

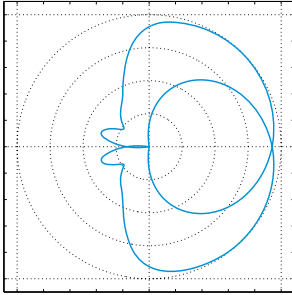
# Esfera

## SPB 8000

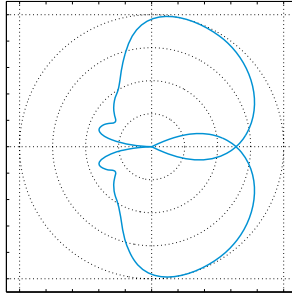


Instruction manual

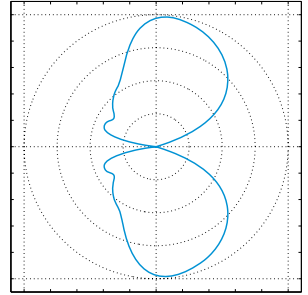
A



— 0.0

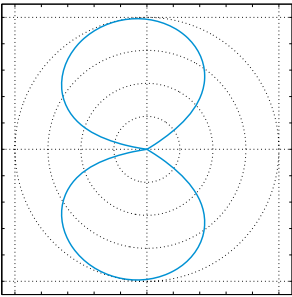


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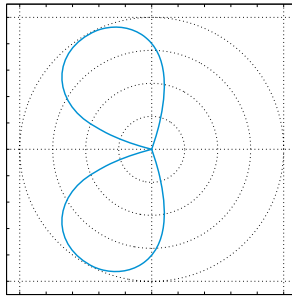


— 1.0

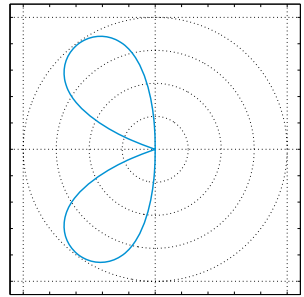
B



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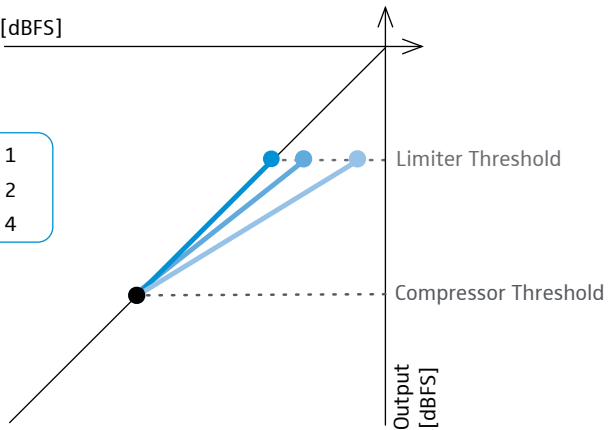


— 1.0

C

Input [dBFS]

- Compressor Ratio = 1
- Compressor Ratio = 2
- Compressor Ratio = 4



# Important safety instructions

1. Read these instructions.
2. Keep these instructions. Always include these instructions when passing the apparatus on to third parties.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power supply cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments, accessories or spare parts specified by Sennheiser.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus.  
When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. 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 or objects have fallen into the apparatus, when the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. To completely disconnect this apparatus from the AC mains, disconnect the power supply cord plug from the AC receptacle.
16. **WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
17. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
18. The mains plug of the power supply cord shall remain readily accessible.



### Hazard warnings on the rear of the SPB 8000

The label shown on the right is attached to the rear of the SPB 8000. The symbols on this label have the following meaning:



Presence of uninsulated dangerous voltage within the SPB 8000's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



Never open the SPB 8000 as there is a risk of electric shock. There are no user serviceable parts inside.



Read and follow the safety and operating instructions contained in the instruction manual.



### Risk of fire due to overloading

Do not overload wall outlets and extension cables as this may result in fire and electric shock.

### Intended use

Intended use of the SPB 8000 includes:

- having read and understood this instruction manual, especially the chapter "Important safety instructions",
- using the product within the operating conditions and limitations described in this instruction manual.

"Improper use" means using the product other than as described in this instruction manual, or under operating conditions which differ from those described herein.

This instruction manual is also available on the Internet at [www.sennheiser.com](http://www.sennheiser.com).



# The Esfera surround microphone system

Esfera is a surround microphone system which is easy to install and very easy to use. Esfera provides 5.1 surround sound from just two channels, making complicated surround mic installations a thing of the past. The system consists of the SPM 8000 stereo microphone – supplied complete with basket windshield, suspension with pistol grip, “hairy” cover and cable – and the SPB 8000 processing unit that converts the signals of the microphones into a complete 5.1 audio signal.

