

# SZI 1029

## IR Audio Transmission Technology | Modulators/Radiators

### General Description

The SZI 1029 is a 5-W high-power radiator for use with all wideband and narrow-band modulators. The radiator is automatically switched on by the RF carrier and can cover areas of up to 800 m<sup>2</sup> in single-channel operation. High-quality GaAlAs transmitting diodes have been arranged in 12 independent groups to ensure reliable transmission. A malfunction indicator is triggered when the radiating power is reduced by more than 30 %.



### Technical Data

IR diodes.....	132 GaAlAs
Average radiating power .....	5 W
Operating voltage.....	85 – 260 V, 50 – 60 Hz
Current consumption	
– operation.....	350 mA (120 V: 610 mA)
– stand-by .....	50 mA
RF input .....	BNC socket
Input impedance .....	appx. 5 kΩ
Max. coverage area.....	appx. 800 m <sup>2</sup> (2626.87 sq ft)
Threshold voltage for automatic on/off function.....	50 mV (RF signal)
RF output .....	BNC socket
Weight .....	appx. 2.1 kg (4.64 lbs)

### Features

- High-power radiator with a maximum coverage area of 800 m<sup>2</sup> (2626.87 sq ft)
- RF output for connecting additional radiators
- Automatic on/off function
- Versatile installation due to 5/8", 3/8" and 1/2" threads
- Excellent reliability due to 12 independent groups of transmitting diodes and malfunction indicator
- Delivery includes: 1 radiator  
1 mains cable

### Recommended Accessories

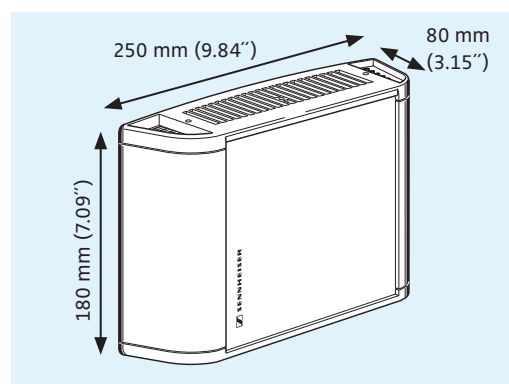
- BNC-BNC co-axial cable  
GZA 1019 A 1 (1 m/3.28 ft)  
GZA 1019 A 5 (5 m/16.40 ft)  
GZA 1019 A 10 (10 m/32.81 ft)
- GZV 1019 A BNC coupler
- GZP 10 mounting plate
- GZG 1029 swivel joint
- MZT 100 anti-vibration table stand

Cat. No. 002324  
Cat. No. 002325  
Cat. No. 002326  
Cat. No. 002368  
Cat. No. 003193  
Cat. No. 003226  
Cat. No. 001883

### Product Variants

- SZI 1029-EU: High-power radiator, Euro mains cable, 5 W radiating power, black housing
- SZI 1029-UK: as SZI 1029-EU, but with UK mains cable
- SZI 1029-120: as SZI 1029-EU, but with USA mains cable
- SZI 1029-EU-W: as SZI 1029-EU, but with white housing
- SZI 1029-24: as SZI 1029-EU, but with operating voltage of 24 V DC

Cat. No. 003664  
Cat. No. 004077  
Cat. No. 004078  
Cat. No. 004076  
Cat. No. 004100



