

### SUMMARY

- Moored Conductivity, Temperature, and (optional) Pressure, at user-programmable intervals (6 seconds to 6 hours).
- RS-232 serial interface (RS-485 or SDI-12 / RS-232 optional), internal memory, and internal batteries (can be powered externally).
- 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 8000+ instruments deployed since 1997.

### DESCRIPTION

The SBE 37-SMP MicroCAT is a high-accuracy conductivity and temperature (pressure optional) recorder with **Serial interface**, internal battery, non-volatile **Memory**, and integral **Pump**. The MicroCAT is designed for moorings or other long-duration, fixed-site deployments. Constructed of titanium and other non-corroding materials to ensure long life with minimum maintenance, the MicroCAT's depth capability is 7000 meters; it is also available with an optional 350-meter plastic *ShallowCAT* housing.

Calibration coefficients are stored in EEPROM, allowing the MicroCAT to output data in ASCII engineering units (decimal or XML format); raw output is also available. The data includes Conductivity, Temperature, Pressure (if optional pressure sensor is installed), and time. If desired, the MicroCAT can calculate and output salinity and sound velocity (Chen-Millero).

### SENSORS

The MicroCAT retains the temperature and conductivity sensors used in our time-proven SeaCAT and SeaCAT*plus* products. Electrical isolation of conductivity electronics eliminates any possibility of ground-loop noise. The unique internal-field conductivity cell permits the use of expendable anti-foulant devices, for long-term bio-fouling protection. 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, from 0 - 20 meters to 0 - 7000 meters. Compensation of the temperature influence on pressure offset and scale is performed by the MicroCAT's CPU.

### PUMP

The integral pump runs for 1.0 second 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 inside the cell to maintain saturation.

### COMMUNICATIONS AND INTERFACING

The MicroCAT communicates via standard RS-232 interface. Data can be uploaded at up to 115.2K baud. Real-time data can be transmitted up to 1600 meters (5200 feet) at 600 baud, simultaneous with recording. The user can upgrade firmware through the external connector, without opening the housing. There are two optional interfaces:

- **RS-485** interface allows multiple MicroCATs to share a common 2-wire cable, minimizing cable complexity for C-T chains.
- **RS-232 / SDI-12** dual interface allows for setup and data upload via RS-232 using the full set of commands, while a more limited set of commands can be sent via SDI-12 to make small setup changes in the field and to poll for data. User-selectable output variables for this interface, designed for coastal deployments, includes specific conductivity.

User-selectable operating modes include:

- **Autonomous Sampling** – At pre-programmed intervals of 6 seconds to 6 hours, the MicroCAT wakes up, runs the pump, samples, stores data in memory, and goes to sleep.
- **Polled Sampling** – 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, samples, stores data in memory, and goes to sleep.

### SOFTWARE

The MicroCAT is supplied with a powerful Windows 2000/XP 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, sound velocity, and density.



**DATA STORAGE AND BATTERY ENDURANCE**

Temperature and conductivity are stored 6 bytes/sample, time 4 bytes/sample, and optional pressure 5 bytes/sample; memory capacity exceeds 530,000 samples. The MicroCAT is powered by a 7.8 Amp-hour (nominal) battery pack with twelve AA lithium batteries (Saft LS14500) which, when removed from the MicroCAT, can be shipped via commercial aircraft. The pack provides sufficient internal battery capacity for more than 380,000 samples for a typical sampling scheme. \*

**SPECIFICATIONS**

**Measurement Range**

*Conductivity:* 0 - 7 S/m (0 - 70 mS/cm)  
*Temperature:* -5 to 35 °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  
*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 seconds/month

**Quiescent Current \*** 30 microAmps

**Sampling and Communication Current \***

*Communication* 4.3 milliAmps  
*Sampling (excluding pump)* 9.1 milliAmps if transmitting real-time;  
 7.9 milliAmps if not transmitting

