

SK 9000



Instruction manual

Contents

Important safety instructions	2
The SK 9000 bodypack transmitter	4
Delivery includes	4
Product overview	5
Preparing the SK 9000 for use	6
Connecting the antenna	9
Connecting the KA 9000 COM command adapter	9
Using the SK 9000	10
Switching the SK 9000 on/off	10
Activating/deactivating the automatic lock mode (Autolock)	12
Basic functions of the Sennheiser operating menu	13
Overview of the status displays	13
Overview of the menu items	14
Cleaning and maintaining the SK 9000	17
If a problem occurs	18
Specifications	19
System characteristics	19
Operating conditions	20
SK 9000 characteristics	20

Important safety instructions

- Read this instruction manual.
- Keep this instruction manual. Always include this instruction manual when passing the product on to third parties.
- Heed all warnings and follow all instructions.
- Do not use the product near water.
- Only clean the product with a dry cloth.
- Do not place the product near any heat sources such as radiators, stoves, or other devices (including amplifiers) that produce heat.
- Only use attachments, accessories or spare parts specified by Sennheiser.
- Refer all servicing to qualified service personnel. Servicing is required if the product has been damaged in any way, liquid has been spilled, objects have fallen inside, the product 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 product to rain or moisture.
- Do not expose the product to dripping or splashing.



Intended use

Intended use of the Digital 9000 system components 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 these instructions, or under operating conditions which differ from those described herein.

This instruction manual is also available at www.sennheiser.com.

















Safety instructions for lithium-ion rechargeable batteries

If abused or misused, the rechargeable batteries may leak. In extreme cases, they may even present a risk of



- explosion,
- fire development,
- heat generation,
- smoke or gas development.

Sennheiser does not accept any liability for damage arising from abuse or misuse.

	Keep away from children.		Only charge rechargeable batteries with a charger recommended by Sennheiser.
	Observe correct polarity.		
	Do not expose to moisture.		Pack/store charged rechargeable batteries so that the terminals cannot contact each other – danger of shorting out/ fire hazard.
	Only charge rechargeable batteries at ambient temperatures between 10 °C/50 °F and 40 °C/104 °F.		
	Do not mutilate or dismantle.		Switch rechargeable battery-powered products off after use.
	Immediately remove rechargeable batteries from an obviously defective product.		When not using rechargeable batteries for extended periods of time, charge them regularly (about every three months).
	Do not continue to use defective rechargeable batteries.		
	Only use rechargeable batteries specified by Sennheiser.		Do not heat above 70 °C/ 158 °F, e.g. do not expose to sunlight or throw into a fire.
	Remove the rechargeable batteries if the product will not be used for extended periods of time.		
	Store the product in a cool and dry place at room temperature (approx. 20 °C/68 °F).		Dispose of rechargeable batteries at special collection points or return them to your specialist dealer.

The SK 9000 bodypack transmitter

The SK 9000 transmitter offers great ease of use and can easily be adapted to any transmission situation:

- Rugged housing
- Input gain adjustable in 3 dB steps
- Switchable 1 kHz test tone, useful for level matching the system and for the walk test
- High accuracy of charge status display (BA 61) or remaining operating time display (B 61)
- Switchable low cut filter for filtering out low frequency components
- Frequencies tuneable in 25 kHz steps
- Power supply optionally via BA 61 lithium-ion accupack or B 61 battery pack (3 AA size alkaline batteries or 3 AA size lithium batteries)
- Automatic detection of the input signal type (mic, line, instrument) when Sennheiser accessories are used
- Emulation of different guitar cable lengths
- Different clip-on microphones for different areas of application (see page 6)
- Command function via KA 9000 COM command adapter

Delivery includes

- 1 SK 9000 bodypack transmitter
- 1 supplement "Framework requirements and restrictions on frequency usage"
- 1 instruction manual

