PRA-AR616 Router amplifier, 600W 16-zone

PRAESENSA



- Amplifier with integrated spare channel and relay-based router to drive up to 16 zone outputs
- Flexible line supervision with end-of-line devices or impedance monitoring, configurable per zone output
- Full supervision with integrated fail-safe redundancy
- Low power consumption and heat loss
- IP-networked on OMNEO for audio and control

The PRA-AR616 is a single-channel amplifier with an integrated relay-based router to drive up to 16 zones. The router amplifier can be used with both 100 V and 70 V loudspeaker systems in Public Address and Voice Alarm applications. The amplifier fits especially well in centralized system topologies, but also supports decentralized system topologies because of its OMNEO IP-network connection, combined with the DC-power from a multifunction power supply.
The loudspeaker loads share the 600 W of output power through the 16 relay outputs. The digital sound processing and control, which allow for better sound quality and speech intelligibility, are available for one channel and consistent across all zones.

Functions

Efficient 1-channel, 16 zones power amplifier

- Transformerless, galvanically isolated, 70/100 V outputs for a maximum total load of 600 W.
- The output power of 600 W is flexibly assigned to the loudspeaker loads due to the relay-routing topology.
- Cost- and space-saving, integrated, additional independent spare channel (maximum 600 W) for fail-safe redundancy.
- Class D amplifier channel with two-level power lines for high-efficiency in all operating conditions. The dissipation and the heat loss are minimized to save on energy and battery capacity for backup power.

Flexibility in loudspeaker topologies

- Sixteen zone outputs or up to eight A/B outputs support redundant loudspeaker wiring topologies. The outputs are individually supervised and disabled in case of a fault.
- Class A loop wiring possible between the A and B loudspeaker outputs.

General purpose control inputs and outputs

- Eight control inputs to receive signals from external systems with configurable connection supervision.
- Four voltage-free, single pole, double-throw (SPDT) relay contacts to activate external devices.
- Control input and output functions are software configurable.

Sound quality

- Audio-over-IP using OMNEO, the high-quality digital audio interface compatible with Dante and AES67; with an audio sample rate of 48 kHz with 24-bit sample size.
- Large signal to noise ratio, wide audio bandwidth and very low distortion and crosstalk.
- Digital signal processing, including equalization and limiting to optimize and tailor the sound. These are available for one channel and consistent across all zones.

Supervision

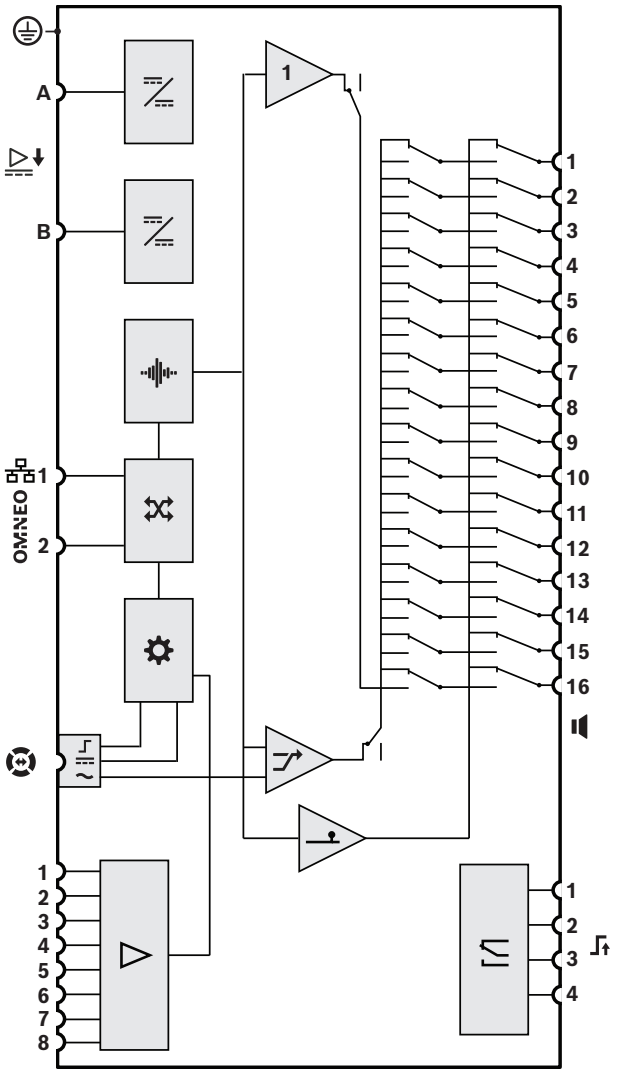
- Supervision of amplifier operation and all of its connections; faults are reported to the system controller and logged.

- Loudspeaker line integrity supervision without interruption of audio, using end-of-line devices (separately available) for best reliability.
- Loudspeaker line supervision with impedance measurement for a maximum of four branches. Each relay output supports impedance measurement for up to 300 m of cable length and 200 W. Cost-efficient monitoring through 22 nF capacitors on each branch.
- Line supervision with end-of-line devices or impedance monitoring can be configured per zone output.
- Network link supervision.

