# The DS100 Signal Engine


## The d&b audiotechnik Soundscape

The d&b Soundscape is the acoustic environment in context, as perceived, experienced and understood. It defines acoustic environments in which people feel performances, speeches and presentations, real or abstract. It introduces another dimension to the d&b system approach, aligning the aural and visual perception, either realistically, or imaginatively. The d&b Soundscape also includes functionality which can modify the acoustic environment by imposing a different reverberation signature in the audience area, whether inside or outside.

## DS100 Signal Engine

The d&b DS100 Signal Engine is the platform underneath the Soundscape, based on a specialized rack mount 3 RU audio processor with Audinate Dante networking. It provides a 64 x 64 audio matrix with level and delay adjustments at all cross points.

The DS100 is a versatile tool for use within complex audio systems to route and distribute multiple audio channels to numerous amplifiers driving loudspeaker positions and zones, show relay and break out rooms. The networking capabilities with a Dante enabled processor are significant, particularly for busy, multi-room complexes.

The DS100 completely integrates with the overall d&b system approach, including loudspeakers, amplifiers, rigging, transport and networking accessories and the DS10 Audio Network Bridge, which interfaces between Dante audio networking and the AES3 inputs of the d&b amplifiers. The DS100 and DS10 both operate on standard networking technologies, making them flexible and efficient. The complete system is designed and optimized in the d&b ArrayCalc Simulation Software, and controlled via the d&b R1 Remote Control Software.

The comprehensive input processing provides gain, EQ, delay and polarity switches, enabling the user to combine all types of input signals to create a mix from a wide variety of sources. Extended processing capabilities are also provided on every output.



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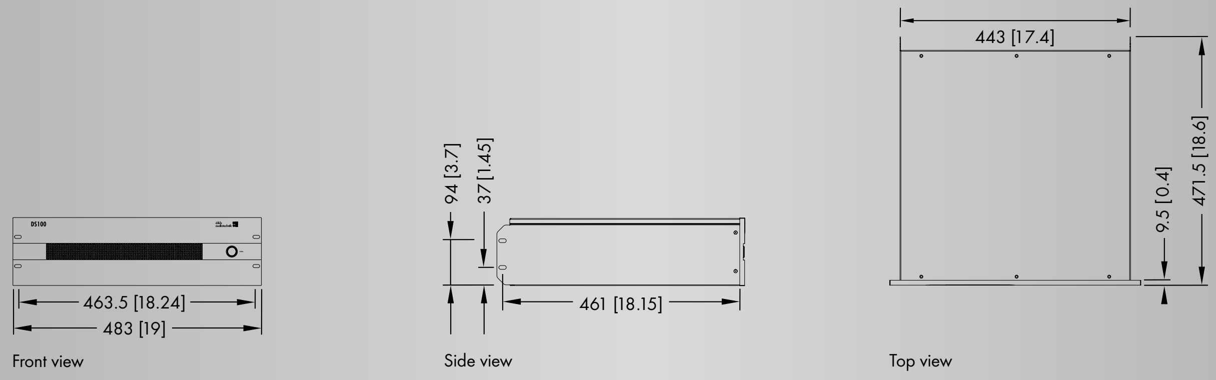


**DS100 Signal Engine dimensions in mm [inch]**

## I/O
Audio Interface ........ Dante™, AES67
Connectors ........ 2 x RJ45 for Dante Primary/Secondary
Sample rate for I/O ........ 48 kHz
Inputs ........ 64
Outputs ........ 64

## Latency
Dante In to Out ........ < 1.5 ms at 48 kHz
........ plus Dante network latency

## Input processing
Gain ........ - 120 to + 24 dB
Polarity ........ 0° / 180°
EQ ........ 8-band PEQ with high/low shelf
Delay ........ up to 500 ms
Mute ........ On / Off

## Matrix Processing
Crosspoint Mute ........ On / Off
Crosspoint Level ........ - 120 to + 10 dB
Crosspoint delay ........ On/Off
........ up to 500 ms

## Output processing
Gain ........ - 120 to + 10 dB
Polarity ........ 0° / 180°
EQ ........ 16-band PEQ with high/low shelf
Delay ........ up to 500 ms
Mute ........ On / Off

## En-Scene
Input sources ........ Up to 64
Positioning ........ Static or dynamic (moving)
Control ........ Manual or external
External control ........ OSC, OCA/AES70

## En-Space
Convolvers ........ Up to 144
Impulse response length ........ up to 10 seconds

## Remote control
Interface ........ OCA/AES70, OSC via Ethernet (RJ45)
Ethernet Speed ........ 100/1000 Mbps

## Power supply
Type ........ Universal range switched mode power supply
Rated mains voltage ........ 100 - 240 V, 50 - 60 Hz

## Dimensions, weight
Dimensions (H x W x D) ........ 3 RU x 19" x 481 mm
Weight ........ 5.8 kg / 12.8 lb



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# The DS100 Signal Engine

## Architectural specifications

The device shall be based on a specialized 19", 3 RU rack mounting PC audio processor with Audinate Dante audio networking.

The I/O sample rate shall be 48 kHz, while the basic latency shall be < 1.5 ms @ 48 kHz (plus Dante network latency).

The input processing shall provide input gain (–120 to +24 dB), switchable polarity (0°/180°), a 8-band PEQ with high/low shelf, as well as a input delay of up to 500 ms and a mute switch.

