



GAI-TRONICS®
A HUBBELL COMPANY

Model 013-02-0095-002 *Elemec3* System Controller

Confidentiality Notice

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General Information

The Model 013-02-0095-002 *Elemec3* System Controller is the central component of an *Elemec3* central amplifier system, processing all operations through its highly configurable system software. It is designed to be installed in a standard (19-inch) *Elemec3* system control cabinet.

The *Elemec3* System Controller provides continuous monitoring functions for up to 16 Microphone Access Panels and sends/receives data from the *Elemecplus* Power Amplifiers, to provide complete high integrity system monitoring, from microphone panel to loudspeaker. The integral software audio players and the *Elemec3* System Controller to amplifier audio paths are also monitored.

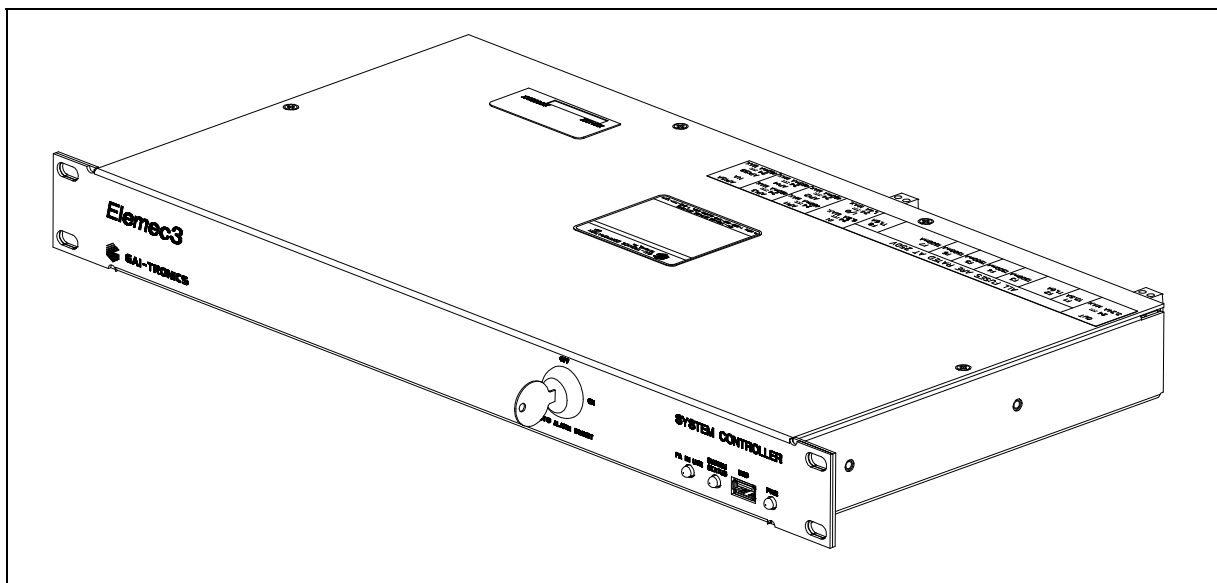


Figure 1. *Elemec3* System Controller

The system provides two internal audio paths to enable simultaneous broadcast of audio to distinct output zones. For ease of installation and maintenance all cabinet internal connections are on a plug/socket basis.

The software control is designed to be as flexible as possible, and can easily be configured via the TCP/IP network connection on the rear of the **Elemec3** System Controller using the **Elemec3** Console software application. Hot standby amplifier control is provided so that a powered spare amplifier(s) is automatically connected to the loudspeaker network of the failed amplifier(s).

PABX access and Page/Party[®] access are configured so that telephone/intercom inputs can be digitally stored and replayed to completely eliminate the possibility of acoustic feedback between telephone/intercom and local loudspeaker.

Up to 256 individually programmed relay outputs and 256 input contact points are available through the LAN interface on the rear of the **Elemec3** System Controller. Duplicate **Elemec3** System Controller can be used for additional redundancy. System status, including current audio activity, faults, input, output and amplifier states, are monitored via the TCP/IP network connection using the **Elemec3** Portal software application.

The **Elemec3** System Controller is exclusively designed for use in an **Elemec3** system and is not intended for use with other types of equipment.

