

DS

DS100
Manual 1.8 en



Notes on document version

All previous versions of this document are hereby no longer valid.

Version 1.8: Now also 96 kHz sampling.
Refer to:
⇒ Chapter 3 "Technical specifications"
on page 6.

General information

DS100 Manual

Version: 1.8 en, 03/2023, D2034.EN .01

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Keep this document with the product or in a safe place so that it is available for future reference.

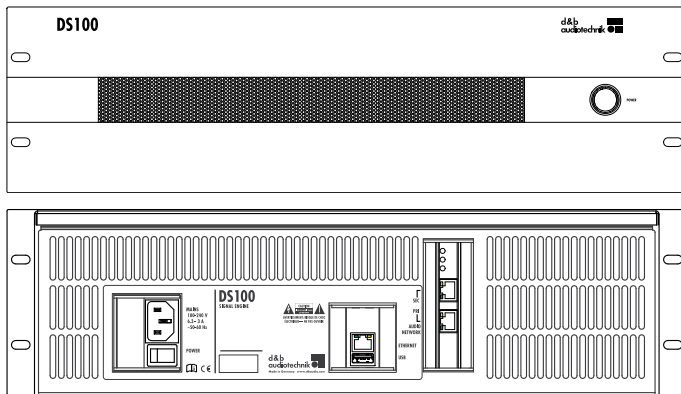
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1.1 Intended use

The d&b DS100 Signal Engine is a specialized 3 RU, 19" rack mount audio processor with Audinate Dante® audio networking.

In its base configuration, it provides a 64 x 64 level / delay audio matrix. Additional software modules provide dynamic source positioning and emulated acoustics functions.

NOTICE!

The device complies with the electromagnetic compatibility requirements of EN 55103 (product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use) for the environments E1 (residential), E2 (business and commercial), E3 (outdoor use in urban areas) and E4 (outdoor use in rural areas).

Acoustic interferences and malfunctions may occur if the unit is operated in the immediate vicinity of high-frequency transmitters (e.g. wireless microphones, mobile phones, etc.). Damage to the device is unlikely but cannot be excluded.

1.1.1 Software Terms of Use

The software modules installed on the DS100 shall only be used to the extent intended/documented. d&b shall not be liable for any damage resulting from any other or non-conforming use.

You may not decompile, copy, alter or enhance the software modules installed on the DS100 or their source codes in any form. d&b will investigate any infringement of copyright or intellectual property rights.

1.1.2 Application

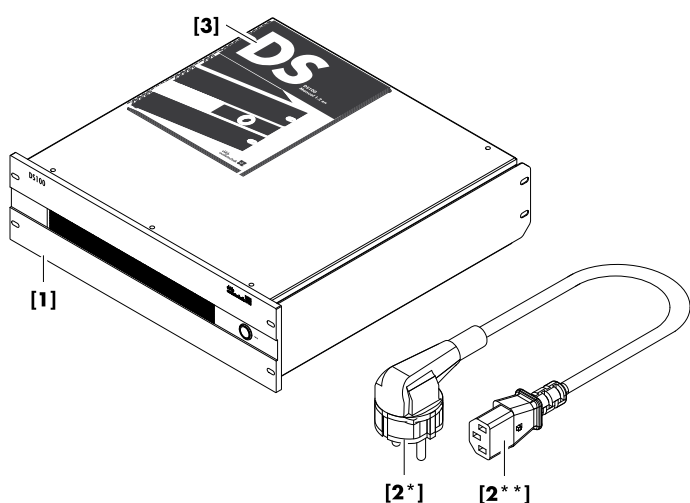
The DS100 Signal Engine is a versatile tool for large and complex audio systems that are used to route and distribute a large number of audio channels to many different amplifier channels, break out rooms, loudspeaker zones, or positions.

The DS100 completely integrates with the overall d&b system approach which includes loudspeakers, amplifiers, rigging, transport and networking accessories, and the DS10 Audio network bridge. The DS10 interfaces between Dante audio networking and the AES3 inputs of the d&b amplifiers.

d&b audio systems including the DS100 are designed and optimized using the d&b ArrayCalc Simulation software and are controlled using the d&b R1 Remote control software.

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

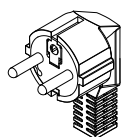
The audio matrix with level, mute, and delay controls at every crosspoint is a very flexible tool to either simply distribute audio signals to the intended output or, if the crosspoint delay is enabled, to position audio sources in a distributed loudspeaker setup.



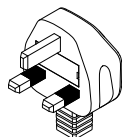
Before starting up the device, please verify the shipment for completeness and proper condition of the items.

If there is any sign of obvious damage to the unit and/or the power cord, do not operate the unit and contact your local dealer from whom you received it.

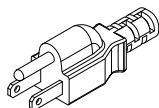
Pos.	Qty.	d&b Code	Description
[1]	1	Z4100	d&b DS100 Signal Engine
Including:			
[2]	1	Z2611.xxx	Power cord (specific to country* with IEC type** plug)
[3]	1	D2034.EN .01	DS100 Manual



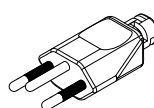
Z2611.000
3-pin Schuko
CE 7/7
IEC Lock**



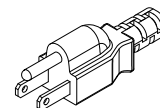
Z2611.010
3-pin GB
BS 1363A
IEC Lock**



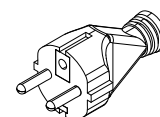
Z2611.020
3-pin USA
NEMA 5-15P
IEC Lock**



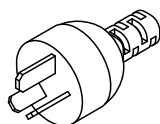
Z2611.030
3-pin Swiss
SEV1011
IEC Lock**



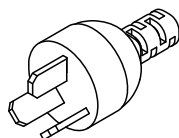
Z2611.040
3-pin Japan
NEMA 5-15P
IEC Std.**



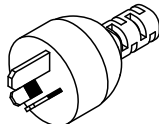
Z2611.050
3-pin South Korea
KS C8305
IEC Std.**



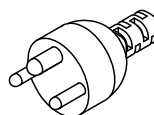
Z2611.060
3-pin Argentina
IRAM 2073
IEC Std.**



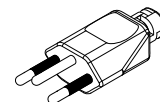
Z2611.070
3-pin China
GB 2099
IEC Std.**



