PLM 12K44

Overview and Functions

The unit shall comprise a four-in/four-out digital loudspeaker drive processor with power amplifier outputs. Additional capabilities and facilities shall include load verification and real-time performance monitoring; low-latency, Ethernet-based audio networking; third-party control system compatibility using custom middleware; control and monitoring of internal parameters from a remote computer; and optional software integration of industry-standard acoustical measurement tools. All control, monitoring and measurement facilities shall be remotely accessible via a custom PC software interface supplied with the unit. The included integrated software package also shall include a custom amplifier configuration interface and additional features to expedite system design, specification and commissioning.

Digital Loudspeaker Processing

The unit shall include four discrete modules of digital loudspeaker processing. Audio inputs shall be analog with floating ground isolation, AES3 digital, AES67 and dual redundant Dante Ethernet-based network. Auto failover switching among inputs shall be user programmable. Facilities shall be provided for flexible input mixing and routing. DSP capabilities shall include raised cosine equalization, FIR, linear-phase and classical crossovers, and peak and RMS limiters.

Power Amplifier

Maximum total power output (all channels driven) shall be 12,000 W or 3,000 W per channel nominal at 4 ohms. The amplifier topology shall allow flexibility in output power management, with the capability to allocate total available power across output channels as needed for the application. Any channel shall be capable of being significantly scaled up in order to distribute the output power, up to 5900 W into optimal impedance. Maximum peak output voltage shall be 194 V and maximum output current shall be 67 A. When adjacent channels are bridged, power output per channel shall be 8800 watts into 8 ohms, 9600 watts into 4 ohms and 10000 watts into 4.4 to 6.6 ohms. The amplifier shall incorporate power factor correction (PFC) to reduce requirements on the mains distribution system. Amplifier gain shall be digitally configurable from 22 dB to 44 dB. The unit shall exhibit the following performance parameters: Frequency response shall be 20 Hz – 20 kHz ± 0.05 dB (1 W into 8 ohms). Dynamic range shall be >114 dB. Propagation delay shall not exceed 1.61 ms for AES3 input (96 kHz) or 1.68 ms for analog input. The unit shall incorporate a DSP-implemented zero overshoot voltage peak limiter adjustable per channel for voltage threshold and profile.

Load Verification and Circuit Protection

The unit's DSP and on-board firmware, in conjunction with supplied PC control software and loudspeaker database, shall enable the unit to verify that loudspeaker loads are connected as intended, and to identify defective drivers or faulty wiring. The DSP and associated software also shall allow real-time monitoring of critical performance parameters for both the power amplifier section and connected loudspeakers. Circuits and sensors shall be provided for warning and protection against VHF (Very High Frequencies), DC at output, over-temperature, open load, excessive current, and voltage peak clipping.

Connectors, Network, and User Interfaces

The rear panel shall provide inputs for analog signals on four XLR-F connectors and for AES3 digital signals on two XLR-F connectors. In addition, two etherCON® housed RJ45 Ethernet jacks shall be provided for AES67 and Dante networked digital audio as well as monitoring and control via remote PC. The unit shall be compatible with use as part of a low-latency, self-configuring digital audio network that supports sampling frequencies of 48 and 96 kHz. Output connectors on the unit shall be either binding post or Neutrik® speakON® (2 x NLT4 and 1 x NLT8). The front panel user interface shall include a high-brightness 2.5-inch LCD panel, a moisture-resistant silicone touch pad, and a rotary encoder. The user interface shall be menu-driven, with screen displays and soft-keys accessing functions of the digital loudspeaker processor and the power amplifier. Dedicated keys shall be provided for Mute Enable, Meter and Menu functions. Multicolor LEDs shall indicate presence of any warning or fault conditions. The unit shall be supplied with a custom software program for comprehensive monitoring of system status and operating parameters, as well as control of DSP and amplifier functions. The software program shall be compatible with use on a Tablet PC, and shall offer plug-in integration of proprietary audio and acoustical measurement tools in the same user interface.

Power Supply, Protection, and Cooling

The power supply shall be a universal regulated switch mode type operating at voltages from 70 V to 265 V at line frequencies of 45 Hz to 66 Hz. Under-voltage limiting shall enable continued operation with line sags as low as 65 V. A soft start circuit shall limit current inrush at power-up to 8 A. A power average limiter shall incorporate a software-control breaker emulation to prevent tripping of mains fuses. The amplifier shall be cooled by three temperature-controlled, variable-speed fans, with air flow from front to back

Physical

The unit shall be 483 mm (19 in.) wide, 88 mm (3.5 in / 2 U) high, and 498 mm (19.6 in.) deep including handles and rear support. The weight shall be 16.5 kg (36 lbs). The chassis housing shall be black painted steel with a black painted steel and aluminum front surround and handles. The unit shall be approved for use as specified by CE, ANSI / UL 60065 (ETL), CSA C22.2 NO. 60065, PSE, RCM, FCC and BIS India. The unit shall be the Lab.gruppen PLM 12K44.