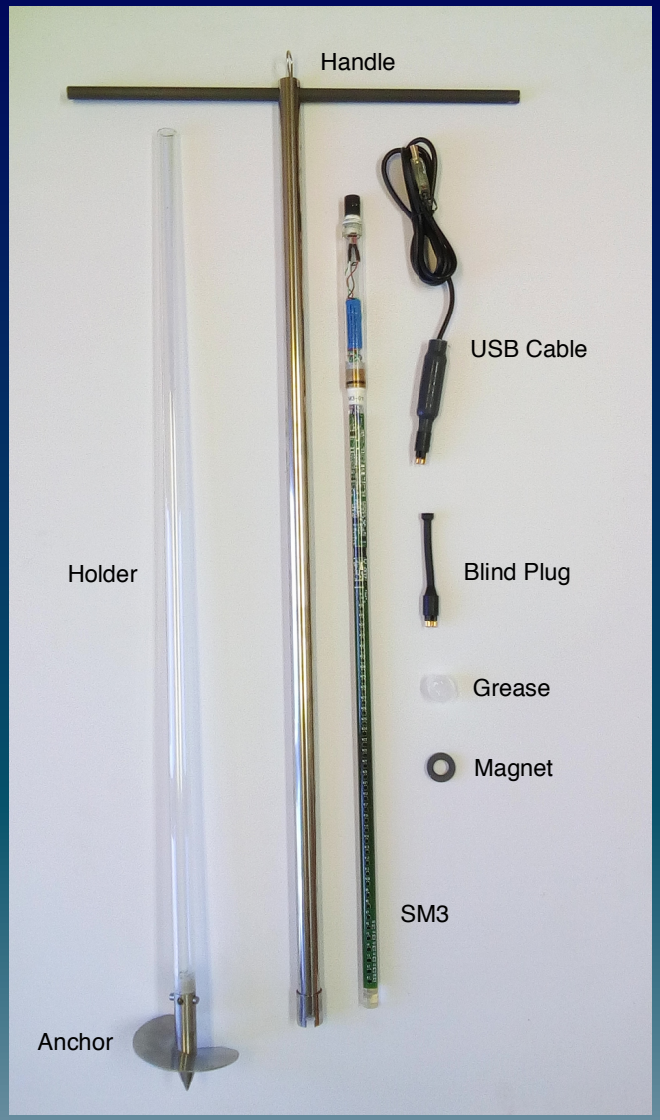

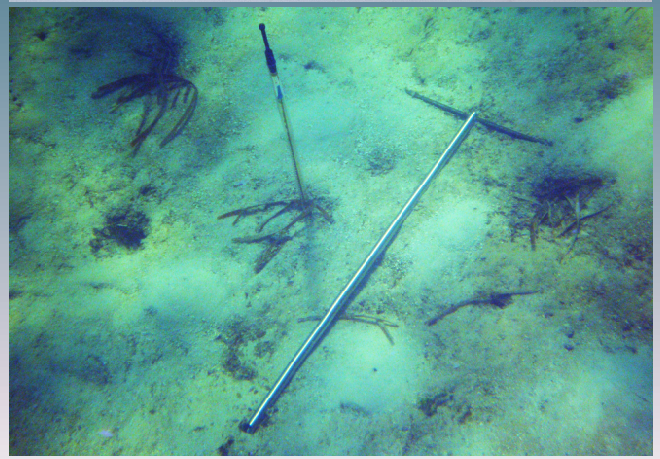

Principle

The sensor consists of a vertical array of 36+1 optical backscatter (OBS) detectors. These generate 37 backscatter turbidity measurements (FBU) and 35 nephelometric turbidity measurements (FNU). The software calculates a combined best average, and plots the data in color with 5 mm resolution. The bottom level is estimated from the turbidity profile.

Applications

- Continuous monitoring of near-bed sediment pollution
- On-line warning system of sediment deposition
- Early warning of incipient erosion and scour
- Studies of bedform variability and sand transport
- Studies of mud accumulation and resuspension
- Measuring the settling process of suspended matter

Features

- Available models with mechanical cleaner and vibrator
- Stand-alone logging and/or real-time monitoring
- Networking and telemetry available

Specifications

Wavelength	945 nm (NIR)
Number of OBS detectors	36 + 1
Detector spacing	10 mm + 110 mm
Sensor diameter	15 mm
Holder tube, house diameter	20 mm
Data output	Turbidity in 72 levels, bed level, temperature
Turbidity resolution	1 FTU
Bed level resolution, precision	0.01 mm, 0.1 mm
Memory size	16,384 measurements
Logging interval	1 second to 24 hours
Burst samples	20, 1…16 s interval
Communication, charging	USB to RS485 cable
Intended deployment time	Weeks to months
Battery, rechargeable	AA, 900 mAh

Specifications subject to change without prior notice.

