GAI-TRONICS®
A HUBBELL COMPANY

Clean Phone® VoIP Telephones

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Confidentiality Notice

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Product Overview

GAI-Tronics' Model 295-712F (flush-mount) and Model 295-712W (wall-mount) Clean Phone® VoIP (Voice over Internet Protocol) telephones are designed for the exacting requirements of clean rooms. They are constructed of stainless steel and have a completely smooth polyester front panel that will not trap particulate matter. Make calls by pressing one of the three auto-dial buttons or by using the fully functional keypad. The oversized, clearly labeled buttons allow trouble-free operation with gloved hands.

Clean Phone VoIP telephones connect to a 10/100/1000 BaseT Ethernet network. The telephones operate from PoE (Power-over-Ethernet) or an external power source. VoIP telephones provide direct point-to-point communication between personnel throughout a facility over an existing LAN.
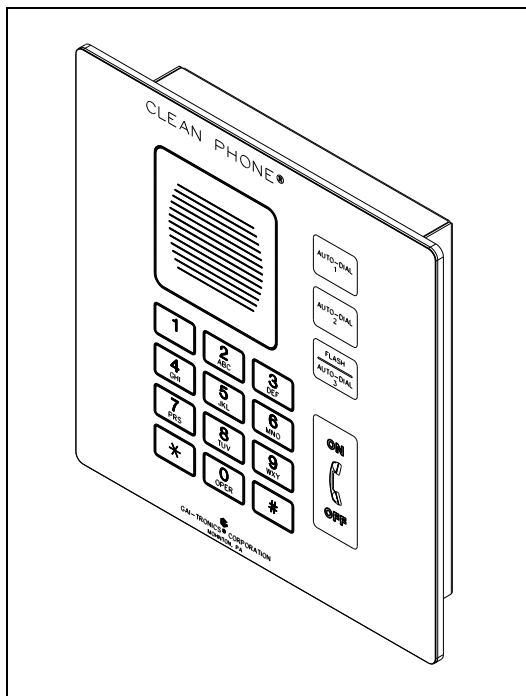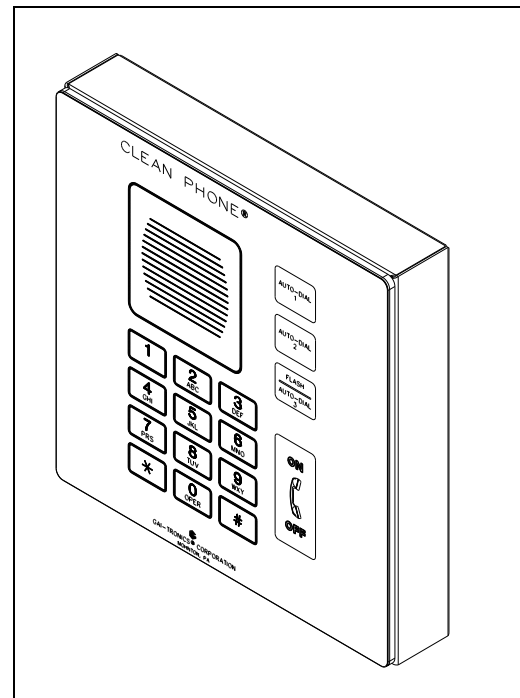

Figure 1. Model 295-712F

Figure 2. Model 295-712W

Models

This manual covers the following Clean Phone VoIP telephones:

Table 1. Model Chart

Model	Description
295-712W	**Surface-Mount VoIP Telephone** with stainless steel front panel and polyester overlay, three autodial buttons, hookswitch push button, off-hook indicator, keypad, and stainless-steel surface-mount enclosure.
295-712F	**Flush-Mount VoIP Telephone** with stainless steel front panel and polyester overlay, three autodial buttons, hookswitch push button, off-hook indicator, keypad, and stainless-steel mounting bracket.

System Requirements and Limitations

Clean Phone VoIP telephones require PoE (Power-over-Ethernet) or a local 24–48 V dc power source for operation. Connect two VoIP telephones in a peer-to-peer configuration without the need for a LAN. A 10/100/1000 BaseT Ethernet network with SIP (Session Initiation Protocol) server is required for systems containing three or more VoIP telephones. Conferences are limited by the customer's LAN media capabilities and the services available at each telephone.

Each telephone can also receive multicast broadcasts. Multicast enables sending a single audio stream to multiple end points simultaneously, achieving multi-point paging, or public address functionality over IP. Multicast requires the use of a SIP server that specifically supports multicast functionality. Configure (enabled) each telephone to receive multicast packets individually.

VoIP Subscriber Tips

New and existing subscriptions to an interconnected VoIP service provider should address the following points:

- Provide accurate physical address information to the VoIP service provider to ensure that emergency services can be dispatched to the location.

- Be familiar with the VoIP service provider's procedures for updating the address and promptly update address information in the event of a change.

- Have a clear understanding of any limitations of the local 911 service.

- Be aware that VoIP telephone services may not work if the power is out or the Internet connection is down. Consider installing a backup power supply, maintaining a traditional telephone line, or having a wireless telephone as a backup.

- For questions about interconnected VoIP and 911, or VoIP in general, see http://www.fcc.gov/cgb/consumerfacts/voip.html.

