GSL

SL-Series

Contents

d&b System reality

As the name implies a d&b audiotechnik system is not just a loudspeaker. Nor is it merely a sum of the components: loudspeakers, amplifiers, signal processors, networking, software and accessories. Right from the outset the d&b audiotechnik approach was to build integrated sound reinforcement systems that actually are more than the combination of parts: an entirety where each fits all. Every element is tightly specified, precisely aligned and carefully matched to achieve maximum efficiency. For ease of use, all the user-definable parameters are incorporated, allowing the possibility of adjustment, either directly, via remote control surfaces, or integrated within wider networks. Neutral sound characteristics leave the user all the freedom needed to realize whatever the brief. At the same time d&b offers finance, service and support, a knowledgeable distribution network, education and training as well as technical information, so the same optimal acoustic result is achieved consistently by every system anywhere, at any time. In reality: the d&b System reality.

The SL-Series comes from an applied evolution; a complete system package designed specifically for use in the largest sound reinforcement applications in significantly sized arenas, stadiums and festivals, to accurately deliver any performance style or musical genre. A development with more than one dimension, unprecedented directivity control and headroom over the entire audio spectrum, significant LF extension, coupled with comprehensive rigging, cabling and transportation solutions to deliver the highest speed of deployment. The SL-Series is a complete package that combines unparalleled audio performance with maximum efficiency, all neatly aligned with the system design, deployment and control capabilities within the tried and tested d&b Workflow.

The GSL System

GSL8 and **GSL12** loudspeakers are acoustically matched and constructed to be mechanically compatible sharing the same vertical directivity, size, footprint, weight, rigging and driver complement. The 2-Way active design features two 14" LF drivers, two side firing 10" LF drivers combining in a geometry that creates unprecedented low frequency headroom which couples towards the front to increase the LF output and cancels towards the rear. The driver compliment is completed by one hornloaded 10" MF driver and three custom designed 1.4" exit HF drivers with 3.4" voice coils in a compact format mounted to a dedicated waveshaping device. The symmetrical arrangement of the LF drivers around the centrally mounted coaxial MF and HF components allows a smooth overlap of the adjacent frequency bands in the crossover designs with the 14" LF drivers being driven from one amplifier channel, while all other components are passively crossed over and driven from a second amplifier channel. The 80° horizontal directivity pattern of the GSL8 is seamlessly maintained down to 45 Hz and its high output capability can cover a distance range of over 100 m (330 ft), depending on the climatic conditions. The GSL12 has a wider horizontal dispersion pattern of 120° which is also maintained down to 45 Hz.

The **SL-SUB** and **SL-GSUB** share the same width as the GSL8 and GSL12 loudspeakers, the SL-SUB is equipped with compatible flying fittings, while the SL-GSUB is for ground stack use only. The bass-reflex design uses three 21" high excursion drivers, one of which radiates to the rear to produce cardioid subwoofer performance to avoid unwanted energy behind the system. The SL-SUB and SL-GSUB extend the bandwidth of a GSL System down to 30 Hz as well as increasing its headroom. The SL-SUB and SL-GSUB can be deployed in conventional left and right ground stacked setups as well as in distributed SUB arrays to achieve an even venue specific coverage pattern.

The patented GSL System flying hardware and method enables rapid deployment of GSL8 and GSL12 arrays directly from the Touring cart in either compression or tension rigging modes. For the compression mode, a straight array is flown from the Touring carts, a hoist or hand winch is then used to curve the array to the defined splay angles. Designed to fit within standard shipping container and truck sizes, the GSL Touring cart accommodates four GSL8 or GSL12 loudspeakers, including flying frames.

GSL8 loudspeaker

GSL12 loudspeaker

SL-SUB

SL-GSUB

The d&b ArraySight laser inclinometer fits to the GSL flying frame, PoE is provided over an Ethernet connection which also relays data from on-board temperature and humidity sensors back to the R1 Remote control software using the OCA/AES70 protocol. All GSL System loudspeakers are finished with a PCP (Polyurea Cabinet Protection) coating that provides resistance for mobile systems to the adverse effects on cabinets in changing ambient outdoor conditions.

The d&b software offering aides the entire system setup process. The **d&b ArrayCalc simulation software** allows the virtual optimization of loudspeaker line arrays, point source and column loudspeakers as well as subwoofers and their adjustment to venue conditions. The **d&b NoizCalc immission modelling software** uses international standards to model noise immission from d&b loudspeaker systems. NoizCalc takes data from ArrayCalc and calculates the sound propagation towards the far field. The complete system configuration simulated in ArrayCalc is assimilated by the **d&b R1 Remote control software** into an intuitive graphical user interface to manage the amplifiers, and loudspeakers, from anywhere in the venue.

d&b amplifiers are specifically designed for use with d&b loudspeakers, and are at the heart of the d&b system approach. These devices contain extensive Digital Signal Processing capabilities to provide comprehensive loudspeaker management and specific switchable filter functions to precisely target the system response for a wide variety of applications. The four channel **D80** amplifier is intended for both mobile and installation applications requiring the highest Sound Pressure Levels. The d&b Dx amplifiers all provide extensive user-definable equalization containing two 16-band equalizers with parametric, notch, shelving and asymmetric filters as well as delay capabilities of up to 10 seconds.

The **DS10 Audio network bridge** provides 16 AES3 outputs and interfaces between the Dante audio transport protocol and the d&b amplifiers.

The **DS100 Signal Engine** is 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. Additional software modules provide source positioning and emulated acoustics functions.

D80 amplifier

DS10 Audio network bridge

DS100 Signal Engine
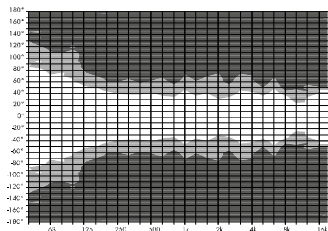
The GSL8 loudspeaker

GSL8 loudspeaker

The GSL8 is a line array module specifically designed for large-scale sound reinforcement. Up to twenty-four GSL8 loudspeakers can be flown in vertical columns producing an 80° constant directivity dispersion pattern in the horizontal plane. The GSL8 houses two 14" neodymium forward facing LF drivers and two side firing 10" neodymium LF drivers. A coaxial mid-high section contains an MF horn with a 10" driver and three 1.4" exit, 3.4" voice coil HF compression drivers mounted to a dedicated wave shaping device. SL-Series flying hardware comes with a patended workflow with integrated tension and compression rigging mode, allowing splay angles between cabinets from 0° to 7° in 1° increments. The loudspeakers are driven actively by two channels of an appropriate d&b amplifier, one channel powering the 14" LF drivers, the second channel powers all other components, these are passively crossed-over. This component geometry allows for a smooth crossover design with well-defined overlaps between adjacent bands providing consistent, even and very accurate horizontal dispersion. Due to the arrangement of the front and side firing LF drivers, accurate directivity control is maintained from 45 Hz to above 18 kHz.

