VOICE ALARMS & EN54

Powersoft

A CASE FOR
CLARITY

In critical situations, being able to deliver clear, intelligible, and audible messages is key to make sure all visitors are aware of the emergency to leave the venue and ensure their safety.

In these instances, studies have shown that the public is more willing to respond and take actions when given clear, vocal instructions, instead of alarm tones and bell rings.

The system must be capable of performing at any time with the push of a single button, in a straightforward manner, and give constant feedback to the operators about its state.

Redundancy plays a massive role and must be implemented throughout, from routing and prioritizing input signals, to creating separate lines for the loudspeakers.

Powersoft amplifiers offer a series of technologies that are crucial in the implementation of Emergency Systems, and with a comprehensive line of dedicated install amplifiers, they are more than capable of delivering the power required to be heard, **loud and clear.**

VOICE ALARMS

VA, PAVA SYSTEMS DESIGNED TO KEEP US SAFE

A Voice Alarm (VA) system is a sound system specifically designed to assist the effective evacuation of an area or building during an emergency. Oftentimes these are paired with the fire alarm system. The PAVA system incorporates elements of a public address one and is used for mixed entertainment/emergency purposes.

In both systems, the concept of redundancy is of paramount importance. Continuity of service must be ensured even in the event of a malfunction, and this is where a monitoring device comes into play by constantly checking all the components and reporting back their state and the conditions of the elements of the chain that are located in the various zones.

A series of precautions must be considered in the design phase: it is good practice not to drive the speakers of a given zone from the same output channel, but instead assigning them to two separate ones. The same principle applies to input selection, in this case having multiple foldback sources will ensure that emergency messages will be ready to play even in case of a fault.

Indication panels are used to monitor the condition of the VA and to report about system and transmission faults, so that an operator may promptly intervene when needed.

A typical VA/PAVA System is comprised of:

- Separate/Redundant outputs
- Amplifiers
- Audio processor
- Control and monitoring processor
- Message Player
- Indicator Panel

Example of a small 2 zone voice alarm system showing all monitoring and functionality for Voice alarm systems

SMALL TWO-ZONE VOICE ALARM SYSTEM
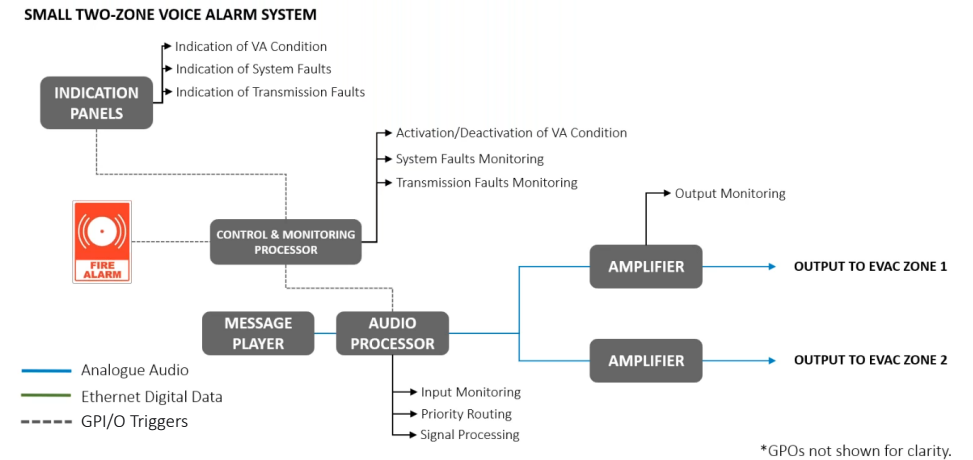
THE POWERSOFT ADVANTAGE

ULTIMATE SYSTEM SIMPLYFIERS

With 25 years of experience and innovation packed in each amplifier, Powersoft brings a set of features that are aimed at simplifying their implementation in safety and emergency systems.

The audio processor, the control and monitoring processor, and-of course- the amplifier, are all enclosed in a single, ultra-efficient and reliable device, making them the perfect solution when designing an emergency system from the ground up, or when renovating pre-existent ones.

The unique sound-shaping tools made available by the in-built DSP are controlled and managed through ArmoníaPlus, which also enables full monitoring of the system through HealthPlus.