Features and Functions

The Clean Phone VoIP telephones include the following features:

- SIP compatible (RFC3261)

- automatic call diversion (memory list)

- real-time alarm reporting via SNMP, syslog, or TMA software

- configurable via web page, serial link, or download

- four auxiliary inputs

- two dry-contact outputs

- multicast capability, up to eight addresses

Operation

Autodial Calls

Press the desired autodial push button to place an immediate call to a preprogrammed number.

> The hookswitch indicator illuminates when the call connects.

Terminate the call by:

- pressing the ON/OFF push button

- hang up of the receiving telephone

- exceeding the call duration timeout

- SIP server disconnect

General Telephone Calls

To place a general telephone call:

1. Press the ON/OFF push button.

2. Wait for the dial tone.

3. Use the keypad to dial the desired number.

   The hookswitch indicator illuminates when the call connects.

4. Terminate the call by:

   - pressing the ON/OFF push button
   - hang up of the receiving telephone
   - exceeding the call duration timeout
   - SIP server disconnect

Figure 3. Front Panel

Receive a Call

Clean Phone VoIP telephones automatically go off-hook (auto-answer) when called.
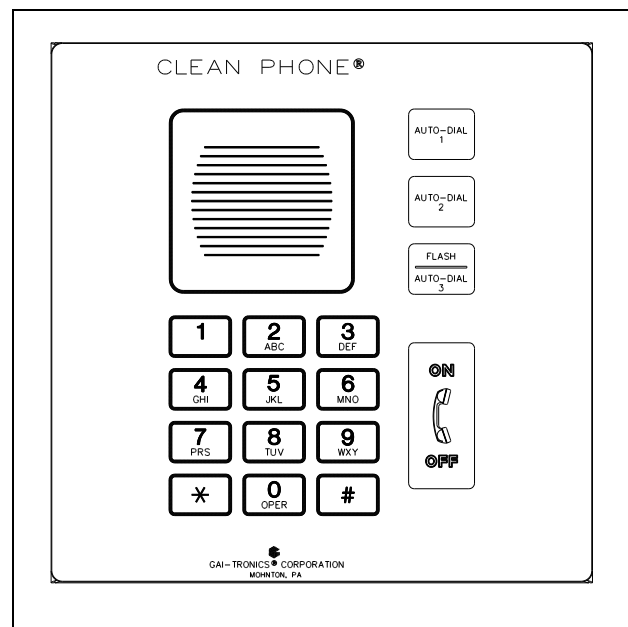
Multicast Broadcast Reception

The SIP server sends a page request to a specific multicast IP address and multiple telephones accept and play the subsequent audio stream to complete a multicast call. Program GAI-Tronics' VoIP telephones for up to eight multicast addresses to permit receipt of multicast broadcasts from separate sources or to enable zoning of broadcasts. Assign each multicast address a priority (via programming) to define audio source priority. A telephone with multicast enabled can still make and receive normal calls (peer-to-peer or SIP server). Assign a priority level for normal calls to define whether calls override multicasts or vice versa.

Monitoring and Reporting

Each telephone recognizes and generates several hardware and configuration fault condition alarms. Signal these alarms to a remote site using three methods:

- syslog output over TCP

- SNMP (Simple Network Management Protocol)

- TMA (Telephone Management Application) software (purchased separately)

Available alarms:

- handset integrity loop (if applicable)

- configuration error

- cold reset (power cycle)

- warm reset (internal command)

- keypad error (if applicable)

- key-hook (off hook status, if applicable)

- register fail (unsuccessful SIP registration)

- audio path test (speaker/microphone test)

Status Indication

Power

The ON LED, on the VoIP PCBA (see Figure 9 on Page 10), illuminates when power is applied to the telephone.

Heartbeat

The HB LED, on the VoIP PCBA (see Figure 9 on Page 10), flashes when communication over the LAN is established.

Link

The LNK LED, on the VoIP PCBA (see Figure 9 on Page 10), indicates an active network connection when illuminated.

Speed

The SP LED, on the VoIP PCBA, (see Figure 9 on Page 10), indicates a 100 Mbps network connection when illuminated or a10 Mbps connection when off.

VoIP Circuit PCBA Pushbuttons

Reset

Press the RESET button (see Figure 9 on Page 10) momentarily to warm reboot the telephone. The telephone maintains the current configuration.

Factory

Use the FACTORY button (see Figure 9 on Page 10), to erase the current configuration and restore the factory default settings as follows:

1. Press and release the RESET button.

2. Press and hold the FACTORY button for 10 seconds while the telephone is rebooting.

The telephone will reboot again with the factory default settings configured.

Installation

General Information

⚠WARNING⚠ —This product may contain hazardous voltages. Always remove power to this station and any associated equipment before beginning any installation.

⚠CAUTION⚠ —Do not install this equipment in areas other than those listed in the Approvals section of this manual. Such installation may cause a safety hazard and consequent injury or property damage.

Install equipment without modification and according to all applicable local and national electrical codes. Consult the NEC (National Electrical Code, NFPA 70), Canadian Standards Association (CSA 22.1), and local codes for specific requirements regarding your installation. Install Class 2 circuit wiring in accordance with the NEC.

