DS

DS20
Manual 1.4 en

d&b audiotechnik

ETH 1

ETH 2

mni'n

ETH 3

ETH 4

PRI
SEC

MODE

d&b
audiotechnik

BYPASSED
SUBSCRIBED

IDENTIFY
SYNC ERROR

d&b
audiotechnik

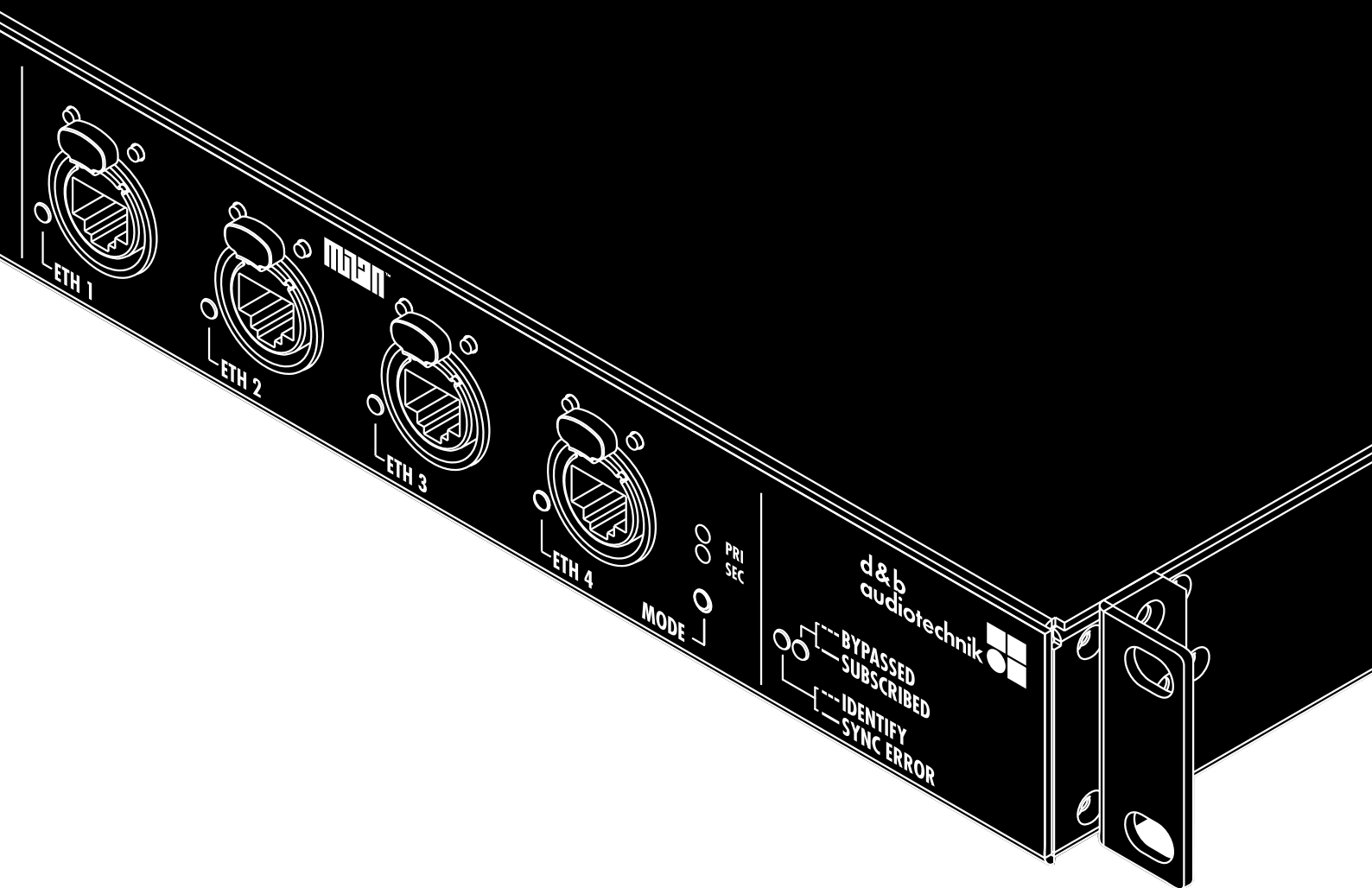**Notes on document version**

All previous versions of this document are hereby no longer valid.

