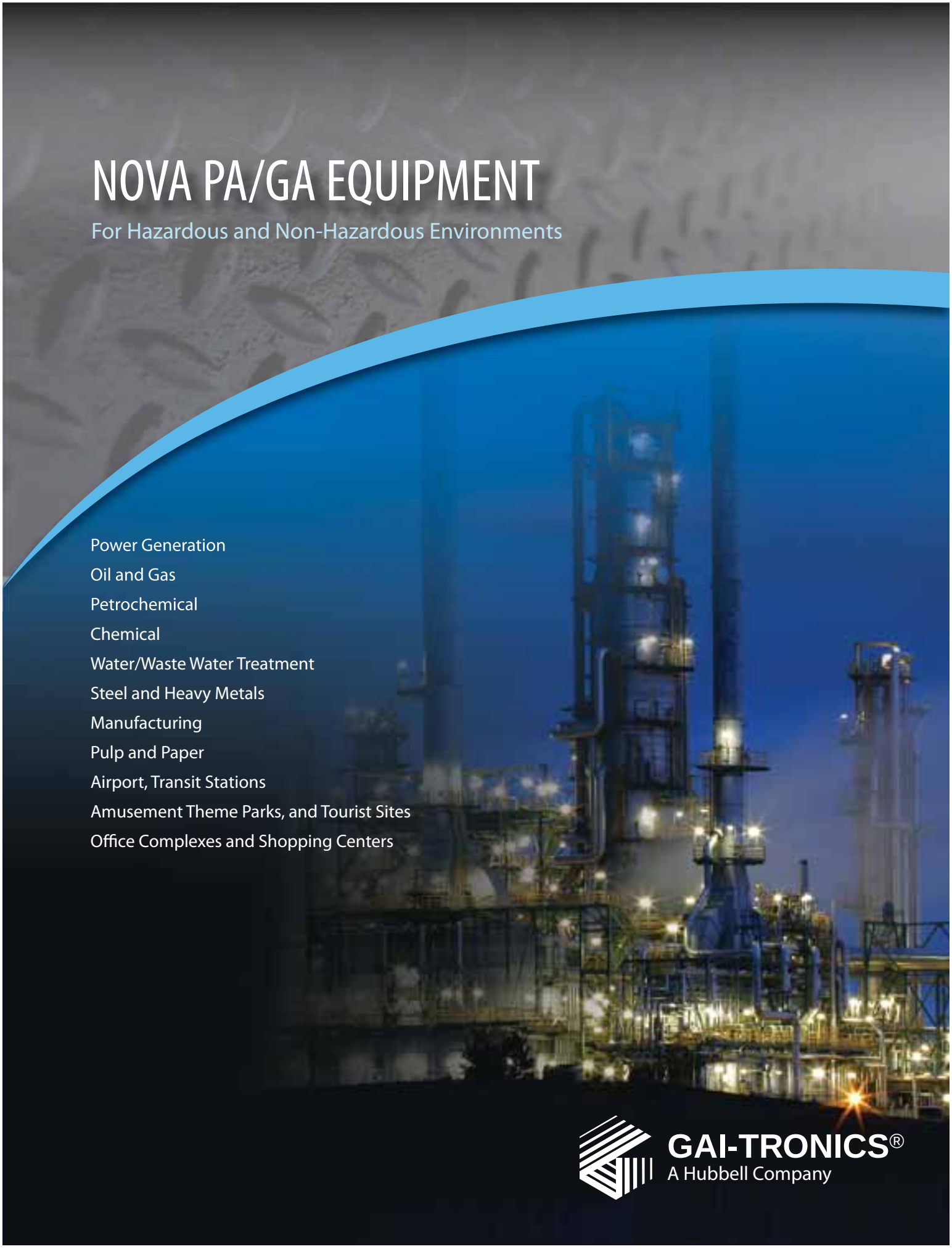
NOVA PA/GA EQUIPMENT

For Hazardous and Non-Hazardous Environments



- Power Generation
- Oil and Gas
- Petrochemical
- Chemical
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- Steel and Heavy Metals
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- Pulp and Paper
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GAI-TRONICS®
A Hubbell Company

NOVA PA/GA EQUIPMENT

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The NOVA Public Address and General Alarm system utilizes microprocessor technology and cutting edge digital voice techniques to provide superior performance and reliability for all types of facilities. From remote system monitoring, to complete system health checks, to individually addressable speakers, NOVA's innovative features meet customer requirements in a wide range of applications.

