

S1 DIGITAL



Instruction manual

 **SENNHEISER**

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Important safety information

- ▶ Please read this instruction manual carefully and completely before using the product.
- ▶ Always include this instruction manual when passing the product on to third parties.
- ▶ This instruction manual is also available on the Internet at www.sennheiser-aviation.com or www.sennheiser.com.

Preventing health problems and accidents

- ▶ Always maintain a distance of at least 3.94" (10 cm) between the ear cups and the cardiac pacemaker or implanted defibrillator since the product generates permanent magnetic fields.
- ▶ Keep product, accessory and packaging parts out of reach of children who could swallow smaller pieces.
- ▶ Switch the product off after use to conserve battery power. Remove the rechargeable batteries if the product will not be used for extended periods of time.
- ▶ If during flight operation you, as the pilot, operate your connected **Bluetooth®** device using the headset, this can limit your attention. During flight operation, do not use the headset for making phone calls or listening to music.
- ▶ With the NoiseGard™/digital noise compensation switched on, typical aircraft sounds (for example, those from engines, propellers, warning alarms, etc.) may sound different to you. Before operating any aircraft, make sure that, with NoiseGard™/digital switched on, you can hear and recognize these sounds. Set the volume to safe levels that do not interfere with your ability to hear informational sounds and warning alarms.
- ▶ The product is capable of producing sound pressure exceeding 85 dB(A). In many countries 85 dB(A) is the maximum legally permissible level for continuous noise exposure during the working day. Do not listen at high volume levels for long periods of time to prevent hearing damage.

Preventing damage to the product and dysfunctions

- ▶ Always keep the product dry and do not expose it to extreme temperatures (hairdryer, heater, extended exposure to sunlight, etc.) to avoid corrosion or deformation.
- ▶ Only use the product in environments where wireless **Bluetooth** transmission is permitted.
- ▶ Only clean the product with a soft, dry cloth.
- ▶ Never repair or attempt to repair a defective product yourself. Contact your Sennheiser partner or the Sennheiser Service Department.

- ▶ Only replace parts of the product whose replacement is described in this instruction manual. All other parts of the product must be replaced by your Sennheiser partner.

Information on active and passive noise attenuation

The S1 DIGITAL is a headset with digital adaptive noise compensation. As with any complex electronic device, it is possible for the electronics of the headset to fail during operation.

However, the S1 DIGITAL is designed to reduce the effects of such failures and to allow for continued use of NoiseGard™/digital. NoiseGard™/digital is active when the headset is switched on and the Power LED 18 lights up.

- ▶ Switch the headset off if you experience loud tones, distortion, or loss of communications. You can then continue to use the S1 DIGITAL as a passive noise attenuation headset.

Intended use

Intended use of the product includes

- having read and understood this instruction manual, especially the chapter “Important safety information”,
- 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.

The S1 DIGITAL headset

The S1 DIGITAL aviation headset incorporates the latest in digital technology. Featuring NoiseGard™/digital noise compensation and excellent passive noise attenuation, the headset is currently the only one on the market that provides optimum protection against cockpit noise over the entire frequency range. The S1 DIGITAL has been designed for use in noisy single- and multi-engine propeller aircraft and helicopters.

The headset is characterized by its high-quality appearance and offers outstanding wearing comfort. With ear pads specially designed for spectacle wearers, a contact pressure that is individually adjustable and a two-piece headband, the headset is always comfortable to wear even on long flights. In addition, the headset has been designed with an emphasis on well-balanced weight distribution.

Bluetooth

The S1 DIGITAL complies with the new **Bluetooth** 2.1 standard. Via its **Bluetooth** interface, it can be connected to a wide variety of **Bluetooth** enabled devices. Bluetooth wireless technology allows the S1 DIGITAL to communicate with your **Bluetooth** enabled device (e.g. mobile phone, MP3 player, PC or PDA) within a range of up to 10 meters.

Features

- Pilot's headset with NoiseGard™/digital, offering digital adaptive noise compensation
- Superb passive noise attenuation
- Extremely comfortable to wear due to adjustable contact pressure and ear pads specially designed for spectacle wearers
- Well-balanced low weight
- Foldable ear cups
- Excellent audio quality
- Crystal clear speech intelligibility due to 3-step treble boost/equalizer function
- Peak level protection safeguards your ears from volume peaks above 110 dB
- Control unit with **Bluetooth** technology for controlling audio devices and mobiles phones
- "Auto shut-off" extends battery life
- Power supply for NoiseGard™/digital via on-board DC power supply system (optional)
- Fail safe operation – the headset can be used as a conventional, passive headset in case of power failure
- Made in Germany
- Microphone BIAS – independent power supply for your headset allows for communication outside the aircraft

Delivery includes



S1 DIGITAL headset



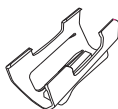
Transport case for headset and accessories



Cable clip



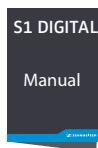
Wind and pop screen



Belt clip



Quick Guide



Instruction manual



A list of accessories can be found on the S1 DIGITAL product page at www.sennheiser-aviation.com or www.sennheiser.com.

For information on suppliers, contact your local Sennheiser partner:

- www.sennheiser-aviation.com > "Purchase Information"
- www.sennheiser.com > "Service & Support"

Product overview

Overview of the headset

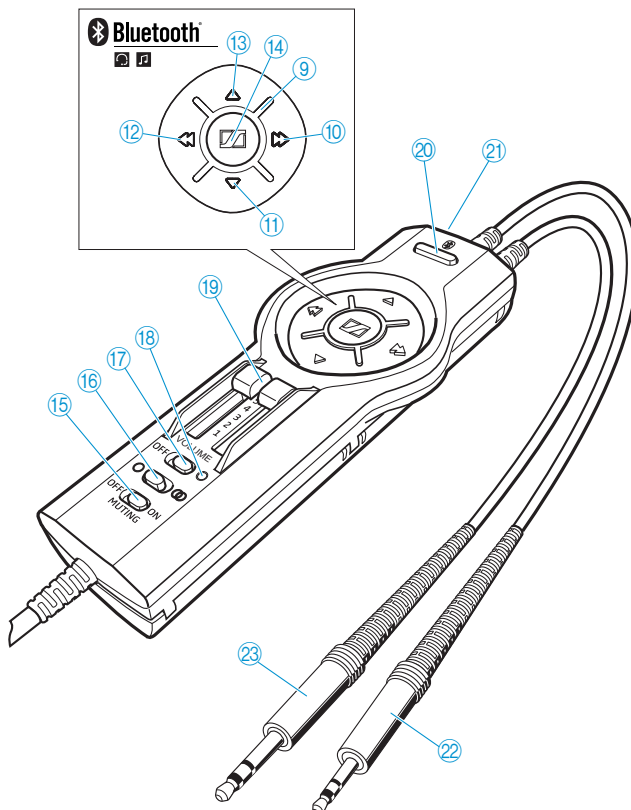


- | | |
|---|---|
| ① Headband padding | ⑤ Microphone |
| ② (Outer) NoiseGard™/digital microphone | ⑥ (Inner) NoiseGard™/digital microphone |
| ③ Smart Update button | ⑦ Ear pads |
| ④ Smart Update LED | ⑧ Contact pressure slide switch |



Before wearing the headset, remove the protective foil **A** from the Sennheiser logo.