Redundant analog and digital inputs can be prioritized and managed automatically so that emergency messages can be played instantaneously and with maximum intelligibility when necessary.

The GPI can be used to control vital functions of the amplifier, depending on the model, including standby ON/OFF, source selection, and volume. The GPO is a normally Open/Normally Closed terminal used for status monitoring and alarm notification/Activation.

Multiple levels of accessibility can be set up to enable specific controls while inhibiting others. This is crucial for large systems that may be managed remotely by an administrator with full control privileges and operated on-site by skilled personnel and untrained users alike.

Powersoft offers all-in-one solutions that can replace multiple devices, streamlining the system and making it simple to operate and maintain.

These advanced amplifier platforms offer separate/redundant outputs, a state of the art audio processor, and a control and monitoring processor. The only things that are left out of the eqation are the speakers, the message player, and the indicator panel.

The same example takes a different form when Powersoft's amplifier platforms are used.

**SMALL TWO-ZONE VOICE ALARM SYSTEM**
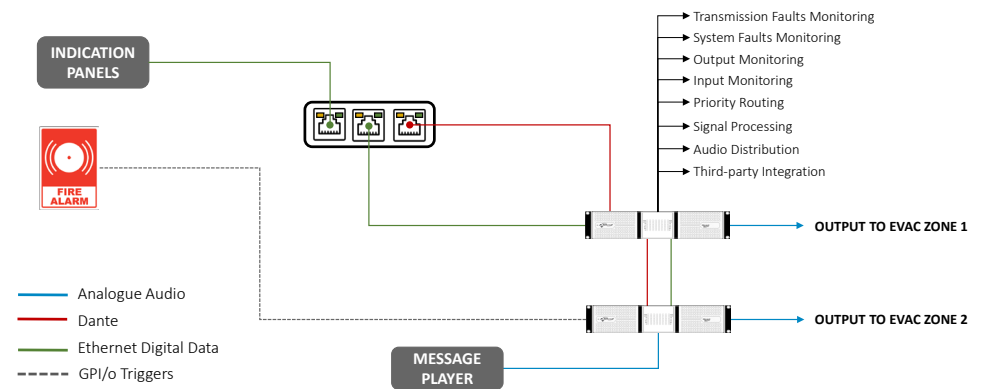
With system integrity being a critical element in emergency applications, Powersoft amplifiers bring industry-leading performances that can be measured through their renowned sound qualities, build quality, and reliability. This is why they are already in use in some of the world's most demanding installations and why they are trusted by leading industry professionals.

Any input signal can be routed and managed with the utmost flexibility, which comes in handy with larger systems or in those that share their use with public address or entertainment ones.

The sound-shaping tools provided by the advanced DSP and managed through ArmoníaPlus can be used to achieve the required levels of clarity for emergency messaging while giving the possibility to tailor the acoustic signature of a given area.

The system monitoring options enabled by HealthPlus give the operator the peace of mind to know that everything is under control and, more crucially, any transmission or system fault notification can be shared with the central unit's fault monitoring panel.

The state of the art DSP brings the advanced signal routing options and sound shaping tools required to ensure redundancy and proper intelligibility within the system.
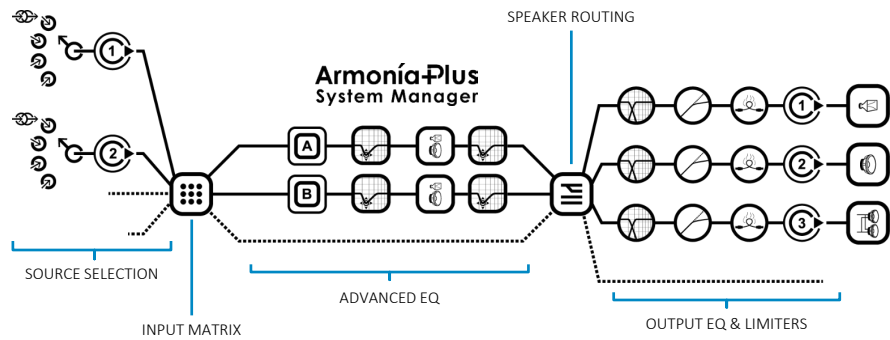

The souce selection option grants 4 layers of safety in the event of a malfunction of a sound source, both analog and digital signals can be routed to any source selection queue.