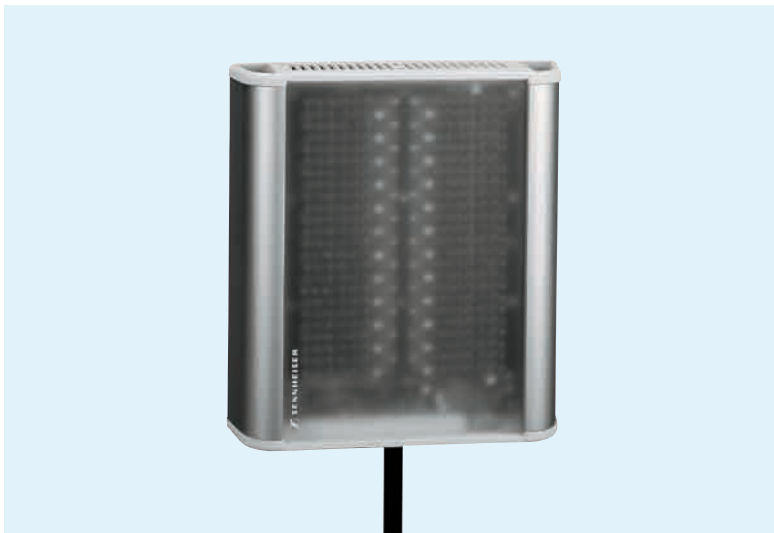
Dimensions of the SZI 1029

# SZI 1029-10

## IR Audio Transmission Technology | Modulators/Radiators

### General Description

With a radiating power of 10 W, the SZI 1029-10 is the most powerful Sennheiser radiator. Like the SZI 1029, it is fitted with an automatic on/off function, independent diode groups and a malfunction indicator – but with twice the amount of IR diodes, the SZI 1029-10 is able to cover areas of up to 1,600 m<sup>2</sup> (5253.33 sq ft) in single-channel operation.



### Technical Data

IR diodes.....	264 GaAlAs
Average radiating power .....	10 W
Operating voltage.....	170 – 260 V, 50 – 60 Hz
Current consumption	
– operation.....	700 mA (120 V: 1 A)
– stand-by .....	50 mA
RF input .....	BNC socket
Input impedance .....	appx. 5 kΩ
Max. coverage area.....	appx. 1,600 m <sup>2</sup> (5253.33 sq ft)
Threshold voltage for automatic on/off function.....	50 mV (RF signal)
RF output .....	BNC socket
Weight .....	appx. 3.0 kg (6.62 lbs)

### Features

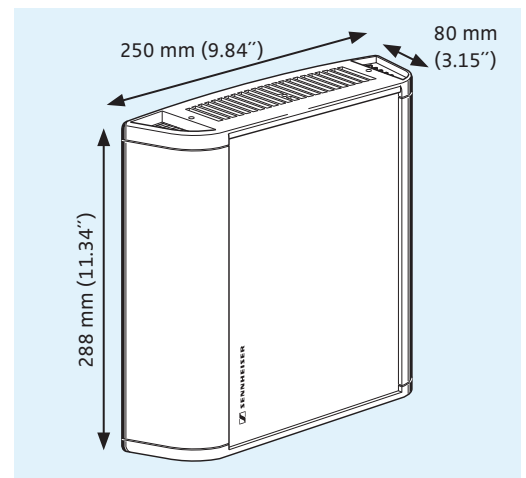
- High-power radiator with a maximum coverage area of 1,600 m<sup>2</sup> (5253.33 sq ft)
- RF output for connecting additional radiators
- Automatic on/off function
- Versatile installation due to 5/8", 3/8" and 1/2" threads
- Excellent reliability due to 12 independent groups of transmitting diodes and malfunction indicator
- Delivery includes: 1 radiator  
1 mains cable

### Recommended Accessories

- |                                      |                 |
|--------------------------------------|-----------------|
| ■ BNC-BNC co-axial cable             | Cat. No. 002324 |
| GZA 1019 A 1 (1 m/3.28 ft)           | Cat. No. 002325 |
| GZA 1019 A 5 (5 m/16.40 ft)          | Cat. No. 002326 |
| GZA 1019 A 10 (10 m/32.81 ft)        | Cat. No. 002368 |
| ■ GZV 1019 A BNC coupler             | Cat. No. 003193 |
| ■ GZP 10 mounting plate              | Cat. No. 003226 |
| ■ GZG 1029 swivel joint              | Cat. No. 001883 |
| ■ MZT 100 anti-vibration table stand |                 |

### Product Variants

- |   |                 |
|---|-----------------|
| ■ SZI 1029-10-EU: high-power radiator, Euro mains cable, 10 W radiating power, white housing    | Cat. No. 004005 |
| ■ SZI 1029-10-120: as SZI 1029-10-EU, but with USA mains cable and 90 – 130 V operating voltage | Cat. No. 004006 |