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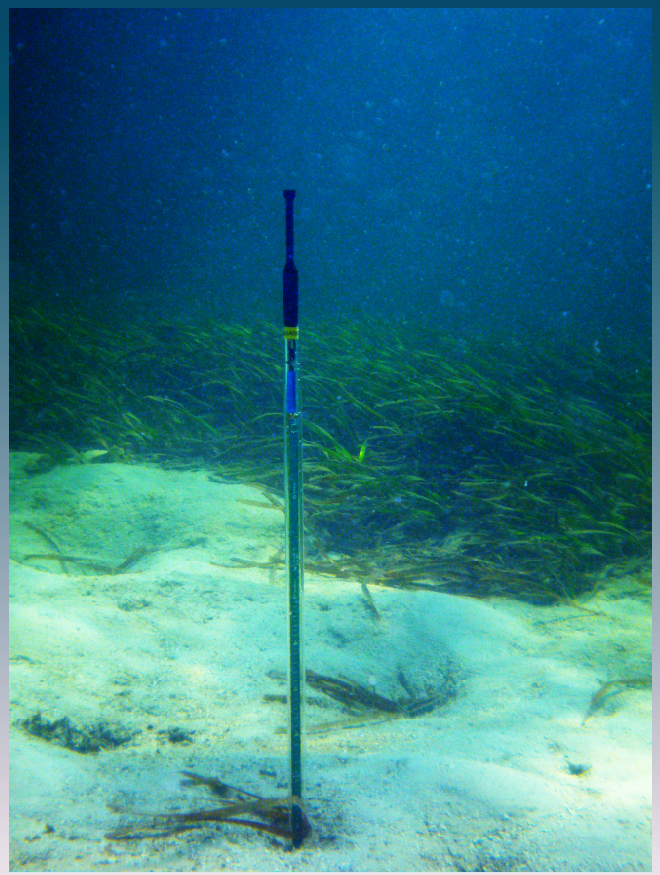
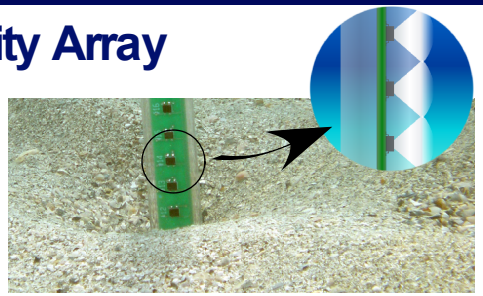
SediMeter™

SM3

- Bottom Level
- Vertical Turbidity Profile
- Burst Sampling



Turbidity Array



The SediMeter sensor consists of an array of 36 optical backscatter detectors (OBS) mounted inside a vertical transparent tube, at 1 cm interval, plus one. These OBSes emit infrared light and measure the backscattered light, producing 37 backscatter turbidity measures. Simultaneously the adjacent detectors measure the side-scattered light, thus creating an additional 35 nephelometric turbidity measures. Using these 72 values the software creates a **turbidity profile** with 5 mm resolution in color, where air is blue, sediment beige, and water black.

Bed Level

The bed level of the sea floor is interpolated from the backscatter profile. The level is reported with a resolution of 0.01 mm, making it possible to detect the sedimentation of as little as 0.1 mm, and of 100 g/m^2.

Burst Sampling

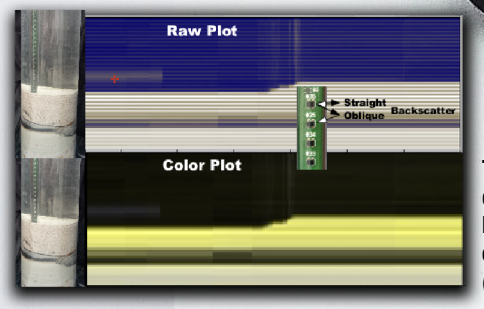
For each measurement up to 20 sub-samples of level and turbidity can be taken at an interval of 1 to 16 seconds. This is useful if the instrument is located on a site with wave action, where both the level and the turbidity can change during a wave period. Using burst sampling it is easier to separate this noise from the long-term trend of interest.

Deployment

The traditional method of deployment uses a holder tube that is screwed down. The holder tube protects the sensor but introduces a bias in the turbidity readings. By cutting the holder tube and mounting the instrument appropriately, the 37th OBS detector can be used to measure the turbidity without bias.

Software

The free PC software is used to configure the instrument, to download data, to analyze data, to display data on a web server, and to do real-time monitoring of a single instrument or a network of instruments.



The SediMeter.exe software presents the data in various ways, including as a Color Plot where solids (beige to brown) are easily distinguished from turbid water (gray to black) and air (blue).