

D SERIES: **NEW INTEGRATION** SUPERPOWER



Cutting-edge power, **proven** reliability, and **unprecedented** output configuration flexibility. All with **seamless** network integration and onboard system surveillance.



Barclays Center, New York

One advanced install-dedicated amplifier platform. Two integrated DSP and networking choices.

D Series is based on the same foundation of robust, high-power amplifier technologies as Lab.gruppen's renowned PLM Series of Powered Loudspeaker Management systems – an amplifier platform with a proven record of reliability and sonic performance on the world's most grueling concert tours and in high-profile, large-scale installations.

With D Series, those same core technologies have been updated and refocused to provide the ultimate solution for the most demanding digitally networked installed sound applications – in stadia, arenas, theme parks, performing arts centers, racecourses and other large commercial sound installations.

In addition to legendary Lab.gruppen reliability and sonic excellence, D Series incorporates newly refined output stage technologies along with installation-targeted hardware and software features that enable optimized audio system design and configuration. Together, these new technologies allow systems integrators to minimize both initial equipment costs and end users' long-term energy consumption.

The D Series platform is available in two variants. The Lake variants come with on-board Dante networking as standard, and also offer options for full integration with leading third-party networking and control systems via purpose-developed middleware. Meanwhile, the Tesira® variants integrate seamlessly into Biamp Systems' AVB-based networked DSP platform as a dedicated, high-power output object.

Tesira® Variant



INCORPORATING **TESIRA**
BIAMP

Lake Variant



INCORPORATING **lake**

Features and benefits:

- **Four-channel amplifiers available in three power models**
 - D 200:4 - 20000 W of total output power
 - D 120:4 - 12000 W of total output power
 - D 80:4 - 8000 W of total output power
- **Rational Power Management (RPM™)**
 - True flexibility in allocating power output across channels to match requirements, enabling more efficient use of amplifier inventory
 - Any channel is capable of delivering up to 5000 W power output, from total available power in each frame
- **True 'open-interoperability' for seamless integration with a wide range of networked audio and control environments**
- **Redundant audio inputs & dedicated on-board surveillance & load monitoring system**
- **Unique power supply technologies**
 - Regulated Switch-Mode Power Supply (R.SMPS™) maintains stability despite mains voltage and fluctuations
 - Best-in-class Power Factor Correction (PFC)
 - Current Draw Modelling (CDM™) reduces mains peak draw
 - Breaker Emulation Limiter (BEL™) - Tailors D Series to the available mains distribution
 - Under-voltage Limiting (UVL™) for continued operation despite severe voltage drops
- **CAFÉ (Configuring Amplifiers For the Environment) Software incorporating ESP™ (Equipment Specification Predictor) for design, system and equipment planning, installation and commissioning**





Sir Chris Hoy Velodrome, Glasgow

The Solid Foundation:

Lab.gruppen Core Technologies

D Series is built around proven Lab.gruppen amplifier technologies with an established track record of undisputed sonic excellence

