

# LISST-25

## Constant Calibration Suspended Sediment Sensor

### • Particle Concentration • Sauter Mean Diameter • Optical Transmission

A submersible Laser-scattering instrument that shows true volume concentration and mean size. Sequoia Scientific, Inc. has developed a field instrument for *in-situ* measurements that overcomes the historical problem of calibrations changing with particle size.

The LISST-25 series of Sediment Sensors is based on the same laser scattering principles as our popular LISST-100 Particle Size Analyzers. The LISST-25 interprets two weighted sums of forward-angle laser scattering to obtain the total particle volume and area concentrations. The ratio of total volume to total area provides the Sauter Mean Diameter (SMD). The LISST-25 is now available in two versions. The LISST-25A is an analog-output, sensor-only version. The LISST-25X is a self-contained system with expanded capabilities.

The LISST-25A is designed as a direct replacement for older technology turbidity type sediment sensors. The advantage of the LISST-25A, in addition to providing a mean particle size, is that it holds calibration over a 200:1 range of particle sizes. Over this size range, the calibration of older technology turbidity type sediment sensors can change by up to 20000%. The LISST-25A is directly compatible with many existing instrument packages, including SeaBird CTD.

The LISST-25X is a self-contained instrument that includes a programmable data logger, alkaline battery pack, built-in depth sensor, and some expanded features. In addition to recording the Total Volume concentration and Sauter Mean size of the configured size range, the LISST-25X can be programmed to store the particle concentration and SMD in a pre-selected size sub-range. For example, the total concentration can be separated into fine and coarse groups. This capability is available only with Sequoia's LISST-25X.

- Laser Optics - Small Angle Forward Scattering (Mie Theory)
- Single Calibration for all Particle Sizes in range
  - 1.25 - 250  $\mu\text{m}$  standard
  - 2.50 - 500  $\mu\text{m}$  optional
- Programmable Data Logger
- In-situ Measurements



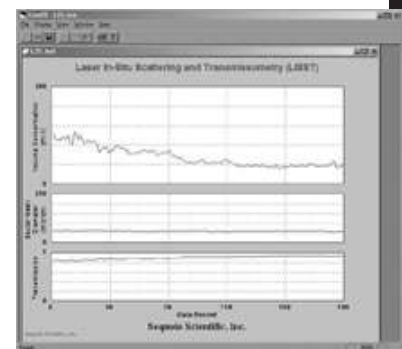
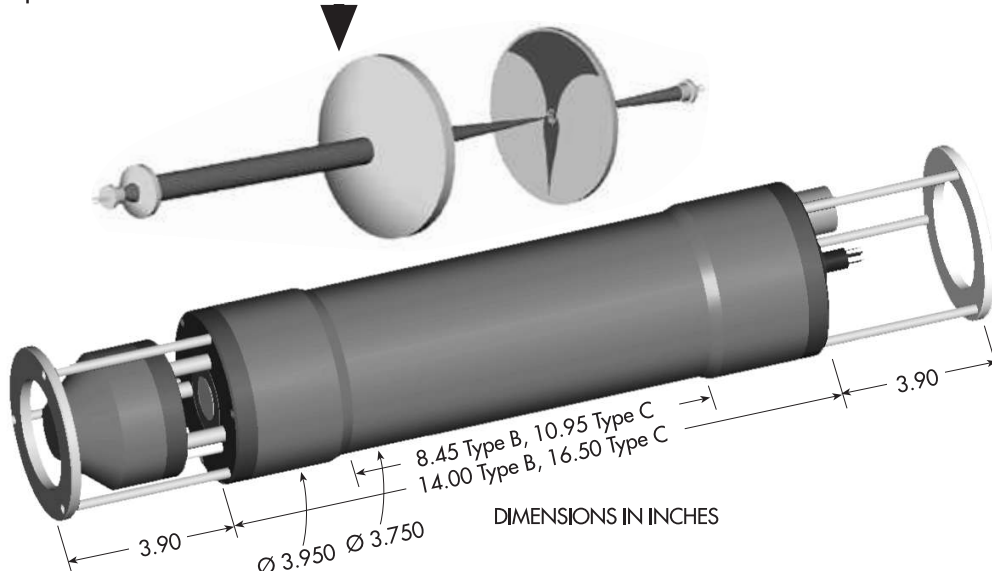
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## LISST-25 Technical Specifications

<b>Technology</b>	Small-angle forward scattering (also called Laser diffraction)	
<b>Laser</b>	Solid state diode, 670nm (red)	
<b>Optical Path</b>	2.5 cm (standard), 1.0 and 0.5 (optional, contact factory for special needs)	
<b>Concentration range</b>	500 mg/l (standard), based on ISO-12103-1, A4 test dust, 25,000 mg/l of 200 micron sand [corresponding concentration for 5 mm path: 2,500 mg/l and 125,000 mg/l]	
<b>Size Range</b>	Type-B 1.25-250 microns Type-C 2.5-500 microns	
<b>Accuracy</b>	Concentration 2% [for fixed shape factor] Size 20% Transmission 0.1%	
<b>Resolution</b>	Concentration 0.025% of full-scale Size 1 micron Transmission 0.1%	
<b>Weight</b>	Air 9.8 lbs Water 3 lbs	
<b>Depth rating</b>	300 meters	

Parameters & Features	25A	25X	Notes
<b>Parameters Measured:</b>			
Total Volume Concentration	X	X	Units: micro-l/l
Sauter Mean Size	X	X	Units: microns
Optical Transmission	X	X	Percent.
Total Volume Concentration - Sub-range		X	Call for available size ranges
Sauter Mean Size - Sub-range		X	(as selected above)
Depth		X	300 m range, 7 cm resolution
Date and time		X	YY/MM/DD HH:MM:SS
<b>Features:</b>			
Analog output	X		0-5V
Built-in programmable datalogger		X	27,000 samples
Serial Data Interface		X	RS-232C
External power input	X	X	6-12 VDC @ 250mA max.
Internal battery pack		X	4 x 9V Alkaline, or Lithium

The LISST-25 instruments use a diode laser, collimating and receiving optics, and distinctively shaped silicon that respond directly to particle volume and area concentration.



Windows '95/'98/NT software is supplied to process raw data into a time series of particle volume concentration, optical transmission, and the Sauter Mean Diameter. The results can be saved in ASCII format.