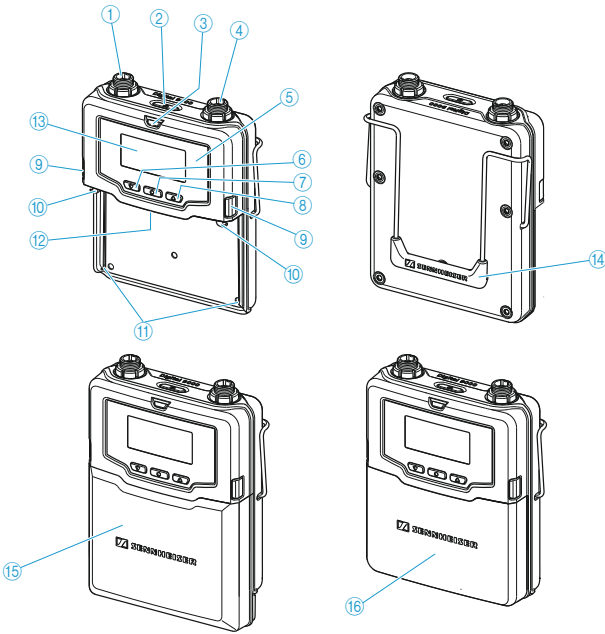






You additionally require microphones or the CI 1-4 line/instrument cable as well as a BA 61 accupack and/or a B 61 battery pack.



A list of accessories can be found on the Digital 9000 product page at www.sennheiser.com. For information on suppliers, contact your local Sennheiser partner: www.sennheiser.com > "Service & Support".

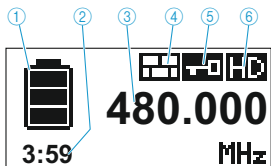
Product overview



- ① 3-pin special audio socket for
 - Sennheiser microphones
 - Sennheiser CI 1-4 instrument cable
 - KA 9000 COM command adapter
- ② **ON/OFF** button  with ESC function (cancel)
- ③ **ON** LED
 - lights up constantly: transmitter is operational
 - flashes regularly: remaining operating time is less than 30 minutes
 - flashes with high levels: audio signal is excessively high
- ④ Antenna socket
- ⑤ Infra-red interface
- ⑥ **DOWN** button 
- ⑦ **SET** button 
- ⑧ **UP** button 
- ⑨ Catches for accupack/battery pack
- ⑩ Snap-in elements for accupack/battery pack
- ⑪ Guide rails for accupack/battery pack
- ⑫ Contacts for supply voltage and data contacts
- ⑬ Display panel
- ⑭ Belt clip
- ⑮ Battery pack for 3 AA size cells
- ⑯ Accupack

Overview of the standard display after switch-on

After switch-on, the bodypack transmitter displays the following standard display:



- ① Display for charge status of the accupack/battery pack
- ② Operating time display (only when used with the BA 61)
- ③ Frequency/channel/name display, switchable
- ④ "Encryption" display
- ⑤ Lock mode icon
- ⑥ Transmission mode display: "HD" (High Definition Audio) or "LR" (Long Range Audio)


Condenser microphones for SK 9000 bodypack transmitter

Microphone	Pick-up pattern
MKE 1	omni-directional
MKE 2	cardioid
ME 102	omni-directional
ME 104	cardioid
ME 105	super-cardioid
HSP 2	omni-directional
HSP 4	cardioid

Sennheiser CI 1-4 line/instrument cable

¼" (6.3 mm) jack plug (silent plug) to 3-pin special audio connector

Preparing the SK 9000 for use

 For detailed information on the following points, refer to the instruction manual for the Digital 9000 system.

Selecting the accupack/battery pack

You can power the SK 9000 bodypack transmitter using:

- the BA 61 accupack
- the B 61 battery pack for three 1.5 V AA size batteries



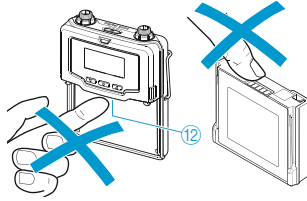
Charge the BA 61 accupack before using it for the first time (see the instruction manual for the Digital 9000 system).

CAUTION!