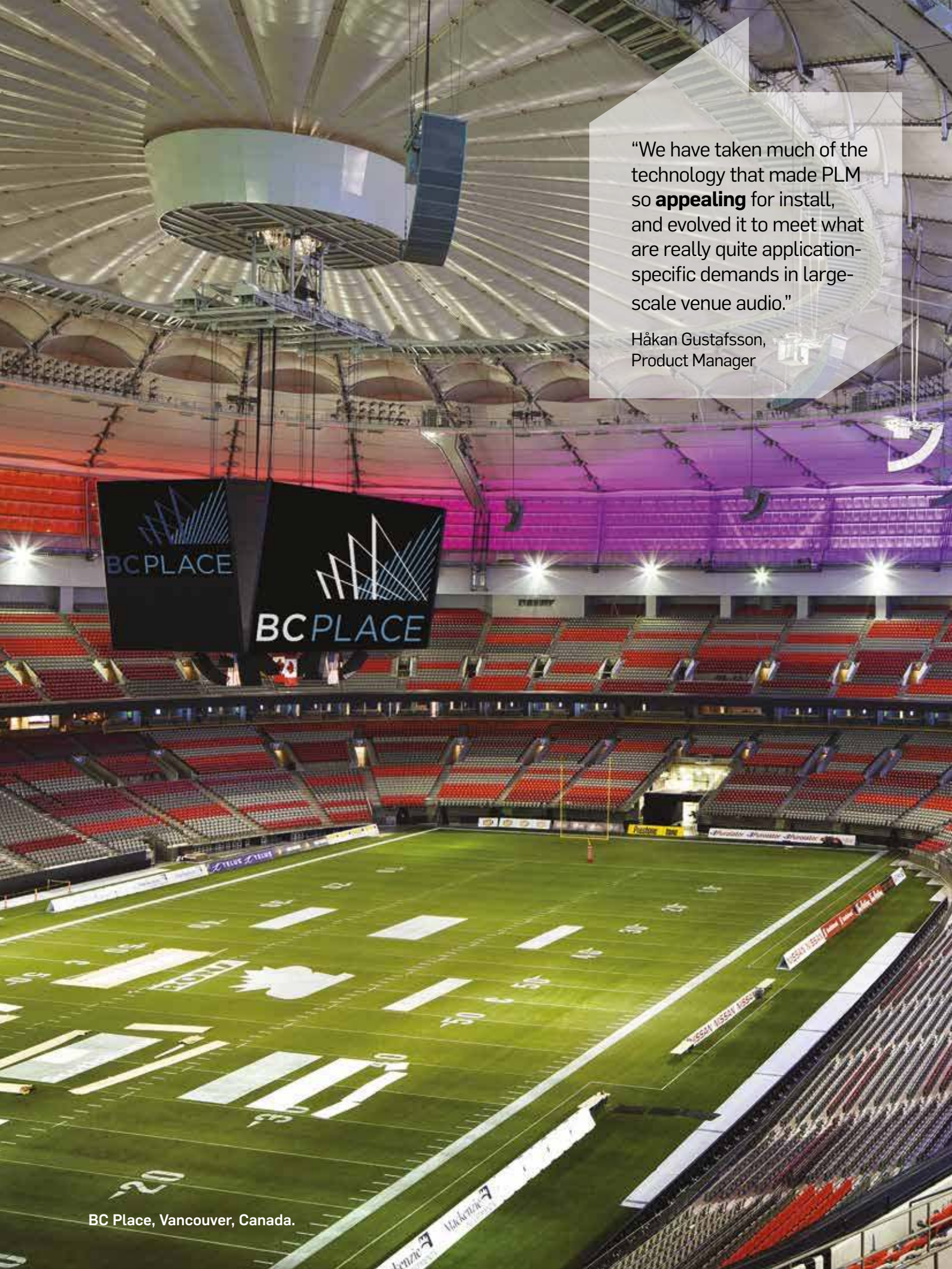
and rock-solid reliability in both touring and high performance for large scale installed applications.

Key Lab.gruppen technologies incorporated in the D Series platform include:

- **Regulated Switch-Mode Power Supply (R.SMPS) –**
A fully regulated design that ensures stable output power independent of deviations in the mains voltage
- **Breaker Emulation Limiter (BEL) –**
Dedicated algorithm anticipates breaker behavior to prevent power interruption
- **Under-voltage Limiting (UVL) –**
Reduces power output for continued operation despite severe voltage drops
- **Best-in-class Power Factor Correction (PFC) –**
Unique Current Draw Modeling (CDM™) reduces mains peak draw.
- **Patented Class TD® Output Stage –**
Combines the efficiency of Class D with the sonic qualities of Class B topologies.
- **Inter-Sample Voltage Peak Limiter (ISVPL™) –**
Digitally controlled peak limiter with exceptional accuracy for maintaining sonic purity
- **Intercooler® Cooling System –**
Extraordinarily efficient, the copper-finned Intercooler is mounted transverse to air flow to prevent “heat island” overheating of last output devices
- **Full Suite of Protection Circuits –**
D Series units and connected loads protected by Current Average Limiter (CAL), Very High Frequency Protection (VHF), Direct Current Protection (DC), Short Circuit Protection, Current Clip Limiter, Voltage Clip Limiter



Regulated Switch-Mode Power Supply (R.SMPS)



"We have taken much of the technology that made PLM so **appealing** for install, and evolved it to meet what are really quite application-specific demands in large-scale venue audio."

