

Model 10961-101 AMI Centra-Page Interface

Confidentiality Notice

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General Information

GAI-Tronics' Centra-Page systems provide dependable paging and party line communications for rugged and hazardous industrial facilities. Centra-Page systems feature centrally located electronics that provide environmental protection and unitized amplification for easy maintenance.

Standard Centra-Page cabinets can support up to 30 handset stations, and in most cases, up to 60 paging speakers. Alarms and telephone interfacing can be added to Centra-Page systems with the addition of a Model 10959-208 Audio Messenger Interface (AMI) and a Model 10961-101 AMI Centra-Page Interface.

The Model 10961-101 AMI Centra-Page Interface, in combination with the AMI, can replace the Model H97019 Programmable Tone/Speech Generator and the Model 10448-202 Telephone Interface for Centra-Page systems or the Model GTB93017 Programmable Telephone Interface in CP/P II systems.

The Model 10961-101 AMI Centra-Page Interface is designed to provide five alarm inputs to activate the Model 10959-208 AMI's tone/speech generator when both are mounted in a Model 10468-002 Centra-Page Central Cabinet and are properly configured.

The AMI Centra-Page Interface can provide Centra-Page systems access to the public telephone network. The telephone line coupler is designed for loop start operation with bridged ringing. This coupler is registered by the FCC number ADGOT01B46055. The Ringer Equivalence Number (REN) is 0.1A, with an RJ11C connection.

The Model 10961-101 AMI Centra-Page Interface contains a priority alarm test panel and a telephone interface panel. The 69542-001 PCBA and 69407-002 I/O Controller PCBA are mounted on the rear along with a power terminal block. The AMI Centra-Page Interface outline is shown in Figure 1.

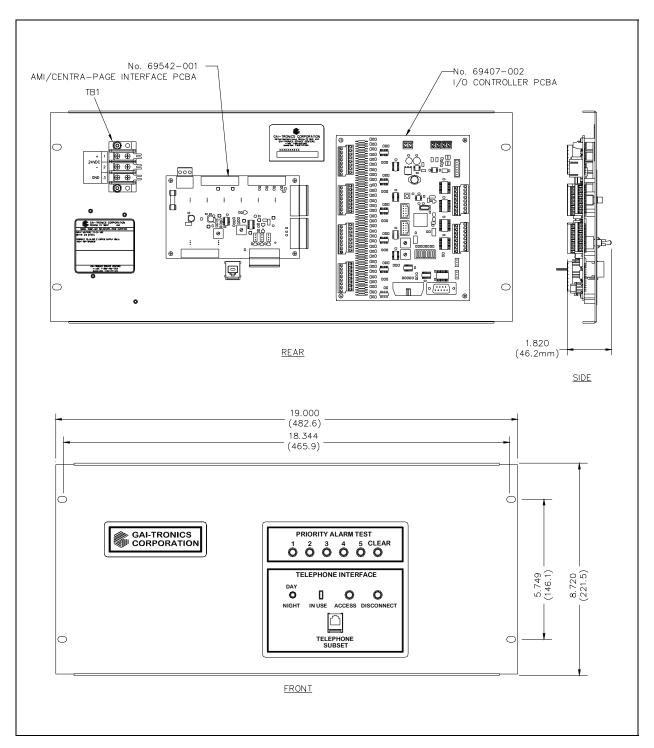


Figure 1. Model 10961-101 AMI Centra-Page Interface

Installation

Power Disconnect. The power cord is the main power disconnect for all units. Disjontion de l'alimentation. Le cordon d'alimentation est la disjonction d'alimentation principale tous les appareils. Para Desconectar la Alimentación: El cable de alimentación es el medio principal de desconexión del equipo. Netzanschluß. Wenn man das Netzkabel aus der Steckdose zieht, dann ist die Spannungszuführung zum Gerät vollkommen To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord. Pour réduire le risque d'incendie, utiliser uniquement des conducteurs de télécommunications 26 AWG ou ATTENTION de section supérieure. PRECAUCIÓN 4 Para aminorar la posibilidad de incendios, utilice solamente cable de telecomunicaciones de calibre 26 (sistema AWG americano) o mayor. Um die Brandgefahr zu verringern, verwenden Sie bitte nur Fernmeldekabel der Stärke Nr. 26 AWG oder höher. .WARNING $\angle !$ Do not apply power until all the connections have been wired. Warning: Observe precautions for handling electrostatic sensitive devices. ackslashWARNING ackslashConnect only to a UL-listed Class 2 power source.

