks described in this section.	Contact GAI-Tronics service for repair or replacement of the module.

Specifications

Electrical

Power Requirements.....	10.8–13.2 V dc (12 V dc @ 265 mA nominal)
Number of control inputs.....	2
Number of fault outputs.....	1
Fault output type	Form “C” dry contact
Fault output contact rating	1 A maximum @ 30 V dc

Connections

25-pin “D-Sub”	3
Modular (plug-in) terminal blocks	4
Minimum terminal block conductor size	No. 28 AWG (0.5 mm ²)
Maximum terminal block conductor size	No. 12 AWG (3.0 mm ²)

Mechanical

Module dimensions	7.50 L × 4.00 W × 1.56 H inches (190.5 × 101.6 × 39.7 mm)
Module weight	0.43 lbs. (0.20 kg)

Environmental

Temperature range (operating/storage).....	-4° F to 158° F (-20° C to 70° C)
Humidity.....	85% non-condensing relative humidity

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.

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