

LISST-BLACK

OIL-RESPONSE INSTRUMENT

- **Particle Size Distribution**
- **Volume Concentration**
 - **Refined Fuels**
 - **Crude Oil**
 - **Chlorophyll**
- **Beam Attenuation**

The LISST-Black is a self-contained stand-alone instrument for use on profiling packages, towed and remote vehicle applications, for deployment during and after an oil spill event. The system will continuously measure particle size distribution and concentration, along with the fluorescence of refined fuels, crude oil and chlorophyll, as well as beam attenuation.



FEATURES

- Complete package based on small angle forward scattering laser diffraction technology
- LISST-200X integrated with Turner Designs Cyclops-7F fluorometers
- Measures refined fuels, crude oil, chlorophyll, particle size, concentration, beam attenuation, depth, temperature
- Self-Contained with internal programmable datalogger for autonomous data collection
- Externally powered (short- and long-term deployment battery packs included)
- USB connection to PC for programming, offloading and real-time size distribution displays
- Integrated depth and fast response temperature sensors
- Integrates on profiling package, tow vehicle or mooring/lander

Fluorometer Performance

The Turner Designs submersible instrumentation modules used in the LISST-Black includes single-channel fluorometers for detection of refined fuels, crude oil, and chlorophyll. Together with particle information from the LISST-200X, this package solution provides a comprehensive picture of potential contamination.

SPECIFICATIONS (subject to change without notice)

Parameters Measured

- Particle size distribution from 1 μm to 500 μm in 36 size ranges
- Depth @ 0.01 m resolution
- Temperature @ 0.01 $^{\circ}\text{C}$ resolution; response time 2.5 s
- Optical transmission @ 0.1 % resolution
- Volume Concentration @ 0.1 $\mu\text{L}\cdot\text{L}^{-1}$ resolution
- Beam attenuation
- Phycocyanin
- Phycoerythrin
- Chlorophyll

Operating Concentration Range

- Optical transmission from 0.3 - 0.99 (30 % - 99 %)
- Concentration from $\sim 0.5 \text{ mg}\cdot\text{L}^{-1}$ - $700 \text{ mg}\cdot\text{L}^{-1}$ (particle-size dependent)

	Minimum Detection	Linear Range
Oil - Fine	0.4 ppm	0-20 ppm
Oil - Crude	0.2 ppm	0-1,500 ppm
Chlorophyll	0.03 $\mu\text{g}/\text{L}$	0-500 $\mu\text{g}/\text{L}$

Technology (laser diffraction)

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

Mechanical and Electrical

- Dimensions [W×H×L]: 10.03 cm × 13.21 cm × 63.9 cm (3.95" × 5.2" × 25.2")
- Weight: [air / water]: 6 kg / 2.5 kg (13.2 lbs / 5.5 lbs)
- Depth rating: 600 m
- External power input: 12 VDC nominal, 8 VDC - 24 VDC
- Current drain at 12 V: 100 mA Sampling, 8 mA between samples
- Sampling rate: Up to 1 Hz
- Data storage: 1 GB ($\sim 12,000,000$ measurements; ~ 140 days @ 1 Hz)
- SubConn MCBH3M, MCBH5M and MCBH6M connectors
- Refined fuels – EX 290, EM 350
- Crude oil – EX 325 nm, EM 410-600 nm
- Chlorophyll – optical filters: EX 465, EM 496