If replacing existing equipment, remove the tone generator, telephone interface, and the associated wiring prior to installing the Model 10961-101 Interface.

The Model 10961-101 AMI Centra-Page Interface and the Model 10959-208 AMI should be installed in the Centra-Page central cabinet at the same time. Allow 6U of open space immediately below the Model 10461-002 Card Rack in the lowest position in the cabinet to mount the AMI, and immediately beneath it, the Centra-Page Interface. Refer to Figure 2.

NOTE: The standard lengths of the interconnecting cables do not allow for blank panel space between these pieces of equipment.

- 1. Carefully unpack and identify the various components. The Model 10959-208 AMI includes a parts envelope containing mounting hardware, a CD, and a 12 V dc Walpac. The Model 10961-101 AMI Centra-Page Interface includes a parts envelope containing seven cable assemblies, four mounting screws, a Flash Memory card, a modular RJ11 splitter, a 33-ohm resistor, and a Centra-Page terminal block label. The seven cable assemblies are:
 - 61531-033
- 61531-038
- 61531-041 (9-inch green ground wire)

- 61531-034
- 61531-039
- 61531-035
- 61531-040
- 2. Use the mounting hardware supplied with the AMI to mount it directly below the bottom card rack. The AMI occupies 1U of space.
- 3. Make all the required wiring connections before mounting the Model 10961-101 AMI Centra-Page Interface. Refer to Figure 4 and Figure 5.

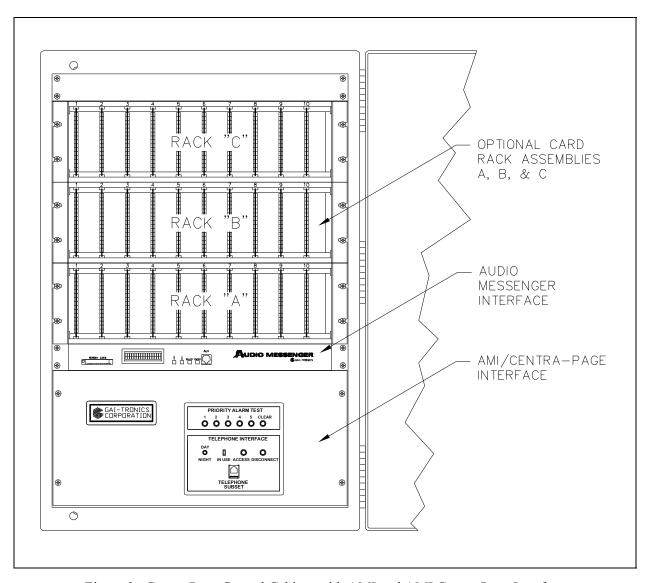


Figure 2. Centra-Page Central Cabinet with AMI and AMI Centra-Page Interface (front of center section)

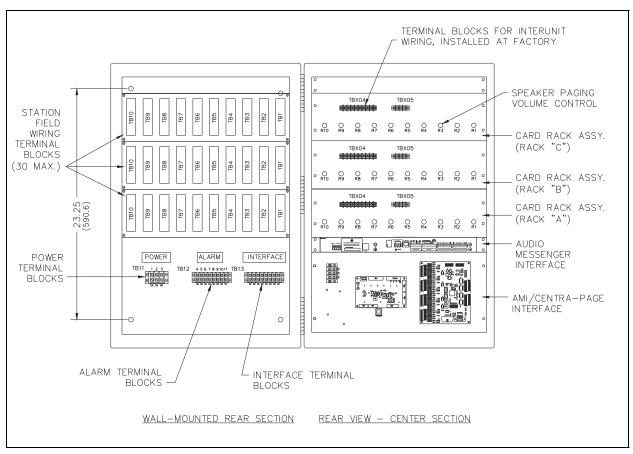


Figure 3. Centra-Page Central Cabinet (Showing front of rear section and the rear of the center section)