Important Safety Instructions



This symbol indicates the presence of uninsulated “dangerous voltage” within the product’s enclosure. This may constitute a risk of electric shock.



The user should consult the operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
8. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

9. Only use attachments/accessories specified by the manufacturer.
10. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
11. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Front Panel Indicators & Control

The **Elemec3** System Controller front panel is equipped with an alarm switch, three LED indicators and a USB port (reserved for future use). The switch allows the operator to switch off and on specific inputs. The LEDs indicate whether the page system is in use, the power is applied to the unit, and whether the system is operating normally or has a fault condition.

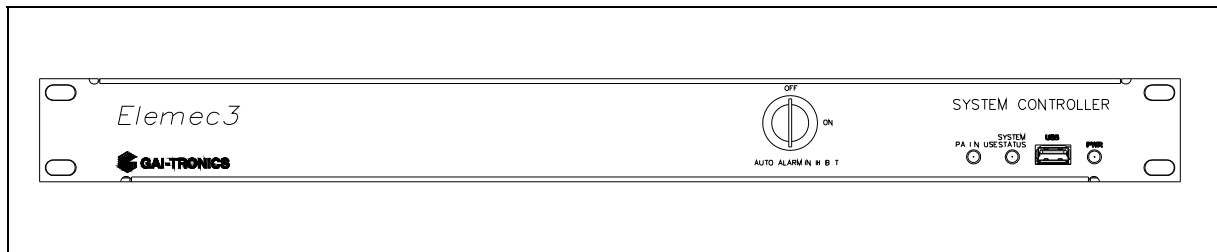


Figure 2. **Elemec3** System Controller – Front View

Rear Panel Connections

Refer to Figure 3. System connections are made to the rear of the **Elemec3** System Controller.

