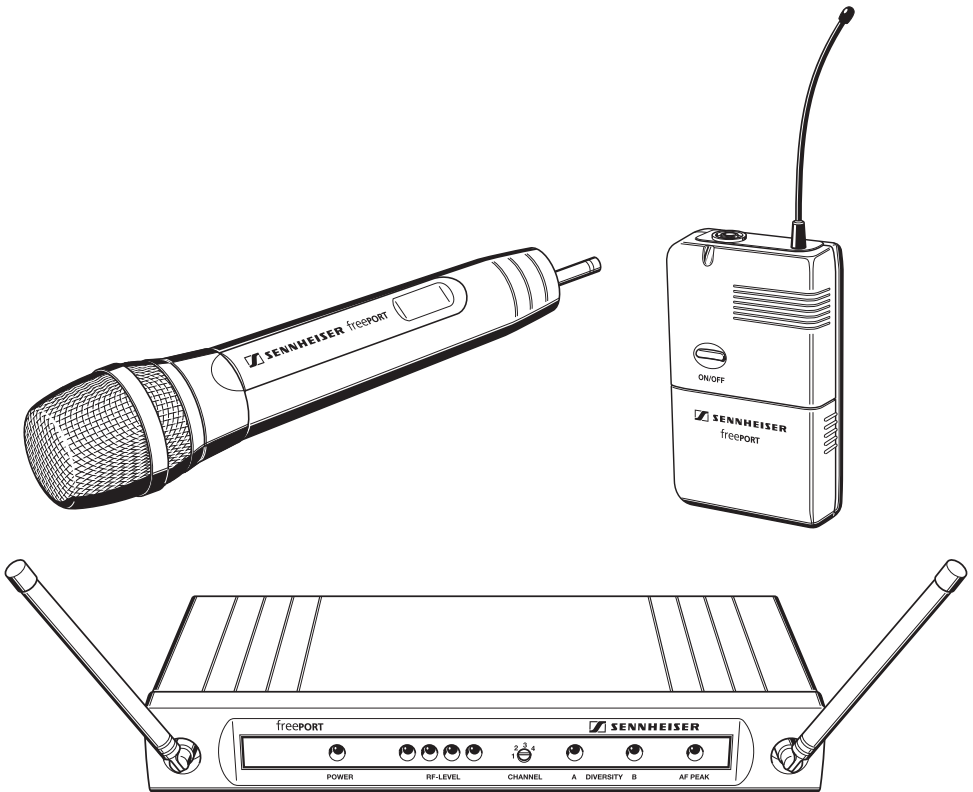


freePORT™

Instructions for use



Contents

Important safety instructions	2
The freePORT systems	3
Delivery includes	4
EM 1 receiver	4
SK 2 bodypack transmitter	6
SKM 3 radio microphone	8
Setting up the system	9
Care and maintenance	10
If problems occur... ..	11
Accessories and variants	11
Specifications of the freePORT systems	12
Connector assignment	13
Manufacturer declarations	14
Warranty	14
CE Declaration of Conformity	14
Batteries or rechargeable batteries	14
WEEE Declaration	14
Statements regarding the FCC and Industry Canada rules	14

Thank you for choosing Sennheiser!

We have designed this product to give you reliable operation over many years. Over half a century of accumulated expertise in the design and manufacture of high-quality electro-acoustic equipment have made Sennheiser a world-leading company in this field.

Please take a few moments to read these instructions carefully, as we want you to enjoy your new Sennheiser products quickly and to the fullest.