Håkan Gustafsson,
Product Manager

RPM & CAFÉ: Optimizing efficiency with flexible output configurations

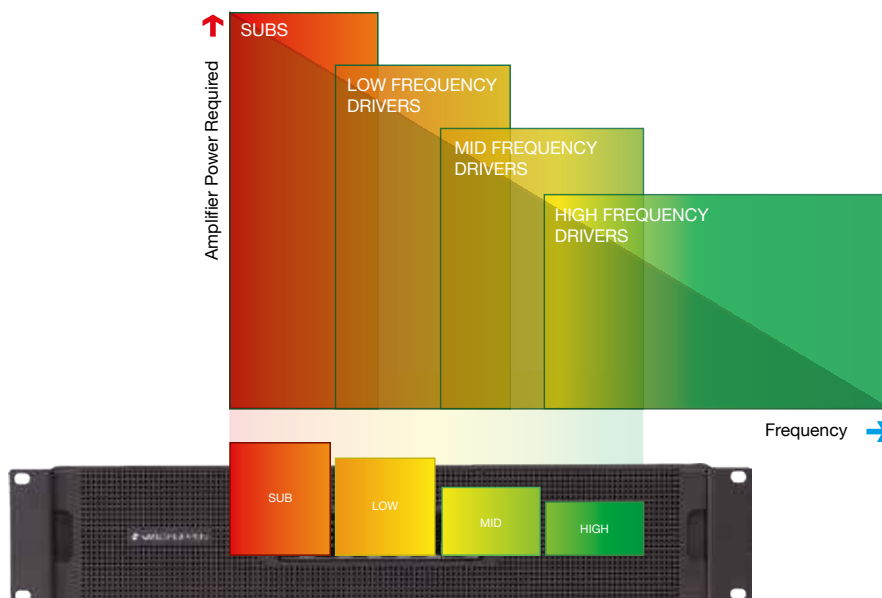
Rational Power Management (RPM): True flexibility in power allocation

Lab.gruppen's D Series provides consultants and integrators with unprecedented flexibility for specifying amplifier output channels to meet the varying load conditions within a single complex project. For the first time, Rational Power Management (RPM) provides true flexibility in allocating available power across the four output channels. Each channel may be tailored to meet the requirements of the connected load, and any power not used for that channel may be allocated for use on other channels.

In addition, regardless of model, RPM ensures that one or more channels can supply up to 5000 W of output. This avoids amplifier "over-specification" on all channels or bridging of adjacent channels in order to meet minimum demands on one power-hungry load, resulting in loss of channel count.

RPM also incorporates features that safeguard the defined power output of one or more specified channels. Using CAFÉ software, it is possible to ensure that the full output power will be maintained regardless of demand of other channels, with the remaining channels responding to a best-case scenario to deliver defined power output while maintaining rail voltage and power supply optimisation.

Rational Power Management results in real-world savings, both immediate and long-term. In many cases, fewer amplifiers – or lower cost models – may be specified while still fulfilling all power requirements. It also allows better mains management, avoiding over-specification of mains distribution, cooling, and UPS (where required). Finally, the overall gains in efficiency in larger systems will minimize current consumption and reduce operation costs – a "green bonus" for the system owner.



D Series - Amp channels power adjusted to match the loudspeaker requirements



CAFÉ with ESP: Integrated software for efficient project planning and fast system configuration

CAFÉ (Configuring Amplifiers For the Environment) is a dedicated software application for Windows and OSX that provides tools for system planning, specification and commissioning. CAFÉ improves work flow efficiency at every stage of the project, from initial design through bid tender and final system optimization.

CAFÉ software incorporates an innovative design tool, the Equipment Specification Predictor (ESP), that assures optimum specification of D Series units for any complex installation project. ESP examines the system requirement and then generates

a comprehensive report that includes models numbers and quantities, heat generation, channel power allocation, and current draw.

