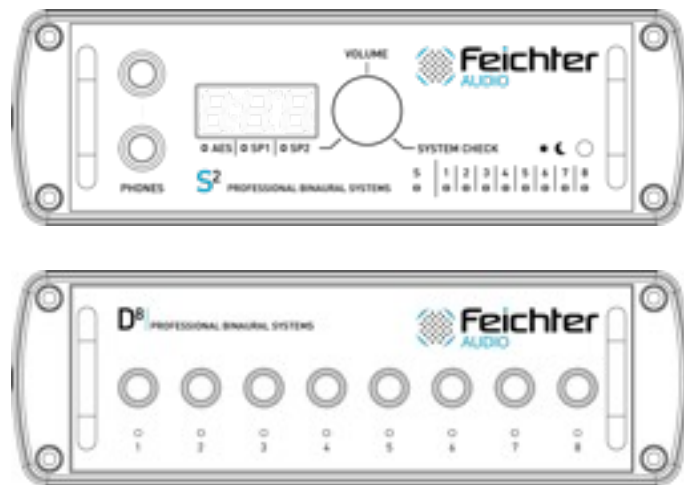


S² D⁸

High quality
64 Headphones
Distribution System



Binaural
Professional Systems

User manual
— [Revision 1.0 - June 2015] —








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SAFETY INSTRUCTIONS AND WARNING

Read carefully this manual before using your Feichter Audio devices. Keep it for future reference.

If you have an issue during the installation, please contact Feichter Audio assistance.

AUDIO WARNING		
 	<p>This equipment can create high sound levels. Over exposure to excessive sound levels can damage your ears resulting in permanent noise-induced hearing loss.</p> <p>To avoid hearing damage, limit the time you use the headset at high volume and/or set the volume to a safe level.</p> <p>The volume control of headphones is exclusively the responsibility of users.</p>	
ELECTRICAL WARNING		
	<p>To avoid the risk of shock and fire, keep this equipment away from rain and other moisture. Do not use this equipment if it is wet. Make sure your devices are properly ventilated. Keep away from any source of heat.</p> <p>Do not attempt to service the equipment. There are no user-serviceable parts inside. Please refer all servicing to Feichter Audio.</p> <p>Any attempt to service the equipment will expose you to a risk of electric shock, and will void the manufacturer's warranty.</p> <p>The product should be connected only to the correct power supply as indicated on the product. Do not operate with damaged cord. Replace the fuse by an equivalent model.</p> <p>This equipment must be grounded.</p> <p>Unplug this apparatus during lightning storms or when unused for long periods of time.</p>	<p>Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems).</p> <p>This product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment.</p> <p>By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local waste disposal service or the shop where you purchased the product.</p>
		



As a precaution, **do not wear headphone during starting**, even if the system has an advanced protection system, sudden shock noises which could harm your hearing may appear.

This system uses a proprietary network distribution to link D⁸ boxes. RJ45 sockets **are not compatible with Ethernet consumer network**. Never attempt to connect Ethernet consumer equipment.

TECHNICAL INFORMATION

The documentation is available in French and English language and is provided with:

- ➔ Individual approval report (A6 format delivered with each box)
- ➔ Paper manual (A5 format with each system)
- ➔ The electronic version of the manual and a binaural sound movie are available online on Feichter Audio

For comments, suggestions and customer service, please contact us by e-mail:

support@feichter-audio.com

PACKAGE'S CONTENTS S²

- ➔ Power supply unit S²
- ➔ Power cable
- ➔ 1/4" stereo jack plug (« key lock »)
- ➔ Paper manual

The power supply unit S² is delivered with a 1/4" male jack plug



To prevent any undesired modification during performances the S² box buttons are locked by default. Buttons can be activated by plugging the provided stereo jack adapter or any standard 1/4" stereo jack in one of the two phones output.

PACKAGE'S CONTENTS D⁸

- ➔ Distribution unit D⁸
- ➔ Paper manual
- ➔ Additional set of label (ID)
- ➔ A shielded Cat-5 cable, if applicable



D⁸ can be delivered with high quality shielded Cat-5 cable. Use only shielded Cat-5 cable.

Unshielded consumer cable can cause damages to components of the system.

PHILOSOPHY

Thank you for choosing our product. Feichter Audio systems are designed with care and enthusiasm and we hope it will meet yours expectations for many years.

Feichter Electronics is associated with Pascal Rueff, pioneer of binaural sound, to design and manufacture in France professional audio equipments which will be particularly appropriated to high quality 3D audio.

Our range of Binaural Professional System fulfill the requirements of binaural production: dynamic, skill, silence. This level of quality, not just to satisfy but to exceed the demands of standard stereo production.

Wear your favorite headphones and discover high quality binaural productions with our products, on the website www.binaural.fr



HIGH QUALITY FOR EACH HEADPHONE

The Feichter Audio's binaural distribution system is the first solution of immersive sound with no-compromised quality.

Ultra-quiet and dynamic, the couple S²-D⁸, is the best option to offer an optimal 3D experience over headphone to listening groups.

Modular and easy to install, our system may fits a control room, a studio or concert hall. Its networked architecture allows an unlimited number of headphones.

