**EQUIPMENT SPECIFICATION**

**GAI-TRONICS**

**CLEAN ROOM**

**COMMUNICATION PRODUCTS**

**(ANALOG AND VoIP)**

**EQUIPMENT SPECIFICATION**

**GAI-TRONICS CLEAN ROOM COMMUNICATION PRODUCTS**

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**Equipment Locator**

**Model Number Section**

**295-001F, 295-001W 10.0.0**

**295-712F, 295-712W 11.0.0**

**12509-042, 12509-043, 12.1.0**

**12509-044**

**13360, 13361 12.2.0**

* 1. **Scope and Intent**

This specification identifies and details GAI-TRONICS’ Clean Room Communication products, accessories, and peripherals to provide two-way communications in a sterile/clean room environment. Each clean room product shall be designed to withstand chemical wipe-down to maintain particle-free status. Each analog Clean Room telephone shall provide two-way communications via connection to any conventional, analog telephone network. Each Clean Room VoIP Telephone shall be considered an “end device”, designed for installation into an existing SIP compatible VoIP system and shall offer the same two-way communication performance

Note: All IP servers, hubs, power supplies, and other active VoIP system/network devices shall be the responsibility of others.

**2.0.0 Seller Warranties**

* 1. The Seller warrants the satisfactory and successful operation of all equipment furnished under this specification at the ratings, under the conditions, and for the type of service specified herein.
  2. Goods manufactured by the seller are warranted to be free from defects in material and workmanship until one year after the date of shipment. Equipment supplied by but not manufactured by the seller shall be subject to the original equipment manufacturer’s standard warranty.
  3. **Workmanship**

All work shall be performed in accordance with the best modern practice in design, manufacture, and fabrication of all material and apparatus by this specification, notwithstanding any omission from the specifications or drawings.

**4.0.0 Material and Construction**

All materials used in the construction of the apparatus shall be new and selected as the best available for the intended purpose, considering long life and best engineering practices. Factors of safety shall be used throughout the design. Only heavy-duty industrial components rated to operate within the temperature ranges and other environmental conditions specified in Paragraph 7 shall be used.

All Clean Room Communication Devices shall include a front panel graphic overlay designed for use in clean room, clinical, or sanitary environments. The overlay shall minimally withstand exposure to the following chemicals:

**Ajax/Vim in solution Downey/Lenor1 Petroleum spirit1**

**Alkalicarbonate solution1 Ethanol Phosphoric acid (<30%)**

**Ammonia (<40%) Glycerin Potassium ferricyanide**

**Acetic Acid (50%) Glycol Potassium hydroxide (<30%)**

**Ariel powder in solution1 Gumption1 Pure turpentine**

**Bleach1 Hydrochloric acid (<36.7%) SBP 60/951**

**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**

**Diesel Persil powder in solution Wisk**

* 1. **Installation**

5.1.0 Analog Clean Room Telephones

The specified analog telephone products shall be line powered and designed for connection to the following networks via standard telephone or Cat5/6 wire pairs:

* Central Office (C.O.) line to the Public Switched Telephone Network (PSTN)
* 24 V dc or 48 V dc analog station port of a Private Branch Exchange (PBX), Private Automatic

Branch Exchange (PABX), or Key Service Unit (KSU).

A dedicated telephone line shall be required for each smart telephone. Models requiring vandal-resistant hardware shall be noted. Telephones shall be suitable for installation in temperatures between -40° C and +60° C.

* 1. VoIP Clean Room Telephones

The specified VoIP telephone products shall be design for installation on an existing ethernet network and shall provide an RJ45 connection to that network. These telephones are intended to be connected to a SIP-compatible PBX or server for internal (within the network) and external (outside the network) dialing. Equipment and wiring shall be installed by the Purchaser. Telephones shall be suitable for installation in temperatures between -20° C and +60° C.

The specified VoIP telephone products shall provide dial-up (autodial or manual), two-way communications over 10/100 BaseT Ethernet (RJ45) network. The system shall provide Call Control/Set-up Signaling via Signal Initiated Protocol (SIP), RFC3261.

