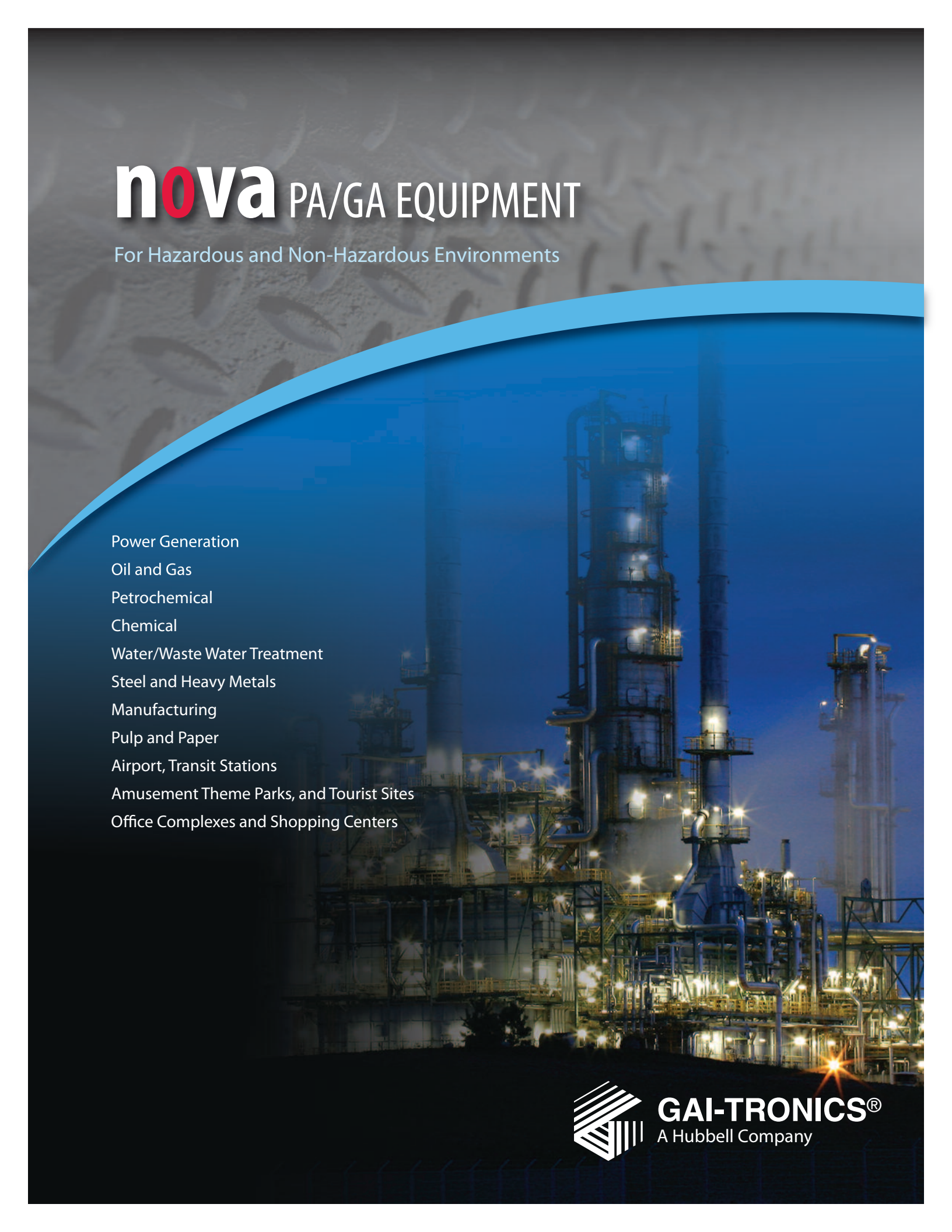
nova PA/GA EQUIPMENT

For Hazardous and Non-Hazardous Environments



- Power Generation
- Oil and Gas
- Petrochemical
- Chemical
- Water/Waste Water Treatment
- Steel and Heavy Metals
- Manufacturing
- Pulp and Paper
- Airport, Transit Stations
- Amusement Theme Parks, and Tourist Sites
- Office Complexes and Shopping Centers

GAI-TRONICS®
A Hubbell Company

nova PA/GA EQUIPMENT

For Hazardous and Non-Hazardous Environments

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 informs 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 majority of any system sizes.