To ease the installation, the diagnosis mode enables to detect defective devices or any other problem in the system preventing unpleasant surprises.

MAIN FEATURES

- ➔ PCM 24BITS 96KHZ
- ➔ INAUDIBLE SELF-NOISE
- ➔ HIGH QUALITY DAC AND AMPLIFIERS
- ➔ GLOBAL VOLUME CONTROL
- ➔ AUTOMATIC DIAGNOSIS OF HEADPHONES (UNPLUGGED OR DEFECTIVE)
- ➔ HIGH IMMUNITY AGAINST ELECTROMAGNETIC INTERFERENCES
- ➔ STURDY BUT LIGHTWEIGHT CONSTRUCTION
- ➔ NEUTRIK® CONNECTORS
- ➔ WORLDWIDE POWER INPUT (100-240VAC) AND BATTERIES (OPTION)
- ➔ DESIGNED AND MANUFACTURED IN FRANCE

There are two types of boxes:

S²

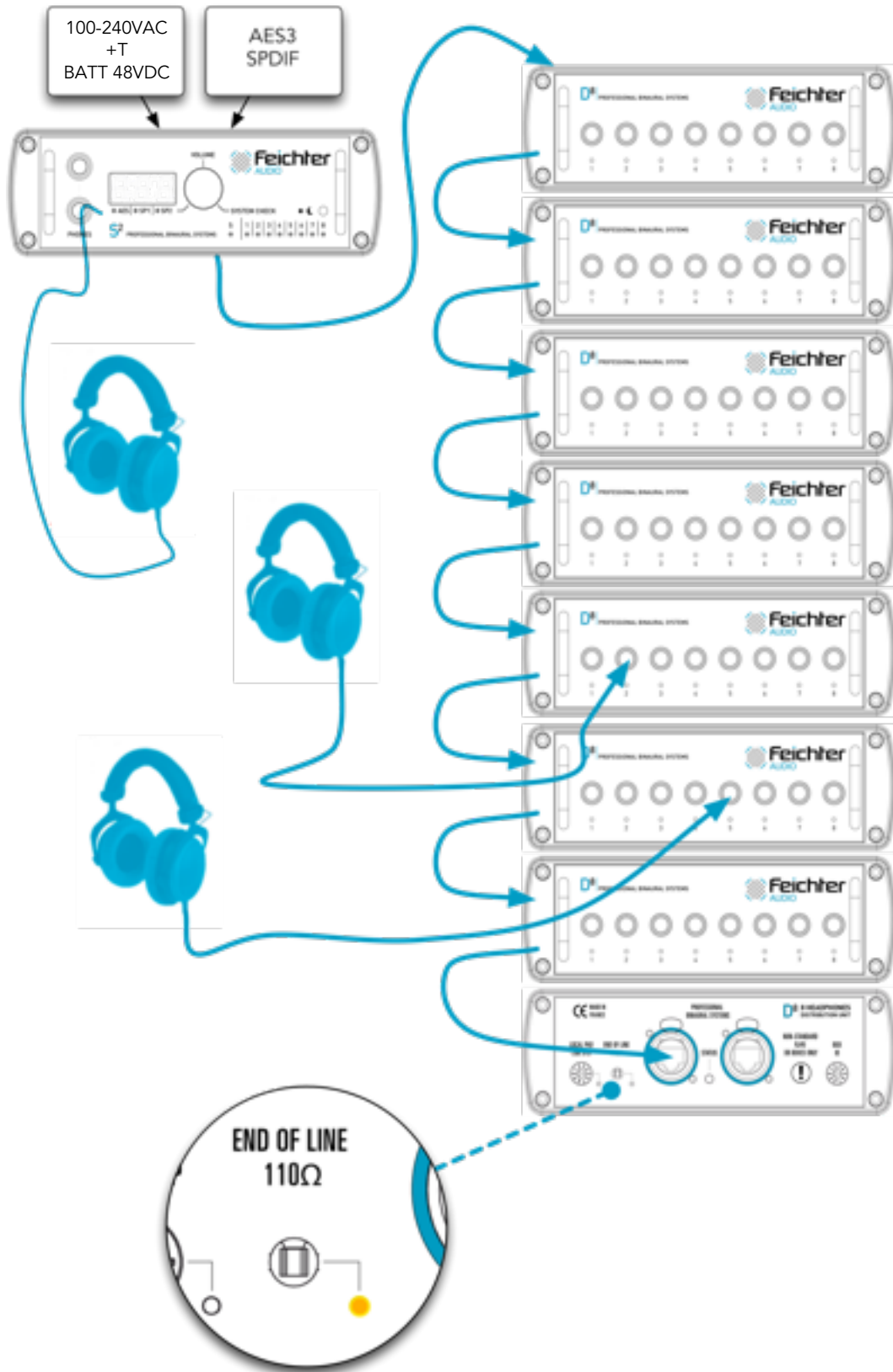
Power supply and diagnosis unit. Digital audio interface with two high-quality headphones outputs.