Overview of the control unit



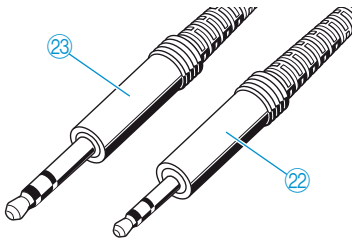
- ⑨ LED
- ⑩ Fast-forward button
- ⑪ Volume button
- ⑫ Rewind button
- ⑬ Volume button
- ⑭ Multi-function button
- ⑮ **MUTING OFF/ON** switch
- ⑯ Mono /stereo switch
- ⑰ Power **OFF/ON** switch
- ⑱ Power LED
- ⑲ Master **VOLUME** slide control
- ⑳ Phone button
- ㉑ Hollow jack socket for optional power supply
- ㉒ 5.25 mm jack plug (PJ-068 equivalent)
- ㉓ 1/4" (6.35 mm) jack plug (PJ-055 equivalent)



You can directly remote-control any **Bluetooth** device supporting the AVRCP profile and connected to the S1 DIGITAL by using the operating elements ⑨ to ⑭.

Putting the S1 DIGITAL into operation

Connecting the headset to the intercom



► Connect the jack plugs of the control unit to the corresponding jack sockets of your intercom.

Jack plug of the control unit	Jack socket of the intercoms
5.25 mm jack plug 22	Microphone input
1/4" (6.35 mm) jack plug 23	Headphone output

Powering the headset

CAUTION

Danger of short circuit!

Technical defects can cause a short circuit.

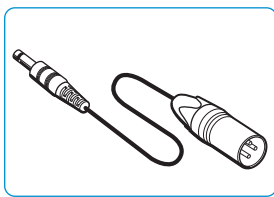
► Before putting the headset into operation, ensure that the socket of the on-board DC power supply system is protected by a 1 A fuse.

There are different options for powering the headset:

- Connection to the on-board DC power supply system (12 – 35 V_{DC}) via a mounted 3-pole XLR socket or the cigarette lighter socket
- Power supply via two batteries/rechargeable batteries inserted in the control unit (to be ordered separately)

Connection via a 3-pole XLR socket

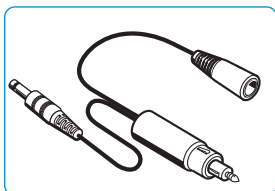
The [Adapter-P-XLR-3](#) adapter cable (optional accessory available from your Sennheiser partner) allows you to connect the headset to the on-board DC power supply system (12 – 35 V_{DC}) via a mounted 3-pole XLR socket.



- Have a 3-pole XLR socket (optional accessory) mounted by a technician qualified to perform this type of installation.
- Connect the [Adapter-P-XLR-3](#) adapter cable to the mounted 3-pole XLR socket.
- Connect the hollow jack plug of the adapter cable to the hollow jack socket on the control unit.

Connection via the cigarette lighter socket

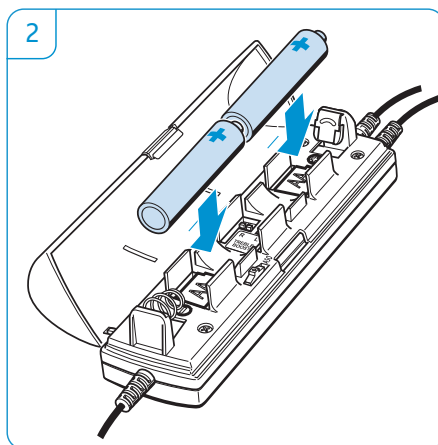
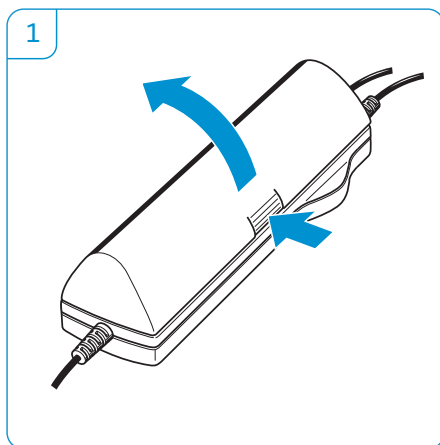
The **Adapter-P-CIG** adapter cable (optional accessory available from your Sennheiser partner) allows you to connect the headset to the on-board DC power supply system (12 – 35 V_{DC}) via the cigarette lighter socket.



- ▶ Connect the cigarette lighter plug to the on-board DC power supply system.
- ▶ Connect the hollow jack plug of the adapter cable to the hollow jack socket on the control unit.
- ▶ Where required, connect an additional device to the XLR-3 socket of the adapter cable (max. 1 A).

Power supply via two batteries/rechargeable batteries

- 1 Open the cover of the battery compartment on the control unit.
- 2 Insert two AA size batteries/rechargeable batteries. Observe correct polarity.
- 3 Close the cover of the battery compartment.



When you switch the headset on (see page 19), the Power LED **18** provides information on the remaining battery/rechargeable battery capacity.

LED lights up **yellow**: The battery/rechargeable battery capacity is sufficient.

LED lights up **red**: The batteries/rechargeable batteries are flat.

Type of use	Type	Operating time
NoiseGard™/digital	Alkaline batteries/rechargeable batteries	approx. 25 hrs
	Lithium batteries	approx. 40 hrs
NoiseGard™/digital and Bluetooth technology	Alkaline batteries/rechargeable batteries	approx. 15 hrs
	Lithium batteries	approx. 25 hrs

If the battery capacity is low, the headset automatically switches off to protect the batteries/rechargeable batteries from total discharge and leakage.

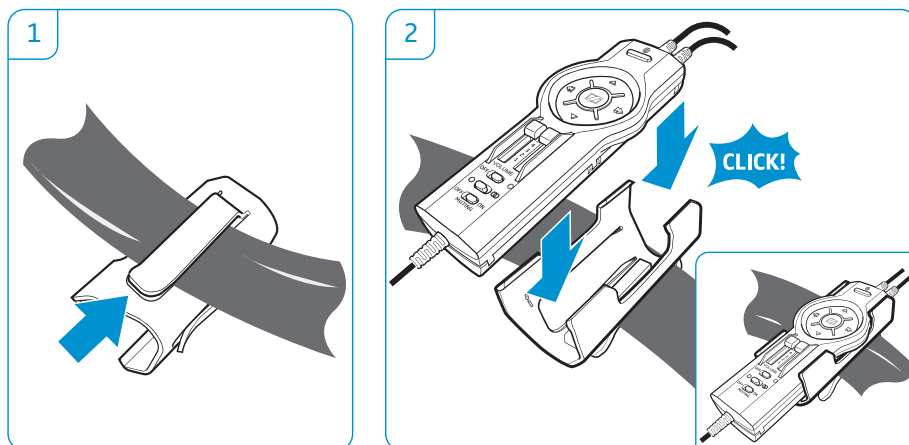
- Replace the batteries or recharge the rechargeable batteries.

Attaching the belt clip, the cable clip and the design caps

Attaching the belt clip

The belt clip allows you to attach the control unit to the seat belt so that the control unit doesn't hinder you.