- Fully networkable system offers almost limitless audio distribution capability
- Remote network interface reduces costs by allowing remote maintenance and system reconfiguration.
- Fault diagnosis / alarm reporting are shown on the access panel to inform operator of system problems immediately.
- Fully configurable messages and alarm tones offer practically unlimited capacity of expansion.
- With GAI-Tronics patented Smart Modules, the system monitors troubleshooting of the individual speakers, line transformers, and voice-coils with no additional cabling required, which significantly reduces maintenance costs.
- Large capacity CobraNet® digital audio matrix accommodates virtually any size system.

System Capabilities

The NOVA PA/GA System offers a wide range of features and accommodates the largest of system requirements. NOVA offers:

- Up to 32 duplicated (A/B) nodes in a single network
- Up to 64 audio inputs such as Access Panels, telephone or radio systems
- Up to 16 simultaneous audio paths per network
- Up to 128 paging zones
- 256 Inputs / 320 Outputs for external system interface such as fire and gas detection, process monitoring, pullboxes, sounders, beacons, and others.
- Individually controlled and monitored speakers
- 24 Hours of Message Memory
- 64,000+ Intelligent Devices in a Network
- Amplifier back-up via hot standby, redundancy of central equipment, or complete system duplication.

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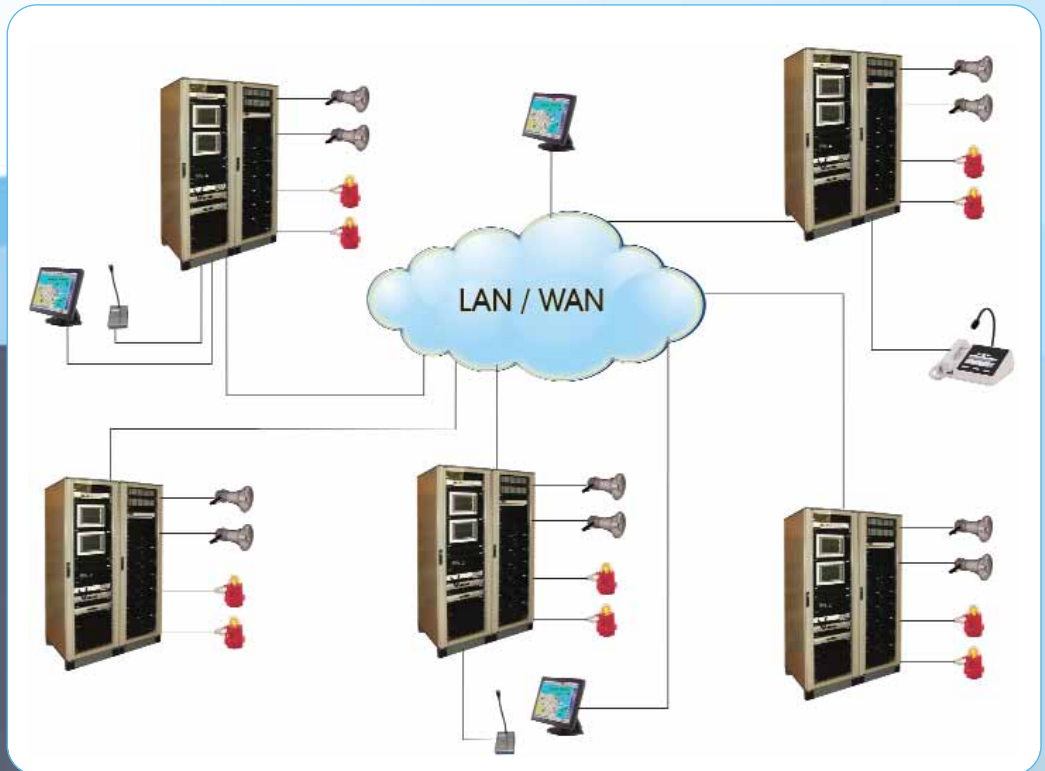
General System Specifications