D⁸

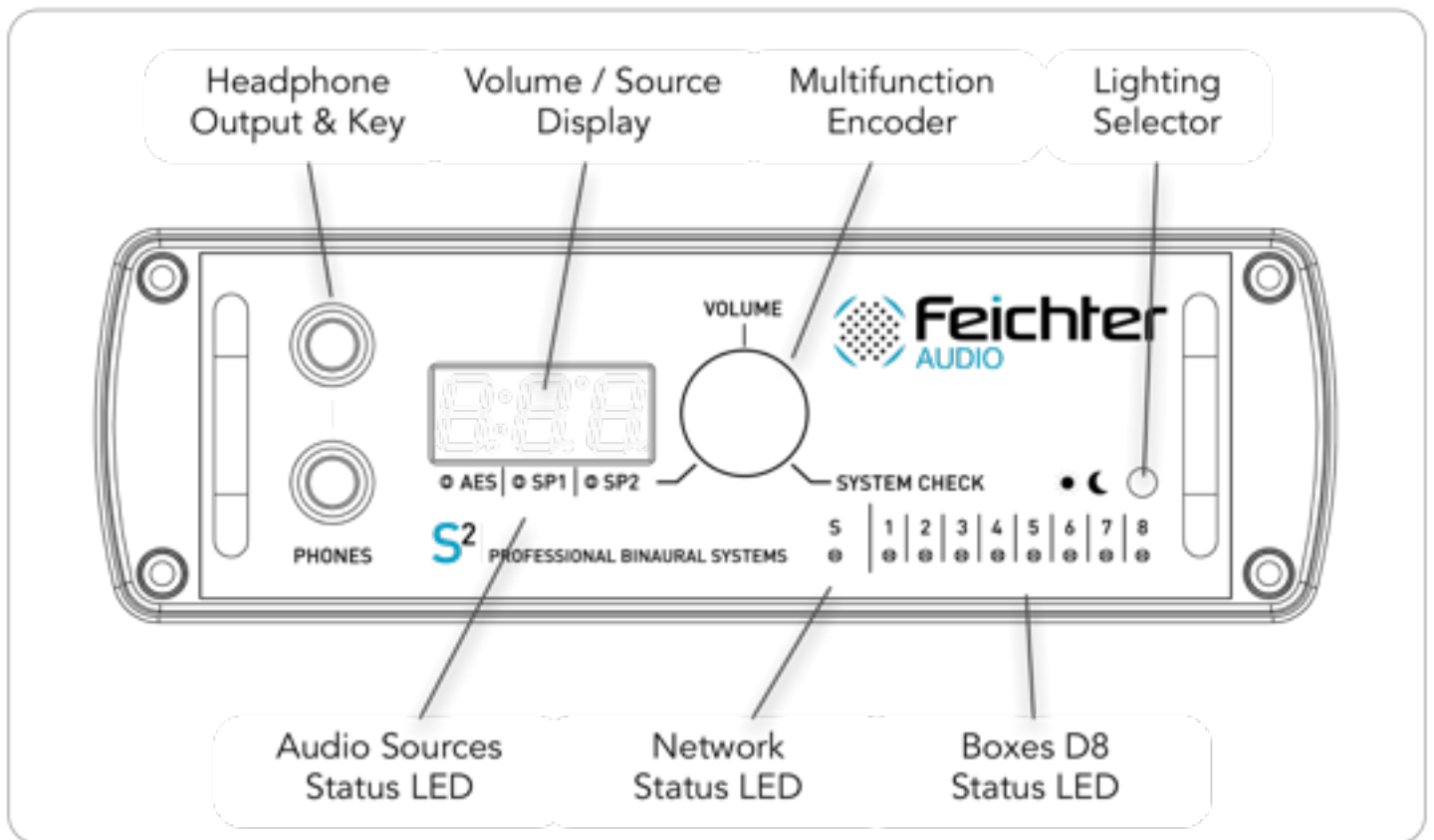
Distribution unit with 8 analog high-quality headphones outputs.

- ➔ A single S² box can pilot from one to eight D⁸ boxes : this means 64 headphones, on a network up to 100 meters cable length.
- ➔ A single shielded cable with locking connectors delivers sound, power and control.
- ➔ Each headphone output is controlled by an individual amplifier.
- ➔ In the "diagnosis mode", S² allows defaults detection when : headphones are not well-plugged, if their cable is damaged or broken or when the transducer is defective.
- ➔ This distribution system accepts PCM signals sampled at rates from 44,1 to 96 kHz and encoded from 16 to 24 bits using AES3 or SPDIF (electrical or optical) protocols.
- ➔ The system is designed to deliver the same quality and sound level to everyone in the audience. Each D⁸ box has an independent attenuator allowing fine level control to use a different batch of headphones on each box.
- ➔ Reflections of digital audio signal are prevented by using a resistance of 110 Ω at the end of the network. This impedance is activated by a switch on the last network's box.

