

FLUIDION® DEEP WATER SAMPLER

The miniaturized sampling system for AUVs, ROVs, Moorings and Gliders

The FLUIDION Deep Water Sampler is a miniaturized sampling system for deep water research and subsea deployment on AUV/ROV or glider platforms. The pressure-balanced pumping technology can operate in water depths from surface to 6000m, and can perform pre-programmed or triggered sampling based on sensor reading, or on external command. For autonomous shallow water applications, a battery power pack and a scheduler module are also available.



The first water sampler for AUVs and gliders

The Deep Water Sampler allows up to 26 grab samples to be collected at depths of 300m (shallow), 1500m (deep), 3000m (ultra-deep) or 6000m (extreme) using miniaturized peristaltic pump (PP) technology. Specifically designed as a modular system for easy fitting onto any glider or in the payload bay of an AUV or ROV, the Deep Water Sampler is a first for autonomous underwater vehicles: returning in-situ samples to surface allows for subsequent lab analysis (complete fingerprinting of hydrocarbon traces, full ocean chemistry, biology) and verification of inline sensor measurements. Being pressure balanced, the entire system maintains constant buoyancy throughout the deployment.

Extended deployment and triggering options

With power-down and deep-sleep modes that allow ultra-low energy consumption, the Deep Water Sampler can be deployed for extended periods. A separate scheduler and power source are available for shallow-water applications, rendering the system fully autonomous for extended deployment on moorings. Simple maintenance and conditioning between sampling campaigns can be performed directly in the field, allowing for quick redeployment. The equipment can be easily programmed and controlled through a serial protocol or using the software interface, which allows the option of pre-programmed samples (when outfitted with the optional power pack and scheduler), or real-time triggered sampling as directed by the AUV/glider or an optional inline sensor.

Versatile sampling configurations

The controller can be deployed in a variety of configurations. This versatility enables a wide range of sampling strategies. The sampling bottles can be outfitted with various kinds of filters to concentrate suspended matter and biological material, or they can be prefilled with different sample preservatives or biocides. Optionally, the Deep Water Sampler can be equipped with a selective manifold flushing system, which ensures on-demand, representative, zero cross-contamination sampling (optional). The volume and material of the sampling bottles can be customized to address specific applications. The number of sample bottles and their physical configuration can easily be adapted to most platforms – we routinely manufacture custom fixtures and sampling configurations to address the most diverse client requirements.

Fluidion® is a high-technology company that designs and manufactures innovative sample collection and chemical/microbiological in-line and in-situ analysis instruments for water quality monitoring and environmental applications. The core technology relies on Fluidion's proprietary patented fluidic and sampling systems.

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TECHNICAL SPECIFICATIONS

Dimensions and weight <i>*controller and compensator</i>	20cm X 20cm X 15cm, 5kg 8" X 8" X 6", 5kg	Number of samples <i>*model-dependent</i>	14 standard, 26 maximum*
Sample trigger	On-demand, AUV trigger, inline sensor, scheduler module	Sampling technologies	Miniaturized Peristaltic Pump
Materials	PVC, SST 316, Polypropylene	Sample volume	100 mL standard, Other options available on demand
Power <i>*for shallow water (optional)</i>	12V AUV/glider battery; Power pack and scheduler*	Depth rating <i>*model-dependent</i>	300 m, 1500m, 3000m, 6000m*
Current consumption	10 mA (stand-by) 300 mA (active sampling) 0 mA (power-down mode)	Communication	RS232, Subconn MCBH6 connector Other options available on demand

An expanding range of applications

The Deep Water Sampler can provide a versatile instrument in a wide range of applications: Studying ocean chemistry and acidification; Collecting water quality baselines around off-shore industrial facilities; Observing deep water pollution plumes; Fingerprinting of hydrocarbon traces; Performing microplastics pollution research; Acquiring samples for oceanographic biology research, such as metagenomics and microplankton studies; Performing scientific exploration of remote or inaccessible locations; Studying subsea hydrothermal sources.

Deployment examples



Left: The Deep Water Sampler pictured in the Antarctic, where it was deployed on an AUV to collect samples down to 3000m depth, under the Antarctic ice shelf. **Middle and Right:** configuration for autonomous long-term deployment on a mooring in the Gulf of Mexico, including the power pack and scheduler module.

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