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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, accessories and software. 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 integrated to achieve maximum efficiency. For ease of use, all the user-definable parameters are integrated, allowing the possibility of adjustment, either via remote control surfaces or directly on the amplifiers. Neutral sound characteristics leave the user all the freedom needed to realise whatever the brief. At the same time d&b offers integrated 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.
Clarity, bandwidth, high power and headroom capabilities make the Q-Series loudspeakers an ideal option for speech and music in many small to medium scale theatre and presentation situations, live television and orchestral shows. The scope of applications is intentionally broad, ranging from single loudspeakers right through to multiple cabinet arrays. These flexible loudspeakers can be effortlessly and scalably combined for a multitude of small to large coherent arrays. To this end a variety of technologies are used: conventional rotatable CD horns, dipolar driver arrangements, low compression vented designs with high excursion drivers and toroidal waveshaping devices, all integrated using line array principals. The Q loudspeakers are designed for a wide range of applications with a clear perspective to provide mobile, flexible, configurable array solutions to the most arduous sound reinforcement situations. The Qi loudspeakers differ only in cabinet construction and mounting hardware. They are intended for permanently installed performance spaces where the specification is rider driven by the artist or mix engineer’s preferences. Both the Qi loudspeakers and mounting hardware can be properly colour matched to interior designs and are weather protected for climatically hostile environments.
The Q-Series

The 2-way passively crossed over Q1 and Q11, Q7 and Q17 as well as Q10 and Q110 loudspeakers share the same physical size, shape and driver complement. The highest degree of constant directivity is maintained using a large frequency overlap through the crossover range, while the recessed dipolar positioning of the two 10” low frequency drivers mechanically time aligns these with the 1.3” exit HF driver. The Q1 and Q11 HF drivers are fitted with a toroidal waveshaping device that has a 75° horizontal dispersion pattern. The HF drivers of Q7 and Q17 as well as Q10 and Q110 are fitted to rotatable 75° x 40° and 110° x 40° (h x v) constant directivity horns respectively, allowing horns to be configured for use both vertically or horizontally. When deployed upright, the Q7 and Q17 as well as Q10 and Q110 are accurate stand-alone full range loudspeakers with vertical directivity control extending approximately one octave below similarly sized biaxial loudspeakers. Their horizontal coverage angles can also be used to fulfill near field or infill functions for line arrays, either flown, stacked or ground supported. When deployed horizontally with the horn rotated, the horizontal dispersion control of Q7 and Q17 is maintained down to approximately 400 Hz. This performance can be used very effectively in critical positions close to open microphones and also allows Q7 and Q17 loudspeakers to be combined as the near field element in Q1 and Q11 columns.

The Q, Qi and QiCSA subwoofers complete the Series, sharing the same width as the other loudspeakers and having compatible flying fittings that enable their use in columns with Q and Qi loudspeakers respectively. The Q, Qi and QiCSA-SUB cabinets are bass-reflex designs with an 18” high excursion driver. Multiples of three Q-SUBs or two Qi-SUBs and one QiCSA-SUB can be combined to produce Cardioid Subwoofer Arrays (CSA).

The d&b software offering aides the entire system setup process, from the simulation and planning of the loudspeaker systems, to the remote control and monitoring of the system functions during the event, followed by service functionality to verify system performance prior to de-rigging. The 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. Using the R1 export function, a project file containing the simulation data, including the respective amplifier settings is generated for deployment in the R1 Remote control software. R1 then feeds the settings to the amplifiers from a central location to allow rapid verification and fine adjustment on site. Service functions enable firmware updates of the amplifiers as and when these are available.

The d&b D6 and D12 dual channel as well as the D80 four channel amplifiers realize the complete system and incorporate d&b loudspeaker specific configuration information. They provide three different power ranges and have analog and digital signal inputs and links. These devices are specially designed and manufactured by d&b utilizing Digital Signal Processing and include switchable functions for precisely tailoring system response for a wide variety of applications. Delay capabilities and equalization on each channel of every amplifier reduce the need for external processing devices, with user definable 4-band parametric EQ for the D6 and D12 compared to the two 16-band equalizers incorporated into the D80.
The Q1 and Qi1 loudspeakers

