



## OBS-5+

### Monitoring System with Pressure Sensor for High Suspended-Sediment Concentrations



## Accurate, Rugged

Includes a Pressure Sensor

### Overview

The OBS-5+ monitors high sediment concentrations using an infrared laser and a proprietary dual photo-detection 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 are also stored internally.

The OBS-5+ is ideal for monitoring dredging and site-remediation operations, determining dredge efficiency, providing data for sediment transport research, and supporting undersea mining and trenching.

*(OBS® is a registered trademark of Campbell Scientific.)*

### Benefits and Features

- ▶ Connects directly to a PC—no datalogger needed
- ▶ Operates up to six months on three C-cell batteries
- ▶ Monitors high sediment concentrations (up to 200g/l)
- ▶ Records 200,000 scans of data in the OBS-5+ flash memory

### Technical Description

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.

#### Advantage of Multiple Detectors

Unlike single-detector systems such as the OBS-3+, which cannot measure suspended solids concentration (SSC) levels greater than about 10 g l<sup>-1</sup> (mud) and 100 g l<sup>-1</sup> (sand), the OBS-5+ uses multiple detectors. With these detectors and an embedded controller, the OBS-5+ extends

the measurement range of the sensor by a factor of about ten.

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.

## Reference

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

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## Specifications

Connector	MCBH-8-FS, wet-pluggable
Wetted Materials	316 stainless steel, Delrin, and 20% GF polycarbonate
Operating Temperature Range	0° to 40°C
Storage Temperature Range	-20° to +70°C
Infrared Wavelength	780 nm
Scattering Angles	105° to 165° (clean water)
Drift over Time	< 30 ppm per month
Drift over Temperature	< 200 ppm per °C
Maximum Sampling Rate	25 Hz
Maximum Data Rate	2 Hz
Data Capacity	8 MB
Maximum Number of Data Lines	200,000
Battery Capacity	8 Ahr
Maximum Battery Life	3,000 h
External Supply Voltage	6 to 18 Vdc
External Supply Current	55 mA
PC Interfaces	RS-232/115 kbps, RS-485/115 kbps
Maximum Concentration Range	› Concentration measurement range and accuracy depend on the sediment type.

	› 0 to 50 g l <sup>-1</sup> (for mud) Mud is defined as D <sub>50</sub> = 20 µm.
	› 0 to 200 g l <sup>-1</sup> (for sand) Sand is defined as D <sub>50</sub> = 250 µm.
Pressure Measurement Range	0 to 10, 20, 50, 100, or 200 m
Turbidity Measurement Range	0.4 to 1,000 NTU
Concentration Accuracy	› 4% of reading (for sand) › 2% of reading (for mud)
Pressure Accuracy	0.5% of full scale
Turbidity Accuracy	1.5% of full scale
Maximum Submersion Depth	300 m (984 ft)
Diameter	6.0 cm (2.4 in.)
Length	38.0 cm (15 in.)
Weight	2.04 kg (4.5 lb)
Submerged Weight	1.02 kg (2.3 lb)

### Accuracy

Sediment Concentration	› 2% of reading (for mud) › 4% of reading (for sand)
Pressure	0.5% of full scale
Turbidity	1.5% of full scale

For comprehensive details, visit: [www.campbellsci.eu/obs-5](http://www.campbellsci.eu/obs-5) 



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