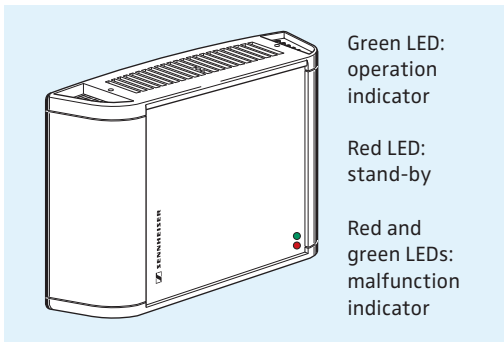
Dimensions of the SZI 1029-10

# SZI 1029

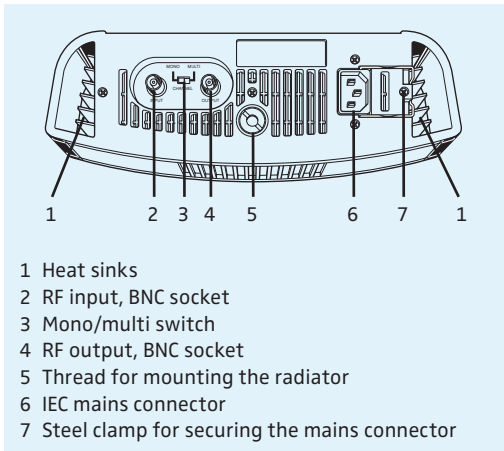
## IR Audio Transmission Technology | Modulators/Radiators



SZI 1029 radiator



LED indicators of the SZI 1029



Bottom view of the SZI 1029 with sockets and controls

### SZI 1029

The SZI 1029 is a high-power radiator for wideband or narrow-band signals from any modulator. Its mains unit automatically adapts to mains voltages of 85 – 265 V and mains frequencies between 50 and 60 Hz, the individual product variants only differing in the type of mains cable supplied. The only exception is the SZI 1029-24 which operates on 24 V DC. For 24-V equipment, mains voltage regulations are no longer applicable, thus making installations by audio-visual companies much easier.

All controls and connectors of the SZI 1029 are on the base. A 5/8" thread with an adaptor for conversion to 3/8" and 1/2" threads makes for versatile mounting. If the radiator is to be stand-mounted, its cables are guided unobtrusively down the stand. For ceiling mounting, the SZI 1029 is simply turned upside down (the bottom faces the ceiling) and the cables are guided along the ceiling.

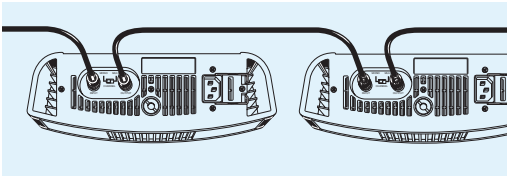
The 132 IR diodes of the SZI 1029 are arranged in independent groups of eleven. The operational status of the diodes and the radiator is indicated by a green and a red LED at the front. If only the red LED is lit, the radiator is in stand-by mode and a mains voltage is present, but there is no RF carrier. If only the green LED is lit, the radiator is operating and transmitting an IR signal. The radiator switches on automatically as soon as it receives an RF signal of at least 50 mV. When the RF signal is no longer present, the radiator switches back to stand-by. If both the red and the green LED are lit, the radiator indicates a malfunction: more than four diode groups fail to operate. The radiator will continue to operate at a reduced radiating power but it should be repaired as soon as possible.

The sockets and controls are on the base of the SZI 1029 (see diagram on the left). On each side, the radiator is fitted with a heat sink. When installing the radiator, care should be taken that these sinks are not covered and that the radiator is not mounted horizontally. The optimum position is vertical or almost vertical so that air can circulate freely through the cooling fins and heat is dissipated quickly. The modulator signal is fed to the BNC RF input. An automatic modulation control compensates for cable losses and ensures an optimum modulation level for the IR diodes. At the RF output socket (BNC) the signal can be daisy-chained to additional radiators.