WIRING OVERVIEW



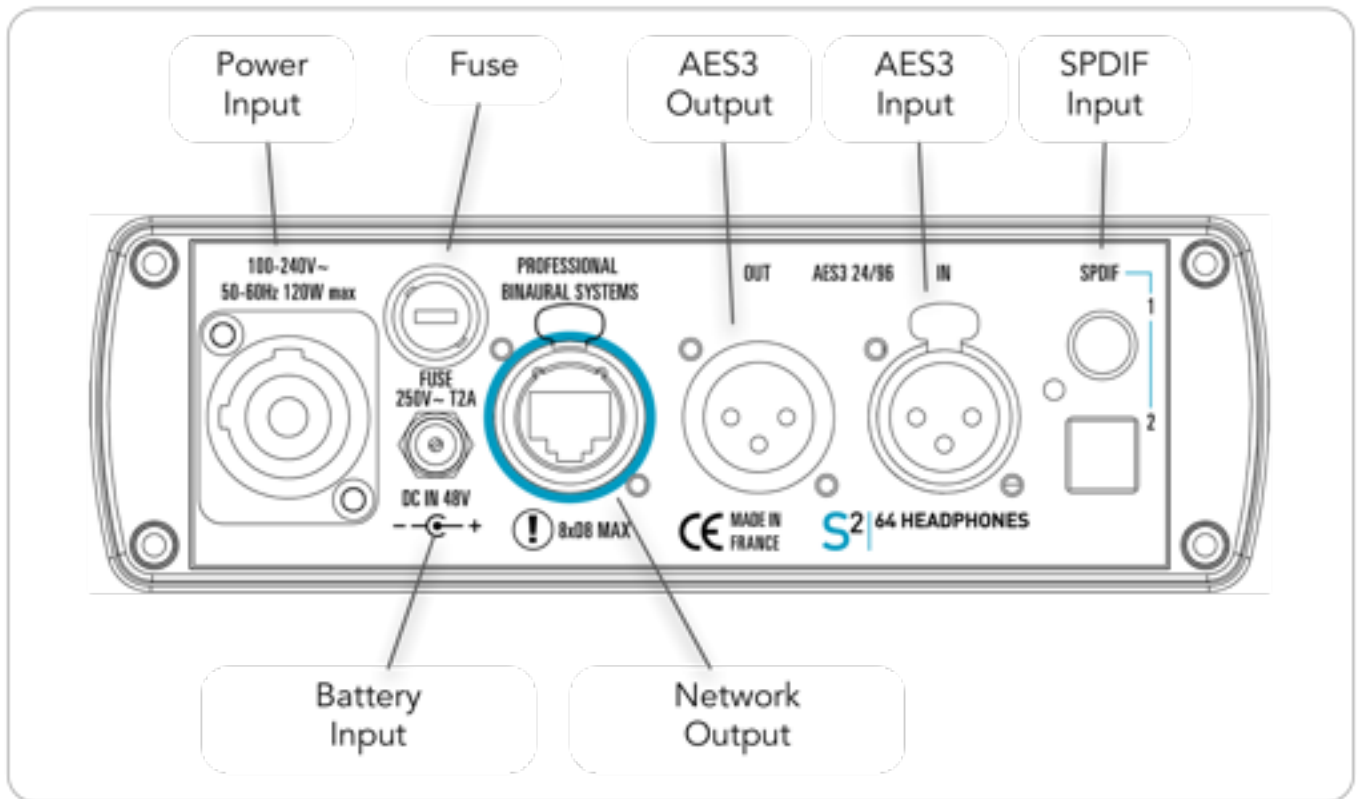
S² FRONT FACE



Headphone Output & Lock	Two 1/4" headphones outputs Commands lock Saving settings
Volume/Source Display	Level attenuation display in dBFs Visualisation of selected source [AES, SP1, SP2] Diagnosis informations [SYS, End, Id] [---] when commands are locked
Multifunction Encoder	Multi-purpose rotary control: Level control, audio source selection (AES, SP1, SP2) and mode selection (exploitation/diagnosis)
Lighting selector	Set 3 levels of brightness (day / night / off)
Audio Sources Status LED	Indicate the activated or selected audio source
Network Status LED	Indicates the general state of the network
Status LED [1-8] D8 boxes	Indicate D ⁸ boxes status and headphones connected

