

# inspired audio

## The eFlex Q20 Networked system amplifier

The Inspired Audio eFlex Q20 is the company's touring benchmark to integrate with speakers from the MQ, Optima and Vector product ranges. Key features are:

- 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
- Powerful grouping for multi-layer EQ and effective control of large systems
- DSP Drive Modules for loudspeaker processing



## General Specifications

Amplifier topology	5 <sup>th</sup> 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)
	Front panel switch, network command and audio detection

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## Power Output

<b>Model:</b> Q20	
<b>Power specification</b>	RMS output power per channel, all channels driven with continuous program material and a nominal ambient temperature of 40degC / 105degF
<b>Crest Factor of 4 (12dB), 2-Ohm nominal load</b>	5,000W
<b>Crest Factor of 2.8 (9dB), 4-Ohm nominal load</b>	2,600W
<b>Crest Factor of 2 (6dB), 8-Ohm nominal load</b>	1,300W
<b>Bridged, per channel pair, 4-Ohm nominal load</b>	10,000W
<b>70V / 100V line operation, Crest Factor 4 (12dB)</b>	5,000W Hi-Z, 70V/100V

## Audio Performance

<b>Amplifier topology</b>	Proprietary 5th generation Linea Research Class D
<b>Amplifier modulation scheme</b>	Low feedback, multiple loop, with feed-forward error correction
<b>Dynamic range to amplifier output</b>	Analogue input, better than 113dBA typical AES / Dante™ input, better than 114dBA typical
<b>Frequency response, 4 Ohm load</b>	+/- 0.5dB, 5Hz to 20kHz -2.5dB, below 3Hz to beyond 30kHz
<b>Total harmonic distortion, THD</b>	<0.05% typical, 1kHz signal, AES17 filter, 4 Ohm load
<b>Inter-channel crosstalk, worst case combination</b>	better than -85dBr at 1kHz and -75dBr at 10kHz
<b>Maximum analogue input level</b>	+20dBu
<b>Analogue input sensitivity range for full output</b>	0dBu to +20dBu, continuously adjustable
<b>Analogue input and link</b>	Input 20k Ohm, electronically balanced, link directly connected to analogue input
<b>Analogue ground scheme</b>	AES48 standard compliant
<b>AES3 input</b>	Transformer isolated with unique active cable equalisation for extended range
<b>AES3 link</b>	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
<b>AES3 supported sampling rates</b>	24kHz to 192kHz (auto locking)



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## Digital Signal Processing

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

## 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.

<b>System protection</b>	<b>Speaker protection</b>
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	<b>VX output limiters</b>
	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.
<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 commanded to power 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 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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## 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

## 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).

## Rear panel schematic