Damage to the bodypack transmitter and/or the accupack/battery pack

If you touch the following contacts, they can become dirty or damaged:

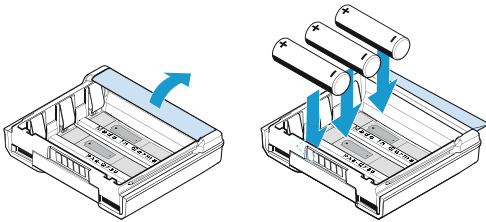
- Contacts for supply voltage and data contacts ⑫ of the bodypack transmitter
- Charging and data contacts of the BA 61 accupack
- Data contacts of the B 61 battery pack



▶ Do not touch the contacts of the accupack/battery pack nor the contacts of the bodypack transmitter.

Inserting batteries into the B 61 battery pack

▶ Insert the batteries into the battery pack (see diagram). Observe correct polarity when inserting the batteries.

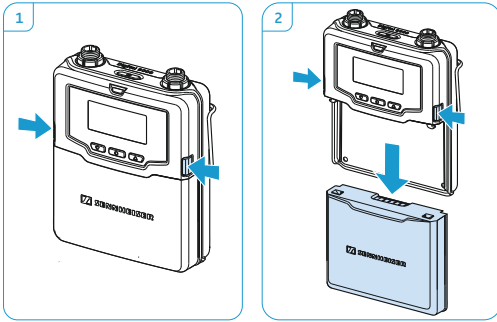


Only insert high-quality AA size batteries (e.g. lithium or alkaline batteries) into the B 61 battery pack. If you insert rechargeable batteries, the charge status display ① will show a wrong value.

Removing and attaching the accupack/battery pack

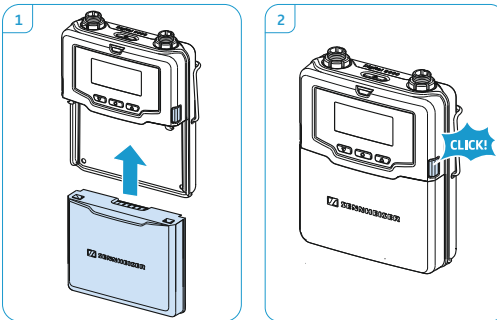
To **remove** the accupack/battery pack:

- ▶ Push the two catches ⑨ and pull the accupack/battery pack away from the bodypack transmitter as shown in diagram 2.



To **attach** the accupack/battery pack:

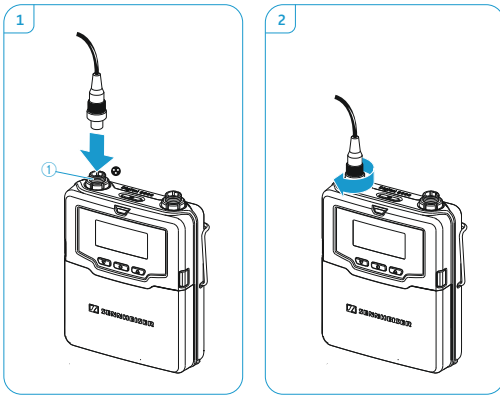
- ▶ Slide the accupack/battery pack onto the guide rails ⑪ (see diagram 1) until it locks into place with an audible click. The bodypack transmitter is then operational.



Connecting microphones and audio sources

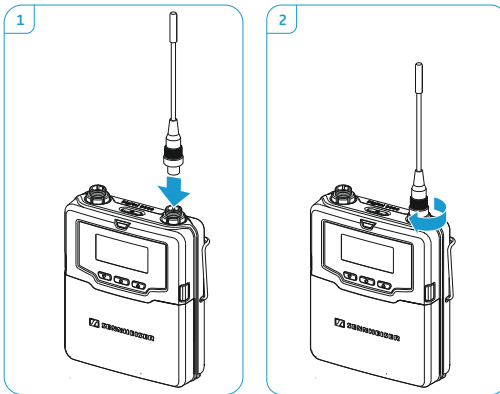
- ▶ Connect the 3-pin special audio connector of the Sennheiser microphone or the Sennheiser CI 1-4 line/instrument cable to the 3-pin special audio socket ①.

- ▶ Lock the 3-pin special audio connector by screwing down the coupling ring.