Dante patching can be done directly from ArmoníaPlus alongside with any signal coming from third party devices that are located within the same network.

These layers of safety are automatically selected in case of a disruption of input signal, ensuring the adequate level of redundancy.
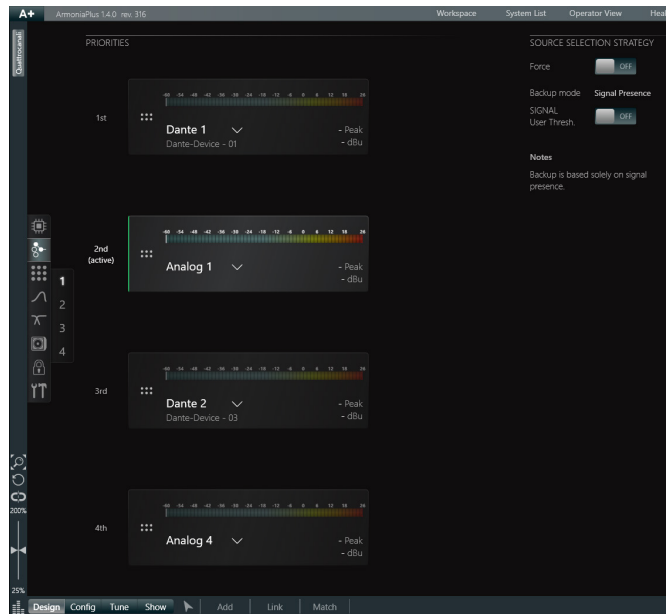

The advanced system monitoring features introduced with Health+ are critical to provide real-time information on:
• Active, passive or missing inputs
• Speaker integrity, headroom and impedance
• Events such as firmware update and network communications
• Amplifier status and faults, e.g. temperature, current and mains voltage
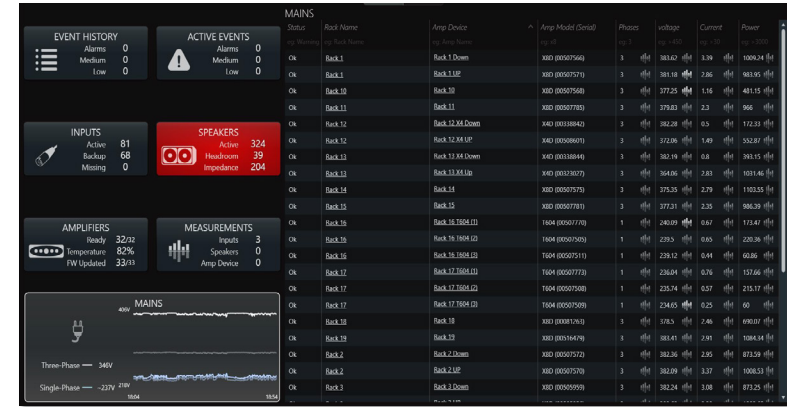
Input Pilot tones can also be used as triggers for source selection and to perform integrity checks. These are also used to communicate with other devices to activate other alarms.
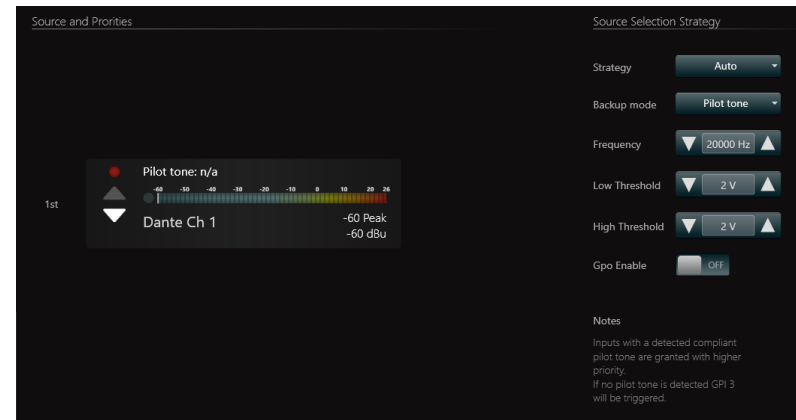
Powersoft advanced amplifier platforms can be controlled through the in-built GPI, and the GPO provides NC/NO contact terminals for status monitoring and alarm notifications.
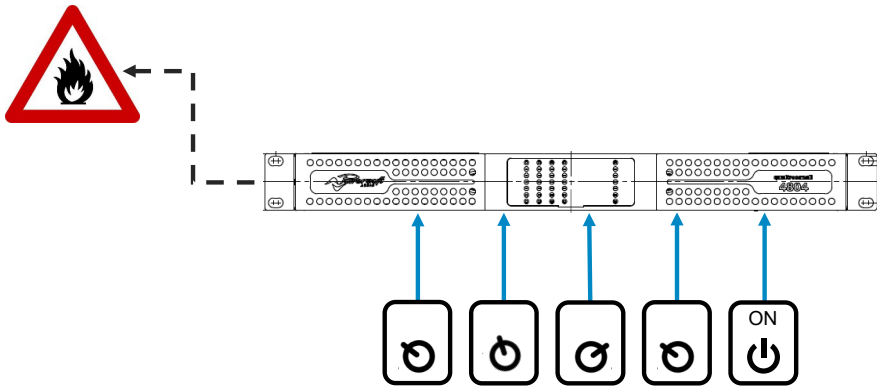