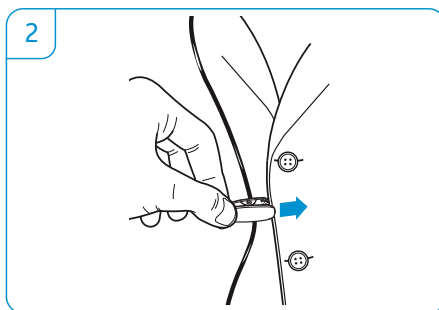
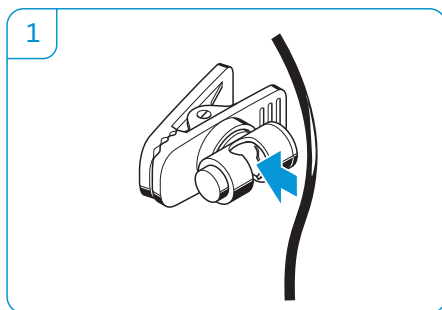
- 1 Slide the belt clip onto the seat belt.
- 2 Snap the control unit into the belt clip. Make sure not to squeeze any connection cable.



Attaching the cable clip

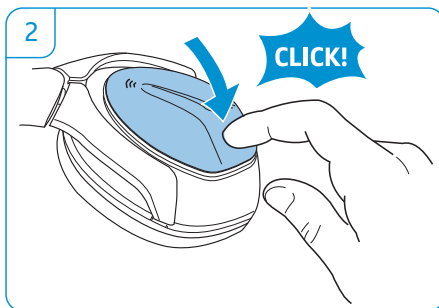
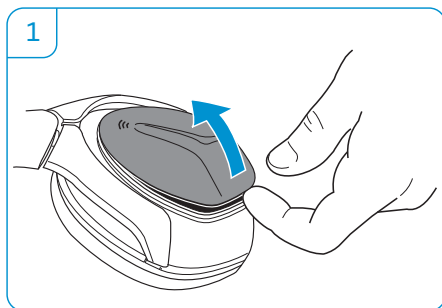
The cable clip allows you to attach the headphone cable to your clothing so that the cable doesn't hinder or distract you.

- 1 Guide the headphone cable through the cable clip.
- 2 Attach the cable clip to your clothing.
- 3 Loop the cable through the clip so that the headphone cable doesn't hinder you.



Attaching the design caps

Design caps in different finishes and with individual imprints are available from your Sennheiser partner.



Connecting the headset to a Bluetooth device

CAUTION

Danger of malfunction due to radio waves!

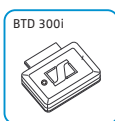
The transmitted radio waves of mobile phones can impair the operation of sensitive and unprotected devices.

- Only make calls with the headset in environments where wireless **Bluetooth** transmission is permitted.

The headset complies with the **Bluetooth** 2.1 standard. In order that data can be transmitted wirelessly using **Bluetooth** technology, you have to pair your headset with a **Bluetooth** device.

The headset can save the connection profiles of up to eight **Bluetooth** devices with which it has been paired. After switch-on, the headset automatically tries to connect to the last connected **Bluetooth** device.

If you pair the headset with a ninth **Bluetooth** device, the saved connection profile of the first **Bluetooth** device will be overwritten. If you want to re-establish a connection with the first **Bluetooth** device, you have to pair the headset with this **Bluetooth** device again.





- If your audio source does not have a **Bluetooth** interface, use an optional dongle (see page 30).

Pairing the headset with a Bluetooth device

The following chapter describes, by way of example of a mobile phone, how to pair the headset with a **Bluetooth** device.


- ▶ Make sure that
 - the headset is connected to the on-board DC power supply system or that the control unit is equipped with fully charged batteries/rechargeable batteries,
 - the mobile phone's **Bluetooth** visibility is enabled (see the instruction manual of the corresponding **Bluetooth** device),
 - the headset is placed close to the mobile phone (approx. 50 cm or 19.7").
- ▶ Switch the headset on by setting the Power **OFF/ON** switch ⑰ to the position **ON**.




- ▶ Press and hold the multi-function button  until the  LED alternately flashes blue and red.

- ▶ On your audio source, activate the **Bluetooth** function "Add a new device".
- ▶ When the mobile phone prompts for a password or PIN code, enter the default PIN code "0000".
- ▶ Proceed as described in the instruction manual of the mobile phone.



Once the headset has found the mobile phone, the devices exchange device identification information. The  LED flashes 3 times blue. You hear an ascending beep. The devices have identified each other and the headset is paired with the mobile phone.



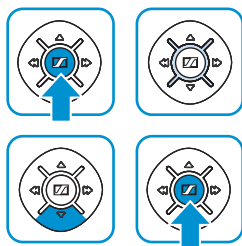
If no device is found within approx. 5 minutes, the  LED flashes 3 times red and you hear a descending beep. The headset will then try for 3 minutes to connect to one of the up to 8 previously paired **Bluetooth** devices. If this fails, the **Bluetooth** function automatically switches off after 10 minutes.






- ▶ In this case, repeat the necessary steps to pair the headset with the mobile phone again.

Switching the “Bluetooth connection” flashing on/off

To switch the flashing **off** during an existing **Bluetooth** connection:

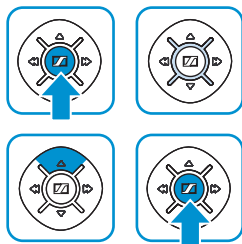
- ▶ Switch the **Bluetooth** function off (see page 17).








- ▶ Press and hold the multi-function button  until the  LED alternately flashes blue and red.
- ▶ Briefly press the Volume  button.
- ▶ To make the new setting effective, press and hold the multi-function button  until the  LED **stops** flashing.

To switch the flashing **on** during an existing **Bluetooth** connection:

- ▶ Switch the **Bluetooth** function off (see page 17).



- ▶ Press and hold the multi-function button  until the  LED alternately flashes blue and red.
- ▶ Briefly press the Volume  button.
- ▶ To make the new setting effective, press and hold the multi-function button  until the  LED **stops** flashing.

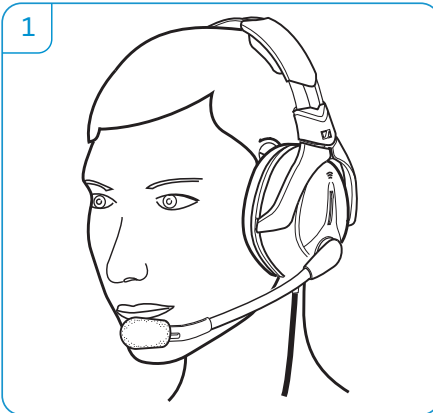
Using the S1 DIGITAL

Individually adjusting the headset and wearing it

Adjusting the headband

For good noise attenuation and best possible comfort, the headset has to be adjusted to properly fit your head. To do so, you can adjust the headband.

- 1 Wear the headset so that the headband runs over the top of your head.
- 2 Adjust the length of the headband so that
 - your ears are completely inside the ear pads,
 - you feel even, gentle pressure around your ears,
 - a snug fit of the headband on the head is ensured.

