

Son et Ultrason FR

Maquette vitesse du son FR

Sound and Ultrasound GB

Sound speed apparatus GB

Réf :
302103
302098

Français – p 1

English – p 5

Version : 7104

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Sound speed apparatus GB

1. Description



1.1 Objectives of the Apparatus

Designed and developed by Jeulin, this apparatus aims at measuring the sound speed between the following elements:

- the transmitter in the Initio® casing
- the sound level meter placed on its support.

1.2 Composition

The products ref 302098 and 302103 are composed of:

- a casing consisting of the buzzer
- a sound level meter support
- a sound level meter

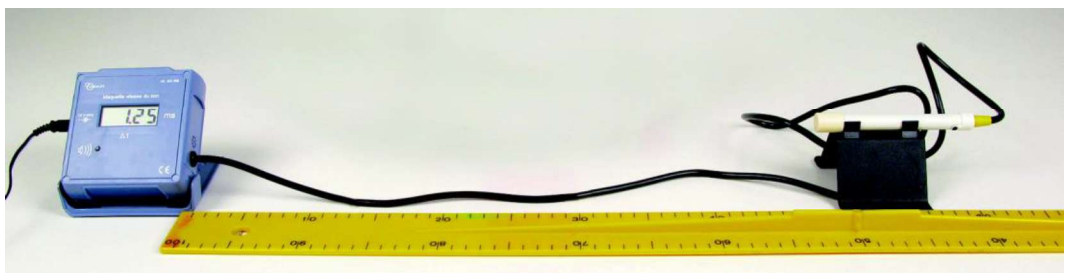
The product ref 302103 apparatus is equipped with a wireless transmitter that allows multiple users (up to 5) to connect to the apparatus simultaneously.

For more information, kindly go to «Wi-Fi Connection and Software» (See 3.1 et 3.2)

2. Non-connected Apparatus: ref 302098

Experiment: determining the sound speed

2.1 For a Given Distance



Step 1: Place the buzzer® and the sound level meter receiver as shown above. Check their alignment.

Step 2: Adjust the distance separating both elements between 50 cm and 100 cm.

Step 3: Trigger the sound emission by pressing the button



Step 4: Note the sound wave flight time using the screen.

Step 5: Conclude on the sound speed knowing this time (Δt) and the distance separating the emitter from the receiver (d) through the following equation:

$$v_{\text{sound}} = \frac{d}{\Delta t}$$

2.2 For Several Distances

- For several different distances, repeat the experiment described below from step 1 to 4 mentioned in the previous paragraph.
- Plot the curve $d = f(\Delta t)$ on a graph paper or using a spreadsheet/graph.
- Determine the slope of the curve.
- Compare it to the sound speed.

3. Connected Apparatus: 302103

3.1 Connection to a Computing Device Equipped with Wi-Fi

3.1.1 Compatible Devices

- Tablet
- Computer

3.1.2 Apparatus – Computing Device Association

Step 1: Power the apparatus with the provided power supply.

Step 2: Activate the Wi-Fi of your computing device (tablet or computer)

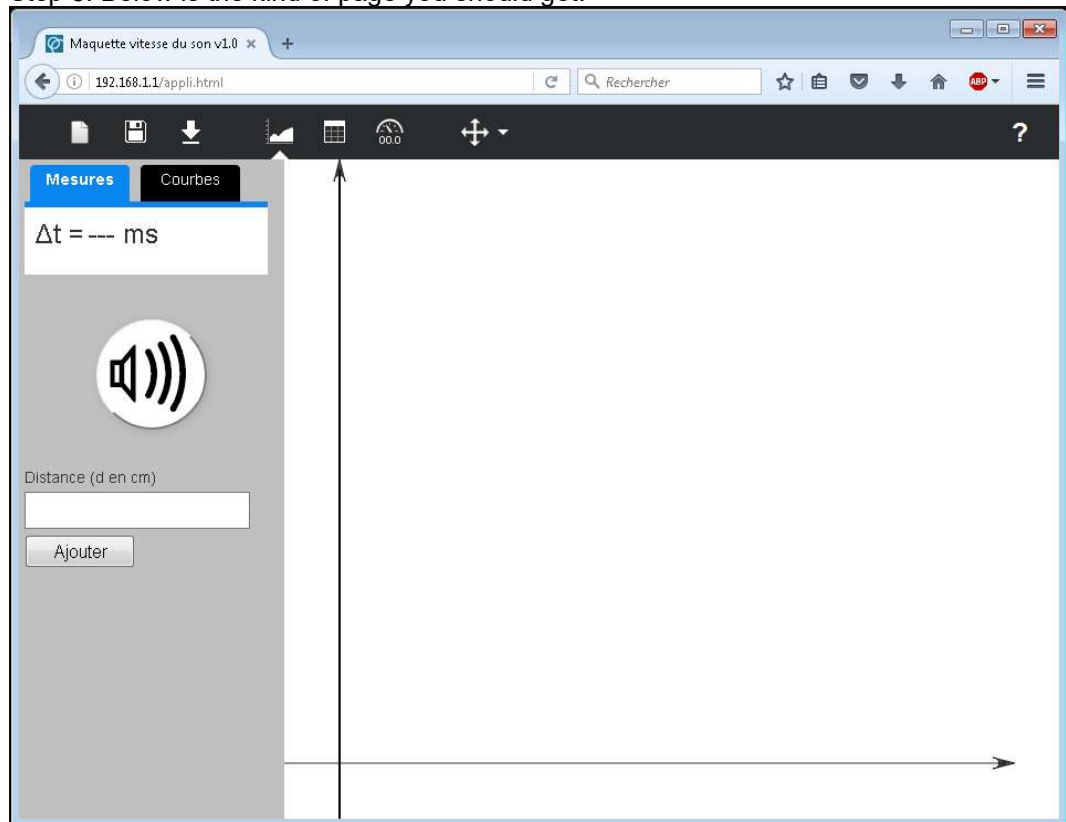
You will find at the rear of the apparatus (under the stand) the SSID information as shown below.



Step 3: From your computing device, select the network that has the same name as the SSID of your apparatus. You can connect up to 4 computing devices to each apparatus simultaneously.

Step 4: Open your internet browser and enter the URL shown on your apparatus (<http://192.168.1.1>).

Step 5: Below is the kind of page you should get:



3.2 The Software

The software consists of 3 areas.

3.2.1 Area 1: Upper Horizontal Bar

This horizontal bar consists of several icons.



In order from left to right:

- New document
- Save
- Download
- Graph => Displays the graphics area
- Spreadsheet => Displays the spreadsheet area
- Diagram => Displays a diagram
- Drop-down menu for setting up axes and functions such as the linear regression.

3.2.2 Area 2: Side Menu

In the side menu, the experimenter can activate the connected sound speed apparatus buzzer (302103).

The experimenter will be able to note the distance separating the emitter from the receiver and, thus, point by point, observe the flight time evolution.

This observation will be made either in the "diagram" menu (see above) or in the "graphic" menu (see above).



3.2.3 Area 3: Graphic

The axes adjustment standard functions are available in this area.

3.3 Experiment: Determining the Sound Speed

The experiment becomes more recreational when using this connected apparatus. The students obtain the results without having to reinvest the graph plotting skills.

Therefore, they focus on analyzing the results.

Conducting this experiment requires referring to the experimental guidelines given in Chapter 2.

4. After-sales service

The device is under a 2-year guarantee.

For any repairs, adjustments or spare parts please contact:

JEULIN – TECHNICAL SUPPORT
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