Version 1.4:

Most current feature set.

General information

DS20 Manual

Version: 1.4 en, 12/2023, D2743.EN .01

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

We recommend you to regularly check the d&b website for the latest version of this document.

When reselling this product, hand over this document to the new owner.

If you supply d&b products, please draw the attention of your customers to this document. Enclose the relevant documents with the systems. If you require additional documents for this purpose, you can order them from d&b.

IMPORTANT SAFETY INSTRUCTIONS

Explanation of graphical symbols

The lightning symbol within a triangle is intended to alert the user to the presence of uninsulated "dangerous voltages" within the unit's chassis that may be of sufficient magnitude to constitute a risk of electric shock to humans.
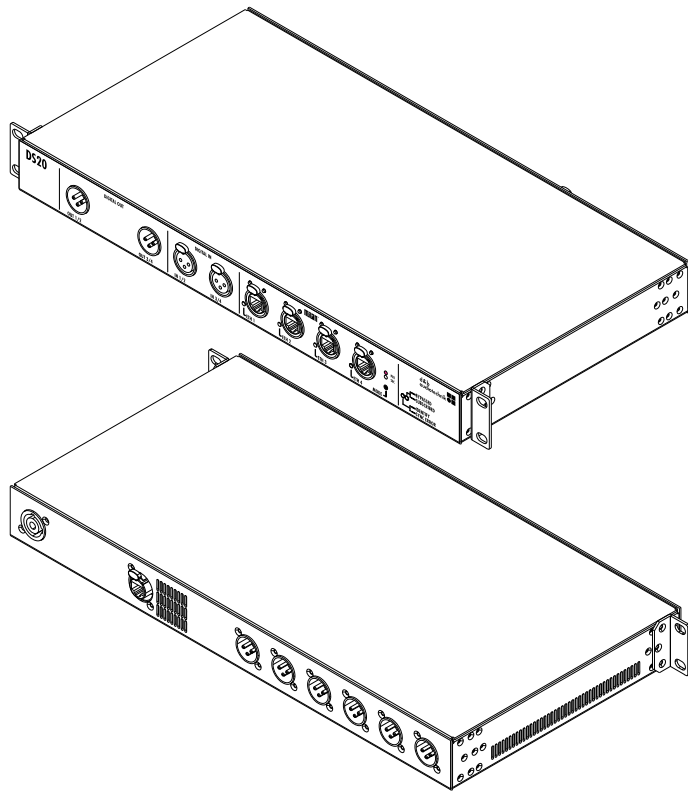
The exclamation point within a triangle is intended to alert the user to the presence of important operating and service instructions in the literature accompanying the product.

Before using this product, carefully read the applicable items of the following safety instructions.

1. Keep these instructions for future reference.
2. Read these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. **WARNING!** To reduce the risk of fire or electric shock:
    - Do not expose this unit to rain or moisture.
    - Keep water or other liquids away from the unit.
    - Do not place liquid filled containers, for example beverages, on top of the unit.
    - Do not operate the unit while it is wet or standing in liquid.
6. Always operate the unit with the chassis ground wire connected to the electrical safety earth.
    Do not defeat the safety purpose of a grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The third prong is provided for your safety.
    If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
7. Do not use this unit if the power cord is damaged or frayed. Protect the power cord from being walked upon or pinched, particularly at the plugs and the point where it exits from the apparatus.
8. The unit is intended for use in a 19" rack. Follow the mounting instructions. When a rack on wheels is used, exercise caution when moving the loaded rack to avoid injury from tipping over.
9. Unplug this apparatus during lightning storms or when unused for long periods of time.
10. Lay all cables connected to the unit carefully so that they cannot be crushed by vehicles or other equipment and that no one can either step on them or trip over them.
11. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way such as:
    - Power-supply cord or plug is damaged.
    - Liquid has been spilled into the unit.
    - An object has fallen into the unit.
    - The unit has been exposed to rain or moisture.
    - The unit does not operate normally.
    - The unit was dropped or the chassis is damaged.
    - Do not remove top or bottom covers. Removal of the covers will expose hazardous voltages. There are no user serviceable parts inside and removal may void the warranty.
12. Use the mains plug as the disconnecting device and keep it readily accessible. If the mains plug is not readily accessible due to mounting in a 19" rack, then the mains plug for the entire rack must be readily accessible.
13. An experienced user must always supervise the equipment, especially if inexperienced adults or minors are using the equipment.

