



# CB-PLM5K44 Amplifier



## Features and Benefits

- 4 x 1250 W nominal output power for a total of 5000 W
- Any channel is capable of delivering up to 2000 W power output, from total available power
- 2U chassis weighing only 11.4 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 CB-5K44 model to match requirements, enabling more efficient use of amplifier inventory
- 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 65V
- Power Average Limiter (PAL) with software-controlled Breaker Emulation Limiter (BEL) prevents mains fuse tripping
- Amplifier Design: Class D 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 150 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 1250 Watts output power [CB-PLM5K44], 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-PLM5K44 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-PLM5K44 Amplifier



## Specifications

<b>General</b>	
Processing / Network	Lake / Dante
Numbers of amplifier channels	4
Total burst power all channels (share among channels with RPM)	5000 W
<b>Max. Output Power (all ch.'s driven) <sup>1)</sup></b>	
2 ohms	900 W
2.67 ohms	1250 W
4 ohms	1250 W
8 ohms	1250 W
16 ohms	700 W
Hi-Z 70 V	1300 W
Hi-Z 100 V	1250 W
<b>Max Output Power Single Channel <sup>1)</sup></b>	
2 ohms	900 W
2.67 ohms	1250 W
4 ohms	1750 W
8 ohms	1350 W
16 ohms	700 W
Hi-Z 70 V	1450 W
Hi-Z 100 V	2000 W
<b>Amplifier Output Modules (all models, all channels)</b>	
Peak output voltage	150 V
Max output current	30 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)	147 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
<b>Audio Performance (Amplifier platform with digital input)</b>	
THD + N 20 Hz - 20 kHz for 1 W	< 0.05 %
THD + N at 1 kHz and 1dB below clipping	< 0.04 %
Dynamic range	> 112 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
<b>Lake Processing</b>	
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
<b>Measurement &amp; Analysis</b>	
Pilot tone generation and analysis	Yes
Load impedance analysis	Yes
Real Time Analyzer (RTA), 3rd party integration	Yes
<b>Dante Audio Network</b>	
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
<b>Device Presets</b>	
Local memory locations for the settings of the product	100
<b>AES Inputs</b>	
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 %
<b>Analog Inputs</b>	
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 %
<b>Limiters</b>	
Adjustable Inter-Sample Voltage Peak Limiter (ISVPL)	17.8 - 150 V, step size 0.1 V
Current Peak Limiter < 300 ms	30 A peak
Current Average Limiter (CAL) > 300 ms	15 Arm
LimiterMax (rms and peak limiters)	
MaxRMS (rms voltage limiter)	Yes
MaxPeak (peak voltage limiter)	Yes
<b>Gain</b>	
Amplifier gain	22 - 44 dB, step size 0.1 dB
Digital attenuator	- Inf to 0 dB, step size 0.25 dB
<b>Rear-panel interface</b>	
Analog input	4 x 3 pin XLR, electronically balanced
AES inputs	2 x 3 pin XLR
Output Connectors	Neutrik speakON (4 x NLT4) and 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	Detachable locking 3-pin IEC rated at 250V / 16A
Cooling	Four fans front-to-rear airflow temperature controlled speed
<b>Front-panel interface</b>	
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
<b>Mains power</b>	
Nominal voltage	100 - 240 V AC 50 - 60 Hz
Operating voltage	70 - 265 V AC
Mains wall plug	Selectable order CEE 7/7, "Schuko" 230 V / 16 A, NEMA 5-15 125 V / 15 A, BS1363-A 250 V / 13 A, IA16A3 250 V / 16 A, AU/NZ 250 V / 10 A, JP 125 V / 15 A, CPCS-CCC 250 V / 10A
<b>Power supply features</b>	
Soft start / Inrush power	Yes
Power Factor Correction (PFC)	> 0.98 for mains power > 300 W
Regulated switch mode power supply	Yes
Breaker Emulation Limiter (BEL)	Configurable current threshold and breaker profile
BEL max current threshold	15 A
Power Average Limiter (PAL)	Yes
Under Voltage Limiter (UVL)	Yes
Mains under voltage and overvoltage protection and mains glitch tolerance	Yes
<b>Dimensions</b>	
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")
<b>Weight</b>	
	11.4 kg (25.1 lbs)
<b>Finish</b>	
	Black painted steel chassis with black painted steel / aluminium front
<b>Approvals</b>	
	CE, ANSI / UL 60065 (ETL), CSA C22.2 NO. 60065, PSE, RCM, FCC and CCC

