



PAGASYS

Digital Public Address and General Alarm Systems with Networked Options

PUBLIC ADDRESS & GENERAL ALARM SYSTEMS for SAFETY CRITICAL APPLICATIONS.

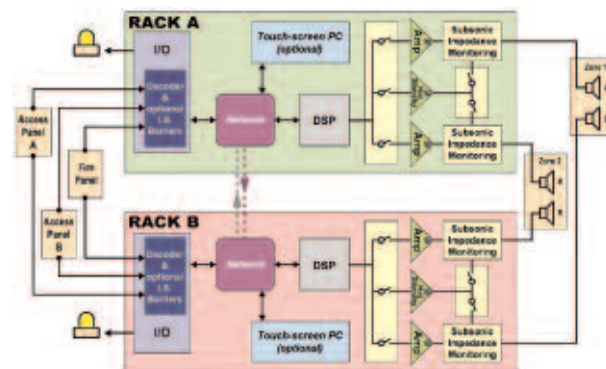
- *Proven system design operating at many locations worldwide*
- *Stand-alone, Hot Standby, or Duplicated systems with Network Options*
- *Field configurable zones, I/O, and access panels*
- *Impedance monitoring of speaker circuits with optional Individual Intelligent Speaker Monitoring and remote Tapping system (ISMT)*
- *Windows™ GUI, MIMIC and system diagnostics*
- *Modular Construction with Hot Swappable Amplifiers & Power Supplies*
- *Greater than 84% efficiency Class D (Digital) PWM amps*
- *UKOOA, PFEER, NORSOK, IMO, ABS, SOLAS, DNV*
- *PBX Interface & Feedback Eliminator (options)*
- *Full compliment of safe and hazardous area access panels and microphone stations*
- *Automatic E-MAIL notification in the event of failure*

Specifically developed for the stringent requirements of the offshore oil and gas markets, PAGASYS is ideally suited for offshore platforms, land based petro-chemical plants, military, and applications requiring the highest degree of reliability and functionality. Stand-alone or fully duplicated failsafe systems can be customized to meet the specific requirements of the application.

Pulse-width modulated, Class 'D' amplifiers operate with greater than 84% efficiency; minimizing heat generation; and preventing power surges upon start up. Also, these compact PA/GA systems require less space, a smaller UPS, and less cooling than conventional systems.

On-board digital signal processors (DSP) provide tone generation and pre-recorded voice messages. Analog audio inputs permit seamless integration of external tone generators and intercom systems. An expandable I/O card approach allows you to integrate third party alarm systems and auxiliary signals, such as fire & gas detection controls and beacons, for a completely integrated facility emergency notification system.

Each PAGASYS rack can be equipped with hot standby amplifiers that assume the load in the event of an individual amplifier failure. Failed amplifiers and power supplies can be replaced quickly without having to power down the system or disconnect wiring. User controls and fault reporting are easily accessed on the optional touch screen PC or remotely via a lap top computer or Windows™ based user interface.