Important safety instructions

- Read this instruction manual.
- Keep this instruction manual in a safe place. Always include this instruction manual when passing the device and the mains unit on to third parties.
- Heed all warnings and follow all instructions.
- Clean the device and the mains unit only with a dry cloth.
- Refer all servicing to qualified service personnel. Servicing is required if the device or the mains unit has been damaged in any way, liquid has been spilled, objects have fallen inside, the device or the mains unit has been exposed to rain or moisture, does not operate properly or has been dropped.
- **WARNING:** To reduce the risk of fire or electric shock, do not expose the device and the mains unit to rain or moisture. Do not place objects filled with liquids, such as vases or coffee cups, on the device.
- Only use the supplied mains unit.
- Disconnect the mains connector from the wall socket
 - to completely disconnect the device from the mains,
 - during lightning storms or when unused for long periods of time.
- The mains unit must be operated only from the type of power source specified in the chapter "Specifications of the freePORT systems" (page 12).
- Ensure that the mains unit is
 - always readily operable and easily accessible,
 - properly plugged into the wall socket,
 - only operated within the permissible temperature range,
 - not covered or exposed to direct sunlight for longer periods of time in order to prevent heat accumulation (see "Specifications of the freePORT systems" on page 12).
- Do not block any ventilation openings. Install the device and the mains unit in accordance with the manufacturer's instructions.
- Do not install the device and the mains unit near any heat sources.
- Only use attachments/accessories specified by Sennheiser.

The freePORT systems

Designed for different areas of application, the freePORT systems are available in three variants.

- **Presentation Set:**
This system is ideal for presentation applications. The unobtrusive ME 2 clip-on microphone is virtually invisible.
- **Instrument Set:**
This system is for connecting musical instruments (e.g. guitar) which have a 1/4" (6.3 mm) jack socket directly to the bodypack transmitter.
- **Vocal Set:**
This system is ideal for vocal and speech applications.

Transmitters and receivers of the freePORT systems have four factory-preset frequencies for direct channel selection – ready for immediate use after switch-on.

The freePORT systems are available in three UHF frequency ranges:

- Frequency range A: 719 to 721 MHz
- Frequency range B: 691 to 693 MHz
- Frequency range C: 742.5 to 744.5 MHz
- Frequency range E: 863 to 865 MHz

Notes:

Use of A, B and C frequency ranges must be licensed. Most EU countries do not require licensing for use of frequency range E.

Frequency range B (691 to 693 MHz) is intended for use solely in the USA and Canada.

Please be legal and observe the country-specific regulations of the licensing authorities. Sennheiser are not responsible if you operate illegally.

To avoid interfering with other users, the transmitter should be switched off when not in use.

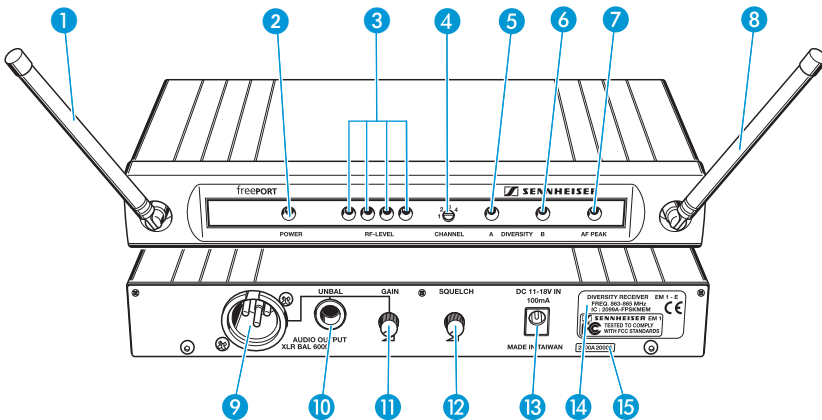
Features of the freePORT systems:

- Up to four transmission links per frequency range which can be operated simultaneously
- Reliable transmission technology
- Diversity technology for minimizing dropouts in the reception
- Adjustable squelch for eliminating RF interference
- Rugged housings
- Crystal-clear reception due to dynamic processor

Delivery includes

FreePORT systems	EM 1 receiver	SK 2 bodypack transmitter	SKM 3 radio microphone	Mains unit (N1xy)	ME 2 clip-on microphone	1/4" (6.3 mm) jack cable	Stand mount	Instructions for use
Presentation Set	X	X		X	X			X
Instrument Set	X	X		X		X		X
Vocal Set	X		X	X			X	X

