CAMPBELL SCIENTIFIC®

WHEN MEASUREMENTS MATTER

OBS-5+

High Suspended Sediment Concentration Monitoring System with Pressure Sensor

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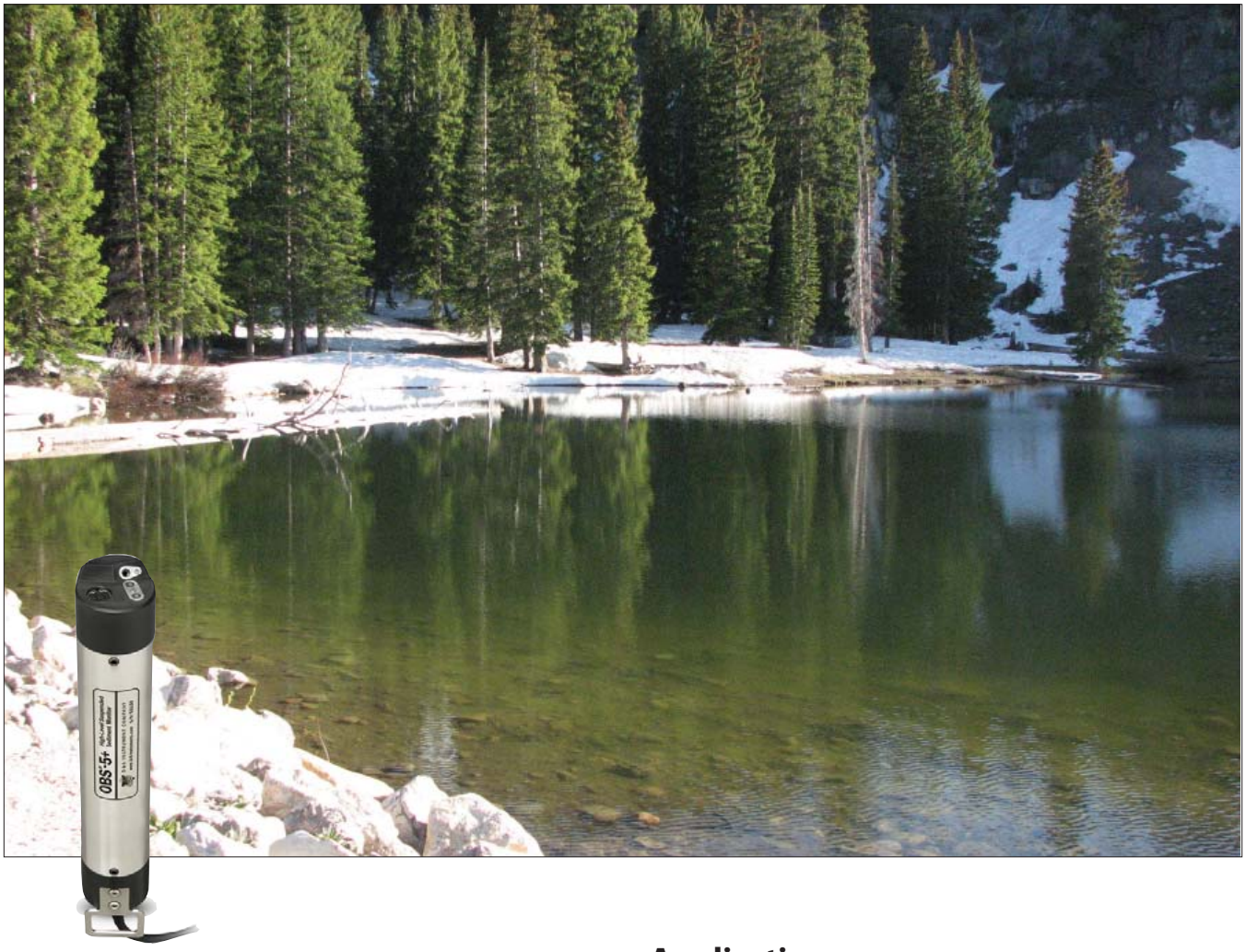


The OBS-5+ monitors high sediment concentrations using an infrared laser and a proprietary dual photodetection system (U.S. Patent No. 5,796,481). The probe transmits sediment concentration and depth to a PC via an RS-232 or RS-485 link. Data is also stored internally.

The OBS-5+ has a Windows® GUI that enables the user to generate and store sediment calibration tables, log data, program logging/sampling schemes, and graphically display data. Using the Windows GUI, an operator can calibrate the OBS-5+ with sediments, change electronics gain to optimize resolution, create as many as 15 unique sediment lookup tables, and store those tables in flash memory for future use. Users can complete the entire calibration process without spreadsheet calculations and curve fitting.

Applications

- Monitor dredging and site-remediation operations
- Determine dredge efficiency
- Provide data for sediment transport research
- Support undersea mining and trenching