## The SPB 8000 processing unit

The SPB 8000 processing unit converts the signals of the SPM 8000 stereo microphone into a complete 5.1 audio signal.

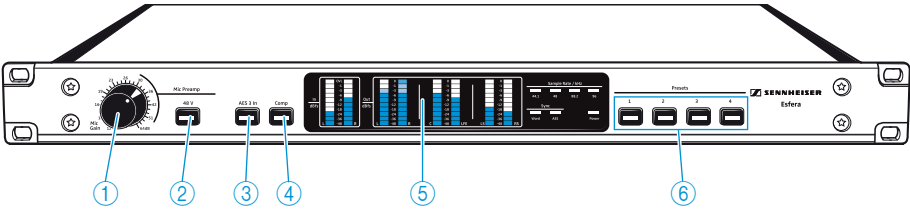
- Supplies microphones with 48 V phantom power
- Input switchable between analog and digital AES3 signals
- Switchable compressor
- 4 programmable presets for storage of 5.1 surround parameters
- SPB 8000 adjustable via a web interface

## Package contents

- 1 SPB 8000 processing unit
- 3 mains cables (EU, UK and US version)
- 1 network cable
- 4 self-adhesive feet
- 1 instruction manual

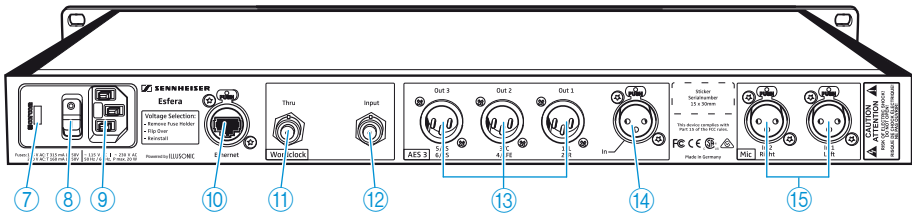
# Product overview

## Overview of the front panel



Operating element	Function
① Mic Preamp rotary switch	Adjusts the preamplification for analog input signals
② 48 V button	Activates/deactivates phantom power for analog input signals <ul style="list-style-type: none"> <li>• Button lights up red: phantom power is activated</li> </ul>
③ AES 3 In button	Activates/deactivates the digital audio input <ul style="list-style-type: none"> <li>• Button lights up red: digital audio input is activated</li> </ul>
④ Comp button	Activates/deactivates the compressor <ul style="list-style-type: none"> <li>• Button lights up red: compressor is activated</li> </ul> <div style="background-color: #0070C0; color: white; padding: 5px; display: inline-block; margin-top: 10px;"> <span style="font-size: 1.2em; font-weight: bold;">i</span> You can also activate/deactivate the compressor via the web interface.                 </div>
⑤ Display panel	Displays different parameters, details can be found on page 6.
⑥ Presets buttons	Calls up the presets <div style="background-color: #0070C0; color: white; padding: 5px; display: inline-block; margin-top: 10px;"> <span style="font-size: 1.2em; font-weight: bold;">i</span> The presets are adjusted via the web interface (see page 11). You can also call up the presets via the web interface.                 </div>

## Overview of the rear panel

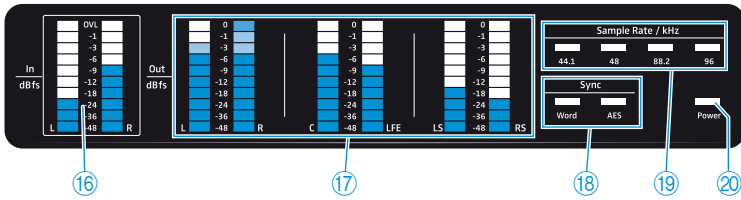


### Operating element

- ⑦ Display of the current operating voltage
- ⑧ ON/OFF switch
- ⑨ IEC mains socket
- ⑩ Ethernet network socket
- ⑪ Thru socket (BNC), word clock loop-through output (75 Ω)
- ⑫ Input socket (BNC), word clock input (75 Ω)
- ⑬ XLR-3M sockets for digital output signals, balanced, AES3
  - Out 1: Digital output for the channels Front Left (1/L) and Front Right (2/R)
  - Out 2: Digital output for the channels Center (3/C) and LFE ("Low Frequency Effects", 4/LFE)
  - Out 3: Digital output for the channels Surround Left (5/LS) and Surround Right (6/RS)
- ⑭ In socket (XLR-3F) for digital input signals Left (L) and Right (R), balanced, AES3
- ⑮ In1 Left socket (XLR-3F) for analog input signals Left and In2 Right socket (XLR-3F) for analog input signals Right, balanced

**i** For the pin assignment of the sockets of the SPB 8000 processing unit, refer to the chapter "Specifications" on page 16.