Contents

1.1 Intended use

NOTICE!

The device complies with the electromagnetic compatibility requirements of EN 55032:2019 (product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use) for the environment Class B (residential).

Acoustic interference 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.

The d&b DS20 is a 16 output channel break-out box connecting the Milan™ audio network to the AES3 digital audio standard.

In addition, 4 x AES3 input channels are provided for use as a simple break-in box, e.g. at Front of House.

The DS20 is mainly intended for use within the d&b Touring rack assemblies.

The device is configured and controlled via controller software that uses the ATDECC protocol and thus supports Milan™/AVB.

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.

Note: For rack assembly instructions please refer to ⇒ Chapter 4.2 "Rack mounting and cooling" on page 9.
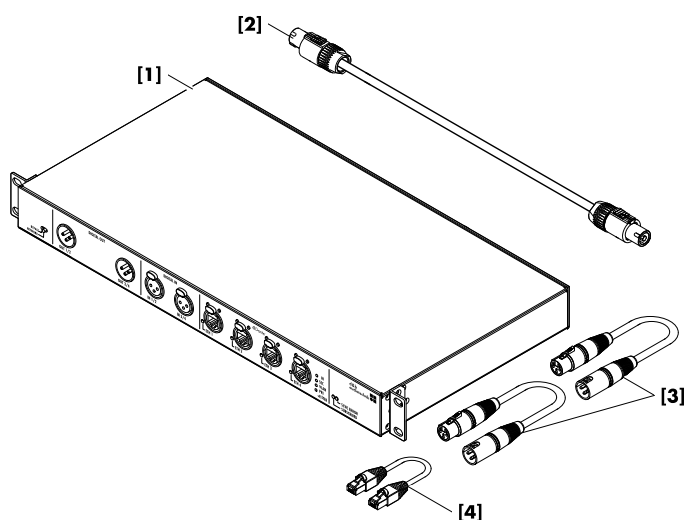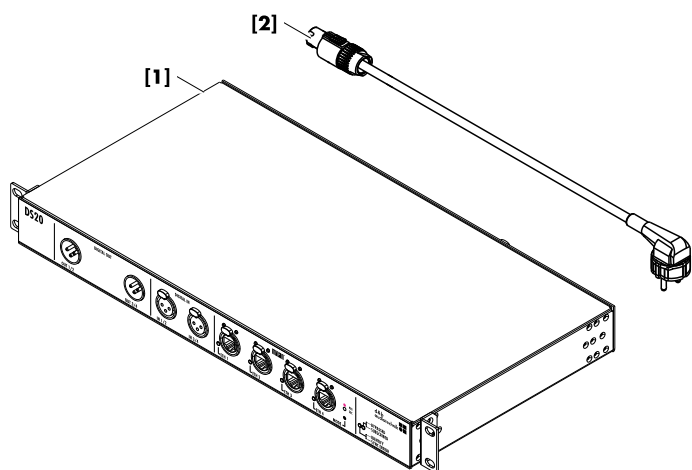
Z4011 DS20

Pos.	Qty.	d&b Code	Description
[1]	1	Z4011	d&b DS20 Audio network bridge.
Including:			
[2]	1	Z2610.xxx	Power cord (specific to country).
	1	D2743.EN .01	DS20 Manual.

Z5564 DS20 Rack upgrade kit

Pos.	Qty.	d&b Code	Description
[1]	1	Z4011	d&b DS20 Audio network bridge.
Including:			
[2]	1	Z2610.130	Power cord (powerCON®/ powerCON®. Used to connect the device to the auxiliary powerCON® socket at the rear of the mains distributor.
[3]	2	E7500.024	AES/EBU XLR cable. Used to connect the digital outputs 1/2 and 3/4 to the digital inputs D1/2 and D3/4 of the I/O panel.
[4]	1	K6018.025	CAT5e patch cable. Used to connect the ETH 3 connector of the device to the ETH 1 connector of the I/O panel.
	1	D2743.EN .01	DS20 Manual.