An extensive set of limiters is provided to ensure system integrity, these include:
• RMS, Peak and Clip Limiters
• TruePowerTM
• Current Limiter
• Soft-knee
• Frequency Shaping

Delivering signals through a Dante network is a simple and effective way to distribute audio from multiple sources into any Powersoft DSP+D amplifier.
The redundant ports can be used to route the same signals from two separate lines, ensuring continuity of service even with the sudden interruption of one path.

All Dante enabled amplifiers support AES67, granting compatibility with third-party devices and systems.
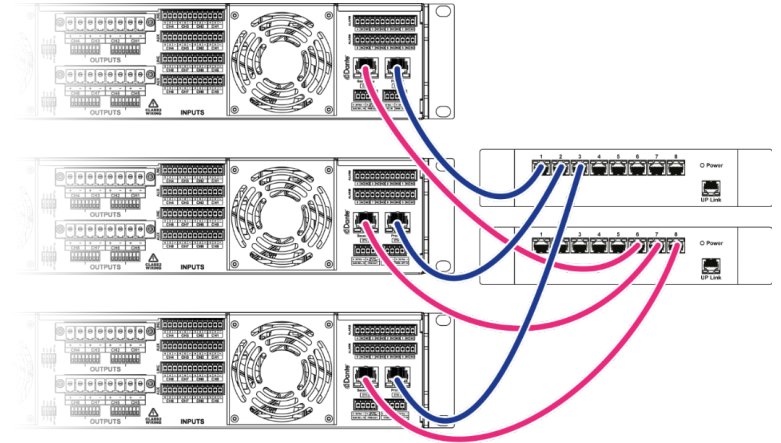
Even more flexibility and routing options are granted by Powersoft's Dante enabled amplifiers, thanks to the Dante Output.

Any of the analog signals from the physical inputs of the amplifier, even those that are not used in the amplifier's source selection and internal DSP, may be transmitted through the Dante network, alongside with any of the matrix's outputs, source selection outputs, or ways outputs.

Adding this "breakout box" function makes it possible to route any type of signal as required and grants the possibility to expand the system down the line.