The PA/GA system can be divided into one or more zones which can be accessed independently for announcement or alarm broadcasts. Broadcasts are transmitted through loudspeakers installed throughout the facility. The system permits calls between it and any existing public address system. The system is modular in design and is easily expanded to include remote amplifiers and/or combinations of amplifiers. The area of coverage will be such that calls will be clearly audible in the paged operating areas and their surrounding areas.

Loudspeakers and/or beacon circuits support paging zones where one or more loudspeaker circuits can be grouped into a zone. Each loudspeaker or beacon circuit is connected to the central equipment for amplification and control / monitor functions. The system can interface to other systems such as telephone, radio, or other paging/intercom systems. Up to 64 individually prioritized audio interfaces are supported. Additional interfaces support external alarm/monitor systems; NOVA can activate external system alarms and, accept external system alarm/audio inputs initiating both alarms and beacon/strobes.

Touch screen desktop or rack access panels allow voice announcements and alarm control operations. Announcements can be configured to broadcast in designated zones, or a zone selection feature enables users to direct announcements to selected zones. Access panels are connected to the central equipment and assigned an access priority for announcements, thereby ensuring that the panel with the highest authority level takes precedence over lower level panels. Alarms are likewise given a broadcast priority that gives the most critical alarm precedence.



NOVA Central Processing Unit

- 10.4"VGA colour TFT display installed in a 19" 6U panel
- TCP/IP network layer, with standard Ethernet interface for system control
- Two RS232 and three USB 2.0 ports for interconnection of compatible devices
- True redundant capability
- Rack mount sliding keyboard
- Diskless and fanless unit
- Industrial grade components
- Audio matrix and I/O board management
- TCP/IP Ethernet connection to other systems
- Controls broadcast of alarm tones and speech messages
- Upgrade, configuration, adjustment of whole system through built-in user interface

Technical Specifications

Construction: 19" - 6U CPU plus 1U Keyboard

Dimensions: 482 x 267 x 150 mm (19 x 10½ x 6 inches);
Keyboard: 488 x 45 x 375 mm

Power Supply: 24 VDC

Power Consumption: 40W

Operating Temperature: 0° / 50°C (32° / 122° F)

Storage Temperature: -20° / 70°C (-4° / 158° F)

Minimum Configuration

Processor: Intel Celeron 600 MHz min.

Storage Device: Slot for Compact Flash, 2048MB

Keyboard: 104 keys, weatherproof IP65

Ports: 2 RS232 Serial ports
3 USB ports
2 10/100 FAST Ethernet port
1 DVI Video interface
1 PS/2-keyboard/mouse
2 PCI slots

Operating System: Linux

Class D Audio Power Amplifier

- Efficiency 80% (240VAC 100V Line)
- LCD Status Indication
- Comprehensive fault monitoring
- User-friendly Set-up & Commissioning
- Class D Operation
- Dual Channel (300W per) split amp
- 600W 2U Modular Design

At the heart of all GAI-Tronics' Public Address Systems is the D600i Class D Power Amplifier (2x300W). The D600i is designed for performance in a range of applications, from continuous 300W RMS rated outputs for Alarm Systems to high quality music reproduction.

