

Navis BGCi + pH

Autonomous Profiling Float with integrated Biogeochemical Sensors

Now available with a deep, stable pH sensor, the Navis BGCi + pH introduces the Float Deep SeaFET™ to the community for autonomous profiling float missions. The Float Deep SeaFET™ is integrated into the SBE 41N profiling float CTD data stream. This float also integrates the Float Deep SeaFET™ into the SBE 41N pumped flow path for bio-fouling protection.

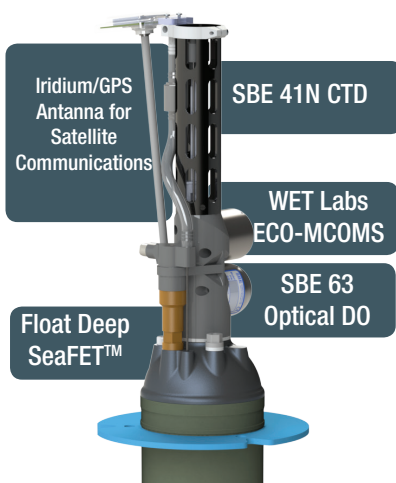
The SBE 41N CTD measures conductivity, temperature, and pressure (depth). The SBE 41N manages the installed sensors to take continuous measurements at 1 Hz through ascent, and provide high accuracy, resolution, and stability data. The pump-controlled, T-C ducted flow minimizes salinity spiking caused by mismatch of temperature and conductivity measurements.

The individually calibrated SBE 63 Optical Dissolved Oxygen sensor is integrated within the CTD flow path, providing optimal correlation with CTD measurements.

The ECO-MCOMS uses demonstrated WET Labs technology to supply three optical sensors in one, providing chlorophyll a, backscattering, and CDOM, or chlorophyll a and 2 backscattering channels. ECO-MCOMS is integrated directly into the float end cap and co-located with DO and physical measurements.

The Float Deep SeaFET™ is an adaptation of the Deep-Sea DuraFET developed collaboratively by the Monterey Bay Aquarium Research Institute (MBARI), Scripps Institution of Oceanography (SIO), and Honeywell. The Deep Sea DuraFET technology was developed by Ken Johnson at MBARI and Todd Martz at SIO.

Navis BGCi + pH Head



Navis BGCi + pH
with optional Deep
SUNA

Features

- Navis Autonomous Profiling Float
- SBE 63 Optical Dissolved Oxygen sensor
- WET Labs ECO-MCOMS fluorometer / backscattering sensor
- Float Deep SeaFET™
- SBE 41N CTD — integrated data stream for all sensors on float, and continuous profiling from 2000 dbars; same CTD family as current Argo floats
- Additional bolt-on sensors available
- Flexible mission sequencing, allowing more frequent sampling in upper water column
- Backed by Sea-Bird Scientific warranty

Initial Accuracy

pH	± 0.05 pH
Temperature	± 0.002 °C
Salinity	± 0.002 PSS-78
Pressure	± 2 decibars
Dissolved Oxygen	± 3 µmol/kg or ± 2%
Chlorophyll Fluorescence	± 0.2% of full scale (relative to specific monoculture of phytoplankton [diatom] grown in specific light/nutrient conditions)
CDOM Fluorescence	± 0.3% of full scale (relative to Quinine sulfate dihydrate)
Backscattering	± 0.2% of full scale (relative to polystyrene beads [2 µm ±0.1 µm mean diameter])

Typical Stability

pH	0.036 pH/year
Temperature	0.0002 °C/year
Salinity	0.001 PSS-78/year
Pressure	0.8 decibars/year
Dissolved Oxygen	<1 µmol/kg/100,000 samples (20 °C; sample-based drift)



Dan Schuller of Scripps Institution of Oceanography deploys a SOCCOM float on cruise of R/V Polarstern from Cape Town, South Africa to Neumayer Station Antarctica, December 2014. Older cowlings base shown. (Photo by Hannah Zanowski, Princeton University)



Closeup of Float Deep SeaFET™ pH Sensor Probe Assembly

Volume Change	1.7% (minimum fractional)
Depth Rating	2000 dbars
Communications	Iridium Transceiver 9523 — RUDIGS, circuit switched
Position	GPS, Garmin 15xL-W, mean acquisition time 70 sec
Park Interval	1 - 15 days
Materials	Aluminum hull, seamless natural rubber external bladders
Weight (in air)	< 20 kg (excluding optional bolt-on sensors)
Self-Activation	Starts operating automatically on deployment, when pressure reaches user-programmable setpoint
Internal Batteries	4 packs of 3 DD lithium sulfuryl chloride cells (cannot ship in passenger aircraft; Class 9 Dangerous Goods)
Power Endurance	220 2000-dbar cycles (mission dependent; excluding optional bolt-on sensors)
Memory	CTD stores one 2000-dbar profile
Dimensions	Hull diameter 14 cm, ring diameter 24 cm, total length 167 cm