

# ● 48M series

## 8 Channel Advanced System Amplifiers



Linea Research 8 channel amplifiers offer a unique combination of power and audio performance, seamlessly combined with advanced DSP and network control. Sharing the same feature set and form factor as Linea's 44M series amplifiers and available in models

developing between 400 and 2,500 Watts per channel (or up to 5,000 Watts for a bridged pair). Uniquely each channel can be configured to deliver this power into 2, 4, or 8 Ohm nominal loads as well as 25V, 70V & 100V constant Voltage (CV) lines. This offers designers

and integrators unparalleled flexibility along with the cost effectiveness and space efficiency of an 8 channel product. Generous power reserves ensure that pristine sound quality is maintained even under the most extreme conditions.



- Eight channels of sonically pure Class D amplification
- Unique, precise, 96kHz digital signal processing
- Over-designed switch mode power supply
- 3,200 to 10,000 Watts RMS total output
- Full front panel user interface
- Ethernet network for system operation and monitoring
- 4 Analogue, 2 AES3 and 8 Dante™ / AES67 digital network audio inputs
- Powerful grouping & multi-layer EQ
- Fully designed and engineered by Linea's in-house development team
- Manufactured, tested and supported entirely in the UK

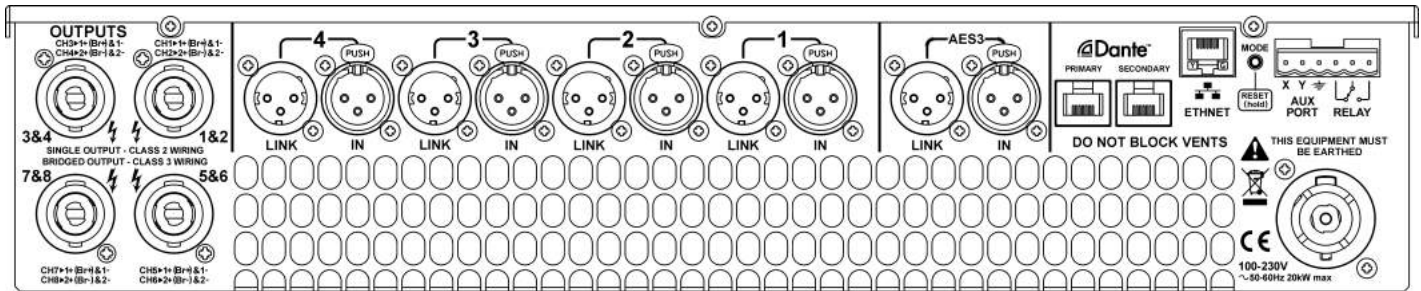
Power per channel, all channels driven

Model	48M20	48M10	48M06	48M03
2 Ohm	1,500	1,250	750	400
4 Ohm	2,500	1,250	750	400
8 Ohm	1,500	1,250	750	400

At Linea Research you will find a company which is committed to designing and producing the finest audio equipment in the world. Research and Development work is led by founder directors Ben Ver and Paul Williams who share a distinguished 25-year history at the top end of our industry. Together with the third founder, Davey Smalley who incorporated Linea in 2003, they have successfully supplied tens of thousands of products to all corners of the globe via OEM technical partners.

Linea Research products are now available under our own brand from a team of distribution partners who share a passion for and commitment to high end audio engineering.

When you choose Linea you will be working with people who design the products, people who use the products and above all, people who know pro audio and care about performance and quality.



## General Specifications

Number of output channels	Eight
Total power output, all channels driven	20,000, 10,000, 6,000 and 3,000 Watts RMS
Audio inputs	4x Analogue, 2x AES3 and 8x Dante™ / AES67 (factory fitted option)
Digital Signal Processing	High performance DSP on all inputs and outputs
Control, monitoring and system status alarms	Ethernet network Volt-free relay and contact closure port
Power-save modes	Standby after user defined time with fast wake up on audio Deep ECO sleep after user defined time with wake up on command
System standby and wakeup	Front panel switch, network command and audio detection

## Power Output

Model	48M20	48M10	48M06	48M03
Power specification	RMS output power per channel, all channels driven with continuous program material and a nominal ambient temperature of 40°C / 105°F			
Crest Factor of 4 (12dB), 2 Ohm nominal load	1,500W	1,250W	750W	400W
Crest Factor of 2.8 (9dB), 4 Ohm nominal load	2,500W	1,250W	750W	400W
Crest Factor of 2 (6dB), 8 Ohm nominal load	1,500W	1,250W	750W	400W
Bridged, per channel pair, 4 or 8 Ohm load	3,000W / 5,000W	2,500W	1,500W	800W
25V line (CV) operation, Crest Factor 4 (12dB)	625W	625W	485W	355W
70V line (CV) operation, Crest Factor 4 (12dB)	1,937W	1,250W	750W	400W
100V line (CV) operation, Crest Factor 4 (12dB)	2,500W	1,250W	750W	400W

