



GAI-TRONICS®  
A HUBBELL COMPANY

# Models 12600-002 and 12600-40x Line Current Boost Circuit Assemblies

## Confidentiality Notice

This manual is provided solely as an operational, installation, and maintenance guide and 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

This manual covers the following models of the GAI-Tronics Line Current Boost Circuit Assemblies:

Model	Description
12600-002	Single Channel Line Current Boost Circuit
12600-401	4-Channel, DC-powered Line Current Boost Circuit
12600-402	8-Channel, DC-powered Line Current Boost Circuit
12600-403	4-Channel, AC-powered Line Current Boost Circuit
12600-404	8-Channel, AC-powered Line Current Boost Circuit

The GAI-Tronics Line Current Boost Circuit (LCBC) Assemblies are designed to augment available line current to an analog 2-wire bridged ringing telephone line. They are designed specifically to provide an additional 30 mA line current to a GAI-Tronics line-powered emergency telephone.

Telephone and PBX lines typically provide 20–35 mA or less line current to analog telephone instruments. Several devices, including GAI-Tronics' line of RED ALERT® emergency telephones, require additional line current to drive speakers, power optical coupling devices, and electronic devices such as microprocessors. The additional line current provided by the LCBC provides sufficient line current for a substantial increase in audio power to the emergency telephone speaker.

## Operation

The LCBC is designed to be installed anywhere along the telephone line, preferably at a main or intermediate distribution location. A CMOS differential amplifier and two threshold comparators are used to monitor the dc voltage across the phone line (tip and ring).

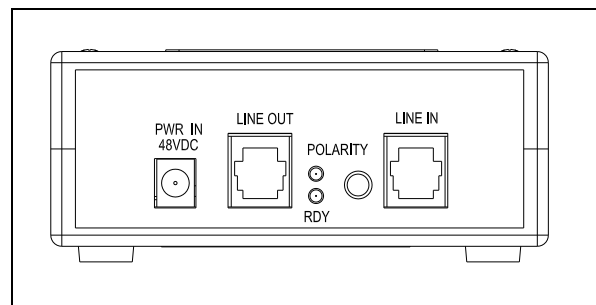


Figure 1. Model 12600-002

The LCBC automatically adds 30 mA current to the available line current during off hook conditions when the dc voltage between tip and ring falls below 15 V dc. The total line current available is the sum of the current provided by the PBX and the additional 30 mA line current added by the LCBC. This current is available to drive speakers and other devices.

When the device connected to the line is placed on-hook (dc line voltage greater than 20 V), the LCBC automatically disconnects the 30 mA supplemental line current. The LCBC is transparent to incoming ring signals, allowing operation on a 2-wire bridged ringing configuration.

