



OceanPack™ Family

Mobile & modular
 $p\text{CO}_2$ analyzer & underway systems

for



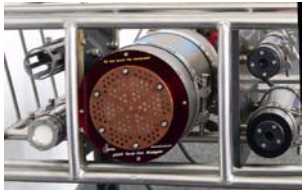
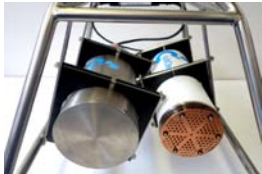
Water quality measurements

Monitoring & profiling

Inspection & exploration



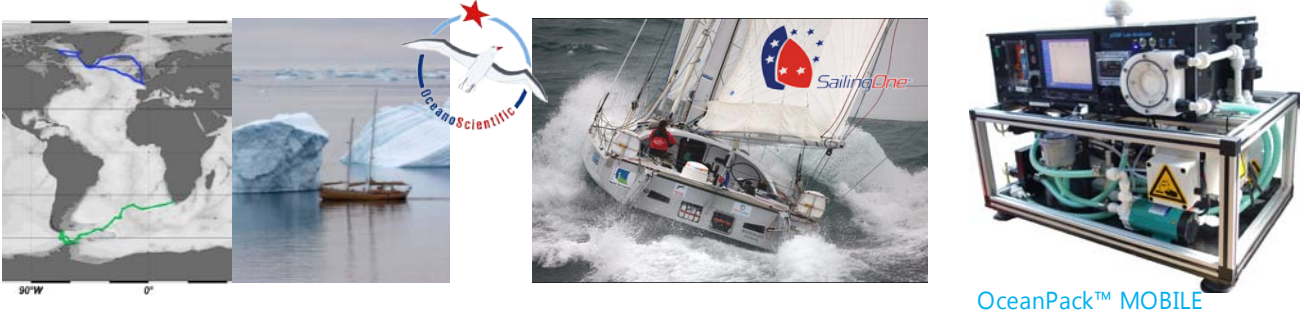
		PARAMETER	DESIGN
OCEANPACK AUMS Autonomous Underway Measurement System for vessels and monitoring stations		$p\text{CO}_2$ and any type and number of internal or external sensors (examples see "Additional Devices") Nutrients (extra 19" rack) Water sampler Meteorology Air- CO_2 , GPS (Top-Box)	Flow-through System ("FerryBox") Optionally racks for nutrient analyzers or water sampler Top-Box for meteorology and independent Air- CO_2 analyzer Automatic cleaning Ship system integration Debubbler and sensor integration
OCEANPACK RACK Versatile measurement system for vessels and monitoring stations		$p\text{CO}_2$ and few internal or external sensors (examples see "Additional Devices") Meteorology Air- CO_2 , GPS (Top-Box)	"Underway" System 19" Rack / Flow-through Optionally: Top-Box for meteorology and independent Air- CO_2 analyzer Ship system integration Debubbler and sensor integration
OCEANPACK AQUA AquaCulture and MariCulture monitoring and control system		Any parameter e.g. $p\text{CO}_2$, Nutrients, Oxygen, pH, Light, Flow, Turbidity, H_2S etc.	Industrial AquaCulture System High precision analysis for sensible products such as RAS, IMTS or contamination free fish breeding Flow-through or inline sensors
TOP-BOX MK3 SAE Air- CO_2 Analyzer with LI-7200x analyzer for Sea-Air Exchange analysis		Air- CO_2 (MK3: LI-7200x) GPS external sensors on request e.g. Meteorology	High-end state-of-the-art Analyzer Stainless steel IP68 enclosure Complete remote data acquisition system Protected against spray & waves "Arctic" version -40°C to +50°C
OCEANPACK MK2 (LI-COR), MK5 (LOW COST) Standard $p\text{CO}_2$ flow-through analyzer		$p\text{CO}_2$ and few external sensors (examples see "Additional Devices") Air- CO_2 , GPS (Top-Box) Optionally Water system with Debubbler	Standard Analyzer Small footprint and extreme tough design Top-Box for meteorology and independent Air- CO_2 analyzer Ship system integration
OCEANPACK LAB Laboratory mobile analyzer		$p\text{CO}_2$ Few external sensors can be customized connected (examples see "Additional Devices")	All-in-one Lab-Analyzer 19" Unit with touch-screen High precision, ultra-compact Top-Box for meteorology and independent air- CO_2 analyzer

<p>OCEANPACK BUOY</p> <p>Sea-Air Exchange buoy analyzer for surface monitoring</p>		<p>$p\text{CO}_2$ 4 external sensors (examples see "Additional Devices") Air-CO_2 sequentially</p> 	<p>Low-Power Buoy System POM / Titanium $\phi 200\text{mm} \times 500\text{mm}$ max. 50m operating depth High-precision LI-COR LI-840x Sea-Air analysis No reference gas required Li-Ion batteries available</p>
<p>OCEANPACK SUB</p> <p>Subsea analyzer for deep-sea monitoring ROV and AUV integration & INSPECTION ROV</p>	 <p>Photo: ROV Inspection Sensor Pack</p>	<p>$p\text{CO}_2$ External sensors (examples see "Additional Devices") Subsea data logger Offshore leak detection Condition monitoring Low-cost type MK5 available</p>	<p>First subsea LI-COR LI-840x Titanium $\phi 168\text{mm} \times 350\text{mm}$ 300, 1000 ...6000m operating depth Subsea Li-Ion batteries available</p>  <p>Photo: $p\text{CO}_2$ subsea analyzer with Li-Ion Battery</p>