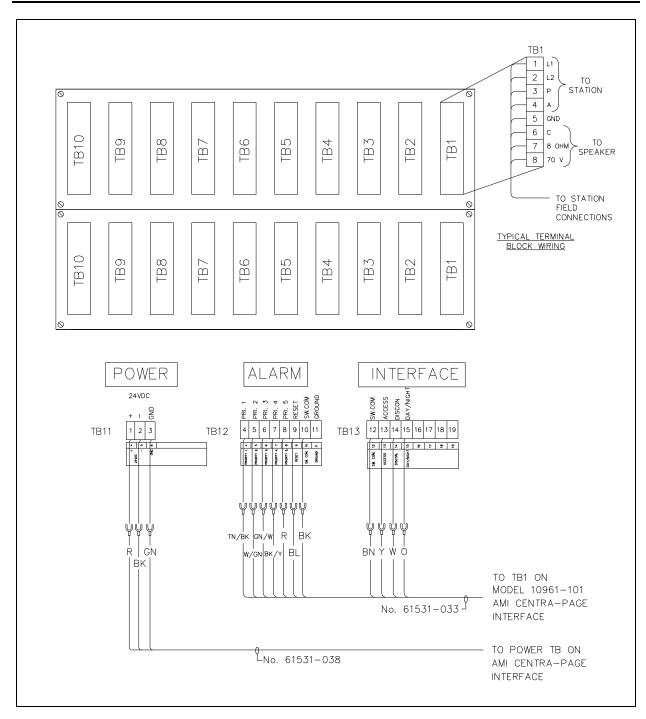


Figure 4. Wiring of Central Cabinet's wall-mounted section

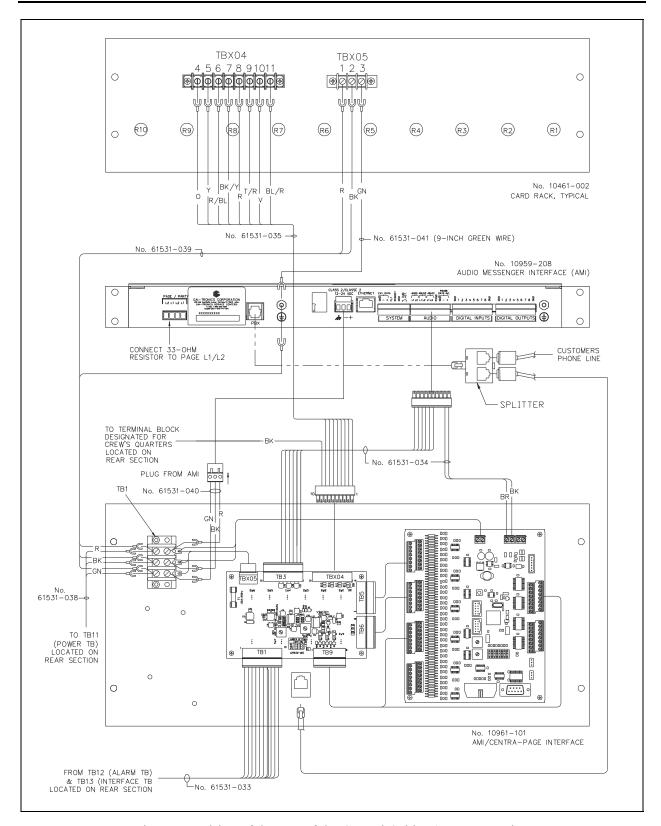


Figure 5. Wiring of the rear of the Central Cabinet's center section

NOTE: The connectors for TB6 (power) and TB3 (audio) from the back of the AMI must be attached (terminated) to the cable assemblies according to the steps 4 and 5 below:

4. Remove TB3 (AUDIO) connector from the back of the AMI. Attach the mating end of the connector to the 61531-034 cable assembly. See Figure 6. Using this 10-position removable terminal block, connect the six wires from positions 1 through 6 of the 61531-034 cable assembly. The brown and black wires from positions 9 and 10 are not connected to this terminal block. Refer to Figure 5.

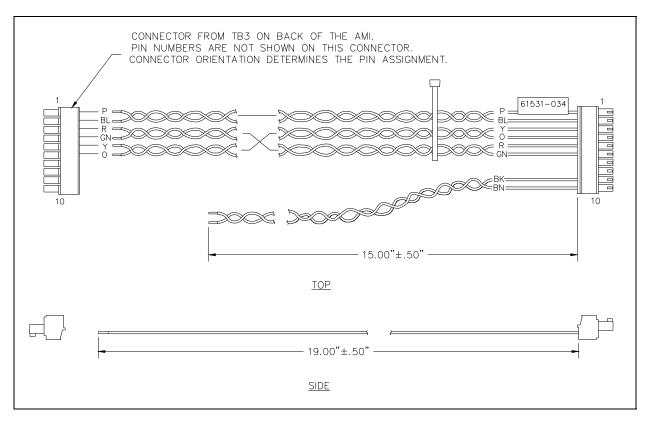


Figure 6. 61531-034 Cable Assembly

Connector from AMI TB3 (Audio)