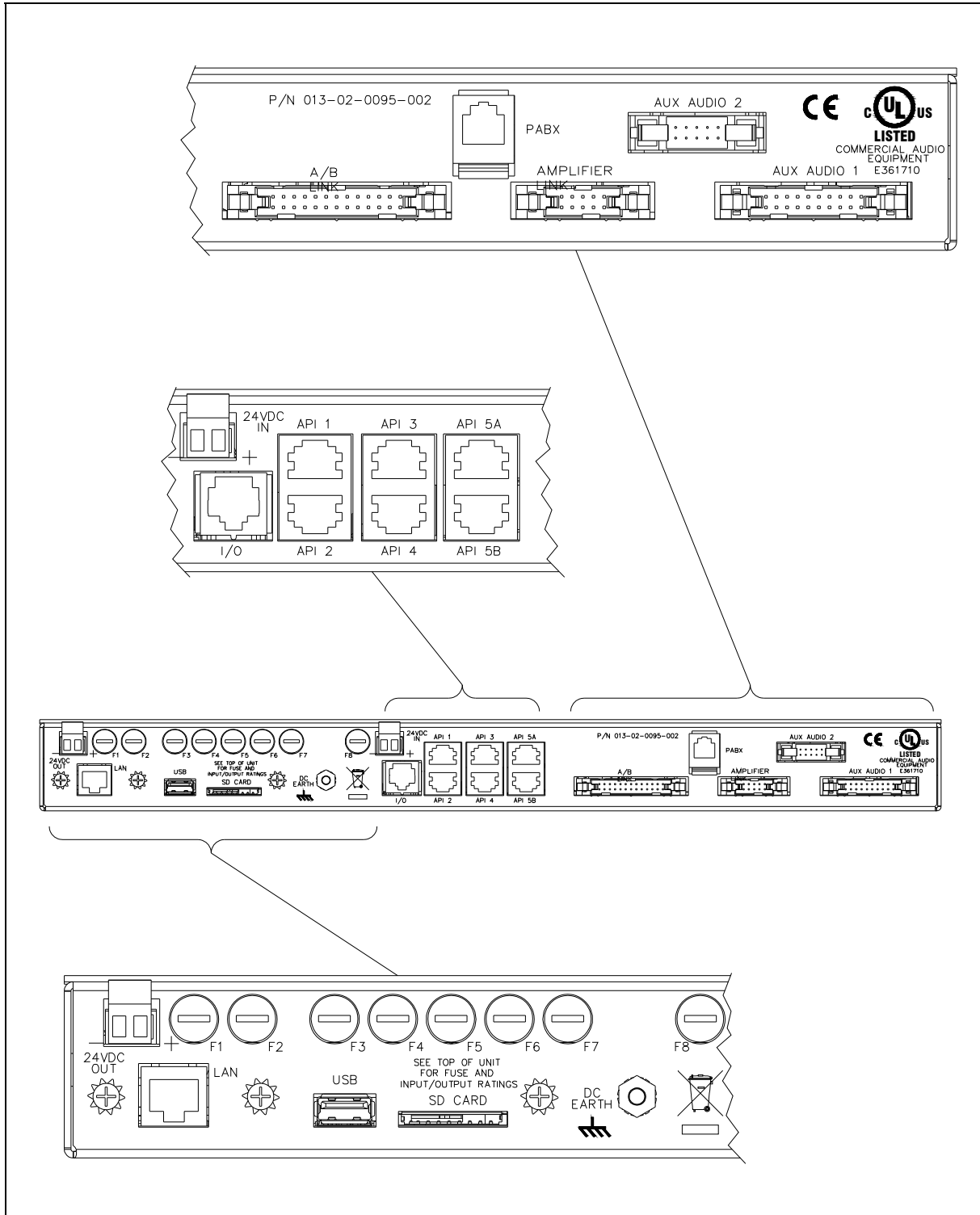


Figure 3. **Elemec3** System Controller – Rear View

Internal Connections

All internal connections are plug and socket connections.

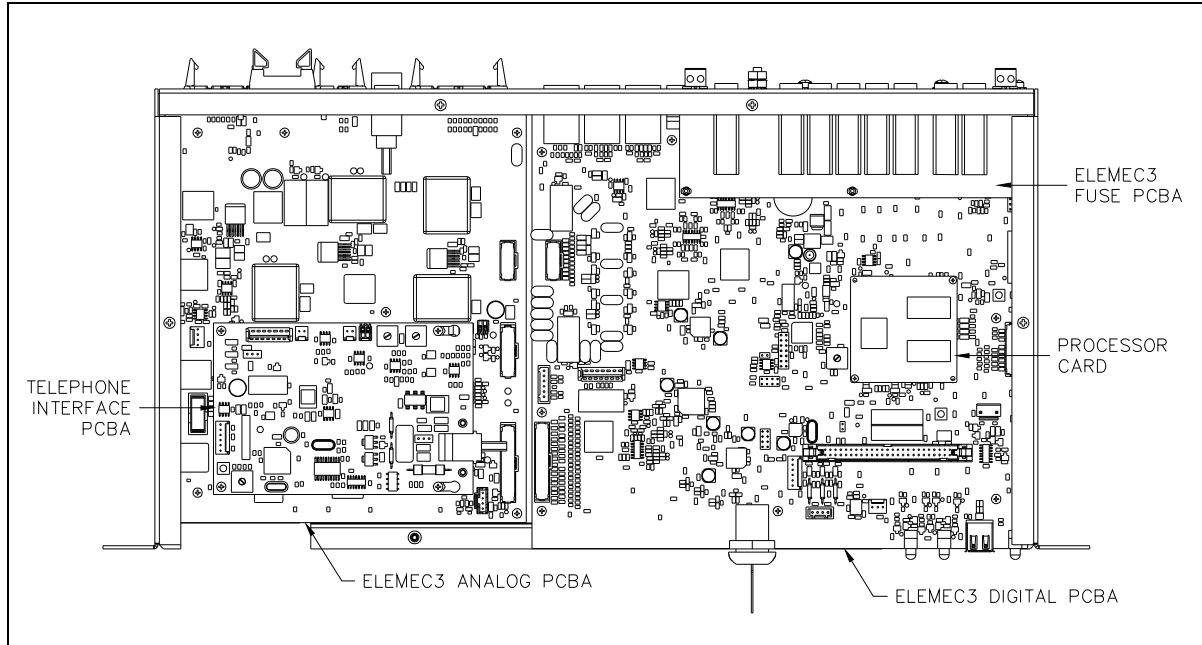


Figure 4. **Elemec3** System Controller – Internal Components – Top View

The main internal components are listed in Table 1 below:

