Leaders in particle analysis for over 25 years

At CytoBuoy, we specialise in advanced imaging particle analysis instruments and software, empowering researchers in aquatic science, water monitoring, aquaculture, and bioprocess monitoring. With over 25 years of experience, we develop innovative tools that support scientific research, early warning systems for Harmful Algal Blooms, and production optimisation for aqua culture, both in laboratories and maritime environments.

Our unique flow cytometry technology combines particle scanning and imaging, offering high-quality data, automation, and a low total cost of ownership.

Need additional solutions like data buoys, multi-point sampling, or automated staining? Or more information on the best possible configuration, additional solutions? Contact us to arrange a no-obligation demonstration. We've got you covered.

Discover all the possibilities and more at **www.CytoBuoy.com**

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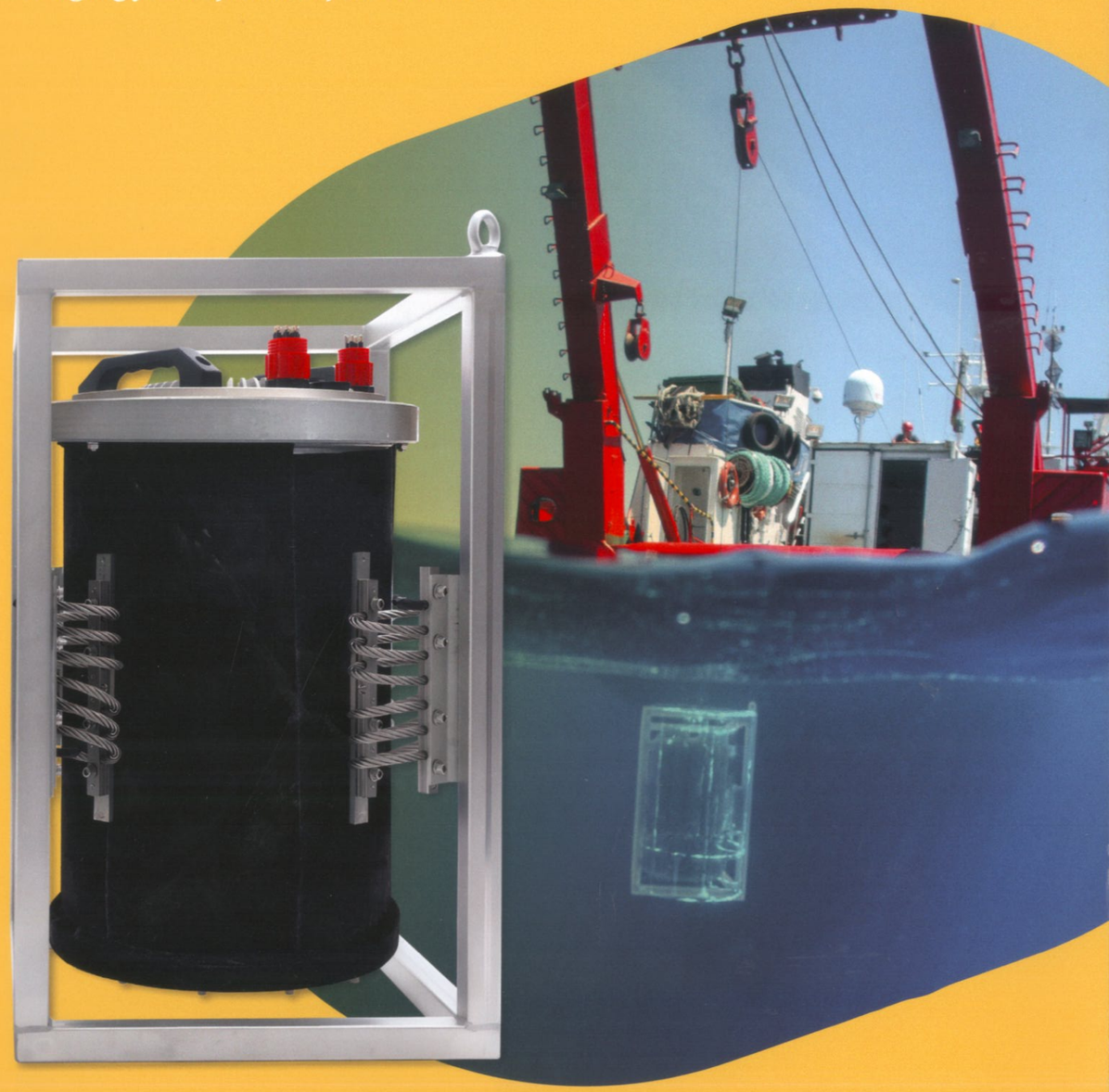
CytoBuoy