The cabinets are constructed from marine plywood and have an impact and weather protected PCP (Polyurea Cabinet Protection) finish. The front and side panels incorporate rigid metal grills backed by an acoustically transparent and water repellent fabric. Each side panel incorporates a recessed handle, with additional handles are provided at the rear.
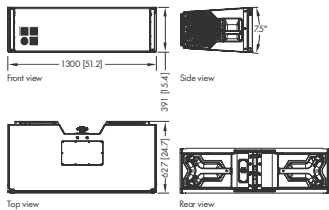

GSL8 horizontal dispersion characteristics[2]

System data

Frequency response (–5 dB standard)	45 Hz - 18 kHz
Frequency response (–5 dB CUT mode)	70 Hz - 18 kHz
Max. sound pressure (1 m, free field)	
GSL8 with D80	150 dB[1]

Loudspeaker data

Nominal impedance front LF	4 ohms
Nominal impedance side LF/MF/HF	4 ohms
Power handling capacity front (RMS/peak 10 ms)	800W/3200W
Power handling capacity side (RMS/peak10 ms)	800W/3200W
Nominal dispersion angle (horizontal)	80°
Splay angle setting	0 ... 7° (1° increment)
Components	2 x 14" front LF driver
	2 x 10" side LF driver
	1 x 10" MF driver
	3 x 1.4" exit compression driver with 3.4" coil
	Passive crossover network
Connections	1 x NLT4 F
Weight	80 kg (176 lb)

GSL8 cabinet dimensions in mm [inch]

# The GSL12 loudspeaker

GSL12 loudspeaker

The GSL12 is a line array module specifically designed for large-scale sound reinforcement. Up to twenty-four GSL12 loudspeakers can be flown in vertical columns producing a 120° constant directivity dispersion pattern in the horizontal plane. The GSL12 houses two 14" neodymium forward facing LF drivers and two side firing 10" neodymium LF drivers. A coaxial mid-high section contains an MF horn with a 10" driver and three 1.4" exit, 3.4" voice coil HF compression drivers mounted to a dedicated wave shaping device. Splay angles between cabinets can range from 0° to 7° in 1° increments. The loudspeakers are driven actively by two channels of an appropriate d&b amplifier, one channel powering the 14" LF drivers, the second channel powers all other components, these are passively crossed-over. This component geometry allows for a smooth crossover design with well-defined overlaps between adjacent bands providing consistent, even and very accurate horizontal dispersion. Due to the arrangement of the front and side firing LF drivers, accurate directivity control is maintained from 45 Hz to above 18 kHz. The cabinets are constructed from marine plywood and have an impact and weather protected PCP (Polyurea Cabinet Protection) finish. The front and side panels incorporate rigid metal grills backed by an acoustically transparent and water repellent fabric. Each side panel incorporates a recessed handle, with additional handles are provided at the rear.


GSL12 horizontal dispersion characteristics[2]

System data

Frequency response (–5 dB standard)	45 Hz - 18 kHz
Frequency response (–5 dB CUT mode)	70 Hz - 18 kHz
Max. sound pressure (1 m, free field)	
GSL12 with D80	149 dB[1]

Loudspeaker data

Nominal impedance front LF	4 ohms
Nominal impedance side LF/MF/HF	4 ohms
Power handling capacity front (RMS/peak 10 ms)	800W/3200W
Power handling capacity side (RMS/peak10 ms)	800W/3200W
Nominal dispersion angle (horizontal)	120°
Splay angle setting	0 ... 7° (1° increment)
Components	2 x 14" front LF driver
	2 x 10" side LF driver
	1 x 10" MF driver
	3 x 1.4" exit compression driver with 3.4" coil
	Passive crossover network
Connections	1 x NLT4F
Weight	80 kg (176 lb)
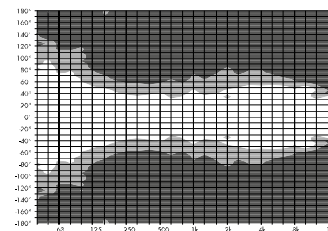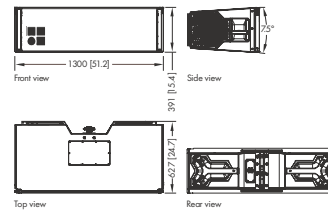
GSL12 cabinet dimensions in mm [inch]

---

[1] SPLmax: Broadband signal IEC 60268
[2] Dispersion angle vs frequency plotted using lines of equal sound pressure (isobars) at –6 dB and –12 dB

SL-SUB and SL-GSUB

The SL-SUB and SL-GSUB are cardioid subwoofers to compliment the GSL8 and GSL12 loudspeakers. The SL-SUB rigging hardware allows columns of up to 14 cabinets to be flown while the SL-GSUB is intended for ground stacked applications only. Both subwoofers are actively driven, 2-way bass-reflex designs housing three long excursion 21" neodymium drivers. Two drivers face to the front while one radiates to the rear. The front and rear facing drivers operate in independent bass reflex chambers and are driven from separate amplifier channels. The cardioid dispersion pattern reduces unwanted energy behind the system, lessens stimulus of the reverberant field to deliver highly accuracy low frequency reproduction. The frequency response extends from 30 Hz to 90 / 70 Hz. The SL-SUB cabinet incorporates front and rear rigging strands while the SL-GSUB has no rigging components and is intended for ground stack purposes. The cabinets are constructed from marine plywood with an impact and weather protected PCP (Polyurea Cabinet Protection) finish. The front and rear of the subwoofers are protected by rigid metal grills backed by an acoustically transparent and water repellent fabric. Two runners extend from the front to rear to protect the bottom panel. Two correspondingly shaped recesses are incorporated in the top panel accepting the runners and preventing cabinet movement when subwoofers are stacked. The side panels incorporate four recessed handles and four heavy duty wheels are mounted on the rear of the subwoofers.

System data

Frequency response (–5 dB standard).................... 30 Hz - 90 Hz
Frequency response (–5 dB INFRA mode) .... 30 Hz - 70 Hz
Max. sound pressure (1 m, free field)..
with D80 .... 144 dB [1]

Loudspeaker data

Nominal impedance front/rear .... 3/6 ohms
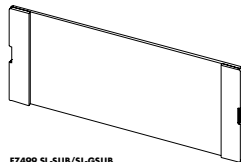Power handling capacity front (RMS/peak 10 ms)....1000/4000
Power handling capacity rear (RMS/peak 10 ms) .500/2000 W
Components .... 3 x 21" driver
Connections .... 1 x NLT4 F
Weight ....SL-SUB 138 kg (304 lb)
Weight ....SL-GSUB 132 kg (291 lb)
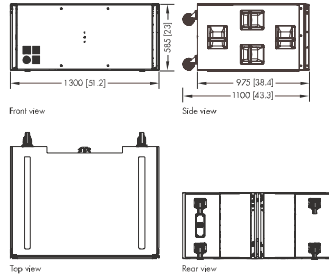
SL-SUB/SL-GSUB cabinet dimensions in mm [inch]
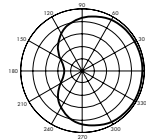
Cardioid polar pattern