SMALL TWO-ZONE VACIE SYSTEM
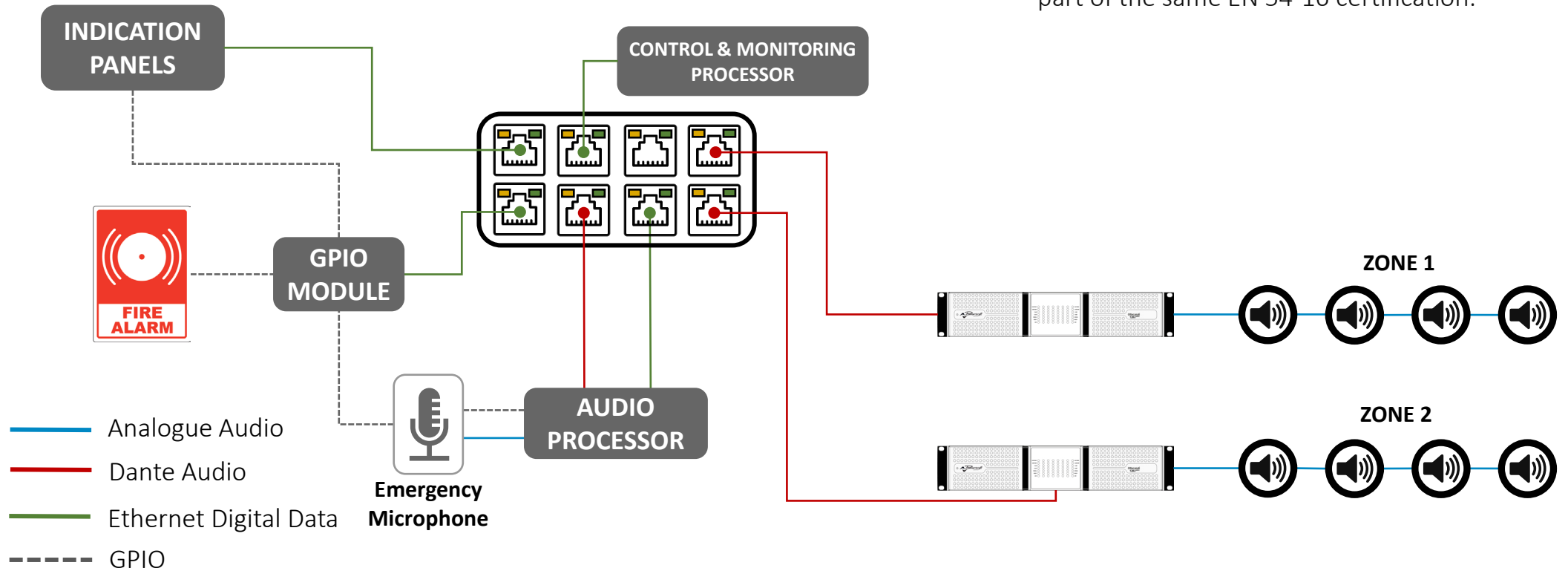
✔ COMPLIANT

Compliance achieved with products that are part of the same EN 54-16 certification.

INDICATION PANELS

CONTROL & MONITORING PROCESSOR

FIRE ALARM

GPIO MODULE

ZONE 1

ZONE 2

AUDIO PROCESSOR

Emergency Microphone

— Analogue Audio

— Dante Audio

— Ethernet Digital Data

----- GPIO

APPLICATION EXAMPLE.