Terminal	Wire Color	Function
TB3-1	Purple	+ Page or alarm from AMI
TB3-2	Blue	- Page or alarm from AMI
TB3-3	Red	+ Party line from AMI
TB3-4	Green	- Party line from AMI
TB3-5	Yellow	+ Party line to AMI
TB3-6	Orange	- Party line to AMI
TB3-7 thru TB3-10	N/C	

5. Remove TB6 (power) connector plug from its socket on the back of the AMI. Attach the TB6 connector plug to the 61531-040 cable assembly conductor ends that do not have spade lugs. Refer to Figure 7.

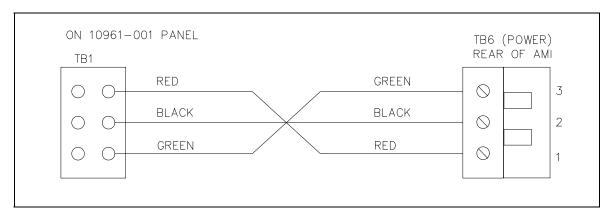


Figure 7. 61531-040 Cable Assembly Connector Termination

6. Connect the 61531-038 and 61531-039 cable assemblies to the outside of TB1 (mounted on the AMI Centra-Page Interface plate) and the 61531-040 cable assembly to the inside of TB1.

Terminal	Terminal Wire Color Function	
TB1-1	Red	+24 V dc
TB1-2	Black	(-) of 24 V dc
TB1-3	Green	Ground

TB1 on AMI Centra-Page Interface Panel

- 7. Connect the 61531-033 cable connector to TB1 on the 69542-001 PCBA.
- 8. Connect the 61531-034 cable connector (the end without the brown and black wires) to TB3 on the 69542-001 PCBA. Connect the brown and black wires to TB2 on the 69407-002 PCBA.

TB2 on 69542-001

Terminal	Wire Color	Function
TB2-1	Brown	+RS-485 data
TB2-2	Black	-RS-485 data

9. Connect the 61531-035 cable connector to TBX04 on the 69542-001 PCBA.

- 10. Mount the Model 10961-101 Interface directly beneath the AMI in the Centra-Page central cabinet.
- 11. Connect the 61531-038 cable assembly to the central cabinet's TB11 located on the rear panel. See Figure 4.

Terminal	Wire Color	Function
TB11-1	Red	+24 V dc
TB11-2	Black	(-) of 24 V dc
TB11-3	Green	Ground

11. Connect the red and black wires of cable assembly 61531-039 to the TBX05 terminal block on the card rack located in the lowest mounting position. Connect the green wire from the 61531-039 cable assembly and one end of the 61531-041 grounding wire to the grounding lug on the back of the AMI. Connect the other end of the 61531-041 to the card rack's TBX05 terminal block.

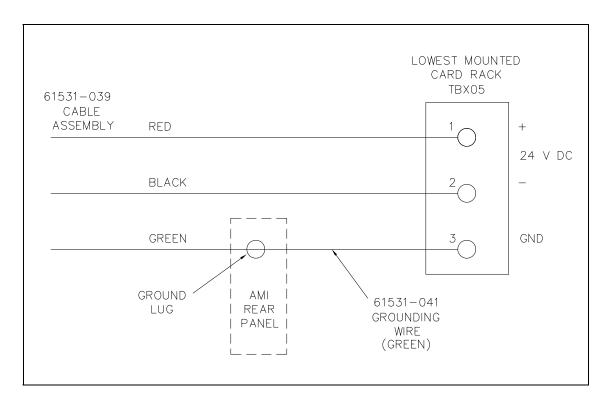


Figure 8. 61531-039 Cable Assembly Termination

- 12. Plug the 61531-040 cable's TB6 connector (attached in step 5) back into its original location on the rear of the AMI.
- 13. Install the Centra-Page terminal block label beneath TB13 on the central cabinet's rear panel. Connect the 61531-033 cable to the central cabinet's back panel TB12 (ALARM) and TB13 (INTERFACE). Refer to Figure 4.