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 simultaneous audio paths per network
- Up to 64 nodes in a single network (bigger systems can be realized grouping more sub-networks)
- Up to 64 audio inputs such as Access Panels, telephone or radio systems, BGM, tone generators
- Up to 128 paging zones per node
- 256 Inputs / 256 Outputs for external system interface such as fire and gas detection, process monitoring, pushbuttons, sounders, beacons, and others
- Individually controlled and monitored speakers
- Up to 138 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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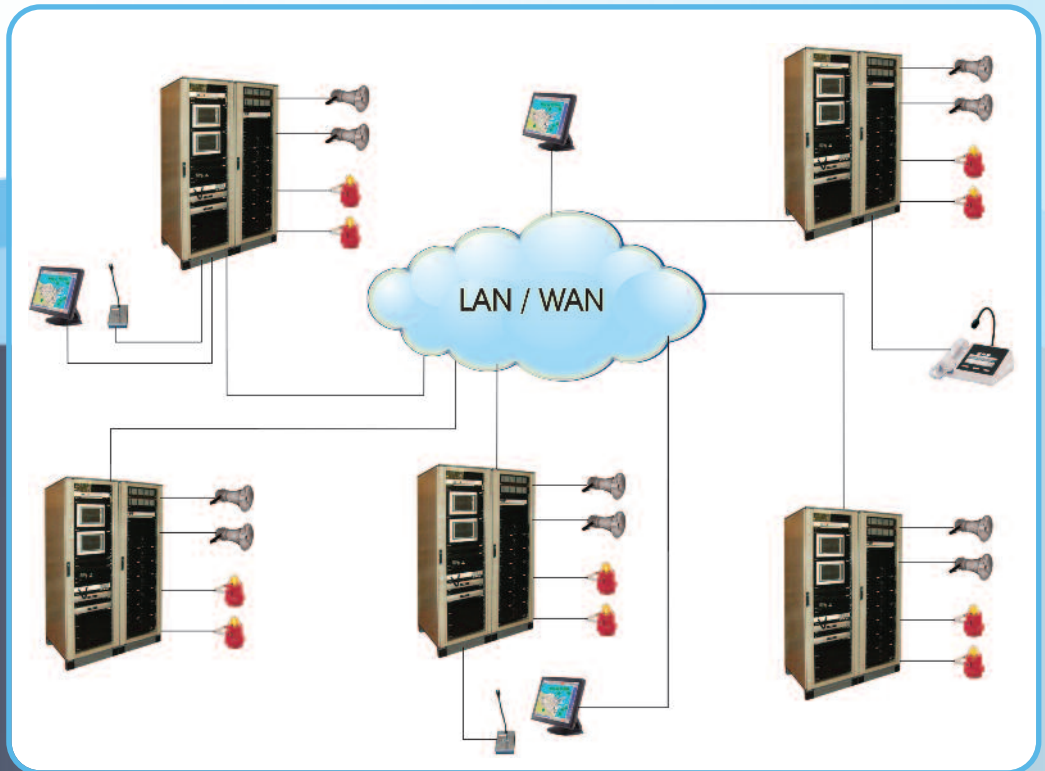
General System Specifications

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 PA/GA EQUIPMENT

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 devices management
- TCP/IP Ethernet connection to other systems
- Broadcast controls 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 330 mm (19 x 10.4 x 13 inches);
Keyboard: 482 x 45 x 243 mm

Power Supply: 24 VDC ±25%

Power Consumption: 45W

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

Fan Kit equipped: 0° / 60°C (32° / 140° F)

Minimum Configuration

Processor: Intel® 1600 MHz min.