EM 1 receiver



Operating controls

- 1 Antenna A
- 2 Operation indication, green LED (POWER)
- 3 RF level indication, four green LEDs (RF LEVEL)
- 4 Channel selector switch CHANNEL (1 to 4)
- 5 Diversity indication, yellow LED A (lights up if antenna 1 is active)
- 6 Diversity indication, yellow LED B (lights up if antenna 9 is active)
- 7 AF PEAK, red LED (lights up if the audio level is too high)
- 8 Antenna B
- 9 Audio output, XLR-3M socket, balanced (AUDIO OUTPUT XLR BAL)
- 10 Audio output, 1/4" (6.3 mm) jack socket, unbalanced (AUDIO OUTPUT UNBAL)
- 11 Audio output level control (GAIN)
- 12 Squelch threshold control (SQUELCH)
- 13 DC socket for connection of mains unit (DC 11–18 V IN, 100 mA)
- 14 Type plate
- 15 Serial number

Connecting the receiver

- ▶ Insert the DC connector on the mains cable into the DC socket 13 and connect it to the mains. The green LED for operation indication (POWER) 2 lights up and the receiver is ready for operation.
- ▶ To deactivate the receiver, remove the mains plug from the mains outlet.

Aligning the antennas

- ▶ Set up the antennas and align them upwards in a V-shape. The LEDs A and B indicate which diversity section (i.e. which antenna) is active.

Connecting the amplifier/mixing console

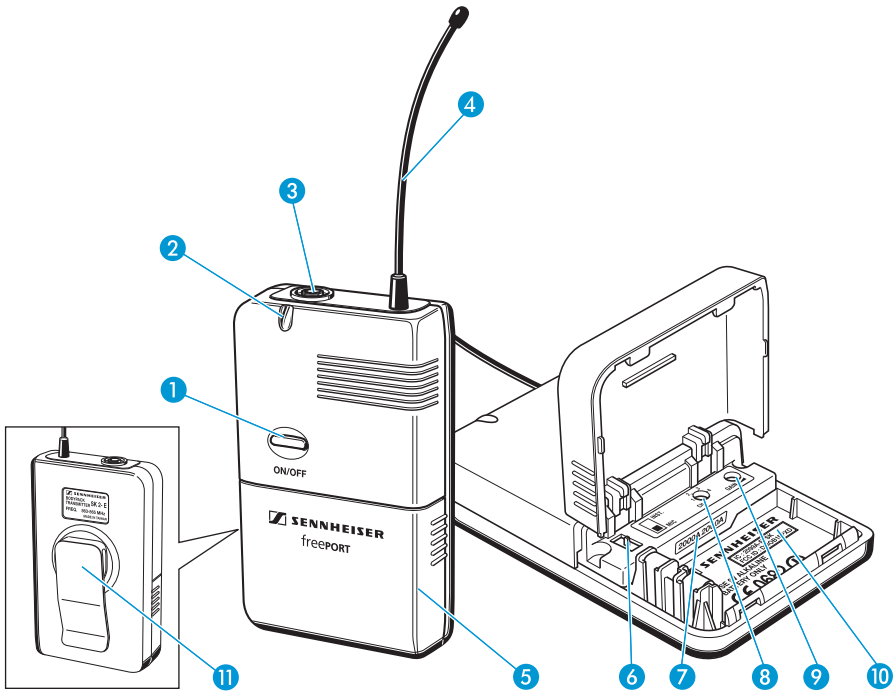
- ▶ Connect the amplifier/mixing console to the XLR-3M socket 9 or the 1/4" (6.3 mm) jack socket 10.
- ▶ Use the GAIN control 11 to adapt the level of the audio output to the input of the amplifier or mixing console. The adjusted audio output level is common for both sockets. If the level is adjusted too high, the audio signal will be distorted. If, on the other hand, the level is adjusted too low, this will result in an audio signal with high background noise.

Selecting and changing a channel

You can change the channel on the receiver during running operation. The receiver then immediately receives on the new channel.

- ▶ Use a small screwdriver to set the channel selector switch 4 to the desired channel. You can switch between four different channels ("Selecting a channel").