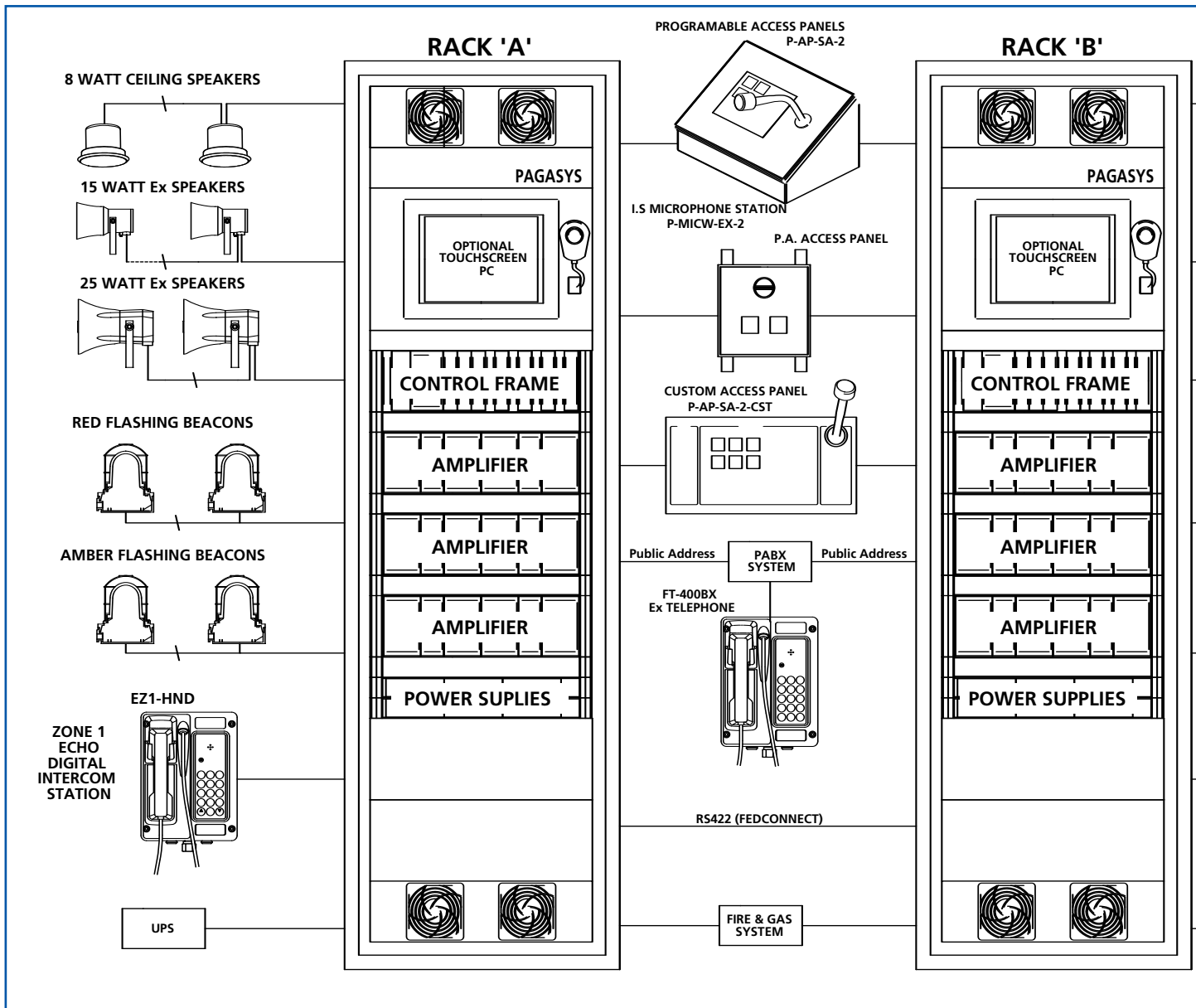


Fig. 1: The above system demonstrates a typical duplicated / redundant "master" "slave" configuration with separate A Access panels. The system accepts duplicated inputs from the Fire & Gas and ESD systems to automatically initiate alarm provided for interfacing with an external system. Connection to external intercoms and a PBX are common features. Fig means of raising alarms and testing the Speakers and Beacons. Single rack systems with hot stand-by are also a standard

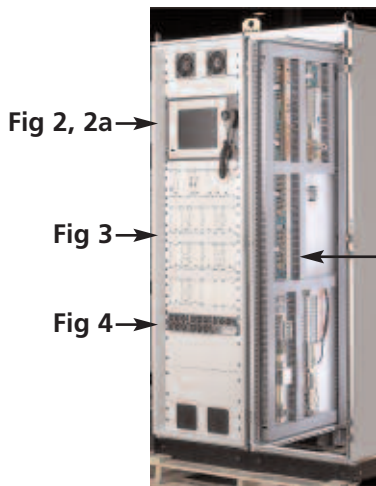


Fig. 2: Engineers Test Panel (ETP), Touch Screen PC (option)



Fig. 2a: Field Programmable ETP or Remote Access Panel, Provides Control Status



Fig. 3: Card Frame Mounted Amplifiers. Hot-swappable amps allow for quick and easy field replacement without shutting the system down.