Imaging flow cytometry solutions

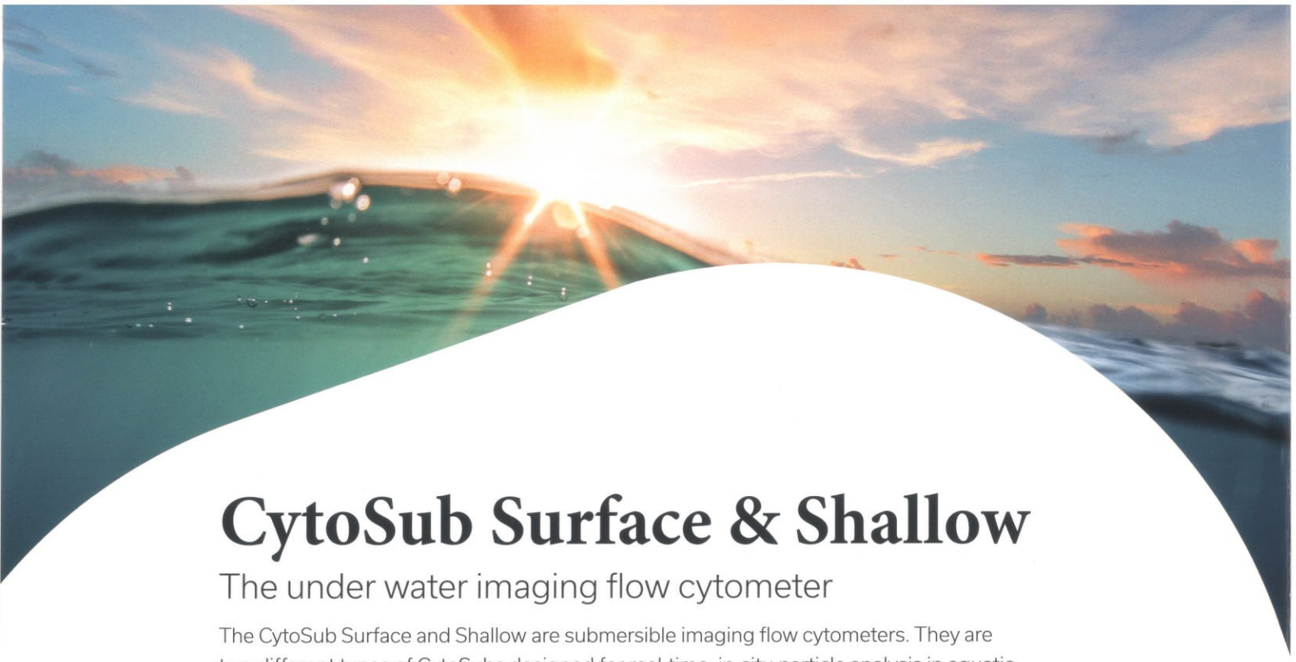
Zealquest Asia



CytoSub Surface & Shallow

Waterproof imaging flow cytometers for submerged use in sea, lakes, rivers and ponds (2m - 20m depth)

v1.1 (2025-03)



CytoSub Surface & Shallow

The under water imaging flow cytometer

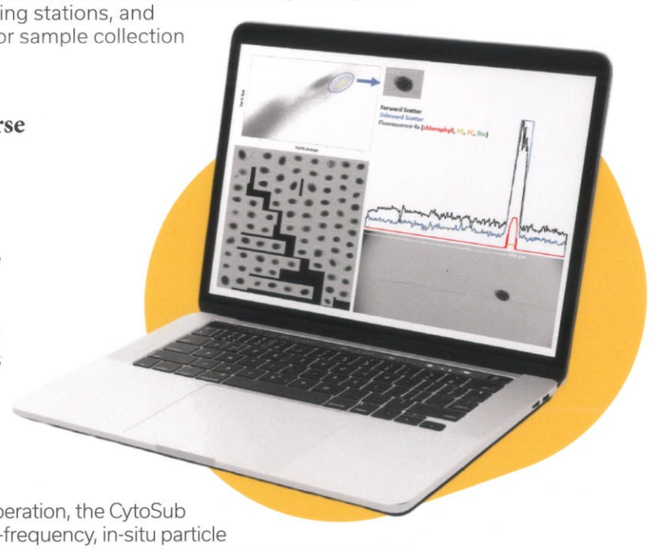
The CytoSub Surface and Shallow are submersible imaging flow cytometers. They are two different types of CytoSubs designed for real-time, in-situ particle analysis in aquatic environments. By combining imaging with flow cytometry, it provides high-resolution insights into plankton, sediments, and water quality directly at depth, eliminating the need for lab-based analysis. With fully automated operation and deployment at 2m (Subsurface) or 20m (Shallow), CytoSub enables continuous, high-frequency monitoring for research, environmental management, and aquaculture.