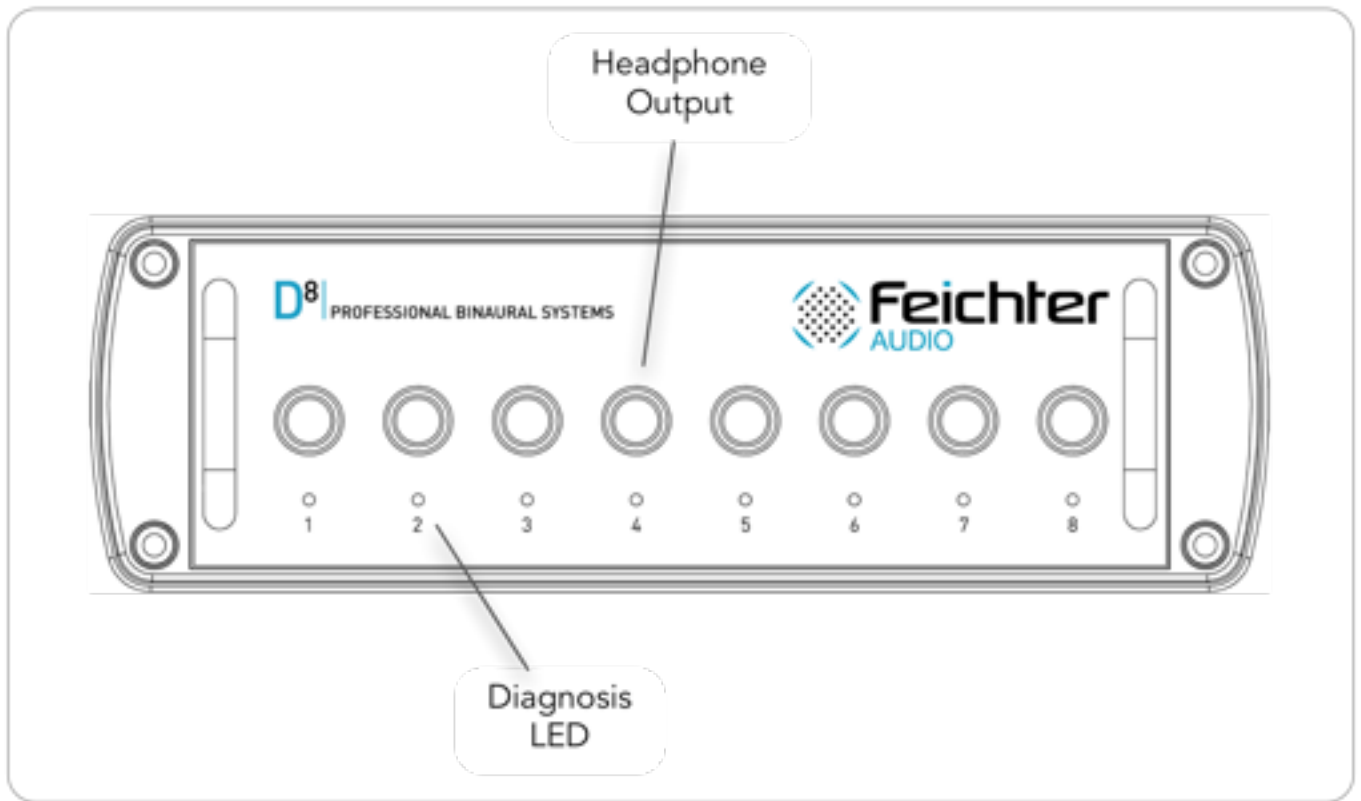
REAR FACE

S²



Power Input	Power supply inlet, 100-240VAC on PowerCon®
Fuse	Time-delay fuse 2A
AES Output	AES3 digital output (by-passed digital audio input AES3 or SPDIF)
AES Input	AES3 stereo Input
SPDIF 1 Input	SPDIF stereo electric Input
SPDIF 2 Input	SPDIF stereo optical Input
Battery Input	Power supply input, 48VDC barrel jack (5,5mm-2,5mm, ⊕ inside)
Network Output	Output network on EtherCon®