If required, seller shall provide technical guidance during installation and/or testing, via telephone, at no additional charge. After installation is completed, the Seller shall be prepared to perform a checkout of the system. If required by the buyer, a seller-provided factory technician shall visit the job site to assist with system layout and design (pre-sale) or to make necessary adjustments and instruct the operating and maintenance personnel on the proper use and care of the system (post-sale). Charges for these on-site services shall be on a per diem basis (including travel time), plus all expenses on a cost-plus basis.

* 1. **Operation and Maintenance Instructions**

All equipment requiring continued interaction, service, or support shall be provided with complete operation (user) and maintenance (service) manuals. All available documentation shall be packaged with the equipment and/or readily accessible via the manufacturer’s website.

* 1. **Environmental Conditions**

Equipment shall be suitable for use in indoor, dry environments.

* 1. **Equipment Operation**
  2. Clean Room Analog Telephone

The Clean Room Analog Telephone shall include two, programmable auto-dial pushbuttons to store frequently dialed telephone numbers. The telephone shall also include a “flash” button to enable the flash features of the connected PBX in the telephone system.

Clean Room Analog Telephones shall include:

* Completely smooth, chemical-resistant front panel
* Oversized buttons with clearly marked functions
* Auto-answer feature
* 12-button keypad with On/Off, illuminated switch
* Two (2) Autodial pushbuttons
* Flash pushbutton
* Integral speaker and microphone
* Automatic rollover on autodial calls
* Two (2) volt-free outputs for peripheral device control
* Reporting/monitoring capable as specified in section 8.3.0.

Placing a autodial call shall require:

1. Press the desired autodial pushbutton and place an immediate call to a preprogrammed number. An off-hook indicator shall illuminate when the call is connected.
2. The call shall be terminated by:

* Pressing an on/off pushbutton.
* Hanging up the called number.
* Exceeding a preprogrammed call duration timeout.

Placing a general telephone call shall require:

1. Pressing an on/off pushbutton.
2. Waiting for dial tone.
3. Using the keypad to dial the desired number. An off-hook indicator light shall illuminate when the call is connected.
4. The call shall be terminated by:

* Pressing an on/off pushbutton.
* Hanging up the called number.
* Exceeding a preprogrammed call duration timeout.

The Clean Room Analog Telephone shall be factory programmed to automatically answer an incoming call but shall be capable of being programmed for manual answer, if desired.

Clean Room Analog Telephones shall be capable of providing two (2) separate, isolated, solid-state switch outputs, each rated at 125 mA @ 48 V dc. Each output shall be capable of being programmed for activation (closure) during the following conditions:

* Call received (confirmed call connection)
* Call placed (activates at start of call, deactivates when confirmed call connection occurs)
* Answer Voice Call (becomes active at the start of a voice call received by the telephone)
* Track Ringing (active while telephone is generating a simulated ring-back tone)
* Non-Keypad Voice Call (active at the start of a voice call not dialed using the keypad)
* Keypad Voice Call (active at the start of a voice call dialed using the keypad)
* Any Call (active at the start of any call, inbound or outbound)
* Open Gate Contact (pulses active when telephone receives proper command

Clean Room Analog Telephones shall be capable of communicating with a central PC that hosts dedicated software designed for monitoring operation. Data shall be reported or made available via polling or call-in protocol. Said software shall be designed and provided by the emergency and assistance telephone manufacturer and shall comply with section 12.1.0 of this specification.

* 1. Clean Room VoIP Telephone

The Clean Room VoIP Telephone shall provide two-way communications in clean room/sterile environments. It shall provide handsfree operation after the incoming or outgoing call has been connected and shall offer an auto-answer feature. The telephone shall be offered in flush mounting or surface-mounting models. The panel and rear box material shall be stainless-steel. The panel shall be covered with a graphic overlay material that is resistant to wipe-down with chemicals typically found in a clean room environment for a particulate-free design.