Centra-Page Cabinet Back Panel - Alarm -TB12

Terminal	Wire Color	Function
TB12-4	Tan/black	Priority 1
TB12-5	White/green	Priority 2
TB12-6	Green/white	Priority 3
TB12-7	Black/yellow	Priority 4
TB12-8	Red	Priority 5
TB12-9	Blue	Reset
TB12-10	Black	Switch common
TB12-11	NC	Ground

Centra-Page Cabinet Back Panel - Interface - TB13

Terminal	Wire Color	Function
TB13-12	Brown	Switch common
TB13-13	Yellow	Access
TB13-14	White	Disconnect
TB13-15	Orange	Day/Night
TB13-16	NC	NC
TB13-17	NC	NC
TB13-18	NC	NC
TB13-19	NC	NC

14. Connect the 61531-035 cable assembly to the bottom card rack's TBX04 according to the table below, except for the black wire, which goes to the position 2 of the terminal block for the crew's quarters.

Card Rack - TBX04

Terminal	Wire Color	Function
TBX04-4	Orange	Alarm mute
TBX04-5	Yellow	Alarm
TBX04-6	Red/blue	Page
TBX04-7	Black/yellow	Alarm common
TBX04-8	Red	Party 2
TBX04-9	Tan/red	Party common
TBX04-10	Violet	Party 1
TBX04-11	Blue/red	Page common

- 15. Install the modular RJ11 splitter into the RJ11 jack on the rear on the AMI. Connect the phone cable from the AMI Centra-Page Interface into one of the splitter RJ11 jacks. Connect the telephone line into the other splitter RJ11 jack.
- 16. Remove the Flash Memory card from the AMI and replace it with the Flash Memory card that came with the AMI Centra-Page Interface. Keep the Flash Memory card as a spare.

NOTE: The 12 V dc Walpac is not used in this installation.

- 17. Connect the 33-ohm resistor to Page L1 and L2 on the P1 connector of the AMI.
- 18. All field wiring is brought into the terminal blocks on the cabinet back panel. After the field wiring is connected, apply 24 V dc to TB11 on the central cabinet's rear panel. Refer to Figure 3.

Startup

The AMI begins its startup procedure when 24 V dc is applied. When the startup procedure is complete, the AMI will be communicating with the 69407-002 I/O controller PCBA on the Model 10961-101 Interface.

"System Up" will be displayed on the AMI. When viewed from the rear of the cabinet, LED1 on the 69407-002 should be flashing. Use the display and the buttons on the front of the AMI to set the time and date. Refer to GAI-Tronics Pub. 42004-345 for more setup and operation information for the AMI.

Quick Test

- 1. Press the PRIORITY 1 button on the front of the Interface panel to play the Alarm 1 tone over the Centra-Page station and the crew's quarters speakers.
- 2. Press the CLEAR button on the front panel of the AMI Centra-Page Interface to stop the alarm tone.
- 3. Set the DAY/NIGHT switch on the front of the AMI Centra-Page Interface panel to Night Mode. Call the AMI from an external line or a phone with a different number than the AMI.
- 4. When ringing can be heard through the Centra-Page system, press the ACCESS button on the front of the Interface panel to answer the phone.
- 5. From a Centra-Page station set to party line 1, take the handset off-hook. There should be two-way audio with the calling phone.
- 6. Press the DISCONNECT button on the front of the AMI Centra-Page Interface panel to hang up the phone.

Operation

General

The Model 10959-208 AMI has an on-board MP3 player that generates pre-recorded tones and speech messages. It stores these sound and its configuration files on a Flash Memory card. It also contains a telephone interface PCBA that connects to the Public Switched Telephone Network (PSTN).

The Model 10961-101 AMI Centra-Page Interface is designed to allow the capabilities of the AMI to be used by a Centra-Page system. The AMI Centra-Page Interface contains two boards: the 69407-002 I/O controller and the 69542-001 AMI Centra-Page Interface PCBAs. The interface connects the alarm, page, and party audio between the AMI and the Centra-Page system. In addition, the panel and remote switches connect to the AMI Centra-Page Interface communicating their state to the AMI.

Alarms and Paging

Five alarms can be activated from the push buttons on the front panel of the AMI Centra-Page Interface or from remote switches (momentary/N.O.). The alarms can be cleared or reset using the push button on the front panel. For convenience, a remote switch can be connected to control each alarm. Use terminal block TB11 on the Centra-Page central cabinet's rear panel to connect the remote switches.

