

Shadowgraph V3

Telecentric Imaging System

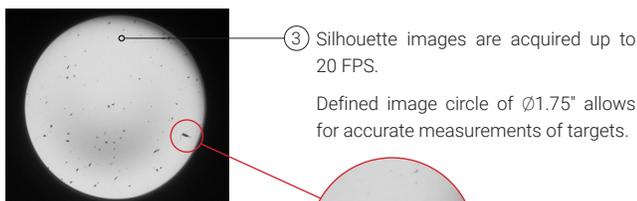
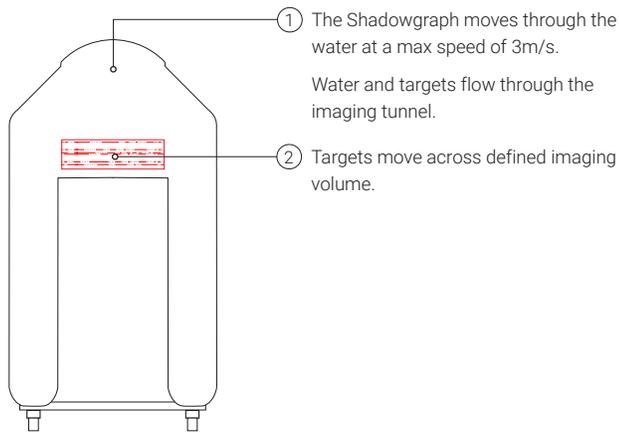
Wassoc's Shadowgraph V3 is a compact subsea imaging system utilizing telecentric optics to capture in situ silhouette images of zooplankton (or other small targets) as they flow through a defined volume. Multi-wavelength collimated backlight(s) and high speed image capture provides uniformly exposed images with high resolution. Coupled with defined imaging volume, targets are easily measured and quantified. Integral UV lights and hard-coat anodized components mitigate biofouling and corrosion on long deployments.



Features



How It Works



③ Silhouette images are acquired up to 20 FPS.

Defined image circle of $\varnothing 1.75''$ allows for accurate measurements of targets.

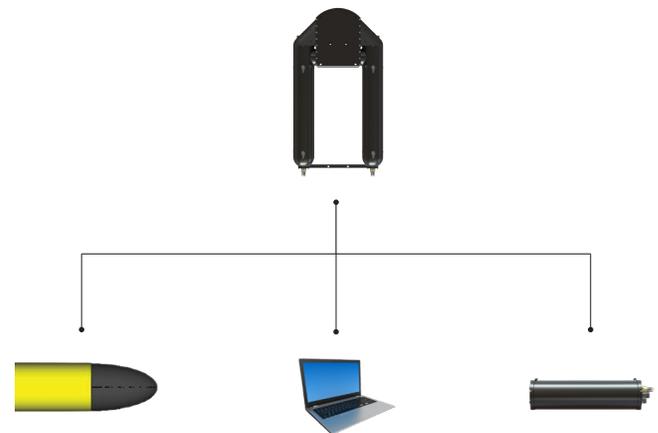
Image of zooplankton captured by Shadowgraph in Resurrection Bay, Alaska.

Photo courtesy of University of Alaska Fairbanks.

* Detailed view of target.

Multiple Configurations

The Shadowgraph is optimized for integration onto a subsea glider. However, due to its size, RS-232 communication protocol, and low power requirements, the Shadowgraph can be integrated onto virtually any subsea asset.



AUV/ROV Integration

Ready for integration onto a Teledyne Slocum G3 Glider, or equivalent.

Best for: Validation of acoustic data.

Web Based GUI & PC Serial Terminal

Operable via PC and DC Power Supply or integrate onto a towed platform as a network device.

Best for: Lab settings, fixed installations, or towed platforms.

Programmable Controller

Optional programmable controller and battery.

Best for: Autonomous fixed installations, CTD casts, etc.

Specifications

Mechanical

Housing MaterialAnodized Aluminum, SS, Delrin
 Dimensions (L x W x H), in [cm] 20.5 [52.1] x 11.7 [29.7] x 2.75 [7.0]
 Weight (air/water), lbs [kg] 9.4 [4.25] / 0.8 [0.4]
 Connector.....SUBCONN MCIL8M

Environmental

Depth Rating1000m
 Operating Temp -10 to +50°C
 Biofouling Mitigation UVC LED Array
 Corrosion Mitigation Aluminum Alloy Sacrificial Anodes

Electrical

Power Supply5–25 VDC
 Power Consumption ~4W (max) / 1.8W (avg)[†]
 SSD Capacity 2TB

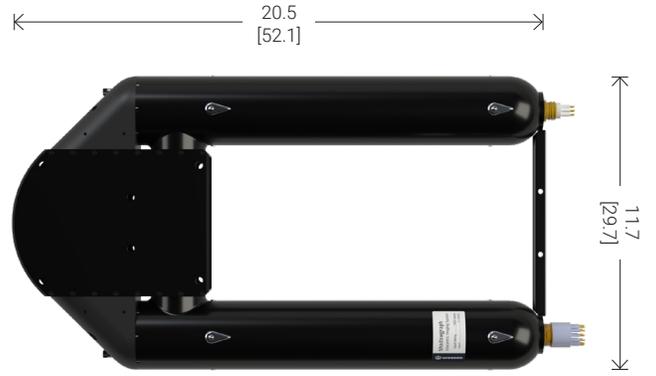
Optical

Image Sensor 2.2MP, 1/2.7 CMOS, Global Shutter
 Color Monochrome (8/10/12 bit channel)
 Pixel Size Square, 2.79µm
 Active Pixels 1600 x 1400
 Min Shutter Speed 100µs
 Imaging Rate 20 FPS
 File Type jpeg, png, or raw dng
 Back Light Dimmable
 Blue 458nm
 Green 528nm
 Red 625nm
 Resolving Power ≥100µ, up to 11 line pairs per mm (LP/mm)
 Imaged Volume, cu. in [cc] 12.2 [200.8]
 Image Circle, in [cm] Ø1.65 [4.2]
 Tunnel Width, in [cm] 5.71 [14.5]

System

Comms RS-232, WLAN, Ethernet LAN Cat5

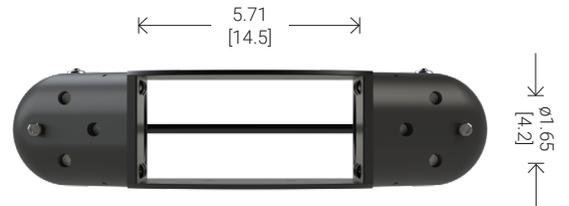
[†]Max wattage during boot; average wattage during capture.



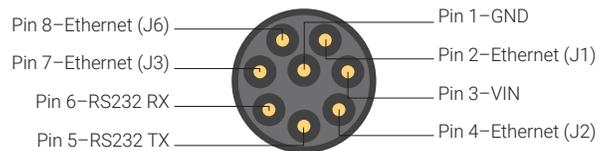
Top View
 *Not to Scale
 in [cm]



Side View
 *Not to Scale
 in [cm]



Front View
 (imaged volume dimensions)
 *Not to Scale
 in [cm]



Connector Detail
 *Not to Scale