Clean Room VoIP Telephones shall include:

* Completely smooth, chemical-resistant front panel
* Oversized buttons with clearly marked functions
* Auto-answer feature
* 12-button keypad with On/Off, illuminated switch
* Three (3) Autodial pushbuttons
* Integral speaker and microphone
* Multi-cast (up to 8 addresses) or peer-to-peer capable
* Automatic rollover on autodial calls
* Two (2), programmable volt-free outputs for peripheral device control
* Reporting/monitoring capable via dedicated software, SNMP, or Syslog

All Clean Room VoIP Telephones shall provide DTMF, ring, and dial comfort tones. Each telephone shall include the following network features:

* SIP compatible (RFC3261)
* Real-time alarm reporting via SNMP, syslog, or dedicated monitoring software
* Power-over-Ethernet (PoE) compatible
* Configurable via web page, serial link, or download
* Two, programmable volt-free contact outputs (rated at min. 5A @ 250V ac / 30 V dc)
* Direct peer-to-peer dialing (point-to-point)

Placing an autodial call shall require:

1. Press the desired autodial pushbutton and place an immediate call to a preprogrammed number. An off-hook indicator shall illuminate when the call is connected.
2. The call shall be terminated by:

* Pressing an on/off pushbutton.
* Hanging up the called number.
* Exceeding a preprogrammed call duration timeout.

Placing a general telephone call shall require:

1. Pressing an on/off pushbutton.
2. Waiting for dial tone.
3. Using the keypad to dial the desired number. An off-hook indicator light shall illuminate when the call is connected.
4. The call shall be terminated by:

* Pressing an on/off pushbutton.
* Hanging up the called number.
* Exceeding a preprogrammed call duration timeout.

The Clean Room VoIP Telephone shall be factory programmed to automatically answer an incoming call but shall be capable of being programmed for manual answer, if desired.

Clean Room VoIP Telephones shall provide dial-up (autodial or manual), two-way communications over 10/100 BaseT Ethernet (RJ45) network. The system shall provide Call Control/Set-up Signaling via Signal Initiated Protocol (SIP), RFC3261.

All specified VoIP Telephones shall meet the following technical requirements:

**Codes and Audio:** G.711 A-Law G.711 µ-Law G.722 G.729 G.723.1 MP-MLQ G.723.1 ACELP; Codec preference sequence, DTMF in band/out of band (RFC2883), configurable comfort tones (nation specific)

**Call Set-up Protocol:** Session Initiation Protocol (SIP), RFC3261 compliant

**WiFi Network (when required):** IEEE 802.11 a/b/g/n; Static IP provisioning or DGCP STUN client

**Security:** Password protected

**Reliability:** MTBF of greater than 50,000 hours, using MIL-HDBK-217F Notice 2

**Quality of Service:** Priority of IP Packets according to TOS and DiffServ VLAN Priority according to IEEE8021.p/802.1q.

**Configuration/IP Address:** Via configuration file or on-board password protected web page server; Static IP address or Dynamic Host Configuration Protocol (DHCP)

**Monitoring:** Automatic fault reporting via SNMP or Syslog messaging; Real-time over TCP/IP proprietary Syslog Application; Scheduled reporting via system polling by central PC software

**Update Server:** Configuration and Firmware update via TFTP

**Redundancy:** Supports up to 4 SIP proxys

**Time/Date:**  Simple Network time protocol with time zone and daylight saving; date format – European / U.S.

All Clean Room VoIP Telephones shall be capable of reporting connection and equipment faults via SNMP, the Syslog, or by being monitored from a central PC that hosts dedicated software designed for monitoring operation via polling or call-in protocol. Said software shall be designed and provided by the emergency and assistance telephone manufacturer and shall comply with section 12.1.0 of this specification.

* 1. **Field Wiring/Interconnection**

Power shall be provided to each VoIP telephone device via 24V min., 53V max. dc or IEEE Compliant Power-Over-Ethernet (PoE), over spare pairs only. Telephones shall draw a maximum of 12W.