Each alarm plays a different tone and each has a different priority level assigned to it. Alarm 1 has the highest priority and Alarm 5 the lowest. If an alarm tone is playing and a higher priority alarm is activated, the higher priority will override the lower priority alarm. Pot 15 on the 69542-001 PCBA adjusts the alarm audio level.

If an alarm is playing and someone makes a page from a Centra-Page station the alarm will be reduced by -7 dB and the page will play over top of the alarm. If the alarm is still active when the page is complete, the alarm level will return to its normal level.

Crew's Quarters Muting

The crew's quarters speakers are normally muted and no alarms or pages are broadcast. The Model 10961-101 Interface has an output that allows the crew's quarters speakers to be unmuted so that selected alarms can be heard. The output can be set up so that it is active when one or all of the first three alarms are played.

Jumpers P1 to P3 are used to select alarms 1 to 3. Putting the jumper across positions 1 and 2 makes the output inactive for that alarm and putting the jumper in positions 2 and 3 activates the output for that alarm. The output is on TBX04 on the AMI Centra-Page Interface's 69542-001 PCBA. It is position 9 of TBX04 and will have a black wire long enough to connect to the back panel of the Crew's Quarters terminal block.

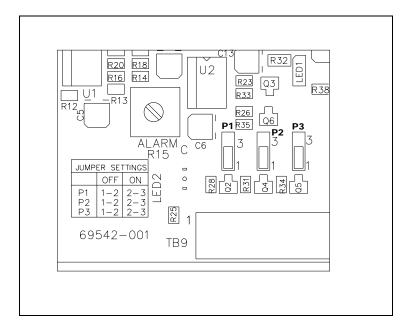


Figure 9. Crew's Quarters Jumpers on the 69542-001 PCBA in the Model 10961-101 AMI Centra-Page Interface

Telephone Interface

The Model 10959-208 AMI connects to the PSTN, and through the Model 10961-101 AMI Centra-Page Interface, connects to the Centra-Page system. Pressing the Interface's front panel ACCESS and DISCONNECT buttons causes the AMI to take the phone line on or off-hook. Pot R10 on the 69542-001 PCBA can adjust the level of the audio from the phone line to the Centra-Page party line.

NOTE: The IN USE LED on the front panel of the Interface lights when the phone line is connected to party line 1.

There are two modes of operation: Day mode and Night mode. The Day/Night mode toggle switch on the Interface's front panel is used to switch between the two modes. If the toggle switch is put in the Night position, a remote switch (maintained) connected to terminal block TB13 on the rear panel of the Centra-Page Central Cabinet can be used.

Day Mode

An attendant, with access to a phone on the same line as the AMI and a Centra-Page station, answers the incoming call and pages the person being called. When that person answers on party line 1 of the Centra-Page system, the attendant presses the ACCESS button to connect the phone line to the party line. Upon completion of the call, the attendant presses the DISCONNECT button to hang up the phone line.

If the attendant is not there, the AMI will auto-answer after the fourth ring. The caller will hear two beeps, and can then make a live page. When a Centra-Page station goes off-hook after the page, the phone is connected to party line 1. The AMI will go back on-hook 15 seconds after the station goes back on-hook.

Night Mode

In night mode an incoming call is auto-answered after one ring. The ring message is played over the paging system until a Centra-Page station on party line 1 goes off-hook. The page then stops and the phone line is connected to party line 1. The AMI will go back on-hook 15 seconds after the station goes back on-hook.

There is a one-minute time out if the page is not answered and then the AMI will hang up the call.

Options

The configuration on the Flash Memory card in the AMI contains all the parameters for alarm, paging and telephone operation. To change any of these operating parameters, the ACT software that comes with the AMI must be installed on a PC with a card reader. Using the ACT software, the configuration can be edited and the Flash Memory card can be reprogrammed.

The ACT software has a Default AMI Centra-Page configuration template available from Configuration pull down window. Select "Add New" then from the New Configuration window, select AMI Centra Page Default, and give the new configuration a unique name. The new configuration will show up in the list of configurations and can be selected and edited.

Use ACT Software Version 2.1.9M or greater for creating default Centra-Page configurations.

Using Optional Inputs and Outputs

To use the optional inputs and outputs on the AMI and I/O controller PCBA, the AMI configuration must be changed. Refer to the Model 10959-208 AMI manual, GAI-Tronics Pub. 42004-345, and online help to set them up. The charts below show the layouts for the inputs and outputs.