**E7499 SL-SUB/SL-GSUB
Wooden lid**

Tension and compression modes

The GSL System rigging has been optimized to incorporate solutions for every eventuality. The patented flying hardware and method enables rapid deployment of GSL8 and GSL12 arrays directly from the Touring cart in either compression or tension rigging modes. Tension mode uses the well-established d&b three-point rigging, while the compression mode needs a smaller footprint and is faster and safer for large arrays. Loudspeakers are flown as straight arrays, the d&b Z5704 Compression set curves the array to produce the coverage defined by the splay angle settings; a motorized chain hoist may also be used.[1]

Mounted directly on the GSL Flying frame, the d&b ArraySight laser inclinometer contains temperature and humidity sensors, this information is relayed to the R1 Remote control software using the OCA/AES70 protocol.
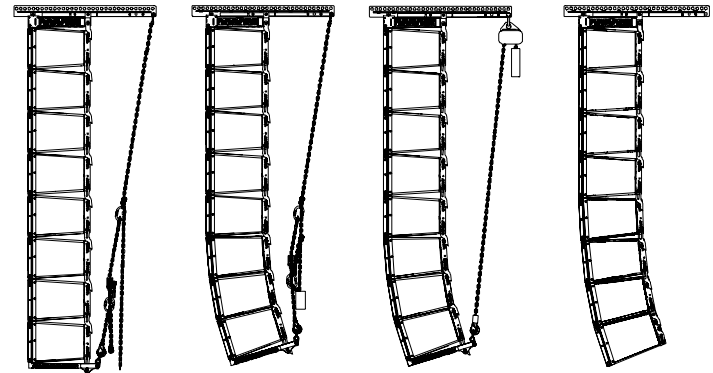
Uncompressed array with lever hoist

Compressed array with lever hoist

Compressed array with motorized chain hoist

Splay angles set in tension mode
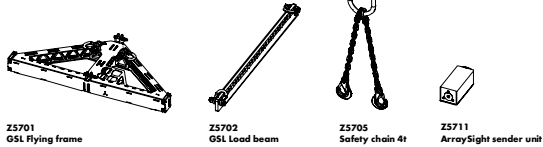
[1]   SPLmax: Broadband signal IEC 60268

[1]   The maximum permitted compression force is 1000 kg
(1.0 t/10 kN). The motor hoist must be equipped with two independent brakes (according to the German D8 Plus standard)

The GSL rigging system
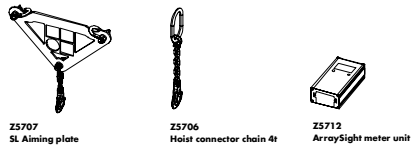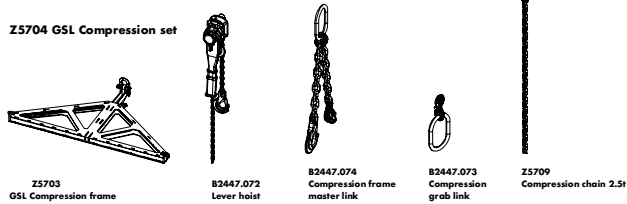
The GSL rigging examples

Safety approval
d&b loudspeakers and accessories are designed for setup and use within situations requiring compliance with the provisions and directives of the DGUV regulation 17 (formerly BGV C1).
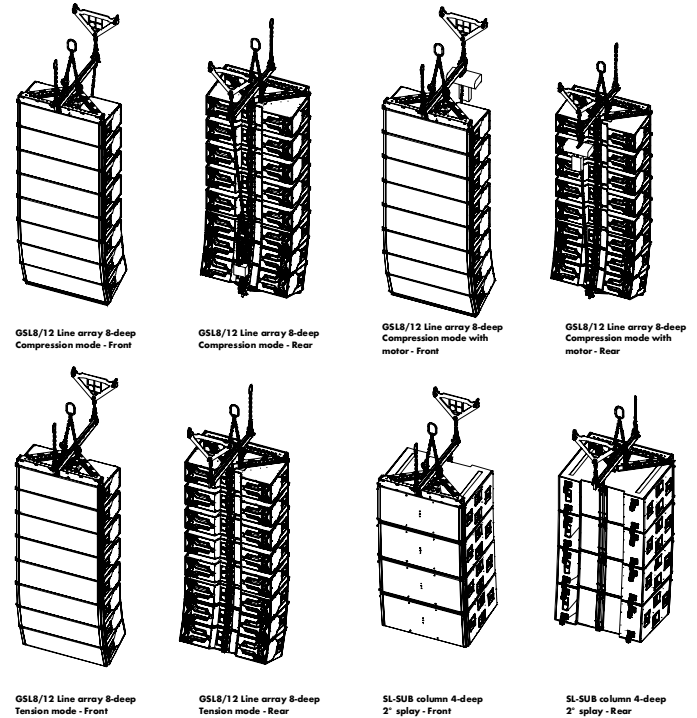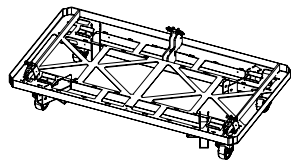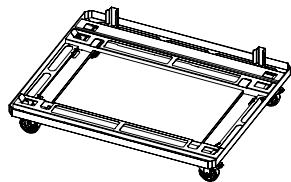
These rigging examples are for illustration only. For further information please refer to the TI 385 d&b Line array design as well as the GSL Rigging manual, both of which are available for download at www.dbaudio.com.
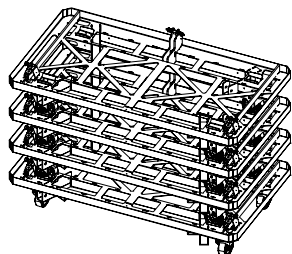
Z5708 GSL Flying frame set