The Q1 and Q1i are line array loudspeakers for use in vertical columns. The Q1i is the installation version of the Q1 loudspeaker, it differs only in cabinet construction and mounting hardware. The Q1 and Q1i cabinets are passive 2-way designs housing two 10” LF drivers and a 1.3” HF compression driver with a toroidal waveguide device to achieve a 75° horizontal dispersion characteristic. The two 10” neodymium LF drivers are positioned in a dipolar arrangement providing an exceptional dispersion control even at lower frequencies, with the 75° nominal angle being maintained down to 400 Hz. The Q1 and Q1i cabinets can be combined with the respective Q or Qi subwoofer systems in mixed line array setups, as a separate subwoofer column or in ground stacked applications. For further extension of bandwidth and headroom ground stacked JINFRAS subwoofers can be used. The Q1 and Q1i cabinets are constructed from marine plywood and have an impact resistant paint finish. The front of the loudspeaker cabinets are covered with a replaceable acoustically transparent foam and protected by a rigid metal grill. Four M10 threaded inserts on each side panel of the Q1i cabinet enclosure are provided for attaching installation hardware whilst the Q1i cabinet incorporates a pair of handles and has integrated line array rigging hardware.

System data
Frequency response [-5 dB standard].............. 60 Hz - 17 kHz
Frequency response [-5 dB CUT mode]............. 100 Hz - 17 kHz
Max. sound pressure (1 m, free field)...............
-18 dBu

Q1 cabinet dimensions in mm [inch]

Q & Q1i loudspeaker data
Nominal impedance........................................ 8 ohms
Power handling capacity (RMS/peak 10 msec).... 400/1600 W
Nominal dispersion angle (h x v)....................... 75°
Components..............................................
2 x 10” driver/1.3” compression driver
2 x N414/FM
Connections Q1............................................
optional 2 x EPS or 2 x NL4
Connections Q1i.......................................... 22/21 kg [49/46 lb]
Weight Q1/Q1i..............................................

The Q7 and Qi7 loudspeakers

The Q7 and Qi7 are full range loudspeakers. The Q7 is the installation version of the Q7 loudspeaker, it differs only in cabinet construction and mounting hardware. The Q7 and Qi7 are 75° x 40° passive 2-way cabinets housing two 10” LF drivers and a 1.3” HF compression driver with a rotatable constant directivity horn and a passive crossover network. The two 10” neodymium LF drivers are positioned in a dipolar arrangement providing exceptional vertical dispersion control with the 40° nominal angle being maintained down to 400 Hz. The precisely controlled 75° horizontal dispersion performance provides the ideal pattern for many medium throw requirements. The horn can be rotated by 90°.

The Q7 and Qi7 can be used as stand-alone full range systems in combinations with other Q and Qi loudspeakers, ground stacked or mounted on a high stand. Q7 and Qi7 cabinets can also be combined in flown array systems.

The Q7 and Qi7 cabinets are constructed from marine plywood and have an impact resistant paint finish. The front of the loudspeaker cabinets are covered with a replaceable acoustically transparent foam and protected by a rigid metal grill. Four M10 threaded inserts on each side panel of the Q7 cabinet enclosure are provided for attaching installation hardware whilst the Q7 cabinet incorporates a pair of handles and has integrated line array rigging hardware.

System data
Frequency response [-5 dB standard].............. 60 Hz - 17 kHz
Frequency response [-5 dB CUT mode]............. 100 Hz - 17 kHz
Max. sound pressure (1 m, free field)...............
-17 dBu

Q7 cabinet dimensions in mm [inch]

Q & Q7i loudspeaker data
Nominal impedance........................................ 8 ohms
Power handling capacity (RMS/peak 10 msec).... 400/1600 W
Nominal dispersion angle (h x v)....................... 75° x 40°
Components..............................................
2 x 10” driver/1.3” compression driver
2 x N414/FM
Connections Q7............................................
optional 2 x EPS or 2 x NL4
Connections Q7i.......................................... 22/21 kg [49/46 lb]
Weight Q7/Q7i..............................................

1 Broadband measurement, pink noise, crest factor 4, peak measurement, linear weighting
2 Dispersion angle vs frequency plotted using lines of equal sound pressure (isobars)
at -6 dB and -12 dB
3 Dispersion angle vs frequency plotted using lines of equal sound pressure (isobars)
at -6 dB and -12 dB
The Q10 and Qi10 loudspeakers

The Q10 and Qi10 loudspeakers are the dedicated subwoofers for the Q and Qi loudspeakers respectively and can be used to supplement the top cabinets in various combinations, either flown or ground stacked. The Q-SUB is the installation version of the Q-SUB, differing only in cabinet construction and mounting hardware. The Q and Qi subwoofers are actively driven bass reflex designs, housing a long excursion 18” driver. The subwoofers can be combined with the respective Q and Qi loudspeakers in line arrays, as a separate column or in ground stacked applications where the subwoofers also mechanically support the top loudspeakers. The Q and Qi subwoofer cabinets are constructed from marine plywood and have an impact resistant paint finish. The Q-SUB is also available in Special Colour (SC) and Weather Resistant (WR) options. The front of the subwoofer cabinets are covered with a replaceable acoustically transparent foam and protected by a rigid metal grill. Installation hardware is attached to the Q-SUB enclosure through four M10 threaded inserts on each side panel. The Q-SUB incorporates a pair of handles, a M20 threaded flange in the top panel and integrated line array rigging hardware.