VoIP network cable shall comply with Cat5 or Cat5e UTP Static IP provisioning or DHCP STUN client standards and connect to each VoIP Telephone via RJ45 connector.

All local analog audio and power wiring shall conform to the specific equipment’s installation instructions and local and national codes.

**10.0.0 Clean Room Analog Telephone**

10.0.1 Description

The Clean Room Analog Telephone shall be designed for use in an indoor environment and shall comply with Sections 1.0.0 (Scope and Intent), 5.1.0 (Installation) and 8.1.0 (Equipment Operation) of this specification. The telephone shall be offered in flush-mounting or surface-mounting configurations. Mounting hardware shall be designed to create a surface seal that prevents particle ingress.

10.0.2 Performance Specifications

The Clean Room Analog Telephone shall meet the following performance and physical specifications:

**Electrical**

Frequency Response . . . . . . . . . . . . . . . . . . . . . . . . . . . …….. . . . . . . . . . . . . . . . . . . . . . . . . 300-3,000 Hz

Battery Voltage (tip and ring) . . .. ……. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . . 24 V dc or 48 V dc

Inter-digit Pause. . . . . . . . . . .. . . . . . . . . .. ……. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . . . 100 ms

Audio Output . . . . . . . . . . . . . . . . . . . . . . . . .1 kHz ton - 87± 3 dB SPL @ 1 meter with 40 mA loop current

Minimum Loop Current . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 24 mA (35 mA recommended

Phone Line Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ..Loop start, central office (CO), or Analog

station port (PBX, PABX, or KSU)

Signaling Tone (DTMF) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 100 ms tone duration

Supervisory dc Current . . . . . . . . . .. . . . . . . . . . . . .. . . . .. . . .. . . Minimum 20 mA dc; maximum 60 mA dc

Supervisory dc Voltage . . . . . . . . . . . . . . . . . . .. . . . . . . . . . . . . . . . . . . ..24-60 V dc (not polarity sensitive)

Network Interface . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . .. Loop start

Auxiliary Output (isolated solid-state switch. . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . .. ..48 V dc @ 125 mA

28 VRMS ac @ 80 mA RMS

Receiver Volume Gain. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ………….. +18 dB in 3dB increments

Memory . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. Non-volatile EEPROM

**Mechanical**

Mounting . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . …..Flush or Surface

Cable Entry. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Rear back-box or mtg. bracket

Construction

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

Back Enclosure or Mtg. Bracket . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 16-gauge stainless-steel

Dimensions

Front Panel . . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . 12.00 W x 12.00 H inches (305 x 305 mm)

Mtg. Bracket (flush-mount) . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10.7 W x 10.8 H x 1.8 D inches

(273 W x 276 H x 44 D mm)

Back Enclosure (surface-mount) . . . . . . . . . . . . . . . .. . . . . . . . . . . . . . . . 12.0 W x 12.0 H x 3.5 D inches

(305 W x 305 H x 52 D mm)

Cutout for mounting back box . . . . . . . . . . . . . . . . . . .. . . . . 10.13 H x 7.63 W inches (257.3 x 193.8 mm)

Weight . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. … . . . . . . . . . . . . . . . . . …………10.0 lbs.

**Environmental**

Operating Temperature. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . -4º F to + 140º F (-20º C to +60º C)

Relative Humidity . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . .. . . . . . . . . . Up to 95% non-condensing

PCBA (Printed Circuit Board Assembly) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Conformal Coated

**Approval Standards**

Compliance to Standards . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . . . . . . . . . . . . . . FCC CRF 47 Part 15

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

**FCC Information**

FCC Registration Number. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ..US:ADGTE10A-GTC2010

Ringer Equivalence Number (REN). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .5B

Network Connection (USOC). . . . . . . . . . . . . . . . . . .. . . .. . . . . . . . . . . . . . . . .. . . . . . . . . . . . . .. . . RJ11

Meets hearing aid compatibility magnetic field intensity and volume control technical standards per FCC Sections 68316 and 38.317.

