CytoSense Classic

Advanced imaging flow cytometry for laboratory and maritime applications

The CytoSense Classic is an innovative mobile instrument designed for individual particle analysis using advanced imaging flow cytometry. By combining imaging and particle detection, CytoSense provides high-precision and reliable insights into a wide range of particle sizes, from 0.3 µm to 800 µm in width and up to 2.5 mm in length. The system is widely used in online (source) water monitoring & water labs, aquaculture industries, and harmful algal blooms monitoring, enabling real-time and detailed particle analysis in diverse aquatic environments. Its capability extends to detecting particle size ranges from picoplankton up to small mesoplankton, offering valuable insights for environmental monitoring and research.

This versatile system can be deployed in laboratories or aboard ships within a ferrybox setup. The adjustable configuration allows adaptation to specific particle types and application modes, ensuring optimal performance across different environments. With real-time online monitoring, automated data processing, and clustering, CytoSense delivers fast and efficient results.

Additionally, it offers a low total cost of ownership, thanks to the use of recirculating sheath fluid, sustainable antifouling, and a clog-free design that requires no hardware modifications.

Flexible configuration for diverse applications

- 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
- Optional add-ons, including an automated cleaning system, ferrybox interface, and staining module

With its robust design and extensive customisation options, the CytoSense Classic is the ideal solution for precise and efficient particle analysis in both laboratory and maritime environments.
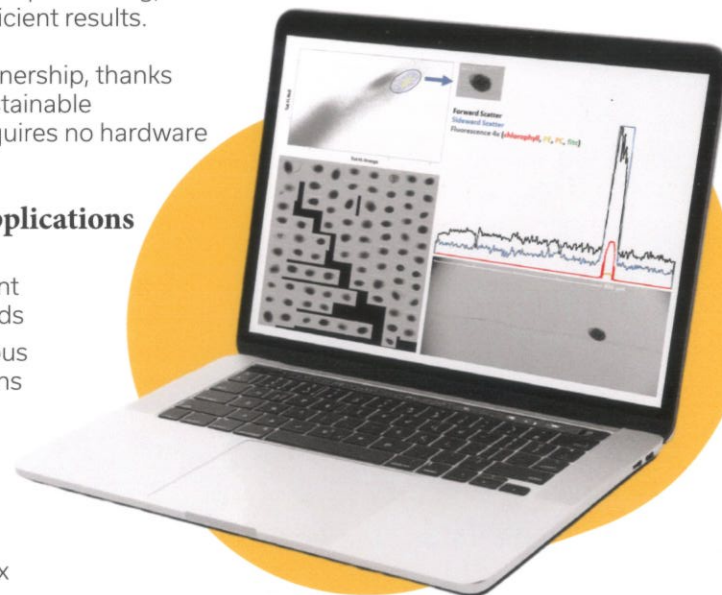
Measuring principle

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 Lab Hull	ø300 mm, 482mm length
Dimensions Lab Frame	365x365x 348mm shockproof
Weight instrument in Lab frame	25 kg.
Ambient temperature	5-30 degrees Celsius
Material hull	Carbon
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

Interface

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

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

Zealquest Asia