

Portable Flow-Through Optical Imager For Small Aquatic Organisms



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.

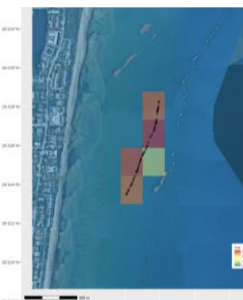
Plumbing Fittings:

- 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

Performance:



The temporally resolved data are suitable 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 transects sampled off the southeast coast of Florida.

Weight: 15 lb **Size:** L=21" x H=8 1/4" x D=7"
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