Once the D Series units are implemented into the design, CAFÉ provides the tools for channel output configuration and commissioning. During operation, CAFÉ also provides comprehensive system surveillance for monitoring critical operating parameters of amplifier channels and connected loads.

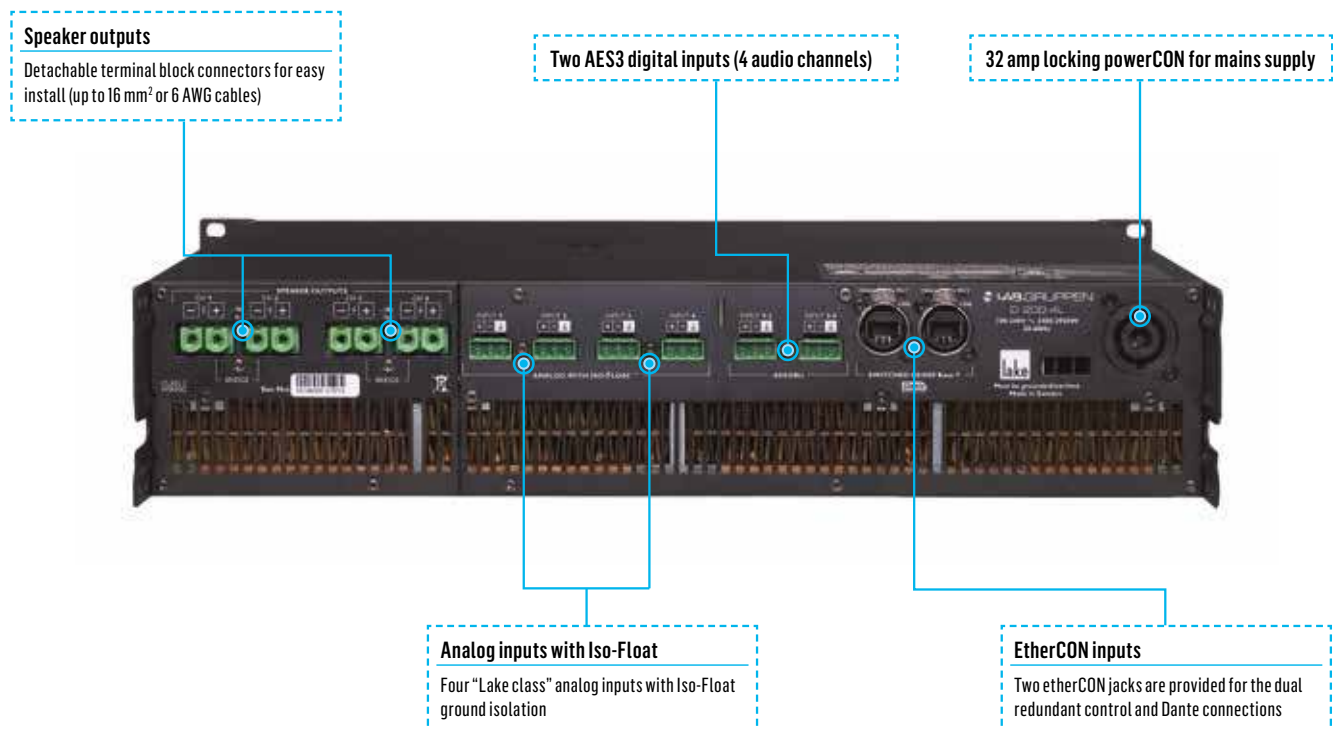


Lake Variants:

Power and flexibility for **any** networked solution

D Series Lake variants provide extraordinary input flexibility, the legendary power of exclusive Lake processing algorithms, comprehensive control and load monitoring via Lake Controller, and seamless integration into Dante digital audio networks. In addition, by employing dedicated middleware, D Series Lake variants can be integrated with many of the most widely used third-party digitally networked matrix and DSP platforms.