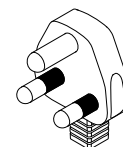
Z2611.080
3-pin Australia
AS 3112
IEC Std.**



Z2611.100
3-pin Denmark
Afsnit 107-2-D1
IEC Std.**



Z2611.110
3-pin Brazil
NBR 14136
IEC Std.**



Z2611.120
3-pin South Africa
SANS 164-1
IEC Std.**

* Mains plug types and associated standards / ** IEC type

IEC Lock: Lockable IEC plug

IEC Std.: Standard IEC plug

(Illustrations are approximations only and not true to scale)

Power supply

Universal range switched mode power supply	
Mains connection	IEC type socket
Rated mains voltage	100 to 240 V, 50 - 60 Hz
Nominal power	400 W

Thermal and Environmental conditions

IP class	IP20
Operating temperature range	0 °C to 50 °C
.....	32 °F to 122 °F
Storage temperature range	-20 °C to 70 °C
.....	-4 °F to 158 °F
Operating humidity range (rel. non-condensed)	10% to 85%
Storage humidity range (rel. non-condensed)	15% to 90%

Fan noise emission

Idle (@ 22 °C / 71.6 °F)	36 dB(A)
Full load (@ 22 °C / 71.6 °F)	42 dB(A)
Full load (@ 50 °C / 122 °F)	54 dB(A)

Dimensions and weight

Height x width x depth	3 RU x 19" x 481 mm
.....	3 RU x 19" x 18.93"
Weight	11.2 kg / 24.7 lb

Connections

ETHERNET	1 x RJ45
.....	LAN 100/1000 Mbps
.....	OCA/AES70
.....	OSC
.....	SNMP
AUDIO NETWORK	Dante audio network/AES67
.....	2 x RJ45 for Dante Primary/Secondary
.....	Gigabit only
USB	USB 3.0 port

Controls and indicators

Mains power switch	Rocker switch on rear panel
POWER	Push-button switch with integrated ring-LED indicator
Boot time	Appr.: 45 sec.

I/O

Sample rate for I/O	48/96 kHz
Inputs	64
Outputs	64

Latency

Dante In to Out	< 1.4 ms @ 48 kHz
.....	< 1.6 ms @ 96 kHz
.....	plus Dante network latency

Input processing

Gain	-120 dB ... +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 dB ... +10 dB
Crosspoint Delay	Up to 500 ms

Output processing

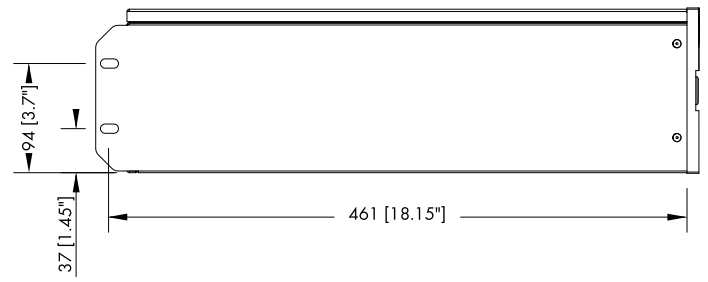
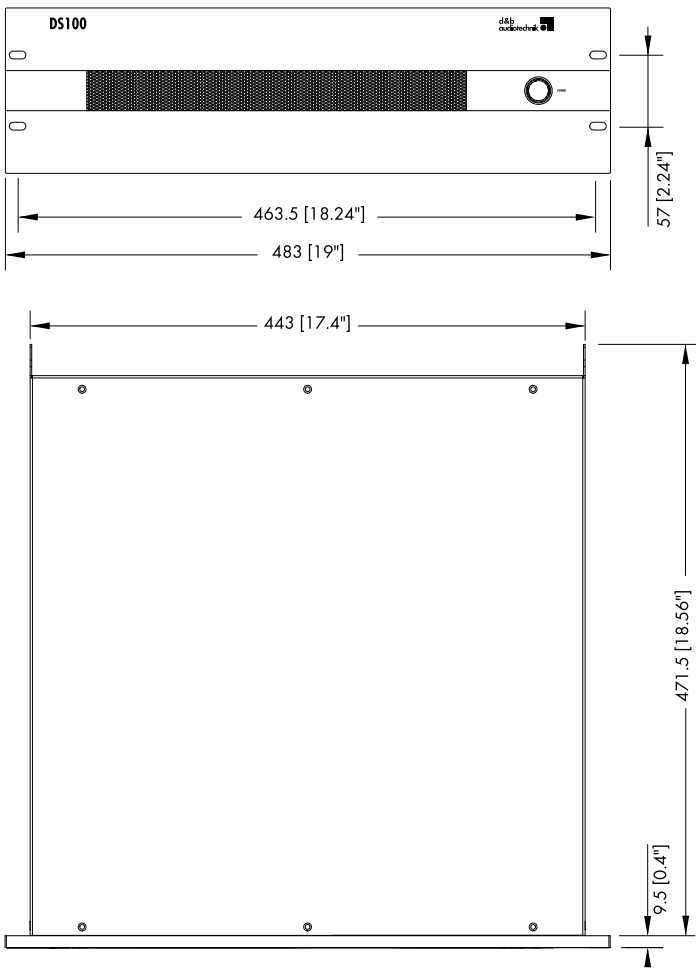
Gain	-120 dB ... +10 dB
Polarity	0 °/180 °
EQ	16-band PEQ with high/low shelf
Delay	Up to 500 ms
Mute	On / Off

En-Scene

Input sources	Up to 64
Positioning	Static or dynamic (moving)
Control	Manual or external
External control	OCA/AES70 and OSC