Input Layout for Default AMI Centra Page Configuration

Inputs in ACT Configuration	Where Input Terminal is Located:	Description
1	Input 1 on AMI TB2 (Audio): 2 & 1	Not used
2	Input 2 on AMI TB2 (Audio): 3 & 1	Not used
3	Input 3 on AMI TB2 (Audio): 4 & 1	Not used
4	Input 4 on AMI TB2 (Audio): 5 & 1	Not used
5	Input 5 on AMI TB2 (Audio): 6 & 10	Not used
6	Input 6 on AMI TB2 (Audio): 7 & 10	Not used
7	Input 7 on AMI TB2 (Audio): 8 & 10	Not used
8	Input 8 on AMI TB2 (Audio): 9 & 10	Not used
9	On rear panel TB12:4, 10 (PRIORITY 1, SW. COM.)	Alarm 1
10	On rear panel TB12:5, 10 (PRIORITY 2, SW. COM.)	Alarm 2
11	On rear panel TB12:6, 10 (PRIORITY 3, SW. COM.)	Alarm 3
12	On rear panel TB12:7, 10 (PRIORITY 4, SW. COM.)	Alarm 4
13	On rear panel TB12:8, 10 (PRIORITY 5, SW. COM.)	Alarm 5
14	On rear panel TB12:9, 10 (Reset, SW. COM.)	Clear Alarms
15	Input 7 on I/O controller TB5:13, 14	Not used
16	Input 8 on I/O controller TB5:15, 16	Not used
17	On rear panel TB13:13, 12 (DISCON., SW. COM.)	Phone Disconnect
18	On rear panel TB13:14, 12 (ACCESS, SW. COM.)	Phone Access

Inputs in ACT		
Configuration	Where Input Terminal is Located:	Description
19	On rear panel TB13:15, 12 (MODE SEL., SW.COM.)	Day/Night mode
20	Input 12 on I/O controller TB6:7, 8	Station Off-Hook
21	Input 13 on I/O controller TB6:9, 10	Alarm Mute
22	Input 14 on I/O controller TB6:11, 12	Not used
23	Input 15 on I/O controller TB6:13, 14	Not used
24	Input 16 on I/O controller TB6:15, 16	Not used
25	Input 17 on I/O controller TB7:1, 2	Not used
26	Input 18 on I/O controller TB7:3, 4	Not used
27	Input 19 on I/O controller TB7:5, 6	Not used
28	Input 20 on I/O controller TB7:7, 8	Not used
29	Input 21 on I/O controller TB7:9, 10	Not used
30	Input 22 on I/O controller TB7:11, 12	Not used
31	Input 23 on I/O controller TB7:13, 14	Not used
32	Input 24 on I/O controller TB7:15, 16	Not used
33	Input 25 on I/O controller TB8:1, 2	Not used
34	Input 26 on I/O controller TB8:3, 4	Not used
35	Input 27 on I/O controller TB8:5, 6	Not used
36	Input 28 on I/O controller TB8:7, 8	Not used
37	Input 29 on I/O controller TB8:9, 10	Not used
38	Input 30 on I/O controller TB8:11, 12	Not used
39	Input 31 on I/O controller TB8:13, 14	Not used
40	Input 32 on I/O controller TB8:15, 16	Not used

Output Layout for Default AMI Centra Page Configuration

Outputs in ACT Configuration	Where Input terminal is Located:	Description
1	Output 1 on AMI TB1: 2 & 1	Not used
2	Output 2 on AMI TB1: 3 & 1	Not used
3	Output 3 on AMI TB1: 4 & 1	Not used
4	Output 4 on AMI TB1: 5 & 1	Not used
5	Output 5 on AMI TB1: 6 & 10	Not used
6	Output 6 on AMI TB1: 7 & 10	Not used
7	Output 7 on AMI TB1: 8 & 10	Not used
8	Output 8 on AMI TB1: 9 & 10	Not used
9	Output 1 on I/O controller TB10:1	Not used
10	Output 2 on I/O controller TB10:2	Not used
11	Output 3 on I/O controller TB10:3	Not used
12	Output 4 on I/O controller TB10:4	Not used
13	Output 5 on I/O controller TB10:5	Not used
14	Output 6 on I/O controller TB10:6	Not used
15	Output 7 on I/O controller TB10:7	Not used
16	Output 8 on I/O controller TB10:8	Not used
17	Output 9 on I/O controller TB10:9	Not used
18	Output 10 on I/O controller TB10:10	Not used
19	Output 11 on I/O controller TB10:11	Not used
20	Output 12 on I/O controller TB10:12	Not used
21	Output 13 on I/O controller TB10:13	Not used
22	Output 14 on I/O controller TB10:14	Not used
23	Output 15 on I/O controller TB10:15	Not used
24	Output 16 on I/O controller TB10:16	Not used
25	Output 17 on I/O controller TB9:1	Not used
26	Output 18 on I/O controller TB9:2	Priority 1 Crew's Quarters active
27	Output 19 on I/O controller TB9:3	Priority 2 Crew's Quarters active
28	Output 20 on I/O controller TB9:4	Priority 3 Crew's Quarters active
29	Output 21 on I/O controller TB9:5	Telephone Page