Operating conditions

Temperature range ....0 °C ... 40 °C / 32 °F ... 104 °F

Storage temperature .... –20 °C ... 70 °C / –4 °F ... 158 °F

Humidity (rel.), long term average.. < 70%

Power supply

Mains connector ....powerCON®

Rated mains voltage .... 100 to 240 V, 50 – 60 Hz

Overvoltage protection .... Up to 400 VAC

Power consumption .... 10 W (max)

Digital inputs

DIGITAL IN .... 4 channel (2 x AES3)

....3 pin XLR female

Pin assignment ....1 = GND, 2 = AES Signal, 3 = AES Signal

Input impedance .... 110 ohms

Sampling rate .... 32 – 192 kHz

Synchronization ....Sample Rate Converter (SRC)

Digital outputs

DIGITAL OUT .... 16 channels (8 x AES3)

.... 3 pin XLR male

Pin assignment ....1 = GND, 2 = AES Signal, 3 = AES Signal

Output impedance.. 110 ohms

Sampling rate ....48/96 kHz

Synchronization ....Milan™ network

Network

Connectors .... etherCON®

.... built-in 5-port AVB bridge

.... 100/ 1000 Mbits

Device type... Bridged End Station

Input channel streams.......... 4 streams with up to 8 channels @ 48/96 kHz

Output channel streams .... 1 stream with 4 channels @ 48/96 kHz

Network redundancy .... configurable

Controls and indicators

Mode .... Push button

Bridge port modes ....RGB LEDs

BYPASSED/SUBSCRIBED (Rx subscription) .... LED indicator green

IDENTIFY/SYNC ERROR.. LED indicator red

Dimensions and weight

Height x width x depth.. 1 RU x 19" x 232 mm

....1 RU x 19" x 9.1"

Weight ....3.8 kg / 8.37 lb

232 [9.1"]   1 RU
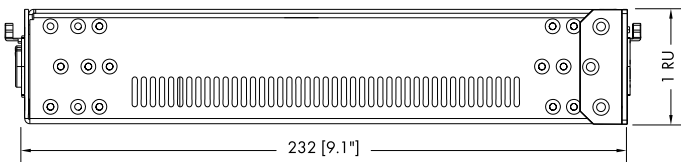
4.1 Overview

Front panel
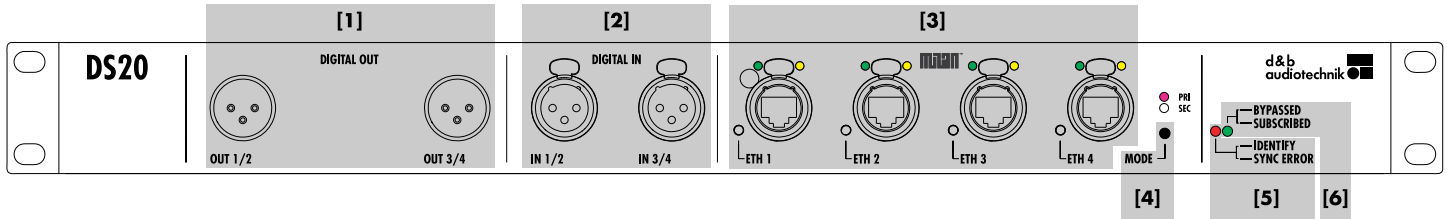
[1] XLR male digital outputs 1-4 (AES3). Refer to ⇒ Chapter 4.4.1 "DIGITAL OUT 1 – 4" on page 10.

[2] XLR female digital inputs 1-4 (AES3) with Sample Rate Converters (SRCs) Refer to ⇒ Chapter 4.4.2 "DIGITAL IN 1 – 4" on page 10.

[3] etherCON® AVBbridge ports 1-4 with dedicated indicators for:
- Ethernet link/Activity indicator.
- Ethernet Gigabit indicator.
- Bridge port mode indicator.

Refer to ⇒ Chapter 4.4.3 "ETH 1 - ETH 5" on page 10.

[4] Mode button. Refer to ⇒ Chapter 4.4.4 "Mode push button" on page 11.

[5] BYPASSED/SUBSCRIBED indicators. Refer to ⇒ Chapter 4.4.5 "BYPASSED/SUBSCRIBED/IDENTIFY/SYNC ERROR" on page 11.

[6] IDENTIFY/SYNC ERROR indicators. Refer to ⇒ Chapter 4.4.5 "BYPASSED/SUBSCRIBED/IDENTIFY/SYNC ERROR" on page 11.