En-Space

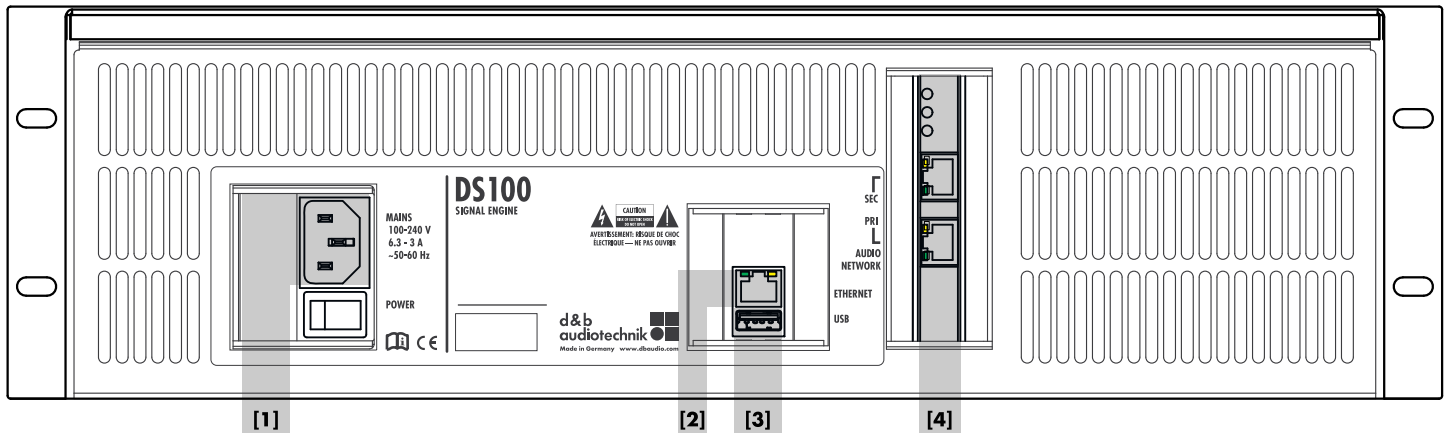
Convolvers	Up to 144
Impulse response length	Up to 10 seconds



DS100 dimensions in mm [inch]

4.1 Overview

Connections



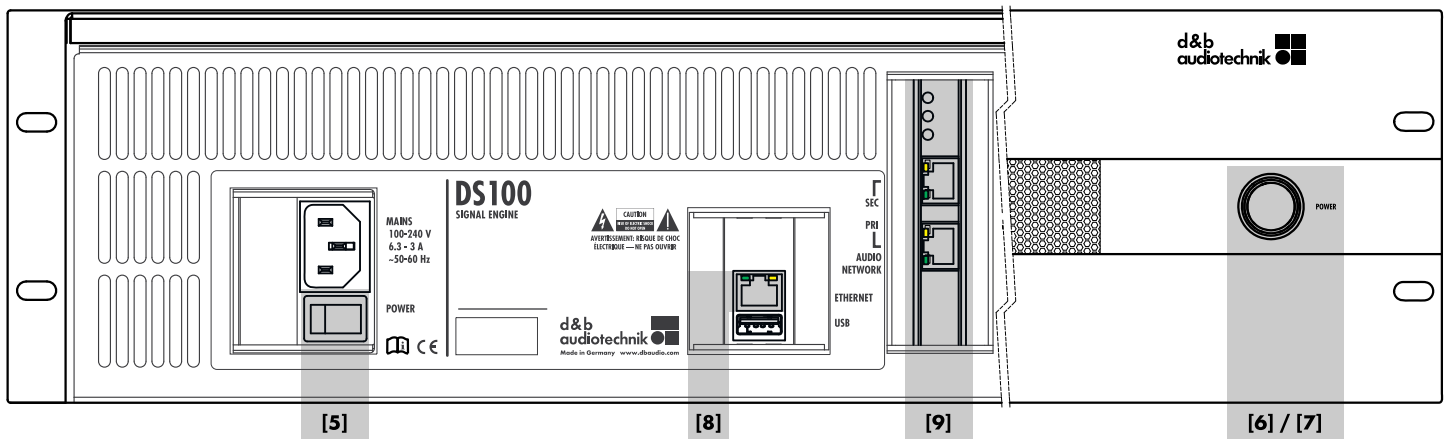
[1] IEC mains connector socket
Refer to ⇒ Chapter 4.3.1 "Mains connection" on page 10.

[2] ETHERNET (LAN port)
Refer to ⇒ Chapter 4.3.2 "ETHERNET" on page 11.

[3] USB (USB 3.0 port)
Refer to ⇒ Chapter 4.3.3 "USB" on page 11.

[4] AUDIO NETWORK
Dante audio network
Refer to ⇒ Chapter 4.3.4 "AUDIO NETWORK" on page 11.

Controls and indicators

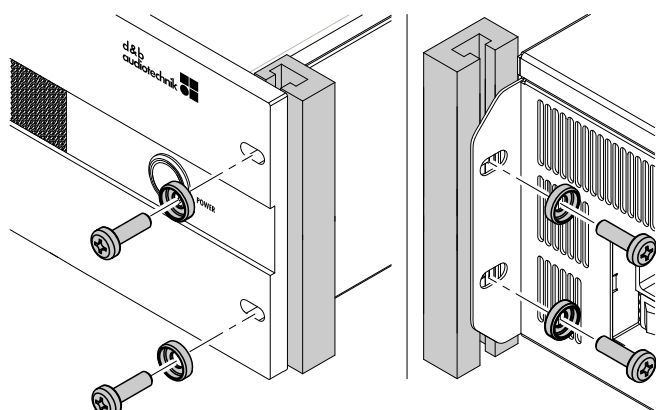


[5] Mains power switch
Refer to ⇒ Chapter 4.4.1 "Mains power switch" on page 12.

[8] ETHERNET network indicators
Refer to ⇒ Chapter 4.4.3 "ETHERNET indicators" on page 14

[9] AUDIO NETWORK indicators
Refer to ⇒ Chapter 4.4.4 "AUDIO NETWORK indicators" on page 14.

[6] POWER button with integrated power on indicator
[7] POWER button and LED indicator
Refer to ⇒ Chapter 4.4.2 "POWER button and LED indicator" on page 12.



4.2 Rack mounting and cooling

Rack mounting

The enclosure is designed to fit standard 19" equipment racks or cabinets.

NOTICE!

