

T20-T10-T06-T03: Advanced Systems Amplifier



T48 series

MAIN FEATURES

- Eight channels of sonically pure Class D amplification
- Unique, precise 96kHz digital signal processing
- Over designed switch mode power supply
- 3.200 to 20.000 Watts RMS total output
- Analogue, AES3 and DANTE™ digital network audio input
- Full front panel user interface
- Ethernet network software for system operation and monitoring
- DSP Drive Module for loudspeaker processing
- Powerful grouping for multi-layer EQ and effective control of large systems
- Easy User grouping & Overlay
- Accepts 48kHz and 96kHz FIR files via System Engineer Software (certain models)

8 channels, power output per channel				
	T20-48	T10-48	T06-48	T03-48
2 Ohm	1500W	1250W	750W	400W
4 Ohm	2500W	1250W	750W	400W
8 Ohm	1500W	1250W	750W	400W

T20 - T10 - T06-T03 8 Channel Advanced System Amplifier

The T48 Series is an advanced 8-channel power amplifier which offering a combination of power delivery, sonic performance and efficiency in a robust package, surpassing to similar products.

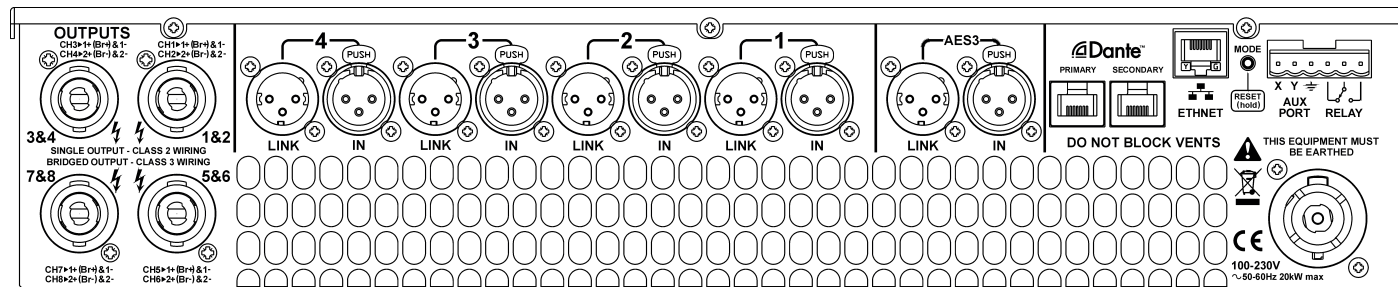
Spanning 3.200 to 20.000 Watts RMS output power, all models share a high end specification with generous power reserves. The integrated state-of-the-art DSP and network control being the perfect complement to the world's finest loudspeaker systems.

This truly revolutionary amplifier platform provides a logical front panel user interface and powerful Ethernet based remote control. Both provide access to all features allowing rapid system configuration with full performance monitoring and analytics.

The advanced 96kHz DSP is fully integrated into the T-Series to provide a multitude of features that ensure maximum performance and worldwide compatibility of Technare enclosures. Also the new hardware upgrade released (marked with the reference "F") provides up to 1000 FIR filter taps @ 48kHz on each output channel, which is implementable via System Engineer Software providing an extra optimisation process in line array systems.

The T-Series amplifiers employ comprehensive protection functions to maintain safe operating conditions of both the amplifier and the loudspeakers driven – including a powerful VX Limiter suite, which sports Peak, RMS and excursion limiting, as well as multiband limiting for passive 2-way enclosures.

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General Specifications

Amplifier topology	Class D
Number of channels	Eight
Total Power output, all channels driven	20.000, 10.000, 6.000 and 3.200 Watts RMS
Audio inputs	4x Analogue, 2x AES3 and 4xDante™ / AES67 (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 mode	Standby after user defined time with fast wake-up on audio Deep ECO sleep after user defined time, wake up on command
System sleep and wakeup	Front panel switch, network command and audio detection

Audio Performance

Amplifier topology	Proprietary Class D
Amplifier modulation scheme	Low feedback, multiple loop, with feed-forward error correction
Dinamic range to amplifier output	Analogue input, better than 113dBA typical AES / Dante™ input, better than 114dBA typical
Frequency response, 4 Ω 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 Ω load
Inter-channel crosstalk worst case combination	Better than -85dBr at 1kHz and -75dBr at 10kHz
Maximum analogue input level	+20dBu
Analogue input sensitivity range for full output	0dBu to +20dBu, continuously adjustable
Analogue input and link (four channels)	Input 20k Ω , electronically balanced, link directly connected to analogue input
Analogue ground scheme	AES48 standard compliant
AES3 Input (two audio channels)	Transformer isolated with unique active cable equalisation for extender range
AES3 Link (two audio channels)	Active AES3 signal regeneration. Automatic direct bypass to 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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Power Output

MODEL	T20-48	T10-48	T06-48	T03-48
Power Specification	RMS output power per channel, all channels driven with continuous program material and nominal ambient temperature of 40degC/ 105degF			
Crest Factor of 4 (12dB), 2Ω nominal load	1500W	1250W	750W	400W
Crest Factor of 2.8 (9dB), 4Ω nominal load	2500W	1250W	750W	400W
Crest Factor of 2 (6dB), 8Ω nominal load	1500W	1250W	750W	400W
Bridge, per channel pair, 4 or 8 Ω nominal load	5kW @8ohm	2500W	1500W	800W
100V line (CV) operation, Crest Factor 4 (12dB)	2500W	1250W	750W	400W
70V line (CV) operation, Crest Factor 4	1937W	1250W	750W	400W

Digital Signal Processing

Resolution	40 bit, 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 module
Drive module input processing	Input signal routing, delay, gain, HPF, Polarity, Mute EQ: 2x low shelf, 6xPEQ/ band pass and FIR shelving filters
Drive module output processing	Source, delay, gain, polarity, Mute, crossover filters, VX limiters EQ: low shelf, 8xPEQ/ band pass and FIR 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
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	>600 Joules
Nominal mains input voltage range	85V to 240V Power supply automatically detects voltage and configures accordingly
Mains inputs 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 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, DSP	DC Offset protection
Main voltage within acceptable limits	Excessive HF energy (VHF) limiter
Internal power rails producing correct output	
Fan operation 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, measurement recorded against time	Monitoring, device statics 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.	

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
Main input connector	Neutrik 32A Powercon™
Dante™ Primary and Secondary	2x Shielded RJ45
Relay output & contact closure input	Phoenix pluggable terminal block (mating plug supplied)
Front panel display (backlit)	Backlit, Graphical, high contrast, daylight visible
Front panel encoders	Two, idented, velocity sensitive
Front panel push buttons	Large, tactile, illuminated
LED indicators	Bright, easily differentiated
Enclosure	Standard 19" 2U (88x357)mm (14"deep) with handles and optional rear support
Net Weight	12.5kg (27.5 lbs)