

Interference of ultrasonic waves by a Lloyd mirror 1.5.20-00

NEW

- What you can learn about ...
- Longitudinal waves
 - Superposition of waves
 - Reflection of longitudinal waves
 - Interference

Principle:

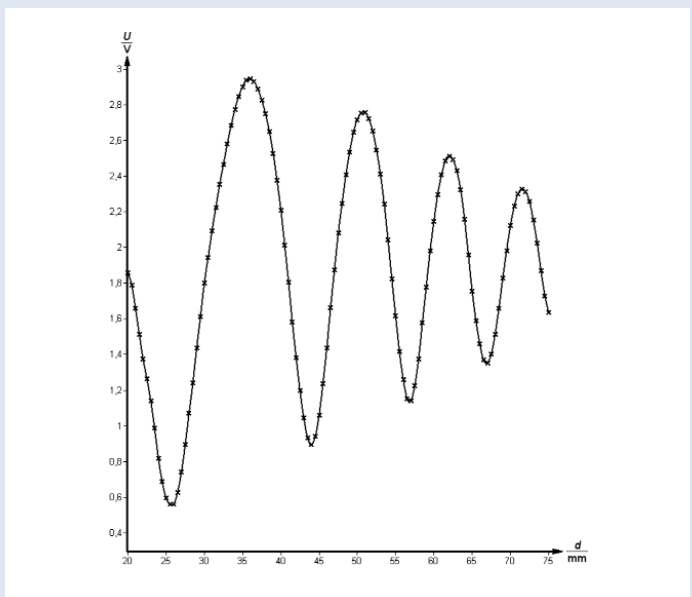
A partial packet of radiation passes directly from a fixed ultrasonic transmitter to a fixed ultrasonic receiver. A further partial packet hits against a metal screen that is positioned parallel to the connecting line between the transmitter and receiver, and is reflected in the direction of the receiver. The two packets of radiation interfere with each other at the receiver. When the reflector is moved parallel to itself, the difference in the path lengths of the two packets changes. According to this difference, either constructive or destructive interference occurs.



What you need:

Ultrasound operation unit	13900.00	1
Power supply 5 VDC/2.4 A with DC-socket 2.1 mm	13900.99	1
Ultrasonic transmitter	13901.00	1
Ultrasonic receiver on stem	13902.00	1
Digital multimeter 2010	07128.00	1
Optical profile bench, $l = 600$ mm	08283.00	1
Base for optical profile bench, adjustable	08284.00	2
Slide mount for optical profil bench, $h = 80$ mm	08286.02	2
Slide mount	08286.00	1
Sliding device, horizontal	08713.00	1
Swinging arm	08256.00	1
Screen, metal, 300 mm x 300 mm	08062.00	1
Measuring tape, $l = 2$ m	09936.00	1
Connecting cable, 4 mm plug, 32 A, red, $l = 50$ cm	07361.01	1
Connecting cable, 4 mm plug, 32 A, blue, $l = 50$ cm	07361.04	1

Complete Equipment Set, Manual on CD-ROM included
Interference of ultrasonic waves
by a Lloyd mirror **P2152000**



The received signal as a function of the reflector distance d .

Tasks:

1. The sliding device is to be used to move the reflector screen positioned parallel to the connecting line between the transmitter and receiver parallel to itself in steps of $d = (0.5-1)$ mm. The reflector voltage U is to be recorded at each step.
2. The d values of the various maxima and minima are to be determined from the $U = U(d)$ graph and compared with the theoretically expected values.