Ocean Monitoring

Systems

Sensors / Analyser

Sampler

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OceanPack™, pCO_2 Analyzer & Sampler

Modular, easy to use and reliable monitoring and sampling systems. Water quality monitoring for: profiling, underway and mooring applications

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ISO 9001

subCtech
Subsea Technologies

OceanPack™ Family

SubCtech provides a versatile and cost efficient platform with its OceanPack™ measuring system. It consists of a vast number of high-end SubCtech products.

OceanPack™ RACK

Classical "FerryBox"-design, flexible, expandable

- Robust, versatile standard 19" racks
- Water system fully removable for easy service
- CO_2 tolerant debubbler for gas analysis: mBubbler®
- Built in NetDI® data logger
- The data logger highlights data automatically with quality flags
- Auto-zeroing calibration for long-time high-accuracy operations
- Easy integration of instrumentation via NetDI® data management system
- connected simultaneously via up to 30 serial interfaces
- Expandable via optional RS485 bus

OceanPack™ CUBE

Compact, versatile measurement system

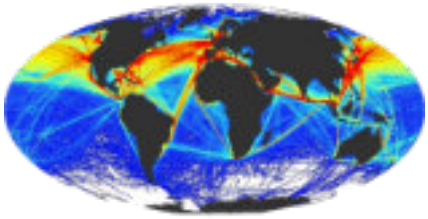
- 19-inch rack format allows the mounting of 19-inch standard frames
- Touch Screen: the new 7"touch screen enables an intuitive control of the device
- Matching flight-case for fast and safe transportation
- Internal sea-water pump for below or above the waterline installations
- NetDI® data logger, robust Flat-Membrane-Equilibrator

OceanPack™ RACE

Highly mobile, extremely robust

- PCO_2 ocean-lab + optional Air-CO_2
- 24 V DC power supply, <30 W operation, <14 W standby
- 15 kg lightweight mechanical frame
- Up to 10 sensors/analysers
- Calibration-free sensors with integrated automatic self-calibration unit
- Integrated small debubbler (mBubbler®) for gas-tolerant de-airing
- Anti-Fouling design

Technology	OceanPack™ flow-through systems (also known as FerryBox or Underway System) with NetDI® for manifold measurement platforms: research vessels, ships of opportunity, platforms, racing yachts etc.
Sensors	Nearly any oceanographic sensor can be integrated into OceanPack™ (e.g. pCO_2, SST, SSS, D.O., algae). In addition, external devices can be included: nutrient analyzers, water samplers, meteorological stations, GPS, Air-CO_2 analysers - up to 30 sensors/analysers
Calibration	All provided sensors are mostly calibration free for approx. 1 year. The SubCtech analysers incorporate a fully automatic self-calibration (e.g. for achieving SOCAT conform quality data)
Storage	Self-recording on 32 GB SD cards, data download via USB or telemetrical via modem
Pump	Self-priming, low-power consuming sea water pump, corrosion free
Debubbling	Integrated debubbler (mBubbler®) unit for gas-tolerant de-airing, works up to ± 30° roll angel



Sensors / Analyser

Instruments for greenhouse gas measurements (CO_2 and or CH_4) in water and air

OceanXpert-Lab IR-CO_2

Mobile flow-through analyser for precise pCO_2 measurements

- Premium optical NDIR LI-COR® analyzer Li-850x
- High precision
- Auto calibration, SOCAT-ready
- Simple Touch-screen operation via NetDI®
- Lowest maintenance
- Robust against sediments, fouling, shock & vibration
- Operates on small vessels up to larger underway systems
- Optional Top-Box contains GPS, AIR-CO_2 analyser or meteo sensors

OceanXpert-Sea IR-CO_2

Precise optical Subsea pCO_2 analyser

- Premium optical NDIR LI-COR® analyser Li-850x
- Robust, versatile and compact submergible housing for buoy and subsea applications (e.g. monitoring Offshore Oil&Gas or CCS)
- ROV or AUV integration
- optional external Li-Ion PowerPack™