Safety Guidelines

Adhere to the following guidelines to ensure the safety of all personnel when installing any GAI-Tronics equipment:

-   Do not install wiring during a lightning storm.

-   **Electrostatic Discharge (ESD) Protection:** The VoIP telephone may have an earth ground terminal provision. If so, connect it to ground in accordance with all local safety regulations and the NEC. Ensure grounding for safe and stable communications. Do not use long and coiled ground wires. Trim ground wires to the required length. Use a star configuration whenever possible. Please note that proper grounding does not eliminate the need for lightning protection for the telephone or the telephone system. GAI-Tronics recommends using a Category 5 data line lightning surge protector for telephones subject to any electrostatic discharge (e.g. lightning).

-   Do not install jacks in wet locations unless the jack is specifically for wet locations.

Station Placement

Consider station placement and volume levels to prevent feedback problems in the system. To reduce unpleasant feedback problems:

- point the telephone away from other nearby telephones

- reduce the volume levels

Avoid feedback problems by installing each Clean Phone VoIP telephone in a separate room and wall.

Model 295-712F

The mounting and wiring instructions are as follows:

1. Remove the front panel from the back bracket.

3. Mark the wall using the cut-out dimensions as a guide (see Figure 6).

4. Make the required cuts to create the opening for the back box.

5. *If using Power-over-Ethernet, with no optional inputs or outputs:*

    1. Place the bushing around the Ethernet cable approximately 5 inches from the end of the cable.
    2. Snap the bushing closed and insert it into the double **D** hole in the bottom of the back bracket. See Figure 4 and Figure 7).

6. *If using local power or optional inputs or outputs:* route the cables through the **D** hole in the bottom of the back bracket (see Figure 7).

