

ARCHITECT & ENGINEERS SPECIFICATION

ALC-404D

4 x 400W AMPLIFIED LOUDSPEAKER CONTROLLER + DSP AND DANTE®

The Amplified Loudspeaker Controller shall provide four channels of power amplification and digital signal processing with analog and Dante inputs. Total available power can be safely distributed asymmetrically across the outputs in any combination of low impedance and 70V/100V loads in single ended and/or bridged configurations. Power delivered from each output is individually monitored and automatically limited to the stated, safe operating ranges. Total shared power available per amplifier is monitored and limited separately by the internal microprocessor-controlled power supply. A manufacturer-authored loudspeaker preset library is included within the Biamp Community OEM Plugin for the ArmoniaPlus™ software and shall include manufacturer-optimized equalization, high pass filters, multi-stage limiters, and other model-specific control settings tailored to each loudspeaker, ensuring consistent sound quality and complete loudspeaker protection.

The amplifier shall include a switch mode power supply with power factor correction, smart rail management and bridgeable switch mode fixed frequency Class D output circuit topology. The amplifier shall operate from 100V - 240V, -10% / +10% 50/60 Hz, universal AC input power with minimum voltage for power up at 90V and shall draw 251W (1.4A @ 230V) or 227W (2.1A @ 115V) when driven with pink noise signal at 1/8 of rated power into 4 ohm loads. The power supply of the amplifier will integrate Power Factor Correction (PFC), in order to minimize interference with the electrical grid.

The amplifier shall be provided with an IEC C20 main detachable connector and power cord set with IEC C20 connector on amplifier side and Schuko plug for EU and 3 Pin American plug on the other. The amplifier shall have internal heat sinks cooled by a continuously variable speed fan with a Microprocessor Temperature Control. Airflow shall be from front to rear. The amplifier shall be able to drive low impedance loads (2/4/8 ohms) and 70V/100V distributed lines selectable per channel by using dipswitch settings at the rear panel of the amplifier. Furthermore, it shall be able to provide more than 32 different possible output configurations (lo-Z, hi-Z, bridge mode, parallel mode, and combinations of these). The amplifier shall deliver a maximum output power per channel of; 400W at 8Ω; 400W at 4Ω; 400W at 2Ω; 800W at 8Ω bridged; 800W at 4Ω bridged; 400W at 100V and 400W at 70V.

The amplifier shall have energy save capabilities that can be activated for each channel pair. In Energy Save mode, the amplifier shall enter a low power consumption idle state when no signal activity is detected for more than 4 seconds. Normal operation shall be resumed in a matter of milliseconds when an incoming signal is detected on the channel pair. In Energy Save mode, the power consumption shall not exceed 20W @ 230V or 20W @ 115V (0.46A @ 230V or 0.46A @ 115V). In Idle mode, the amplifier shall not absorb more than 31.5W @ 230V or 31.1W @ 115V (0.25A @ 230V or 0.45A @ 115V). Thermal dissipation of the amplifier will not exceed 344 BTU/h (@230V) and 261 BTU/h (@115V) when at 4 ohm at 1/8 of maximum power.

The amplifier shall contain a DSP board for real-time audio processing not exceeding a 2.5ms fixed latency architecture. As part of the DSP the amplifier will offer a 4 x 4 matrix for all analog and digital inputs. Integrated in the DSP will be filters per channel offering raised-cosine, custom FIR, parametric IIR, peaking, hi/lo-shelving, all-pass, band-pass, band-stop, hi/lo-pass filters and a crossover linear phase (FIR), Butterworth, Linkwitz-Riley, Bessel: 6 dB/oct to 48 dB/oct (IIR).

For time alignment the DSP in the amplifier will offer Delay 2s (input) + 100ms (output). The limiters in the DSP will contain TruePower™, RMS voltage, RMS current and Peak limiters. Active DampingControl™ and LiveImpedance™ measurement will be part of the DSP. The internal memory of the amplifier will contain predefined presets with cross-over settings and will allow for 200 user presets and snapshots to be stored. The amplifier will offer pilot tone sensing on all inputs and outputs, redundant input switch over, pilot tone backup strategy with delay compensation, output load monitor and output load detection. Network audio expansion shall be provided by the Dante protocol with a capacity of 4 x 4 channels. Connectors shall be gigabit RJ45 utilizing CAT6 cable.

Remote control and monitoring of the status of the amplifier shall be provided by an RJ45 port separated from the Dante port. The amplifier shall be equipped with remote On/Off contacts and gain selection switches which will allow the amplifier to operate with 26, 29, 32 and 35 dB gain applied to the input signal. The amplifier shall be capable of implementing HPF filter to either 35 Hz or 70 Hz configurable per channel, but is redundant and need not be implemented when the amplifier is operated using the manufacturer-authored loudspeaker presets.

The amplifier shall implement triggering signals to broadcast alarms by providing a pair of paralleled general purpose output connections per channel: one Normally Open (NO) and one Normally Closed (NC). The GPO contacts will be used to report potentially dangerous faults or generally unsafe operation conditions by toggling alarm switches relative in case of no AC mains, thermal stress, short circuit in output wiring, amplifier is in Standby and any fault preventing the normal operation of an output channel. The amplifier shall offer remote level adjustment for each output channel. For ease of work the amplifier will offer a CH1 Master setting that will allow remote control channel one to control the volume for all of the channels of the amplifier.

The amplifier shall have a synchronized off-on muting, acting for four seconds after turn-on and within 500 mS after turn-off or loss of AC power. Each channel shall have DC protection in order to protect against infrasonic signals and very low frequencies at the output stage that could damage loudspeakers. Each channel shall have VHF protection in order to protect loudspeakers from strong, very high frequency signals. Each channel shall have circuitry to protect against short circuits or other stressful output circuits events. Each channel shall have an independent clip limiter in order to prevent severely clipped waveforms from reaching the loudspeakers, while maintaining full peak power. Each channel shall have long term limiters in order to protect loudspeakers against non-musical signals such as sine waves, feedback signals, etc.

The amplifier shall contain a module which shall connect the amplifier to 100 Mbps Ethernet networks, allowing it to be remotely controlled and monitored via proprietary software running on an external PC. The amplifier front panel shall provide ON LED and STANDBY LED, ArmoniaPlus ID push button, Soft Reset push button, Hard Reset push button, Self-Check function, Status LED strip, LED signal metering per channel, level potentiometer per channel, power push button and a USB port reserved for servicing. The amplifier rear panel shall provide AC mains connector, Phoenix output connectors, Phoenix line input connector, Phoenix GPI connector, Phoenix GPO connector, Phoenix, RJ45 Ethernet connector, RJ45 Dante connector, system configuration dip switches and output configuration dip switches. The amplifier shall be the Biamp Community ALC-404D.