



Elemecplus

Digitally Controlled PA and Alarm System PA/GA With Class 'D' Amplifier, for Oil and Gas Markets



The Elemecplus is a digitally controlled Public Address and General Alarm System (PA/GA). Designed principally for **life critical installations** in the **Oil and Gas** market, it is also suitable for many industrial communications requirements.

The Elemecplus high integrity Public Address & Alarm System is commonly used on Oil & Gas Platforms, FPSO's, Power Stations & Oil Refineries, Chemical Plants & Industrial Complexes Worldwide where the safety of all personnel is of immense importance.

The equipment is specifically and fundamentally designed for failsafe operation, with extensive system and fault status monitoring for maximum availability at all times.

In addition to General Paging and Emergency Broadcasts, Alarms can be automatically initiated, e.g. from fire and gas alarm and emergency shut down systems. Alarm tones or pre-recorded digital voice evacuation messages can be broadcast.

- 600W Intelligent Power Amps
- Up to 19.2 kW (64 amplifiers) of Audio Power per system
- Fully duplicated, duplicated or single configuration
- Compliant to UKOOA, PFEER, IMO, SOLAS, DNV, NORSOK requirements / guidelines
- Multiple Hot Standby power amplifiers
- Plug and socket construction for easy maintenance
- Up to 16 fully monitored full featured microphone access panels over 3-pair cable
- Message storage and replay up to 2 mins
- Auto access panel lockout on panel failure (time-configurable)
- System status and fault log monitoring via Ethernet link
- Emergency Access fallback operation
- Intrinsically Safe (I.S.) ATEX microphone panels to Group IIB/C
- Auxiliary Audio Input e.g. music
- CE Compliant
- PABX Telephone & Page/Party® Access
- Engineers Test Panel provision
- Fibre Optic link to remote amplifiers
- Auto alarm override feature
- Supports Alarm Zoning requirements
- Amplifier Sub-Zoning
- Two priority levels for routine speech
- Beacon Cable Monitoring
- Ultrasonic Loudspeaker Network Monitoring

PA Controller



The centre of the Elemecplus PA/GA system is the Controller Unit. Designed for 19" Equipment cabinet mounting, this unit is microprocessor controlled and software configurable.

The Controller Unit provides continuous monitoring functions for up to 16 Microphone Access Panels and sends/receives data from the Elemecplus Power Amplifiers, to provide complete high integrity system monitoring, from microphone panel to loudspeaker. Integral Alarm Tone Generator circuits are also monitored.

A backlit LCD provides instant status information of system activity and faults; a major advantage to operator and maintenance personnel. To increase security, a watchdog circuit allows Emergency fallback to increase the integrity. This allows manual initiation of Emergency

Speech and audible alarms in the event of processor failure.

For ease of installation and maintenance all cabinet internal connections are on a plug/socket basis. The software control is designed to be as flexible as possible, and can easily be downloaded to the Controller.

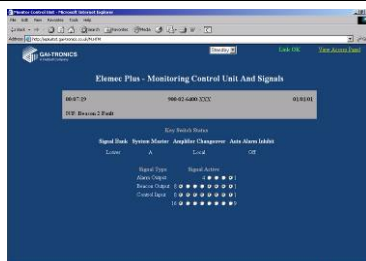
As a security measure, Alarm Tone types can only be changed by replacing an I.C. (EPROM) on the main PCB within the Controller.

Hot standby Amplifier Control is provided whereby a powered spare amplifier/s is automatically connected to the loudspeaker network of a failed amplifier/s. PABX access and page/party access is configured so that telephone/intercom inputs are digitally stored and replayed to completely eliminate the possibility of acoustic feedback between telephone/intercom & local loudspeaker.

Eight individually programmed beacon control outputs are available to operate beacon relays during emergency speech/alarm broadcasts. A numerical keypad enables certain test and setup functions to be implemented e.g. Amplifier Tick Tone, Alarm & PABX broadcast levels.

The controller can be supplied in duplicated format for additional redundancy.