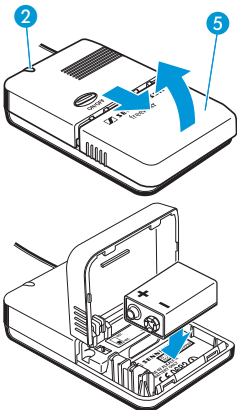
SK 2 bodypack transmitter



Operating controls

- 1 ON/OFF button
- 2 Operation and battery status indication, red LED
- 3 Microphone/instrument input, 3.5 mm jack socket (lockable)
- 4 Antenna (can be screwed off)
- 5 Battery compartment cover
- 6 MIC/INST slide switch
- 7 Serial number
- 8 Channel selector switch CH (1 to 4)
- 9 Sensitivity control GAIN
- 10 Type plate
- 11 Belt clip

Inserting/replacing the battery



We recommend powering the bodypack transmitter by a 9 V PP3 alkaline battery (IEC 6 LR 61). If powered by a rechargeable 9 V battery, the operating time will be drastically reduced.

- ▶ Open the battery compartment by first sliding the battery compartment cover in the direction of the arrow. Then flip the battery compartment cover open.
- ▶ Insert the battery as shown. Please observe correct polarity when inserting the battery.
- ▶ Close the battery compartment.

Note:

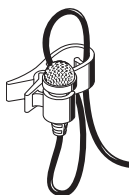
When the red LED 2 goes off during operation, you must replace the battery as soon as possible.

Connecting the microphone/instrument cable

The audio input is designed for the connection of both the ME 2 clip-on microphone and instruments (e.g. guitars).

- ▶ Connect the 3.5 mm jack plug from the microphone/instrument cable to the 3.5 mm jack socket ③.
- ▶ Check the setting of the MIC/INST slide switch ⑥ which allows you to switch between microphone and instrument operation. If necessary, readjust the setting.
- ▶ Use the GAIN control ⑨ to adjust the transmitter sensitivity so that the receiver receives a good audio signal (no distortion and no background noise).

Attaching and positioning the microphone



Use the microphone clip to attach the ME 2 clip-on microphone to clothing (e.g. tie, lapel). Conduct the microphone cable so that noise due to friction is avoided and make sure that the antenna and the cable do not cross. The omni-directional microphone picks up sound equally from all directions. However, it should be attached as close as possible to the sound source.

Attaching the bodypack transmitter to clothing

- ▶ Use the supplied belt clip ⑪ to attach the bodypack transmitter to clothing. Make sure that the antenna is at least 1 cm away from the body and is not kinked.

Switching the bodypack transmitter on/off

- ▶ Press the ON/OFF button ① to switch the bodypack transmitter on or off. If the bodypack transmitter is switched on, the red LED ② lights up.

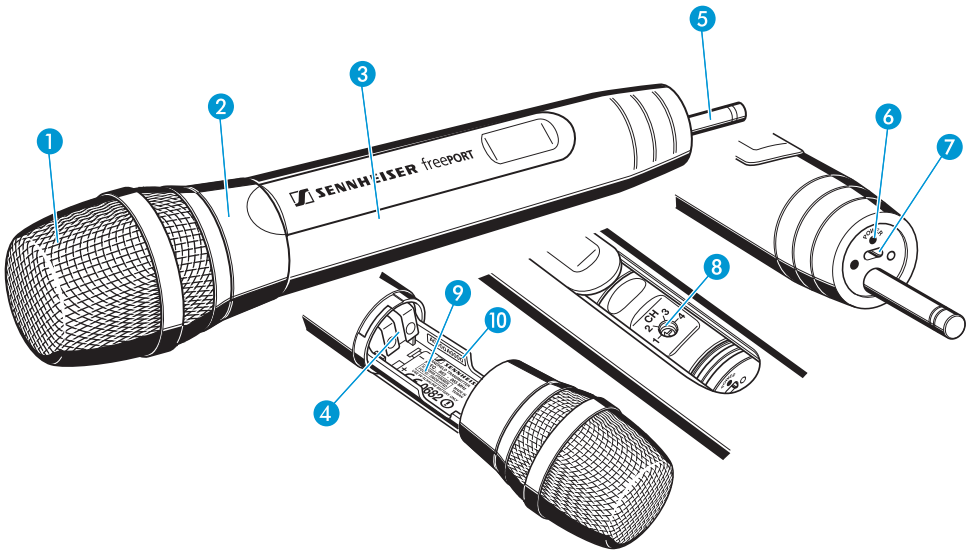
Note:

Remove the battery when the transmitter will not be used for extended periods of time.