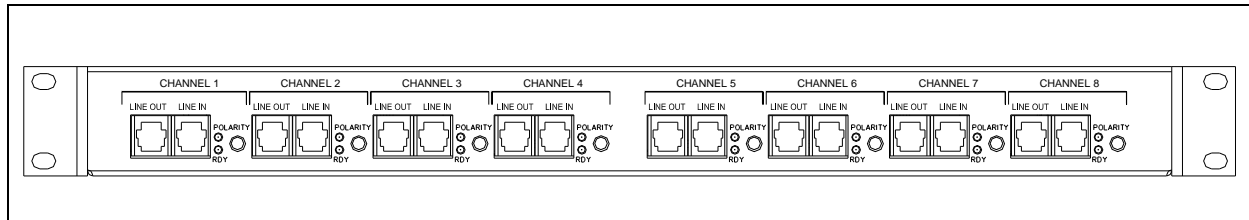


Figure 2. Front Views of Model 12600-402/404 8-Channel LCBC Assemblies

**NOTE:** Model 12600-401/403 4-Channel LCBC Assemblies contain a blank panel on the right side.

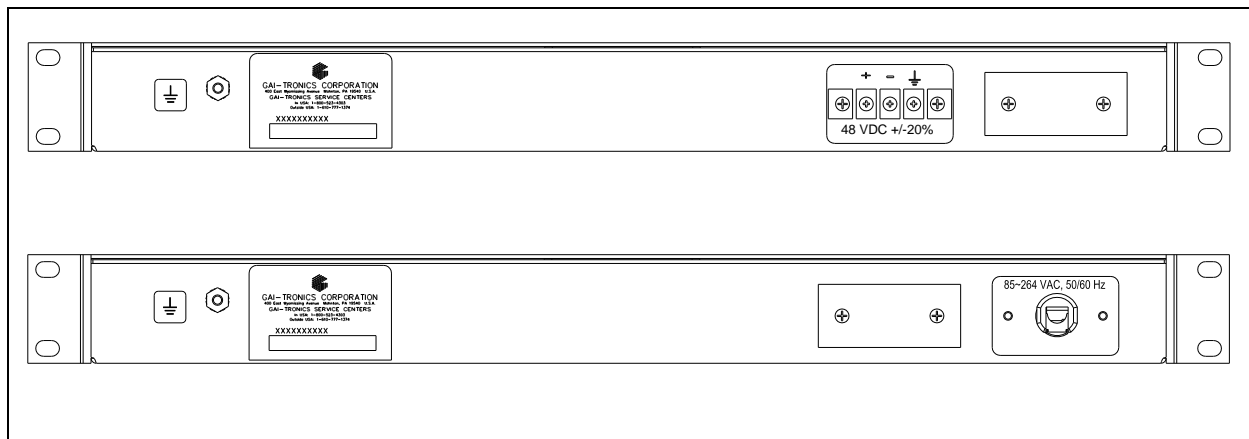


Figure 3. Rear Views of Models 12600-401/402 DC-Powered (top) and Models 12600-403/404 AC-Powered LCBC (bottom) Assemblies

## PABX Interface Requirements

- **minimum loop current:** 8 mA dc (LCBC disconnected)
- **maximum recommended loop current:** 40 mA dc (LCBC disconnected)
- **ringer requirements:** type B ringer

# Installation

## Mounting

The 12600-40x LCBC units can be placed on a table or desk, or can be mounted in a standard EIA 19-inch electronic equipment rack, requiring 1U (1.75 inches) of vertical space.

Install the four stabilizing feet if the LCBC is to be placed on a table or desk,

For rack-mounting:

1. Install the mounting brackets using the eight 8-32 × 3/8-inch screws provided.
2. Mount the LCBC into the rack using the four 10-32 × 3/4-inch screws provided.