Rear panel
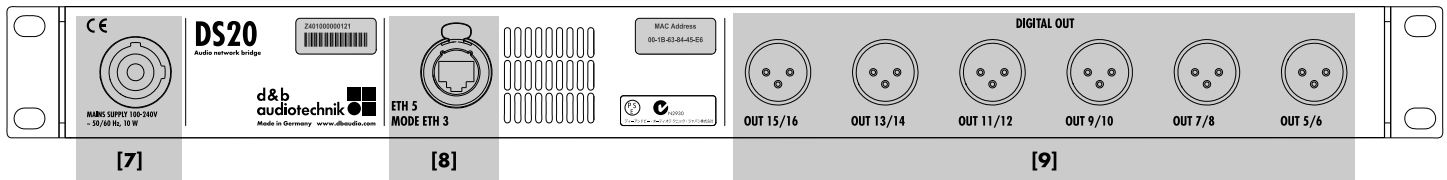
[7] powerCON® Mains connector socket. Refer to ⇒ Chapter 4.3 "Mains connection" on page 9 .

[8] etherCON® AVBbridge port 5. Refer to ⇒ Chapter 4.5.1 "ETH 5/MODE ETH 3" on page 12.

[9] XLR male digital outputs 5-16 (AES3). Refer to ⇒ Chapter 4.5.2 "DIGITAL OUT 5 – 16" on page 12.

4.2 Rack mounting and cooling

Rack mounting

The enclosure provides six different positions for the rack ears enabling different rack mounting options inside a d&b Touring rack assembly or any other rack assembly.
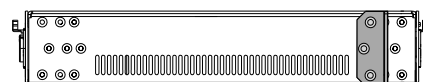
The corresponding positions and their intended purpose are shown in the table below:
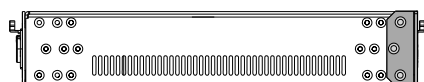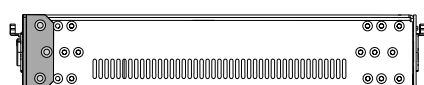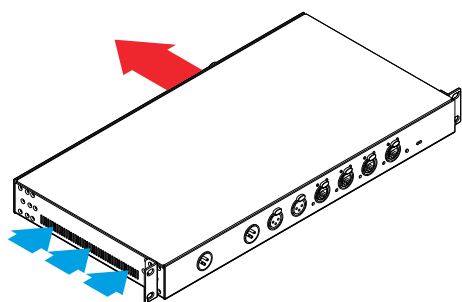

Flat:
Intended for any rack assembly.
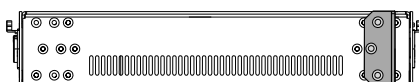
Pos. 1:
Used when mounted above the I/O panel.

Pos. 2:
Used when mounted above the amplifier.

Rear mounting

In addition, the device can also be mounted to the rear of a rack, provided the required mounting rails are available.
For this purpose, the side panels also provide the same mounting hole options (grid) at the rear as shown in the graphic opposite.

Cooling

Thermal conditions are a vital factor to ensure operational safety of the device. The DS20 is equipped with a fan that draws cool air from one side panel into the housing and channels the warm air towards the rear vents of the device.

- Please ensure that adequate cool airflow is provided.
- Do not block or cover the rear panel vents or the side panel air intake.
- If the DS20 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.

4.3 Mains connection

WARNING!
**Potential risk of electric shock or fire.**

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 mains plug under load.

Before connecting the device to mains voltage, check that the mains voltage and frequency correspond to the specifications on the rating label above the mains connector socket on the rear panel of the unit.

A powerCON® mains connector socket **[7]** is fitted on the rear panel and an appropriate power cord **[2]** is supplied.
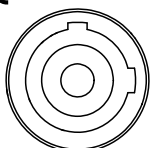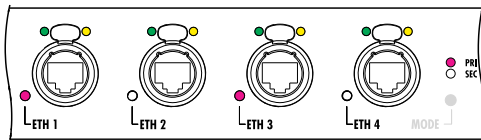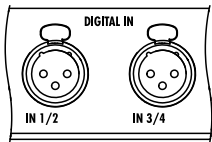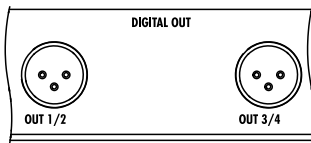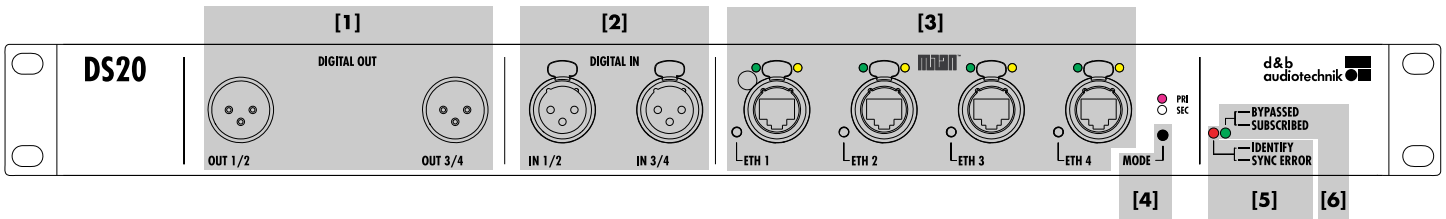