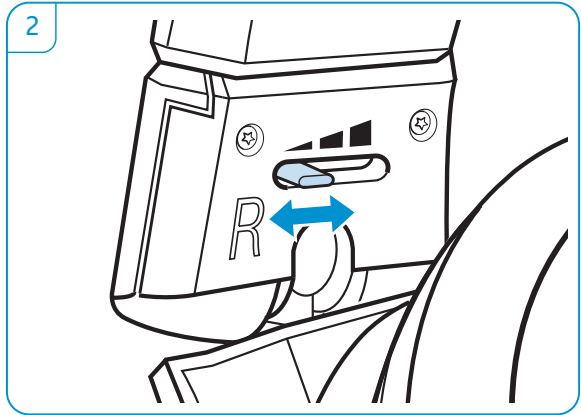
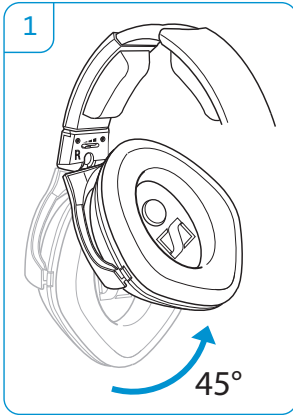


Adjusting the contact pressure

The S1 DIGITAL allows you to choose your preferred contact pressure setting, which offers a good balance between best possible noise attenuation and still comfortable contact pressure.

In order to achieve greater noise attenuation, a higher contact pressure is required.

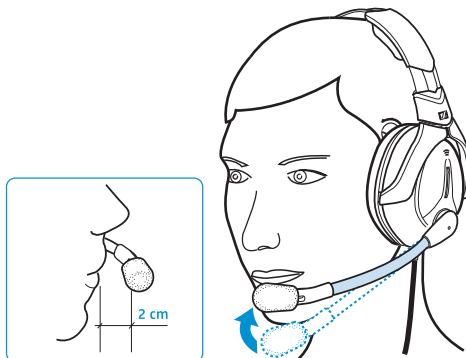
- 1 Tilt the ear cups by approx. 45° to release the mechanics of the slide switches.
- 2 Use the 3-step slide switches to change the contact pressure for each ear cup.



Positioning the microphone towards the corner of the mouth

The microphone boom is flexible, so you can position it individually.

- Bend the microphone boom so that the microphone is placed at the corner of the mouth. Maintain a distance of approx. 2 cm between microphone and mouth.
- Always use the supplied wind and pop screen.

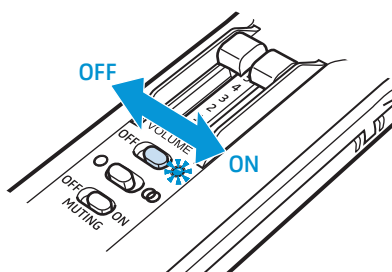


Switching the headset on/off

- Set the Power **OFF/ON** switch to the position **ON**.

ON NoiseGard™/digital is switched on. The Power LED lights up, indicating the battery charge status or power supply via the on-board DC power supply system.

OFF NoiseGard™/digital is switched off. The Power LED goes off.

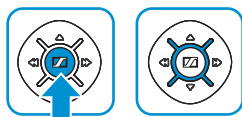




i When the S1 DIGITAL, and thus NoiseGard™/digital, is switched off, it can be used as a conventional, passive headset.

Switching the Bluetooth function on/off

- Switch the headset on to use the **Bluetooth** function.


Switching the Bluetooth function on



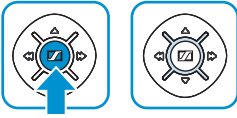
- Press and hold the multi-function button  until the  LED flashes blue. You hear an ascending beep.



When switching the **Bluetooth** function on for the first time, the headset will automatically go into pairing mode.

When the headset is already paired with a **Bluetooth** device, the **Bluetooth** connection is automatically established. You hear a beep in the headset.

When the headset is already paired with a **Bluetooth** device but the **Bluetooth** device is switched off or out of range, the  LED flashes blue. The headset will try for 3 minutes to connect to one of the up to 8 previously paired **Bluetooth** devices. If this fails, the **Bluetooth** function automatically switches off after 10 minutes.

Switching the Bluetooth function off



- ▶ Press and hold the multi-function button  until the  LED flashes 3 times red.
You hear a descending beep.
The **Bluetooth** function is deactivated.



If you switch the **Bluetooth** function off, NoiseGard™/digital remains switched on.

Adjusting the headset to the listening situation

Adjusting the volume



WARNING

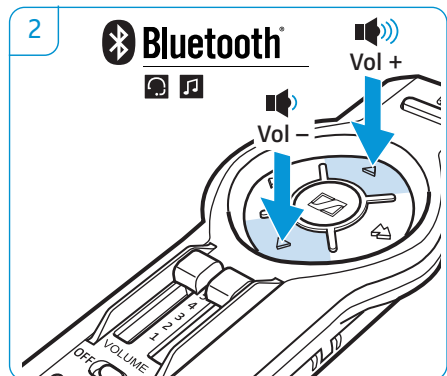
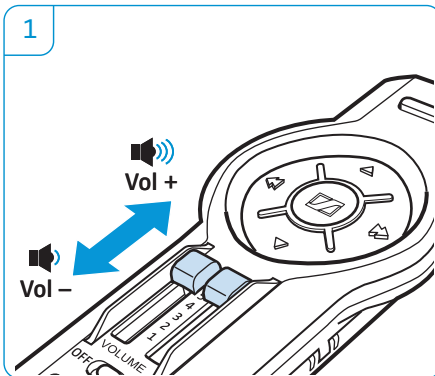
Danger of hearing damage!

Listening at high volume levels for long periods can lead to permanent hearing defects.




- ▶ Before putting the headset on, set the volume to a low level.
- ▶ Do not continuously expose yourself to high volumes.

The control unit features a Master **VOLUME** slide control which allows you to adjust the volume for the left and right channel separately. Using the Master **VOLUME** slide control you simultaneously adjust the volume for both ATC communications and your connected **Bluetooth** device.


- 1 Use the Master **VOLUME** slide control to adjust the volume to a comfortable level.
- 2 Use the Volume ▼ button and the Volume ▲ button to adjust the volume of your connected **Bluetooth** device to the volume for ATC communications.




Switching between mono and stereo mode

The control unit features a mono /stereo  switch  which allows you to switch between mono and stereo mode, depending on the intercom.

► Set the mono /stereo  switch  to the desired position:

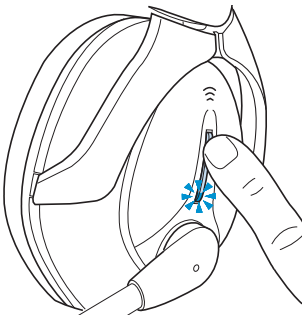
 = mono

 = stereo

Using Smart Update

The noise level in the cockpit changes depending on the flight situation. Whenever you perceive a change in the noise level (e.g. during take off and when the cruise altitude is reached), you should perform the Smart Update in order to ensure optimum noise compensation at any given time.

The outer and inner microphones measure the sound and NoiseGard™/digital is adjusted accordingly via the electronics. Smart Update only works when the headset is switched on.