Fig. 1: World Class Wiring practice meets international requirements.

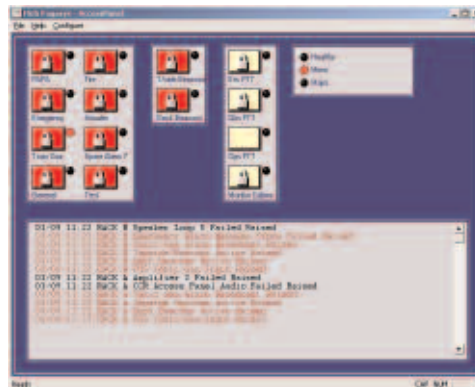
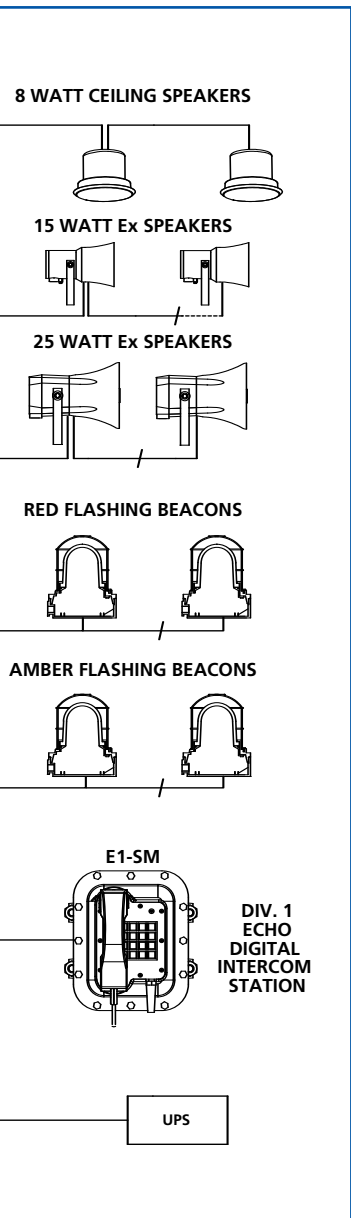


Fig. 2a: PAGASYS systems come with a MS-Windows™ based system control and configuration software. The above screen depicts the soft engineers test panel screen. The upper section contains

buttons to control and test the operation of the system and fault indicators. The lower section contains a log of the most recent events recorded by the program. This software can reside either in an external PC or in an optional integral touch screen panel. Operation of the system is not dependent on this software.

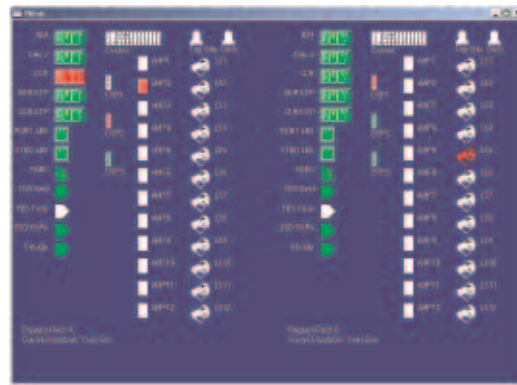


Fig. 2b: The Mimic screen provides a graphical (GUI) representation of the real time status of the system. Items shown in green are healthy, areas in red are faulty, active elements in white. Faults also show up as text statements on the engineers test panel-logging area as shown in Fig. 2a.

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VB control lines from the field
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d configuration.



Fig. 4: Modular power supplies fitted into card frame. Power supplies can be sized so that any single module failure will not affect the system. Hot-swappable for quick field service.