Z5701
GSL Flying frame

Z5702
GSL Load beam

Z5705
Safety chain 4t

Z5711
ArraySight sender unit

Z5704 GSL Compression set

Z5703
GSL Compression frame

B2447.072
Lever hoist

B2447.074
Compression frame master link

B2447.073
Compression grab link

Z5709
Compression chain 2.5t

Z5707
SL Aiming plate

Z5706
Hoist connector chain 4t

Z5712
ArraySight meter unit

GSL8/12 Line array 8-deep Compression mode - Front

GSL8/12 Line array 8-deep Compression mode - Rear

GSL8/12 Line array 8-deep Compression mode with motor - Front

GSL8/12 Line array 8-deep Compression mode with motor - Rear

GSL8/12 Line array 8-deep Tension mode - Front

GSL8/12 Line array 8-deep Tension mode - Rear

SL-SUB column 4-deep 2° splay - Front

SL-SUB column 4-deep 2° splay - Rear

The GSL carts

E7490
Touring cart 4 x GSL8/GSL12
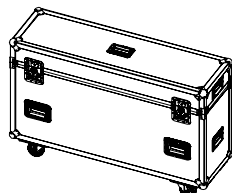

E7492
Touring cart 3 x SL-SUB/SL-GSUB

E7490
GSL8/GSL12 Touring cart stackable
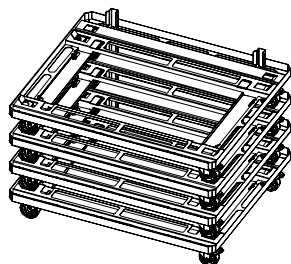
E7492
SL-SUB/SL-GSUB Touring cart stackable
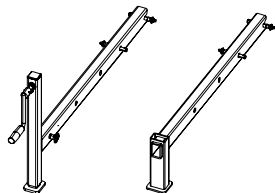
E7494
SL Outriggers

E7497
Touring case GSL compression

The GSL carts examples

Safety approval

d&b loudspeakers and accessories are designed for setup and use within situations requiring compliance with the provisions and directives of the DGUV regulation 17 (formerly BGV C1).
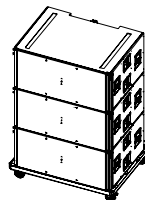

E7490
Touring cart 4 x GSL8/GSL12
Loaded in Compression mode
with mounted GSL Flying frame

E7490
Touring cart 4 x GSL8/GSL12
Loaded in Tension mode
with mounted GSL Flying frame
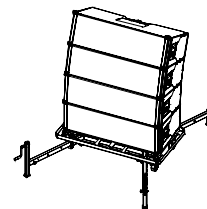
GSL8/GSL12 Ground stack with
E7490 Touring cart
**and E7494 Outriggers as Ground support**

E7492
Touring cart 3 x SL-SUB /SL-GSUB
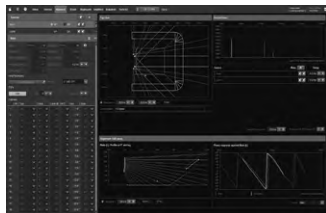
The d&b ArrayCalc simulation software

The d&b ArrayCalc simulation software is the prediction tool for d&b line arrays, column and point source loudspeakers as well as subwoofers. This is a comprehensive toolbox for all tasks associated with acoustic design, performance prediction, alignment, rigging and safety parameters. For safety reasons d&b line arrays must be designed using the d&b ArrayCalc simulation software. ArrayCalc is available as a native stand-alone application for both Microsoft Windows[1] (Win7 or higher) and Mac OS X[2] (10.7 or higher) operating systems. In combination with the d&b Remote Network, this can significantly reduce setup and tuning time in mobile applications and allows for precise simulations when planning installations. Listening planes can be defined in the venue tab, creating a three dimensional representation of any audience area in a given venue. This can also include balconies, side stalls, arenas, in the round scenarios or festivals. Special functions assist in obtaining accurate dimensions with laser distance finders and inclinometers.
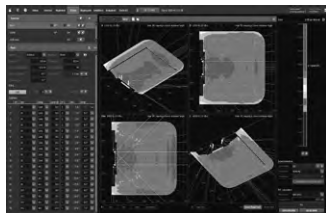
Simulation

Up to fourteen flown arrays or subwoofer columns can be defined in a project file as single hangs or in pairs. A selection of d&b point source loudspeakers can also be fully integrated as well as a ground stacked SUB array consisting of up to fifty one positions. All can be freely positioned according to their intended application, for example as main hang, outfill, nearfill or delay. Position, orientation, aiming and coverage details are displayed. Level over distance is calculated for each source with high resolution in real time, for either band limited or broadband input signals. The comprehensive simulation precisely models the actual performance of the system, taking into account input level, all system configuration options (such as CUT, CPL, HFC or INFRA), limiter headroom and air absorption. Acoustic obstacles, such as video screens, can be added to a model. Acoustic shadowing, whether by these obstacles, or a balcony overhang, is taken into consideration. The load status of all array rigging components is calculated accurately and displayed to determine whether a given array is within the load tolerance. Subwoofer array design is assisted by coverage and polar plot prediction. A specialized algorithm allows the user to specify subwoofer positions and a coverage angle, which is then converted into appropriate delay settings that result in the desired dispersion. The alignment tab enables different sources to be time aligned to one another, as well as showing arrival times and Sound Pressure Levels at a definable reference point on one of the audience areas. For alignment of the flown system with the ground stacked SUB array, the phase response of both the SUB array and a flown source is calculated at a definable reference point.
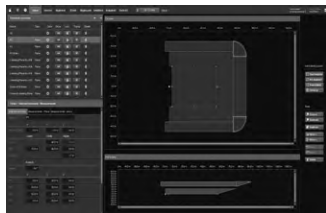
Venue

Alignment

3D Plot quad

Both simulations reflect changes in delay time to the single sources in real time. The d&b ArrayCalc simulation software is available at www.dbaudio.com, along with further information and video tutorials.

Prediction

The level distribution resulting from the interaction of all active sources can be mapped onto the audience areas in a three-dimensional view, which can also be zoomed, rotated and exported as a graphics file. EASE and DXF data export capabilities are also available. A rigging plot with all necessary coordinates, dimensions and weights of arrays is generated for export and printing and a parts list, detailing all components required. The d&b ArrayCalc Viewer app presents this key information for positioning and flying a d&b audiotechnik loudspeaker system on a mobile device. Once the system has been designed, calculated and optimized, all relevant project information can be shared via email, AirDrop, or downloaded onto any iOS or Android device.
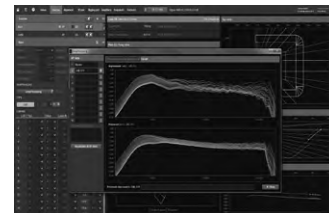
ArrayProcessing

The optional ArrayProcessing function applies powerful filter algorithms to optimize the tonal (spectral) and level (spatial) performance of a line array column over the audience area defined by its mechanical vertical coverage angle. Within the d&b ArrayCalc simulation software, spectral and level performance targets over the listening areas can be defined while specific level drops or offsets can be applied to certain areas, to assign reduced level zones. ArrayProcessing applies a combination of FIR and IIR filters to each individual cabinet in an array to achieve the targeted performance, with an additional latency of only 5.9 ms. This significantly improves the linearity of the response over distance as well as seamlessly correcting for air absorption. In addition, ArrayProcessing employs the same frequency response targets for all d&b line arrays, to ensure all systems share a common tonality. This provides consistent sonic results regardless of array length or splay settings. The resulting coverage is enhanced with spectral consistency and defined level distribution, achieving more linear dispersion and total system directivity to cover longer distances or steep listening areas effectively.