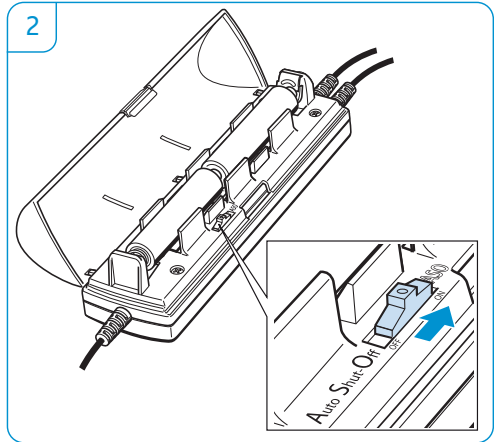
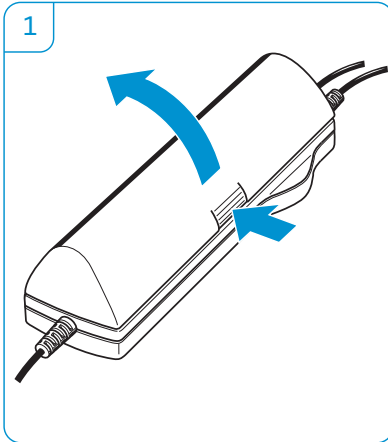
► Press the Smart Update button.

The Smart Update button lights up for approx. 4 seconds and you hear an acknowledgement tone, indicating that NoiseGard™/digital is adjusted to the noise level.

Activating the “auto shut-off” function

The “auto shut-off” function automatically switches the headset off when it is disconnected from the intercom or when the aircraft avionics are switched off. With the “auto shut-off” function activated, the operating time is increased. The headset is delivered ex-works with the function deactivated.

- 1 Open the cover of the battery compartment on the control unit.
- 2 Set the **Auto Shut-Off** switch to the position **ON**.
- 3 Close the cover of the battery compartment.



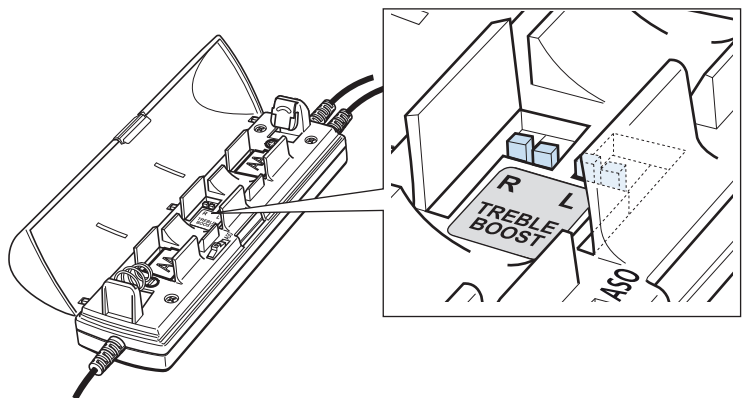
Microphone BIAS – microphone supply for mobile phones

When used in the cockpit, the headset is powered via the intercom. If you want to use the headset for making phone calls outside the cockpit, you have to deactivate the “auto shut-off” function.

- Set the **Auto-Shut-Off** switch to the position **OFF**.

Switching the 3-step treble boost on/off

The switches for the 3-step treble boost allow you to individually adjust the speech intelligibility for the left and right channel separately. For this, you can boost the frequency response in the approx. 1 kHz to 6 kHz region in three steps.



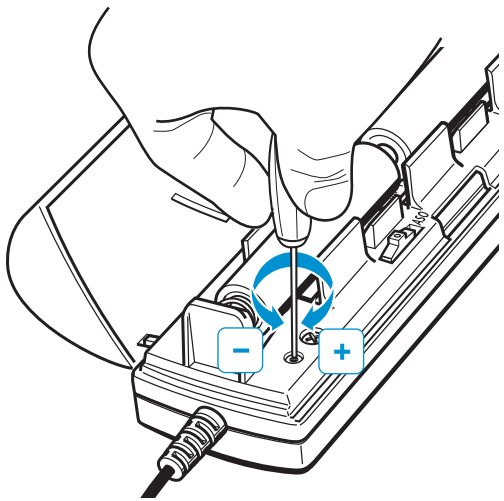
The following switch positions apply to the left and right channel:

<div>ON</div> <div><div>1</div><div>2</div></div>	<div>ON</div> <div><div>1</div><div>2</div></div>	<div>ON</div> <div><div>1</div><div>2</div></div>	<div>ON</div> <div><div>1</div><div>2</div></div>
No treble boost	Treble boost – step 1	Treble boost – step 2	Treble boost – step 3

Adjusting the microphone sensitivity

The microphone sensitivity has been factory preset to 35 mV/Pa.

- Use a slotted screwdriver to adjust the microphone sensitivity.



Remote-controlling connected Bluetooth devices

You can directly remote-control any **Bluetooth** device supporting the AVRCP profile and connected to the S1 DIGITAL by using the buttons on the headset. Please refer to the instruction manual of your audio source for information on whether your **Bluetooth** device supports the AVRCP profile.

Adjusting the volume for connected devices



WARNING

Danger of hearing damage!

Listening at high volume levels for long periods can lead to permanent hearing defects.

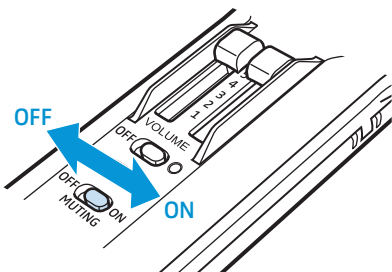
- ▶ Before putting the headset on, set the volume to a low level.
- ▶ Do not continuously expose yourself to high volumes.

- ▶ Use the Volume ▼ button and the Volume ▲ button to adjust the volume of your connected **Bluetooth** device. When the minimum or maximum volume is reached, you hear an acknowledgement tone.

Button	Duration	Function
		Incrementally increases the volume
		Incrementally reduces the volume
		Continuously increases the volume
		Continuously reduces the volume

Muting connected Bluetooth devices



















If the **MUTING OFF/ON** switch is set to the position **ON**, any **Bluetooth** transmission is muted once ATC communications have been established. When the ATC conversation is over, the muting is automatically canceled.



- ▶ Set the **MUTING OFF/ON** switch to the desired position to mute your connected **Bluetooth** device or to cancel the muting:
OFF = muting is canceled
ON = muting is activated

Remote-controlling an audio source


If your headset has a **Bluetooth** connection to an audio source (e.g. iPod, MP3 or CD player), you can use the S1 DIGITAL to remote-control the audio source as follows:

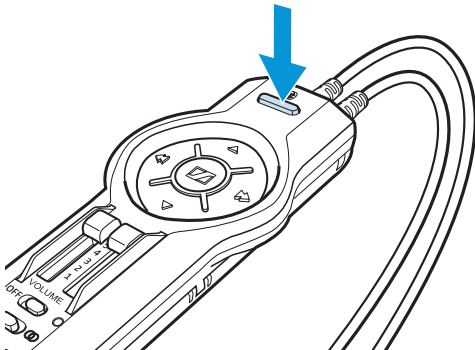
Button	Duration	Function
		 Plays the track
		 Stops the track (acknowledgement tone)
		 Skips to the next track
		 Skips to the previous track
		 Fast-forwards the track *
		 Rewinds the track *

* These functions are not supported by all connected **Bluetooth** devices.