The matrix processing shall provide a mute switch, level control (–120 to +10 dB) and a delay of up to 500 ms for every cross point.

The output processing shall provide output gain (–120 to +10 dB), switchable polarity (0°/180°), a 16-band PEQ with high/low shelf, as well as a output delay of up to 500 ms and a mute switch.

An Ethernet port (RJ45 - LAN 100/1000 Mbps) shall be provided to allow remote control via OCA/AES70 and OSC. Network monitoring shall be supported via SNMP.

The dimensions (H x W x D) shall not exceed 3 RU x 19" x 481mm (3 RU x 19" x 18.93") and shall weigh no more than 11.2 kg (24.7 lb).

Additional software modules shall be available to allow Sound object positioning and virtual acoustics.

The Sound object software module shall allow for static or dynamic (moving) positioning of up to 64 sources either controlled manually or externally (OSC, OCA/AES70). It shall be vector based and should dynamically calculate a dedicated set of parameters (level, time, width, filters) for each object and all relevant loudspeakers. The source positioning software module GUI shall allow the sources to be positioned on a graphic representation of the venue.

The virtual acoustics software module shall provide up to 64 convolver outputs with an impulse response length of at least 10 seconds. It shall based on an in-line technology, requiring no microphone feedback loops. The proprietary process shall be based on a large number of impulse responses, captured in an acoustically well designed room, while a specially designed algorithm shall provide up to 144 convolvers, to recreate the response of the originally captured room.

The device shall be the DS100 by d&b audiotechnik GmbH & Co. KG.

The software modules shall be the "d&b En-Scene" module for source positioning and the "d&b En-Space" for virtual acoustics.

## Features and benefits

- Distribution and routing of large channel counts to multiple locations across the network is achieved efficiently.
- Seamless integration with the d&b DS10 Audio Network Bridge and the d&b Workflow.
- Enhance the acoustic experience of an audio system in a way that matches the visual involvement of the audience, rather than hearing the sound from a loudspeaker that doesn’t fit with the physical location of the original sound source, or object.
- A captivating, acoustically convincing, flexible, fast and easy to use multi-channel audio solution for creating soundscapes.
- Increased creativity in the design process of loudspeaker systems, with the ability to recreate realistic sonic environments or an imaginative atmosphere for the audience.
- Enhance the experience in performing arts and captivate the audience in conferences and worship.
- A d&b Soundscape fits directly into the d&b system approach, guaranteeing the greatest consistency, maximum reliability and highest performance.
- Improved interaction for artists between the creative process of live performance or pre-recorded material and the physics of sound reinforcement.

## Applications

- Concert halls
- Opera houses
- Theatres
- Corporate events
- Multi-purpose venues
- Live performance venues
- Night clubs
- Houses of worship
- Open air venues



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# The d&b Soundscape

## d&b En-Scene

The d&b En-Scene software allows sources to be audibly positioned or repositioned, onstage, or within the acoustic space. This improved source orientation means the audio image is focussed on the physical location of the instrument, or voice, on a stage, whether static or moving. This makes the amplification of a performance transparent and realistic for the listeners throughout the whole audience area. A voice, instrument, or sound object, may also be placed creatively, depending on the desired artistic effect. A major advantage of the d&b audiotechnik approach is an extended freedom of artistic creativity.

In the first instance, it is possible to reproduce precisely what is happening on stage. On top of this, using the processing over the distributed loudspeakers, the listener experience can be moved to another level, whilst still maintaining the imaging on stage. Therefore, the En-Scene software makes it possible to produce compelling soundscapes that can only be experienced when physically present at the event. The object positioning element of the software allows an instrument or voice to be positioned on a graphic representation. In a theatre environment this area would primarily be the stage, although positioning sources around the audience space is also possible.

d&b En-Scene is a form of vector based panning between all the available loudspeakers. Vector based panning could best be described by a source or signal from the stage that is distributed to all relevant loudspeakers with a unique set of levels, times and, if required, filters. The approach makes a loudspeaker system into an acoustic environment in which sound objects can be placed.

An all-inclusive environment, not just with one perfect seat in the centre of the auditorium, every seat is the sweet spot.

## d&b En-Space

In the modern venue model, a single room becomes a multipurpose space, because event programming often requires a venue to be versatile. The acoustic environment of a venue can have a significant impact on the performances staged within it. A concert venue without well defined acoustics can have a negative impact on the listener experience. Many multi-purpose venues are acoustically inadequate when used for orchestral music events, too short a reverberation time with poorly defined early reflections, being among the frequent shortcomings of this type of venue.

With the En-Space software, a d&b Soundscape efficiently delivers a convincing acoustic environment to the entire audience to mimic a different acoustic space. The system can be setup and operated quickly and easily, day by day, in different rooms, from multipurpose halls to outdoor venues, and is suitable for creating soundscapes in mobile or installation situations. Fitting acoustic conditions can be applied exactly as the performance requires. This neutral and transparent effect changes the acoustic environment, creating an ideal platform for the artists and optimal listening conditions for the audience.

d&b En-Space is an in-line technology, meaning to generate or expand the acoustic environment it does not use microphone feedback loops to create a regenerative component. The proprietary d&b process is based on capturing a large number of impulse responses in an acoustically well designed room, then using these to recreate this acoustic environment with a loudspeaker system in a different place. This is achieved using a specially designed algorithm with up to 144 convolvers recreating the response of the original room. The resulting ambience is very natural, supporting the program material being performed in a way that enhances rather than disturbs the listening experience.