All three D Series Lake models incorporate four full-featured Lake Processing modules, with four discrete channels of audio throughput input to output. Audio signals are selectable from four channels of analog (each with exclusive Iso-float™ ground isolation), four channels of AES3 digital, and eight dual redundant Dante networked digital inputs. Input signals are individually selectable for each channel, with programmable failover to analog.



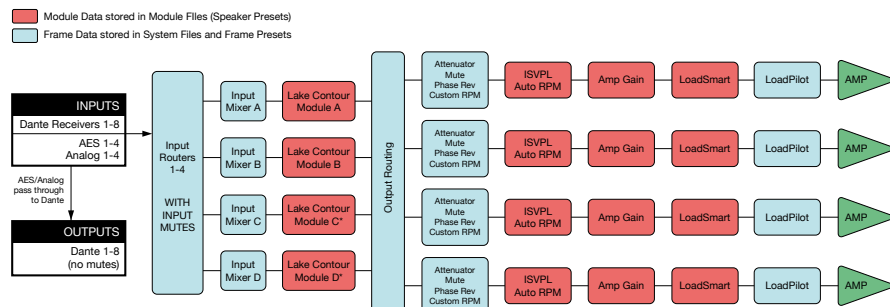


All D Series Lake variants offer:

- **Four complete Lake Processing modules –**
Classic, linear phase and FIR filters
Group control with Raised Cosine™ MESA EQ™ asymmetric filters
LimiterMax™ peak and RMS limiters
- **Input flexibility and redundancy –**
Four analog inputs with Iso-float ground isolation
Two AES3 digital inputs (four audio channels)
Eight dual redundant Dante network inputs
- **Comprehensive loudspeaker preset database (LoadLibrary™)**
- **Wireless tablet control with Lake Controller software for convenient remote system tuning and commissioning**



Opposite is the signal flow block diagram of D series Lake. The input section (inputs, input router and input mixer) allows for mixing capabilities as well as redundant and prioritized inputs with automatic switch-over in case of signal failure. Up to four Lake Processing modules provide user EQ and loudspeaker processing, including LimiterMax limiting. Each power output channel provides individual channel processing, including ISVPL limiter, RPM and load monitoring.



“D Series is about offering **freedom** - freedom to use any network, any loudspeaker, any third party control system, and in any configuration. We believe it is now the most **compelling** choice of amplifier for large scale projects available on the market.”