Remote-controlling a mobile phone







If your S1 DIGITAL has a **Bluetooth** connection to your mobile phone, the  LED flashes blue when the mobile phone is ringing. You can also hear the ring tone of your mobile phone in the headset if your mobile phone supports this function.








When the mobile phones rings:

Button	Duration	Function
		Accepts/ends the call
		Rejects the call (acknowledgement tone)

When the mobile phone is switched on, does not ring and you do not make a phone call:

Button	Duration	Function
		Redials the last number (acknowledgement tone)
		Activates voice dial





During a call:

Button	Duration	Function
		Transfers the ongoing call back to the mobile phone
		Activates the muting function (acknowledgement tone)
Any button		Deactivates the muting function

Resetting the settings of the headsets

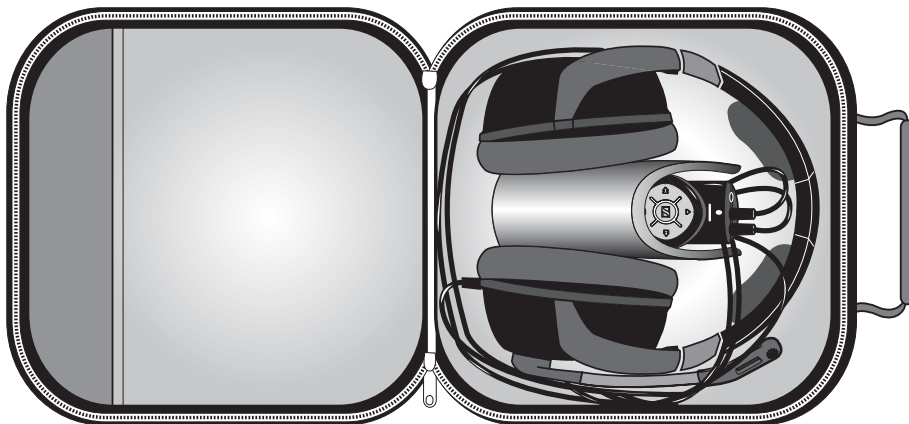
You can reset all settings of your headset to the factory default settings. In doing so, the connection profiles of the **Bluetooth** devices used are deleted, thus preventing that other users of the headset can access your **Bluetooth** enabled devices.



- ▶ Press and hold the multi-function button  until the  LED flashes 3 times red. The **Bluetooth** function is switched off.
- ▶ Press and hold the multi-function button  until the  LED alternately flashes blue and red.
- ▶ Press the Phone button for at least 5 seconds until the settings of the headset are reset.

Transporting the S1 DIGITAL

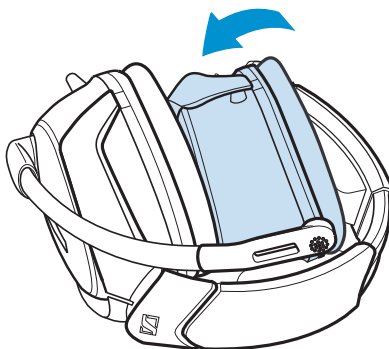
The headset comes with a transport case. To ensure optimum protection of the headset when not in use or during transport, you should store the headset in the supplied transport case.



Folding up the headset

For space-saving stowage, e.g. in your pilot's case, you can fold the headset compactly.

- Fold the right ear cup inwards.



Cleaning/maintaining the S1 DIGITAL

CAUTION

Liquids can damage the electronics of the product!

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

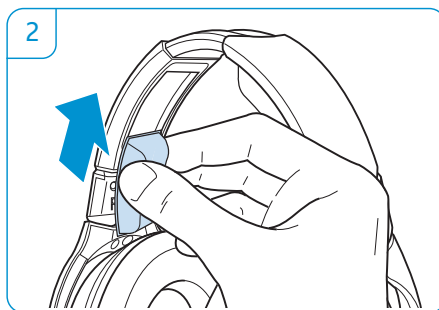
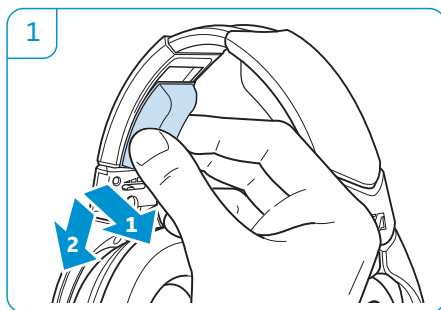
- ▶ Keep all liquids far away from the product.
 - ▶ Do not use any solvents or cleansing agents.
-
- ▶ Before cleaning, pull out the plugs of the product from the connections in the aircraft.
 - ▶ Only use a soft, dry cloth to clean the product.

Replacing the headband padding, ear pads and wind screen

For reasons of hygiene, you should replace the headband padding, the ear pads and the wind screen from time to time. Spare parts are available from your Sennheiser partner.

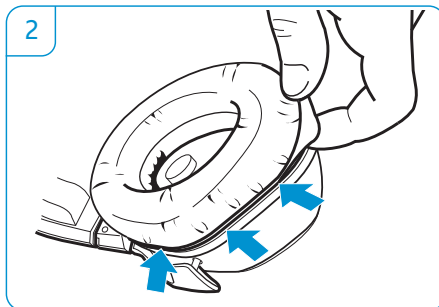
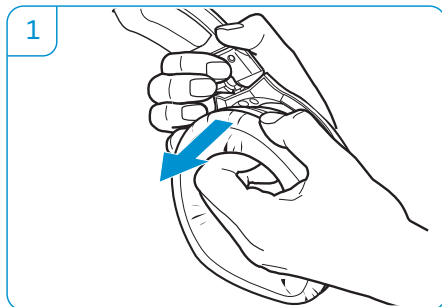
Replacing the headband padding

- 1 Slightly lift the headband padding and carefully remove it from the holder.
- 2 Slide the new headband padding into the holder.



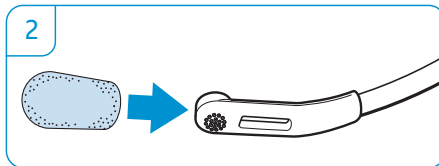
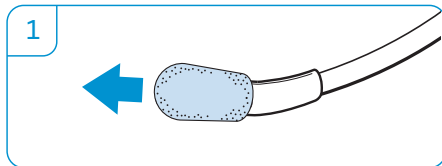
Replacing the ear pads

- 1 Grasp the edge of the ear pad and peel it up and away from the ear cup.
- 2 Slide the new ear pad onto the ear cup.



Replacing the wind screen

- 1 Pull the wind screen from the microphone.
- 2 Carefully slide the new wind screen over the microphone.



If a problem occurs ...