## Overview of the display panel



### Operating element

- ⑩ Display of the modulation of the **In** audio inputs Left (**L**) and Right (**R**)
- ⑪ Display of the signal strengths of the **Out** 5.1 audio outputs:  
Front Left (**L**) and Right (**R**)  
Center (**C**) and Low Frequency Effects (**LFE**)  
Surround Left (**LS**) and right (**RS**)
- ⑫ Synchronization display (**Sync**) via AES signal (**AES**) or word clock input (**Word**)
- ⑬ Display of the sample rate (**Sample Rate/kHz**): 44.1, 48, 88.2, 96
- ⑭ **Power** display



## Connecting the SPB 8000 to the mains power supply/ disconnecting it from the mains power supply



### CAUTION

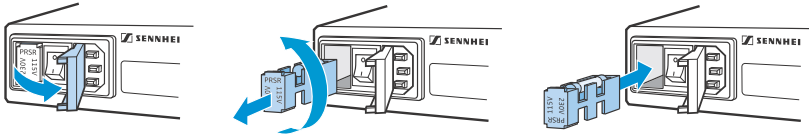
Damage to the SPB 8000 and danger of material damage due to an unsuitable power supply!

If the display of the current operating voltage ⑦ displays a wrong voltage or if you connect the SPB 8000 to an unsuitable power supply, this can cause damage to the device or material damage.

- ▶ Always make sure that the display of the current operating voltage ⑦ displays the correct voltage (115 V or 230 V AC (factory default setting)).
- ▶ If necessary, change the voltage as described below.
- ▶ Always ensure a reliable mains ground connection of the SPB 8000 – especially when you are using multi-outlet power strips or extension cables.

To adapt the SPB 8000 to the available mains voltage:

- ▶ Pull out the mains cable from the IEC mains socket ⑨.
- ▶ Set the ON/OFF switch ⑧ to position “0”.
- ▶ Make sure that the display of the current operating voltage ⑦ displays the correct voltage.
- ▶ If necessary, change the voltage as shown:



To connect the SPB 8000 to the mains power supply and switch it on:

- ▶ Plug the mains cable to the IEC mains socket ⑨.
- ▶ Plug the mains connector into the wall socket.
- ▶ Set the ON/OFF switch ⑧ to position “1”.  
The Power display ⑳ lights up red.

To completely switch off the SPB 8000 and disconnect it from the mains power supply:

- ▶ Set the ON/OFF switch ⑧ to position “0”.
- ▶ Pull out the mains connector from the wall socket.

## Feeding SPM 8000 audio signals to the SPB 8000

You can either directly feed the SPM 8000 audio signals to the SPB 8000 or you can record the SPM 8000 audio signals using a recording device and then feed the audio signals to the SPB 8000.

### Feeding analog audio signals to the SPB 8000

- ▶ Make sure that the analog input of the SPB 8000 is activated (the **AES 3 In** button ③ does not light up).

#### Directly feeding SPM 8000 audio signals to the SPB 8000

- ▶ Connect the SPM 8000 to the XLR-3 sockets ⑮ of the SPB 8000 (red = right, yellow = left). To do so, use the supplied Y adapter cable.
- ▶ Activate the phantom power of the SPB 8000 by pressing the **48 V** button ②. The button lights up red.

#### Feeding audio signals from a recording device to the SPB 8000

- ▶ Connect the analog output sockets of your recording device to the XLR-3 sockets ⑮ of the SPB 8000 (red = right, yellow = left).

### Feeding digital audio signals to the SPB 8000

- ▶ Use balanced AES3-XLR cables with a 110  $\Omega$  impedance and a high shielding effectiveness (e.g. Sennheiser GZL AES-10) for all digital connections.

#### Feeding audio signals from the SPM 8000/a recording device to the SPB 8000 using a AES3-compliant A/D converter

- ▶ Make sure that the A/D converter delivers AES3-compliant output signals.
- ▶ Connect the SPM 8000/the recording device to the A/D converter.
- ▶ Connect the A/D converter to the XLR-3 socket ⑭ of the SPB 8000.
- ▶ Activate the AES3 input of the SPB 8000 by pressing the **AES 3 In** button ③. The button lights up red.

