SEA-BIRD SCIENTIFIC

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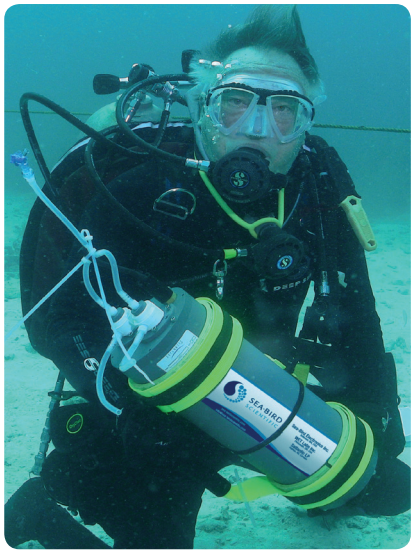
Ocean pH Sensors


SeaFET™ in use at the Cabrillo National Monument, San Diego, CA

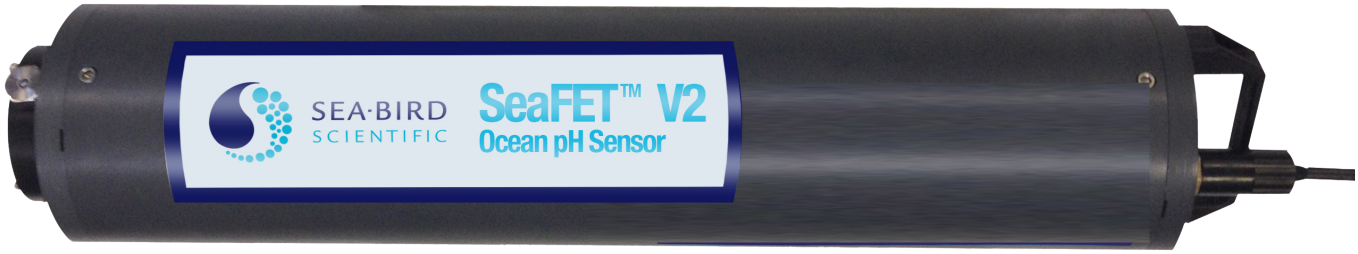
Sea-Bird Scientific's line of ocean pH sensors use Honeywell's innovative ion-sensitive field effect transistor (ISFET) technology to provide a level of precision and stability not before possible.

The original SeaFET™ Ocean pH Sensor was developed by Dr. Ken Johnson of the Monterey Bay Aquarium Research Institute (MBARI) and Dr. Todd Martz of the Scripps Institution of Oceanography. Sea-Bird Scientific collaborated with MBARI and Scripps to adapt Honeywell's ISFET technology for the broader scientific community and expand the sensor options to address multiple applications.



SeaFET™ V2 Ocean pH Sensor

The SeaFET™ V2 Ocean pH sensor uses the ISFET technology for stable, long-term pH measurements in salt water. The pH sensor has been used extensively around the globe for ocean acidification research, coral reef research, coastal marine biology and environmental monitoring. The SeaFET™ V2 Ocean pH sensor is fully autonomous with internal power, sample scheduling and data logging capabilities.



SeapHOx™ V2 and Deep SeapHOx™ V2

Ocean CT(D)-pH-DO Sensor

The Sea-Bird Scientific SeapHOx™ V2 system is comprised of the SeaFET™ V2 Ocean pH sensor and the SBE 37-SMP-ODO MicroCAT CTD+DO sensor. This new system allows for collection and combination of pH data and critical oceanographic/biological measurements of temperature, salinity, and oxygen. The integrated package also enables the SeaFET™ V2 to take advantage of the MicroCAT's pumped flow path and anti-fouling technology, extending deployment durations.

Depth Variations

- The SeapHOx™ V2 (top right) is intended for moored applications of up to 50 m in depth
- The Deep SeapHOx™ V2 (bottom right) is intended for moored applications of up to 2000 m deep

Anti-BioFouling Measures

- The SeaFET™ V2's copper fittings, installed at the intake and the pump exhaust, inhibit bio-fouling (see photo next page)
- The MicroCAT's pumped flow path and anti-fouling technology allows for extended deployment durations