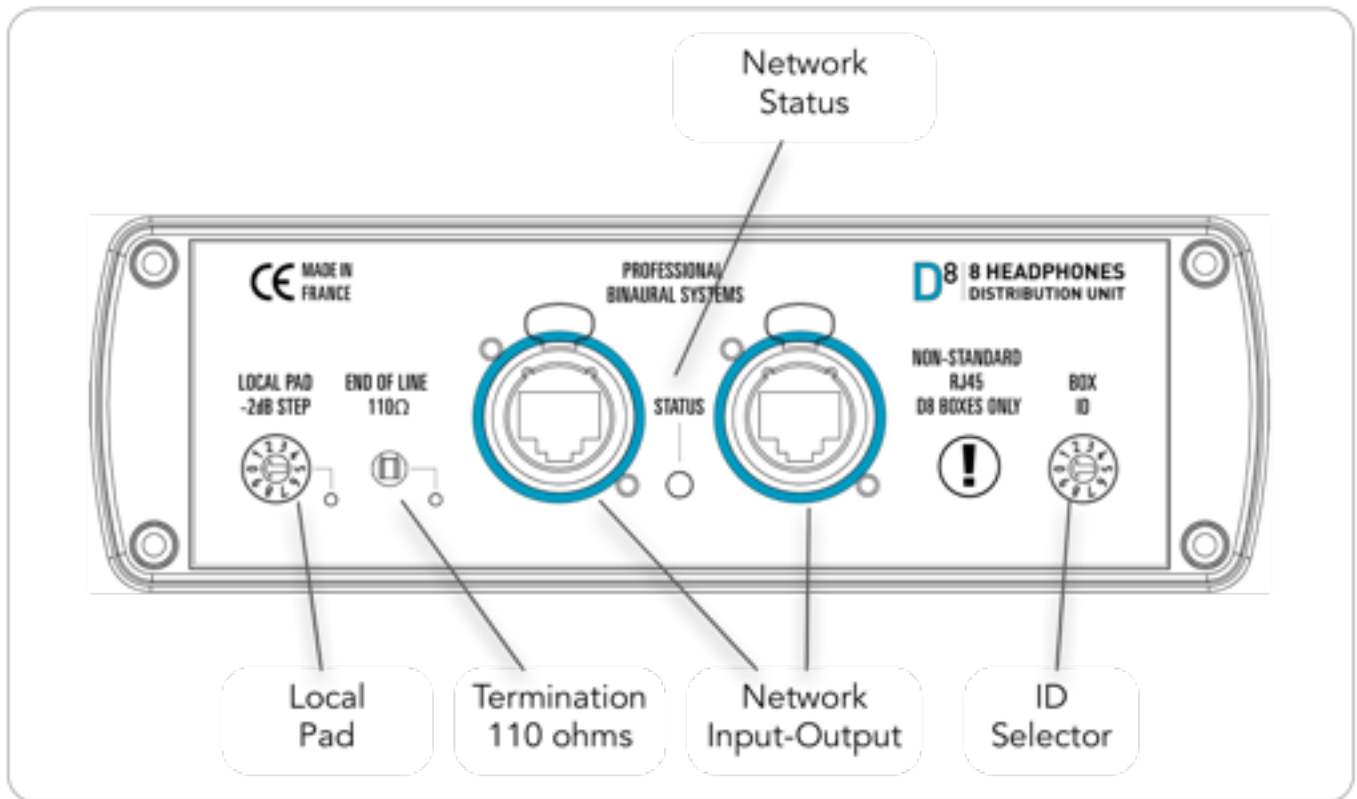
D⁸ FRONT FACE



Headphones [1-8] Output	1/4" Analog Stereo Headphones Output
Diagnosis [1-8] LEDs	Indicate headphones failures

REAR FACE

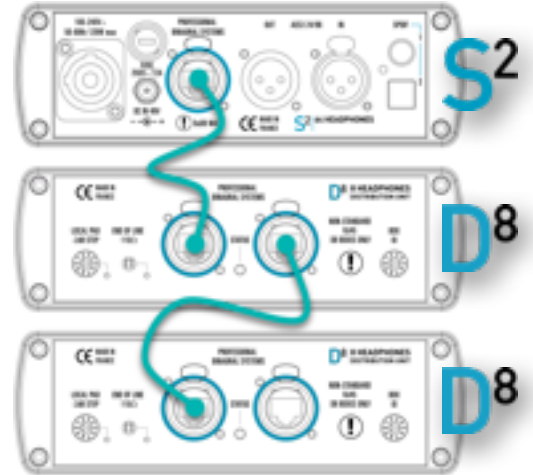
D⁸



Local attenuator [PAD]	Adjustable level attenuator from 0 to -18dBFs steps of 2dBFs
Terminaison 110 ohms	Network's termination button, push it on the last box of the network
Network 'state	Indicate network addresses problems
Network Input-output	Network Input-output on EtherCon® connector
ID Selector	Box network ID address, hided by a sticker

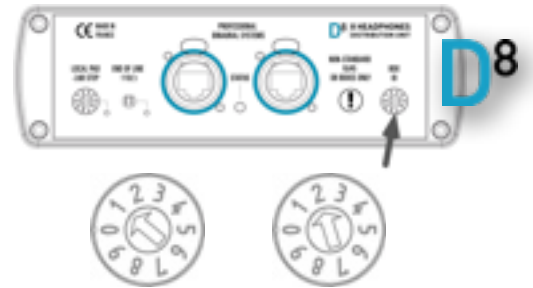
1. System wiring

- ➔ Identify EtherCon® connectors marked by [PROFESSIONAL BINAURAL SYSTEMS]
- ➔ Connect the S² box with a shielded Cat-5 cable to the first D⁸ box
- ➔ Each EtherCon® plug can be used as input or output
- ➔ Connect with another shielded Cat-5 cable, the next D⁸ box
- ➔ Connect up to eight D⁸ boxes



2. Address

- ➔ Each D⁸ box must have an unique address [ID]
- ➔ ID 1 is set by default, except if you have bought a complete system
- ➔ With a flat screwdriver, set the box ID
- ➔ The order in the network does not matter, but each box must have an unique address



3. Powering

- ➔ Power S² box with the power cable supplied (PowerCon® plug)
- ➔ The PowerCon® connector acts as main system switch by locking and unlocking
- ➔ OR connect a 48V battery pack (in option) properly loaded on [DC IN 48V]
- ➔ The system starts in "exploitation mode" and last settings are loaded



GUIDE OWNERSHIP 2

4. Network termination

- ➔ On the last D⁸ box on the network, engage the button [END OF LINE]
- ➔ The yellow led switches on, network is ready



5. Connect the audio source

- ➔ Plug a digital audio source to one of the S² digital audio inputs (44.1 to 96 kHz, 16 to 24 bits)
- ➔ Formats AES3 and SPDIF (RCA or TOSLINK) are supported



6. Choose the audio source

- ➔ Unlock the S² unit by plugging stereo jack in one of the outputs [Phones]
- ➔ Push the button [volume] once. The active source name is displayed
- ➔ Turn the button [volume] to select the desired audio source
- ➔ After three seconds, push the button [volume] again, to confirm the selection



7. Adjust the level sound

- ➔ Unlock the S² unit by plugging stereo jack in one of the outputs [Phones]
- ➔ Turn the button [volume]; the corresponding value is displayed on the screen
- ➔ The sound level is displayed in dBFs
- ➔ Level can be adjust by steps of 0.5 dBFs. Lighted point on the right side of the screen represents decimal point values



