

## Connector lead with two metal rods 1017344

### Instruction manual

11/14 SD/UD



- 1 Connector lead between 1 pair of 4-mm safety plugs and a 3.5-mm jack plug
- 2 2 Metal rods with 4-mm safety sockets

### 1. Safety instructions

The connector lead is solely designed for use with microphone box 1014520 (230V) or 1014521 (115V) and microsecond counter 1017333 (230V) or 1017334 (115V). The two metal rods are exclusively for use with this connector lead.

Safe operation of both the connector lead and the metal rods is guaranteed as long as they are used as specified. Safety cannot, however, be assured if the lead or the rods are not used correctly or are treated without due care.

- The connector lead and metal rods may only be used in dry rooms.
- Do not connect anything other than the two metal rods to the 4-mm safety plugs of the connector lead.
- Do not connect anything other than the connector lead to the 4-mm safety sockets of the metal rods.
- Do not apply any external voltage to the 4-mm safety plugs of the connector lead.

### 2. Contents

- 1 Connector lead between 1 pair of 4-mm safety plugs and a 3.5-mm jack plug
- 2 Metal rods with 4-mm safety sockets

### 3. Technical data

Length of connector lead: 75 cm  
 Input: 2x 4-mm safety plugs  
 Output: 3.5-mm jack plug  
 Dimensions of metal rods: 110x10 mm  
 Overall weight: 200 g approx.

#### 4. Description

The connector lead with two metal rods is an adapter lead for connecting the two metal rods with 4-mm safety sockets to microphone box 1014520 (230V) or 1014521 (115V). For this purpose, the input is equipped with 4-mm safety plugs and the output has a 3.5-mm jack plug.

The two metal rods and the connector lead allow for simple determination of the speed of sound. This involves starting a microsecond counter connected to the first channel of the microphone box by banging the two metal rods together. A microphone probe connected to the second channel of the microphone box receives the sound pulse generated by this and immediately stops the microsecond counter. From this measurement of the time it takes the sound to arrive, along with the distance from the microphone probe at which the two rods were banged together, it is possible to determine the speed of sound.

#### 5. Disposal

- The packaging should be disposed at local recycling centres.
- If the connector lead itself is to be disposed of, it must not be included with normal household waste. It should be placed in the relevant containers for electrical refuse. The metal rods can be disposed of with normal rubbish.



#### 6. Sample experiment

##### Determining the speed of sound

Required equipment:

1 Connector lead with 2 metal rods	1017344
1 Microphone box (@230 V)	1014520
or	
1 Microphone box (@115 V)	1014521
1 Microsecond counter (@230 V)	1017333
or	
1 Microsecond counter (@115 V)	1017334
1 Microphone probe, short	4008308
2 HF leads, BNC/4-mm plugs	1002748

- Connect the 4-mm safety plugs of the connector lead to the 4-mm sockets of the metal rods.
- Connect the microphone probe to the input of microphone box channel A and the connector lead to the input of channel.
- Set the gain for the inputs to both channel to its maximum and set the outputs to trigger .
- Connect a BNC/4-mm plug adapter lead to the output of channel A. Connect the red 4-mm plug to the red 4-mm socket (Stop) of the microsecond counter. Connect the black 4-mm plug to the black 4-mm socket (ground).
- Connect the other BNC/4-mm plug adapter lead to the output of microphone box channel B. Connect the red 4-mm plug to the green socket (Start) of the microsecond counter. Connect the black 4-mm plug to the black 4-mm socket (ground).
- Connect the microphone box and the microsecond counter to their corresponding plug-in power supplies.
- Bang the two metal rods hard together at a specific distance, some 50 – 100 cm from the microphone probe.

This causes the time measurement to begin. When the sound pulse is detected by the microphone probe, the measurement is ended. The microsecond counter then displays the time it has taken the sound to travel from the rods to the microphone probe. Should the microsecond counter fail to display anything, bang the metal rods together again.

Note: once the metal rods have successfully started the timing, they must not touch again

The speed of sound can be calculated from the time it has taken the sound to travel the distance, as measured by the counter, and the chosen distance between the rods and the microphone probe.

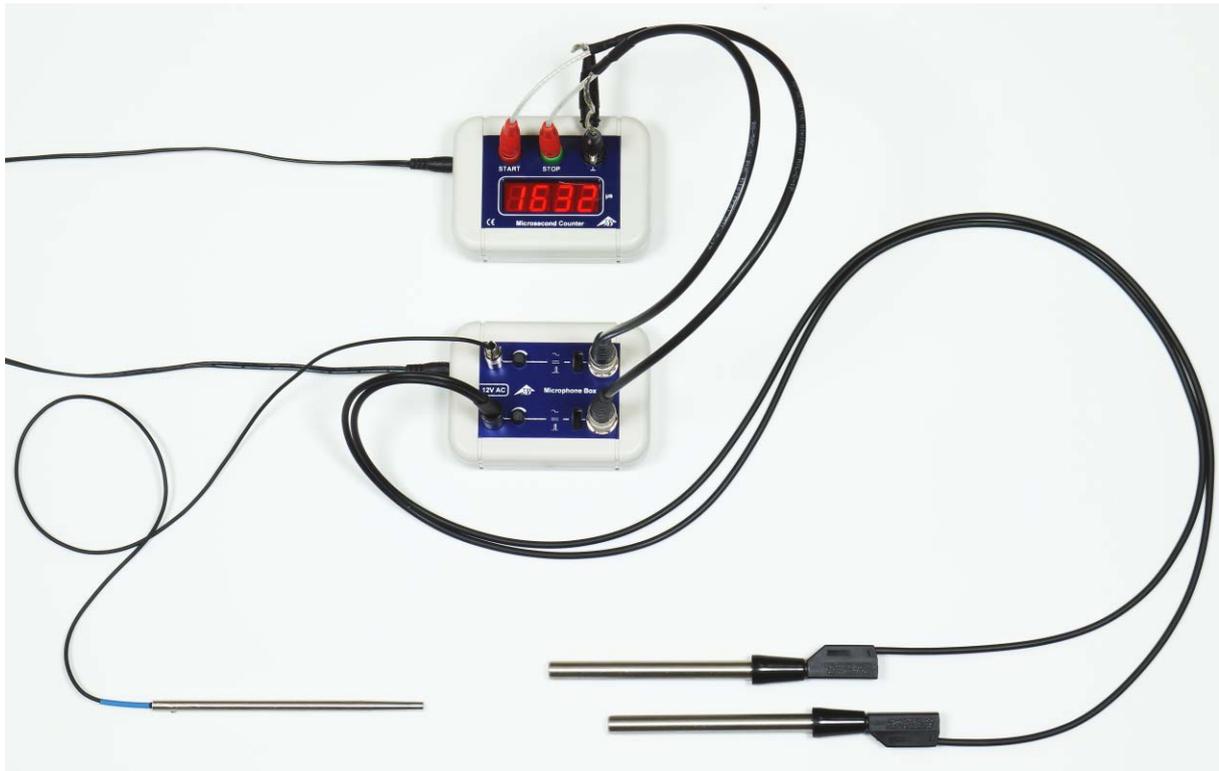


Fig. 1: Experiment set-up.

