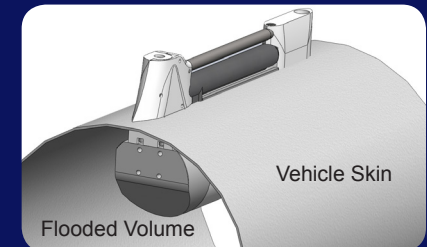


Glider Payload CTD (optional DO) GPCTD

The GPCTD is a modular, low-power profiling instrument for autonomous gliders with the high accuracy necessary for research, inter-comparison with moored observatory sensors, updating circulation models, and leveraging data collection opportunities from operational vehicle missions. The externally powered, continuously pumped CTD consumes only 175 mW recording at 1 Hz (190 mW for real-time data). One Alkaline D cell could operate the CTD continuously for 114 hours (9.5 days at 50% duty cycle, profiling continuously at 1 Hz on every glider upcast); one Lithium DD cell could provide 48 days continuous profiling on every upcast. Data are output in engineering units.

The GPCTD can optionally be equipped with an SBE 43F Dissolved Oxygen sensor, but does not support other auxiliary sensors.



Features

- Conductivity, Temperature, Pressure, and (optional) Dissolved Oxygen (modular SBE 43F DO sensor).
- Pressure-proof module allows for exchange of CTD (and DO sensor) without opening glider pressure hull.
 - Assembly visible on glider exterior consists of intake sail (with integral T-C duct and anti-foulant device), internal field conductivity cell, and exhaust sail with pump connections. Intake sail allows measurements to be made outside vehicle's boundary flow (where old water is thermally contaminated by vehicle). Pump pulls water into intake sail, past temperature sensor, through anti-foulant device and conductivity cell, and out exhaust sail (preventing exhaust re-circulation and Bernoulli pressure differences from changing flow rate). Outside of conductivity cell is free-flushed, minimizing salinity errors. Connecting neck, electronics, pump, and DO sensor are in a flooded space inside hull, placed so that tubing lengths are minimized (between conductivity cell and pump intake, and from pump outlet to sail exhaust fitting), sharp bends are avoided, and pump and tubing are oriented to avoid trapping air that will interfere with pump priming.
- RS-232 interface, memory, real-time output, no batteries (for use on vehicles that can supply power).
- Four sampling modes: Continuous (1 Hz), Fast Interval (5-14 sec intervals), Slow Interval (15-3600 sec intervals; CTD only), and Polled.
 - Continuous sampling time series suitable for corrections (e.g. response filtering, alignment, thermal mass correction) for dynamic errors in data.
 - File headers (maximum 1000) contain beginning and ending sample numbers, sampling mode and interval, and starting date/time.
- Unique flow path, pumping regimen, and expendable anti-foulant device, for maximum bio-fouling protection.
- Pump-controlled, T-C ducted flow to minimize salinity spiking.
- Depths to 350 or 1500 m.
- Field-proven design based on Argo float CTD, with more than 10,000 Argo float CTDs deployed.
- Seasoft® V2 Windows software package (setup, data upload, data processing).
- Five-year limited warranty.

Components

- Unique internal-field conductivity cell permits use of expendable anti-foulant device, for long-term bio-fouling protection.
- Aged and pressure-protected thermistor has a long history of exceptional accuracy and stability.
- Pressure sensor with temperature compensation is available in four strain-gauge ranges (to 2000 m).
- (optional) Oxygen sensor is field-proven, individually calibrated SBE 43F Dissolved Oxygen sensor.
- For Continuous and Fast Interval sampling, pump runs continuously, providing bio-fouling protection and correlation of CTD (and optional DO) measurements.

Options

- Strain-gauge pressure sensor in one of 4 ranges (to 2000 m).
- SBE 43F interface in GPCTD, and modular SBE 43F Dissolved Oxygen Sensor in 600 or 7000 m housing.
- Plastic (350 m) or titanium (1500 m) housing.

Measurement Range

Conductivity	0 to 9 S/m (calibrated 0 to 6 S/m)
Temperature	-5 to +42 °C (calibrated +1 to +32 °C)
Pressure	0 to 100 / 350 / 1000 / 2000 m (calibrated to full scale)

Initial Accuracy

Conductivity	In calibration range: ± 0.0003 S/m; Outside calibration range: ± 0.0010 S/m ¹
Temperature	In calibration range: ± 0.002 °C; Outside calibration range: ± 0.004 °C ¹
Pressure	In calibration range: $\pm 0.1\%$ of full scale range

Typical Stability

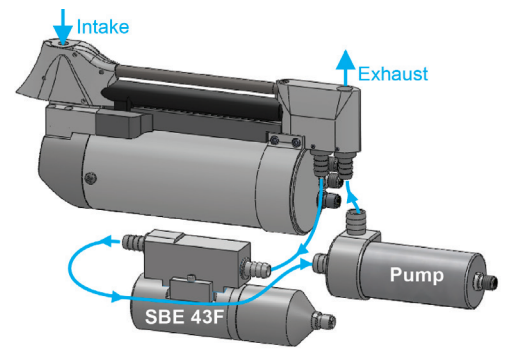
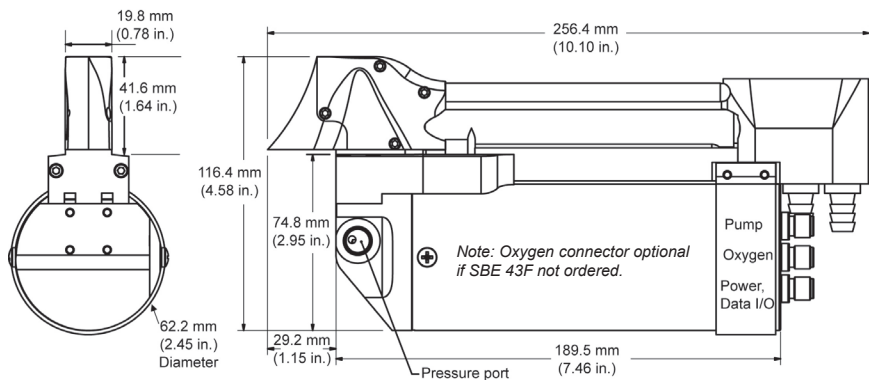
¹ Due to fit extrapolation errors.

Conductivity	0.0003 S/m per month
Temperature	0.0002 °C per month
Pressure	$\pm 0.05\%$ of full scale range per year

Resolution

Conductivity	0.00001 S/m
Temperature	0.001 °C
Pressure	0.002% of full scale range

Sampling Speed	1 Hz (1 sample/sec) maximum
External Power Requirements	8 to 20 VDC nominal. CTD only: 175 mW recording at 1 Hz; 190 mW transmitting real-time data. CTD & DO: 265 mW recording at 1 Hz; 280 mW transmitting real-time data.
Memory	8 Mbytes; 699,000 samples CTD (194 hours at 1 Hz) or 559,000 samples of CTD & DO (155 hours at 1 Hz)
Data Format	Real-time and uploaded data in decimal or Hex: S/m, °C, decibars, DO frequency.
Housing, Depth Rating, & Weight	CTD & pump: Plastic, 350 m, in air 1.0 kg, in water 0.2 kg; Titanium, 1500 m, in air 1.2 kg, in water 0.4 kg. SBE 43F DO sensor: Plastic, 600 m, in air 0.3 kg, in water 0.1 kg; Titanium, 7000 m, in air 0.4 kg, in water 0.2 kg.



With SBE 43F Oxygen Sensor (plumbing approximate)

Forward End View

Side View

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