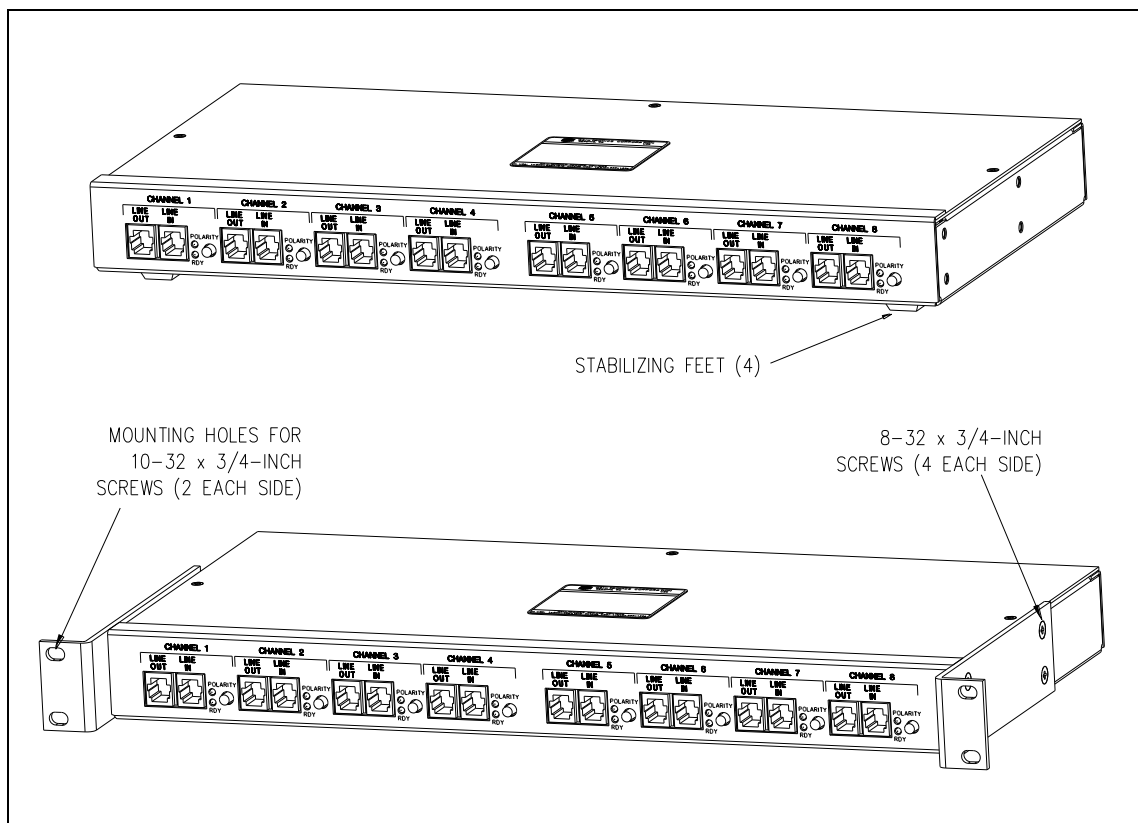




Figure 4. Mounting Details

## Wiring

 **CAUTION**  —The dc line current (LCBC disconnected) should be less than 40 mA dc. Operation with line currents above 70 mA dc (includes LCBC 30 mA plus 40 mA line current) may damage some telephone instruments. Line current can be measured by connecting a dc ammeter between the tip and ring wires (red and green) from the telephone line. Polarity of the current is unimportant.

Install a UL lightning arrestor on the LINE IN and LINE OUT phone cable if they are at risk of being exposed to lightning strikes. The lightning arrestor must be installed as close to the phone as possible to maximize the protection. It must not be installed within the enclosure supplied with the phone. Please consult our Service Center at 800-492-1212 for further information.

Install the Line Current Boost Circuit Assembly as follows:

1. Connect the incoming PBX line(s) to LINE IN connection(s).
2. Connect the telephone instrument(s) to LINE OUT connection(s).
3. Connect the power source.
4. Place the telephone instrument(s) on-hook.
5. If the green POLARITY light is on, the polarity for that line or channel is correct.
6. If the POLARITY light is off, press the associated POLARITY button. The POLARITY light should turn on.
7. When the green POLARITY light and the blue READY light are on, the telephone instrument is operational.
8. When the telephone instrument is taken off-hook the blue READY light goes off. The green POLARITY indicator may remain on or go off while the telephone instrument is off-hook.

## Operation

After installation, no direct user interface is required for the operation of the Line Current Boost Circuit Assembly.

## Troubleshooting

Problem	Solution
No LED illuminated	check power supply
Green LED will not illuminate	check phone line for tip-ring voltage

## Specifications

### Model 12600-002

Power supply..... 48 V dc @ 250 mA (unregulated)  
 Input voltage to plug-in power supply ..... 120 V ac ±10% @ 60 Hz  
 Input power to plug-in power supply..... off-hook: 6.0 W maximum; On-hook 4.0 W maximum  
 Dimensions ..... 4.50 × 3.00 × 2.00 in (114.3 × 76.2 × 50.8 mm)  
 Weight.....0.5 lbs.

**Models 12600-401 and 402**

Input voltage ..... 48 V dc  $\pm$ 20%  
 Dimensions (without mounting brackets) ..... 17.00  $\times$  9.00  $\times$  1.75 inches (431.8  $\times$  228.6  $\times$  44.4 mm)  
 (with brackets) ..... 19.00  $\times$  10.00  $\times$  1.75 inches (482.6  $\times$  254.0  $\times$  44 mm)  
 Weight 8.5 lb maximum

**Models 12600-403 and 404**

Input voltage ..... 85–264 V ac @ 50/60 Hz  
 Dimensions (without mounting brackets) ..... 17.00  $\times$  9.00  $\times$  1.75 inches (431.8  $\times$  228.6  $\times$  44.4 mm)  
 (with brackets) ..... 19.00  $\times$  10.00  $\times$  1.75 inches (482.6  $\times$  254.0  $\times$  44 mm)  
 Weight..... 8.5 lbs. maximum

**Environmental**

Operating temperature 40 °C to +70 °C  
 Supplemental line current ..... 30 mA dc  $\pm$ 5 mA

**PABX interface requirements:**

Minimum on-hook tip/ring voltage.....20 V dc (LCBC disconnected)  
 Minimum loop current .....8 mA dc (LCBC disconnected)  
 Maximum recommended loop current.....40 mA dc (LCBC disconnected)  
 Optional ringer requirements ..... Type B ringer

**NOTE:** The supplemental line current has a negative temperature coefficient promoting temperature stability for both the LCBC and the telephone instrument connected to the LCBC.

Transient protection ..... meets the requirements of FCC Part 68 Type A & B transient protection

# Warranty

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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

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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.