7. Place the back bracket in the wall. Locate the mounting holes (see Figure 7).

Figure 4. Bushing

8. Drill holes in the lower right and upper left corners and secure the bracket with screws.

9. Drill the remaining holes and secure the bracket with the remaining screws.

10. Plug in the Ethernet cable and connect all other optional cables (see the Field Wiring section).

11. Perform the initial programming of the telephone (see the Programming section).

12. Take the front panel of the VoIP Clean Phone and align it with four slots in the back bracket.

13. Press the panel in firmly and then push downward to seat the panel in the slots.
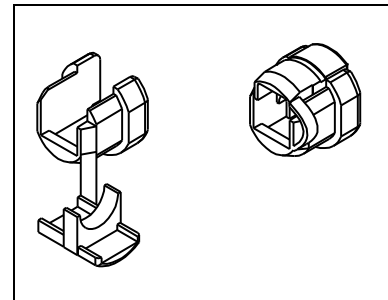
NOTE: The Model 295-712F allows for general wipe down cleaning and to prevent collection (internally and externally) of particulate matter. Attain additional protection against moisture by sealing the outer edge of the telephone panel to the mounting surface with silicone or RTV. Verify that the sealing substance used is compatible with cleaning solutions used.
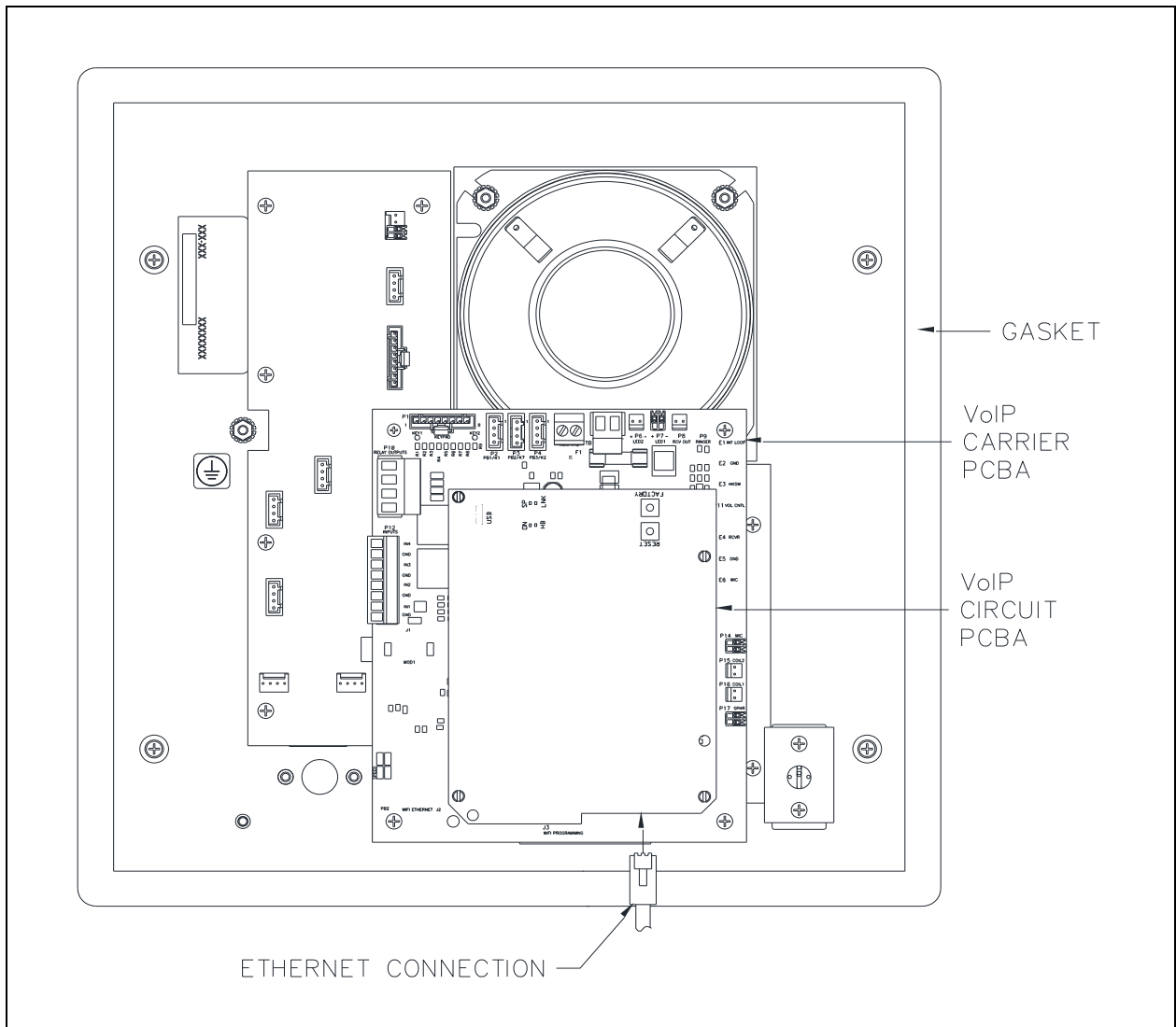
Figure 5. Inside Front Panel
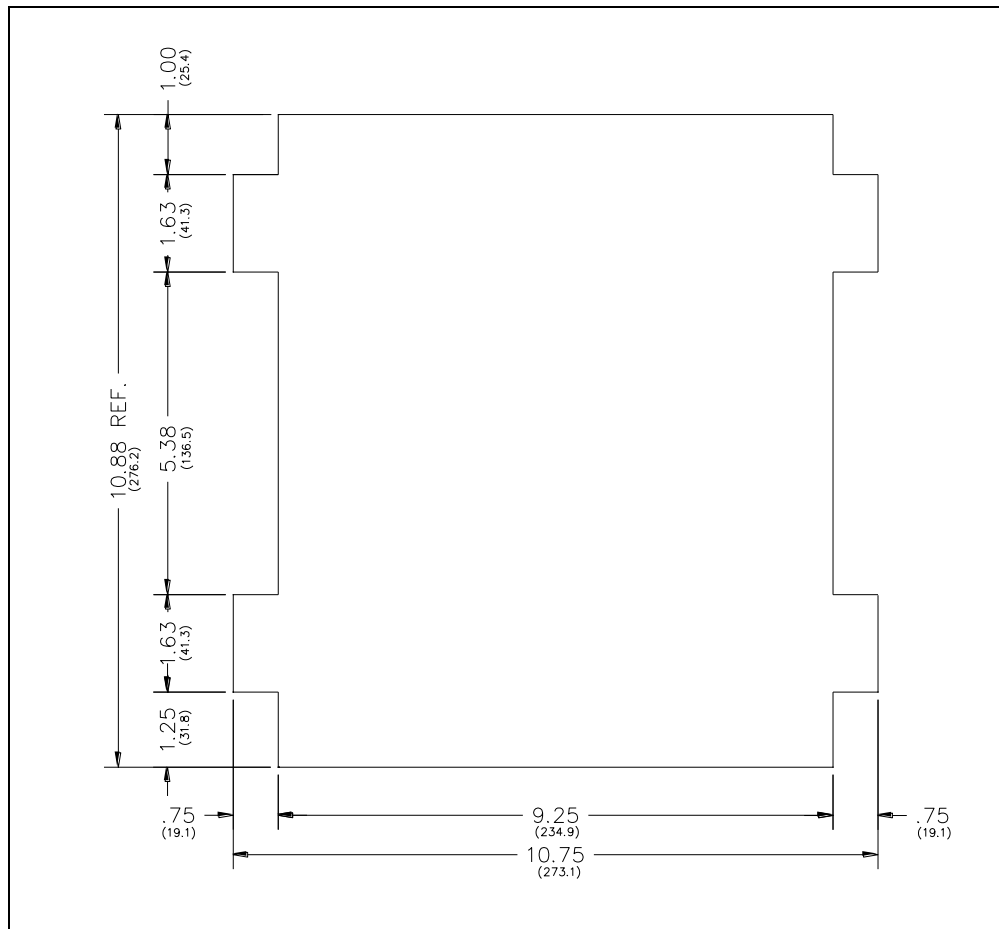
Figure 6. Wall Cut-out Dimensions for Model 295-712F
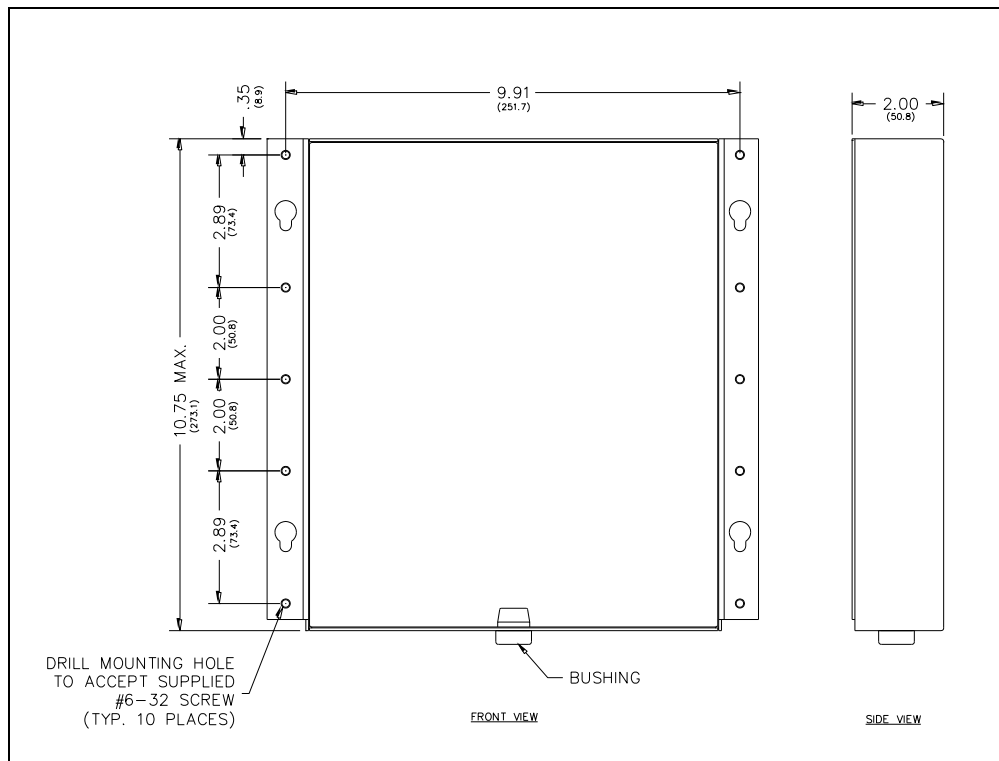
Figure 7. Back Box for Model 295-712F