SMALL PAVA TWO-ZONE VACIE SYSTEM
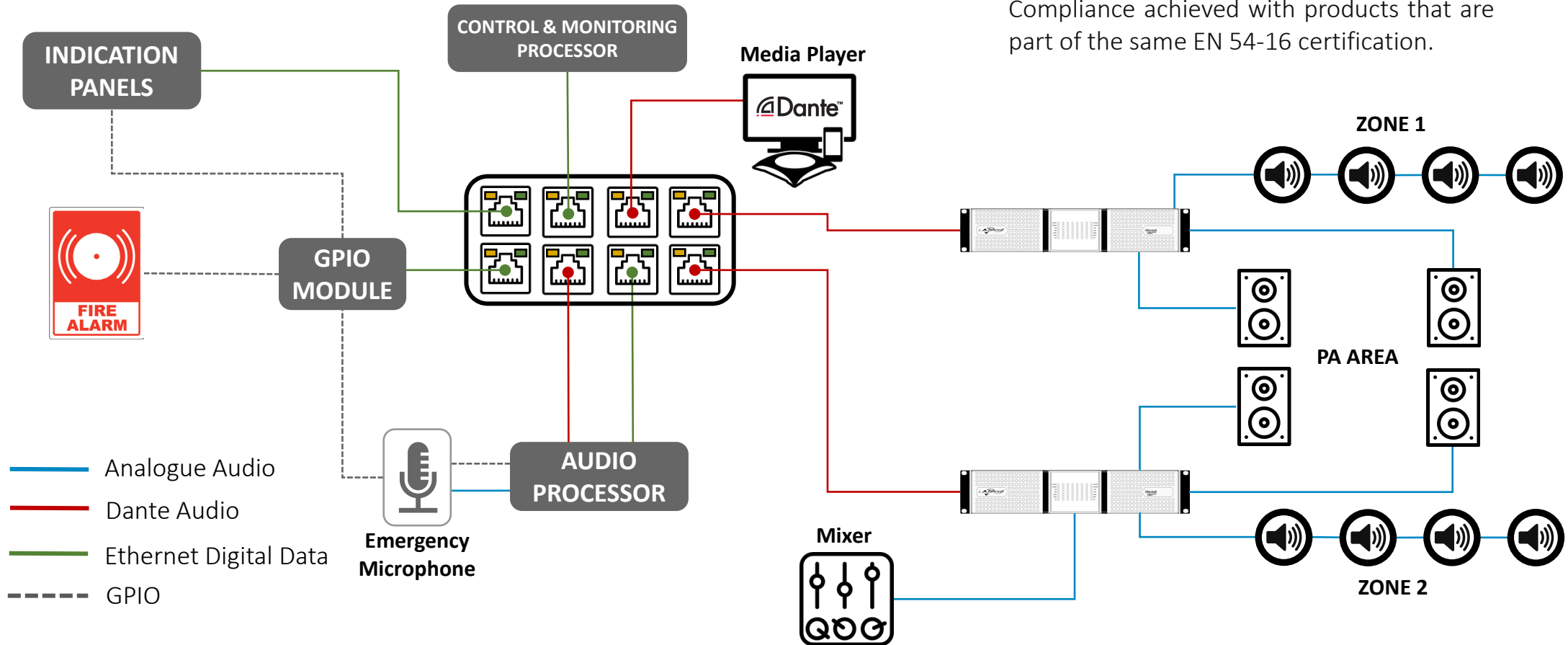
✔ COMPLIANT

Compliance achieved with products that are part of the same EN 54-16 certification.

INDICATION PANELS

CONTROL & MONITORING PROCESSOR

Media Player

Dante™

FIRE ALARM

GPIO MODULE

ZONE 1

PA AREA

Emergency Microphone

AUDIO PROCESSOR

Mixer

ZONE 2

—— Analogue Audio

—— Dante Audio

—— Ethernet Digital Data

----- GPIO

EN54

EN54
COMPLIANT
EN54-16

EN54

QUALITY, CERTIFIED

As a European product standard, EN54 is used as a quality standard to which devices must comply to be used in Fire Detection and Fire Alarm Systems.

Within EN54, the EN 54-16 subdivision regulates Voice Alarm Control and Indication Equipment. It specifies the requirements, testing, and performance criteria for the VACIE for use in fire detection and fire alarm systems installed in buildings, where the alarm signal is in the form of tone(s) or voice message(s), or both.

Under the Construction Product Regulation, the VACIE is classed as a single product.
Powersoft, just like many others in the professional audio industry, brings just one of the products required, albeit an outstanding one at it.
In this case, the products have been tested along with other items of equipment in order to create a 'complete' VACIE.

Powersoft amplifiers are part of the VACIE and are therefore covered by EN 54-16.

CONTENT

The following table portrays the requirements of an EN54 compliant system.

SECTION	CONTENT
General Requirements for Indications	Describes the minimum requirements for indication of functional conditions. The VACIE shall be able to indicate: • Quiescent conditions; • Voice alarm conditions; • Fault warnings; • Disablement conditions.
Quiescent Conditions	States that the indication of quiescent states must not be confused with other states.
Voice Alarm Conditions	Provides general requirements for the VACIE under Voice Alarm operation, such as: • Reception and processing of fire signals. • Activation of VA outputs. • Indication and display of the VA condition. • Phased evacuations. • Silencing the VA after the message has been broadcasted and resetting the VA condition.
Fault-Warning Conditions	Provides general requirements for the VACIE when in Fault warning condition, such as: • Reception and processing of fault signals. • Indication of faults in specified functions. • Indication of faults in circuits or transmission paths. • System fault indication. • Transmission of fault warnings.
Design Requirements	Covers the general design requirements and manufacturer's declaration to be verified and tested, such as: • Installation instructions and complete user/technical documentation. • Mechanical and electrical design and robustness. • Integrity of transmission paths. • Accessibility of indications and controls. • Guidelines for indication colours, and light emitting and alphanumeric indicators. • Audio performance.