System data
Frequency response [-5 dB standard].................40 Hz - 130 Hz
Frequency response [-5 dB 100 Hz mode]........40 Hz - 100 Hz
Max. sound pressure (1 m, free field)..............129 dB
with D6 ..............................................133 dB
with D12 .............................................137 dB
with D80 ...........................................139 dB

Loudspeaker data
Nominal impedance..............................8 ohms
Power handling capacity (RMS/peak 10 msec) ....400/1600 W
Nominal dispersion angle (h x v)....................110° x 40°
Components.................................2 x 10” LF drivers/1.3” HF compression driver/passive crossover network
Connections Q10..........................................................2 x NL4
Connections Qi10..........................................................2 x NL4
Weight Q10/Qi10..........................................................23/21 kg (49.6 lb)

The Q and Qi subwoofers

The Q and Qi subwoofers are the dedicated subwoofers for the Q and Qi loudspeakers respectively and can be used to supplement the top cabinets in various combinations, either flown or ground stacked. The Q-SUB is the installation version of the Q-SUB, differing only in cabinet construction and mounting hardware. The Q and Qi subwoofers are actively driven bass reflex designs, housing a long excursion 18” driver. The subwoofers can be combined with the respective Q and Qi loudspeakers in line arrays, as a separate column or in ground stacked applications where the subwoofers also mechanically support the top loudspeakers. The Q and Qi subwoofer cabinets are constructed from marine plywood and have an impact resistant paint finish. The Q-SUB is also available in Special Colour (SC) and Weather Resistant (WR) options. The front of the subwoofer cabinets are covered with a replaceable acoustically transparent foam and protected by a rigid metal grill. Installation hardware is attached to the Q-SUB enclosure through four M10 threaded inserts on each side panel. The Q-SUB incorporates a pair of handles, a M20 threaded flange in the top panel and integrated line array rigging hardware.

System data
Frequency response [-5 dB standard].................40 Hz - 130 Hz
Frequency response [-5 dB 100 Hz mode]........40 Hz - 100 Hz
Max. sound pressure (1 m, free field)..............129 dB
with D6 ..............................................133 dB
with D12 .............................................137 dB
with D80 ...........................................139 dB

Loudspeaker data
Nominal impedance..............................8 ohms
Power handling capacity (RMS/peak 10 msec) ....400/1600 W
Components.................................18” driver
Connections........................................optional 2 x NL4
Weight............................................42 kg (92.6 lb)
The QiCSA subwoofer

QiCSA subwoofer
The QiCSA subwoofer is a specifically designed version of the Qi-SUB for use as the rear facing element in Cardioid Sub Arrays (CSA) only. The QiCSA-SUB only differs from the Qi-SUB visually, as the CSA version features a grill and foam on both the front and the back of the loudspeaker to visually integrate with Qi-SUB's in an array. The QiCSA subwoofer is an actively driven bass reflex design, housing a long excursion 18” driver.

The QiCSA subwoofer cabinet is constructed from marine plywood and has an impact resistant paint finish. The QiCSA is also available in Special Colour (SC) and Weather Resistant (WR) options. The front and rear of the subwoofer cabinets are covered with a replaceable acoustically transparent foam and protected by a rigid metal grill. The grill facing backwards is fitted with a single NL4 connector at the bottom left hand side.

Installation hardware is attached to the QiCSA-SUB enclosure through four M10 threaded inserts on each side panel.

System data
Frequency response [-5 dB standard] ........... 40 Hz - 130 Hz
Frequency response [-5 dB 100 Hz model] .... 40 Hz - 100 Hz
Max. sound pressure (1 m, free field) 129 dB
with D6 ........................................ 129 dB
with D12 ........................................ 133 dB
with D80 ........................................ 133 dB

Loudspeaker data
Nominal impedance . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 8 ohms
Power handling capacity (RMS/peak 10 msec) ...... 400/1600 W
Components ........................................ 18” driver
Connections ........................................ 2 x NL4/1 x NL4
Weight ........................................ 40 kg (88 lbs)

The Qi Weather Resistant and Special Colour options

The Weather Resistant and Special Colour options are only available to order with the Qi version cabinets and appropriate accessories.