R1 Remote Control Software

R1 uses the same project file created by ArrayCalc and generates an intuitive graphical user interface including complete details of the simulated system, loudspeakers, amplifiers, remote IDs, groups, ArrayProcessing data and all configuration information. This workflow removes the need to manually transfer data from one software program to the other.
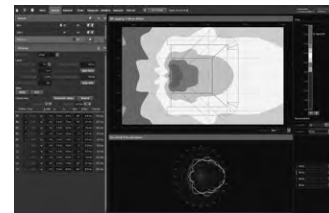
Sources, SUB array

ArrayProcessing

Amplifiers

The d&b NoizCalc immission modelling software

The d&b R1 Remote control software

The d&b software uses international standards to model the far field noise immission from multiple complex and coherently emitting sources such as line arrays and subwoofer arrays. Gaining permission and licenses to stage live open air events often requires an official statement with a prediction of how noise could impact on the surrounding area. Careful planning of the combined directivity and the direction can influence the immission result outside of the event area. NoizCalc takes all complex loudspeaker data and a reference point from the d&b ArrayCalc simulation software and calculates the sound propagation and relative attenuation values towards the far field for a certain scenario with particular meteorological conditions for one or more d&b loudspeaker systems.

The results are displayed on a 3D terrain map showing the calculated immission on the areas surrounding the audience listening zones. This visual representation shows the actual system performance in the far field, enabling users to optimize for listeners while satisfying local noise restrictions and offsite regulations. To ensure the results are reliable, NoizCalc includes all complex data concerning the addition and subtraction of sound waves, including phase information to describe the combination and interaction effects within a loudspeaker system consisting of multiple line arrays, subwoofer arrays and delay systems.

NoizCalc models immissions in the far field according to the internationally accepted ISO 9613-2 or Nord2000 calculation standards. Ground characteristics can be set depending on the absorbency or reflectivity of surfaces, while areas with volume attenuating properties can be defined. Buildings can be included, and the maximum reflection order option adjusts how many reflections are calculated. Parameters for humidity, air pressure and temperature ensure that the correct air absorption figures are accounted. The ISO 9613-2 standard requires limited meteorological information and assumes a worst case scenario. The more sophisticated propagation model, Nord2000 enables a more precise handling of meteorological conditions allowing the user to model with prevailing wind information. The d&b NoizCalc immission modelling software is available at www.dbaudio.com for registered download, along with further information and video tutorials. It was developed in collaboration with SoundPLAN, a specialist software developer for environmental noise prediction.

Editor

Graphic plot

The remote control capability of the d&b Remote Network enables central control and monitoring of a complete d&b loudspeaker system from anywhere in the network, be it from a computer in the control room, at the mix position, or on a wireless tablet in the auditorium. This central access to all functions through the d&b Remote Network, to controls as well as detailed system and device diagnostics information, unlocks the full potential of the d&b system approach. In a typical user workflow, the d&b Remote Network takes settings optimized in the d&b ArrayCalc simulation software and applies these to all the amplifiers within the network. The importation of settings from ArrayCalc allows the system configuration to be quickly accomplished, providing more time for verification and fine tuning.

All features, functions and controls available on the front panel of d&b amplifiers may be remotely controlled and/or monitored using the d&b R1 Remote control software. This allows each channel of the amplifier to be controlled and enables the creation of groups of loudspeakers. When grouped together, a button or fader can control the overall system level, zone level, equalization and delay, power ON/OFF, MUTE, as well as loudspeaker specific function switches such as CUT/HFA/HFC and CPL An offline mode is provided for preparation in advance of an event, without the amplifiers being present or connected. d&b System check verifies that the system performs within a predefined condition, while the Array verification function automatically identifies the physical position of a loudspeaker in an array to check that the system is cabled correctly. Extensive facilities for storing and recalling system settings are provided allowing those to be repeated, as and when required. For mobile applications, project files can be easily adjusted for use with a different set of equipment at another location.

In installation projects system integrators can configure the d&b Remote Network to offer access to different levels of control, tailored to the operational demands. For example, power ON/OFF for daily use, or more complex functionality for detailed control. Password protection is available to restrict access. Input and Load monitoring allow installation operators to ensure optimum performance at all times. The d&b R1 Remote control software enables d&b amplifiers to be remotely controlled using both Ethernet and CAN-Bus in parallel.
The software is optimized for use with touch screen, mouse and keyboard and runs on both Microsoft Windows[1] (Win7 or higher) and Mac OS X[2] (10.7 or higher) operating systems. Further information is provided in the d&b Amplifier and Software brochure which is available for download at www.dbaudio.com.

Home

Remote in Configuration mode
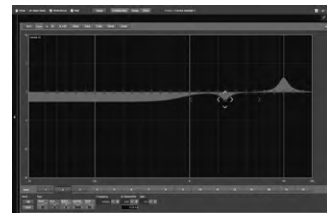
16-band equalizer

[1] Microsoft Windows is a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries
[2] Mac OS X is a trademark of Apple Inc., registered in the U.S. and other countries

The DS100 Signal Engine

The GSL System package

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. Additional software modules provide dynamic source positioning and emulated acoustics functions.

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. The complete system is designed and optimized in the d&b ArrayCalc simulation software, and controlled via the d&b R1 Remote control software.

DS100 Signal Engine front view

The full functionality of any d&b system is instantly inherited from the software suite for planning, modelling and control. This includes ArrayCalc, ArrayProcessing, NoizCalc, Dante audio transport via the DS10 Audio network bridge, OCA/AES70, and the R1 Remote control software. At the heart is the D80 Touring rack which houses six amplifiers and utilizes the new MC24/LKA25 loudspeaker multicore solution. This provides twelve channels per cable to power an array of twelve GSL loudspeakers from one amplifier rack via two loudspeaker multicore cables.

The d&b SL-Series is a special loudspeaker system, a complete package guaranteeing consistency in transport, cabling, amplification, rigging and operation, with all the performance and reliability advantages of the d&b System reality.

The D80 amplifier

The D80 Touring rack assmbly

The 2 RU four channel D80 amplifier is a high power density amplifier, ideally suited for use mobile environments. The signal delay capability enables user definable settings of up to 10 s (= 3440 m/11286 ft) to be applied independently to each channel. The same applies to the two 16-band equalizers, providing optional parametric, asymmetric, shelving or notch filtering. The D80 incorporates a colour TFT touchscreen, offering quick access to the menu structure, while the rotary encoder can be used for fine adjustment. The front panel and the integrated touchscreen of the D80 amplifier is tilted up for ease of operation when the amplifier is below eye level.
The LoadMatch function integrated within the D80 amplifier electrically compensates the properties of loudspeaker cable used. The D80 incorporates Class D amplifiers utilizing a switched mode power supply with active Power Factor Correction(PFC) suitable for mains voltages 100 V/127 V, 50 – 60 Hz and 208 V/240 V, 50 - 60 Hz and maintains a stable output when used with weak or unstable mains supplies.

