



CB-PLM12K44 Amplifier



Features and Benefits

- 4 x 3000 W nominal output power for a total of 12000 W
- Any channel is capable of delivering up to 5900 W power output, from total available power
- 2U chassis weighing only 16.5 kg
- Four 'Lake Class' analog inputs with Iso-Float™ ground isolation
- Two AES3 on XLR digital inputs (4 audio channels)
- Eight dual-redundant Dante network audio inputs and outputs
- Compatible with PLM, Lake, LM Series and D Series
- Rational Power Management (RPM) - Flexible power output allocation across channels of the 12K44 model to match requirements, enabling more efficient use of amplifier inventory
- Copper-finned Intercooler with transverse-mounted output devices
- Rugged - road tested construction
- Unique universal, Regulated Switch-Mode Power Supply (R.SMPS™) maintains stability despite mains voltage fluctuations
- Best-in-class Power Factor Correction (PFC) helps maintain full output during extended power bursts
- Current Draw Modelling (CDM™) reduces mains peak draw
- Breaker Emulation Limiter (BEL™) - Tailors CB-PLM+ Series to the available mains distribution
- Under-Voltage Limiting (UVL) enables continued operation with mains voltage sags as low as 65 V
- Power Average Limiter (PAL) with software-controlled Breaker Emulation Limiter (BEL) prevents mains fuse tripping
- Amplifier Design: Class TD® output stage
- Digitally controlled and recallable 'amplifier gain' adjustable in 0.1 dB steps
- Digital output attenuation in 0.25 dB steps from -inf to 0 dB
- Digitally implemented, zero-overshoot Inter-Sample Voltage Peak Limiting (ISVPL) adjustable in 0.1 V steps from 17.8 to 194 V
- LoadSmart load verification
- Extensive loudspeaker preset database (LoadLibrary™)
- LoadPilot™, Dual Pilot tone Generating and Monitoring
- CAFÉ Integration
- Dante low-latency digital network included as standard
- Full support for Dante Controller
- Lake's exclusive classic/linear-phase/FIR speaker processing platform with four throughputs
- Group control with Raised Cosine™ MESA EQ™ asymmetric filters
- LimiterMax™ peak and RMS limiters
- Comprehensive clocking management system with low latency sample rate conversion
- Multiple and redundant inputs with programmable fallover
- Primary and secondary network connections
- High-resolution daylight viewable front-panel LCD display
- Moisture resistant silicone touchpad for front-panel display mode selection and menu navigation

CB-PLM+ Powered Loudspeaker Management System

The CB-PLM+ range sets the benchmark for Powered Loudspeaker Management Systems. CB-PLM+ combines four channels of amplification with unrivalled signal processing and audio management, allowing complete integration in the devices and offering many unique functions not found in other amplifier and DSP "combined" platforms.

CB-PLM+ has been designed with total integration at the core of the system, allowing complete control and monitoring of the whole platform ecosystem – including networking, audio I/O, signal processing, amplifiers, power supply and connected mains supply – delivering unique operational benefits and system control for the user via Lake Controller, CAFÉ and Third Party Protocol integration.

Building on the TEC Award winning PLM 20000Q, CB-PLM+ offers 4 x 5000 Watts output power (CB-PLM 12K44), twice the processing power and throughput, and a whole host of additional features and improvements designed to offer real world benefits. CB-PLM+ makes any production life cycle easier to specify, smoother to run, more efficient to control and monitor – at the system design stage, during the show, and right through to final load out. Proven at all levels of concert touring, the CB-PLM+ series incorporates road tested and environmentally conscious technologies.

The CB-PLM 12K44 offers a touring technology first: Rational Power Management (RPM™), a new proprietary Lab.gruppen innovation that rationalises power allocation between channels to optimise performance and potentially minimise amplifier inventory.

As with previous generations of PLM, the new CB-PLM+ models benefit from the proven package of onboard Lake Processing and Dante™ digital audio networking, plus redundant audio inputs as well as onboard load monitoring to fulfill the requirements of mission-critical live sound applications, where the show must go on, no matter what.

CB-PLMI2K44 Amplifier



Specifications

General

Processing / Network	Lake / Dante
Numbers of amplifier channels	4
Total burst power all channels (share among channels with RPM)	12000 W

Max. Output Power (all ch.'s driven) 1)

2 ohms	3000 W
2.67 ohms	3000 W
4 ohms	3000 W
8 ohms	1900 W
16 ohms	950 W
Hi-Z 70 V	3000 W
Hi-Z 100 V	3000 W

Max Output Power Single Channel 1)

2 ohms	4400 W
2.67 ohms	5900 W
4 ohms	4600 W
8 ohms	2300 W
16 ohms	1150 W
Hi-Z 70 V	3300 W
Hi-Z 100 V	4700 W

Amplifier Output Modules (all models, all channels)

Peak output voltage	194 V
Max output current	67 A
Rational Power Management (RPM)	Any channel has potential to deliver the max single channel output power
Default voltage limitation (can be lifted with RPM configuration)	175 V
Protection features	Current Average Limiter (CAL), Very High Frequency Protection (VHF), Direct Current Protection (DC), Short Circuit Protection, Current-Clip Limiter, Voltage Clip Limiter, Temperature protection