Weather Resistant (WR) option
The WR option enables operation of loudspeakers in changing ambient conditions, however it is not intended to enable permanent, unprotected operation of loudspeakers outdoors. Cabinets being used outdoors with the WR option should always be aimed either horizontally or with a downward tilt. The QiCSA-SUB should only be aimed horizontally. An additional cover should be positioned over the loudspeakers.

Qi loudspeakers with the Weather Resistant option are supplied with a fixed cable. Cable type H07RN-F 2 x 2.5 mm² / AWG 13 with a length of 5.5 m (18 ft) as standard or length as required.

Special Colour (SC) option
The paint finish of all loudspeaker cabinets and most accessories can be executed in almost all RAL colours in accordance with the RAL colour table. Items such as chains, fixing screws, shackles, eyebolts and screws are not painted. Other paint finishes such as metallic are available on request. The acoustically transparent foam fitted behind the rigid metal grill is also painted with the requested RAL colour.
Safety approval

d&b loudspeakers and accessories are designed for setup and use within situations requiring compliance with the provisions and directives of BGV C1 Rule for the Prevention of Accidents.

With a 15° vertical HF dispersion per cabinet, the Q1 can be used to construct vertical columns that produce a curved coherent wave front. The mechanical and acoustical design of the cabinet enables vertical splay angles to be set between 0° and 14°. Q1 cabinets can therefore be used in vertical configurations starting from two cabinets with a 15° to 30° dispersion, up to twenty cabinets with a fully user and venue defined vertical profile.

For further information please refer to the TI 385 d&b Line array design and Q-Series Rigging manual, which are available for download at www.dbaudio.com.

The Q1 rigging system

The Q1 rigging examples

Z5154 Q Rigging set
Z5151 Q Splay link
Z5153 Q Front link
Z5153 Locking pin 8 mm

Z5159 Q Flying frame
WLL: 480 kg / 1058 lb
or twenty Q1 loudspeakers

Z5160 Q Load adapter
WLL: 480 kg / 1058 lb
or twenty Q1 loudspeakers;
aiming of a column by 1/1,
1/2 or 1/4 detents

Z5156 Q Flying adapter
For three Q1 loudspeakers;
maximum

Z5152 Q Front link

Z5155 Q Hoist connector chain
WLL: 480 kg / 1058 lb
or twenty Q1 loudspeakers

Z5048 Flying pin 10 mm

Z5147 Q Hoist connector chain
WLL: 480 kg / 1058 lb
or twenty Q1 loudspeakers

Z5160 Q Load adapter

E6507 1t Shackles

Z5151 Q Splay link
Z5153 Q Front link
Z5153 Locking pin 8 mm

Z5159 Q Flying frame
WLL: 480 kg / 1058 lb
or twenty Q1 loudspeakers

Z5160 Q Load adapter

E6507 1t Shackles

Z5151 Q Splay link
Z5153 Q Front link
Z5153 Locking pin 8 mm

Z5159 Q Flying frame
WLL: 480 kg / 1058 lb
or twenty Q1 loudspeakers

Z5160 Q Load adapter

E6507 1t Shackles

Q1 line array with
Z5159 Q Flying frame
Z5154 Q Rigging set
Z5155 Q Hoist connector chain
66507 1t Shackles

Q1 array with
Z5156 Q Flying adapter
Z5154 Q Rigging set
Z5147 Rota clamp
Z5160 Q Load adapter

Q1/Q-SUB ground stack with
Z5154 Q Rigging set
Z5159 Q Flying frame
Z5154 Q Rigging set

Q1 ground stack with
Z5159 Q Flying frame
Z5154 Q Rigging set

Z5147 Rota clamp
WLL: 500 kg / 1100 lb;
for a tube diameter up to
51 mm / 2”

Z5147 Rota clamp
WLL: 500 kg / 1100 lb;
for a tube diameter up to
51 mm / 2”

Z5155 Q Hoist connector chain
WLL: 480 kg / 1058 lb
or twenty Q1 loudspeakers

Z5048 Flying pin 10 mm
Safety approval
d&b loudspeakers and accessories are designed for setup and use within situations requiring compliance with the provisions and directives of BGV C1 Rule for the Prevention of Accidents.
The Qi1 rigging system

Safety approval

d&b loudspeakers and accessories are designed for setup and use within situations requiring compliance with the provisions and directives of BGV C1 Rule for the Prevention of Accidents.

The Qi1 rigging examples

With a 15° vertical HF dispersion per cabinet, the Qi1 can be used to construct vertical columns that produce a curved coherent wave front. The mechanical and acoustical design of the cabinet enables vertical splay angles to be set between 0° and 14°. Qi1 cabinets can therefore be used in vertical configurations starting from two cabinets with a 15° to 30° dispersion, up to nine cabinets with a fully user and venue defined vertical profile. Qi subwoofers can be integrated at any position within the array.