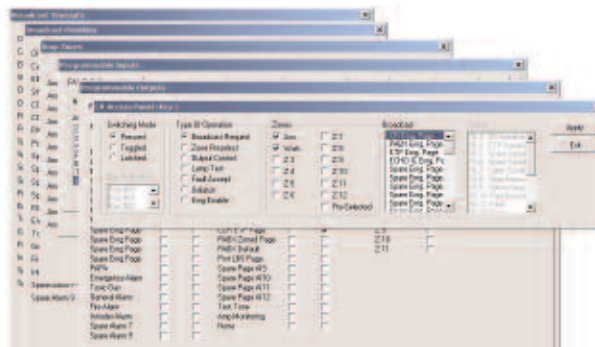


Fig. 3a: A PAGASYS system is field configurable. No need to wait for custom factory software

for changes, allowing for quick commissioning and field modifications. The above screens show examples of how easy it is to change the system configuration. Easy to follow and easy to understand, the Windows™ are laid out so that the user just has to "point & click". Settings are then saved in the non-volatile system memory. The configuration screens can be protected against modification by unauthorized users. Screens are available for adjusting monitoring times, broadcast priorities, timeouts, assigning functions, assignment of email addresses (fault notification), just to name a few.

GENERAL SYSTEM OVERVIEW: PAGASYS

The PAGASYS system employs a modular construction approach, which provides significant benefits including, commonality of parts, which means a less costly system and fewer spare parts to manage. System standardization results in shorter design and manufacturing times. Reduced cabling allowing for faster site installation. System configuration via user-friendly Windows™ software allows for rapid commissioning. A flexible network concept makes PAGASYS easy to expand and upgrade. Ethernet / Cobra-Net™ solutions are available for large-scale networked applications.

System Functionality and Capacity:

The PAGASYS system provides both indoor and outdoor Public Address/General Alarm capability, across Oil and Gas Exploration and Production facilities, petrochemical and industrial plants, military installations, or wherever high integrity safety critical communications are essential. At the core of the system is the control frame which contains the network/processor, digital signal processing (DSP), amplifier control & monitoring, and input / output cards. The PAGASYS control frame will accept up to 48 audio inputs. Additionally, the control frame can store on its DSP cards 12 internal re-record-able tones or digital messages, each up to 40 sec's duration. Digital message capacity is expandable by the addition of a Federal Signal digital storage processor. By connecting to a PC mimic via an RS232 link it is possible to configure the DSP's to: establish external audio input signal monitoring by using 20Khz, 30Hz or wide band pilot tone monitoring, choose the preferred pre-announcement chime, fix the input/output volume control, set the 30Hz amplifier monitoring tone level, and download messages from a PC.

Each rack includes a control frame, Input/Output terminations (these accept alarms to and from external systems such as the Fire and Gas system and then trigger tones, messages or beacons), amplifiers, power supplies, loudspeaker loop monitoring units and a test/access panel as required. These modules are mounted into card-frames, which are housed in one or more (depending on the number of amplifiers required) standardized 600x800x2000, 42U 19" rack with 100mm plinth, side and rear panels, front profile frame and a solid lid. Up to 1,000 watts of amplification power can be fitted into a 3U card-frame with a maximum 9,000 watts per control frame. A maximum 36 zones are available in a 9,000 watt rack expandable up to 72 zones by the addition of another rack. Extra racks can be added allowing for site wide expansion as the need arises.

Networking and Redundancy:

A PAGASYS system can be supplied as a single stand-alone rack, a fully duplicated dual redundant system, or a redundant network system. In a dual redundant or network redundant system, in the event of a system component failure (such as a DSP card or audio input from an access panel) audio is re-routed via other control frames to maintain full operation. Even if the control frame fails completely, direct audio analog input will still be available at that rack. PAGASYS is compatible with a number of different networking technologies and system topologies based on copper or fiber-optic transmission to provide the level of redundancy required for the application.

