

# Navis Autonomous Profiling Float with Integrated Biogeochemical Sensors



## SUMMARY

- Navis Autonomous Profiling Float
- SBE 63 Optical Dissolved Oxygen sensor
- WET Labs MCOMS fluorometer / backscattering sensor
- One additional optional sensor, bolt-on
- SBE 41N CTD -- integrated data stream for all sensors on float, and continuous profiling from 2000 dbars; same CTD family as current Argo floats
- Sufficient power for 250 profile cycles to 2000 dbars (without optional bolt-on sensor)
- Flexible mission sequencing, allowing for more frequent sampling in upper water column
- Backed by Sea-Bird Scientific warranty

## DESCRIPTION

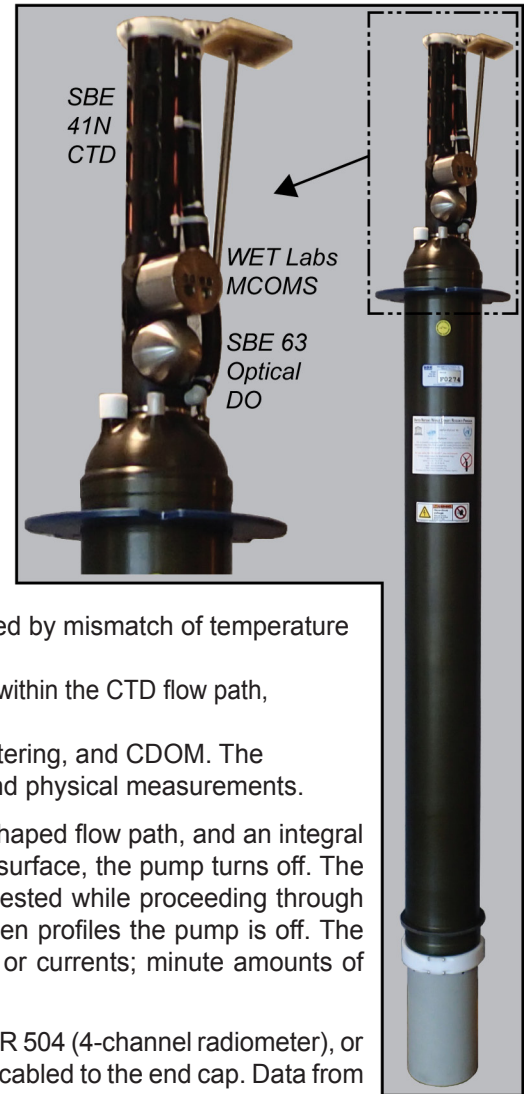
A Navis autonomous profiling float with integrated optical Dissolved Oxygen sensor (SBE 63) and WET Labs MCOMS is now available from Sea-Bird Scientific. The sensors take continuous measurements at 1 Hz through ascent, and provide high accuracy, resolution, and stability.

- The SBE 41N CTD measures conductivity, temperature, and pressure (depth). 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 optimum correlation with CTD measurements.
- The MCOMS is three optical sensors in one, providing chlorophyll a, backscattering, and CDOM. The MCOMS is integrated directly into the float end cap and co-located with DO and physical measurements.

The carefully engineered anti-foul protection includes anti-foulant devices, a U-shaped flow path, and an integral pump. On the float's ascent, as it approaches 10 to 5 dbars beneath the ocean surface, the pump turns off. The U-shaped flow path prevents sea surface oils and contaminants from being ingested while proceeding through the ocean surface skin and sitting at the surface during data transmittal. Between profiles the pump is off. The U-shaped flow path prevents water flow through the system caused by waves or currents; minute amounts of anti-foulant concentrate inside the conductivity cell to minimize bio-fouling.

As an option, other sensors, such as a Satlantic Deep SUNA (nitrate), Satlantic OCR 504 (4-channel radiometer), or WET Labs C-Rover 2000 (transmissometer), can be attached to the float hull and cabled to the end cap. Data from all sensors, including the optional bolt-on sensor, is integrated in the data stream by the SBE 41N CTD electronics.

For detailed information on the operation of the Navis float, **see the Navis float datasheet.**



Navis BGC Float Deployment in the Mediterranean

Photo by Christoph Gerigk,  
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## SPECIFICATIONS

### Measurements:

<b>Temperature:</b>	± 0.002 °C initial accuracy, 0.0002 °C/year stability
<b>Salinity:</b>	± 0.002 PSS-78 initial accuracy, 0.001 PSS-78/year stability
<b>Pressure:</b>	± 2 decibars initial accuracy, 0.8 decibars/year stability
<b>Dissolved Oxygen:</b>	± 3 µmol/kg or ± 2% initial accuracy, <1 µmol/kg/100,000 samples stability (20 °C; sample-based drift)
<b>Chlorophyll fluorescence:</b>	± 0.2% of full scale initial accuracy (relative to specific monoculture of phytoplankton [diatom] grown in specific light/nutrient conditions)
<b>CDOM fluorescence:</b>	± 0.3% of full scale initial accuracy (relative to Quinine sulfate dihydrate)
<b>Backscattering:</b>	± 0.2% of full scale initial accuracy (relative to polystyrene beads [2 µm ±0.1 µm mean diameter])
<b>Volume change</b>	1.7% (minimum fractional)
<b>Depth rating</b>	2000 dbars
<b>Communications</b>	Iridium Transceiver 9522B -- RUDICS, circuit switched. Nominal transmission time 275 sec for 2000 dbar profile (2 dbar bins of 1 Hz data; without optional bolt-on sensor)
<b>Position</b>	GPS, Garmin 15xL-W, mean acquisition time 70 sec
<b>Park interval</b>	1 - 15 days
<b>Materials</b>	Aluminum hull, seamless natural rubber external bladders
<b>Oil reservoir</b>	300 ml
<b>Ballasting</b>	Self-ballasting, 1 day to equilibrate
<b>Weight in air</b>	< 20 kg (without optional bolt-on sensor)
<b>Box</b>	Stackable, export-compliant
<b>Self-activation</b>	Starts operating automatically on deployment, when pressure reaches user-programmable setpoint
<b>Internal batteries</b>	4 packs of 3 DD lithium sulfuryl chloride cells (cannot ship in passenger aircraft; Class 9 Dangerous Goods). Each pack has 10.8 V open circuit voltage & 30 AH capacity; 1166 kJ (4664 kJ/4 packs).
<b>Power consumption</b>	13 kJ for 2000-dbar profile cycle (without optional bolt-on sensor)
<b>Power endurance</b>	250 2000-dbar cycles (without optional bolt-on sensor)
<b>Memory</b>	CTD stores one 2000 dbar profile
<b>Dimensions</b>	Hull diameter 14 cm (5.5 in.), Ring diameter 24 cm (9.5 in.), Total length 167 cm (65.7 in.)



with bolt-on  
WET Labs  
C-Rover 2000  
(optional)

with bolt-on  
Satlantic  
Deep SUNA  
(optional)