Fault tolerance

- Dual OMNEO network connections, supporting Rapid Spanning Tree Protocol (RSTP), for loop-through connections to adjacent devices.
- Dual 48 VDC inputs with polarity reversal protection, each with a full power DC/DC converter, operating in tandem for redundancy.
- The integrated spare channel (maximum 600 W) automatically replaces the failing channel, maintaining the sound processing settings.
- When configured, eight A and B zone outputs enable redundant loudspeaker wiring topologies.
- Backup analog audio lifeline input driving the spare amplifier channel to serve all connected loudspeaker zones in case both network connections, or the amplifier network interface, would fail.

Connection and functional diagram



	DC to DC converter	1	Main amplifier channel
	Audio processing (DSP)		OMNEO network switch
	Controller		Lifeline control interface
	Lifeline supply input		Lifeline audio input
	Spare amplifier channel		Control input processor
	Supervision amplifier channel		Control output relay

Front view



Front panel indicators and controls

	Spare channel substitute	White

	Signal Fault	Green Yellow
	Ground fault	Yellow
	Device fault	Yellow
	Audio lifeline substitute	White
	Network link to system controller Network link lost Amplifier in standby mode	Green Yellow Blue
	Power on	Green

Rear view



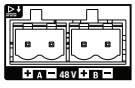
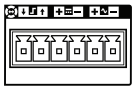
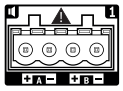
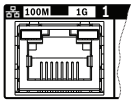
Rear panel indicators

	100 Mbps network 1 Gbps network	Yellow/orange Green
	Power on Device in identification mode	Green Green blinking
	Device fault	Yellow/orange

Rear panel controls

	Device reset to factory default	Button

Rear panel connections

	48 VDC input A-B	
	Lifeline interface	
	Loudspeaker output A-B	
	Control input 1-8	
	Control output 1-4	
OMNEO	Network port 1-2	
	Safety ground	

Architects' and engineers' specifications

The router amplifier shall be IP-networked and have a maximum 600 W 1-channel with an internal relay-based router for 16 zone outputs. It shall be designed exclusively for use with PRAESENSA systems. The amplifier shall route the audio to its connected loudspeaker load through 16 relay outputs, supporting 70 V or 100 V operation with direct drive capability and outputs that are galvanically insulated from ground. The amplifier shall have a built-in independent spare amplifier channel for automatic failover. The amplifier shall provide an interface for control data and multi-channel digital audio over OMNEO using dual Ethernet ports for redundant network connection, supporting RSTP and loop-through cabling, with automatic failover to an analog lifeline input. The amplifier shall have eight general purpose control inputs with connection supervision and four voltage free control outputs. The amplifier shall have dual power supply inputs and power supplies. The A and B zone outputs shall accommodate group loudspeakers with support for class-A loudspeaker loops for redundancy purposes. All relay outputs shall supervise the integrity of connected loudspeaker lines without interruption of audio distribution through end-of-line devices or configurable impedance monitoring. All connected loudspeaker lines shall be supervised. On the same amplifier, it shall be possible to configure each zone output with end-of-line devices supervision for best reliability or with impedance monitoring without interruption of audio. The amplifier shall provide front-panel LED status indications for the network link, ground fault, power supplies and zone outputs. The panel also shall provide additional software monitoring and fault reporting features. The amplifier shall be rack mountable (1U) and feature software-configurable signal processing including level control, parametric equalization and limiting. The amplifier shall be certified for EN 54-16 / ISO 7240-16, marked for CE and be compliant with the RoHS directive. Warranty shall be three years minimum. The amplifier shall be a Bosch PRA-AR616.

Regulatory information

Emergency standard certifications	
Europe	EN 54-16 (0560-CPR-182190000)

Emergency standard certifications	
International	ISO 7240-16

Emergency standard compliance	
Europe	EN 50849
UK	BS 5839-8

Regulatory areas	
Safety	EN/IEC/CSA/UL 62368-1
Immunity	EN 55035 EN 50130-4
Emissions	EN 55032 ICES-003 FCC-47 part 15B class A EN 62479
Environment	EN/IEC 63000

Installation/configuration notes

This is a professional product that should be installed, used and maintained by trained professionals only.

Parts included

Quantity	Component
1	Router amplifier, 600W 16-zone
1	Set of 19"-rack mounting brackets (pre-mounted)
1	Set of screw connectors and cables
1	Quick installation guide
1	Safety and security information

Technical specifications

Amplifier outputs

Nominal output voltage	
100 V mode, 1 kHz, THD <1%, no load (VRMS)	100 VRMS
70 V mode, 1 kHz, THD <1%, no load (VRMS)	70 VRMS

Maximum output power* / RMS power*	
100 V mode, load 16.7 Ω / 20 nF | 70 V mode, load 8.3 Ω / 20 nF	
Maximum loudspeaker load (W)	600 W
Maximum output power (W)	600 W
RMS power (W)	150 W
DC offset voltage (mV)	< 50 mV
*EIAJ test standard, 1 kHz, 8/40 ms	