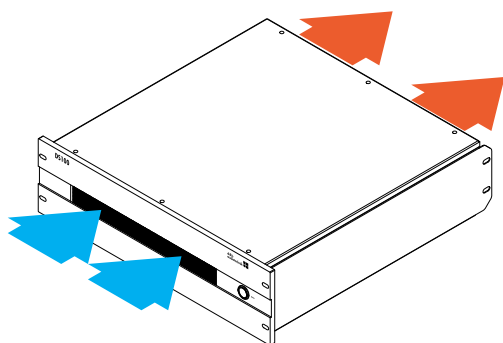
When mounting applicable d&b devices into 19" equipment racks or cabinets, it is strongly recommend that you:

- **Always** fix the device at its **front AND rear-mounted rack ears** using appropriate rack mounting screws and U washers, as shown in the graphic opposite.
 - Alternatively use shelves fixed to the inner sides of the equipment rack or cabinet.
-

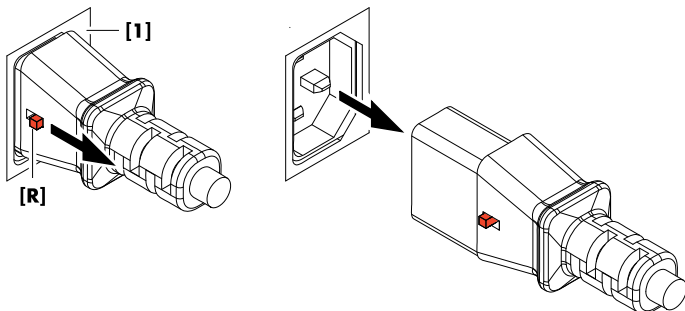
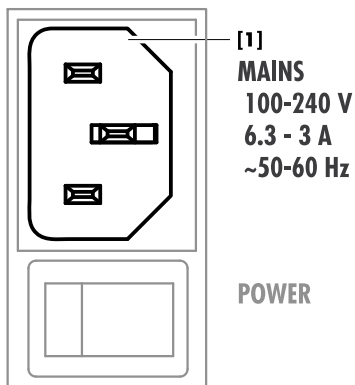
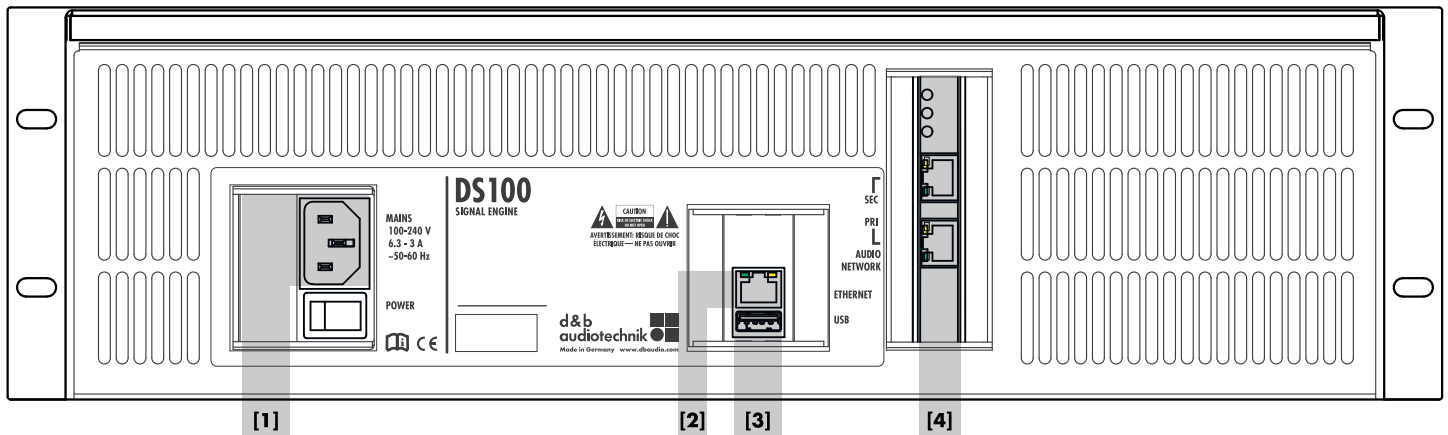
Cooling

Thermal conditions are a vital factor to ensure operational safety of the device. The device is equipped with three internal fans that draw cool air from the front into the housing and channel the warm air towards the back of the device.

- Please ensure that adequate cool airflow is provided.
- Do not block or cover the front panel air intake or the vents on the rear panel.
- If the device is installed in sealed cabinets (e.g. in fixed installations), use additional fan modules with filters that can be easily replaced without opening the sealed cabinets.
- Do not rack up DS100 devices together with other devices producing additional heat with opposing airflow.



4.3 Connections



4.3.1 Mains connection



WARNING!
Potential risk of electric shock.

The device is a protective class 1 unit. A missing earth (ground) contact may cause dangerous voltages in the housing and controls and may lead to electric shock.

- Connect the device to mains power supplies with protective earth only.
- If there is any sign of obvious damage to the power cord and/or mains plug, do not use the power cord and replace it before further use.
- Please ensure the mains connector is accessible at any time to disconnect the device in case of malfunction or danger. If the mains plug is not readily accessible due to mounting in a 19" rack or equipment cabinet, then the mains plug for the entire rack or cabinet must be readily accessible.
- Do not connect or disconnect the IEC mains plug under load or live.

An IEC type mains connector socket [1] is fitted on the rear panel. An appropriate power cord with an IEC type mains plug is supplied with the device.

Before connecting the device to mains voltage, check that the mains voltage and frequency correspond to the specifications on the rating label next to the IEC type mains connector socket [1].

Lockable IEC type mains plug (IEC Lock)

Once the mains plug is connected, it is locked to avoid accidental disconnection of the device.

To disconnect the power cord, pull the release button [R] towards you and pull out the mains plug.

4.3.2 ETHERNET

An Ethernet port (100/1000Mbps/peer-to-peer) **[2]** is provided enabling remote control via Ethernet.

4.3.3 USB

An USB 3.0 port **[3]** is provided for future functionality.

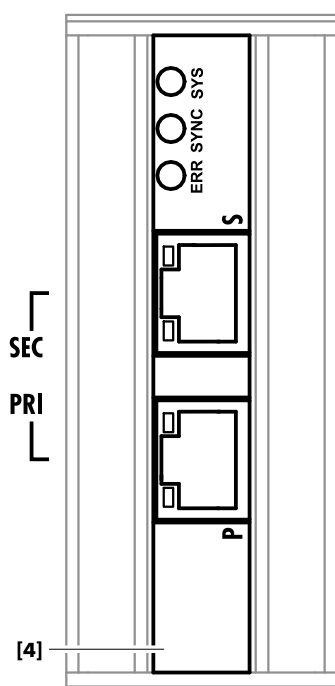
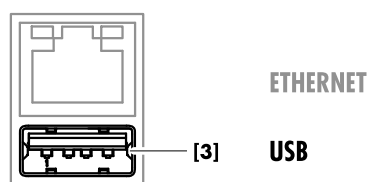
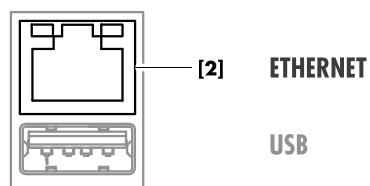
4.3.4 AUDIO NETWORK

The DS100 provides a fully supported Dante audio network interface **[4]** (Gigabit only).