**Pump Current** 0.025 Amp-seconds/sample

**Acquisition Time** 1.9 - 2.9 seconds/sample, dependent on sampling mode and inclusion of pressure sensor

**Power Supply** 7.8 Amp-hour (nominal) battery pack

**Optional External Power** 0.25 Amps at 9-24 VDC

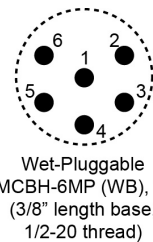
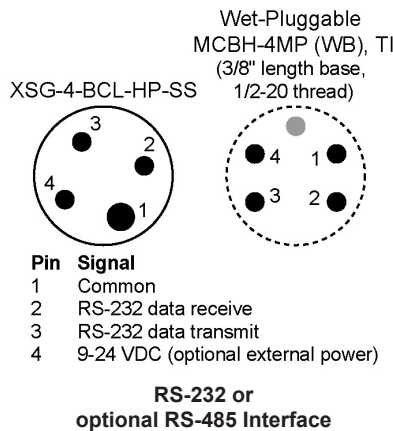
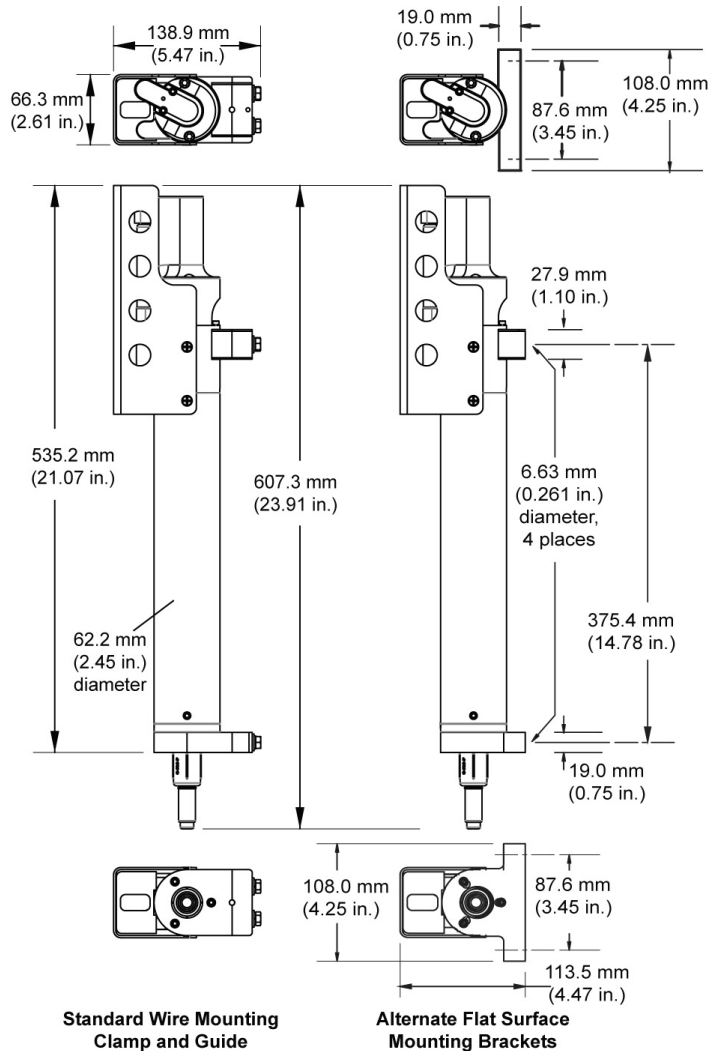
**Housing and Depth Rating**

*Standard* Titanium, 7000 m (23,000 ft)  
*Optional ShallowCAT* Plastic, 350 m (1150 ft)

**Weight** (with standard mounting clamp and guide)

*Standard* In air: 3.7 kg (8.3 lbs)  
 In water: 2.2 kg (4.8 lbs)

*Optional ShallowCAT* In air: 3.4 kg (7.5 lbs)  
 In water: 1.6 kg (3.5 lbs)



Pin	Signal
1	Common
2	RS-232 data receive
3	RS-232 data transmit
4	SDI-12 data transmit
5	--
6	9-24 VDC external power

\* Power consumption / battery endurance values are for standard RS-232 interface; for optional interfaces, see corresponding manual.