

X4 Amplifier Platform

Architect's and Engineer's Specifications

The amplifier shall be a four-channel model with a switch mode power-supply with power factor correction and bridgeable switch mode fixed frequency class D output circuit topology.

The amplifier shall operate in a wide range of mains voltage – namely from 85 V up to 460 V – and suites any distributing alternating-current electrical power configuration (single-phase, bi-phase or three-phase) without need of manual selection, nominally: single-phase 100 - 240 Vrms, 50/60 Hz, three-phase 200 - 415 Vrms. The amplifier's power supply shall have a power factor greater than 0.9 when driving a 4 ohm load at 1/8 of the maximum output power.

The AC mains connection shall be provided by means of an euroblock Phoenix DFK-PC 5/ 5-STF-7,62 connector for being plugged with the Phoenix PC 5/ 5-STF1-7,62 flying plug.

The amplifier shall have internal heat sinks cooled by continuously variable speed fans: air flow shall be from front to rear.

The amplifier shall implement a full featured 40 bit floating point internal precision DSP platform embedding a complete digital audio signal management system that provides non-boolean signal routing and mixing, multi-stage equalization with raised-cosine, IIR and FIR filters, multi-stage 150 ms + 2 s + 100 ms delays, gain and polarity adjustment, crossover, peak limiters, true power limiters and active damping control.

The processing architecture shall encompass the following stages: input source selection with backup policy, aimed to manage input gain and delay of analog and digital sources and automatic switch to a reliable input connection in case of any signal fault; matrix, providing a non-boolean routing architecture that allows free channel assignment and level adjustment; input processing, aimed to optimize levels and shape the sound of the input signals; speaker processing, designed to offer effective filters for loudspeaker performance optimization; speaker routing, aimed to suit the configuration of multi-way loudspeakers; output processing, featuring crossover, IIR filters, limiters, delay and damping control on output channels, aimed at fine tuning the output signals and optimize the power delivered to the loudspeaker.

The unit shall implement built-in networking capability providing full remote management of multiple devices through dedicated software running on an external PC. The amplifier shall provide local WiFi connectivity for monitoring and basic settings activity via mobile devices.

The unit shall support linear daisy-chain, star and loop wired network topologies, Fast Ethernet (IEEE 802.3u, 100 Mbit/s) and Gigabit Ethernet (IEEE 802.3ab, 1 Gbit/s) networks and provide the Zeroconf networking methodology as well as auto IP addressing and static IP addressing.

The amplifier shall support Dante™ communication protocol and Dante™ redundant networking.

The front panel of the amplifier shall implement one USB port, one WiFi on/off switch button, four dual rgb back illuminated switch button aimed to toggle the mute command on related channels, one dual rgb back illuminated main on/off switch button, one callback button aimed to reveal the unit on the dedicated management software running on an external PC within the network.

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The dual rgb back illuminated buttons shall light on with different colors and fashions according to the channel status: channel ready, mute, limiters engaged, signal presence, input clipping, channel fault, standby mode.

The rear panel of the amplifier shall implement four analog input XLR connectors, two AES3 digital input XLR connectors, two output Neutrik NL4MD speakON connectors, two Neutrik etherCON connectors for networking and Dante™ communication, one AC mains Phoenix DFK-PC 5/ 5-STF-7,62 connector.

Each channel shall meet the following performance criteria: 1600 W maximum output power per channel at 8 ohm, 3000 W maximum output power per channel at 4 ohm, 4000 W maximum output power per channel at 2.7 ohm, 6000 W maximum output power at 8 ohm bridged, 10400 W maximum output power at 4 ohm bridged; 175 V_{peak} maximum unclipped output voltage, 130 A_{peak} maximum output current; output noise < 70 dB A-Weighted at 8 ohm - Analog to Analog / Digital to Analog, dynamic range 114,3 dB A-Weighted at 8 ohm - Analog to Analog / Digital to Analog, damping factor at 8 ohm (20Hz - 500Hz) > 5000, slew rate (input filter bypassed) > 50 V/μs, 5 Hz - 30 kHz frequency response (-3 dB , 1 W at 8 ohm), -70 dB crosstalk (1 kHz), THD+N (from 0.1 W to Full Power) < 0.5% (typical < 0.01%), DIM (from 0.1 W to Full Power) < 0.5% (typical < 0.01%), 20000 ohm balanced input impedance, +25 dBu input acceptance.

The dimensions of the amplifier shall allow for 483 mm (19 in) EIA standard RS-310 rack mounting and it shall occupy one rack unit; the amplifier shall be 44.5 mm (1.75 in) tall and 450 mm (17.7 in) deep behind the rack-mounting surface. The amplifier's weight shall not exceed 15 kg (33.0 lb).

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