**IC Information (Canada)**

IC Certification Number. . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . . . . . . . . . . . . . . . . . …IC: 922B-GTC2010

Ringer Equivalence Number (REN). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .5B

Connecting Method. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . . . . . . . . .. . . . . . . . . . . . . .. CA11A

10.0.3 Peripheral Equipment and Accessories

The following peripheral equipment, accessories, and sub-components shall be offered in support of the Clean Room Analog Telephone:

**Telephone Management Application Software,**  as referenced in section 12.1.0.

10.0.4 Equipment Manufacturer and Model Numbers

The Clean Room VoIP Telephone shall be GAI-TRONICS Model Numbers:

* **295-001F** Flush-mount Clean Phone® Telephone
* **295-001W** Surface-mount Clean Phone® Telephone

Peripherals and accessories shall be GAI-TRONICS model number, specified as:

* **12509-042** Telephone Management Application (TMA) Software Package

**11.0.0 Clean Room VoIP Telephone**

11.0.1 Description

The Clean Room Analog Telephone shall be designed for use in an indoor environment and shall comply with Sections 1.0.0 (Scope and Intent), 5.2.0 (Installation) and 8.2.0 (Equipment Operation) of this specification. The telephone shall be offered in flush-mounting or surface-mounting configurations. Mounting hardware shall be designed to create a surface seal that prevents particle ingress.

11.0.2 Performance Specifications

The Clean Room VoIP Telephone shall meet the following performance and physical specifications:

**Electrical**

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

Local Power Requirements (if used) . . . .. . . . . . . . . .. ……. . . . . . .24-48 V dc (a separate, isolated power supply must be provided for each telephone)

Power Consumption. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . … . . . . . . 6 watts, max.

Microphone. . . . . . . . . . . . . . . . . .. . . . . . …………. . . . . . . . . …. . . . . . . . . … . . . . . . . . . . . . …... .Electret

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

UTP Static IP provisioning or DHCP STUN client

Call Control Signaling . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . … SIP (RFC3261 compliant)

Configuration . . . . . . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .Embedded web server;

Configuration file download

Direct serial connection; Password protection

Codecs and audio . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ……. G.711 A-Law, G.711 μ-Law, G.722, G.729,

G.723.1 MP-MLQ, G.723.1 ACELP

Call Diversion . . . . . . . . . . . . . . . . . . . . . . . . . . . . .Configurable call list Numbers or URIs (max 20 entries)

with comfort tones, diverts to next in list if the call fails

**Inputs**

Keypad. . . . . . . . . . . . . . . . . . . . .. . . . . . …………. . . . . . . . . …. . . . . . . . . … . . . . . . …………3 x 4 matrix

Call Push Buttons. . . . . . . . . . . . . . . . . . . . .. . . . . . …………. . . . . . . . . …. . . . . . . . . … . . . . . Autodial (3)

Activation Pushbuttons . . . . . . . . . . . . . . . . . . .. . . . . . …………. . . . . . . . . …. . . . . . . . . … . …….ON/OFF

**Outputs**

Output control (2) contact rating.. . . . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . 5 A @ 30 V ac/dc (resistive load)

Speaker out (max.). . . . . . . . . . . . . . . . . . . . .. . . . . . …………. . . . . . . . …5 dBS SPL @ 1 meter (@ 1kHz)

Ambient Noise Level Limit. . . . . . . . . . . . . . . . . . . . .. . . . . . …………. . . . . . . . . …. . . . . . . . . … …75 dBA

**Indicators**

External . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .Off-hook indicator light

Internal on VoIP PCBA . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Power, Heartbeat & EACT L.E.D.s

**Mechanical**

Mounting . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . …..Flush or Surface

Cable Entry. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Rear back-box or mtg. bracket

Electrical Connections . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . RJ45 and Terminal block

Construction

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

Back Enclosure or Mtg. Bracket . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 16-gauge stainless-steel

Dimensions

Front Panel . . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . 12.00 W x 12.00 H inches (305 x 305 mm)

Mtg. Bracket (flush-mount) . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10.7 W x 10.8 H x 1.8 D inches

(273 W x 276 H x 44 D mm)

Back Enclosure (surface-mount) . . . . . . . . . . . . . . . .. . . . . . . . . . . . . . . . 12.0 W x 12.0 H x 3.5 D inches

(305 W x 305 H x 52 D mm)

Cutout for mounting back box . . . . . . . . . . . . . . . . . . .. . . . . 10.13 H x 7.63 W inches (257.3 x 193.8 mm)

Weight . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. … . . . . . . . . . . . . . . . . . …………10.0 lbs.