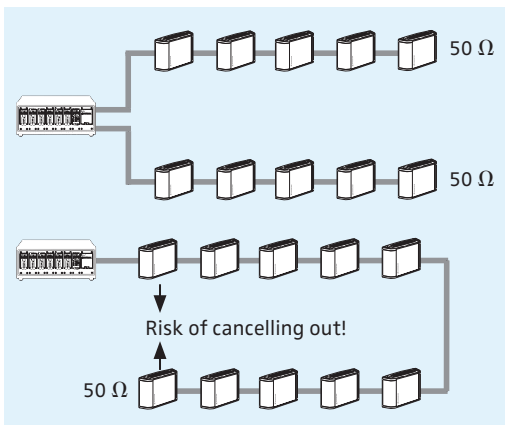
The mono/multi switch increases the radiating power by 3 dB when set to "mono". Thus, the coverage area is appx. 50 % larger, but at the same time, the THD becomes greater, which would lead to interference with higher channels in multi-channel operation. For this reason, you should only switch to "mono" for single-channel applications and use the "multi" position for multi-channel operation. The SZI 1029 radiator has a 5/8" thread and is supplied with an adaptor for conversion to 3/8" or 1/2" threads. You will find suitable attachments such as mounting plates or table stands in the chapter "Accessories". The radiator's IEC mains connector can be secured by a steel clamp. The SZI 1029-24 variant is equipped with an XLR-4 connector as power supply socket.

# SZI 1029

## IR Audio Transmission Technology | Modulators/Radiators



Daisy-chaining the SZI 1029



When planning and installing an IR system you have to pay attention to use the correct terminating impedance for the radiator chains. Sennheiser IR modulators have an output impedance of appx. 50  $\Omega$ , whereas the radiators have a much higher input impedance of > 5 k $\Omega$ . This "headroom" allows you to connect many radiators without any problems. In RF transmission, the output impedance has to be terminated with approximately the same input impedance. If this is not done, reflections may occur at the end of the RF chain and disturb the transmission. So, for reasons of reliability, the end of an RF chain should always be provided with a 50- $\Omega$  terminating impedance. Please note that you should not use "T" adaptors in your RF chain as this would halve the terminating impedance.

For large installations you should use both RF outputs of the modulator and create two RF chains. This not only increases reliability but also avoids cancelling out between radiators due to time delay. Please refer to the chapter "Planning Theory" for more information on time delay and cancellations.

### SZI 1029-10

The SZI 1029-10 is Sennheiser's most powerful radiator. 264 diodes in 24 independent groups provide an average radiating power of 10 W. The SZI 1029-10 is connected and operated like the smaller SZI 1029. The radiator's higher power is a special asset when it comes to covering large halls or auditoria with high ceilings, especially when a large number of channels are used.

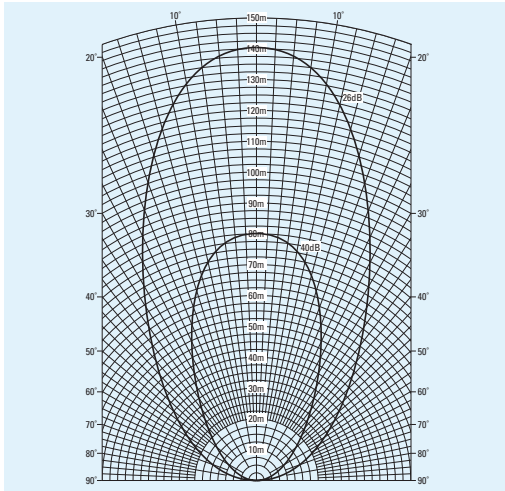
The SZI 1029-10 is also interesting for rental companies: due to the higher radiating power less radiators are required and IR systems can be set up and taken down again more quickly. Sennheiser high-power radiators are convection cooled so no cooling fans are used which could cause disturbing noises.