Connecting the antenna

- ▶ Only use the supplied antenna.
- ▶ Connect the antenna as shown:



Connecting the KA 9000 COM command adapter

- ▶ Connect the 3-pin special audio connector of the KA 9000 COM to the 3-pin special audio socket ① of the SK 9000.
- ▶ Connect the 3-pin special audio connector of the Sennheiser instrument cable to the microphone input socket of the KA 9000 COM.

Using the SK 9000

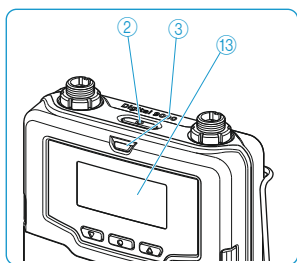
i Before using your bodypack transmitter, ask the relevant wireless regulatory authority for the exact frequency allocations and apply for an individual license if necessary.

The supplied supplement “Framework requirements and restrictions on frequency usage” provides an overview of the different European framework requirements and restrictions on frequency usage. If there is no entry in the supplement, ask the relevant wireless regulatory authority for the current rules governing frequency usage.

i We recommend you to adjust the transmitter settings via the operating menu of the EM 9046 receiver and then to synchronize the transmitter and the receiver.

Switching the SK 9000 on/off

To switch your bodypack transmitter **on**:




▶ Keep the **ON/OFF** button  ② pressed until the Sennheiser logo appears on the display panel ⑬.






The **ON** LED ③ lights up and the selected standard display (here: “Frequency”, see page 16) appears on the display panel ⑬. The bodypack transmitter transmits an RF signal and the transmission mode display “HD”/“LR” lights up constantly:



To switch your bodypack transmitter **off**:


- ▶ Keep the **ON/OFF** button  ② pressed until the display panel goes off.
- ▶ Remove the accupack/battery pack when the transmitter will not be used for extended periods of time (see page 8).

To switch your bodypack transmitter **off** with **the lock mode activated**:

- ▶ Press the **ON/OFF** button  ② while the standard display is shown.
“**LOCK**” appears on the display panel because the lock mode is activated.
- ▶ Press the **UP** button  ⑧ or the **DOWN** button  ⑥.
- ▶ Press the **SET** button  ⑦.
The lock mode is temporarily deactivated, the lock mode icon ⑤ flashes.
- ▶ Within the next 2 seconds, press the **ON/OFF** button  ② and keep it pressed until the display panel goes off.
If you switch on the SK 9000, the lock mode is activated again.





Switching on the SK 9000 on and checking the set frequency before the RF signal is activated

- ▶ Switch on the SK 9000 by keeping the **ON/OFF** button  ② pressed until the “**Name**” standard display appears.
The RF signal is not activated and the transmission mode display “**HD**”/“**LR**” flashes.

If you call up the “**Tune**” or “**Preset**” menu item within the next 10 seconds, the RF signal remains deactivated until you exit the menu item. If you do not call up one of the mentioned menu items, the RF signal is automatically activated after 10 seconds.

To check the set frequency/the selected frequency preset:

- ▶ Call up the operating menu and press the **UP** button  ⑧ / **DOWN** button  ⑥ until the “**Tune**” or “**Preset**” menu item appears.
The set frequency/the selected frequency preset is displayed.

If the displayed value is the desired one:

- ▶ Wait for 10 seconds to pass.
The RF signal is automatically activated and the transmission mode display “**HD**”/“**LR**” lights up constantly.



If the displayed value is **not** the desired one:



- ▶ Call up the “**Tune**” or “**Preset**” menu item.
The RF signal remains deactivated until you exit the menu item.
- ▶ Set the frequency (menu item “**Tune**”) or select a frequency preset (menu item “**Preset**”) and store your setting.
The RF signal is activated and the bodypack transmitter transmits an RF signal on the set frequency.

Activating/deactivating the automatic lock mode (Autolock)

The bodypack transmitter has an automatic lock mode that can be activated or deactivated via the "LOCK" menu item (see page 16).

To **permanently** activate the automatic lock mode:

- ▶ Call up the "LOCK" menu item and select "On".
- ▶ Store your setting by pressing the SET button  ⑦.
The automatic lock mode is permanently activated and the lock mode icon  lights up constantly.