Problem	Possible cause	Solution	Page
Power LED ⑱ does not light up on switch-on	The batteries/rechargeable batteries are flat.	Charge the rechargeable batteries or replace the batteries.	9
	The aircraft fuse is defective.	Check the aircraft fuse.	–
No audio signal during Bluetooth connection	The headset is switched off.	Switch the headset and the Bluetooth function on.	17
	The headset is not paired with a Bluetooth device.	Pair the headset with a Bluetooth device.	12
	The Bluetooth function is switched off.	Switch the Bluetooth function on.	17
Headset cannot be paired	The pairing does not work.	Check if the audio source supports the A2DP profile. If not, use one of the optional stereo audio transmitters.	30
	The audio source is switched off.	Switch the audio source on	12
Headset does not react to any button press	The operation of the headset is faulty.	Change the batteries/rechargeable batteries.	9
No active noise compensation	NoiseGard™/digital is switched off.	Switch NoiseGard™/digital on.	17
	The aircraft fuse is defective.	Check the aircraft fuse.	–
Very low volume communication even though NoiseGard™/digital is switched on	The volume is set too low.	Increase the volume.	18
	The headset is not connected correctly.	Check the jack plugs of the headset.	8
Audio signal in one ear only	You are receiving a mono source but the headset is set to stereo operation.	Set the headset to mono operation.	19
	The Master VOLUME slide control ⑲ is misadjusted.	Check the Master VOLUME ⑲ slide control.	19

If a problem occurs that is not listed in the above table or if the problem cannot be solved with the proposed solutions, please contact your local Sennheiser partner for assistance.

To find a Sennheiser partner in your country, search at www.sennheiser-aviation.com > "Purchase Information" or www.sennheiser.com > "Service & Support".

Accessories and spare parts

Accessories

Cat. No.	Accessory
504987	Adapter-P-XLR-3 adapter cable
504988	Adapter-P-CIG adapter cable
502887	HZH 350 hygiene pads
502389	BTD 300i wireless stereo audio transmitter for iPod and iPhone
502388	BTD 300 Audio wireless stereo audio transmitter for audio/video devices

Spare parts

Leatherette ear pads, 1 pair
GEL ear pads, 1 pair
Wind and pop screen
Headband padding, 1 pair
Cover for inner NoiseGard microphone, 1 pair
Belt clip
HZC 08 cable clip
Transport case

Valuable information on NoiseGard™/digital

Combination of two NoiseGard strategies

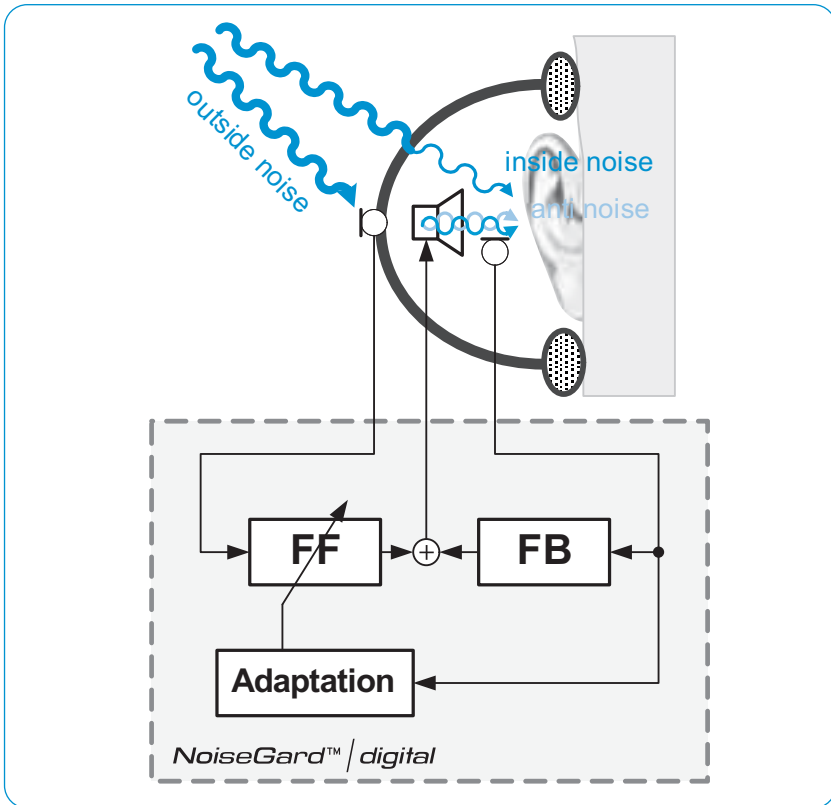
Active noise compensation (ANR, NoiseGard) is based on the principle of cancelling out unwanted sound using “anti-sound” (phase-inverted sound). There are two distinct strategies: the feedback (FB) strategy and the feedforward (FF) strategy.

Operating principle of the two ANR strategies

Feedback (FB) ANR uses microphones integrated inside the ear cups to pick up the sound signal near the ear. This sound signal is processed by a FB control circuit that calculates the required “anti-sound” and outputs it via the loudspeaker. This is the “classic” NoiseGard strategy used in most headsets with analog NoiseGard technology. FB-NoiseGard works especially well in the low-frequency range.

Feedforward (FF) ANR, on the other hand, uses microphones mounted on the outside of the ear cups to directly pick up the unwanted noise. The FF control circuit then calculates the required “anti-sound” and outputs it via the loudspeaker. The FF control circuit cannot become unstable at higher frequencies, and therefore allows for a strikingly increased NoiseGard performance in the upper frequency range.

NoiseGard™/digital uses both ANR strategies. Each ear cup features its own inner and outer microphones and a loudspeaker, allowing the advantages of both the FB and FF strategies to be combined. As a result, the NoiseGard performance is outstanding both in terms of the amount of noise attenuation and the wide range of frequencies over which it is effective.



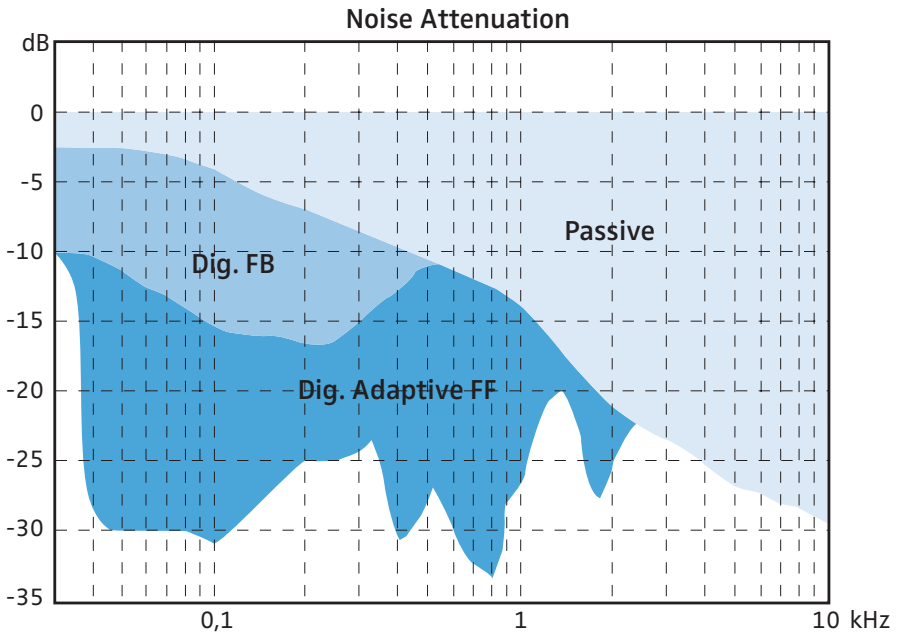
The NoiseGard™/digital technology of the S1 DIGITAL uses an innovative approach. The sound captured by the sensing-microphones is analyzed to calculate the optimum control circuit settings. This calculation is carried out by a high-performance signal processor using a fully-adaptive algorithm. This fully-adaptive algorithm is the core of the NoiseGard™/digital technology and ensures that the currently dominant sound components are particularly well attenuated. The attenuation curve resulting from the adaptation is therefore always optimised for the current situation.