## Audio Performance

Amplifier topology	Linea Research high performance Class D
Amplifier modulation scheme	Low feedback, multiple loop, with feed-forward error correction
Dynamic range Measured relative to the amplifier output	Analogue input, better than 113dBA typical AES / Dante™ / AES67 input, better than 114dBA typical
Gain (with all the DSP level controls set to 0dB)	32dB
Frequency response, 4 Ohm load	<7Hz to >30kHz, 4 Ohms, -2.5dB points
Total harmonic distortion, THD	<0.05% typical, 1kHz signal, AES17 filter, 4 Ohm load
Inter-channel crosstalk, worst case combination	Better than -85dBr at 1kHz and -75dBr at 10kHz
Slew rate	>60V per microsecond typical
Damping factor (Ref 8 Ohms)	>800 at amplifier output (see Linea's "Damping factor debunked" white paper)
Maximum analogue input level	+20dBu
Analogue input sensitivity range for full output	0dBu to +20dBu, continuously adjustable
Analogue input (four channels)	Input 20k Ohm, electronically balanced, link directly connected to input
Analogue ground scheme	AES48 standard compliant
AES3 input (two audio channels)	Transformer isolated with unique active cable equalisation for extended range
AES3 link (two audio channels)	Active AES3 signal regeneration. Automatic direct bypass to the AES3 input ensuring the audio signal will still flow even when the amplifier is powered down
AES3 supported sampling rates	24kHz to 192kHz (auto locking)

# Digital Signal Processing

Resolution	40 bit, Linea Research proprietary algorithms
Sample rate	96kHz throughout
Physical inputs to DSP drive modules	4x Analogue, 2x AES & 8x Dante™ / AES67 inputs can be routed to four DSP drive modules
Drive module input processing	Input signal routing, Delay, Gain, HPF, Phase, Mute <b>EQ:</b> 2x low shelf, 6x PEQ / band pass and FIR shelving filters
Drive module output processing	Source, Delay, Gain, Phase, Mute, Crossover filters, VX limiters <b>EQ:</b> low shelf, 8x PEQ / band pass and shelving filters
Preset management	10 snapshots for device wide setup, 50 presets for loudspeaker settings Presets can be recalled to sets of outputs or individual outputs as required
<b>Unique high-performance processing</b>	
Overlays	Twelve additional independent overlays of EQ, Delay and Gain Flexible grouping for effective control of many amplifier channels in large systems
Class leading VX limiters	See the 'speaker protection systems' section
Hardman crossover filters	Better out of band rejection than Linkwitz-Riley
LIR crossover filters	Unique Linear Phase alignments without the compromises of FIR filters

## Power Supply

Topology (main power supply)	Linea Research high performance Series Resonant
Topology (auxiliary and standby supplies)	Low quiescent Eco-Flyback
Internally stored energy	>600 Joules
Nominal mains input voltage range	85V to 240V, Power supply automatically detects voltage and configures accordingly
Mains input frequency range	47Hz to 63Hz
Mains inrush current (max for <10ms)	6A at 115V, 12A at 230V

## Protections Systems

Under all circumstances the control and protection systems will endeavour to deliver the maximum power possible for a given set of conditions, applying limiters only in extreme circumstances. Muting will only occur when a dangerous situation is detected, normal operation automatically resuming when the condition clears.

System protection	Speaker protection
Excessive power supply current or amplifier output current	Sustained clipping prevention
Excessive temperature per sub system: PSU, amplifier and DSP	DC offset protection
Mains voltage within acceptable limits	Excessive HF energy (VHF) limiter
Internal power rails producing correct output	
Fans operating at correct speed	<b>VX audio output limiters</b>
	Vx provides a linear phase virtual crossover and two limiter paths on each output. This unique system delivers effective protection for systems that incorporate passive crossovers.
<b>Power distribution protection systems</b>	Vx Limit    Multiband peak limiter, two per output
Mains inrush current limiting for soft start and anti-surge	Vx Max    Multiband overshoot limiter, two per output
Mains average current limiting for mains breaker management	X-Max    Driver excursion limiter
Randomised initialisation when remotely powered up	T-Max    Driver thermal limiter (long term power limiter)
<b>Monitoring, measurements recorded against time</b>	<b>Monitoring, device statistics and counters</b>
Supply current	Number of power cycles counted
Supply voltage	Number of mains brownout events counted
Thermal Capacity	Fan speeds continuously monitored
Each driver current	Fan under-speed events counted
Each driver impedance	Various protection mute events counted
Protection limiting for each output	Driver Impedance continuously monitored

An inbuilt notification system is provided to indicate problems to remote devices either via the network or the Volt-free changeover relay contacts accessible on the rear panel.

## Physical

Cooling	Dual vari-speed fans, front to back airflow. Washable, tool-less change filter media.
Analogue IN and LINK	4x female and 4x male Neutrik™ XLR
AES3 dual channel IN and LINK	1x female and 1x male Neutrik™ XLR
Amplifiers output	4x Neutrik Speakon™ NL4 connectors
Mains input connector	Neutrik 32A Powercon™
Dante™ Primary and Secondary	2x Shielded RJ45
Relay output & contact closure inputs	Phoenix™ pluggable terminal block (mating plug supplied)
Front panel display	Backlit, graphical, high contrast, daylight visible
Front panel encoders	Two, detented, velocity sensitive
Front panel push buttons	Large, tactile, illuminated
LED indicators	Bright, easily differentiated
Enclosure	Standard 19" 2U (88mm), 357mm (14") deep with handles and optional rear support
Net Weight	12.5kg (27.5 Lbs)



For more information about the 48M series amplifiers or Linea's other high-performance audio products, please contact us or your local dealer.

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