The d&b 6 x D80 Touring rack assembly and the d&b 3x D80 Touring rack assembly is intended for large scale sound reinforcement applications. It is designed as a complete prewired system amplification rack providing mains power distribution, connector interfaces and all internal cabling for D80 amplifiers. The 19" internal shockmount steel frame also accommodates an I/O panel providing both analog and digital audio signals as well as four network connectors for either Ethernet or CAN-Bus remote networking and a d&b DS10 Audio network bridge. The DS10 Audio network bridge interfaces between Dante networks and AES3 digital audio signals, while also providing distribution of Ethernet control data. The DS10 incorporates an integrated 5-port switch, offering a primary and redundant network for the Dante protocol, as well as advanced functions such as Multicast Filtering and VLAN modes.

The d&b 6 x D80 Touring rack assembly comes with a 2 RU loudspeaker connector panel providing six NL8 (4 channel) and two LKA25 (12 channel) loudspeaker outputs. The loudspeaker connector panel is also equipped with a Power over Ethernet (POE) socket to connect and power a d&b ArraySight inclinometer. The d&b ArraySight inclinometer system is intended to vertically aim an entire array in its operation position. It provides precision angle measurement over a wide measuring range of ±90 degrees. It utilizes an ultra bright green laser to provide a visible indication for aiming the array. The d&b ArraySight sender unit also sends temperature and humidity information to the R1 Remote control software via OCA/AES70. The d&b 3 x D80 Touring rack assembly provides three NL8 (4 channel) and one LKA25 (12 channel) loudspeaker output. Both touring Racks are available with a 32 A CEE mains power distribution or 30 A NEMA mains power distribution panel.

3 x D80 Touring rack front view

6 x D80 Touring rack front view

D80	
User interface	Encoder/colour TFT touchscreen
Output channels	4
Input channels	4 x AES3 or 4 x analog or 2 x AES3 and 2 x analog
Latency	0.3 msec
User equalizers (per channel)	2 x 16-band
Delay	10 sec/3440 m
Maximum output power (THD+N < 0.5%, 12 dB crest factor)	4 x 2000 W into 8 ohms 4 x 4000 W into 4 ohms
Output routing	Dual Channel, Mix TOP/SUB 2-Way Active
Output connectors	NL4/EP5 plus central NL8
Cable compensation	LoadMatch
Power supply	Autosensing switched mode power supply with active PFC
Mains voltage	100 - 127/208 - 240 V, 50 - 60 Hz
Weight (kg/lb)	19/42
Dimensions	2 RU x 19" x 530 mm
Remote	OCA/AES70 via Ethernet/CAN
Airflow	

The operation with the D80 amplifier

The GSL System frequency responses

Amplifier controller setups

Arc and Line setup
The Arc mode is used for line array loudspeakers when used in curved array sections with splay angles between 2° and 7°. The Line mode is used for long throw array sections with three or more consecutive splay settings between 0° and 1°. Compared to the Arc mode, the upper mid range is reduced to compensate for the extended near field.

CUT mode
Set to CUT, the cabinet low frequency level is reduced and it is now configured for use with the d&b SL subwoofer.

HFC mode
Selecting the HFC (High Frequency Compensation) mode compensates for loss of high frequency energy due to absorption in air when loudspeakers are used to cover far field listening positions. HFC has two settings which should be used selectively, HFC1 for cabinets covering distances larger than 40 m (130 ft) and HFC2 for those covering distances larger than 80 m (260 ft).

This can be used to achieve the correct sound balance between close and remote audience areas allowing all amplifiers driving the array to be fed from the same signal source. Thus the whole array performs with comparable headroom.

CPL function
The CPL (Coupling) function compensates for coupling effects between closely coupled cabinets by reducing the low and mid frequency level. CPL begins gradually at 2 kHz, with the maximum attenuation below 100 Hz, providing a balanced frequency response when SL-Series cabinets are used in arrays of five or more. The CPL function can be set in dB attenuation values between –9 and 0.

INFRA mode
With the INFRA mode selected, the upper operating frequency of the system is reduced from 30 Hz to 70 Hz. The SL-SUB/SL-GSUB can now be used to supplement applicable d&b loudspeaker systems operated in full range mode.
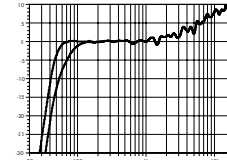
Maximum loudspeakers per amplifier
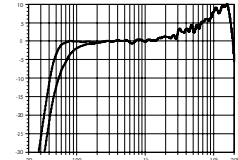
	GSL8	GSL12	SL-SUB	SL-GSUB
D80	2	2	2	2

Available controller settings

	GSL8	GSL12	SL-SUB	SL-GSUB
Arc/Line	x	x		
AP	x	x		
CUT	x	x		
HFC	x	x		
CPL	x	x		
INFRA			x	x

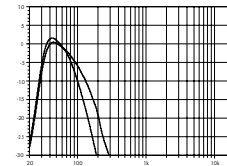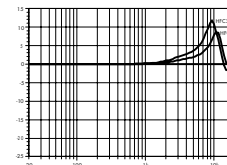**GSL8: Frequency response, standard and CUT modes***
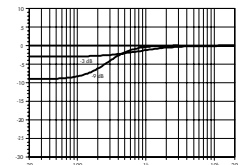* single cabinet within array

GSL12: Frequency response, standard and CUT modes*
* single cabinet within array
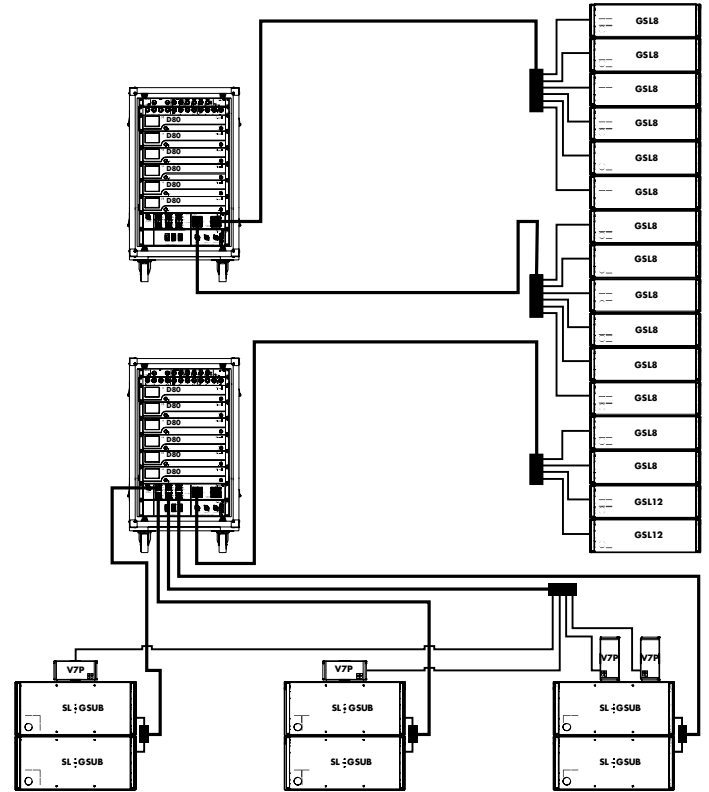