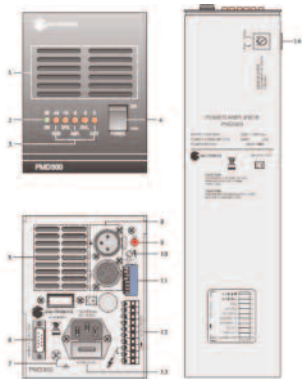
Storage Device: Slot for Compact Flash, 2048 MB

Keyboard: 88 keys, integrated touchpad

Ports: Serial ports RS232/RS422/RS485
5 USB ports 2.0 compliant
2 100/1000 FAST Ethernet port
1 DVI Video interface
1 PCI Express slot

Operating System: Linux

Class D Audio Power Amplifier



- Compact design 3U x 19”
- Up to 4 amplifiers in a single modules cage 3U (PA) + 1U (cage)
- High efficiency “Class D” 300Wrms Amplifier
- Thermal and output overload protections
- Speakers line diagnostics function
- Serial communication interface (RS485)
- Forced cooling by means of dedicated fan activated on temperature threshold

Low frequency 30Hz test, setup and PA diagnostics, line ground leakage detection. A rich set of front panel LEDs is provided for faults indication (ground leakage, overload, over temperature, amplifier fault), power on, Vu-meter function. An output transformer insulates the semiconductors power rails from speaker line increasing safety for critical applications.

Technical Specifications

Electrical

- **Nominal Power Output**: 300Wrms (33.3Ω Load, 230Vac)
- **Line output voltage**: 100Vrms (or client spec)
- **Input sensitivity**: 0dBm (0.775V rms) // 68KΩ
- **Frequency response**: 40Hz - 16kHz (-3dB points)
- **Total harmonic distortion**: <1% at 1kHz, 290Wrms
- **Signal to Noise ratio**: >95dB (A)
- **Operating Voltage Options**: AC Mains 120V or 230V
- **Input Mode**: Mixed (CH1+CH2) / CH1 or CH2 priority
- **Power consumption**: <450W or 550VA (at Nominal Power Output)

Mechanical

- **Mounting**: 19” Standard Rack
- **Audio Connectors**: 2 bal. 3 pin XLR + 3 pin screw terminals
- **AC Power**: IEEE Standard, 3 pin
- **Operating temperature range**: -10°C to +45°C
- **Storage temperature range**: -40°C to +70°C
- **Relative humidity** < 95 %
- **Data Comms (RS485)**: Connector type DB9
- **Weight**: 9,3 Kg
- **Dimensions**: (W x H x D) 100 x 130 x 395 mm, DIN standard 3U

Approvals

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

nova PA/GA EQUIPMENT

NOVA Audio Processor

- Fully digital cross point audio matrix
- CD quality audio signalling
- 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. Configuration of audio matrix allows complete flexibility in system design, including full redundancy. Audio input and output are analogue 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:

- CobraNet® Module (64 channel)
- 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 Modules (4 channels), 4 Output Modules (8 channels)
- Optional CobraNet interface supporting 64 channels of digital audio (32 in / 32 out) over Fast Ethernet

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 485, 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: 128 KB SRAM
- Program Memory - Compact: 512 MB Flash

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 rms

Output:
- Transistor: 24 Vdc ±15%@ 0.5A or 2A
- Switching Voltage: 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: Suitable for Fire & Gas remote interfacing and monitoring

Power Consumption: 24 Vdc / 3W (60W max.)

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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 for 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: 2,5 W 4 Ω
Dimensions: 2U 19" rack x 330 mm / 11 inches depth
Weight: 1 kg (2 lbs)

NOVA Access Panel Units

- Ergonomic, rugged and compact design
- Easy to use Graphical User Interface
- Industrial grade fanless 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 fanless 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

Preamplified Microphone Station

- Power supply: 12 Vcc / 24 Vcc
- Current Consumption: <100 mA
- Frequency resp: 100 ÷ 15.000 Hz
- Audio level (balanced): 1,2 Vrms (adjustable)
- Dynamic limiter
- Dimensions (W x H x D): 116 x 60 (416) x 200 mm
- Weight: 0,85 kg

Controller

Processor: Intel® 1600 MHz Min.