When the automatic lock mode is activated, you can still call up the operating menu and use the UP button  ⑧/DOWN button  ⑥ to select menu items (read-only function). You can also call up the "LOCK" menu item in order to deactivate the automatic lock mode. If, however, you try to call up any other menu item, the following display appears on the display panel:



While this display is shown (about 2 seconds), you can **temporarily** deactivate the lock mode:


- ▶ Press the UP button  ⑧ or the DOWN button  ⑥.
The following display appears on the display panel:



- ▶ Press the SET button  ⑦.
The lock mode is temporarily deactivated. The lock mode icon  flashes.
 - If you do not press a button, the lock mode is activated again after 2 seconds. The lock mode icon  lights up constantly again.
 - If you continue navigating the operating menu or if you call up a menu item, the lock mode is activated 2 seconds after the last button press.
 - If you exit a called up menu item, the lock mode is activated immediately after exiting the menu item.

To **permanently** deactivate the automatic lock mode:









- ▶ Call up the "LOCK" menu item and select "Off".




- ▶ Store your setting by pressing the **SET** button  ⑦.
The automatic lock mode is permanently deactivated. The lock mode icon ⑤ goes off.

Basic functions of the Sennheiser operating menu





A special feature of the Sennheiser 9000 series is the straightforward, intuitive operating concept. As a result, you can act quickly and precisely – even in stressful situations, for example on stage or during a live show or presentation.



Calling up and selecting menu items, changing and storing settings, cancelling an entry

Button	Operation
UP  / DOWN  / SET 	<ul style="list-style-type: none"> ▶ Press the SET button  to call up the operating menu or a menu item, to switch between the selection areas of a menu item and to store your settings. ▶ Press the UP button  /DOWN button  to select menu items and to change the settings of a menu item.
ON/OFF 	▶ Press the ON/OFF button  to exit a menu item without storing your settings or to change from the operating menu to the standard display.













-  When keeping the **UP** button  /**DOWN** button  pressed within a menu item, you continuously adjust the next/previous setting of the menu item. Keep the buttons pressed for a longer time to accelerate the speed.

Overview of the status displays

Status display	Meaning
	SK 9000 switches on
	SK 9000 switches off
	BA/B 61 accupack/battery pack: charge status $\leq 100\%$ $\leq 70\%$ $\leq 30\%$ BA 61 accupack: remaining operating time in h:mm
	Accupack/battery pack is completely discharged, transmitter is not operational

Status display	Meaning
	Setting is being stored
	Firmware is being updated
	Firmware update has failed

Overview of the menu items

Icon	Name	Function	Page
	Tune	Sets a frequency	15
	Preset	Selects a frequency preset	15
	Name	Enters a name	15
	Gain	Adjusts the input gain	15
	Low cut	Sets the low-cut filter	16
	RF mode	Adjusts the transmission mode	16
	Display	Selects a standard display	16
	Cable	Emulates different instrument cable lengths	16
	Lock	Activates/deactivates the lock mode	16
	Test tone	Activates the test tone for level matching the system and for the walk test	16
	Reset	Resets the factory default settings	16
	Information	Displays the firmware version and frequency range	17

“Tune” – Setting a frequency

Via the “Tune” menu item, you can set a frequency. The frequencies are tuneable in 25 kHz steps. If you store your setting, the set frequency is automatically assigned to the user-defined frequency preset “U”. The bodypack transmitter then changes from the currently set frequency preset to the frequency preset “U” and transmits on the set frequency.

“Preset” – Selecting a frequency preset

Via the “Preset” menu item, you can select a frequency preset from the active booster frequency range or the frequency preset “U” (see also the “Tune” menu item).



To activate a different booster frequency range:

- ▶ Proceed as described in the instruction manual for the Digital 9000 system. You first activate the booster frequency range on the EM 9046. If you then synchronize the transmitter and the receiver, the booster frequency range on the transmitter will also be activated.