Web Server Board



The unique IP address of each web server board enables remote monitoring of the system. The board may be LAN or WAN, or in turn connected to the Internet giving world-wide access to system monitoring without dedicated viewer software.

System monitoring is divided into web pages, with the web server opening a general introductory page.

Control unit input and output functions are monitored by selecting the Control Unit and Signals.

From this page the real time state of the systems alarm and beacon outputs, together with the control inputs can be monitored.

This enables the user to monitor all inputs from other devices such as the fire & gas system, therefore extending the monitoring capacity of the web server connection.

Additionally, it allows the user to have a remote mimic display of all current messages seen on the control unit LCD within the main Elemecplus equipment cabinet/s.

The access panel monitoring page mimics the layout and operation of access panels connected to the Elemecplus control unit being viewed.

As key functions are operated the monitoring panel mimics the LEDs indicating the selection of functions and/or alarms.



A drop-down menu located at the top of the page permits the selection of one or all access panels.

GAI-Tronics Systems

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Intelligent Power Amplifier



At the heart of all GAI-Tronics Public Address Systems is the D600i Class D Power Amplifier (2x300W). The D600i is designed for use in GAI-Tronics high integrity Elemec, NOVA and Advance public address and alarm systems.

GAI-Tronics designs and manufactures sophisticated public address and alarm systems to suit specific markets and applications. The NOVA system addresses multiple zones, multiple networks and multiple speech path applications such as large petrochemical facilities. Elemecplus addresses self-contained applications such as platforms and FPSOs. ADVANCE combines public address with multi-station intercom capability.

The field proven D600i amplifier is designed for performance in a range of applications, from continuous 300W RMS rated outputs for Alarm Systems to high quality music reproduction. Each amplifier comprises 2 x 300W channels, each capable of independent operation.

To reduce the risk of single point failure, on AC systems the Amplifier has its own internal power supply. Fault protection and ultrasonic load sensing are contained within the Amplifier. Load sensing is easily configured by use of pushbuttons on the front of each amplifier. This load sensing facility allows loudspeaker monitoring and automatically detects changes in the load of the connected loudspeakers.

Thermostatically controlled fans, integral to each unit, provide forced air cooling to the output power devices only during high temperature operation.

System expansion is easily achieved by simply adding more amplifiers without the need to change controller hardware.

Local/Remote Access Panel



Several types of access panel are available for use with the Elemecplus PA/GA system.

The panels are available in six formats - 19" console mounted, desktop mounting and indoor/outdoor IP66 bulkhead mounting. All are available for use in 'safe areas' weatherproof enclosures or I.S. panels can be supplied for hazardous areas to Zone 1 as ATEX certified EEx ib IIB/C T4. To standardise equipment supply each variant uses the same panel insert.

Either a single set of data control and audio outputs are provided connected to the Central Equipment via only a 3 pair cable, or fully duplicated circuits (from dual segregated switch contacts to dual panel outputs) are also available for use with dual A/B systems.

The access panel insert assembly comprises a mild steel plate pierced to accommodate up to 30 pushbuttons, with a textured polycarbonate overlay with 'secret until lit' status LED's.

All pushbuttons can be individually programmed by software to perform any of the microphone panel functions.

Up to 8 zone select pushbuttons and 8 alarm pushbuttons can be fitted. Emergency Speech and

Alarm pushbuttons are fitted behind a Perspex cover to prevent accidental operation. 'All call' and Sleeping Quarter zone pushbuttons can similarly be fitted behind the cover if required.

Gooseneck or fist microphone options are available with LED "VU" indication. LED's adjacent to the pushbuttons illuminate only when the switch press has been accepted by the Central Equipment to provide added confidence to the operator. Pushbutton legends are easily interchangeable.

Up to 16 fully fitted microphone panels can be connected to the Elemecplus PA/GA system. During Emergency Speech broadcasts the audible Alarms can be programmed to attenuate (typically 12dB) or completely mute.