Setting memory

- ➔ To save volume control and audio source adjustments, the stereo jack must be unplugged for an instant from the [Phones] socket : The LED [S] changes to pink for one second to confirm the saving
- ➔ When starting, the stored settings are automatically loaded

Display intensity

- ➔ The button [☀ 🌙] controls light intensity (digital display and LEDs) according three modes: day / night / off
- ➔ Pressing the button changes the intensity from strong (day) to weak (night), then only the LED [S] switches on (off mode)
- ➔ In off mode, any actions on button [Volume] bring back the lighting to night mode

Setting protected

- ➔ Outputs [Phones] of S² boxes acts as a key. All commands (level and source selection) are locked by default
- ➔ Plug the stereo jack supplied or a standard headphone's jack into the [Phones] sockets to activate controls and change audio source or sound level

AES3 input

- ➔ The AES3 (S²) output returns the activated audio source, No matter if the input signal comes from the AES3 or the SPDIF inputs. Link the AES3 output to the AES3 input of another S² box to expand the network beyond 64 headphones
- ➔ AES3 output keeps the "Consumer" format when it copies out the SPDIF input : there is no re-encoding of AES3, only an electric adaptation of signals is done

Protection rack handles

- ➔ D⁸ box is extremely light, it can be hanged or fastened by its handles
- ➔ S² box 's handles help to protect the button [Volume]; this box is more heavy than D⁸ box, so we do not recommend hang or fasten the device by its handles

ADVANCED FEATURES / EXPLOITATION

Information of EXPLOITATION MODE

Color LEDs of S² and D⁸ boxes display the system state in real time.

LEDs **[AES]**, **[SP1]** and **[SP2]** display the state of active audio source

- ➔ blue: the activated source is valid and delivered to the network
- ➔ blinking blue: the activated source is not valid



LED **[S]** indicates network's state

- ➔ steady blue: network ok
- ➔ blinking blue: network ok, but the selected audio source is not valid



LEDs **[1-8]** and digital display inform about network's problems

- ➔ **[End]** and blinking red: the network is not terminated or the termination is activated twice
- ➔ **[Id]** and blinking red: forbidden address are activated (0 or 9) or the same ID is used by two boxes



LEDs **[1-8]** indicate the status of the corresponding D⁸ boxes connected to the network

- ➔ steady blue: D⁸ box is activated
- ➔ blinking blue: audio signal is not valid
- ➔ steady red: D⁸ box indicates a power supply problem. If it appears, check the wires or the battery level. If the problem remains, contact us



LEDs **[1-8]** and digital display indicate the boxes using an attenuation **[PAD]**

- ➔ steady pink: indicated that PAD button is turned on at the corresponding Box



Diagnosis mode

In "diagnosis mode", the S² and D⁸ boxes color LEDs display the headphones conditions. This function is available for headphones with impedances from 16 to 300 ohms. For higher or smaller impedance, the measurement is no guaranteed.



The diagnosis mode stop the exploitation mode : the diagnosis mode mute the sound signals and the test signal is delivered to the system. This mode is designed to check and setup the installation. The diagnosis mode can be held as long as needed.

To switch to diagnosis mode, press and hold the button [Volume] for 3 seconds

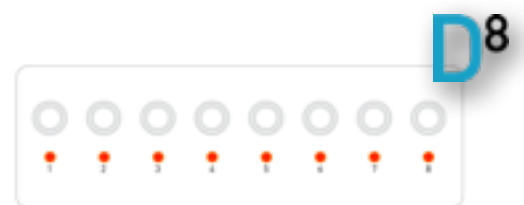
- ➔ the word [SYS] displays
- ➔ to confirm press the button again
- ➔ sound is muted and all LEDs blink

LEDs [1-8] indicate the headphones status on D⁸ boxes connected to the network

- ➔ steady blue: 8 working headphones are connected
- ➔ blinking blue: at least one output headphone is still available
- ➔ steady red: a problem is detected on at least one headphone

LEDs [1-8] indicate status of output headphones

- ➔ steady red: light when the socket is free
- ➔ light off: when the headphones are connected and working properly
- ➔ blinking red: a problem is detected in the connected headphones



To **exit diagnosis mode**, press the button [Volume] once or lock the system by unplugging the 1/4 stereo jack of the socket [Phones].