Model 295-712W

The mounting and wiring instructions are as follows:

1. Remove the front panel from the back box.

2. *If using Power-over-Ethernet, with no optional inputs or outputs:* place the bushing around the Ethernet cable 5 inches from the end of the cable. Snap the bushing closed and insert it into the double **D** hole in the back box (see Figure 4 and Figure 8).

3. *If using local power or optional inputs or outputs:* route the cables through the **D** hole in the back of the back box (see Figure 4 and Figure 8).

4. Position the back-box so that it is level on the wall in the desired location.

5. Use the back box as a template to drill the lower right and upper left corners holes and secure the back box with screws.

6. Drill the remaining holes and completely secure the box with the remaining screws.

7. Plug in the Ethernet cable and connect all other optional cables (see the Field Wiring section).

8. Perform the initial programming of the telephone (see the Programming section).

9. Align the front panel of the Clean Phone with the four slots in the back box.

10. Press the panel in firmly and push it downward to seat it in the slots.

NOTE: The Model 295-712W VoIP Telephone allows for general wipe down cleaning to prevent collection (internally and externally) of particulate matter.
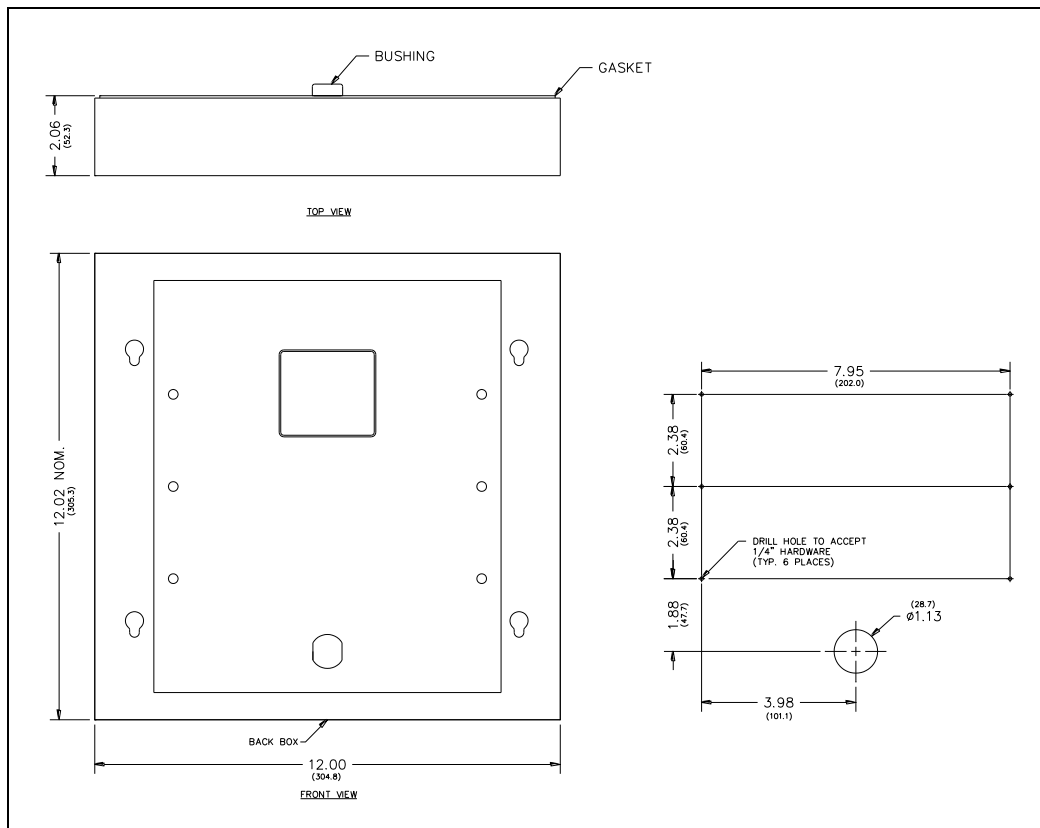
Figure 8. Mounting the Model 295-712W