Both routine and Emergency Speech access are standard with two routine speech priority levels. This is used to allow routine speech to be heard over some alarms but not other alarms. This is in addition to the priority between individual panels.

TECHNICAL SPECIFICATIONS

Controller Unit

Three keyswitches are provided - functionality is as follows:

Keyswitch 1 - Used for duplicated A/B systems. Either system A or B can be set on master to source audible alarms or voice recorded messages.

Keyswitch 2 - Used to select either local or remote Power Amplifiers to be driven by the controller.

Keyswitch 3 - Used to inhibit Auto Alarm inputs e.g. to prevent false alarms during F & G system commissioning.

Mechanical

Dimensions: 483W x 177H x 390D (mm)

Material: Mild Steel

Electrical

- Power 24V DC +/-10% <100mA (unit itself)

- 100mA fused outputs provided for Access Panels, Beacon Relays etc.
- Microphone Panel Audio Input 2.2V p.p. 600Ω
- Microphone Panel Data, RS485 semi-duplex
- Page/Party interface Input Level 1.5V rms
- Control Inputs e.g. Auto Alarms Up to 16 Dry contact or 24V DC
- Amplifier Audio Output 2.2V p.p.
- Amplifier Data Link RS485 semi-duplex
- A/B System interlink 6 pair connection Audio 2.2V p.p. Data RS485 Fully-duplex
- Auxiliary Input e.g. background music 2.2V p.p. 600Ω

Class 'D' Amplifier

LCD Indicator Panel on the front of the amplifier displays the following information:

- High Temperature Operation
- Output Overload Condition
- Amplifier Shutdown Protection Active
- Power Healthy
- Amplifier Enabled / Disabled
- Fuse Failure
- Zone Allocation
- Bargraph at output level

Electrical

- Output power:** 2x300W
- Line output voltage:** 70V or 100V rms (or client spec)
- Input sensitivity:** 0dBm (0.775V rms) for rated output
- Frequency response:** 50Hz - 18kHz (-3dB points)
- Total harmonic distortion:** <2% at 1kHz, full load

- Operating Voltage Options:** 48V DC, Mains 120V or 230V AC
- Operating Temperature:** -20°C to +50°C
- Efficiency:** 80% (typ)
- Signal to Noise ratio:** 60dB (A)

Mechanical

- Dimensions:** 390D x 483W x 88H, DIN standard 2U
- Mounting:** 19" Standard Rack (Shelf or Slider)
- Material:** Welded Steel Tray with Vented Lid
- Finish:** Black Textured Stoved Enamel
- Output Audio Connectors:** WAGO 5 way connector
- AC Power:** IEEE Standard, 3 pin
- DC Power:** Molex 2 way 100mm Mini Fit connector
- Audio / Data Comms (RS485):** IDC
- Weight:** 24Kg max

Access Panel

- Up to 30 pushbuttons
- System Status LEDs
- 300mm gooseneck or fist noise cancelling microphone
- 3 pair connection cable

Electrical

- Power 24V DC nominal (15-30V DC) <65mA
- Audio Pair, uni-directional, 2.2V pp
- Data pair, RS485 semi-duplex
- Audio Conditioning 2:1 compression
- VU Meter LEDs in 6dB steps
- S/N Ratio >60dB
- Environmental -20°C to +50°C RH95%

Mechanical

	Dimensions	Mounting	Material	Connections	Resistance
19" Console Panel	483W x 177H x 135D (mm)	19" Console	Mild Steel	2.5mm ² screw terminal	
Desktop Panel	269W x 90H x 230D (mm)	Desktop	Mild Steel	15 way 'D' connector	
Indoor Bulkhead Panel	450W x 324H x 173D (mm)	Wall Mount	Mild Steel	2.5mm ² screw terminal	
Outdoor Bulkhead Panel	400W x 300H x 210D (mm)	Wall Mount	Stainless Steel	2.5mm ² screw terminal	IP66 (door closed)
I.S. GRP	280W x 280H x 170D (mm)	Wall Mount	Glass Reinforced Polycarbonate	2.5mm ² screw terminal	IP66