Mass Storage Memory: Flash disk 1 GByte min.

Ports: Serial ports RS232/RS422/RS485
5 USB ports 2.0 compliant
2 100/1000 FAST Ethernet port
DVI Monitor connection

Power Supply: 110 – 230 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"): 392(W) x 360(H) x 191(D)
Junction Box (including PC):
300(W) x 360(H) x 280(D)
Microphone: 116(W) x 60 -416(H) x 200(D)

Flush Type: (mm)
Monitor (15") including PC: 435(W) x 330(H) x 148(D)
Junction Box: 300(W) x 360(H) x 280(D)
Microphone: 116(W) x 60-416(H) x 200(D)

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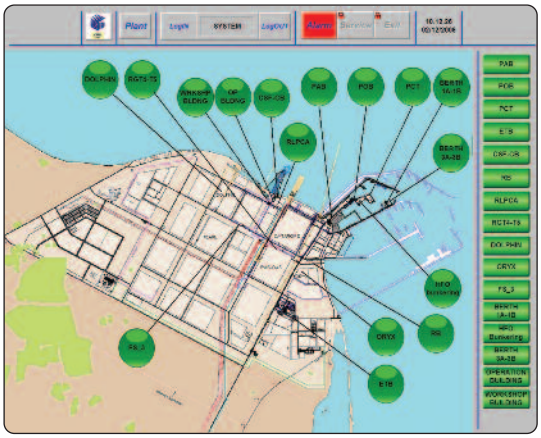
NOVA OLM (On-Line Monitoring)

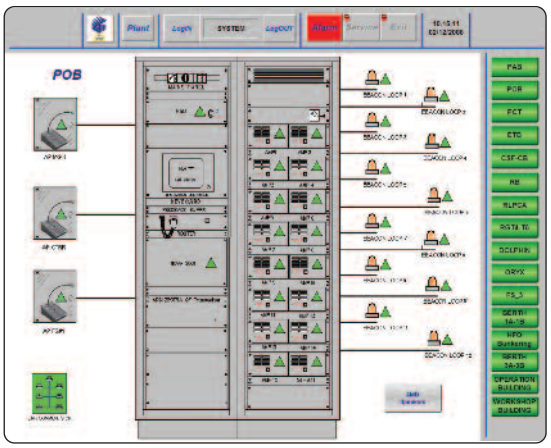
- Full system monitoring
- Easy
- Event Log

Nova On-Line Monitoring (OLM) is a SCADA based system with software loaded at each node.
The graphical interface is totally configurable and typically is organized in hierarchical manner.



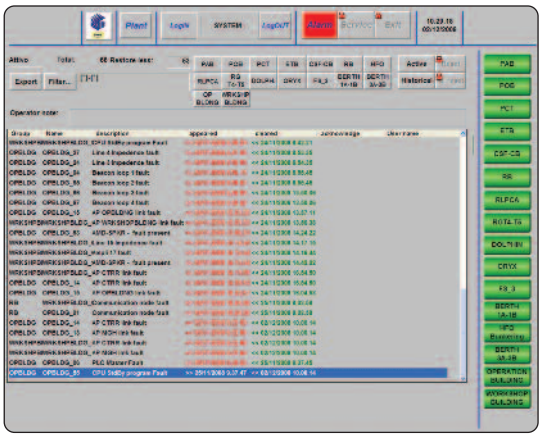
The first level is organized in order to:

- Show the global information (nodes status) through a site (nodes) map.
- Access to the second level (Access Panel Status, Network connectivity, PA/GA Cabinet detailed status,…).
- Access to the user management (it is possible to configure different access levels)
- Access to the log information (monitoring information with start and end timestamp)

