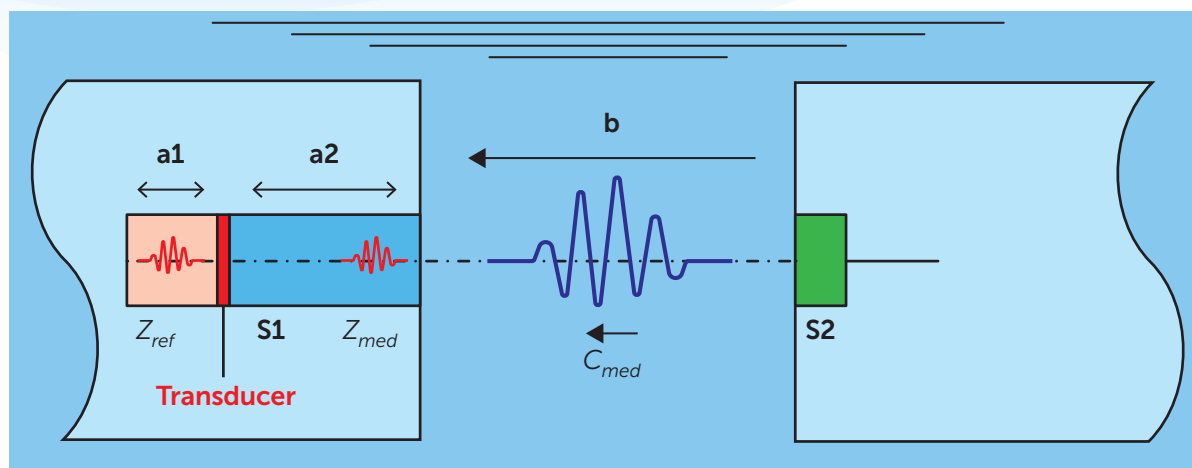


SoniDens

Technical specifications

The SoniDens is an accurate piece of equipment for the measurement of the in situ density of fluid mud (cohesive sediment).



Measuring principle

The operating frequency of the SoniDens is 2 MHz. The functioning of the SoniDens is based on the measurement of three ultrasound parameters:

- » acoustic impedance of the medium (Z_{med});
- » sound speed within the medium (c_{med});
- » ultrasound transmission characteristics (attenuation) of the medium.

For the measurement of the acoustic impedance, ultrasound is emitted by the transducer of the left sensor. The ultrasound waves propagate to both sides and are reflected at both ends of the sensor. The amplitudes of the reflected ultrasound waves correspond to the acoustic impedance of the medium outside the sensor and the acoustic impedance of the reference medium within the sensor.

The sound speed within the medium is based on the measurement of the transmission time of the

ultrasound signal emitted from the second sensor on the right to the receiver (transducer) of the left sensor. This measurement is corrected by the time the transducer needs for reaching maximum signal emission intensity and by subtracting the additional travel time through sensor section.

This density determination is valid for homogeneous media. For inhomogeneous (multiphase) media this density value may not exactly correspond to the mean density of a certain larger volume of such media. Therefore, a correction factor has been experimentally determined from the medium related modifications of the sound waves that have been emitted by the S2 transducer after they have passed through the medium. In this respect, the SoniDens output density value is a combination of the density values, one measured directly at the surface of the sensor window and a second density (integral density value) that is more closely related to the acoustic properties of the sample volume that is penetrated by the ultrasound waves.

1



SoniDens

Technical specifications

Specifications

SoniDens

- » Weight 25 kg
- » Dimensions $l \times w \times h = 50 \text{ cm} \times 20 \text{ cm} \times 8 \text{ cm}$

SoniDens in transport case (incl. 35 m data cable)

- » Weight 33 kg
- » Dimensions $l \times w \times h = 100 \text{ cm} \times 45 \text{ cm} \times 20 \text{ cm}$

Auxiliary items in transport flight case

- » Weight 25 kg
- » Dimensions $l \times w \times h = 65 \text{ cm} \times 55 \text{ cm} \times 30 \text{ cm}$

- » Density resolution $0,001 \text{ g/cm}^3$
- » Density accuracy $\pm 0,007 \text{ g/cm}^3$
(vertical velocity $0,76 \text{ m/min}$)
 $\pm 0,016 \text{ gr/cm}^3$ (vertical velocity $3,8 \text{ m/min}$)
- » Density range $1.000 - 1.800 \text{ kg/m}^3$
- » Density frequency 2 MHz
- » Temperature range $0 - 40 \text{ }^\circ\text{C}$
- » Power supply $110 - 220 \text{ V, AC, } 50 \text{ Hz, } 35 \text{ W}$
- » Depth range $0 - 25 \text{ metre}$
- » Depth accuracy $<0,5\%$ of measured depth (m)

References

A list of reference projects is available via
info@semaso.com



Contact

Feithspark 6
Tolbert, The Netherlands

6 Queen's Drive
Taunton, United Kingdom

E info@semaso.com
W www.semaso.com