

20K-DSP

Advanced System Amplifier



Ligwa's new amplifier represents the leading edge of multi-channel amplifier design. Engineered to surpass similar products sonic performance, power delivery and efficiency in a straight forward and robust package.

The 20K-DSP generates a massive 20,000 watts RMS and shares a high end specification with all the DSP features and power reserves required for the world's finest loudspeakers systems.

This truly universal amplifier system is completed with a logical and comprehensive software package which provides tools for rapid configuration, remote control, performance, monitoring and full system analytics.



- Four channels of sonically pure Class D amplification
- Unique, precise digital signal processing
- Over designed switch mode power supply
- 20,000 watts RMS total output
- Analogue, AES3 and Dante™ digital network audio inputs
- Full front panel user interface
- Ethernet network software for system operation and monitoring
- DSP Drive Modules for loudspeaker processing
- Powerful grouping for multi-layer EQ and effective control of large systems

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General Specifications

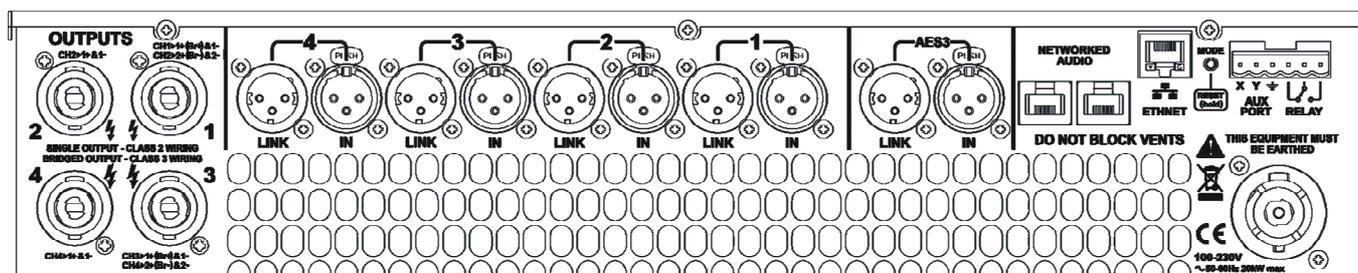
Amplifier topology	5 th Generation Linea Research Class D
Number of channels	Four
Total power output, all channels driven	20,000 Watts RMS
Audio inputs	4x Analogue, 2x AES3 and 4x Dante™ (factory fitted option)
Digital Signal Processing	High performance DSP processing on all inputs and outputs
Control, monitoring and system status alarms	Ethernet network Volt-free relay and contact closure port
Power-save modes	Standby after user defined time, instant wake up on audio (less than 1ms) Deep ECO sleep after user defined time, wake up on command (2-3 seconds)
System sleep and wakeup	Front panel switch, network command and audio detection

Power Output

Model	M20		
Power specification	RMS output power per channel, all channels driven with continuous program material and a nominal ambient temperature of 40degC / 105degF		
Crest Factor of 4 (12dB), 2-Ohm nominal load	5,000W		
Crest Factor of 2.8 (9dB), 4-Ohm nominal load	2,600W		
Crest Factor of 2 (6dB), 8-Ohm nominal load	1,300W		
Bridged, per channel pair, 4-Ohm nominal load	10,000W		
70V / 100V line operation, Crest Factor 4 (12dB)	5,000W Hi-Z, 70V/100V		

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Audio Performance

Amplifier topology	Proprietary 5th generation Linea Research Class D
Amplifier modulation scheme	Low feedback, multiple loop, with feed-forward error correction
Dynamic range to amplifier output	Analogue input, better than 113dBA typical AES / Dante™ input, better than 114dBA typical
Frequency response, 4 Ohm load	+/- 0.5dB, 5Hz to 20kHz -2.5dB, below 3Hz to beyond 30kHz
Total harmonic distortion, THD	<0.05% typical, 1kHz signal, AES17 filter, 4 Ohm load
Inter-channel crosstalk, worst case combination	better than -85dB at 1kHz and -75dB at 10kHz
Maximum analogue input level	+20dBu
Analogue input sensitivity range for full output	0dBu to +20dBu, continuously adjustable
Analogue input and link	Input 20k Ohm, electronically balanced, link directly connected to analogue input
Analogue ground scheme	AES48 standard compliant
AES3 input	Transformer isolated with unique active cable equalisation for extended range
AES3 link	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)

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Digital Signal Processing

Resolution	40 bit, Linea Research proprietary algorithms
Sample rate	96kHz throughout
Physical inputs to DSP drive modules	4x analogue, 2x AES & 4x Dante™ inputs can be routed to four DSP drive modules
Drive module input processing	Input signal routing, delay, gain, HPF, Phase, Mute EQ: 2x low shelf, 6x PEQ / band pass and FIR shelving filters
Drive module output processing	Source, delay, gain, Phase, Mute, crossover filters, VX limiters EQ: low shelf, 8x PEQ / band pass and FIR shelving filters
Preset management	8 snapshots for device wide setup, 50 presets for loudspeaker settings Presets can be recalled to sets of outputs or individual outputs as required
Unique high performance processing	
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	Linear Phase without the compromises of FIR filters

Power Supply

Topology (main power supply)	3rd generation Series Resonant
Topology (auxiliary and standby supplies)	Low quiescent Eco-Flyback
Internally stored energy	>700 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 and 12A at 230V

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Protections Systems

Under all circumstances the control and protection systems will endeavor 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	Audio soft-clip limiter
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	VX output limiters
	Vx provides a linear phase virtual crossover and two limiter paths on each output. This unique system delivers effective protection of speakers with passive crossovers.
Power distribution protection systems	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 commanded to power up	T-Max Driver thermal limiter (long term power limiter)
Monitoring, measurements recorded against time	Monitoring, device statistics and counters
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 alarm and notification system to indicate problems to remote devices either via the network or the Volt-free changeover relay contacts accessibly on the rear panel.	

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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 (supplied)
Front panel display (backlit)	Graphical, high contrast, daylight visible
Front panel encoders	Two, indented, 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 pounds).