MicroCAT C-T (P optional) Sensor (Serial Interface & integral Pump)

SBE 37-SIP

SUMMARY

- Conductivity, Temperature, and (optional) Pressure, continuously or at user-programmable 1-sec to 6-hour intervals.
- RS-232 or RS-485 serial interface, internal memory, and external power.
- Expendable anti-foulant devices, unique flow path, and pumping regimen for maximum bio-fouling protection.
- Depths to 350 meters (*ShallowCAT* plastic housing) or 7000 meters (titanium housing).
- Sea-Bird's field-proven MicroCAT family, with more than 10,000 instruments deployed since 1997.
- Five-year limited warranty.

Titanium housing; plastic housing also available

Deploy in orientation shown (connector at bottom) for proper operation

DESCRIPTION

The SBE 37-SIP MicroCAT is a high-accuracy conductivity and temperature (pressure optional) sensor with **S**erial **I**nterface and integral **P**ump, which includes a non-volatile memory. Externally powered, it is useful as a stand-alone monitoring device, and is easily integrated with current meters, ROVs, AUVs, towed sonars, and other instrumentation platforms. Constructed of non-corroding materials to ensure long life with minimum maintenance, the MicroCAT is rated for operation to 350 meters (plastic *ShallowCAT* housing) or 7000 meters (titanium housing), or pressure sensor full-scale range.

Calibration coefficients are stored in EEPROM, providing data output in ASCII engineering units (decimal or XML); raw output is also available. The data always includes Conductivity, Temperature, and (optional) Pressure; time, sound velocity (Chen-Millero), salinity, depth, and density can also be output.

SENSORS

The MicroCAT retains the temperature and conductivity sensors used in our time-proven SeaCAT and SeaCAT*plus*. Electrical isolation of the conductivity electronics eliminates any possibility of ground-loop noise. The unique internal-field conductivity cell permits the use of expendable anti-foulant devices. The aged and pressure-protected thermistor has a long history of exceptional accuracy and stability.

The optional strain-gauge pressure sensor is available in eight ranges, to a maximum depth of 7000 meters. Compensation of the temperature influence on pressure offset and scale is performed by the MicroCAT's CPU.

PUMP

The integral pump typically runs for 1.0 sec each time the MicroCAT samples, providing the following advantages:

- **Improved conductivity response** – The pump flushes the previously sampled water from the conductivity cell and brings a new water sample quickly into the cell.
- **Improved anti-foul protection** – Water does not freely flow through the conductivity cell between samples, allowing the anti-foul concentration to maintain saturation.

COMMUNICATIONS AND INTERFACING

The MicroCAT communicates via RS-232 or RS-485 serial interface:

- **RS-232** — Real-time data can be transmitted up to 1600 meters at 600 baud (power considerations may limit distance), simultaneous with recording. Data can be uploaded at up to 115.2K baud. The user can upgrade firmware through the external connector, without opening the housing
- **RS-485** — Multiple MicroCATs can share a common 4-wire cable (power, common, data +, data -), minimizing cable complexity for C-T chains.

User-selectable operating modes include:

- **Autonomous** — The MicroCAT is pre-programmed to sample, store data in memory, and transmit data. There are two types of autonomous sampling: *Continuous sampling* at the fastest rate possible (0.9-sec minimum without pressure), with the pump running continuously; or *Interval sampling* at 6-sec to 6-hour intervals, with the pump running before each sample.
- **Polled** — On command from a computer or satellite, radio, or wire telemetry equipment, the MicroCAT wakes up, runs the pump, samples, and transmits data.
- **Serial Line Sync** — In response to a pulse on the serial line, the MicroCAT wakes up, runs the pump, takes 1 sample, stores data in memory, transmits data, and goes to sleep.

SOFTWARE

The MicroCAT is supplied with a powerful Windows software package, Seasoft© V2, which includes:

- SeatermV2© – terminal program for easy communication and data retrieval.
- SBE Data Processing© – programs for calculation, display, and plotting of conductivity, temperature, pressure (optional), and derived variables such as salinity and sound velocity.

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SPECIFICATIONS

Measurement Range

Conductivity:	0 - 7 S/m (0 - 70 mS/cm)
Temperature:	-5 to 45 °C
Optional Pressure:	20/100/350/600/1000/2000/3500/7000 (meters of deployment depth capability)

Initial Accuracy

Conductivity:	± 0.0003 S/m (0.003 mS/cm)
Temperature:	± 0.002 °C (-5 to 35 °C); ± 0.01 (35 °C to 45 °C)
Optional Pressure:	± 0.1% of full scale range

Typical Stability

Conductivity:	0.0003 S/m (0.003 mS/cm) per month
Temperature:	0.0002 °C per month
Optional Pressure:	0.05% of full scale range per year