MAINS SUPPLY 100-240V
~ 50/60 Hz 10 W

[2]   **[7]**
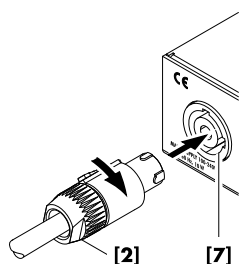
4.4 Front panel

4.4.1 DIGITAL OUT 1 – 4

Two digital output connectors (OUT 1/2 and OUT 3/4) are provided and are intended to feed the AES signal to the inputs D1/2 and D3/4 of the I/O panel within a d&b Touring rack assembly.

4.4.2 DIGITAL IN 1 – 4

In addition, two digital input connectors (IN 1/2 and IN 3/4) are provided to allow the signal bridge to act as a break-in box with a maximum of four AES3 input channels per signal bridge.

> **Note:** Sample Rate Converters (SRC) are used internally on all inputs.

4.4.3 ETH 1 - ETH 5

The DS20 provides a 5-port AVB switch.
Four connectors (ETH1 - ETH4) are provided on the front panel while a fifth port (ETH 5) is provided on the rear panel.
LEDs located beneath each port indicate the respective redundancy network (Primary or Secondary network).

Port	ETH 1	ETH 2	ETH 3	ETH 4	ETH 5
Network	Primary	Secondary	Primary	Secondary	Primary
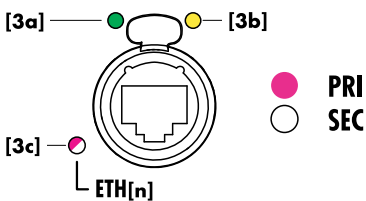
LED indicators

Each etherCON® connector provides the following LED indicators:
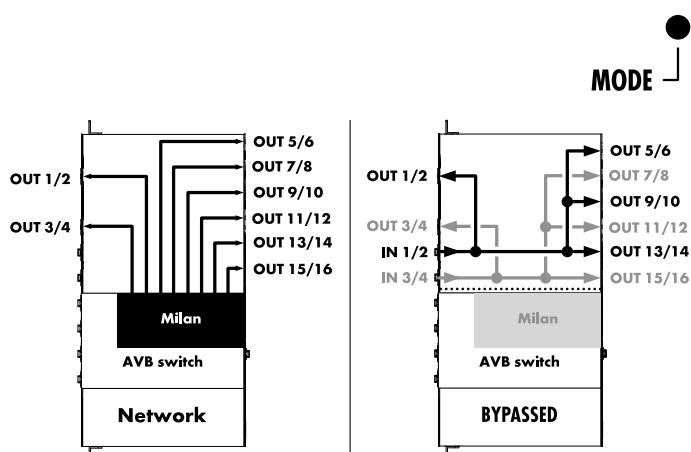

[3a] Ethernet link/activity indicator (green).

[3b] Ethernet Gigabit indicator (yellow).

[3c] Bridge port mode indicator (RGB-LED).
The color coding is as follows:
- **Cyan: PRI**mary.
- **White: SEC**ondary.

MODE

4.4.4 Mode push button

To identify a specific device on the network, push the Mode button briefly. This triggers the IDENTIFY feature and the device is highlighted in Milan™/ATDECC Controller.
Additionally, the DS20 can be changed from its normal operation ('Network mode'", with Milan™ audio I/O) to 'BYPASSED mode'.