Technical Specifications

Electrical

Output Power: 2x300W

Line output voltage: 70V or 100V rms (or client spec)

Input sensitivity: 0cBm (0.775V rms) for rated output

Frequency response: 50Hz - 18kHz (-3dB points)

Total harmonic distortion: <2% at 1kHz, full load

Signal to Noise ratio: -60dB (A)

Operating Voltage Options: 48V DC, Mains 120V or 230V AC

Operating Temperature: -20°C to +50°C

Efficiency: 80% (typ)

Mechanical

Mounting: 19" Standard Rack (Shelf or Slider)

Material: Welded Steel Tray with Vented Lid

Finish: Black Textured Stove Enamel

Output Audio Connectors: WAGO 5 way connector

AC Power: IEEE Standard, 3 pin

DC Power: Molex 2 way 100 mm Mini Fit connector

Audio / Data Comms (RS485): IDC

Weight: 24Kg max

Dimensions: 390D x 483W x 88Hmm, DIN standard 2U

Approvals

CE This mark indicates compliance with the following directives:
Radio & Telecommunications Terminal Equipment Directive 1999/5/EC (R&TTE)

For more information on this product please visit: www.gai-tronics.com/literature/uk/B192.pdf

NOVA PA/GA EQUIPMENT

NOVA Audio Processor

- Fully digital cross point audio matrix
- CD quality audio signaling
- Standard 19" 2U-rack suitable for any 19" cabinet
- Networking capability up to 64 devices
- Easy upgrade and expansion
- Audio over Ethernet by Cobranet technology
- PABX interface module
- Up to 24 input/outputs
- CE & UL approved
- Graphic equalizer
- Built-in diagnostics
- Parametric equalizer
- Feedback suppressor
- Filters: HPF, LPF, high shelf, low shelf, all pass
- Mixers: standard, automatic, combiners
- Controls: levels, invert, mute, preset, logic
- Generators: tone, pink-noise, white-noise
- Programmable delays: 0 to 2Sec

The **Audio Processor** AudiaFLEX offers a unique modular design. The configuration of audio matrix allows complete flexibility in system design, including full redundancy. Audio input and output are analog with internal 24bit A/D & D/A converters. All internal processing is DSP, with Ethernet communication for software control and DSP distribution. A multi-unit network application is available by CobraNet®, transporting digital audio over fast Ethernet.

Technical Specifications

Frequency Response: 20Hz ~ 20kHz @ +4dBu

THD (20Hz ~ 20kHz @ +4dBu):
- Line level < 0.006%
- Mic level < 0.04%

Equiv. Input Noise (20Hz ~ 20kHz, 66dB, 150Ω): -125dBu

Dynamic Range (20Hz ~ 20kHz, 0dB): > 107 dB

Maximum gain input: 66dB

THD (channel to channel @ 1kHz):
- Line level < -80dB
- Mic level < -75dB

Output Impedance (balanced): 200Ω

Input Impedance (mic/line balanced): 8kΩ

Maximum Output (balanced): +24dBu

Maximum Input (mic/line): +24dBu

Phantom power: +48VDC (7mA/input)

Input gain rate: 0dB - +66dB

Sampling rate: 48kHz

A/D – D/A converters: 24-bit

Power consumption (100-240VAC 50/60Hz): 150W

Dimensions (H x W x D): 89 x 483 x 283mm 3½ x 19 x 11 inches

Weight (fully loaded): 6.9 kg/15.25lbs

Options:

- Audio Input Module (2 channel)
- Audio Output Module (2 channel)
- PABX module (2 channel)
- 5W Amplifier (2 channel)
- VoIP Phone Module (2 channel)

Note:
The standard module includes 1 Audio processor (Base Unit) , 2 Input Module (4 channels), 4 Output Module (8 channels)

NOVA Input/Output Module

- Connection to standard field bus (Modbus®)
- Expansibility up to approximately 3,000 I/O's
- Digital & Analog Inputs
- Digital & Analog Outputs
- Real Time Clock

The **Input and Output signals** of the Nova PA/GA system are managed by a Programmable Logic Controller (PLC). The PLC is composed of a Central Processing Unit (CPU) Module and Additional I/O Modules (local or remote). Up to 250 I/O Modules can be connected over a three wire Bus to up to 3000 I/O connections. Communication between PLC and CPU is via Modbus® protocol.