Table 1. **Elemec3** System Controller – Internal Components

Component	Description
Digital PCBA	Central processing unit and digital communications
Analog PCBA	Provides speech recording and play-back to eliminate feedback.
Telephone Interface PCBA	Interface from Elemec3 System Controller to telephone system
Elemec3 Fuse PCBA	See “Specification” section for description

The **Elemec3** System Controller contains an internal clock that continually runs in the background. It has a battery back-up and the time is used as a time stamp on event logs when the status of the system changes, such as an alarm event.

Installation

Mount the *Elemec3* System Controller in the 19-inch rack using the supplied hardware.

The following is a discussion of the types of *Elemec3* systems that can be configured. Refer to your system manual for complete information.

Single System

In a **single** type system, the *Elemec3* System Controller is typically installed in the top position of a standard EIA 19-inch *Elemec3* system equipment rack. It requires 1U (1.75 inches) of height.

Duplicate System

In a “**duplicated**” or redundant system, two *Elemec3* System Controllers, designated as A and B, are located in system racks at different location. In this type of system there are two sets of amplifiers (also designated as A and B) with the two speaker loops run in different routes. If one *Elemec3* System Controller should fail, there would be a 50% loss of audible coverage.

Hot Standby (N+1) System

In a different type of redundant system, referred to as a **Hot Standby (N+1)**, two Controllers, designated as A and B, are located in the same cabinet and control a single set of amplifiers. The advantage to this type of system is that there is no loss of coverage if one *Elemec3* System Controller should fail.

Operation

NOTE: Each **Elemec3** System Controller is custom-configured for a specific application via the **Elemec3** software application. Please refer to your system manual for more information.

The **Elemec3** System Controller front panel contains a rotary key switch, three LEDs and a USB port (reserved for future use).

The key switch provides the capability to turn on or off previously configured inputs.

The LEDs operate in accordance with the following table:

Table 2. Front Panel LED Indications

LED	Indication
PA IN USE	Green – Indicates the PA system is in use. Off – Not in use
SYSTEM STATUS	Green – Normal operation Red – Fault condition – Refer to the display for additional information. Blinking Red – Fault acknowledged Amber – Non-critical fault
PWR	Blue – Power is on. Off – No power

The E3 Controller has been designed so that it can be monitored over an IP based data network either locally or remotely. The loss of connection to the data network therefore constitutes a fault condition which will be duly indicated by the **SYSTEM STATUS** LED on the front of the Controller. For the correct operation of the E3 Controller it should be connected at all times to a network.

Wiring

Connections

24VDC IN – Power is supplied to the **Elemec3** System Controller via the 24VDC IN connector.

DC Earth – A green-yellow conductor shall be installed between the DC EARTH terminal on the rear of the unit to the Telecoms Earth Bar inside the cabinet.

LAN connection – The **Elemec3** System Controller receives its initial programming and subsequent updates and modifications via the LAN connection on the rear panel.

PABX connection – The interface to the telephone system is made via the PABX connector on the rear panel.

API 1–API 4 – Access panel interface connections. Provides the ability to connect to four access panel termination PCBAs, which can each be connected to four user access panels with microphones, for a total of 16 possible.

API 5A–API 5B – Reserved for future use.

SD Card – Reserved for use by a qualified technician.

USB – Reserved for use by a qualified technician.

I/O – Input/output signals that can be used for applications, such as the site Fire & Gas system, monitoring systems, beacons, or loudspeakers.

24VDC Out – Power can be supplied to other components in the system cabinet.

Specifications

Electrical

Power supply requirements.....	24 V dc +/- 10%
Current consumed	6.8 A (maximum)
Controller current consumed.....	<0.76 A (unit itself)
Access Panel Interface Groups 1–4.....	460 mA (maximum)
Access Panel Interface Group 5B.....	460 mA (maximum)
Input /output.....	1.4 A (maximum)
Auxiliary power output.....	2.24 A (maximum)

Fuse Ratings (250 V)

(F2) Controller	T1 A
Additional fused power feeds provided for:	
(F3) Group 1 Access Panel Interface cards	T500 mA*
(F4) Group 2 Access Panel Interface cards	T500 mA*
(F5) Group 3 Access Panel Interface cards	T500 mA*
(F6) Group 4 Access Panel Interface cards	T500 mA*
(F7) Group 5B Access Panel Interface cards	T500 mA*
(F8) Input / Output Cards	T1.6 A
(F1) Auxiliary Power Output	T2.5 A

*Power to access panels is fused to 100 mA on Access Panel Interface cards.