Klas Dalbjorn,
Product Research Manager





D SERIES 200:4

D SERIES 120:4

D SERIES 80:4

Incorporating technologies from

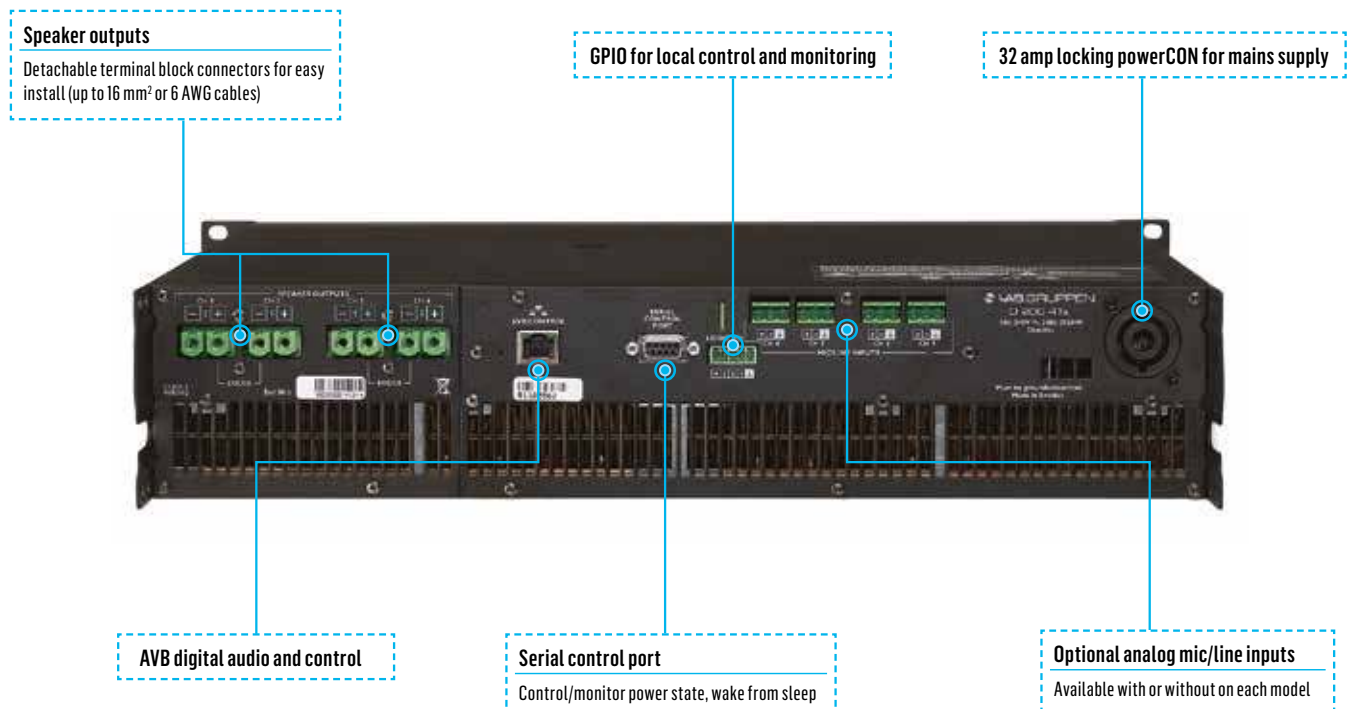
TESIRA
BIAMP

Tesira® Variants:

Potent Power for the AVB Networked Environment

All three power models in the D Series platform are available as Tesira® variants for full integration into Biamp Systems' comprehensive networked environment based on AVB protocols. The D Series units function as a discrete high-power output device in the Tesira®

environment, with multi-channel audio inputs, control and monitoring all carried over a single Gigabit Ethernet port. An analog input option is available for local system input or analog failover redundancy, which may be required in critical PA/VA applications.



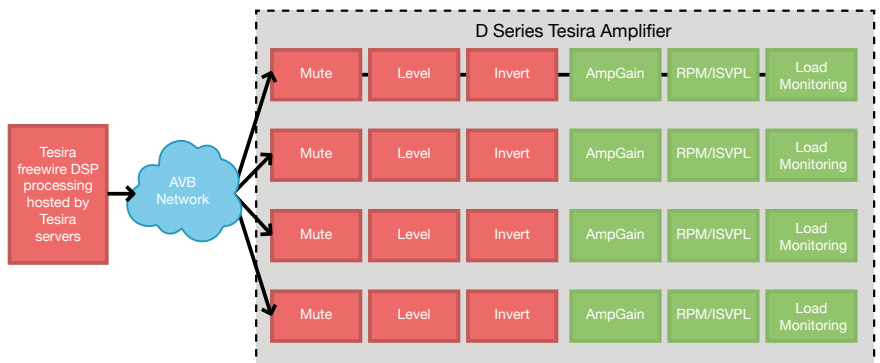


All D Series Tesira® variants offer:

- **Ethernet-based Audio Video Bridging (AVB) networking**
- **Comprehensive amplifier surveillance**
- **Full functionality as Tesira® expander device with integration of amplifier configuration and surveillance**
- **Hot-swappable** - Host name hot swap with complete configuration transfer
- **Power state management for auto power down and ultra-low draw sleep state**
- **Optional four channels of Mic/Line input for local system input or analog failover**
- **Creation of customized control programs using Biamp Canvas software**
- **GPIO and RS232 connectivity for integration flexibility**



Opposite is the the block diagram showing the signal flow and control points for D Series Tesira® variants. The portion shown in red is controlled within the Tesira® software; the portion shown in green is accessible via CAFÉ software and monitored from the Tesira® software.



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Lab.gruppen adopts a policy of continuous improvement and product specification is subject to change.
RPM, R.SMPS, PFC, CDM, BEL, UVL, CAFÉ, ESP, ISVPL, Iso-Float, Raised Cosine, MESA EQ,
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