GENERAL SPECIFICATIONS

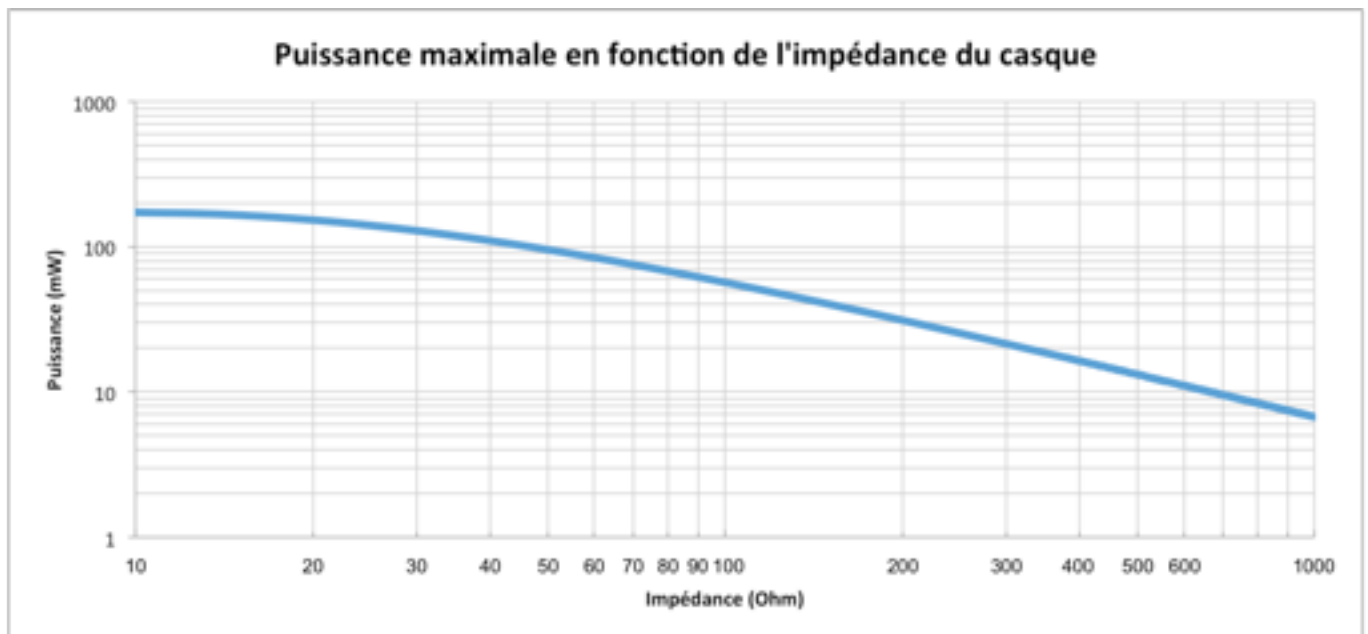
Frequency response	20Hz-20KHz	0/-1dB
SNR	100dB	re +4dBu, 22KHz BW, unity gain
Distorsion	0,01500 %	THD, 1kHz, 0dBFS, on load 32Ohms
Temperature range	+5 à +40°C	
Humidity	< 75%	no-condensing

S² SPECIFICATIONS / POWER SUPPLY UNIT

Sampling frequency	from 28KHz to 108KHz	automatic synchronization with valid frame
Word length	16 to 24bits	
Audio digital formats	AES3 electrical SPDIF optical SPDIF	IEC 60958 Type I XLR IEC 60958 Type II RCA IEC 60958 Type II TOSLINK
Network	non-standard network	RJ45 EtherCon® / Cat-5 shielded straight cable
Power supply	100-240VAC, 50-60Hz, 120W Delay-time fuse 2A	PowerCon®
Auxiliary power supply	48VDC ±6V, 2A	Jack coax cable barrel jack (5.5mm-2,5mm)
Weight	890 g	aluminum box
Dimensions	170 x 145 x 55	length x depth x high

D⁸ SPECIFICATION / DISTRIBUTION UNIT

Output level max	8dBu	@ 0dBFs, per headphone
Power max	130mW 27mW	with 32 ohms with 250 ohms
Address	1-8	address 0 and 9 are not use
Attenuation (PAD)	-18dBFs	steps of 2dBFs
Weight	760 g	aluminum box
Dimensions	170 x 145 x 55mm	length x depth x high



Our amplifier's output level of can seems weak in front of other devices. This conception choice is compatible with EN-50332-2 (150mV / 32 ohms) and guarantee the sound quality for the full scale level. Until 0dBFS and no matter input level, the amplifier's output does not crunch and the distortion rate is remains very low even for loud sounds. The whole dynamic range is available.

It is the user's responsibility to use an appropriate input signal's level.

DÉCLARATION DE CONFORMITÉ

Feichter Electronics, 5 rue Louis de Broglie, 22300 Lannion, France, declares S² et D⁸ products are tested and conformed following standards:

EN 55022 edition 2010	Limited electromagnetic emissions
EN 55024 edition 2010	Immunity against electromagnetic interferences
EN 60950-1 edition 2005	Low-voltage directive
EN 50332-2 edition 2003	Acoustic system equipment
EN 60958 AES-EBU	

Laurent Feichter, 15th june 2015



WWW.FEICHTER-AUDIO.COM

Feichter Audio design and produce systems respecting its social and ecological commitment.

Designed and manufactured in France

Our products are designed and manufactured in our local facilities in Lannion, Brittany. Ours subcontractors are small- and medium-sized businesses and industries: Electronic cards are manufactured in Lannion, the boxes and decorative panels are made in Alsace.

Long service life

The device is designed for professional use and will last for many years. Besides, we conduct durability test on our prototypes, and we perform meticulous quality control on each product before the delivery.

Energy savings

We use the newest technologies of power supply circuitry. Energy saving is guaranteed by the 90% of efficiency of all our power circuits.

Recyclability

Our products can be easily dismantled and do not contained non-recyclable materials.

Control of supply chain

We use exclusively electronic components manufactured by the market leaders. Their certification process and traceability which is used in medical and automotive industry ensure their quality. All components are carefully chosen from certified manufacturers using only responsible raw material (ecological and social large footprint).

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