Field Wiring

Pull the required field cables into the rear enclosure and complete the instructions in the following subsections to install each connections (see Table 2 for recommended conductor sizes and Figure 9 for wiring details).

NOTE: Consult the NEC (National Electrical Code, NFPA 70), Canadian Standards Association (CSA 22.1), and local codes for the specific requirements regarding your installation. Install all equipment without modification and according to local and national codes. Install Class 2 circuit wiring in accordance with the NEC.
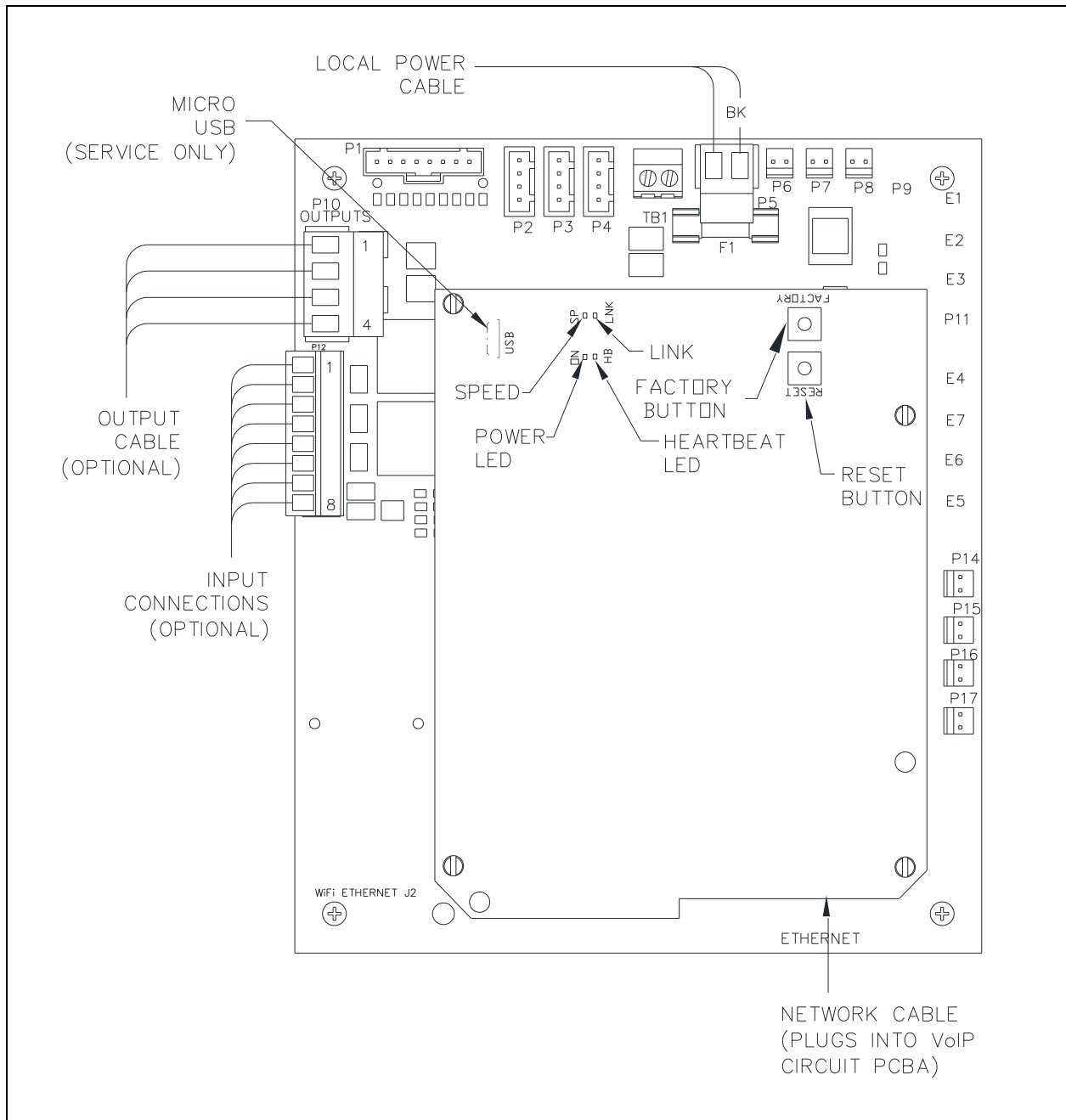
Figure 9. VoIP Telephone PCB Assembly

Recommended Cabling

Table 2. Recommended Cabling

Cable Use	Size and Type
LAN	Category 5 or better Ethernet cable with an RJ45 connector
Power	two-conductor, No. 22 AWG is typical
Inputs	two-conductor, No. 22 AWG is typical
Output contacts	two-conductor, No. 18 AWG is typical

Power

Ground

Required: Connect the enclosure to earth ground:

1. Install a #6 ring lug on the ground conductor.

2. Secure the ground conductor to the ground terminal, located on the rear of the front panel.

Power-Over-Ethernet

Connect power to the system as indicated in the PoE equipment manual.