**Note 1):** Lab.gruppen burst power (1 kHz, 25 ms burst power @ 150 BPM, 12 dB Crest factor)

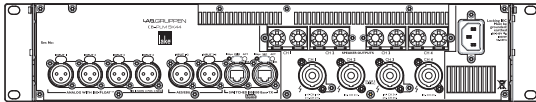
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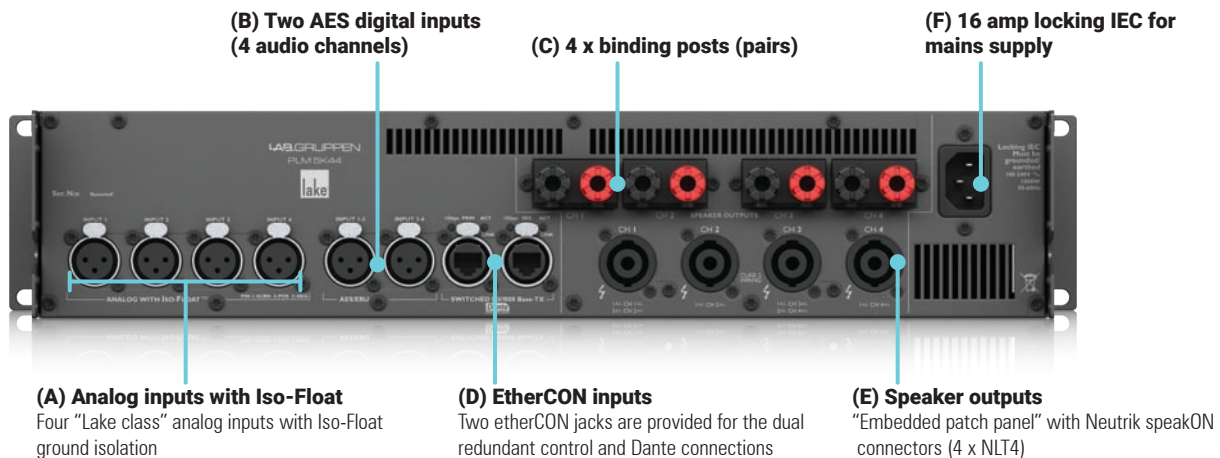
The CB-PLM5K44 is equipped with both binding posts and Neutrik speakON® (4x NLT4) connectors for power outputs. Both connection methods allow for Bridge Mode operation, which is activated from the Lake Controller software.



The front panel is the “local control center” of the CB-PLM5K44. 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.



**(A) - Analog Inputs** - Four analog inputs are available on standard XLR-3F connectors, electronically balanced and featuring Lake Iso-Float circuitry. Impedance is 20 kohms; maximum input level is +26 dBu.

**(B) - AES3 Inputs** - Two latching XLR-3F connectors accept four channels of AES3 digital audio. Input impedance is 110 ohms; ensure that 110 ohm digital audio cables are used.

**(C) - Binding Posts** - Power outputs are available on four (4) separate pairs of fully enclosed binding posts.

**(D) - 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 for 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 use to daisy chain directly to another Lake Processor. The daisy chain topology should not be used with Dante. [NOTE: Do not create a closed loop when configuring multiple devices in an Ethernet network; this will cause a network malfunction.]

**- Secondary Network 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.

**(E) - speakON connectors** - Power outputs are available simultaneously on two 4-pole connectors. The four-pole connectors carry outputs for channels 1&2 and 3&4 respectively. For CB-PLM5K44, connector 1 carries output channels 1 and 2, connector 2 carries channel 2, connector 3 carries channel 3and 4, and connector 4 carries channel 4.

**(F) - Mains Power Connector** - CB-PLM5K44 uses a standard IEC locking connector.