Selecting and changing a channel

- ▶ Switch off the transmitter before you change the channel.
- ▶ Use a small screwdriver to set the channel selector switch ⑧ to the desired channel. You can switch between four different channels. When you switch on the bodypack transmitter again, it will transmit on the new channel ("Selecting a channel").

SKM 3 radio microphone



Operating control

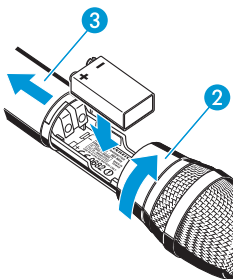
- 1 Sound inlet basket
- 2 Locking ring of battery compartment
- 3 Body of radio microphone
- 4 Battery compartment (not visible from outside)
- 5 Antenna (can be screwed off)
- 6 Operation and battery status indication, red LED (POWER)
- 7 ON/OFF switch
- 8 Channel selector switch CH (1 to 4)
- 9 Type plate
- 10 Serial number

Note:

The microphone head of the radio microphone cannot be changed.

Inserting/replacing the battery

We recommend powering the radio microphone by a 9 V PP3 alkaline battery (IEC 6 LR 61). If powered by a rechargeable 9 V battery, the operating time will be drastically reduced.



- ▶ Turn the locking ring of the battery compartment 2 in the direction of the arrow.
- ▶ Pull the body of the radio microphone 3 in the direction of the arrow as far as it will go.
- ▶ Insert the battery as shown. Please observe correct polarity when inserting the battery.
- ▶ Close and lock the radio microphone.

Note:

When the red LED 6 goes off during operation, you must replace the battery as soon as possible.

Switching the radio microphone on/off

- ▶ Use the ON/OFF switch 7 to switch the radio microphone on or off. If the radio microphone is switched on, the red LED 6 lights up.

Note:

Remove the battery when the transmitter will not be used for extended periods of time.

Selecting and changing a channel

- ▶ Switch off the radio microphone.
- ▶ Open the radio microphone (“Inserting/replacing the battery”).
- ▶ Use a small screwdriver to set the channel selector switch 8 to the desired channel. You can switch between four different channels (“Selecting a channel”).
- ▶ Close and lock the radio microphone.
- ▶ Switch on the radio microphone again.

Sensitivity of the radio microphone

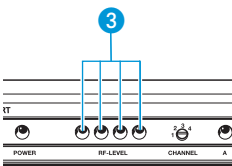
You can vary the bass reproduction by increasing/decreasing the talking distance.

Setting up the system

Before starting transmission, do a soundcheck and set up the system as follows:

Setting up the reception

The receiver’s four LEDs (RF LEVEL) 3 indicate the level of the received RF signal. With the transmitter, walk up and down the transmission area and check if the received RF signal is sufficient everywhere. Reception is good if all four LEDs light up. Please observe the following:

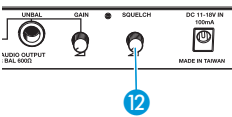


- Transmission range depends to a large extent on location and can be up to 100 m. Observe a minimum distance of 3 m between transmitter and receiver. There should be a “free line of sight” between transmitting and receiving antennas.
- Do not operate the system close to metal objects such as cross members or reinforced-concrete walls. Computers or mobile phones in direct proximity to the antenna will interfere with the reception.
- Each transmitter requires a receiver. When using several transmission links simultaneously, make sure that all transmission links operate on different channels.

Adjusting the squelch threshold

Interference due to other transmission links can be eliminated as follows:

- ▶ Switch off the transmitter. The receiver should no longer receive a signal.
- ▶ If the receiver still receives a signal, use the **SQUELCH** control 12 to increase the squelch threshold so that the signal will no longer be received. If the signal cannot be eliminated in this way, set the transmitter and the receiver to a different channel.
- ▶ Switch on the transmitter again and check if the receiver receives the transmitter signal.



Note:

If the squelch threshold is adjusted too high, the transmission range will be reduced. Therefore, always adjust the squelch threshold to the lowest possible setting.