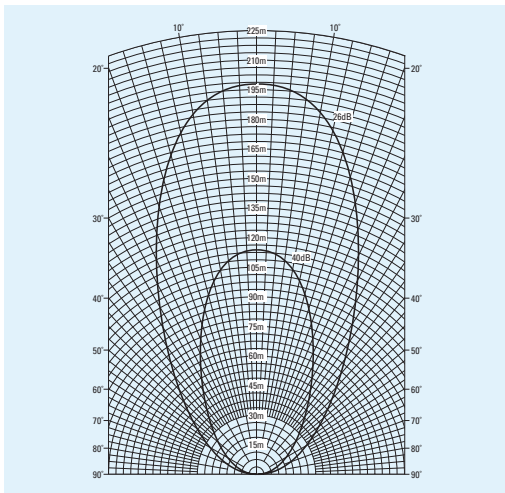
SZI 1029-10 radiator

# SZI 1029

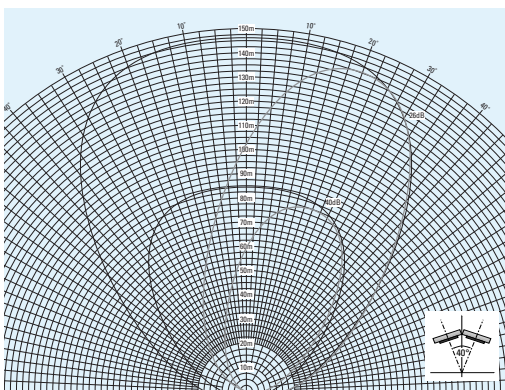
## IR Audio Transmission Technology | Modulators/Radiators



Polar diagram of the SZI 1029\*



Polar diagram of the SZI 1029-10\*



Polar diagram of two SZI 1029, mounted at an angle of 40° to each other\*

### Coverage Area and Polar Diagrams

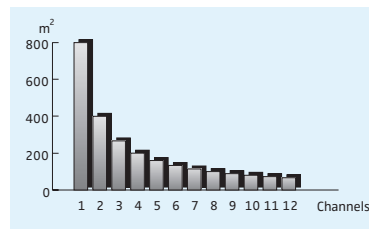
The coverage area of the SZI 1029 and SZI 1029-10 high-power radiators depends on the number of channels transmitted (see also "Multi-Channel Operation"). For single-channel applications, the coverage area is up to appx. 800 m² (2626.87 sq ft) for the SZI 1029 and up to 1,600 m² (5253.33 sq ft) for the -10 variant. The chapter "Practical Planning" has already given you some basic information on the recommended number and position of radiators. Please bear in mind that the devices radiate directionally, i.e. reception outside the radiation angle is only possible if the signal is reflected by walls and ceilings.

The polar diagram on the left is that of the SZI 1029. You can see that the signal-to-noise ratio decreases the further you go away from the radiator. Eventually, the noise becomes so loud in relation to the useful signal that the squelch in the IR receiver mutes the audio output. A signal-to-noise ratio of 26 dB (the outer characteristic in the polar diagrams) gives an intelligible but noisy signal. A signal-to-noise ratio of > 40 dB, on the other hand, ensures a clear audio signal without the annoying noise.

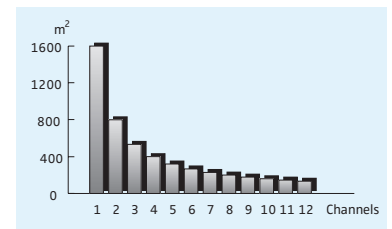
To cover a room more evenly, you can mount your radiators at one point and align them at an angle to one another. In the polar diagram on the left, two SZI 1029 have been mounted at an angle of 40° to each other. For more information on how to work with polar diagrams, please refer to the chapter on "Planning Theory".

### Multi-Channel Operation

All SZI 1029 models are suitable for multi-channel transmissions provided that a suitable modulator is used. The radiator coverage area, however, decreases proportionally with the number of channels the radiator is transmitting. If, for example, your system transmits eight narrow-band channels, the radiating power is uniformly divided between all eight channels. The coverage area is reduced to 1/8th of the area achieved in single-channel operation and a 5-W radiator, for example, will cover 100 m² (328.33 sq ft) instead of the 800 m² (2626.87 sq ft) in single-channel operation.



Coverage area of the SZI 1029



Coverage area of the SZI 1029-10

\*free field, extraneous light < 100 lx, single-channel operation