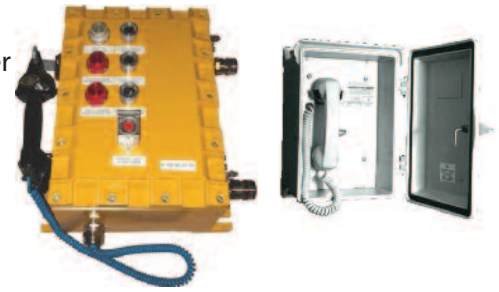


The second level is designed in order to monitor:

- The Access Panel Communication with PA/GA nodes
- The Network connectivity (fiber status, switch status)
- PA/GA status
  - audio matrix and plc status
  - UPS and PSU status
  - tone generator and CPU status
  - Amplifier and loop status



ACCESS PANEL Explosion Proof / Weather Proof



Access Panel is fitted with handset, transformer, preamplifier with compressor, reed relay for handset hook (only for weatherproof version), disconnection relay for nearest loudspeaker (on request) in order to avoid acoustical feed-back, up to 4 push buttons and up to 3 signaling lamps .
The explosionproof version has 4 diodes barriers.

Access Panel is connected with NOVA PA/GA Cabinet through a multi-conductor cable:
- One pair for 24 VDC power supply
- Four pairs for controls and signals
- One twisted and shielded pair for audio signals

Both Explosionproof and Weatherproof versions can be used as Intercom stations connecting multiple units in parallel.

Ex Zones PANEL PC
All operating and visualization components can be configured according to the requirements of the plant.
Constructed as intrinsically safe panel mounting modules and certified for Ex Zone 1 / 2 (Gas),
Zone 21 / 22 (Dusts),
The PANEL PC can easily be integrated into enclosures, walls and cabinets.

NOVA Multimedia PC

- 17" TFT LCD monitor supporting resolutions of up to 1280 x 1024
- Keyboard, numeric keypad and touchpad
- PS/2 and USB compatible

How can we use it?

- Multimedia PC
- Background music
- MP3 and audio player
- Access Panel rack unit
- OLM - rack mount
  On-Line Monitoring

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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 dBm RMS

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 tapping control
- No additional power required
- No additional cabling required

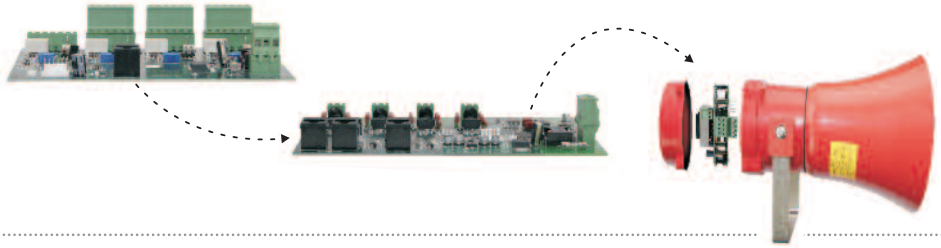
The **NOVA Speaker Monitoring Sub-System** comprises three (3) modules;
- Test Tone Generator
- Speaker Master
- Speaker Remote

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 tapping control.

Both of these major features 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 40 speaker remote units per amplifier loop.



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% @ 150 mA max
Physical Size: 101 W × 165 L × 32 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 +4 dBm to –46 dBm

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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

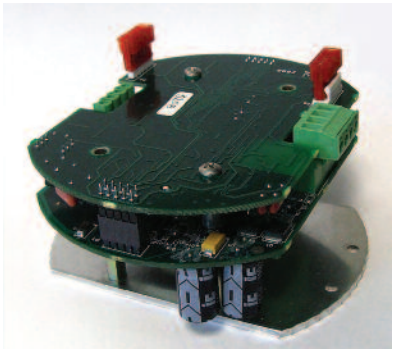
Power Input: 24 V dc +/-20% @ 100 mA maximum

Physical Size: 101 W × 190 L × 32 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 a selection of three available speaker tap settings. In the two ranges, the jumper P6 selects between the low and high output ranges. Two models of Speaker Remotes are available to allow the NOVA system to accept various loudspeakers. The firmware also provides the assignment of four page groups out of a possible 255 for systems that utilize subzoning.