**Environmental**

Temperature Range

Operating . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ... . . . . . . . . . . -4º F to + 140º F (-20º C to +60º C)

Storage . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . . .. . . . . .-40ºF to + 158ºF ( -40º C to +70º C)

Relative Humidity . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . .. . . . . . . . . . Up to 95% non-condensing

PCBA (Printed Circuit Board Assembly) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Conformal Coated

**Approval Standards**

Compliance to Standards . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . FCC CRF 47 Part 15

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11.0.3 Peripheral Equipment and Accessories

The following peripheral equipment, accessories, and sub-components shall be offered in support of the Clean Room VoIP Telephone:

**Telephone Management Application Software,**  as referenced in section 12.1.0.

11.0.4 Equipment Manufacturer and Model Numbers

The Clean Room VoIP Telephone shall be GAI-TRONICS Model Numbers:

* **295-702F** Flush-mount Clean Phone® Telephone
* **295-702W** Surface-mount Clean Phone® Telephone

Peripherals and accessories shall be GAI-TRONICS model numbers, specified as:

* **12509-044** Telephone Management Application (TMA) Package for VoIP Telephones

**12.0.0 Peripheral Equipment**

12.1.0 Telephone Management Application (TMA) Package

12.1.1 Description

The Telephone Management Application (TMA) package shall be designed as a maintenance data collection and reporting tool to allow users to view and report the health of the Telephones in the system. TMA shall be a Windows 10® based software application and shall be intended for use on a dedicated PC. TMA shall be designed to monitor individual Telephones in the system, each on a dedicated analog line or on a common Ethernet network.

The TMA shall be designed to poll each Clean Room Telephone in the system to determine health status and activity. The TMA shall route all analog telephone polling activity through a transceiver designed and manufactured by the TMA software designer. Each transceiver shall poll one telephone at a time, but TMA shall be capable of supporting eight analog (8) line inputs, allowing eight different telephones to be polled simultaneously. A TMA transceiver shall be required for each connected analog line.

The TMA shall be also be capable of polling VoIP telephones via software embedded in the required security key, with no additional cabling requirement.

When polled, each Clean Room Analog Telephone shall report the following to the TMA:

* **Line integrity**
* **Microprocessor health**
* **Stuck buttons**
* **Microphone/speaker circuit integrity**
* **Line interrupt** (power failure)

When polled, each Clean Room VoIP Telephone shall report the following to the TMA:

* **Configuration Error** –Signal that the configuration file currently used by the unit has one entry errors which have been ignored.
* **Cold Reset** – Signal the unit has been reset due to a power cycle (failure)
* **Warm Reset** – Signal the unit has reset due to an internal software command or error
* **Keypad Error** – Signal that a key has remained pressed for the entire usage period
* **Register Fail** – Signal a failure to register with the Proxy server for a period in excess of the usage period
* **Audio Path Test** - Signal a failure in the microphone/speaker operation

The TMA shall be flexible in its provisions for adding, changing, and deleting Telephones within the system. It shall provide a variety of reports minimally in the form of call activity, exception reports (faults), and complete status reports. TMA shall provide an auto-discovery feature to detect and record new Emergency Telephones added to the system. It shall also allow manual entry of newly added Emergency Telephones. All TMA entries shall be done only by authorized personnel, controlled by a system security key.