#### Directly feeding audio signals from an AES3-compliant recording device to the SPB 8000

- ▶ Make sure that your recording device delivers AES3-compliant output signals.
- ▶ Connect the recording device to the XLR-3 socket ⑭ of the SPB 8000.
- ▶ Activate the AES3 input of the SPB 8000 by pressing the **AES 3 In** button ③. The button lights up red.

### Connecting external word clock signals

If you are using the SPB 8000 with other AES3-compliant devices, you should synchronize the SPB 8000 with the word clock signals of the AES3-compliant devices. The SPB 8000 supports word clock sampling rates of 44.1 kHz, 48 kHz, 88.2 kHz and 96 kHz.

- ▶ Use a shielded 75  $\Omega$  coaxial BNC cable to connect the word clock output of an external word clock generator to the **Input** socket ⑫ (BNC) of the SPB 8000.

### Feeding digital audio signals from the SPB 8000 to other AES3-compliant devices

- ▶ Connect the SPB 8000 to a AES3-compliant device.  
To do so, use the XLR-3M sockets for digital output signals ⑬.

## Connecting the SPB 8000 to a computer

You can adjust the presets of the SPB 8000 using a configuration software. To allow for this, the SPB 8000 has to be connected to a computer.

- ▶ Use the supplied network cable to connect the network socket ⑩ of the SPB 8000 to the network socket of a computer.

## Calling up the configuration software and working with presets

The configuration software can be found at [www.sennheiser.com/spb-8000](http://www.sennheiser.com/spb-8000).

The SPB 8000 processing unit is delivered with the IP address set to 192.168.1.75.

- ▶ Make sure that your computer uses the same IP subnet as the SPB 8000 (e.g. IP address: 192.168.1.74, subnet mask: 255.255.255.0).
- ▶ Start the configuration software.  
After installation, the user interface of the configuration software appears:



## Adjusting presets

- ▶ Select a preset (1–4).
- ▶ Adjust the preset according to your needs. An explanation of the settings can be found on the following pages.
- ▶ Click on “Adapt”.  
The preset is stored in the SPB 8000.



The configuration software remote controls the SPB 8000 in real time. All settings made here directly affect the SPB 8000. If you select a preset in the configuration software, this is called up in the SPB 8000.

## Resetting preset settings

As long as you do not click on “Adapt”, you can reset the preset settings to the last stored value at any time:

- ▶ Click on “Cancel”.

To reset all presets to the factory default settings:

- ▶ Click on “Reset” and follow the instructions in the web interface.

## Calling up presets

You can call up the presets via the web interface or directly on the SPB 8000. In order to call up the presets on the SPB 8000, no connection to a computer is required.

- ▶ Press one of the [Presets](#) buttons 1–4 .

## Overview of the web interface



### “Surround Pattern” menu

Setting	Explanation
Pattern	Adjusts the surround parameters
Export	Exports individual presets or all presets
Import	Imports individual presets or all presets
System Delay	Sets the delay times for NTSC and PAL in frames or ms (audio/video sync)

### “System” menu

Setting	Explanation
Connectivity Settings	Allocates the IP address (DHCP or manual allocation)
Firmware	Installs firmware updates (the firmware can be downloaded from <a href="http://www.sennheiser.com">www.sennheiser.com</a> )
Password	Sets the password protection for the web interface, changes the password
Reset	Resets the SPB 8000 to the factory default settings

“Pattern” window

Setting	Explanation
Preset 1–4	Changes between the presets
Front Focus & Surround Focus	Sets the auditory impression... <ul style="list-style-type: none"> <li>for the front output channels L, C and R (Front Focus, see cover, diagram A)</li> <li>for the rear output channels LS and RS (Surround Focus, see cover, diagram B)</li> </ul>
Rotation	Simulates a rotation of the SPM 8000 stereo microphone
Surround Delay [ms]	Sets the delay of the rear output channels
Surround Low Pass [kHz]	Sets the upper frequency limit of the surround channels
Output Gains	Sets the level of the output channels
Compressor/Limiter	See cover, diagram C
Threshold	Sets the threshold of the compressor/limiter
Make up gain	Compensates for level losses caused by the compressor
Limiter	Activates the limiter
Ratio	Adjusts the compression ratio
LFE Low Pass Filter	Adjusts the LFE Low Pass Filter
Windshield High Boost	Compensates for the treble attenuation caused by the “hairy” cover of the SPM 8000

## Cleaning and maintaining the SPB 8000

**CAUTION**

Liquids can damage the electronics of the product!

Liquids entering the housing of the products can cause a short-circuit and damage the electronics.