The PLC CPU can manage an extensive list of remote I/O modules.

The PLC includes as a minimum, one (1) Ethernet port, one (1) RS 232 serial link and two (2) USB ports.

The I/O modules can also be installed separately from the CPU over the three wire bus, to control I/O modules in remote amplifier cabinets, to control the local equipment and/or temperature.

Technical Specifications

Memory:
- User Memory - Compact: 100 KB SRAM
- Program Memory - Compact: 1MB Flash FPROM

Back-up data: On Flash EPROM

Digital Inputs:
- Voltage: 24 Vdc ±15%
- Input current @ 24 Vdc: 3.75 mA (Typ)
- Switching threshold: Low < 5Vdc; High > 15 Vdc
- Input Resistance 6.4 KΩ
- Isolation Voltage: 500V

Output:
- Transistor: 24 Vdc ±15%@ 0.5A or 2A
- Relay: 110 Vdc / 115Vac - 0.5A
- Rated Voltage: 30Vdc / 115Vac
- Max. current per contact 1.0A @ 30 Vdc / 0.5A @ 115 Vac

± 10V Analog Inputs: Resolution 12 bit

Analog Inputs for PT100 / PT1000 Temperature Sensors: Resolution 16 bit; temp. range: -200°C ÷ 850°C

Power Consumption: 24 Vdc / 60W max.

NOVA Engineers Test Panel

- Handheld Push-To-Talk microphone
- Provides easy user interface for messages broadcast
- Allows for audio monitoring from each device for broadcast signal

The **Engineer's Test Panel** is used in conjunction with the NOVA CPU to provide complete system monitoring from a single, central location.

Basic panel configuration includes a handheld Push-to-Talk microphone, Tick-Tone push-button for speaker test and red fault lamp.

An internal loudspeaker with a volume control multiple broadcast monitoring is available on request.

To prevent unauthorized access to the panel, a rotary switch with a key is also available as an option.

Technical Specifications

Audio Output: Balanced, 600 Ω, 0 to 6 dBm output signal
Microphone Preamplifier: Built-in Audio Processor
Loudspeaker: (on request) Output Power: 5 W
Dimensions: 2U 19" rack x 330 mm/ 11inches deep
Weight: 3 kg (6½ lbs)

NOVA Access Panel Units

- Ergonomic, rugged and compact design
- Easy to use Graphical User Interface
- Industrial grade Pentium™ class PC
- One access panel can control a networked audio system.
- Desktop or rack versions with touch-screen or mouse facility
- 15", 17" or 19" LCD-TFT color display,
- Up to 256 soft-keys and soft-lamps, arranged into up to 30 pages

The **NOVA touch screen access panels** employ industrial grade Pentium™ class PC's, and rack-mount, or desk-top LCD-TFT displays for convenience and maximum performance; are simple to install and have intuitive easy-to-use graphic interfaces. NOVA access panels provide zone selection, broadcast command and alarm control as standard.

The touch screen display layout is fully configurable, with the unit's software managing up to 256 key and indicator functions. Connection is via CAT5 cable for data with a shielded twisted pairs for audio. An optional Ethernet modem available for distances over 90m.

Technical Specifications

Audio

- Audio Set: Electret or dynamic goose-neck microphone and microphone preamplifier
- Output: 600 Ω, -9 to +6 dBm

Microphone Preamplifier

- Input impedance: 10 KΩ @ 1 kHz
- Output level: -9 to +6 dBm
- Preamplifier gain: up to +40 dB (adjustable)
- Bandwidth: 300 to 15kHz (-3 dB)
- Signal to noise ratio: > 60 dB
- Distortion (THD): < 1% @ 0dB

Controller

Processor: Intel® Celeron 600 MHz Min.

Mass Storage Memory: Flash disk 1 GByte min.