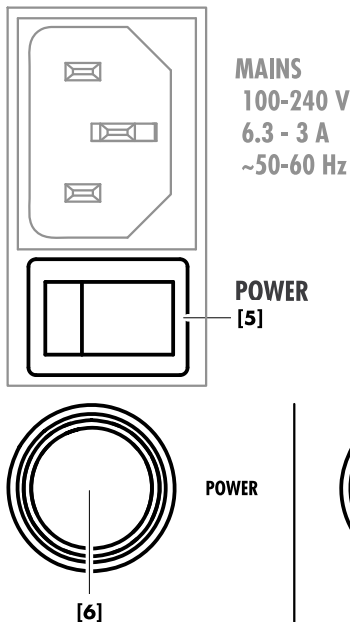
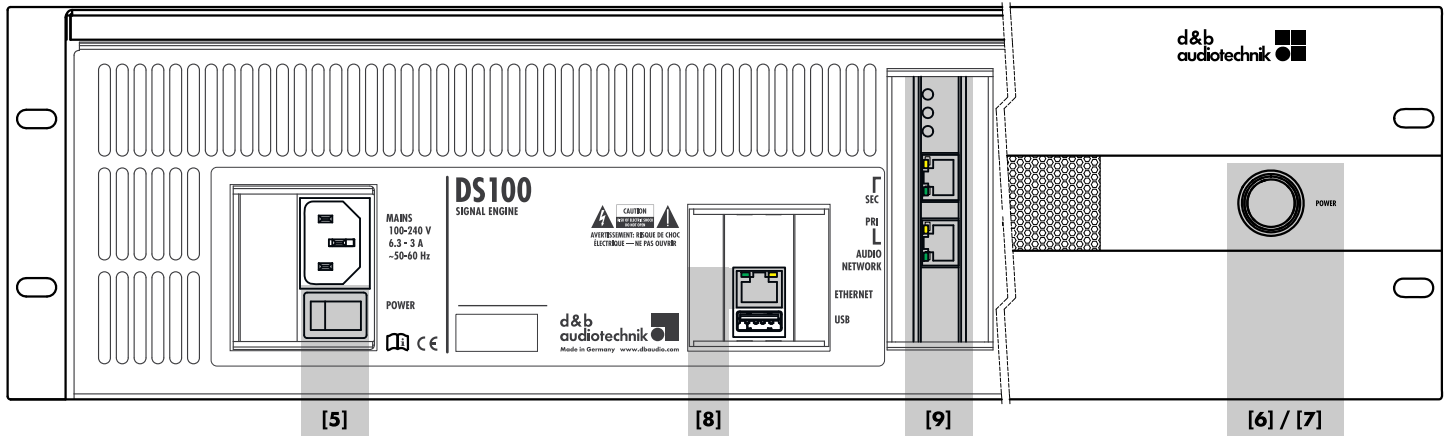
PRImary **RJ45 Ethernet port (P**rietary):
Used to connect the device to the primary Dante network to transmit and receive audio.

SECondary **RJ45 Ethernet port (S**econdary):
Used to connect the device to a secondary network for redundancy.

The DS100 is Dante Domain Manager (DDM) ready. Further information on Dante Domain Manager is available at www.audinate.com.



4.4 Controls and indicators



4.4.1 Mains power switch

The on/off rocker switch [5] is located on the rear panel.

- OFF** Mains isolation is not provided. The mains power supply is switched off but remains connected to the mains.
- ON** The mains power supply is switched on and the device is ready for operation.

4.4.2 POWER button and LED indicator

4.4.2.1 Switching on (boot up)

- ⇒ Provided the mains power switch [5] at the rear is switched on, pushing the POWER button [6] will boot up the device.
 - ↳ The integrated LED indicator [7] illuminates green.

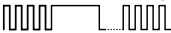


4.4.2.2 Device shut down/Device reset/System status

The POWER button serves to set/reset the device into dedicated system statuses by pressing the button a specified number of times within a time frame of 4 seconds. Provided the device is powered on and fully booted, the table below details the desired device status, the necessary action/sequence and its result:

Device status	Action/Sequence	Result
Power down.	Press power button 2x.	Normal shut down.
Network to default settings.	Press power button 4x.	Network defaults applied: IPmode: DHCP+FB (Fallback). Fallback IPaddress: 192.168.1.100. IPmask: 255.255.255.0. RemID: Set to 0.01.
Network to DHCP+LL settings.	Press power button 5x.	DHCP+LL applied.
Reset device name and audio path.	Press power button 7x.	Reboot: <ul style="list-style-type: none"> ▪ Device name is reset to factory default. ▪ All inputs are reverted to Matrix mode. ▪ All input, matrix nodes and output processing is reset. ▪ Device Scenes and network/remote settings are not affected.

Trouble shooting

The LED indicator **[7]** also serves for basic trouble shooting purposes.