System Fault Monitoring:

To ensure integrity the PAGASYS system automatically incorporates extensive internal self-monitoring, covering: Audio input faults (30Hz, 20KHz, or wide band) Internal audio path faults, Internal communication path faults, such as control system to DSP's and control system to I/O cards, network faults, amplifier faults, monitored alarm input faults for open and short circuit, program and configuration checksum failures, alarm message generators, speaker and or speaker loop faults. When a fault is detected the system can log the fault if a PC is connected. The system can send e-mail to a user or selected support group immediately upon the occurrence of a fault. This group could include Federal Signal, Integrated Systems service department, who could then provide remote support via the Internet.

Loudspeaker loop monitoring and optional individual loudspeaker remote monitoring and tapping:

A standard feature of the system is impedance monitoring of the speaker circuits, which confirms that speaker circuit loadings remain within a calibrated tolerance band. The system can detect loudspeaker short or open circuits and earth faults. Optionally, in the event of an amplifier failure, the system will automatically re-route the signal through a standby amplifier. An infrasonic monitoring signal of 45Hz is used, which (unlike 20KHz) does not generally suffer from signal attenuation caused by cable capacitance and is also virtually immune to spurious readings caused by weather/temperature effects. Each loudspeaker monitoring card will monitor two amplifier loops. Optional to the system is an individual 'Intelligent Speaker Monitoring and Tapping' (ISMT) module, which is used to simplify installation and to increase whole-life system integrity, through timely and accurately targeted maintenance. The ISMT module periodically and automatically checks each loudspeaker (which are fitted with special PCB's) for faults. Additionally, the ISMT module allows for remote volume adjustment of each individual loudspeaker by reconfiguring its internal transformer power tapings. Each ISMT module can handle up to 256 speakers per speaker circuit (depending upon the total power loading of the circuit), with up to 36 speaker circuits per rack.

PAGASYS 'Power':

State of the art 'D' class amplifiers power the PAGASYS system, offering significant performance improvements over traditional class 'A' and 'B' units. Compared to conventional amplifiers the consumption at full power for a typical class A/B amplifier is 480VA. The consumption at full power of a PAGASYS Class D amp is 300VA. Weight is also considerably less, 10kg for a typical AB amp compared to 3kg for the equivalent PAGASYS class D amp. Federal Signals 250/500-watt class 'D' amplifiers have established an excellent reliability track record, offering better than 84% efficiency, while eliminating power surges at start up. This high efficiency and the smaller amplifier footprint means that the overall rack space requirement is dramatically reduced and in most cases the need for auxiliary rack cooling fans is eliminated. Because these amplifiers generate only a fraction of the heat associated with class A and B amplifiers, they can run continuously without the need for fans for extended periods of time. The size of the UPS is also reduced, this is possible because the 'D' class amplifiers have a 'super sleep mode' of operation, and drawing only 60mA of power, when operating on battery back up. PAGASYS class 'D' amplifiers have internal self-monitoring built in and are suitable for use in a conventional configuration or a parallel banking arrangement. PAGASYS racks have the option of an integrated hot standby amplifier to provide backup should an amplifier failure occur.

Interacting and Interfacing with PAGASYS:

Each rack may be equipped with an Engineers Test Panel, which will provide a means of direct interaction with the system, local fault indication and an analog PTT microphone access point, which can be configured to remain available even if the control frame should fail. The standard configurations are a choice of a rack-mounted field programmable Engineers Test Panel complete with a PC serial port for connection to a laptop or a touch screen Engineers Test/Access panel complete with integral permanently rack-mounted LCD touchscreen PC. A wide variety of duplicated / Intrinsically Safe or safe area access panels and microphone stations are available. Access panels can be mounted at the central rack or at remote locations. Connections into other networks e.g. LAN / WANs, using Cobra-Net™ or Profibus™ can be facilitated using gateways through either RS232 or RS485 links. PABX interfaces are also available to enable paging either live or via a 'store and forward' approach in order to avoid feedback. The essence of 'Integrated Systems' philosophy is system interconnectivity, which means that PAGASYS will interface with other Federal Signal systems, including past offerings, the ECHO digital Intercom system, party paging systems and Federal Signal outdoor siren products.

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