SL-SUB/SL-GSUB frequency response, standard and INFRA modes
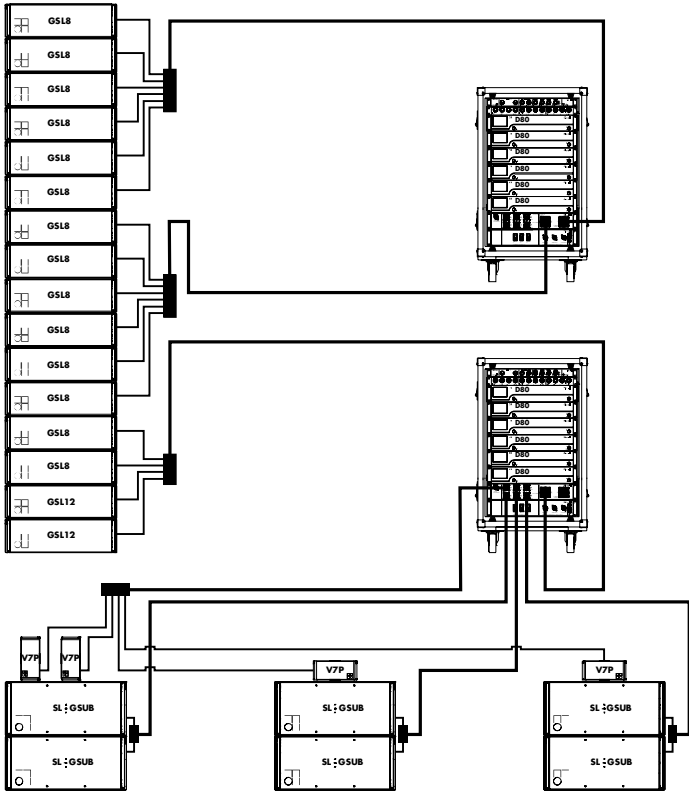

Correction of HFC*
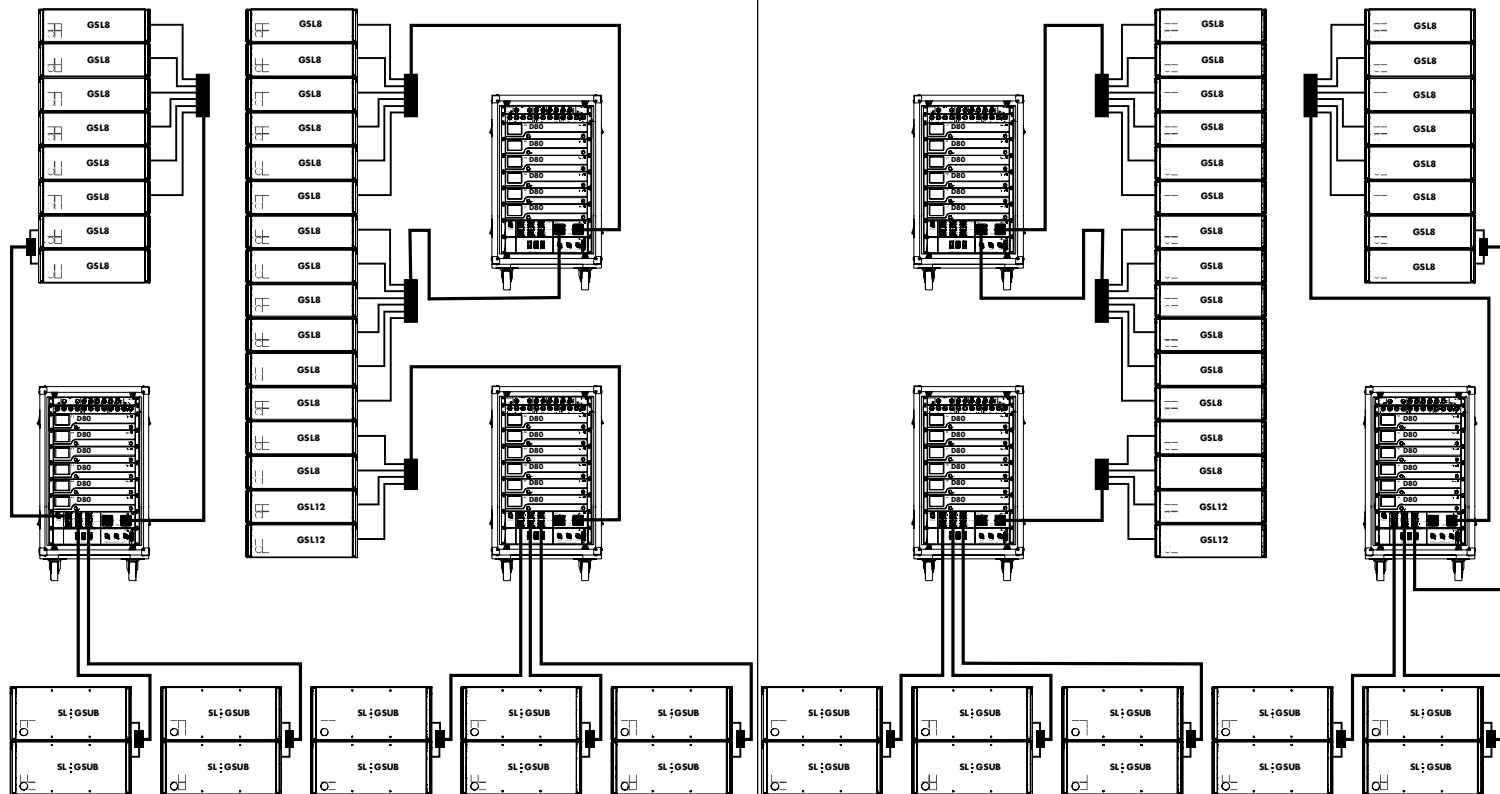*schematic diagram

Correction of CPL*
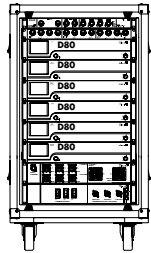*schematic diagram

The GSL System configuration examples

Arena package: SL-Series configuration comprising GSL8/GSL12 mains and V7P fontfill along with ground stacked SL-GSUB with 6 x D80 Touring racks.
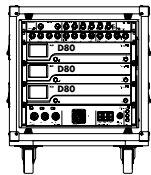
Festival package: GSL8/GSL12 main arrays, GSL8 outfills and SL-GSUB subarray with 6 x D80 Touring racks