Ports: 2 RS232 serial ports
3 USB 2.0 ports
2 10/100 FAST Ethernet ports
1 Video interface (SVGA/DVI)

Power Supply: 85 – 264 VAC; 50/60 Hz

Power Consumption: 150 W

Operating Temperature: 0° C to +40°C / 32°F to + 104°F

Storage Temperature: -20° C to +60°C / -4°F to + 140°F

Dimensions:

Desktop Type: (mm)
Monitor (17"): 391(W) x 366(H) x 203(D)
Junction Box (including PC): 350(W) x 404(H) x 275(D)
Microphone: 116(W) x 440(H) x 200(D)

Flush Type: (mm)
Monitor (15") including PC: 435(W) x 330(H) x 148(D)
Junction Box: 355(W) x 237(H) x 185(D)
Microphone: 116(W) x 440(H) x 200(D)

NOVA PA/GA EQUIPMENT

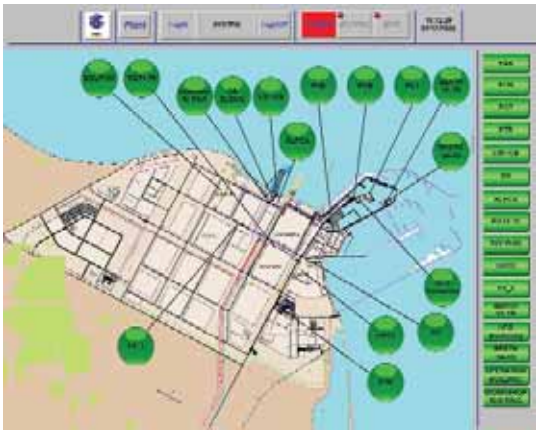
NOVA OLM (On-Line Monitoring)

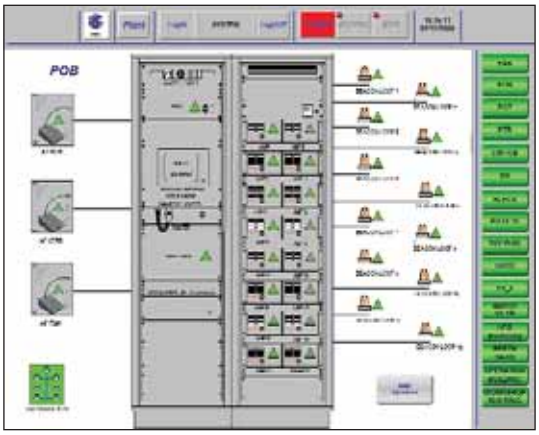
- Full system monitoring
- Easy
- Event Log

Nova On-Line Monitoring (OLM) is a SCADA based system with software loaded at each node. Graphical User Interface based screens are hierarchically organized to two (2) levels, the first level showing the node map, the second level depicting device detail within the node such as amplifiers and audio matrix.

System events are stored in a database logging start and end, date and time.

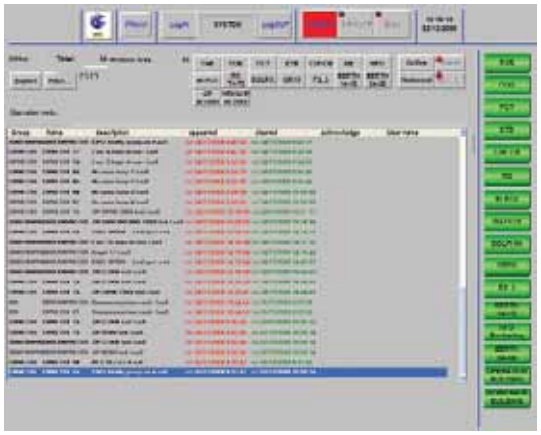
Menus may be filtered to provide custom specific information to the user





The three levels of password protected access are:

- Administrator
- Maintenance: can not do any system configuration
- Normal user (default at power-on and without password) for system status visualization only.