Audio Performance (Amplifier platform with digital input)

THD + N 20 Hz - 20 kHz for 1 W	< 0.05 %
THD + N at 1 kHz and 1dB below clipping	< 0.04 %
Dynamic range	> 114 dB
Channel separation (Crosstalk) at 1 kHz	> 70 dB
Frequency response (1 W into 8 ohm, 20 Hz - 20 kHz)	+/- 0.05 dB
Internal sample rate / Data path	96 kHz / 32 bit floating point
Product propagation delay AES 96 kHz / analog input	1.61 / 1.68 ms

Lake Processing

Loudspeaker processing	Up to 4 modules of Classic/linear-phase/FIR crossover, EQ, delay, LimiterMax™ - peak and RMS limiters
System tuning	Group control with Raised Cosine™ MESA EG™ asymmetric filters
Input redundancy / Matrix	Automatic 4 level input redundancy / 4 input mixers
System integration	Comprehensive 3rd party protocol over UDP Ethernet

Measurement & Analysis

Pilot tone generation and analysis	Yes
Load impedance analysis	Yes
Real Time Analyzer (RTA), 3rd party integration	Yes

Dante Audio Network

Dante I/O	8 x 8
Network topology / redundancy	Flexible topology / Supports daisy-chained and Dual redundant networks
Sample rates / transport	48, 96 kHz / Uni + Multicast
Network latency	0.25, 0.5, 1.0, 2.0, 5.0 ms

Device Presets

Local memory locations for the settings of the product	100
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AES Inputs

Inputs	4 AES inputs
Supported sample rates / resolution	44.1, 48, 88.2, 96, 176.4, 192 kHz / up to 24 bits
Sample rate conversion THD + N 20 Hz - 20 kHz unweighted	0.00003 %

Analog Inputs

Inputs	4 high quality inputs with Iso-Float™ ground isolation
Maximum input / digital reference	+ 26 dBu / + 21 dBu
Sampling rate / resolution	96 kHz / 24 bit
Input impedance balanced / unbalanced	20 k / 10 k ohm
THD + N (typical at 1 kHz unweighted)	0.00022 %
THD + N (typical at 20 Hz and 20 kHz unweighted)	0.00033 %

Limiters

Adjustable Inter-Sample Voltage Peak Limiter (ISVPL)	17.8 - 194 V, step size 0.1 V
Current Peak Limiter < 300 ms	67 A peak
Current Average Limiter (CAL) > 300 ms	33 Arm
LimiterMax (rms and peak limiters)	
MaxRMS (rms voltage limiter)	Yes
MaxPeak (peak voltage limiter)	Yes

Gain

Amplifier gain	22 - 44 dB, step size 0.1 dB
Digital attenuator	- Inf to 0 dB, step size 0.25 dB

Rear-panel interface

Analog input	4 x 3 pin XLR, electronically balanced
AES inputs	2 x 3 pin XLR
Output Connectors	Neutrik speakON (1 x NLT8, 2 x NLT4) or 4 binding posts (pairs)
Auto 100/1000, Auto Uplink	2 x RJ45 etherCON
Control and monitoring interface	Via Ethernet for Lake Controller software, or DLM (the 3rd party protocol)
Detachable mains cord	Neutrik powerCON 32 A
Cooling	Three fans front-to-rear airflow, temperature controlled speed

Front-panel interface

Display	2.5 inch, Black / white, daylight readable LCD
Fault / Warning / Limit / Clip indicators	RGB LED's and detailed fault description on display
Mute and soft function buttons	8 provided
Standby Power button	On / Standby
Mute Enable button	Enables muting of outputs and inputs via soft-button keypad
Meter button	Toggles through meter views
Menu button	Provides a menu driven interface for full function front panel control
Rotary Encoder	Yes
Exit button	Provides a "back" function

Mains power

Nominal voltage	100 - 240 V AC 45- 66 Hz
Operating voltage	70 - 265 V AC
Mains wall plug	NEMA L5-30 "Twist lock" 125 V / 30 A, and CEE 7/7 "Schuko" 230 V / 16 A

Power supply features

Soft start / Inrush power	Yes
Power Factor Correction (PFC)	> 0.98 for mains power > 400 W
Regulated switch mode power supply	Yes
Breaker Emulation Limiter (BEL)	Configurable current threshold and breaker profile
BEL max current threshold	25 A
Power Average Limiter (PAL)	Yes
Under Voltage Limiter (UVL)	Yes
Mains under voltage and overvoltage protection and mains glitch tolerance	Yes

Dimensions

Rack rail to rear panel	W: 483 mm (19"), H: 88 mm (2 U), D: 424 mm (16.7")
Overall depth including handles and rear support	D: 498 mm (19.6")

Weight

Weight	16.5 kg (36 lbs)
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Finish

Finish	Black painted steel chassis with black painted steel / aluminium front
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Approvals