The dominant sound components at the ear depend not only on the noise of the aircraft but also on the user's position in the cockpit and, above all, on how the sound is transmitted through the headphones to the ear. This, in turn, depends on the fit of the headphones, head and ear anatomy and on whether or not spectacles are worn.

When compared with other adaptive technologies that are on the market, the particular strength of the fully-adaptive FF-NoiseGard is its ability to cancel broadband noise and not just individual tonal components. Cockpit noise consists of a mixture of broadband noise components and individual tonal components (e.g. the fundamentals and harmonics of propeller rotation). If only the tonal components are canceled, the broadband noise remains unaffected and no significant noise reduction can be achieved in practice. Because it is fully adaptive, the NoiseGard™/digital technology is able to simultaneously cancel both broadband and tonal sound components, resulting in excellent performance at all times.

Overall noise compensation (principle)

The attenuation curves of the passive attenuation and of the digital FB-ANR are fixed, whereas the attenuation of the digital adaptive FF-ANR depends on the situation. This reveals the powerful effect of adaptivity, which always provides the greatest attenuation of the loudest noise components.



Specifications

Headset

Transducer principle	dynamic, closed
Ear coupling	circumaural
Frequency response	20 – 16,000 Hz
Impedance active/passive	mono: 130 Ω passive/180 Ω active stereo: 260 Ω passive/360 Ω active
Characteristic SPL	98 dB SPL at 1 kHz, 1 V _{rms} 90 dB SPL at 1 kHz, 1 mW
Max. SPL	115 dB SPL at 1 kHz
THD	< 1% at 98 dB SPL
Contact pressure, adjustable	approx. 5 – 7 N

Microphone incl. preamplifier

Type	BKE S1-P
Transducer principle	pre-polarized condenser microphone, noise-compensating
Frequency response	100 Hz – 10 kHz
Output voltage	20 – 80 mV/Pa, adjustable 35 mV/Pa (factory preset)
Terminating impedance	150 – 2,200 Ω
Supply voltage	8 – 16 V _{DC}

General data

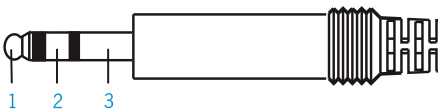
Ambient temperature	operation: –15°C to +55°C storage: –55°C to +70°C
Weight without cable	approx. 410 g
Cable length	approx. 1.90 m
Power supply for operation with NoiseGard™/digital	2.4 – 3.0 V _{DC} (batteries/rechargeable batteries), 4 V _{DC} / max. 250 mA (via Adapter-P-XLR-3 or -P-CIG adapter cable, at 12 – 35 V _{DC} on-board DC power supply)
Operating time (NoiseGard™/digital only)	Alkaline batteries/rechargeable batteries: approx. 25 hrs Lithium batteries: approx. 40 hrs

Bluetooth

Bluetooth	version 2.1 + EDR
Range	up to 10 m
Transmission frequency	2.4 GHz – 2.48 GHz
Transmission power	8 dBm
Profiles	HSP, HFP, A2DP, AVRCP
Codec	SBC

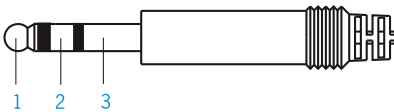
Connector assignment

5.25 mm jack plug (PJ-068 equivalent)



- 1 Not assigned
- 2 Microphone High
- 3 Microphone Low

¼" (6.35 mm) jack plug



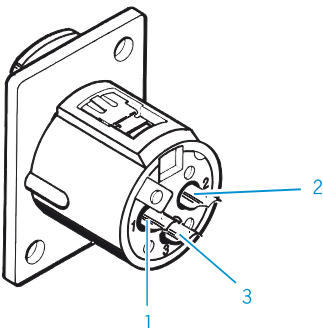
- 1 Audio High left
- 2 Audio High right
- 3 Audio Low

Hollow jack socket on the Adapter-P-XLR-3 and -P-CIG adapter cable



- 1 Power supply (4 V_{DC})
- 2 Ground

XLR 3-pole socket (optional accessory)



- 1 Power supply for NoiseGard™/digital (12–35 V_{DC})
- 2 Ground
- 3 Not assigned

Manufacturer declarations

Warranty

Sennheiser electronic GmbH & Co. KG gives a warranty of 5 years on this product. For the current warranty conditions, please visit our website at www.sennheiser-aviation.com or www.sennheiser.com or contact your Sennheiser partner.

In compliance with the following requirements

- RoHS Directive (2002/95/EC)
- WEEE Directive (2002/96/EC)

CE Declaration of Conformity

- R&TTE Directive (1999/5/EC)

The declaration is available at www.sennheiser.com. Before putting the product into operation, please observe the respective country-specific regulations!

WEEE Declaration



Your Sennheiser product was developed and manufactured with high-quality materials and components which can be recycled and/or reused. This symbol indicates that electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

Please dispose of this product by taking it to your local collection point or recycling centre for such equipment. This will help to protect the environment in which we all live.

In compliance with:

USA	FCC ID: DMOS1CW3011	
Canada	IC: 2099A-S1CW3011	
Europe	CE 0682	


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Other product and company names mentioned in this instruction manual may be the trademarks or registered trademarks of their respective owners.

Statements regarding FCC and Industry Canada

FCC Declaration of Conformity (DoC)	
We,	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;">  <div style="display: inline-block; vertical-align: middle;"> SENNHEISER Model No: S1 DIGITAL </div> </div> <p> Sennheiser Electronic Corporation One Enterprise Drive • Old Lyme • CT 06371 • USA Tel: +1 (860) 434 9190, ext. 144 Fax: +1 (860) 434 1759 </p>
<p>declare the above device comply with the requirements of Federal Communications Commission.</p> <p>This device complies with Part 15 of the FCC rules. Operation is subjected to the following two conditions:</p> <p>1) This device may not cause harmful interference, and</p> <p>2) This device must accept any interference received, including interference that may cause undesired operation.</p> <p>Responsible Party: John Falcone</p>	

This device complies with Part 15 of the FCC rules and RSS-210 of Industry Canada. Operation is subjected 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 equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules and RSS-210 of Industry Canada. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

RF Radiation Exposure Information

Since the radiated output power of this device is far below the FCC radio frequency exposure limits, it is not subjected to routine RF exposure evaluation as per Section 2.1093 of the FCC rules. This device complies with the US and Industry Canada portable device RF exposure limits set forth for an uncontrolled environment and is safe for intended operation as described in the user manual. Further RF exposure reduction can be achieved if the device can be kept as far as possible from the user's body or set to lower output power if such provision is available. The base portion of this device should be installed and operated at least 20 cm away from the user's body. Use of other accessories not verified by the manufacturer may not ensure compliance with FCC and Industry Canada RF exposure guidelines. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

Industry Canada statement

This device complies with RSS-210 of Industry Canada. Operation is subjected 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.

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