These subwoofers can be mounted together in CSA mode, where the centre QiCSA-SUB radiates to the back. For further information please refer to the TI 385 d&b Line array design, which is available for download at www.dbaudio.com.
The Qi rigging system
The Qi7/Qi10 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 BGV C1 Rule for the Prevention of Accidents.

Flown Qi7/Qi10 array with
- Z5145 Ci/Qi Mounting frame
  WLL: 240 kg/530 lb
- Z5170 Qi Mounting adapter
- Z5171 Qi Mounting plate
- Z5173 Qi-SUB Mounting plate

Qi7/Qi10 horizontal array with
- Z5175 Qi Horizontal bracket
- Z5044 MAX Bracket connector

Qi7/Qi10 vertical array with
- Z5161 Qi flying bracket
- Z5175 Qi Horizontal bracket
- Z5054 Ci60/Ci90 Flying adapter

Safety approval
d&b loudspeakers and accessories are designed for setup and use within situations requiring compliance with the provisions and directives of BGV C1 Rule for the Prevention of Accidents.

The Qi7/Qi10 mounting and rigging accessories and examples

Z5145 Ci/Qi Mounting frame
WLL: 240 kg/530 lb

Z5170 Qi Mounting adapter

Z5171 Qi Mounting plate

Z5173 Qi-SUB Mounting plate

Z5161 Qi flying bracket

Z5175 Qi Horizontal bracket

Z5044 MAX Bracket connector

Z5054 Ci60/Ci90 Flying adapter

Z5025 Flying adapter 02

Z5024 Loudspeaker stand adapter

Z5020 Flying adapter 02

Z5024 Pipe clamp for TV spigot
WLL: 100 kg/220 lb
for a tube diameter up to 70 mm/2.75"

Z5160 Q Load adapter
WLL: 480 kg/1058 lb
aiming of a column by 1/1,
1/2 or 1/4 detents

Z5171 Qi Mounting plate
WLL: 500 kg/1100 lb
for a tube diameter up to 51 mm/2"

Z5147 Rota clamp
WLL: 500 kg/1100 lb
for a tube diameter up to 51 mm/2"
The d&b ArrayCalc simulation software

The d&b ArrayCalc simulation software is the simulation 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.

d&b ArrayCalc is available as a native stand-alone application for both Microsoft Windows[^1] (Win7 or higher) and Mac OS X[^2] (10.6 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 initial simulations when planning installations.

Listening planes in three dimensions can be defined, creating a representation of the audience areas in a given venue. This includes areas such as typical listening planes, arenas, balconies, side stalls, and in the round. Special functions assist in obtaining accurate dimensions with laser distance finders and inclinometers.

Acoustic obstacles, such as arena video score boards can be added to a model. The ArrayCalc R1 export function produces a project file for the R1 Remote control software. Complete details of the system simulated in ArrayCalc are generated, including loudspeakers, amplifiers, remote IDs, groups and all configuration information. This workflow sequence removes the need to manually transfer data from one software program to the other. EASE and DXF data export capabilities are also available.

Further information is provided in the d&b Amplifier and Software brochure which is available for download at www.dbaudio.com.

The d&b Remote network

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 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 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.

For mobile applications, d&b System check verifies that the system performs within a predefined condition. Extensive facilities for storing and recalling system settings are provided allowing these to be repeated, as and when required. 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.

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] (10.6 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.

[^1]: Microsoft Windows is a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries.
[^2]: Mac OS is a trademark of Apple Inc., registered in the U.S. and other countries.
The D6, D12 and D80 amplifiers