Functional Tests	Provides the list of functional tests to demonstrate the operational performance and endurance of the VACIE before, during, and/or after environmental and use conditioning, such as:
	• System integrity under VA condition.
	• Subjecting the VACIE to a list of fault conditions to test warning indicators.
	• Checks for manual controls, control devices and emergency microphones.
	• Audio and environmental tests:
	  ○ Output power, signal-to-noise ratio, frequency response.
	  ○ Cold, damp, heat.
	  ○ Impact, vibration.
	  ○ Supply voltage variation and Electromagnetic Compatibility (EMC).

TESTING

THE VACIE SYSTEM

EN54 Certification Procedure is up to the manufacturers or their representatives to prove via an approved certification body that their products comply with the harmonized standards and therefore may carry a CE marking covering EN54-16.

There are several steps to follow in the process of obtaining approval and being allowed to use CE marking according to CPD.

The products have to undergo environmental and safety tests as specified in the standards and a certification bureau will verify amongst other the products functionality with the standards requirements.

Besides the production process at the manufacturers' facility must be regularly audited by the certification body to ensure Factory Production Control.

The certification bodies that test, audit and certify have to be accredited by European accreditation bodies. This is to ensure that product testing and certification follow international standards as to how testing and evaluation are carried out.

All certified products have been subjected and passed EN 54-16 compliance functional tests, including but not limited to:

- Performance under fire conditions
- Response delay (response time to fires)
- Operational reliability
- Durability of operational reliability:
  Temperature resistance
  Impact and vibration resistance
  Electrical stability
  Humidity resistance
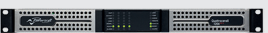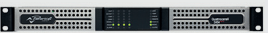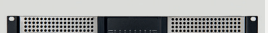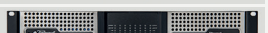
When the EN 54-16 voice alarm standard was launched in 2008, it was designed for companies who only made the entire system. Powersoft's certification permits voice alarm systems to be built in a modular way according to the requirements of each project, utilising a range of products from different manufacturers.

Powersoft amplifiers have been assessed and certified to EN 54-16 as part of a multi-manufacturer enclosed VA system solution, comprising:

- Amplifiers;
- Audio processors;
- Control & Indication processors and panels;
- Network switches;
- Network converters;
- Microphones;
- Supporting analogue, Dante, AES3 and BLU-Link connections.