Outputs in ACT Configuration	Where Input terminal is Located:	Description
30	Output 22 on I/O controller TB9:6	Phone In Use LED
31	Output 23 on I/O controller TB9:7	Not used
32	Output 24 on I/O controller TB9:8	Not used
33	Output 25 on I/O controller TB9:9	Not used
34	Output 26 on I/O controller TB9:10	Not used
35	Output 27 on I/O controller TB9:11	Not used
36	Output 28 on I/O controller TB9:12	Not used
37	Output 29 on I/O controller TB9:13	Not used
38	Output 30 on I/O controller TB9:14	Not used
39	Output 31 on I/O controller TB9:15	Not used
40	Output 32 on I/O controller TB9:16	Not used

NOTE: The ground connections for the outputs on the I/O controller are TB1:1, 2 and any unused input ground terminals, which are the even number terminals of TB5, TB6, TB7 and TB8. Refer to Figure 10.

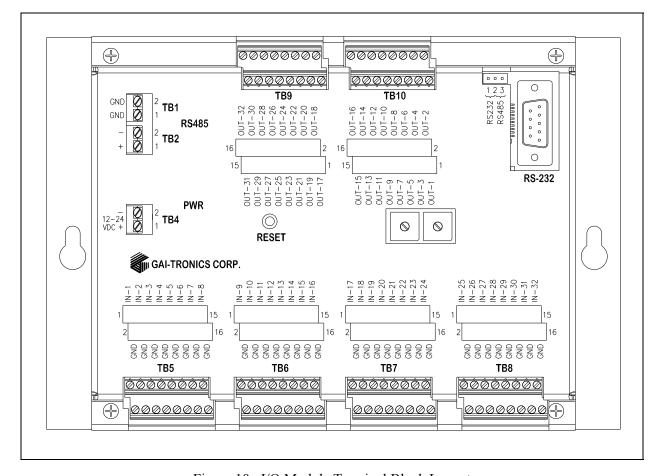


Figure 10. I/O Module Terminal Block Layout

Maintenance

If your AMI Centra-Page Interface requires service, contact your GAI-Tronics 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 will be made without charge. 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
No activity	Check the power on the AMI Centra-Page Interface.
The interface does not answer the phone.	Check that the phone line is connected through the splitter to the AMI.
Inputs are not working.	Check that the AMI is running and LED1 on the I/O controller is flashing.
Auto disconnect is not working.	Check for a subset that is off-hook.

Specifications

Power Supply Requirements for Model 10961-101 Only

Using default configuration:

Power Supply Requirements Using Optional Outputs

Outputs are setup into four groups of eight (1–8, 9–16, 17–24, 25–32)

Each group can sink a total of 500 mA; each input within the group can sink 150 mA.

The power supply for these outputs is not on the 69407-002 I/O controller PCBA.

The external 24 V dc supplied to the 10961-101 can be used.

Mechanical

Enclosure Steel; black, fine-textured paint finish Mounting Rack-mount; 5U in standard 19-inch Dimensions 8.72 H \times 19.00 W \times 1.82 D inches (221.5 \times 482.6 \times 46.2 mm) Weight 5 lbs (2.27 kg)

Environmental

Contact Requirements

Alarm and telephone inputs:

Audio Levels Interfacing AMI to Centra-Page

Replacement Parts

Part Number	Description
69542-001	Centra-Page AMI/Telephone Interface PCBA
69407-002	I/O Controller PCBA

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.

<u>Services.</u> 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.

<u>Warranty Periods.</u> 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.

<u>Limitations / Exclusions.</u> 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.