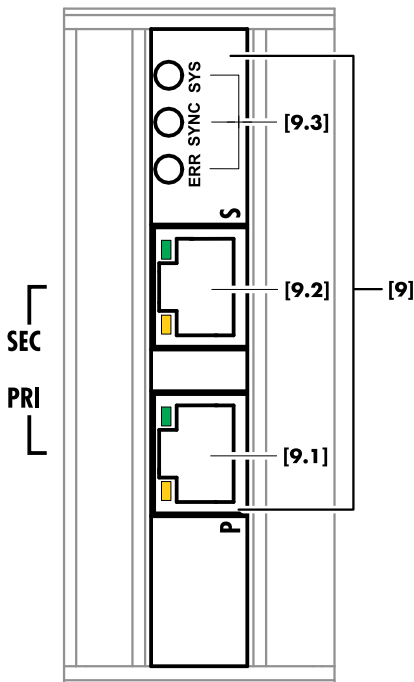
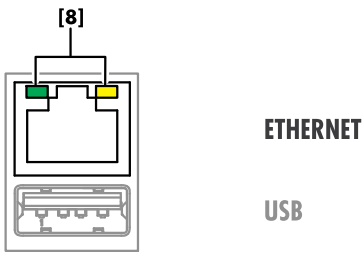
LED status	Description
Off	The system does not operate: <ul style="list-style-type: none"> ▪ No mains supply available. ▪ The mains power switch at the rear [5] is set to off (0). ▪ The POWER button [6] was not pressed. ▪ The mains power supply is faulty.
Illuminates green	<ul style="list-style-type: none"> ▪ Mains supply is available. ▪ The system is switched on and is operating.
Flashing 4 short flashes or 1 long flash followed by 4 short flashes, repeated. 	<ul style="list-style-type: none"> ▪ Power supply fault. Please contact your d&b Service Partner or Service Hub*.
Flashing 2 short flashes, repeated. 	<ul style="list-style-type: none"> ▪ Fault in CPU power supply. ▪ Fault in CPU or BIOS. Please contact your d&b Service Partner or Service Hub*.
Flashing permanently 	<ul style="list-style-type: none"> ▪ Dante I/O fault (Dante card). Please contact your d&b Service Partner or Service Hub*.

*The d&b website at www.dbaudio.com contains a list of all d&b Service Partners or Service Hubs responsible for your region.

Behavior after AC power interruption

If the AC power is interrupted, the device will remember its last power state and restore it when the AC power is re-established. This leads to the following behavior:

AC power interrupted while device is:	Behavior after re-establishing AC power:
On	Device powers up immediately: ⇒ Previous 'ON' state restored. ⇒ Device keeps 'ON' state.
Off	Device powers up immediately: ⇒ Previous 'OFF' state restored. ⇒ Device shuts down.



4.4.3 ETHERNET indicators

Status LEDs [8]

- **Link status / activity LED**
Indicates an established link; flashing indicates link activity.
- **Gigabit link status LED**
Indicates an established Gigabit Ethernet link.

4.4.4 AUDIO NETWORK indicators

Dante audio network indicators [9.1/9.2]

- **Link status / activity LED:**
Green indicates an established link; flashing indicates link activity.
- **Gigabit link status LED:**
Orange indicates an established Gigabit Ethernet link.

Status LEDs [9.3]

The status LEDs indicate the system and clock sync status:

- SYS** Indicates the status of the Dante system.
 - The SYS LED illuminates yellow while the system is booting. If it remains illuminated, the system has failed to boot correctly.
 - The SYS LED color will change to green when the system has booted successfully and is operating properly.
- SYNC** Indicates the clock synchronization status of the Dante device.
 - Illuminates green to indicate that the device is a Dante PTP clock slave and is synchronized to the PTP master.
 - ⬢ A flashing green light indicates that the device is the Dante PTP clock master.
 - Illuminates orange to indicate a network synchronization error. Obtaining network sync may take up to 45 seconds.

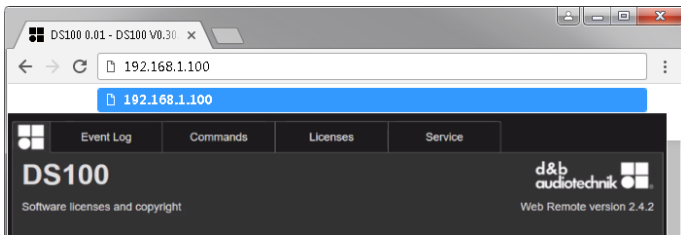
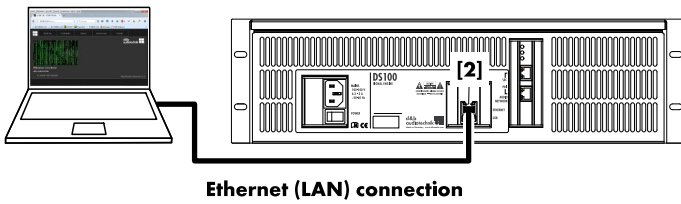
All LEDs flashing green - ⬢

All LEDs flash green when the **Identify** function has been activated using Dante Controller.

All LEDs illuminating red - ●

If all LEDs illuminate red, this indicates that the Dante system has detected errors when booting and has entered failsafe mode.

To restore a device that has entered failsafe mode, use the Dante Firmware Update Manager (available from the d&b website at www.dbaudio.com).



5.1 Physical setup

Simply connect the LAN connector port of your computer to the ETHERNET [2] connector of the device.

5.2 Direct connection

To enable access via the Web Remote interface, proceed as follows:

By factory default, the IP address is set to 192 . 168 . 1 . 100.

To access the device, manually assign an IP address to the computer in your network in the same subnet as the device.

Proceed as follows:

1. Navigate to the network settings of your computer associated with your network adapter.
2. Open the corresponding network properties dialog.
3. Enter a static IP address in the same subnet as the device:
IP address: e.g. 192 . 168 . 1 . 101
Subnet mask: 255 . 255 . 255 . 0
4. Confirm the changes and close the network properties dialog.
5. To display the Web Remote interface page of the device, enter its IP address (192 . 168 . 1 . 100) in the address bar of your web browser.

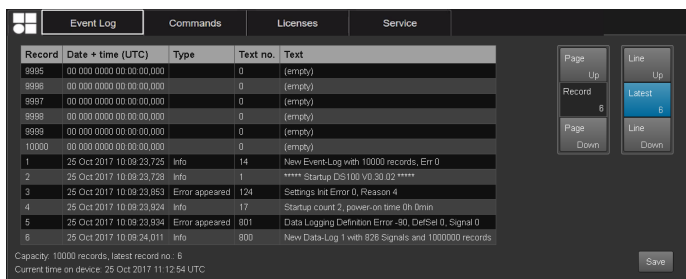
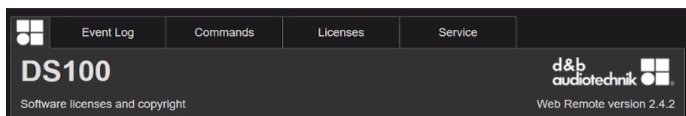
5.3 Web Remote interface

A Web Remote interface is integrated which provides direct access to the DS100 using a standard web browser.

