

## 1.5.21-15 Determination of the velocity of sound (sonar principle)



## What you can learn about ...

- Longitudinal waves
- Sound pressure
- Phase- and group velocity
- Sonar principle

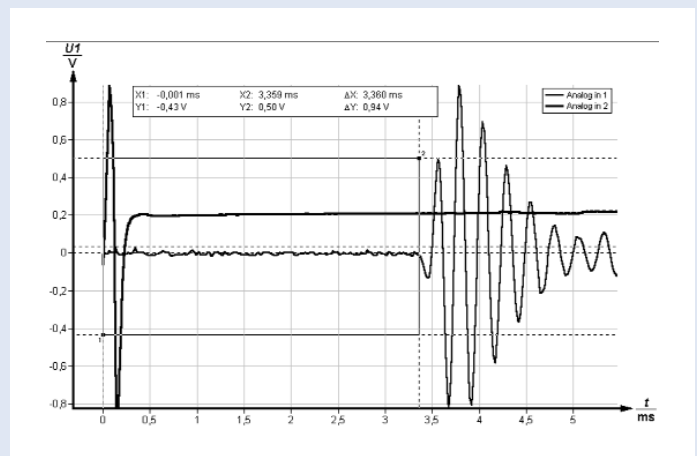
## Principle:

An ultrasonic transmitter emits sound pulses onto a reflector, from which recording of them by a receiver shows a time delay. The velocity of sound is calculated from the path length and transmission time of the sound pulses.

## 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
Cobra3 BASIC-UNIT	12150.00	1
Power supply 12V/2A	12151.99	1
Data cable 2 x SUB-D, plug/socket, 9 pole	14602.00	1
Barrel base -PASS-	02006.55	3
Screen, metal, 300 mm x 300 mm	08062.00	1
Measuring tape, $l = 2$ m	09936.00	1
Meter Scale, $l = 1000 \times 27$ mm	03001.00	1
Screened cable, BNC, $l = 750$ mm	07542.11	2
Adapter BNC socket/4 mm plug pair	07542.27	2
Software Cobra3 Universal recorder	14504.61	1
PC, Windows® 95 or higher		

**Complete Equipment Set, Manual on CD-ROM included**  
**Determination of the velocity of sound**  
**(sonar principle)** P2152115



Measured time between the transmitted and the received reflected ultrasonic waves.

## Tasks:

1. Determine transmission times for different distances apart of the transmitter and the receiver.
2. Plot a graph of the path lengths of the sound pulses against their transmission time.
3. Determine the velocity of sound from the graph.