Two decades have passed since d&b embarked on integrating Digital Signal Processing (DSP) into power amplifiers. It is over ten years since all d&b amplifiers used this technology and included analog and digital signal inputs, extensive loudspeaker control, configuration and protection functions, user definable equalization, delay and the all-embracing remote control functionality as standard. The d&b amplifiers sit right at the very heart of the d&b systems, providing sophisticated control capabilities as well as the power to efficiently drive d&b loudspeakers in whatever the particular application. The amplifiers are developed and manufactured by d&b and incorporate loudspeaker specific setups. Sophisticated protection circuits modelling thermal and mechanical driver behaviour are provided, resulting in the sustained reliability of d&b systems. Switchable functions for precisely tailoring system response in a wide variety of applications are also included, integrating complete loudspeaker system management into the amplifier. The digital elements are specified and constructed to achieve outstanding audio performance while maintaining a very low latency of 0.3 msec. The amplifiers are designed specifically for use with d&b loudspeakers, have remote control, monitoring capabilities and switch mode power supplies. To simplify configuration, the output mode of the amplifier can be configured as Dual Channel, Mix TOP/SUB or 2-Way Active modes depending on the application. The user definable equalization and delay functions incorporated in each channel of all d&b amplifiers are intended for tuning in applications such as infills, frontfills or under balcony delays, without the need for external processors. A signal generator offering pink noise or a sine wave program is also incorporated for test and alignment purposes. d&b amplifiers\(^1\) contain functions to allow system status monitoring and protection features, increasing the longevity of d&b systems. They provide the d&b System check function, which is designed to verify the system performs within a predefined condition; this can be used to report the system condition after a show. Input monitoring can detect incoming pilot tones to verify the integrity of the signal path to the amplifier, while the Load monitoring function determines the status of the loudspeaker impedance. Both d&b System check and Load monitoring can determine the status of an LF or HF driver in systems with multiple elements, even if these are crossed over passively. Automatic and continuous impedance monitoring, along with Input monitoring are designed for incorporation in applications specified to the requirements of International Standard IEC 60849 ‘Sound Systems for Emergency Purposes’. d&b amplifiers feature two control interfaces. Firstly, the front panel rotary encoder, combined with the display, provides full access to settings and functions. Secondly, by utilizing the d&b Remote network, the amplifiers can be remotely controlled and monitored from a virtual centre. Every amplifier channel can be assigned a unique channel and device name to simplify identification. The Wink function, which can be enabled remotely, flashes the display backlight to clearly identify specific amplifiers in a system. An integrated password protected LOCK function prevents unauthorized changes. A powerCON\(^2\) mains connector socket is fitted on the rear panel. The switch mode power supply of each amplifier incorporates mains over-voltage protection, internal current limiting and loudspeaker protection at start up. Temperature and signal controlled fans cool the internal assemblies. d&b amplifiers offer analog and digital AES/EBU signal inputs, with link outputs for each channel. The AES/EBU link output carries a refreshed signal, while a power fail relay is incorporated to prevent interruption of the signal chain, in the event of a power failure. The D12 amplifier incorporates d&b SenseDrive for accurate control of LF drivers in d&b loudspeakers driven 2-Way Active or in actively driven d&b subwoofers. When the D12 is fitted with EPS connectors and appropriate 5-wire cabling, d&b SenseDrive can be used resulting in an extremely precise bass performance even at high levels. The LoadMatch function integrated within the D80 amplifier enables the electrical compensation of loudspeaker cable properties, without the need for an extra conductor. This results in an increased accuracy of audio reproduction over a bandwidth of up to 20 kHz preserving the tonal balance when cable lengths of up to 70 m (230 ft) are used. Firmware updates containing new loudspeaker configurations or additional functions can be loaded to the amplifiers via the d&b Remote network.

Comparison of the D6, D12 and D80 amplifiers

<table>
<thead>
<tr>
<th>Feature</th>
<th>D6</th>
<th>D12</th>
<th>D80</th>
</tr>
</thead>
<tbody>
<tr>
<td>User interface</td>
<td>Encoder/IC display</td>
<td>Encoder/IC display</td>
<td>Encoder/colour TFT touchscreen</td>
</tr>
<tr>
<td>Output channels</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Input channels</td>
<td>2 AES or analog</td>
<td>2 AES or analog</td>
<td>4 AES or analog</td>
</tr>
<tr>
<td>Latency</td>
<td>0.3 msec</td>
<td>0.3 msec</td>
<td>0.3 msec</td>
</tr>
<tr>
<td>User equalizers (per channel)</td>
<td>4-band</td>
<td>4-band</td>
<td>2 x 16-band</td>
</tr>
<tr>
<td>Delay</td>
<td>340 msec/116.9 m</td>
<td>340 msec/116.9 m</td>
<td>10 sec/3440 m</td>
</tr>
<tr>
<td>Rated output power</td>
<td>2 x 300 W into 8 ohms</td>
<td>2 x 750 W into 8 ohms</td>
<td>4 x 2000 W into 8 ohms</td>
</tr>
<tr>
<td></td>
<td>2 x 600 W into 4 ohms (THD+N &lt; 0.1%)</td>
<td>2 x 1200 W into 4 ohms (THD+N &lt; 0.1%)</td>
<td>4 x 4000 W into 4 ohms (THD+N &lt; 0.5%)</td>
</tr>
<tr>
<td>Output routing</td>
<td>Dual Channel w/o B1 and B2</td>
<td>Dual Channel, Mix TOP/SUB 2-Way Active</td>
<td>Dual Channel, Mix TOP/SUB 2-Way Active</td>
</tr>
<tr>
<td>Output connectors</td>
<td>NL4</td>
<td>NL4/EPS/NL8</td>
<td>NL4/EPS plus NLB</td>
</tr>
<tr>
<td>Cable compensation</td>
<td>No</td>
<td>SenseDrive</td>
<td>LoadMatch</td>
</tr>
<tr>
<td>Mains voltage</td>
<td>Wide range switch mode power supply</td>
<td>100/200V or 120/230V</td>
<td>Wide range switch mode power supply</td>
</tr>
<tr>
<td>Weight (kg/lb)</td>
<td>8/17.6</td>
<td>13/28.7</td>
<td>19/42</td>
</tr>
<tr>
<td>Dimensions</td>
<td>2 RU x 15” x 353 mm</td>
<td>3 RU x 19” x 353 mm</td>
<td>2 RU x 19” x 530 mm</td>
</tr>
<tr>
<td>Remote</td>
<td>CAN</td>
<td>CAN</td>
<td>OCA via Ethernet/CAN</td>
</tr>
<tr>
<td>AirFlow</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) At the time of print, certain functions required within applications specified to achieve compliance with IEC 60849 such as Input and Load monitoring are not implemented in the D80 amplifier; please contact your distributor for further information