- ▶ Keep all liquids away from the product.
- ▶ Do not use any solvents or cleansing agents.

- ▶ Disconnect the product from the mains power supply before cleaning.
- ▶ Only use a soft, dry cloth to clean the product.

## Restarting the SPB 8000

- ▶ Simultaneously press the **Comp** + **Preset 1** + **Preset 4** buttons on the SPB 8000.

# Specifications

## Microphone input

Connections	2 XLR-3F sockets, transformerless balanced
Impedance	approx. 4 k $\Omega$ , balanced
Phantom power	48 V, switchable

## Digital input

AES3 standard	channels L/R
Connection	1 XLR-3F socket

## Digital output

AES3 standard	channels L/R, C/LFE, SL, SR
Connections	3 XLR-3M sockets
Sampling rates	44.1 / 48 / 88.2 / 96 kHz
Bit rate	24 bits
Format	professional

## Synchronization

Word clock	via <a href="#">Input</a> socket <a href="#">12</a> (BNC)
AES3 input clock	via <a href="#">In</a> socket <a href="#">14</a> (XLR-3F)

## Audio characteristics

Frequency response measured at AES3 <a href="#">Out 1/2</a>	10 Hz-21 kHz	at 44.1 kHz sampling rate
	10 Hz-22.5 kHz	at 48 kHz sampling rate
	10 Hz-42 kHz	at 88.2 kHz sampling rate
	10 Hz-45 kHz	at 96 kHz sampling rate

Signal-to-noise ratio at 48 kHz sampling rate	CCIR 468:	-82.6 dB, 64 dB gain
	CCIR 468:	-106,1 dB, 30 dB gain
	A-weighted:	-85.5 dB, 64 dB gain
	A-weighted:	-109.3 dB, 30 dB gain
	unweighted:	-84 dB, 64 dB gain
	unweighted:	-104,3 dB, 30 dB gain

THD + Noise	THD at 1 kHz:
	0.03% at 64 dBu, gain: -12 dBFS
	0.004% at 30 dBu, gain: -12 dBFS

Dynamic range	130.3 dB 30 dB gain (A-weighted)
Max. gain	+64 dB
Crosstalk	-70 dB at 10 kHz (-30 dBu input, 30 dB gain)



## Specifications

### Ethernet

Connection	RJ 45 socket
Communication	HTTP (POST request method), JSON-compliant
Firmware update	via HTTP
Ports	80, 9050 with multicast

### Power supply

Voltage ranges	115 V~ / 230 V~, 50/60 Hz
Power consumption	max. 15 W
Fuse values	115 V AC: T 160 mA L 250 V 230 V AC: T 315 mA L 250 V
Mains connector	3-pin, protection class I as per IEC/EN 60320-1

### Other product characteristics

Dimensions	approx. 44 x 482 x 275 mm (H x W x D), depth with controls and sockets approx. 44 x 482 x 260 mm (H x W x D), depth with sockets approx. 44 x 482 x 240 mm (H x W x D), depth of housing
Weight	approx. 3.9 kg




### Operating conditions

Ambient temperature	0 °C to +45 °C
Relative humidity	max. 85 % at 40 °C (non-condensing)


### Storage and transport conditions

Ambient temperature	-10 °C to +70 °C
Relative humidity	max. 95 % at 40 °C

### In compliance with

Europe	 EMC: EN 55103-1/-2 Safety: EN 60065
USA	FCC 47 CFR 15 subpart B
Canada	Industry Canada ICES_003
China	
Australia/ New Zealand	

### Pin assignment of the sockets of the SPB 8000

XLR-3 socket	Pin assignment
	Pin 1: ground Pin 2: audio + Pin 3: audio –

## Manufacturer Declarations

### Warranty

Sennheiser electronic GmbH & Co. KG gives a warranty of 24 months on this product.

For the current warranty conditions, please visit our web site at [www.sennheiser.com](http://www.sennheiser.com) or contact your Sennheiser partner.

### CE Declaration of Conformity

- RoHS Directive (2011/65/EU)
- EMC Directive (2014/30/EU)
- Low Voltage Directive (2014/35/EU)

The declaration is available at [www.sennheiser.com](http://www.sennheiser.com).

Before putting the product into operation, please observe the respective country-specific regulations.

### Statements regarding FCC and Industry Canada

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This class B digital apparatus complies with the Canadian ICES-003. Changes or modifications made to this equipment not expressly approved by Sennheiser electronic Corp. may void the FCC authorization to operate this equipment.

## Software licenses

### Light Weight IP-Stack, lwIP v1.3.1

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### JSon Simple Toolkit 1.1

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