Selecting a channel

Transmitters and receivers have four channels respectively with intermodulation-free frequencies.

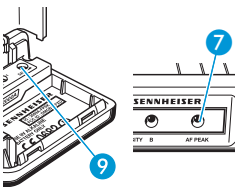
Note:

These frequencies are different to those in evolution systems and freePORT systems should not be used together with evolution systems without great care.

- ▶ Always set the transmitter and the receiver to the same channel.

Adjusting the transmitter sensitivity

- ▶ Use the **GAIN** control 9 on the SK 2 bodypack transmitter to adjust the sensitivity so that even during the loudest passages the **AF PEAK** LED 7 on the EM 1 receiver does not light up.



Care and maintenance

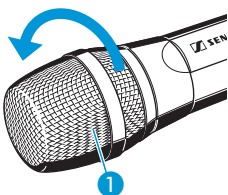
Use a slightly damp cloth to clean the units from time to time.

Note:

Do not use any cleansing agents or solvents.

To clean the SKM 3's sound inlet basket:

- ▶ Unscrew the sound inlet basket 1 (turn counterclockwise) and remove it.
- ▶ Remove the foam insert and use a slightly damp cloth to clean the sound inlet basket.
- ▶ Reinsert the dry foam insert, replace the sound inlet basket on the SKM 3 and screw it tight.



If problems occur...

Problem	Possible cause	Possible solution
No operation indication	Battery is flat	Replace the battery
	No mains connection (receiver)	Check the connections of the mains unit
No RF signal	Transmitter and receiver are not on the same channel	Set transmitter and receiver to the same channel
	Transmitter is out of range	Reduce the distance between transmitter and receiver
RF signal available, no audio signal	Receiver's squelch threshold is adjusted too high	See "Adjusting the squelch threshold" on page 10
Audio signal has a high level of background noise or is distorted	Transmitter sensitivity is adjusted too low or too high	See "Connecting the microphone/ instrument cable" on page 7
	The MIC/INST slide switch on the SK 2 transmitter is not set correctly	
	Receiver's audio output level is adjusted too low or too high	See "Connecting the amplifier/ mixing console" on page 5
Annoying noises	When the battery is almost flat, the transmitter may produce annoying noises which can damage the PA system.	After the LED has gone off, replace the battery as soon as possible or switch the transmitter off.

Accessories and variants

04839	MZW 1	Wind- and popshield for SKM 3
76670	MZQ 1	Microphone clamp for SKM 3
05018	ME 2	Clip-on microphone for SK 2, pre-polarized condenser microphone, omnidirectional
05019	ME 3	Headmic for SK 2, pre-polarized condenser microphone, super-cardioid
05020	ME 4	Clip-on microphone for SK 2, pre-polarized condenser microphone, cardioid
512889	CI1-fp	Guitar cable

Specifications of the freePORT systems

System characteristics

Transmission/receiving frequencies	4 UHF transmission/receiving frequencies Range A: 719 to 721 MHz (719.15 – 719.75 – 720.15 – 720.85 MHz) Range B: 691 to 693 MHz (691.00 – 691.40 – 692.35 – 692.90 MHz) Range C: 742.5 to 744.5 MHz (742.65 – 743.35 – 743.85 – 744.45 MHz) Range E: 863 to 865 MHz (863.10 – 863.70 – 864.10 – 864.90 MHz)
Switching bandwidth	2 MHz
Signal-to-noise ratio	> 95 dB(A)
THD (1 kHz)	< 1 %
Temperature range	-10 bis +45 °C / 95 relative humidity

Individual components

	EM 1 receiver	SK 2 bodypack transmitter	SKM 3 radio microphone
Power supply	12V DC _{NOM} /100 mA	9 V PP3 battery	9 V PP3 battery
Operating time (with alkaline battery)	–	approx. 10 hrs	approx. 10 hrs
Frequency response	–	60...16,000 Hz ± 3 dB	80...16,000 Hz ± 3 dB
RF output power (-3 dB)	–	10 mW	10 mW
AF output voltage	–	–	–
¼" (6.3 mm) jack socket (unbal.):	max. +10 dB _u	–	–
XLR socket (balanced):	max. +16 dB _u	–	–
Dimensions in mm	approx. 35 x 213 x 98	approx. 60 x 100 x 30 (with belt clip)	approx. 285; Ø approx. 35 x 50
Weight	approx. 570 g	approx. 90 g	approx. 210 g
Transducer principle	–	–	dynamic
Pick-up pattern	–	–	cardioid