Each Clean Room Analog Telephone shall take approximately 90 seconds to poll and gather data. Each Clean Room VoIP Telephone shall take approximately 20 seconds to poll. In lieu of polling, Telephones shall be capable of being programmed to “call in” to the TMA. This method shall be expected to require multiple system dial-in numbers if more than one Telephone is required to call-in at a time.

12.1.2 Interconnection

The analog TMA transceiver shall connect to the host PC via USB connector and to the telephone line via 4-pin modular connector (RJ11). A VoIP only TMA shall require only a USB security key for network connection.

12.1.3 Material Provided

The analog TMA package shall include the following material:

* (1) Transceiver Unit
* Software CD-ROM
* Security Key
* Telephone Cable (4-conductor) for connection to PBX line
* USB Cable for connecting host PC to Transceiver Unit

The VoIP TMA package shall include only a USB security key (memory stick) with the operating software.

12.1.4 System Requirements

The customer-provided, TMA host PC shall meet the minimum operating requirements:

* Intel® Pentium™ or AMD® 32-bit or 64-bit Processor
* Windows®  10 operating system
* RAM, hard disk space, and processor speed is dependent on the operating system's

recommended requirements

* CD-ROM Drive
* One USB port for the security key
* One USB port per TMA DTMF Transceiver
* One printer port

12.1.5 Peripheral Equipment and Accessories

The following peripheral equipment, options, and accessories shall be offered in support of the Telephone Management Application and the Clean Room Telephones.

**TMA Expansion Kit** shall provide a transceiver and interconnecting cables for connection to the telephone system and host PC for the purpose of providing the capability to poll via an additional analog line.

12.1.6 Equipment Manufacturer and Model Numbers

The Telephone/VoIP Management Application package shall be GAI-Tronics Model **12509-042**. The TMA Expansion Kit shall be GAI-Tronics Model **12509-043**. A VoIP only TMA kit shall be GAI-Tronics Model **12509-044**.

12.2.0 Clean Room Speaker

12.2.1 Description

The Clean Room Speaker shall be designed to provide outstanding voice reproduction for use in public address and general alarm applications in clean room, clinical, or sanitary indoor environments. It shall be designed for ceiling or flush-mount wall mounting and shall include a completely smooth front panel graphic overlay that conforms to section 4.0.0 of this specification. The Clean Room Speaker shall be offered in an 8 ohm and a 70.7 V configuration. Equipment providing input to these speakers shall be provided by others.

12.2.2 Interconnection

Each Clean Room Speaker shall provide screw lug terminations for cabling from the source equipment. A minimum no. 18 AWG wire pair shall be used for this connection.

12.2.3 Performance Specifications

The Clean Room Speaker shall meet the following performance and physical specifications:

**Electrical**

Power . . .. ……. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . ....8 / 16 watts, continuous

Impedance . . . . . . . . . .. . . . . . . . . .. ……. . . . . . . . . . . . ... . . . 8 ohms or 70.7 V line matching transformer

Sensitivity . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . 102 dB (1 watt at 1 meter)

Frequency Response . . . . . . . . . . . . . . . . . . . . . . . . . . . …….. . . . . . . . . .. . . .. . . . . . 410 to 4200 Hz; ±6dB

Dispersion . . .. ……. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . . . . . . . . . . . . . . . . . . 180° @ 1000 Hz

**Mechanical**

Mounting . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . .. . . . . Ceiling or flush wall mounting

Construction

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

Mtg. Bracket . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 16-gauge stainless-steel

Dimensions

Front Panel . . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . 12.00 W x 12.00 H inches (305 x 305 mm)

Mtg. Bracket (flush-mount) . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10.75 W x 10.75H x 3.5 D inches

(273.1 W x 273.1 H x 88.9 D mm)

Weight . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. … . . . . . . . . . . . .. . . . . 11.0 lbs. (4.99 kgs)

12.2.4 Equipment Manufacturer and Model Numbers

The Clean Room Speaker shall be GAI-TRONICS Model Numbers:

* **13360** Clean Room Speaker, 8-ohm
* **13361** Clean Room Speaker, 70.7 V