Signal processing	
Master EQ	7-band
Level control (dB)	0 dB – -60 dB, mute
Level control resolution (dB)	1 dB
RMS power limiter	RMS power

Lifeline	
Input sensitivity (dBV) (100 V output)	0 dBV
Mute attenuation (dB)	> 80 dB
Minimum signal-to-noise ratio (dBA)	> 90 dBA

Acoustic

Full to no load regulation (dB) (20 Hz to 20.000 Hz @ 1 kHz)	< 0.4 dB
Frequency response (-3 dB) (Hz) (RMS power, +0.5 W)	20 Hz – 20,000 Hz
Total harmonic distortion + noise (%)	< 0.30%
Intermodulation distortion (19/20 kHz) (%) (6 dB below RMS power, 1:1)	< 0.50%
Minimum signal-to-noise ratio (dBA) (100 V mode, 20 Hz to 20 kHz)	110 dBA
Minimum signal-to-noise ratio (dBA) (70 V mode, 20 Hz to 20 kHz)	107 dBA
Crosstalk between Main and Supervision power stages (dBA)	< -84 dBA

Electrical

Loudspeaker load	
Loudspeaker load (maximum) (W)	600 W
Maximum output power (W) *	600 W
RMS power (W)	150 W
Minimum output load impedance (Ω) (100 V mode)	16.70 Ω
Minimum output load impedance (Ω) (70 V mode)	8.2 Ω
Maximum cable capacitance (nF)	2 nF
DC offset voltage (mV)	< 50 mV
*EIAJ test standard, 1 kHz, 8/40 ms	

Power transfer

Input voltage (VDC)	48 VDC
Input voltage (VDC) (tolerance)	44 VDC – 60 VDC
Power consumption, 48 V	
Power consumption (W), sleep mode, no supervision	3.9 W
Power consumption (W), snooze mode, supervision active	4.5 W
Power consumption (W), active mode, idle	25 W
Power consumption (W), active mode, low power	45 W
Power consumption (W), active mode, RMS power	229 W
Power consumption (W), per active port	0.4 W
Heat loss, including power supply	
Maximum heat loss (BTU/h), active mode, idle	102 BTU/h
Maximum heat loss (kJ/h), active mode, idle	108 kJ/h
Maximum heat loss (BTU/h), active mode, low power	171 BTU/h
Maximum heat loss (kJ/h), active mode, low power	180 kJ/h
Maximum heat loss (BTU/h), active mode, full power	273 BTU/h
Maximum heat loss (kJ/h), active mode, full power	288 kJ/h

Supervision	
End-of-line detection mode	Pilot tone supervision, 25.5 kHz, 3 VRMS
Power supply input A/B	Undervoltage
Ground short detection (loudspeaker lines)	< 50 kohm
Amplifier channel redundancy switching	Internal spare channel
Amplifier channel load	Short circuit
Loudspeaker line redundancy switching	A/B group, Class-A loop
Controller continuity	Watchdog
Temperature	Overheat
Fan	Rotation speed
Network interface	Link presence

Network interface	
Ethernet type	100BASE-TX; 1000BASE-T
Ethernet protocol	TCP/IP
Redundancy	RSTP
Control/Audio protocol	OMNEO
Latency (ms) of the network audio	10 ms
Audio encryption	AES 128
Security	TLS
Number of Ethernet ports	2

Reliability	
Mean time between failures (MTBF) (h) (extrapolated from calculated MTBF of PRA-AD608)	300,000 h

Environmental	
Operating temperature (°C)	5 °C – 45 °C
Operating temperature (°F)	41 °F – 113 °F
Storage temperature (°C)	-30 °C – 70 °C
Storage temperature (°F)	-22 °F – 158 °F
Operating relative humidity, non-condensing (%)	5% – 90%
Air pressure (hPa)	560 hPa – 1,070 hPa
Installation altitude (m)	-500 m – 5,000 m
Installation altitude (ft)	1,640 ft – 16,404 ft
Operation vibration	
Amplitude (mm)	≤ 0.70 mm
Acceleration (G)	≤ 2 G
Bump (transport) (G)	< 10 G (IEC 60068-2-27)
Fan airflow	Front to sides/rear
Fan noise, 1 m distance (dBSPLA). idle condition	< 36 dBSPLA
Fan noise, 1 m distance (dBSPLA), RMS power	< 53 dBSPLA

Mechanical	
Dimensions (H x W x D) (mm)	44 mm x 483 mm x 400 mm

Dimensions (H x W x D) (in)	1.76 in x 19 in x 15.7 in
Weight (kg)	8.25 kg
Weight (lb)	18.19 lb
Rack unit (U)	1 U
IP rating	IP30
Color (RAL)	RAL 9017 Traffic black

Ordering information

PRA-AR616 Router amplifier, 600W 16-zone
Network-connected, DC-powered, 1 channel for 16 zones, 600 W power amplifier with integrated spare channel and DSP functions.
Order number **PRA-AR616 | F.01U.415.397**

https://www.keenfinity-group.com

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