ME 2 clip-on microphone

Transducer principle	pre-polarized condenser
Pick-up pattern	omni-directional

Type approvals

In compliance with

CE	EMC	EN 301489-1/-9
	Radio	EN 301357-1/-2
	Safety	EN 60065

Also approved by

Industry Canada

RSS 210,	IC: 2099A
SKM3/EM1-A/-C	IC: 2099A-FPSKMEM
SKM3/EM1-B	IC: 2099A-FPSKMEMB
SK2-A/-C	IC: 2099A-FPSK
SK2-B	IC: 2099A-FPSKB

FCC-Part 74

SK2-A/-C	FCC ID: DMOB1FPXD
SK2-B	FCC ID: DMOB2FPSK
SKM3-A/-C	FCC ID: DMOH1FPXD
SKM3-B	FCC ID: DMOH2FPSKM

Transmitters that operate in the frequency range E (863 – 865 MHz) can be used licence-free in the following countries:

AT, BA, BE, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, ME, MK, MT, NL, NO, PL, PT, RO, RS, RU, SE, SI, SK, TR, UA.

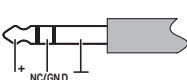
Transmitters that operate in frequency range A (719 – 721 MHz), B (691–693 MHz) or frequency range C (742.5 – 744.5 MHz) must only be used with an appropriate radio transmission licence. Frequency range B is intended for use solely in the USA and Canada.

Frequency range	Presentation Set	Instrument Set	Vocal Set
691 – 693 MHz:			
with US mains unit	freePort fp 12-B-US	freePort fp 72-B-US	freePort fp 35-B-US
719 – 721 MHz:			
with US mains unit	freePort fp 12-A-US	freePort fp 72-A-US	freePort fp 35-A-US
742.5 – 744.5 MHz:			
with EU mains unit	freePort fp 12-C-EU	freePort fp 72-C-EU	freePort fp 35-C-EU
with US mains unit	freePort fp 12-C-US	freePort fp 72-C-US	freePort fp 35-C-US
863 – 865 MHz:			
with EU mains unit	freePort fp 12-E-EU	freePort fp 72-E-EU	freePort fp 35-E-EU
with UK mains unit	freePort fp 12-E-UK	freePort fp 72-E-UK	freePort fp 35-E-UK

Connector assignment

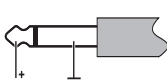
EM 1:

¼" (6.3 mm) stereo jack plug, unbalanced



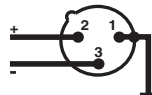
EM 1:

¼" (6.3 mm) mono jack plug, unbalanced



EM 1:

XLR-3F connector, unbalanced



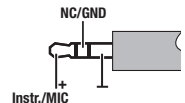
EM 1:

DC connector for power supply



SK 2:

3.5 mm jack plug



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 or contact your Sennheiser partner.

CE Declaration of Conformity

CE 0682 

This equipment is in compliance with the essential requirements and other relevant provisions of Directives 1999/5/EC, 2004/108/EC or 2006/95/EC. The declaration is available on the internet site at www.sennheiser.com.

Before putting the device into operation, please observe the respective country-specific regulations!

Batteries or rechargeable batteries



The supplied batteries or rechargeable batteries can be recycled. Please dispose of them as special waste or return them to your specialist dealer. In order to protect the environment, only dispose of exhausted batteries.

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 bringing it to your local collection point or recycling centre for such equipment. This will help to protect the environment in which we all live.

Statements regarding the FCC and Industry Canada rules

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. 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 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. 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.

This class B digital apparatus complies with the Canadian ICES-003 Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Changes or modifications made to this equipment not expressly approved by Sennheiser electronic Corp. may void the FCC authorization to operate this equipment.

Before putting the device into operation, please observe the respective country-specific regulations!



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