Bypass mode retains all functionalities of the AVB switch, but does not provide any Milan™ audio I/O functionality.
Instead, AES3 audio connected to its inputs is routed directly to the respective onboard outputs as shown in the diagram. This lets the DS20 function as an AES3 distribution amplifier with negligible latency with an isolated built-in AVB switch.

To change from 'Network' to 'BYPASSED' mode, proceed as follows:

1. Push the «Mode» button for 2 seconds.
   ↳ The device enters the configuration mode with the last bridge mode selected and all LEDs flash.

2. Briefly push the «Mode» button to toggle between the two modes.

1 (Default)	**Network**	Milan™ audio I/O + AVB switch
2	**BYPASSED**	AES3 distribution amplifier + AVB switch. ($\Rightarrow$ BYPASSED LED flashes)

3. Once the desired mode is selected, wait for 5 seconds.
   ↳ The set mode will be applied automatically.

   Note: Please note that a change of the mode causes the DS20 to reboot, which briefly interrupts network traffic over AVB.

4.4.5 BYPASSED/SUBSCRIBED/IDENTIFY/SYNC ERROR

BYPASSED   Flashes green when the device is BYPASSED. The digital inputs are routed (with negligible latency) to the outputs as shown in the diagram opposite.
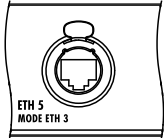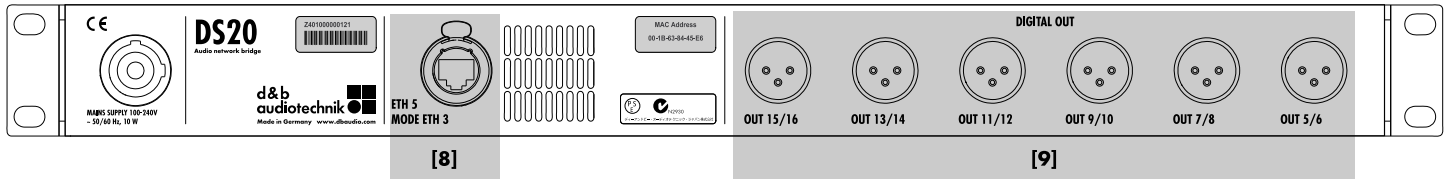
SUBSCRIBED   Illuminates green for three seconds when any of the signal bridge outputs has a configured subscription.

IDENTIFY   Flashes red to physically identify the device when a ping/wink is triggered in the Milan™/ ATDECC controller software.

SYNC ERROR   Illuminates red when the device cannot synchronize with the Milan™ network.
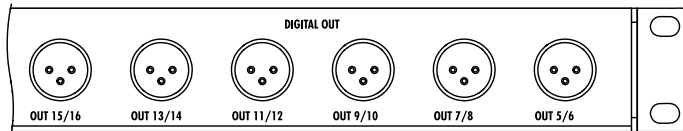
4.5 Rear panel

[8]   [9]
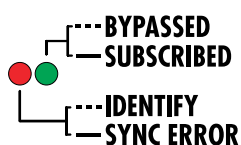
4.5.1 ETH 5/MODE ETH 3
A fifth Ethernet port is provided on the rear panel which is intended for the internal Ethernet wiring within a applicable d&b Touring rack assembly.

4.5.2 DIGITAL OUT 5 – 16
In addition, six digital output connectors are located on the rear panel providing twelve additional AES3 channels.

5.1 Meta data

The DS20 sends meta data (channel labels, cabling information...) via the AES3 outputs alongside the digital audio samples, using the AES3 user bits.

These meta data can be read out by the d&b four channel amplifiers (DS labels).

For more information, please refer to the respective amplifier manuals and/or the R1 Help system.

5.2 DS20 Firmware update

NOTICE!

Only use firmware files provided by d&b. Using firmware files not provided by d&b can result in the DS20 becoming unusable.

Firmware update files are provided by d&b at www.dbaudio.com.

We recommend you to regularly check the related product page on the d&b website for the latest firmware version together with the update procedure instructions.

6.1 Declaration of Conformity

This declaration applies to:

d&b Z4011 DS20 Audio network bridge

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.

6.2 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

6.3 Licenses and patents

This device uses a number of third-party libraries to provide certain features. These libraries are supplied along with the firmware of this device.

The licenses and patents information are provided in a separate document which can be downlaoded from the related product page on the d&b website at www.dbaudio.com.

d&b audiotechnik

www.dbaudio.com

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