Note: The DS100 can only be accessed after connecting the device to a computer via Ethernet. However, this requires to manually set a static IP address on the PC network interface. Connect the DS100 and the computer to the same Ethernet network.

Recommended and tested browsers:

- Windows:**
- Firefox V22.0 or higher
 - Microsoft Internet Explorer V11 or higher
 - Microsoft Edge V12 or higher
 - Google Chrome V21 or higher
 - Opera V15 or higher
- macOS:**
- Safari V6.0 or higher
 - Firefox V22.0 or higher
 - Google Chrome V21 or higher
 - Opera V15 or higher
- iOS:**
- iOS 6 or higher
- Android:**
- Mobile Firefox V27.0 or higher
 - Android Browser V4.4 or higher



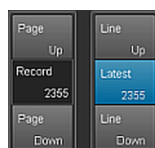
5.4 Web Remote interface page

The Web Remote interface page is split into three tabs: the «Event Log», «Commands» and «Licenses» tabs.

5.4.1 Event Log tab

The «Event Log» stores a maximum of 10000 records. Once the maximum number of records is reached, the system starts deleting the first ones => Ring buffer.

The number of records displayed depends on the size of the browser window.



Located on the right-hand side of the record list are various Navigation buttons allowing you to scroll through the list using the «Page Up/Down» or «Line Up/Down» buttons or by directly jumping to the «Latest» record.

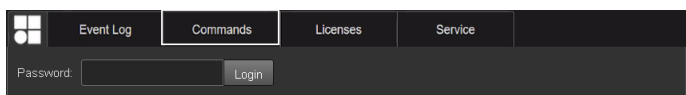
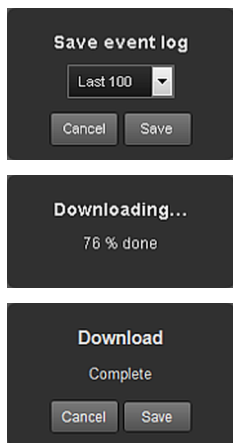
In addition, the editable «Record» field allows you to enter a dedicated record number. The corresponding record will be displayed at the very bottom of the record list.

Storage option

In addition, a storage option is provided which allows you to store the Event log data locally. This is mainly intended for service and/or troubleshooting purposes.

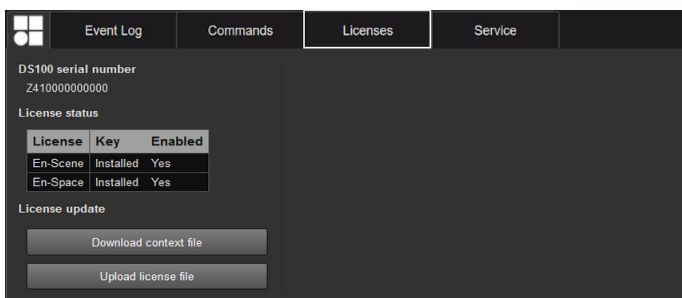
To save the Event log data locally, proceed as follows:

1. Select the «Save» button (Save) at the bottom right corner of the web browser window.
 - ↳ A corresponding dialog will pop up providing you with a drop-down list from which you can select either the number («Last [n]») of records or «All» records to be saved.
2. Choose the desired option from the drop-down list and select «Save».
 - ↳ The event log data will be downloaded and the download progress will be displayed.
 - Once the download is completed, a corresponding message will be displayed.
3. Select «Save» to store the Event log data locally.
 - ↳ Your web browser will display the corresponding dialog and the file will be saved as **Event . log** to the local download directory you have specified in the download settings of your browser.



5.4.2 Commands tab

This functionality is intended for service purposes only.



5.4.3 Licenses tab

Apart from the serial number of the device (⇒ «DS100 serial number»), the «Licenses» tab provides an overview of the licenses installed on the device (⇒ «License status») and allows new licenses or license updates to be uploaded to the device (⇒ «License update»).

5.4.3.1 License update

To upload/exchange license keys, proceed as follows:

1. Select the «Download context file» button.
 - ↳ Your web browser will display the corresponding dialog and the file will be saved as:


```
dbaudio-
DS100_[SerialNumber]_[LicenseKey]_[Date].
rac
```

 to the local download directory you have specified in the download settings of your browser.
2. Send this file via email to your d&b sales partner.
 - ↳ He will then send you the new license file:


```
dbaudio-
DS100_[SerialNumber]_[LicenseKey]_[Date].
rau.
```
3. Once you have received the file, select the «Upload license file» button.
 - ↳ Your web browser will display the corresponding dialog.

Once the license file is uploaded you can enable or disable your license keys within R1.

The screenshot shows the 'Service' tab in a web interface. At the top, there are navigation tabs: 'Event Log', 'Commands', 'Licenses', and 'Service'. Below the tabs is a password field with a 'Login' button. The main content area is titled 'Logged in as 'User 1'' with a 'Logout' button. Under the 'Backup' section, there is a 'Download backup file from device' button. Under the 'Restore' section, there is an 'Upload backup file to device' button. Below these buttons, a message reads: 'Start editing the remote settings (if necessary), then activate backup.' There are five input fields for remote settings: 'Remote ID' (0.63), 'IP mode' (DHCP + LL), 'IP address' (192.168.1.20) with a red warning 'Device subnet will change', 'IP mask' (255.255.255.0), and 'IP gateway' (192.168.1.1). Below these fields is an 'Activate backup file on device' button. At the bottom, under 'Log file collection', there is a 'Download log file collection' button.

5.4.4 Service tab

The «Service» tab provides a «Backup»/«Restore» function for the complete device configuration.

Note: Backups can only be restored on devices of the same type and that have a matching firmware version.

Please note that this function does not backup and restore licenses such as En-Scene or En-Space.

Login

To access the service functions, you first have to log in.

If the device is locked by password protection, use the corresponding password to log in. If no password protection is applied, use "dbaudio" as a password.

Backup

- ⇒ Select the «Download backup file from device» button to store the backup file (*.backup) locally.
 - ↳ Your web browser will display the corresponding dialog and the file will be saved to the local download directory you have specified in the download settings of your browser.