\(^2\) powerCON is a registered trademark of the Neutrik AG, Lucerne Switzerland
The operation with D6, D12 and D80 amplifiers

CUT mode
Set to CUT, the cabinet low frequency level is reduced and is configured for use with d&b active subwoofers.

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 should be used selectively, only for those cabinets covering distances larger than 50 m (160 ft). This enables the correct sound balance between close and remote audience areas, whilst all amplifiers driving the array can be fed with the same signal.

HFA mode
In HFA mode (High Frequency Attenuation), the HF response of the system is rolled off. The HFA provides a natural, balanced frequency response when a unit is placed close to listeners in near field or delay use. High Frequency Attenuation begins gradually at 1 kHz, dropping by approximately 3 dB at 10 kHz. This roll off mimics the decline in frequency response experienced when listening to a system from a distance in a typically reverberant room or auditorium.

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 1 kHz, with maximum attenuation below 400 Hz, providing a balanced frequency response when cabinets are used in arrays of two or more. The CPL function can be set in dB attenuation values between –9 and 0, or a positive CPL value which creates an adjustable low frequency boost around 65 Hz (0 to +5 dB).

100 Hz mode
The 100Hz mode limits the upper operating frequency of the subwoofer to 100Hz, complementing top cabinets in full range mode.

CSA mode
CSA (Cardioid Subwoofer Array) mode enables the combination of three or multiples of three subwoofer cabinets into an array that produces exceptional low frequency directivity control. The amplifier channel for the centre subwoofer of the column, which is physically pointed to the rear, has CSA selected. The forward facing cabinets are driven with an amplifier channel set in the standard mode. The resulting cardioid behaviour of the array will significantly reduce the energy radiated to the rear. For further information please refer to the d&b Ti 330 Cardioid Subwoofer Array, which is available for download at www.dbaudio.com.

The Q-Series frequency responses

#### Maximum loudspeakers per D6, D12 or D80 channel

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q1i</th>
<th>Q7</th>
<th>Q7i</th>
<th>Q10</th>
<th>Q10i</th>
<th>Q-SUB</th>
<th>QCSA-SUB</th>
<th>Qi-SUB</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### D6, D12 and D80 controller settings

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q1i</th>
<th>Q7</th>
<th>Q7i</th>
<th>Q10</th>
<th>Q10i</th>
<th>Q-SUB</th>
<th>QCSA-SUB</th>
<th>Qi-SUB</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUT</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFC</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFA</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPL</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 Hz</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSA</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The d&b amplifier output modes

D6 amplifier in Dual Channel mode for Q7, Q10, Q1, Q10 or Q1 and Q-SUB, Qi-SUB or QiCSA-SUB

D12 amplifier in Dual Channel mode for Q7, Q10, Q1, Q10 or Q1 and Q-SUB, Qi-SUB or QiCSA-SUB

D12 amplifier in Mix TOP/SUB mode for Q7, Q10, Q1, Q10 or Q1 and Q-SUB or Qi-SUB

D80 amplifier in Dual Channel mode for Q7, Q10, Q1, Q10, Q1, Q-SUB, Qi-SUB and QiCSA-SUB