<p style="text-align: center;">COMMON SPECIFICATION (MK2, MK3 LI-COR ANALYZER)</p>	
Sensor technology	High-performance LI-COR [®] LI-840x (MK-2) or LI-7200x (MK-3) • 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...3000 ppm CO_2 • 0...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 vapour, pressure and temperature effects
Sample rate	Configurable output types. 1Hz • 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
Analogue output	0...2.5/5V or 4...20mA • Range can be configured
Data interface	Up to 36 RS-232 or RS-485 • Standard ASCII NMEA-0183 data protocol • Easy integration with existing systems • Optional usage of radio links, Ethernet, WLAN etc.
Additional devices	Multitude of sensors and analyzer are supported, e.g.: • SYSTEAN nutrient analyzer • Water sampler • Direct geo-referencing using GPS • Sensors: Seabird, Sea&Sun, Seapoint, TriOS, Turner, Franatech, bbe, RDI, Aanderaa AADI, WET Labs, Seabird, SMC, Nortek, Sonardyne, Gill etc. • Meteorological & external instrumentation via RS-485 bus
Data logger	SmartDI [®] touch-panel embedded industrial PC data logger • Multi-functional real-time multitasking kernel • Reset and power failure proofed • Low-power • Automatic diagnostic messages • Watchdog • Precise real-time-clock • Redundant storage of data and configuration on CompactFlash or SD card • Expandable via RS-485 modules for pumps, valves etc. • Optional alarms • Optional telemetry
Analogue input	Optional 24 Bit data acquisition • 0/4...20mA, $\pm 10\text{mV}$... $\pm 10\text{V}$ • Expandable

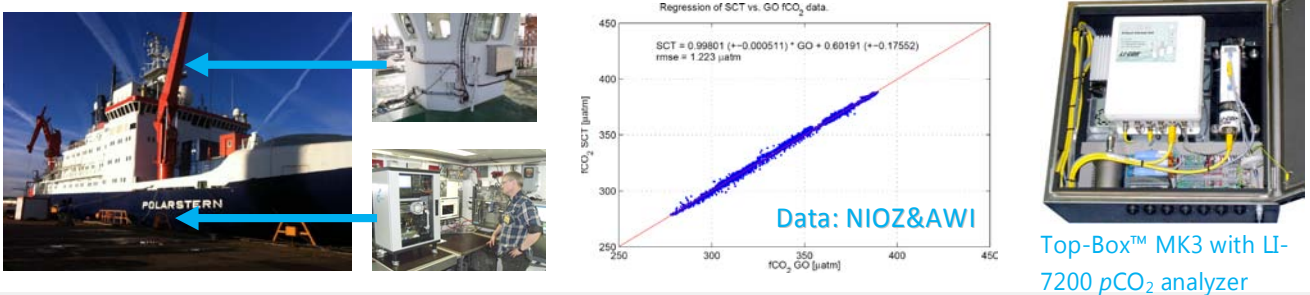
- Complete systems
- Low maintenance
- Harsh environments
- Long-term deployments for autonomous operation
- Fully integrated LI-COR® analyzer
- Automatic calibration
- Small and lightweight design
- Multitude of sensors supported
- Windows® 19" OceanView™ Software

OceanoScientific® System

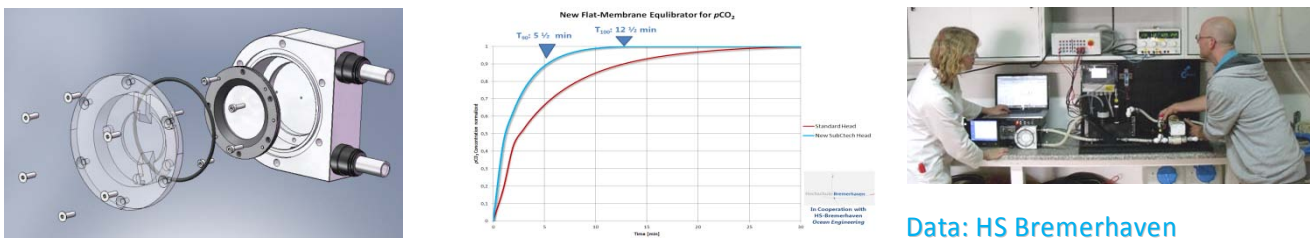


OceanPack™ MOBILE

Sea-Air Exchange



Flat-Membrane Equilibrator (patented)



Field Data