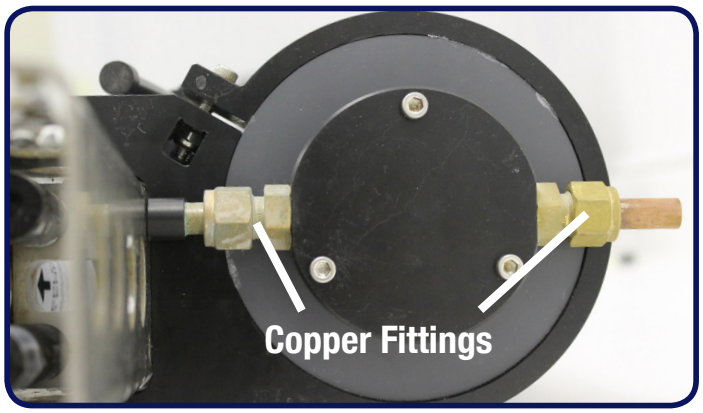
SeapHOx™ V2 Features:

- pH, Conductivity, Temperature, Pressure (optional), and Optical Dissolved Oxygen, at user-programmable intervals
- Integral pump
- RS-232 communications
- Internal memory and batteries (can be powered externally)
- Industry-leading conductivity cell biofouling protection
- UCI software package (setup, data upload, and data processing)
- Field-proven MicroCAT CTD family has more than 10,000 instruments deployed world-wide

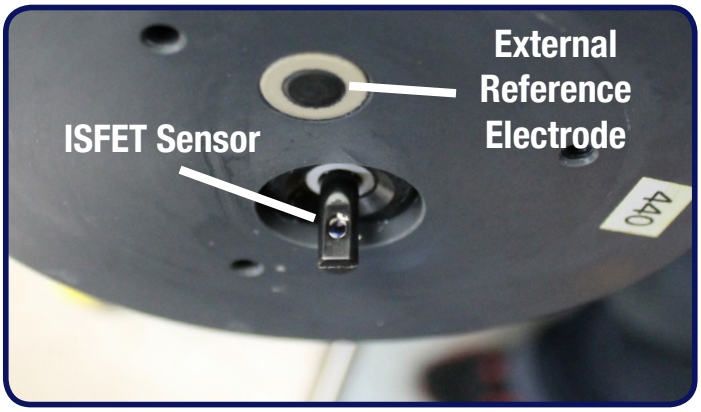
SeapHOx™ V2

Deep SeapHOx™ V2

Below: SeaFET™ V2 connected to MicroCAT pumped flow path for bio-fouling protection



Below: SeaFET™ V2 wet cap removed to show flow sensing element



Float pH

Navis BGCi + pH Float

With an ever expanding demand for autonomous measurement of deep ocean waters, the Float pH is an important addition to Sea-Bird Scientific's Navis BGCi Autonomous Profiling Float, providing deep and stable pH sensor measurements. The deployment of pH sensors on the Navis Float provides a much more complete view of the ocean carbon system.

Utilizing the field-validated MBARI/SIO/Honeywell Deep-Sea DuraFET technology to measure pH onboard the Navis BGCi float, the Float pH incorporates physical property data from the SBE 41N CTD to provide corrected data to the end user.

Bio-fouling protection on the Float pH is provided by utilizing the CTD's pumped flow path.

Navis BGCi Autonomous Profiling Floats integrate a Sea-Bird CTD (SBE 41N), an optical Dissolved Oxygen (DO) sensor (SBE 63), an ECO-MCOMS fluorometer/backscattering sensor, together with multiple optional bolt-on sensors, including the Float pH. More information on this system is available at seabird.com/navis-bgci-pH.

HydroCAT-EP

Multi-Parameter Water Quality Instrument

The HydroCAT-EP uses a field-serviceable and replaceable glass-electrode sensor to measure pH to an initial accuracy of ± 0.1 pH. Like many glass-electrode pH sensors, it can be calibrated with standard pH buffer solutions and is deployable in freshwater and marine environments.

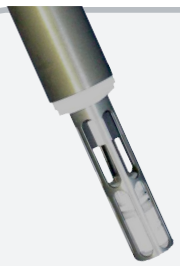
The pH sensor is inline with the other sensors to take advantage of the anti-fouling mechanisms. Streamlined reference checks enable users to generate scientifically defensible data with minimal time and cost required for field maintenance.

The HydroCAT-EP measures:

- pH
- Conductivity
- Temperature
- Pressure
- Dissolved Oxygen
- Chlorophyll
- Turbidity

Auxillary pH Sensors

The SBE 18 and SBE 27 pH sensors are intended for use as add-on auxiliary sensors on our profiling CTDs.



SBE 18 pH Sensor

Pressure-balanced glass-electrode pH reference probe provides in-situ pH measurements for profiling CTDs. Easy to install, service, and calibrate. Depth rating: 1200 m.

SBE 27 pH/O.R.P. (Redox) Sensor

Pressure balanced glass-electrode, pH reference probe, and platinum O.R.P. electrode to provide in-situ measurements. Depth rating: 1200 m.