“Name” – Entering a name

Via the “Name” menu item, you can enter a freely selectable name for the bodypack transmitter. The name can consist of up to 6 characters from the following character set:

```
'+' ',' '-' '|' '/' '0' '1' '2' '3' '4' '5' '6' '7' '8' '9' '*' ';' '<' '=' '>'
'space' '#' 'A' 'B' 'C' 'D' 'E' 'F' 'G' 'H' 'I' 'J' 'K' 'L' 'M' 'N' 'O' 'P'
'Q' 'R' 'S' 'T' 'U' 'V' 'W' 'X' 'Y' 'Z'
```

“Gain” – Adjusting the input gain

Via the “Gain” menu item, you can adjust the input gain in 3 dB steps from –6 to +42 dB.

“Low cut” – Setting the low-cut filter

Via the “Low cut” menu item, you can set the low-cut filter. When you are using Sennheiser microphones or the Sennheiser CI 1-4 line/instrument cable, the bodypack transmitter automatically detects the type of input signal present and changes the possible settings of the “Low cut” menu item accordingly:

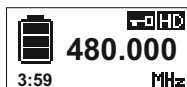
Cable type	Settings
Sennheiser microphone cable	“60 Hz”, “80 Hz”, “100 Hz”, “120 Hz”
Sennheiser CI 1-4 line/instrument cable	“30 Hz”

“RF mode” – Adjusting the transmission mode

The “RF mode” menu item allows you to adjust the transmission mode (see the instruction manual for the Digital 9000 system).

“Display” – Selecting a standard display

The “Display” menu item allows you to select one out of 3 standard displays.



Frequency



Preset



Name

“Cable” – Emulating instrument cable lengths

Via the “Cable” menu item, you can emulate the lengths of instrument cables in 3 steps. You can use this function when you are using the Sennheiser CI 1-4 line/instrument cable.

“Lock” – Activating/deactivating the lock mode

Via the “Lock” menu item, you can activate or deactivate the lock mode. For more information on how to activate or deactivate the lock mode, refer to page 12.

“Test tone” – Activating the 1 kHz test tone

Via the “Test tone” menu item, you can activate a 1 kHz test tone. This test tone is transmitted instead of the input signal. You can use this function for level matching your system or for the walk test.

“Reset” – Resetting the factory default settings

Via the “Reset” menu item, you can reset the bodypack transmitter to its factory default settings.

“Information” – Displaying the firmware version and frequency range

Via the “Information” menu item, you can display the firmware version and the transmitter’s frequency range.

Cleaning and maintaining the SK 9000

CAUTION!

Liquids can damage the electronics of the devices!

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

- ▶ Keep all liquids away from the devices.
 - ▶ Do not use any solvents or cleansing agents.
-
- ▶ Remove the rechargeable batteries or batteries before cleaning.
 - ▶ Only use a soft, dry cloth to clean the bodypack transmitter.
 - ▶ Wipe the contacts ⑫ with a dry cloth.

If a problem occurs ...

Problem	Possible cause	Possible solution
Transmitter cannot be operated, "LOCK" appears on the display panel	Lock mode is activated	Deactivate the lock mode.
No operation indication	Batteries are flat or accupack is flat	Replace the batteries or recharge the accupack (see page 8).
No RF signal at the receiver	Transmitter and receiver are not on the same frequency	Transmitter to the same frequency as the receiver.
	Transmission range is exceeded	Reduce the distance between transmitter and receiving antennas.
	Transmitter's RF signal is deactivated ("RF Mute")	Activate the RF signal.
Audio signal has a high level of background noise or is distorted	Transmitter input gain is adjusted too low/too high	Adjust the input gain (see page 15).

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.com under "Service & Support".

Specifications

System characteristics

Frequency ranges	470 to 798 MHz, divided into 24 MHz booster frequency ranges		
	EM 9046 DRX	TX variant	Booster variant A1–A8
	470–798 MHz (expandable to 934 MHz)	A1–A4	A1 470–494 MHz
		558 MHz	A2 494–518 MHz
			A3 510–534 MHz
			A4 534–558 MHz
			A5–A8
		550– 638 MHz	A6 574–598 MHz
			A7 590–614 MHz
			A8 614–638 MHz
	EM 9046 DRX	TX variant	Booster variant B1–B8
	470–798 MHz (expandable to 934 MHz)	B1–B4	B1 630–654 MHz
		630– 718 MHz	B2 654–678 MHz
			B3 670–694 MHz
			B4 694–718 MHz
			B5–B8
		710– 798 MHz	B6 734–758 MHz
			B7 750–774 MHz
			B8 774–798 MHz
Transmission method	digital modulation “HD” mode: without audio data compression “LR” mode: SeDAC (Sennheiser Digital Audio Codec)		
Audio frequency response	30 Hz to 20 kHz (3 dB) with SK 9000 line-in 30 Hz to 20 kHz (3 dB) with SK 9000 mic		
Dynamic range	“HD” mode: 112 dB(A) “LR” mode: 101 dB(A)		