Technical Specifications

Power Input: 35 Hz tone @ 50 V

Physical Size: 105 W × 100 L × 65 D mm

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

Model 13317-001: 100V line transformer to 8 ohms @ 25W.
High taps: 25W, 12.5W, 6.25W; Low taps: 6W, 3W, 1.5W

Model 13317-002: 100V line transfomer to 16 ohms @ 30W.
High taps: 30W, 15W, 7.5W; Low taps: 6W, 3W, 1.5W

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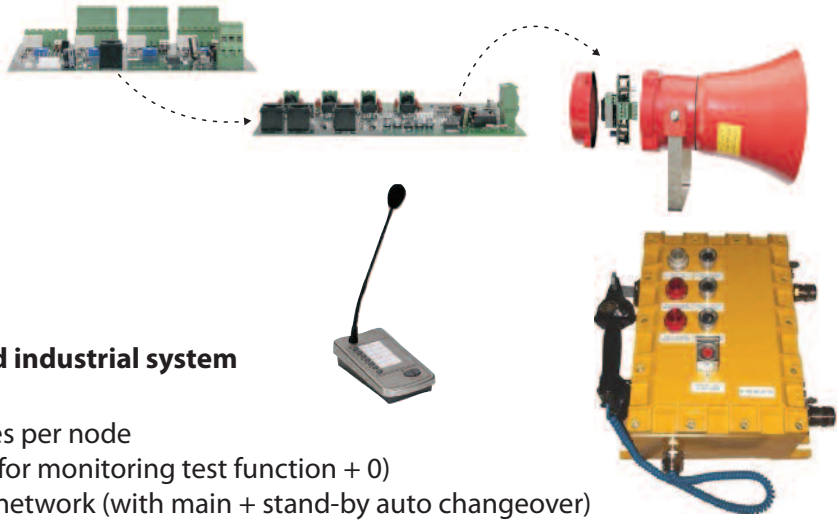

Ideal for facilities requiring a large networked industrial system

32 Simultaneous Audio Paths / **128** Paging Zones per node
64 Alarm Tones / Pre-recorded Messages (62 +1 for monitoring test function + 0)
8/16 simultaneous audio channels through the network (with main + stand-by auto changeover)
Up to **32** access panels per node
Up to **64** nodes per network (bigger systems can be realized grouping more sub-networks)
Up to **256** in and **256** out I/O connections (digital and analogue) per node

Higher availability even in case of HVAC or cabinet fan failures up to 50°C ambient temperature, with a continuative alarm tone, at full Power and up 23+1 amplifiers in a single cabinet. This feature is performed by a software algorithm that manage the Amplifiers thermal transient.

Undistorted audio process, amplification and speakers reproduction at the best clarity even with overdriven audio levels from any connected source, increase of operational safety of all the devices, every kind of digital filter and digital processing easily added depending on requirements.

Audio signals at level node have no practical limitations for any requirements, and 32 simultaneous channels (at 24bit quality and 48Khz sampling frequency at full bandwidth lossless) are routed by the CobraNet® protocol inside a 10-100 Mbit standard Ethernet by copper or fiber network.

Speakers and lines true impedance monitoring without limitations (thanks to the digital process and sharp filtering between amplifiers and audio processors), no audio interruptions or breaking during the test even when audio is broadcasted (test is performed at a very low level and frequency and it is inaudible).

Full control and monitoring of every installed device is provided by operator or automatic routine testing.
The monitoring operates on each amplifier and speaker lines, beacons and lines, interfaces, cabinet fans, etc.

For over 65 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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Pub 081001 Rev. 12/2013