Access Panel Interfaces

Access panels per system.....	16 maximum
	One Type II Access Panel Interface card
	Up to four Type I Access Panel Interface cards

Audio Pair

Operating level.....	2.2 Vpp maximum at 1 kHz
Input impedance.....	600 ohm +/- 50 ohms at 1 kHz
3-dB bandwidth.....	200 Hz–20 kHz (input to zone output)

Data Pair

Operating Speed.....	57.6 kbps
	Isolated RS-485 duplex data

Input / Output Interface

Inputs / outputs per system	240 maximum
16-input / 16-output I/O cards per system	15 maximum
16-input / 16-output I/O cards daisy chained on I/O Interface connector.....	5 maximum

NOTE: Additional I/O cards can be powered via auxiliary power output.

Zone Audio Outputs

Isolation	>500 Vrms
Output Level	2.2 Vpp maximum at 1 kHz into 17-ohm load
THD.....	<1% at 1 kHz at 2.2 Vpp into 600-ohm load
S/N (Access Panel input).....	>60 dB (10 Hz–10 kHz)

Additional Facilities on Zone Outputs

Relay switching to A/B audio input

Page/Party® Audio Interface

Isolation 500 Vrms (input/output and output/output)
 Input level 1.5 Vrms maximum 1 kHz
 3 dB bandwidth 200 Hz–20 kHz (input to zone output)

Amplifier Data Links

Number Two (one local amplifier, one remote amplifier)
 Type RS-485 semi-duplex
 Isolation 1500 Vrms (link – unit)
 Un-isolated link-link and link-A/B data link
 Operating speed 57.6 kbps

A/B Interlinks

Audio Input

Operating level 2.2 Vpp maximum at 1 kHz
 Input impedance >60 k-ohms at 1 kHz
 3-dB bandwidth 200 Hz–20 kHz (input to zone output)

Data Link

Type RS-485 fully duplex
 Isolation 2500 Vrms (link unit)
 Operating speed 57.6 kbps

Auxiliary Audio Inputs

Audio Input

Operating level 2.2 Vpp maximum at 1 kHz
 Input impedance >80 k-ohms at 1 kHz
 3-dB bandwidth 200 Hz–20 kHz (input to zone output)

Aux 1 Control Input

Type Normally open pulled-up contact
 O/C voltage 3.3 V dc nominal
 Current source 300 uA +/-100 uA

Auxiliary Audio Output

Audio Output

Output level 2.2 Vpp maximum at 1 kHz into 600-ohm load
 3-dB bandwidth 200 Hz–20 kHz

Monitor Audio Output

Audio Output

Output level 2.2 Vpp maximum at 1 kHz into 600-ohm load
 3-dB bandwidth 200 Hz–20 kHz

Event Audio Outputs

Audio Output

Output Level.....	2.2 Vpp maximum at 1 kHz into 600-ohm load
3-dB bandwidth.....	200 Hz–20 kHz
Key switch.....	Auto alarm inhibit
Status LEDs	Unit Power PA In Use System Status
Status Monitor.....	Elemec3 Portal

Ports

Ethernet Port.....	RJ45 Connector
USB Device Port - Front.....	Type A
USB Device Port - Rear	Type A
O/C Voltage	5.1 V dc nominal
Current	500 mA (maximum) +/-10 mA per port
Memory card type	SD Memory Card

Environmental

Operating temperature range.....	20° C to +50° C
Relative humidity	95%

Mechanical

Unit dimensions	482.6 W × 43.7 H × 226.3 D mm (19.0 × 1.72 × 8.91 inches)
Unit weight	2.4 kg (5.2 lbs.)

Approval

CE Mark

NRTL.....	UL/CSA 60065
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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.