D80 amplifier in Mix TOP/SUB mode for Q7, Q10, Q1, Q10, Q1, Q-SUB and Qi-SUB

D80 amplifier in a mixed configuration of Dual Channel and Mix TOP/SUB modes for Q7, Q10, Q1, Q10, Q1, Q-SUB and Qi-SUB
The Q-Series cables and adapters

Amplifiers in Dual Channel mode

- 1 x D80 amplifier
  - OUT: NL8
- 2 x D12 amplifier
  - OUT: NL8
- 3 x D6/D12 amplifier
  - OUT: NL8

- Z5330.xxx
  - D80 Touring rack assembly
  - OUT: 3 x NL8
- Z5334.002
  - Adapter NL8F to 4 x NL8M
- Z5340.xxx
  - MC4 Cable NL8 F/M
- Z5347.001
  - Breakoutbox NL8F/M to 6 x NL4
- Z5359.xxx
  - MC2.5 Cable NL4
- Z5344.001
  - Adapter NL8F to 4 x NL4
- Z5344.000
  - Adapter NL8F to 4 x EPS
- Z5346.000
  - Adapter 4 x EPSM to NL8M
- Z5344.001
  - Adapter NL8F to 4 x NL4
- Z5347.000
  - Breakoutbox NL8F/M to 6 x EPS
- Z5344.000
  - Adapter NL8F to 4 x EPS
- Z5345.001
  - Adapter 4 x NL4 to NLT8M
- Z5341.000
  - Adapter LKS19M to 6 x NL4
- Z5344.000
  - Adapter NL8F to 4 x EPS
- Z5345.001
  - Adapter 4 x NL4 to NLT8M
- Z5347.001
  - Breakoutbox NL8F/M to 6 x NL4
- Z5341.000
  - Adapter LKS19M to 6 x NL4
The **Q-Series** configuration examples

1. **Q-Series configuration with flown Q1 line array and ground stacked Q-SUBs with D80 amplifier**

2. **Q-Series configuration with flown Q1 line array with D12 amplifier and ground stacked Q-SUBs in CLA mode with D80 amplifier**

3. **Q-Series L/R configuration with flown Q1 and Q7 line array and ground stacked Q-SUB array with D80 Touring rack**

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1 These configuration examples are also valid for Qi loudspeakers.

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1 These configuration examples are also valid for Qi loudspeakers.
The Q-Series configuration examples

Q-Series configuration with flown Q1 line arrays and ground stacked Q-SUBs in CSA mode with D80 Touring rack and D80 amplifier

Q-Series L/R/C configuration with flown Q1 and Q7 line array and ground stacked Q-SUB sub array in CSA mode with D80 Touring racks

1 These configuration examples are also valid for Qi loudspeakers.
## The Q-Series product overview

### Q loudspeakers
- **Z0501.xxx** Q1 Loudspeaker
- **Z0507.xxx** Q7 Loudspeaker
- **Z0508.xxx** Q10 Loudspeaker
- **Z0510.xxx** Q Subwoofer

### Loudspeaker connector options
- NLT4/F/M connector
- EP5 connector
- NL4 connector

### Q1 loudspeakers
- **Z0521.000** Q1 Loudspeaker NL4 connector
- **Z0527.000** Q7 Loudspeaker NL4 connector
- **Z0528.000** Q10 Loudspeaker NL4 connector
- **Z0530.000** Q Subwoofer NL4 connector
- **Z0531.000** QiCSA Subwoofer NL4 connector
- **Z0532.000** TV spigot for flying adapter 02
- **Z0533.000** TV spigot with fixing plate

### Qi loudspeakers
- **Z0534.000** Qi Loudspeaker NL4 connector
- **Z0535.000** Qi Mounting plate
- **Z0536.000** Qi Horizontal bracket
- **Z0537.000** Qi Mounting adapter

### Qi accessories
- **Z0538.000** Qi Mounting plate
- **Z0539.000** Qi Mounting plate
- **Z0540.000** Qi Mounting plate
- **Z0541.000** Qi Mounting plate
- **Z0542.000** Qi Mounting plate

### Q/Qi accessories
- **Z0543.000** Q/Qi Mounting frame
- **Z0544.000** MC4 Cable NLT4 F/M
- **Z0545.000** Q/Qi Bracket connector

### Miscellaneous
- **Z0546.000** Anti-slip coating
- **Z0547.000** Standard cabinet paint

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1. supplied including Z5154 Q Rigging set
2. WR only for Qi loudspeakers, on request
3. SC only for Qi loudspeakers, on request
4. supplied in pairs
5. available as a download at www.dbaudio.com
6. the complete list of amplifier versions is available in the d&b Amplifier and Software brochure
7. further information is available in the d&b Amplifier and Software brochure