TECHNICAL SPECIFICATIONS CHART

	POWER @ 2Ω	POWER @ 4Ω	POWER @ 8Ω	BRIDGED @ 4Ω	BRIDGED @ 8Ω	70 V	100 V	MAX OUTPUT VOLTAGE @ LO-Z	MAX OUTPUT CURRENT @ LO-Z	CURRENT DRAW* 115 V	230 V	IDLE POWER STD	DSP+D	THERMAL DISSIPATION*	S/N RATIO	DSP+DANTE™ OPTION AVALAIBLE	EN 54-16 COMPLIANT**	
322 A/AD	160 W	160 W	160 W	UP TO 320 W***	UP TO 320 W***	UP TO 320 W***	UP TO 320 W***	142 V$_{PEAK}$	15.6 A$_{PEAK}$	0.8 A	0.4 A	14.0 W (A)	17.0 W (AD)	114 BTU/h	> 103 dBA	AD Version	-	MEZZO
602 A/AD	200 W	300 W	300 W	UP TO 400 W***	UP TO 600 W***	UP TO 600 W***	UP TO 500 W***	142 V$_{PEAK}$	15.6 A$_{PEAK}$	1.2 A	0.6 A	14.0 W (A)	17.0 W (AD)	157 BTU/h	> 105 dBA	AD Version	-	
324 A/AD	80 W	80 W	80 W	UP TO 320 W***	UP TO 320 W***	UP TO 320 W***	UP TO 320 W***	142 V$_{PEAK}$	15.6 A$_{PEAK}$	0.8 A	0.4 A	18.0 W (A)	21.0 W (AD)	131 BTU/h	> 100 dBA	AD Version	-	
604 A/AD	150 W	150 W	150 W	UP TO 400 W***	UP TO 600 W***	UP TO 600 W***	UP TO 500 W***	142 V$_{PEAK}$	15.6 A$_{PEAK}$	1.3 A	0.6 A	18.0 W (A)	21.0 W (AD)	176 BTU/h	> 102 dBA	AD Version	-	
804	2 x 500 W	2 x 400 W	2 x 400 W	1 x 1000 W	1 x 800 W	2 x 400 W	2 x 400 W	80 V$_{PEAK}$	39 A$_{PEAK}$	1.4 A	0.9 A	24.7 W	23 W	161 BTU/h	> 106 dBA	Yes	✓	DUECANALI
1604	2 x 1000 W	2 x 800 W	2 x 800 W	1 x 2000 W	1 x 1600 W	2 x 800 W	2 x 800 W	115 V$_{PEAK}$	45 A$_{PEAK}$	2.5 A	1.5 A	25.5 W	23 W	251 BTU/h	> 109 dBA	Yes	✓	
4804		2 x 2400 W	2 x 1250 W	1 x 6000 W	1 x 4800 W	2 x 2400 W	2 x 2400 W	142 V$_{PEAK}$	80 A$_{PEAK}$	7.0 A	3.9 A	31.1 W	32.5 W	528 BTU/h	> 111 dBA	Yes	-	
1204	4 x 400 W	4 x 300 W	4 x 300 W	2 x 800 W	2 x 600 W	4 x 300 W	4 x 300 W	70 V$_{PEAK}$	33 A$_{PEAK}$	2.7 A	1.6 A	31.6 W	32.8 W	348 BTU/h	> 104 dBA	Yes	✓	QUATTROCANALI
2404	4 x 800 W	4 x 600 W	4 x 600 W	2 x 1600 W	2 x 1200 W	4 x 600 W	4 x 600 W	100 V$_{PEAK}$	45 A$_{PEAK}$	4.2 A	2.4 A	31.6 W	31.8 W	471 BTU/h	> 108 dBA	Yes	✓	
4804	4 x 1500 W	4 x 1200 W	4 x 1200 W	2 x 3000 W	2 x 2400 W	4 x 1200 W	4 x 1200 W	139 V$_{PEAK}$	45 A$_{PEAK}$	9.1 A	5.0 A	32.4 W	33.7 W	768 BTU/h	> 110 dBA	Yes	✓	
4K4	8 x 450 W	8 x 500 W	8 x 250 W	4 x 900 W	4 x 1000 W	8 x 500 W	8 x 500 W	65 V$_{PEAK}$	15 A$_{PEAK}$	6.6 A	3.9 A	50 W	77 W	839 BTU/h	> 107 dBA	Yes	✓	OTTOCANALI
8K4	8 x 850 W	8 x 1000 W	8 x 600 W	4 x 1700 W	4 x 2000 W	8 x 1000 W	8 x 1000 W	90 V$_{PEAK}$	23 A$_{PEAK}$	12.6 A	6.6 A	50 W	77 W	1504 BTU/h	> 107 dBA	Yes	✓	
12K4	8 x 1000 W	8 x 1500 W	8 x 850 W	4 x 2200 W	4 x 3000 W	8 x 1500 W	8 x 1500 W	150 V$_{PEAK}$	54 A$_{PEAK}$	18.5 A	9.7 A	50 W	77 W	2141 BTU/h	> 109 dBA	Yes	✓	
X8	8 x 5200 W	8 x 3000 W	8 x 1600 W	4 x 10400 W	4 x 6000 W			175 V$_{PEAK}$	130 A$_{PEAK}$	32 A	18 A			1946 BTU/h	> 110 dBA	Yes	✓	X SERIES
X4	4 x 5200 W	4 x 3000 W	4 x 1600 W	2 x 10400 W	2 x 6000 W			175 V$_{PEAK}$	130 A$_{PEAK}$	18 A	9 A			1058 BTU/h	> 110 dBA	Yes	✓	

*1/8 of max output power @ 4Ω
** DSP+D Versions Only,
   Ottocanali DSP+D- DSP+ETH Versions

*** Mezzo can't be bridged but power sharing
allows increased power per channel

Data subject to change without notice.

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