# LISST-Deep

## Deep Submersible Particle Size Analyzer

### Particle Size Distribution • Volume Concentration
### Beam Attenuation • VSF

The LISST-Deep, updated in 2023, is a deep-sea version of Sequoia's workhorse LISST-200X. It is a self-contained submersible laser-diffraction particle size analyzer for ocean depths up to 4000 meters. Like the LISST-200X, it measures the concentration of suspended particles in 36 size bins from 1 µm to 500 µm. With an optional battery pack, it can be deployed independently, storing all its data internally. It can also be deployed as part of a CTD package, receiving power from the CTD while producing real-time analog outputs for mean particle size and total concentration. In either configuration it always stores comprehensive particle size data in its own non-volatile memory, for later downloading and analysis. For system integrators, the LISST-Deep can power and accept inputs from up to three external analog sensors, such as fluorometers.

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## FEATURES

- Small angle forward scattering laser diffraction technology
- Measures particle size, concentration, beam attenuation, VSF, depth, temperature
- Self-contained with internal programmable datalogger for autonomous data collection
- Externally powered; 4000 meter battery housing available
- USB connection to PC for programming, offloading and real-time size distribution displays
- Integrated depth and temperature sensors
- Power and integrate up to three external analog sensors
- Analog output of mean particle size and total volume concentration for CTD integration
- Real-time output of complete Particle Size Distribution

## SPECIFICATIONS (subject to change without notice)

**Note: Specifications were different for serial numbers 4055 and lower**

### Parameters Measured

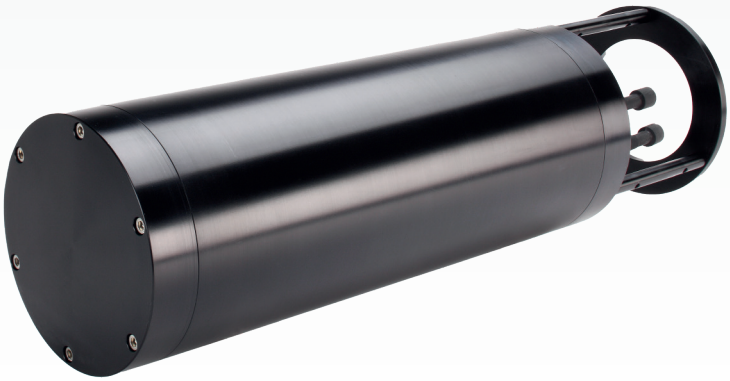
- Particle Size Distribution (1 µm to 500 µm in 36 size ranges)
- Depth (4000 m max depth @ 0.1 m resolution)
- Temperature (- 5 °C to 45 °C @ 0.01 °C resolution
- Optical transmission (0.3 to 0.99 [30 % to 99 % @ 0.1 % resolution])
- Volume Concentration @ 0.1 $\mu L \cdot L^{-1}$ resolution; range strongly particle-size dependent
- Volume Scattering Function (0.039° to 13.8° in water at 36 angles)

### Technology

- Small-angle forward laser scattering
- 32-ring custom photodiode Ring Detector + 4 large angle detectors
- 50 mm optical path
- 670 nm laser diode

### Mechanical and Electrical

- Dimensions [Ø × L]: 12.57 cm × 80.3 cm (4.95” × 31.5”)
- Weight [air / water]: 17 kg / 8 kg (38 lbs / 18 lbs)
- Depth rating: 4000 m
- External power input: 12 VDC nominal, 9 VDC to 24 VDC
- Current drain at 12 V: 75 mA Sampling
- Sampling rate: Up to 1 Hz
- Data storage: 1 GB (~12,000,000 measurements; ~140 days @ 1 Hz)
- SubConn MCBH3M, MCBH5M and MCBH6M connectors



*Left:* Detail of LISST-Deep optical path and laser cable

*Right:* LISST-Deep external battery case (optional accessory)

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