

Portable Flow-Through Optical Imager For Organisms and Particulates



Weight: 20 lb **Size:** L=21" x H=8.25" x D=7.5"

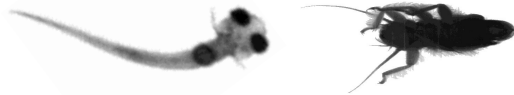
Length includes end port connections; Height includes feet and handles

Minimum organism size range: ≈1mm
(e.g., Daphnia, Cyprinodon egg (not to scale))



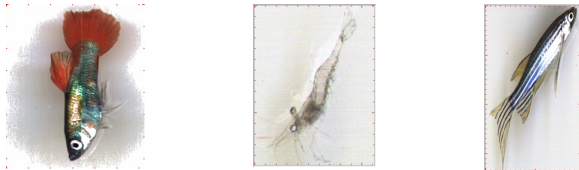
Maximum organism size (width) range: ≈10 mm

The Depth-Of-Field (DOF; width of imaging chamber), is ≈10 mm but organisms of much greater length (e.g., fish and insect larvae) pass through and successfully image due to the line-scan method. Organisms imaged below are ≈10-20 mm length (not to scale)



Front- and back-lit color imaging option:

The front & back lighting can be enabled or disabled, and the intensity adjusted from the front panel to meet requirements. Front-lit color images below are of fish and shrimp (tick marks = 1 mm) passing through the imaging chamber:



Camera 4k, 7 micron, with 53mm FOV, at ≈0.5 mag provides ≈14 micron object resolution. Clarity depends on focus through the 10mm depth-of-field and water quality

For best image rendition, the scan rate should be aligned as closely as possible to the flow rate

Scan Rate (Lines/Sec)	Flow Rate		Mb/minute	
	Gal/hr	L/hr	Grayscale	Color
8000	52	198	469	938
12000	78	296	703	1406
20000	130	494	1172	2344
30000	196	741	1758	3516
35000	228	864	2051	4102



Transportation-Pelican Case
L:24.5" x H:12.3" x D:10.2"
Packaged Weight: 33 lb
Imager in case

Configuration

Processor & software:

- Laptop-minimum i7, 2.8 Ghz with Gig E cable connection to SAO Imager;
- Proprietary software supports both Convolutional Neural Network-based featurizer and engineered features, with capability to utilize other classifiers (e.g., Neural Net, Support Vector Machine, user developed);
- Images can be stored to allow alternative user-selected classification software.

Power:

- NIST approved power supply 110 V to 24 VDC 5A included;
- Unit can run on 12 VDC to 24 VDC sources;
- Can operate in field using 12 V DC battery.

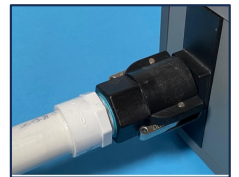
Water Flow :

- Unit operates benchtop or water-side. Customer configurable for use via gravity feed, ambient flow, or pump;
- Customer supplied—Contact OceanSpace for recommendations.

Plumbing Fittings:

- User configures plumbing based on their need;
- Requires 1 inch camlock type fitting;

Caution: Particularly with hard piping, be sure to secure the pipe to avoid stressful side forces that may damage the Imager fitting.



Example:
1" schedule 40
PVC or
1" ID Hose



aquatic
sensors

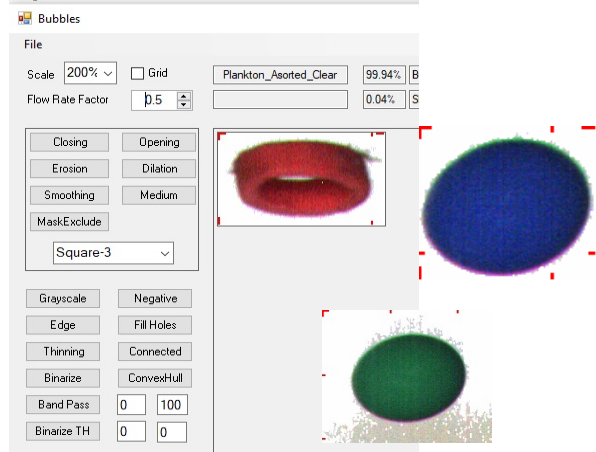
For more info contact:
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Rugged yet Portable Packages Suitable for a Wide Range of Applications



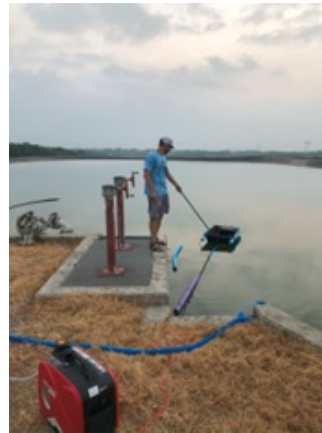
Desktop system for single-pass imaging of previously collected samples



Microplastics imaging (increments are 1 mm)



Deployment aboard crewed (above) or uncrewed (below; proposed application) vessels



Waterside sampling at a fish hatchery



The temporally resolved data are suitable for mapping and for integration with ancillary data, such as temperature, dissolved oxygen, etc. and can be plotted with spatial data to understand fine-scale distribution. The image to the left depicts discontinuous distribution of copepods along a transect sampled off the southeast coast of Florida.



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