Approvals	CE, ANSI / UL 60065 (ETL), CSA C22.2 NO. 60065, FCC, PSE, RCM, BIS India
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Note 1): Lab.gruppen burst power (1 kHz, 25 ms burst power @ 150 BPM, 12 dB Crest factor)

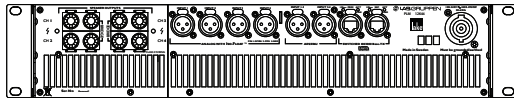
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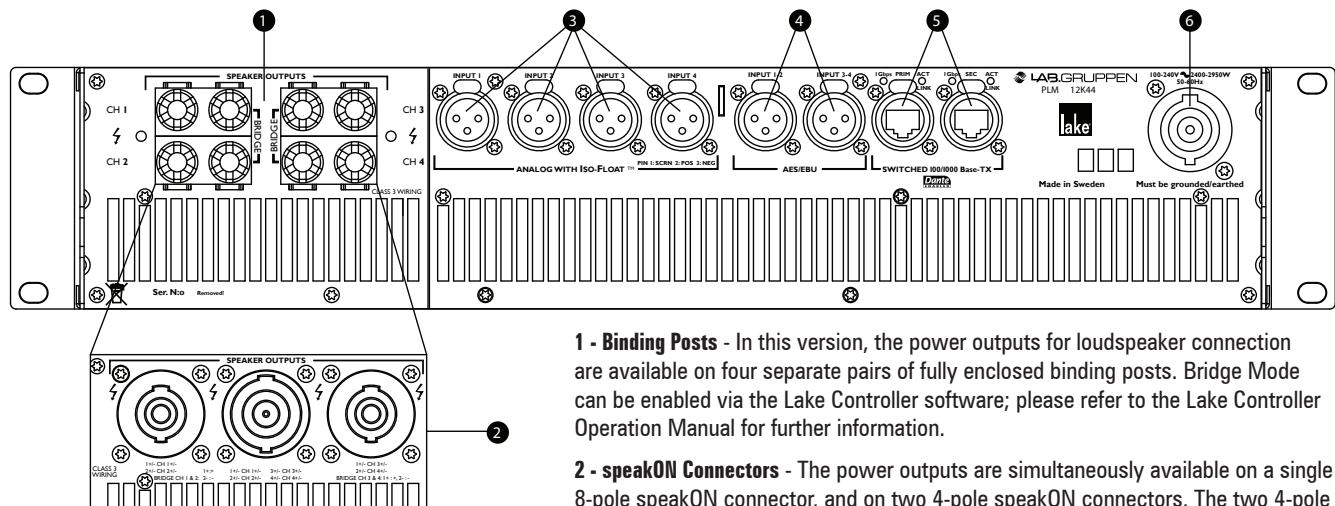
The CB-PLM+ is available with a choice of connectors for power outputs: binding posts or Neutrik speakON®. Both connection methods allow for Bridge Mode operation, which is activated from the Lake Controller software.



The front panel is the “local control center” of the CB-PLM12K44. An intuitive, menu driven interface allows quick access to key functions using the moisture resistant silicone touchpad.



Information is clearly displayed on the daylight-readable, 2.5” LCD panel. The soft-button keypad and precision rotary encoder provides control of processing and amplification functions with key lock available.



1 - Binding Posts - In this version, the power outputs for loudspeaker connection are available on four separate pairs of fully enclosed binding posts. Bridge Mode can be enabled via the Lake Controller software; please refer to the Lake Controller Operation Manual for further information.

2 - speakON Connectors - The power outputs are simultaneously available on a single 8-pole speakON connector, and on two 4-pole speakON connectors. The two 4-pole connectors carry the outputs of channels 1 & 2 and 3 & 4 respectively. Bridge Mode can be enabled via the Lake Controller software. Please refer to the Lake Controller Operation Manual for further information.

3 - Analog Inputs - Analog inputs are available on four standard XLR3F latching connectors. The inputs are electronically balanced and feature Lake Iso-Float circuitry. The impedance is 20 kohms, and the inputs can accept a maximum input level of +26 dBu.

4 - AES3 Inputs - Two latching XLR3F connectors are provided for AES3 digital audio signals (four audio channels). Input impedance is 110 ohms, please ensure that 110 ohm digital audio cables are used; standard XLR microphone cables are rarely suitable for reliable digital audio transmission.

5 - Primary Network Connector - The primary Neutrik RJ45 etherCON® connection provides integration into an Ethernet control network which may include other Lake Processors and the Lake Controller software. Network connection permits full control of all functions along with real-time metering from a remote position. This device supports the Dante audio networking protocol, which allows transmission of multichannel, high-definition digital audio over the same Ethernet connection.

Use the primary connector when using a star network topology, consisting of individual Cat-5e connections between the devices and an Ethernet switch. Alternatively this connection can be used to daisy chain directly to another Lake Processor. The daisy chain topology should not be used with Dante.

6 - Secondary Connector - The secondary network connector can be used to daisy-chain multiple LM, PLM, PLM+ or D Series devices. Alternatively, a Dante dual-network topology can be created by connecting all secondary network connectors to a separate Ethernet switch, ensuring full redundancy in the event of a network component failure.