The GSL System cables and adapters MC8 / MC24

Z5576
6x D80 Touring rack
OUT: 2x LKA 25 / 6 x NL8

Z5570 / Z5571
3x D80 Touring rack
OUT: 1 x LKA 25 / 3 x NL8

Z2710 D80 amplifier
OUT: 1 x NL8

Z5328.xxx
MC24 LKA25 F/M Multicore

Z5343.xxx
MC8 Cable NLT8 F/M

Z5343.xxx
MC8 Cable NLT8 F/M

Z5325.000
LKA25M to 6x NLT4M adapter

Z5348.002
Adapter NLT8F
to 2 x NL4M

Z5347.001
Breakoutbox NLT8F
to 6 x NLT4M

Z5348.002
Adapter NLT8F
to 2 x NL4M

Z5347.001
Breakoutbox NLT8F
to 6 x NLT4M

Z5340.xxx
MC4 Cable NLT4 F/M

Z5340.xxx
MC4 Cable NLT4 F/M
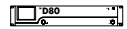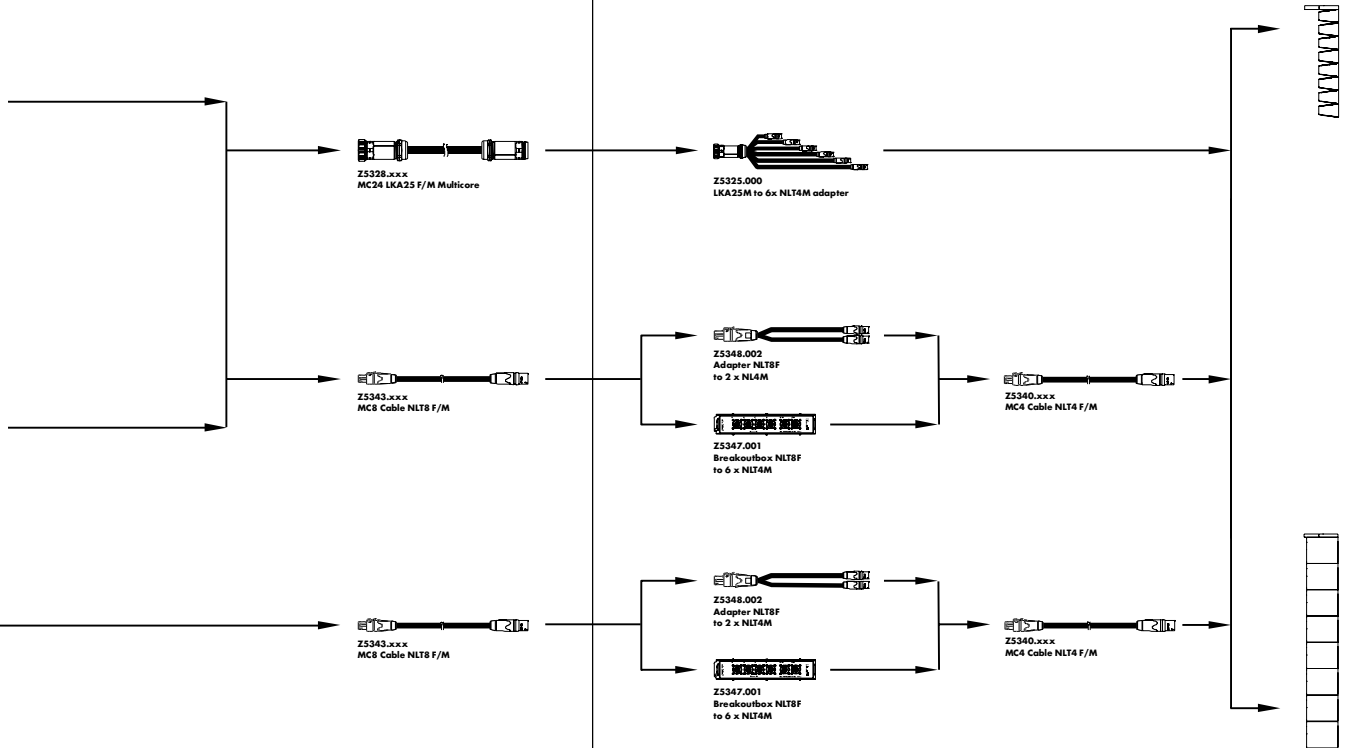
The GSL System product overview

GSL loudspeakers	Z0750.000	**GSL8 Loudspeaker NLT4F**
	Z0751.000	**GSL12 Loudspeaker NLT4F**
	Z0760.000	**SL-SUB Subwoofer NLT4F**
	Z0761.000	**SL-GSUB Subwoofer NLT4F**
GSL accessories	Z5708.000	**GSL Flying frame set**
	Z5704.000	**GSL Compression set**
	Z5707.000	**SL Aiming plate**
	Z5706.000	**Hoist connector chain 4t**
	Z5703.000	**GSL Compression frame**
	Z5712.000	**d&b ArraySight meter unit**
	E7499.000	**SL-SUB/SL-GSUB Wooden lid**
Cart packages	Z7490.750	**GSL8 Cart package**[1]
	Z7490.751	**GSL12 Cart package**[1]
	Z7492.760	**SL-SUB Cart package**[2]
	Z7492.761	**SL-GSUB Cart package**[2]
Carts and cases	E7490.000	**Touring cart 4 x GSL8/12**
	E7491.000	**Touring cart cover GSL8/12**
	E7492.000	**Touring cart SL-SUB**
	E7493.000	**Touring cart cover SL-SUB**
	E7497.000	**Touring case GSL compression**

Amplifiers	Z2710.xxx	**D80 amplifier**[3]
Processing and distribution	Z4010.000	**DS10 Audio network bridge**
	Z4100.000	**DS100 Signal Engine**
Amplifier rack assemblies	Z5570.xxx	**3 x D80 Touring rack**[4]
	Z5571.xxx	**3 x D80 Touring rack** (includes DS10)[4]
	Z5576.xxx	**6 x D80 Touring rack** (includes DS10)[4]
Racks	E7468.000	**D80 Touring rack 2 RU, 19"** SD, shock mounted, handles
	E7483.000	**DS100 Touring rack 3 RU, 19"** SD, shock mounted, handles
Cables and adapters	Z5343.xxx	**MC8 Cable NLT8 F/M**
	Z5340.xxx	**MC4 Cable NLT4 F/M**
	Z5328.xxx	**MC24 LKA 25 F/M Multicore**
	Z5325.000	**Adapter LKA25M to 6 x NLT4M**
	Z5348.002	**Adapter NLT8F to 2 x NLT4M**
	Z5347.001	**Breakoutbox NLT8F to 6 x NLT4M**

[1] Includes 4 x GSL8/12 loudspeakers, GSL Touring cart and GSL Touring cart cover
[2] Includes 3 x SL-SUB/SL-GSUB subwoofers, SL-SUB Touring cart and SL-SUB Touring cart cover

[3] The complete list of mobile amplifier versions is available in the d&b D Amplifier and Software brochure
[4] Further information is available in the d&b D Amplifier and Software brochure

d&b
audiotechnik ®