Unlike traditional sampling, CytoSub preserves delicate plankton structures and delivers real-time, high-resolution imaging of particles from 0.3 µm to 800 µm in width and 2.5mm in length. Its capability extends to detecting particle size ranges from picoplankton up to small mesoplankton, offering valuable insights for environmental monitoring and research.

With automated operation and antifouling technology, CytoSub enables continuous, low-maintenance monitoring in lakes, rivers and oceans. Its cost-effective design integrates seamlessly with buoys, underwater monitoring stations, and underwater vehicles, eliminating the need for sample collection and lab analysis.

Advanced in-situ monitoring for diverse aquatic environments

- High-resolution particle analysis
  Detects and images phytoplankton, zooplankton and sediment in real-time, preserving natural structures.
- Customisable settings to suit different particle species and operational needs
- 1- or 2-laser configuration, with various laser combinations and power options available
- Integrated embedded PC, remotely accessible for streamlined operation



With its submersible design and automated operation, the CytoSub Surface & Shallow is the ideal solution for high-frequency, in-situ particle analysis, delivering precise and real-time insights for environmental monitoring, research, and water quality management.

Measuring principle

Light source	1 or 2 laser options of diverse power and wavelength combinations
Optical detection	• Forward scatter Left and Right • Sideward scatter • Fluorescence Red, Orange, Yellow, Green
Measuring range	• Cell range 0.3 µm – 800 µm • Cell length to 2.5 mm
Injector	Automatic adjustable, 2-stage injector with flushing function
Concentration limit	Particle analysis rate up to 10,000 particles per second
Measuring type	Manual or scheduled (from every 10 minutes up till specific days)

Sampling

Sample flow rate	Up to 20 µl/s
Sample dosing	Valveless, volumetric, semi-continuous pump with 0.8 mm tubing. Direct concentration readout, automatic sampling adjustment based on initial particle concentration
Sheath fluid	Closed sheath fluid path
Filter	0.1 micron absolute filter

Image in Flow

Camera	Options between Pixelink PL-D753 or PL-D757 or PL-D755 or PL-D759
Pixels (HxV)	1936x1464 pixels or 3208x2200 pixels or 2448x2048 pixels or 4096x2160 pixels
Pixel/µm	3.5 pixel/ µm or 4.6 pixel/ µm
Frame Rate	30 fps
Capabilities	• "All" images as per frame rate • "Targeted imaging" specific a priori operator selected target groups • "Smart grid imaging" which operates fully automated to capture images of different particles

Extended autonomous use (optional)

Onsite Calibration	The automatic beads measurement system contains a reservoir filled with microbeads and an automatic injector. A set amount of beads can be added to a measurement protocol. Such a beads measurement can be run manually or scheduled periodically. To align the camera focus CytoUSB software is used to move the automatic injector in to the focal plan based on the results of the beads measurement.
Automatic Cleaning System Internal or External	Automatic biocide dosing, sheath cleaning cycle and extra internal filter system combines several functions like adding new biocide after cleaning the sheath, recurring cleaning of coloring and organic contamination of the sheath by the activated carbon filter, extending your filter capacity.
Ferrybox Interface	Interface to the Cytosense from pressured or underpressured sampling supply with exact location details.

Data acquisition

Pulse data	Real time capturing of all detector output signals for morphological particle analysis
Morphological indicators per optical detector for every single cell	13 morphological indicators per detector (78 characteristics per particle) output e.g. length, average, maximum, number of peaks, asymmetry, inertia, etc.
Images	Full or cropped images

Hull and more

Dimensions Submersible Hull	Ø370 mm, 534mm length
Dimensions Submersible Frame	415x415x745mm
Dimensions Lab Frame	365x365x 348mm
Weight instrument in Submersible Hull	30,9 kg.
Weight Submersible Hull and Frame	46,2 kg.
Weight instrument in Lab frame	25 kg.
Ambient temperature	5-30 degrees Celsius
Depth	CytoSub Surface max. 2m., CytoSub Shallow max. 20m.
Material hull	PVC
Conditions	No direct sunlight
Embedded computer	Core i3 8 GB DDR4 RAM and 1TB SSD incl. Windows 11 pro
Laptop	Intelcore i5, 32GB RAM, 1TB SSD incl Windows 11 pro
Anti-Fouling	Sustainable Finsulate Anti-Fouling (optional)
Deployment	We provide customized support for onsite deployments (optional)

Interface

Data Interface	Ethernet interface based on TCP/IP protocol
Power supply	Input: AC 220V Output: DC 19-75V
Power Consumption	Avg. 50W (depends on the measurement protocol)

Software

CytoUSB	Control the measurement
CytoClus	Understand the data by manual clustering
EasyClus	Automated clustering software to build your own database/libraries. Exclusive of Matlab license

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