OceanXpert-Lab Laser-CO_2/CH_4

Underway analyser for precise pCO_2 , H_2O and pCH_4 measurements

- ABB Los Gatos greenhouse gas analyser
- High precision
- Simple Touch-screen operation to control the NetDI® controller and datalogger
- Optional second display to show Los Gatos analyser interface
- patented Off-Axis Integrated Cavity Output Spectroscopy (OA-ICOS) technology for precise and accurate measurements

Specification - LI-COR® sensor

Sensor Technology	High-performance LI-COR® LI-850x or LI-7200 ● exclusively produced by LI-COR® Biosciences for SubCtech ● Dual-wavelength NDIR detector for CO_2 and H_2O or CH_4
Equilibrator	Silicone flat membrane equilibrator ● Lifetime >10 years ● Fast response time ● No sedimentation or fouling ● Fast exchange with membrane cassettes ● Patent pending
Range	Standard 0 ppm ...3000 ppm CO_2 ● 0 ppt...80 ppt H_2O ● up to 10% CO_2 ● Selectable units
Resolution	0.01 ppm CO_2 ● 0.001 ppt H_2O
Accuracy	Overall accuracy < 1% ● Compensation for water vapor, pressure and temperature effects With auto-calibration < 1ppm ready for SOCAT database
Sample Rate	Configurable, typ. 1 Hz self-recording and real-time output ● Configurable data format
Calibration	Factory calibration with 15 traceable gases to WMO standards for CO_2 ● NIST traceable LI-610 portable dew point generator for H_2O ● User correction supported
Auto Calibration	Auto zeroing at programmed intervals ● Zeroing reference included for >1 year operation time Manual span and optional full auto-span gas calibration, up to 3 gas inputs
Data Interface	RS-232 or RS-485 ● Simple standardized ASCII NMEA-0183 data protocol ● Easy integration with existing systems ● Optional usage of radio links, Ethernet, WLAN etc.
Analogue Output	0 V...2.5/5 V or 4 mA...20 mA ● Range configurable

Sampler

- Complete systems
- Lowest maintenance
- Robustness for harsh environments
- Long-term deployments
- Autonomous operation
- Fully integrated gas analyzer
- Automatic calibration and referencing
- Small and lightweight design
- Open design for a multitude of sensors
- OceanView™ Windows® software

Microplastic Sampler

Sailing meets Science™ - Microplastic Automatic Sampler

- Robust, versatile and compact water proof design
- Highest efficiency sampling, even at high speeds of 30 kn and more
- On board sampler: smallest size, low weight and low power consumption (size like a shoebox)

Volvo Ocean Race: round the world 2018-19
© Volvo Ocean Race. Data source: Dr-Ing. Sören Gutekunst and Dr Toste Tanhua, GEOMAR Helmholtz Centre for Ocean Research Kiel

Racing Yacht "Malizia"
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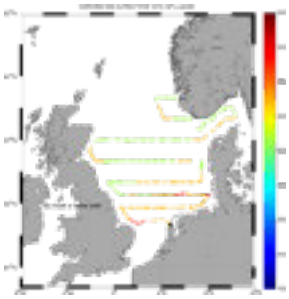

North Sea data: 1.5 Mio. Datasets by NIOZ

Subsea Sampler

Submersible Sampler for Nano- and Microplastics (SuNaMips)

- Collection of small plastic samples down to 30 µm particle size
- Integrated pump and volume flow meter for a precise sampling of a pre-defined water volume
- Internal datalogger and control unit for automatic sampling with user programmed timers of multiple plastic samples over a period of time at greater water depth (up to 600 m)
- Each filter set consists of a cascade of three filters with different mesh sizes for pre-sorting of sampled particles
- Optional integrated, rechargeable Li-ion batteries allow independent sampling without any additional power source.

OceanPack™ Plankton Sampler

Multifunctional sampler - especially for plankton - even at rough seas

- Unattended operation
- Standalone or controlled by external flow through system (FerryBox)
- 16 sample bottles stored on two drawers in a cooled environment
- Automatic preservation after sampling - bottles are seperately closed by valves for safe handling even with toxic agents
- GPS interface for georeferencing
- 7" touch screen for easy configuration of sampling settings
- Real time data output and USB interface for data download

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