Local Power

A separate, isolated, 24 to 48-volt dc power supply is required when PoE is not available (see Table 7 on Page 15 for the recommended optional plug-in power supply). Connect the local 24–48 V dc power source to removable terminal block, P5, located on the VoIP carrier PCBA (see Figure 9):

1. Install ferrules on the wire ends.

2. Connect the positive conductor to the (+) terminal of connector P5.

3. Connect the negative conductor to the (−) terminal of connector P5.

4. Install the removable terminal block onto pin header P5, on the VoIP carrier PCBA.

Table 3. Power—P5

Pin	Label	Description
1	(+)	Positive
2	(−)	Negative

Network

Connect a Category 5 or better Ethernet cable with an RJ45 connector from the LAN (Local Area Network) to the Ethernet jack, on the underside of the VoIP PCBA (see Figure 9).

Auxiliary I/O

Inputs

The telephones have four auxiliary inputs for customer use. Terminate the inputs to terminal block P12, on the VoIP carrier PCBA (see Figure 5 and Figure 9).

Table 4. Auxiliary Inputs—P12

Pin	Label	Function
1	IN4	Input 4
2	COM	Common
3	IN3	Input 3
4	COM	Common
5	IN2	Input 2
6	COM	Common
7	IN1	Input 1
8	COM	Common

Outputs

The telephones have two dry-contact outputs for customer use. Terminate the outputs to connector P10, on the VoIP carrier PCBA (see Figure 5 and Figure 9).

Table 5. Output Contacts—P10

Pin	Label	Description
1	C1	Common Output 1
2	NO1	Normally Open Output 1
3	C2	Common Output 2
4	NO2	Normally Open Output 2

USB port

The USB port is for GAI-Tronics service personnel only. Make no connection to this port.

Programming

The network configuration must provide VoIP service (using the SIP protocol) between the desired locations before attempting to configure a Clean Phone VoIP telephone.

The subsections below provide the general sequence to set up a Clean Phone VoIP telephone:

VoIP PCBA Setup

1. Connect a PC to the same network as the VoIP telephone.

2. Log into the unit's web interface.

   The unit is factory configured with a static IP address: ***192.168.1.2.***

3. Enter the username and password when prompted. The initial factory settings are:

   - USER NAME: *user*
   - PASSWORD: *password*

4. Change the username and password upon first login.

   This security measure helps prevent unauthorized changes to the VoIP telephone's interface configuration.

VoIP PCBA Initial Network Configuration

Configure each VoIP PCBA for operation on the network prior to installation. Assign a local ID, domain, proxy, and registrar.

1. Assign a host name.

   Host names provide identification of different VoIP PCBAs on the network.

2. Test the telephone to ensure successful completion of calls.

3. Maintain the telephone by monitoring alarms.

4. Set up auto-updates.

Refer to Pub. 42004-548 for basic programming instructions for these VoIP telephones.

Auxiliary I/O Configuration

Input Contacts

Each Clean Phone VoIP telephone includes four dry-contact inputs (see the Specifications section for the input ratings). Each input's mode is configurable. Configure inputs for one of the following modes:

- On

- Off

- On/Off

Configure the inputs to update a SYSLOG or generate an SNMP trap when active (see Figure 9 on Page 10). Refer to the Logic Settings section of GTC Pub. 42004-548 for programming instructions for these inputs (see the Reference Documentation section).

Output Contacts

Each Clean Phone VoIP telephone contains two voltage-free output contacts (see Figure 9 on Page 10). Both outputs are SPST (single-pole, single-throw) contacts (see the Specifications section for the output ratings). The mode of each output is configurable. Configure outputs for one of the following modes:

- On
- Off
- Ring

- Connect
- Hook
- In Use

- Ring Out
- Registered
- Emergency

The duration of activation, or on/off times, is configurable in some modes. Refer to the Logic Settings section of GTC Pub. 42004-548, for programming instructions for the outputs (see the Reference Documentation section).

Maintenance

⚠**WARNING** ⚠ —This product may contain hazardous voltages. Always remove power to the station prior to servicing.

Corrective Actions

1. Inspect and replace frayed or cracked wiring.

2. Secure/replace loose wires and terminal lugs.

3. Remove corrosion from terminals.

4. Inspect fuse F1 on the VoIP Carrier PCBA.

USB port

The USB port is for GAI-Tronics service personnel only. Make no connection to this port.

Service

Contact a regional service center for an RA# (return authorization number) if the Clean Phone VoIP telephone requires service. Ship equipment prepaid to GAI-Tronics with an RA# and a purchase order number. Repairs or a replacement are made in accordance with GAI-Tronics' warranty policy if the equipment is under warranty. 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 with locating the nearest regional service center.