Restore

1. Select the «Upload backup file to device» button to upload the backup file onto the device.
 - ↳ Your web browser will display the corresponding dialog.

Once the backup file is uploaded, the «Remote ID» and «IP settings» become accessible and can be edited, if necessary by simply clicking into the corresponding input field..
2. As a final step, select the «Activate backup file on device» button to apply the backup and remote settings.

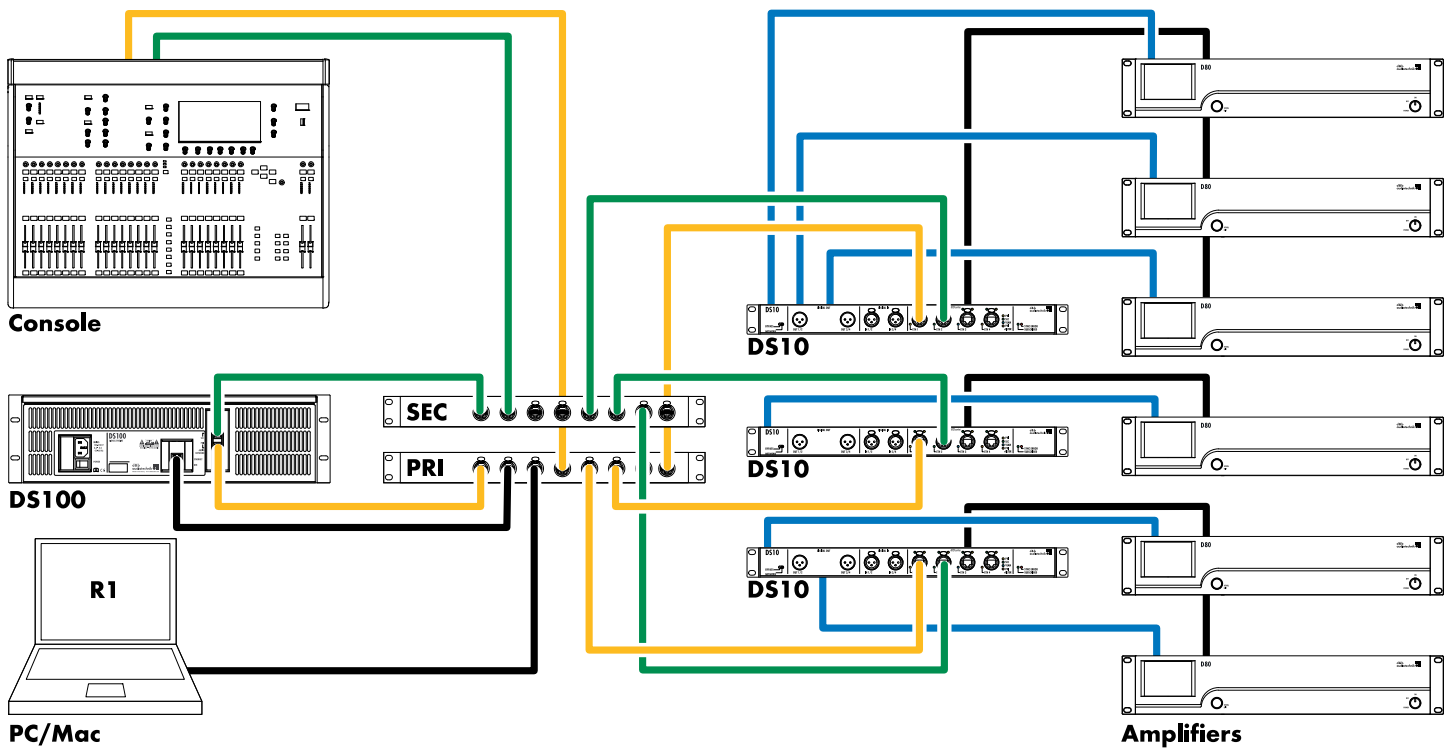
Log file collection

For service or trouble shooting purposes, a log file collection can be downloaded.

- ⇒ Select the «Download log file collection» button to store the collection file (*.logpack.) locally.
 - ↳ Your web browser will display the corresponding dialog and the file will be saved to the local download directory you have specified in the download settings of your browser.

Logout

To exit the «Service» tab functions, click the «Logout» button at the top.



ETHERNET (OCA/AES70)

- Primary
- Secondary
- AES3

7.1 Service



CAUTION! **Potential risk of explosion.**

The device incorporates a lithium battery which may cause danger of explosion if not replaced correctly.

Refer replacement only to qualified service personnel authorized by d&b audiotechnik.

Do not open the device. No user serviceable parts inside. In case of any damage do not operate the device under any circumstances.

Refer servicing only to qualified service personnel authorized by d&b audiotechnik. In particular if:

- objects or liquids have entered the device.
- the device does not operate normally.
- the device was dropped or the housing is damaged.

7.2 Maintenance and care

During normal operation, the device provides maintenance-free service.

Due to the cooling concept, no dust filters are required. As a result, filter exchange or cleaning is not necessary.



8.1 Declaration of Conformity

This declaration applies to:

d&b Z4100 DS100 Signal Engine

by d&b audiotechnik GmbH & Co. KG.

All product variants are included, provided they correspond to the original technical version and have not been subject to any later design or electromechanical modifications.

We herewith declare that said products are in conformity with the provisions of the respective directives including all applicable amendments.

Detailed and applicable declarations are available on request and can be ordered from d&b or downloaded from the d&b website at www.dbaudio.com.



8.2 WEEE Declaration (Disposal)

Electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

Please dispose of this product according to the respective national regulations or contractual agreements. If there are any further questions concerning the disposal of this product, please contact d&b audiotechnik.

WEEE-Reg.-Nr. DE: 13421928

8.3 Licenses and Copyright

This device includes software components released under different open source licenses. These components are supplied together with the d&b firmware.

A list of the components and a full-text version of all licenses and copyrights can be accessed using the Web Remote interface as described in ⇒ Chapter 5 "Initial setup" on page 15.

⇒ Selecting the d&b logo at the top left of the «Web Remote» interface page allows access to the «Software licenses and copyright» information page.

This page provides an overview of the open source software used in this product. As required by the GPL and LGPL licenses, we will send you a copy of the used source code on request. If you would like to obtain a copy, please contact us by mail to:

software.support@dbaudio.com