Specifications

Latency	Analog Audio Out: 3.2 ms Digital Audio Out: 3 ms (AES/EBU)
THD	"HD" mode: < 0.01% (at 1 kHz) "LR" mode: < 0.03% (at 1 kHz)

Operating conditions

Ambient temperature	-10°C to +50°C
Relative humidity	max. 85% at 40°C (non-condensing)
Protection against dripping and light splashing of liquids	the product must not be exposed to dripping and splashing (IP2X)

Storage and transport conditions

Ambient temperature	-25°C to +70°C
Relative humidity	max. 90% at 40°C
Protection against dripping and light splashing of liquids	the product must not be exposed to dripping and splashing (IP2X)
Shock resistance	as per IEC 68 or EN 60068, T2-27

SK 9000 characteristics

RF characteristics

Frequency ranges	470 MHz to 798 MHz, divided into 4 ranges: SK 9000 A1-A4: 470-558 MHz SK 9000 A5-A8: 550-638 MHz SK 9000 B1-B4: 630-718 MHz SK 9000 B5-B8: 710-798 MHz (see also table "System characteristics" on page 19)
Frequency ranges USA	550 MHz to 718 MHz, divided into 2 ranges: SK 9000 A5-A8: 550-638 MHz SK 9000 B1-B4: 630-718 MHz
Switching bandwidth	88 MHz

RF output power	“HD” mode: 10 mW rms, 50 mW peak “LR” mode: 25 mW rms, 50 mW peak
Frequency stability	< 5 ppm
Tuneability	in steps of 25 kHz
Antenna output	coax socket, 50 Ω

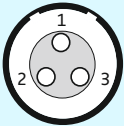
AF characteristics

Mic/line input	3-pin special audio socket
Audio gain	mic: adjustable in 3 dB steps from 0 dB to +42 dB instruments: adjustable in 3 dB steps from -6 dB to +42 dB line: adjustable in 3 dB steps from -6 dB to +42 dB
Input impedance	mic: 22 k Ω instruments/line: 1 M Ω
Lower cut-off frequency (-3 dB)	mic: adjustable 30 Hz, 60 Hz, 80 Hz, 100 Hz, 120 Hz instruments/line: adjustable 30 Hz, 60 Hz, 80 Hz, 100 Hz, 120 Hz
Instrument cable emulation	cable length adjustable in 3 steps

Other characteristics

Operating time	6.5 hrs (with BA 61 accupack)
Power consumption	approx. 1 W
Dimensions	76 x 62 x 20 mm (H x W x D, with BA 61 accupack)
Weight	approx. 147 g (with BA 61 accupack and belt clip)

Pin assignment of 3-pin special audio socket

Socket	Pin assignment
	Pin 1 and thread: ground Pin 2: line/instrument Pin 3: microphone

In compliance with

Europe



EMC EN 301489-1/-9
Radio EN 300422-1/-2
Safety EN 60065
EN 62311 (SAR)

Approved by

USA

FC Part 74
FCC-ID: DMOSK9000
limited to 698 MHz

Canada

Industry Canada RSS-123
IC: 2099A-SK9000
limited to 698 MHz

Brazil

QUANTA BRASIL IMPORTAÇÃO E EXPORTAÇÃO LTDA. 0927-15-7356



0927-15-7356



(78)989-45 108980

EUROBRAS FILM PRODUÇÕES CINEMATOGRAFICAS LTDA. 1350-15-7356



1350-15-7356



(78)98465 470 15 4



Sennheiser electronic GmbH & Co. KG

Am Labor 1, 30900 Wedemark, Germany
www.sennheiser.com

Publ. 06/17, 547017