Line Integrity Module (LIM)

Monitors up to eight (8) speaker lines for:

- Integrity
- Earth/Ground Leakage
- Short Circuit
- Open Circuit

The **Line Integrity Module** (LIM) consists of two circuit boards, the LIM Speaker Line Termination Board and the LIM Controller Board, connected by a ribbon cable and housed within the NOVA central cabinet.

The LIM monitors speaker line integrity by measuring the resistance of up to 8 speaker loops and reports changes of more than 20% in loop resistance.

Test for leakage to earth is conducted by applying voltage between the line loop and earth ground and monitoring the current drain to determine leakage to earth.

Within the NOVA system, the LIM communicates alarm status with the system via RS485. Under control the test interval and monitoring parameters may be remotely controlled by the NOVA CPU.

Technical Specifications

Power Input: 24 V dc +/-20% @ 200 mA maximum
Physical Size: • Line termination: 101 W × 381 L × 101 D mm • Controller: 76 W × 381 L × 101 D mm
Operating Environment: 0° C to 50° C @ 95 % humidity, non-condensing
Inputs: Eight (8)100/70 V audio line pass-through:1200 w max/channel
Outputs: Eight (8) isolated 220 V ac120 mA ac
System Connection: RS485 I/O non-isolated, via 8-pin modular jack
Visual Indication: 11 LEDs for programming and line-fault determination
Line Test Resistance Range: 1 to 40 ohms

NOVA PA/GA EQUIPMENT

Automatic Level Control (ALC)

- Ambient level based, real time level adjustment of paging audio to any area or zone
- Automatic bypass feature for emergency alarms and/or messages

Automatic level Control (ALC) is used in the NOVA public address systems to automatically adjust the volume of paging and other audible media to overcome varying ambient noise levels. Customer programmable levels vary the paging audio to combat ambient noise by matching amounts.

The ALC Kit includes one Control Module mounted within the NOVA central system, and one Remote Module which is connected to a dummy speaker or other microphone device for sensing ambient noise. In a typical system the ALC Control Module is located in-line between the low-level audio path switching equipment and associated power amplifier. The Control Module provides line power to the ALC Remote Module which is located within the paging zone. The ambient noise sample is transmitted to the Control Module to be measured and used to modify the level of the audio to the paging amplifier.

The centrally mounted device is equipped with control pushbuttons and indicators to facilitate easy set-up of the paging volume levels, eliminating the need for test meters and screwdriver adjustment.

During an emergency alarm or page the audio path through the module may be bypassed enabling full volume audio to be broadcast.

Headphones or an external speaker may be connected to the Central Module to monitor audio in the remote location.

Technical Specifications

Control Module

Power Input: 24 V dc +/-20% @ 350 mA maximum

Physical Size: 101 W × 355 L × 76 D mm

Operating Environment: 0° C to 50° C @ 95% humidity (non-condensing)

Paging Input Impedance: 100 kΩ, or jumper-selected 600 ohms

Paging Audio I/O Range: -40 dBm to 0 dBmRMS

Paging Adjustment Range: -3 dB to -50 dB minimum

Emergency Paging Level: Direct wire connection from input to output, no attenuation

Paging Audio Distortion: Less than 1% THD

Output Impedance: 100 ohms, electronically balanced

Monitor Amp Output: 250 µW maximum into a standard 30-ohm headset

Remote Module

Phantom Power Input: (Phantom from master) 20 to 30 V dc @ 35 mA maximum

Physical Size: 101 W × 101 L × ~50 D mm

Operating Environment: -40° C to 80° C @ 95% humidity (non-condensing)

Remote Input: Dedicated 8-ohm speaker or dynamic mic, Input is transformer-isolated and protected against directly-applied signals up to 120 V ac

Speaker Monitoring Sub-System

- Remote individual loudspeaker coil monitoring
- Remote individual loudspeaker volume control
- No additional power required
- No additional cabling required