Resolution

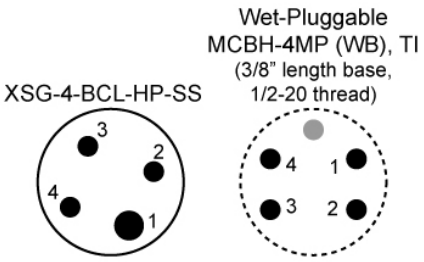
Conductivity:	0.00001 S/m (0.0001 mS/cm)
Temperature:	0.0001 °C
Optional Pressure:	0.002% of full scale range

Clock Stability	5 sec/month
Memory	8 Mbyte; > 530,000 samples
Input Power	0.25 Amps at 9 - 24 VDC
Quiescent Current*	30 microAmps
Communication Current*	4.3 milliAmps
Acquisition Current*	9.1 milliAmps (excluding pump)
Acquisition Time	0.9 - 2.7 sec/sample, *dependent on sampling mode and inclusion of pressure sensor*
Pump Current	25 milliAmps

Housing, Depth Rating, Weight

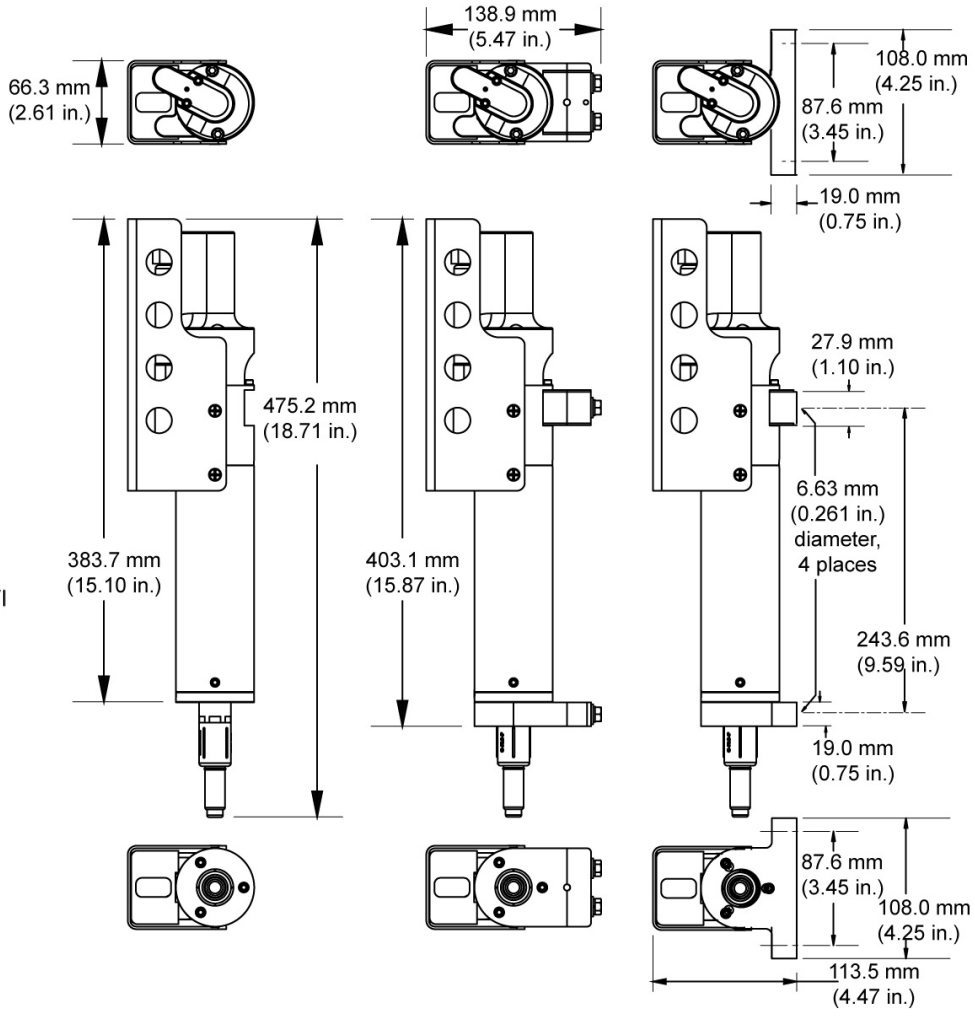
Plastic	350 m (1150 ft)
(with pressure, without clamps)	In air: 2.3 kg (5.0 lbs) In water: 1.4 kg (3.2 lbs)
(with pressure, with clamps)	In air: 2.5 kg (5.6 lbs) In water: 1.6 kg (3.5 lbs)
Titanium	7000 m (23,000 ft)
(without pressure or clamps)	In air: 3.0 kg (6.5 lbs) In water: 1.8 kg (4.0 lbs)

* Power consumption values are for RS-232 interface; for RS-485 interface, see RS-485 manual.



Pin	Signal
1	Common
2	RS-232 data receive
3	RS-232 data transmit
4	9-24 VDC external power

RS-232 Interface
(for RS-485: pin 2 is RS-485 A, pin 3 is RS-485 B)



Standard Without Mounting Hardware | **Optional Wire Mounting Clamp and Guide** | **Optional Flat Surface Mounting Brackets**

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