Features

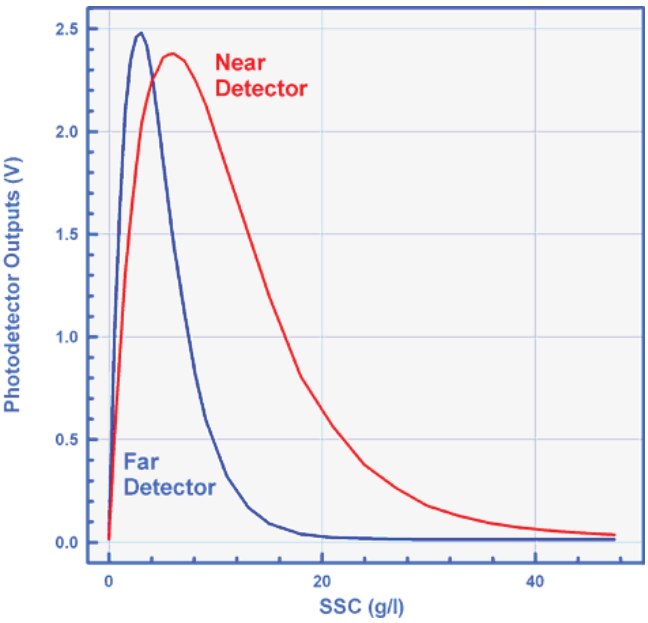
- Runs up to six months on three “C” cells
- Monitors sediment concentrations up to 200 g/l (specific gravity 1.30)
- Logs instrument depth
- Records 200,000 scans of data in flash memory
- Supports RS-232 and RS-485 data links
- Contained in a compact package (15” length, 2.4” diameter)

Advantage of Multiple Detectors*

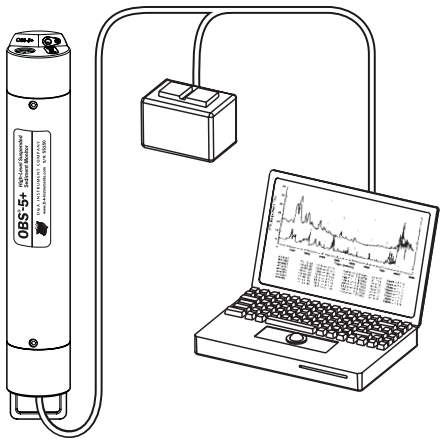
The OBS-5+ uses multiple detectors and an embedded controller, which extend the measurement range of the sensor by a factor of about ten. One limitation of our single-detector systems like the OBS-3+ is that they cannot measure suspended solids concentration (SSC) levels greater than about 10 g/l (mud) and 100 g/l (sand).

The OBS-5+ projects a beam of near infrared (NIR) laser light into a water sample next to two photodetectors. Suspended particles scatter light from the beam onto the detectors and a microcontroller determines SSC from their photocurrents. Because the detectors are unequally spaced from the laser, the particle concentrations corresponding to the peak response are also unequal and after being calibrated with sediment, an OBS-5+ can measure and uniquely resolve sediment SSC values greater than the peaks in response.

The OBS-5+ has been used extensively to monitor dredging and mining operations in the US, EU, China, Vietnam, and Indonesia.



The OBS-5+ detector responses to particle concentration are shown on the chart.



The field cables are used to connect the OBS-5+ to a PC for system configuration. The OBS-5+ can be powered by an external battery.

Ordering Information

System for High Suspended Sediment Concentration

OBS-5+ High Suspended Sediment Concentration Monitoring System with Pressure Sensor (requires three C-cell batteries. Must choose a Pressure Range option (see below). The carrying case and field cable for attachment to a PC are ordered as separately.

Pressure Range Options (must choose one)

-10 Orders a pressure transducer that measures depth up to 10 m (14 psi).

-20 Orders a pressure transducer that measures depth up to 20 m (28 psi).

-50 Orders a pressure transducer that measures depth up to 50 m (71 psi).

-100 Orders a pressure transducer that measures depth up to 100 m (142 psi).

-200 Orders a pressure transducer that measures depth up to 200 m (284 psi).

Cables for Datalogger Attachment

Campbell Scientific offers a choice of field cables that attach the OBS-5+ to a PC. The cables differ in their length.

21385 OBS-5+ Field Cable with 20-meter (66 ft) length.

21100 OBS-5+ Field Cable, with 50-meter (164 ft) length.

Other Accessories

21324 OBS-5+ Carrying Case (Holds 2)

4576 Alkaline C Cell Battery. Three batteries are used to power the OBS-5+. Batteries are not included.

21905 C Cell Battery Spacer that allows a user-supplied lithium battery to power the OBS-5+ instead of three C-cell alkaline batteries.

**Reference: John Downing. 1998. Suspended Particle Concentration Monitor. U.S. Patent Number 5,796,481.*

Specifications

Infrared Wavelength: 780 nm

Scattering Angles (clean water): 105° to 165°

Drift
- **Over Time:** <30 ppm per month
- **Over Temperature:** <200 ppm per °C

Maximum Sampling Rate: 25 Hz

Maximum Data Rate: 2 Hz

Data Capacity: 8 Mbytes

Maximum Number of Data Lines: 200,000

Battery
- **Capacity:** 8 Ahr
- **Life (maximum):** 3,000 hrs

External Supply Voltage: 6 to 18 Vdc

External Supply Current: 55 mA

PC Interfaces: RS-232/115 kbps, RS-485/115 kbps

Maximum Depth: 300 m (984 ft)

Measurement Ranges

Concentration (depends on sediment type)
- **Mud (D50 = 20 µm):** 0 to 50 g/l
- **Sand (D50 = 250 µm):** 0 to 200 g/l

Pressure: 0 to 10, 20, 50, 100, or 200 m

Turbidity: 0.4 to 1,000 NTUs

Accuracy

Sediment Concentration
- **Mud:** 2% of reading
- **Sand:** 4% of reading

Turbidity: 1.5% of full scale

Pressure: 0.5% of reading

Physical

Connector: MCBH-8-FS, wet-pluggable

Wetted Material: 316 stainless steel, Delrin, and 20% GF polycarbonate

Temperature Range
- **Operating:** 0° to 40°C
- **Storage:** -20° to 70°C

Weight: 4.5 lbs (2.04 kg)

Weight (submerged): 2.3 lbs (1.02 kg)

Dimensions: see graphic below