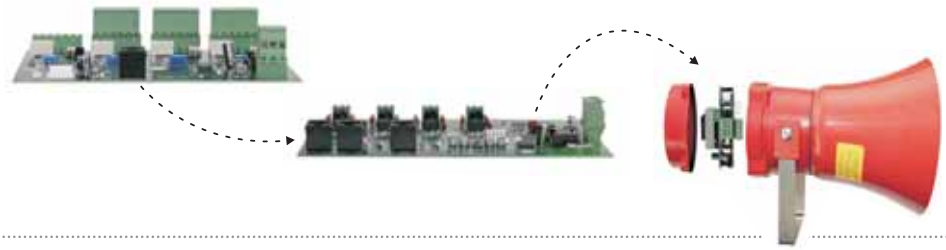
The **NOVA Speaker Monitoring Sub-System** comprises three (3) modules;
- Test Tone Generator
- Speaker Master
- Speaker Remote

The Subsystem is incorporated within the NOVA Public Address System cabinet, and communicates transparently with the system via a common serial interface to the NOVA CPU. The CPU forwards the system indications to an operator paging console typically located in a control room or office.

NOVA speaker monitoring sub-system is able to provide remote individual loudspeaker monitoring and remote individual loudspeaker volume control.

Both of these major features are utilize the speakers existing single pair cable (no extra cores required), without the need of a local power supply and have USA patent (**7,197,148**).

The Nova Speaker Monitoring Subsystem Modules are either housed in the central cabinet (test tone generator and speaker master) or in field locations (speaker remote). A complete system can support up to 20 speaker remote units.



Test Tone Generator

The Test Tone Generator provides inaudible source signal generation and mixing to speaker lines, providing power to the speaker remote boards. It is controlled from the NOVA CPU via an RS-485 serial link.

Technical Specifications

Power Input: 24 V dc +/-20% @ 100 mA max
Physical Size: 101 W × 1656.5 L × 76 D mm
Operating Environment: 0° C to 50° C
Inputs: Four (4) channels, low level (0 dBm) balanced line
Input Inpedance: 600 ohms or 100 kΩ
System Connection: RS-485 I/O non-isolated
Outputs: Four channels, low level (0 dBm) balanced audio line
Output Impedance: 100 ohms
Tone Output Level: Variable from +6 dBm to –26 dBm

Speaker Master

The **Speaker Master** communicates with the NOVA CPU via an RS-485 connection, and transmits speaker commands to the remote speaker modules in order to control broadcast volume levels and locations. It receives acknowledgment messages and speaker integrity messages from the remote modules.

The module has four channels, and transmits and receives communication at 245 kHz. Each channel is connected to the speaker line output of an associated paging zone power amplifier. The module also controls an associated test tone generator module via a dedicated RS-485 connection.

Technical Specifications

Power Input: 24 V dc +/-20% @ 500 mA maximum

Physical Size: 101 W × 190 L × 76 D mm

Operating Environment: 0° C to 50° C

Speaker Remote

The **Speaker Remote** module may be installed inside each speaker that is to be remotely adjusted and monitored. The module receives speaker commands from the speaker master and is powered by the inaudible source signal generated by the test tone generator. The unit monitors the current into the associated loudspeaker to perform a health check of the speaker coil. The transmission of acknowledgments and data back to the speaker master module is performed only on command from the master.

The speaker remote provides two groups of three speaker tap settings, a high power group and a low power group. The tap settings for the high power settings are: 25W, 12.5W, and 6.25W. The low power group is: 6W, 3W, and 1.5W.

Technical Specifications

Power Input: 35 Hz tone @ 50 V

Physical Size: 5.0 L × 4.0 H × ~2.5 D inches

Operating Environment: -40º C to 70º C @ 85% humidity (non-condensing)

For over 60 years, GAI-Tronics has maintained a clear vision: Communications are our core purpose and creating high-performance systems provides value to our customers, now and in the future. Using cutting-edge technology we continue to set the industry standard for durability and reliability, and we address the world's most challenging communication needs. Our design experts will work with you to devise a system that meets your facility's unique and specific requirements.

Visit our Website at:
www.gai-tronics.com

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