Troubleshooting

Table 6. Troubleshooting Chart

Problem	Possible Solution
low volume	Increase the volume level in the telephone's programming configuration.
high volume	Decrease the volume level in the telephone's programming configuration.
front panel push buttons not operational	• Verify proper configuration of the push buttons. • Verify the unit has power applied.
inputs not operational	• Check the input connections. • Verify proper configuration of the inputs.
outputs not operational	• Check the output connections. • Verify proper configuration of the outputs.
cannot make or receive calls	• Check the LAN cable connection. • Verify the unit has power applied. • Verify proper configuration of the LAN parameters. • Verify the telephone has been set up on the network.
no power indication	• Check the power connections. • If using PoE, check the operation of the PoE equipment.

Replacement Parts and Accessories

Table 7. Replacement Parts and Accessories

Part No.	Description
12565-712	Carrier/VoIP PCBA Replacement Kit
12585-001	Speaker Assembly Replacement Kit
40419-011	Optional Plug-in Power Supply, 120/240 V ac input, 24 V dc output
235-001	Maintenance Cover
12575-008	Replacement Front Panel Kit (no PCBA)
12575-009	Replacement Front Panel Assembly (with electronics)

Reference Documentation

VoIP Telephone Basic Configuration Guide 42004-548

VoIP Telephones—Configuration Guide 502-20-0171-001

Specifications

Power

Network power..Power-over-Ethernet, 802.3af compliant (via RJ45)

Local power requirements..24–48 V dc, 6 W

Networking

Network ....10/100 BaseT Ethernet RJ45, Cat5 or Cat5e UTP

static IP provisioning or DHCP STUN client (NAT traversal)

Call control signaling.. SIP (RFC3261 compliant) loose routing

Configuration .... embedded web server

configuration file download

direct serial connection

password protection

Inputs

Keypad..3×4 matrix

Push buttons.. three autodial and an off-hook indicator/switch

Configurable inputs (quantity = 4)..internal pull-up 3.3 V dc tolerant

Outputs

Output 1 ....8 A @ 30 V ac/dc (resistive load)

Output 2 ....8 A @ 30 V ac/dc (resistive load)

Indicators

External..off-hook indicator light

Internal on VoIP PCBA .... power, heartbeat, link, and speed LEDs

Audio output ....85 dB SPL or greater @ 1.0 m (@ 1 kHz)

Mechanical

Temperature range:

     Operating ....−4 °F to +131 °F (−20 °C to +55 °C)

     Storage ....−40 °F to 158 °F (−40 °C to +70 °C)

Relative humidity.. up to 95%, non-condensing

PCBA (printed circuit board assembly) .... conformal coated

Model 295-712F Clean Phone

Construction:

     Front panel ....8 mil polyester over 16-gauge stainless steel

     Mounting bracket...16-gauge stainless steel

Dimensions

     Front panel .... 12.00 H × 12.00 W in; (304.8 × 304.8 mm)

     Mounting bracket................................10.88 H × 10.75 W × 1.75 D in; (276.2 × 273.1 × 44.3 mm)

Model 295-712W Clean Phone

Construction

     Front panel ....8 mil polyester over 16-gauge stainless steel

     Back enclosure ....16-gauge stainless steel

Dimensions

Front panel .... 12.00 H × 12.00 W in (304.8 × 304.8 mm)

Back enclosure .... 12.00 H × 12.00 W × 2.06 D in (304.8 × 304.8 × 52.3 mm)

Shipping weight & dimensions .... 12.15 lb, 17.00 H × 17.00 W × 11.00 D in

Chemical Resistance

The Clean Phone graphic overlay is designed to withstand exposure to many chemicals. Please visit GAI-Tronics' website at www.gai-tronics.com for a complete listing of compatible cleansers:

Ajax/Vim in solution	Downey/Lenor[1]	Petroleum spirit[1]
Alkalicarbonate solution[1]	Ethanol	Phosphoric acid (<30%)
Ammonia (<40%)	Glycerin	Potassium ferricyanide
Acetic Acid (50%)	Glycol	Potassium hydroxide (<30%)
Ariel powder in solution[1]	Gumption[1]	Pure turpentine
Bleach[1]	Hydrochloric acid (<36.7%)	SBP 60/95[1]
Castor oil	Hydrogen Peroxide (25% solution)	Sulfuric acid (<10%)
Caustic soda (<40%)	Linseed Oil	Tomato Ketchup
Cutting oil	Methanol	Trichloroacetic acid (<50%)
Cylohexanol	Nitric Acid (<10%)	White spirit
Diacetone alcohol	Paraffin oil	Windex[1]
Diesel	Persil powder in solution[1]	Wisk

[1]Extremely faint glossing of the texture was noted.

The Clean Phone graphic overlay is NOT resistant to the following:

Concentrated mineral acids	High pressure steam at over 100º C	Methylene chloride
Concentrated caustic solution	Benzyl alcohol	UV exposure
Dimethylformamide	Tetrahydrofuran	

Approvals

Safety of Information Technology Equipment .... UL/CSA 60950

Compliance to Standard .... FCC CFR 47 Part 15

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Depending upon the wiring and features used on this device, additional precautions may be necessary not to cause harmful interference. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.