

# Digital Oceanographic Pressure Sensor

## SBE 50



The SBE 50 is a high-accuracy, high-resolution (16 Hz sampling) pressure sensor, intended for towed vehicle, ROV, AUV, or other autonomous profiling applications at depths up to 7000 meters (23,000 feet).

The SBE 50's pressure sensor (offered in eight full scale ranges from 20 to 7000 dbars) is the superior, micro-machined, silicon strain-gauge developed by Druck, Inc. This design is entirely different from conventional 'silicon' types in which the deflection of a metallic diaphragm is detected by epoxy-bonded silicon strain gauges. The Druck sensor employs a micro-machined *silicon diaphragm* into which the strain elements are implanted using semiconductor fabrication techniques. Unlike metal diaphragms, silicon's crystal structure is almost perfectly elastic, so the pressure hysteresis is minimal. Compensation of the temperature influence on pressure offset and scale is performed by the SBE 50's CPU.

The SBE 50 is an easy-to-use, light, compact instrument ruggedly made of titanium and other low-maintenance (plastic) materials; it is well suited to even the smallest vehicle. Commands sent to the SBE 50 provide status display, data acquisition setup, and diagnostic tests. The SBE 50 must be externally powered, and its RS-232C data (and/or optional 0 - 5 volt output) logged or telemetered by the vehicle to which it is mounted. The SBE 50 does not support auxiliary sensor inputs.



## SAMPLING MODES

The SBE 50 has two sampling modes:

- **Autonomous sampling** – The SBE 50 runs continuously and samples at sixteen scans per second (16 Hz). It can be set to average up to 255 samples, transmitting only the averaged data. The SBE 50 can be programmed to begin autonomous sampling when power is applied or on command.
- **Polled sampling** – On command, SBE 50 takes one sample and transmits the data.

## DATA OUTPUT

The SBE 50 outputs:

- Raw pressure and pressure temperature values, **or**
- Data in ASCII engineering units (pressure in decibars or psia, or depth in meters or feet) – pressure is calculated using calibration coefficients stored in EEPROM; depth is calculated from pressure, based on user selection of salt or fresh water and user-input latitude.

## AUTONOMOUS WATER SAMPLER CONTROL

The SBE 50 can be integrated with the SBE 32 Carousel Water Sampler and Auto Fire Module (AFM), or with the SBE 55 ECO Water Sampler, to provide autonomous water sampler control for a system deployed on a non-conducting cable. The AFM or ECO supplies power to the SBE 50 and monitors the pressure transmitted by the SBE 50 in real-time, closing water sampler bottles at pre-defined pressures or depths, or whenever the system is stationary for a specified period of time.

## STANDARD FEATURES AND OPTIONS

The SBE 50 is supplied with:

- Titanium housing for depths to 7000 meters
- Strain-gauge pressure sensor
- XSG 4-pin I/O bulkhead connector
- MCBH Micro connector in lieu of XSG (optional)

The SBE 50's **optional Voltage Output interface** provides 0 - 5 volt output proportional to the pressure or depth, *in addition to* the RS-232C output. When equipped with the Voltage Output Interface, the SBE 50 uses a 6-pin I/O bulkhead connector.

A Windows 95/98/NT/2000/XP terminal program, **SEATERM**, is supplied for instrument setup, status display, and diagnostics.



**Sea-Bird Electronics, Inc.**

13431 NE 20th Street, Bellevue, Washington 98005 USA

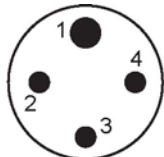
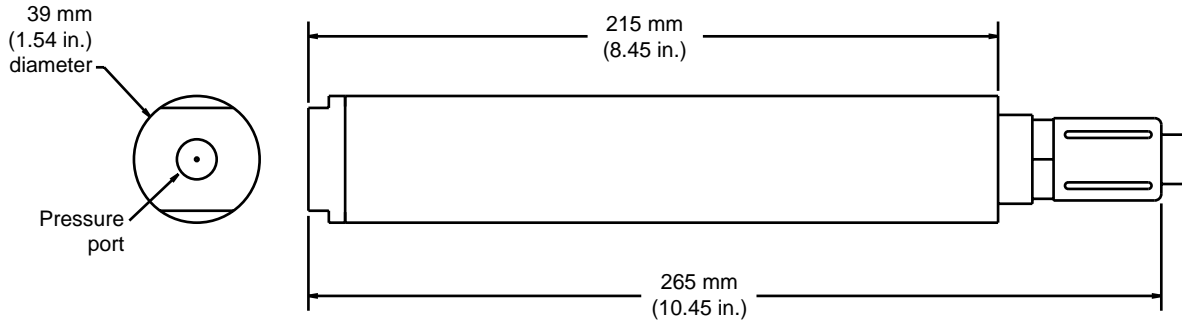
Website: <http://www.seabird.com>

E-mail: [seabird@seabird.com](mailto:seabird@seabird.com)

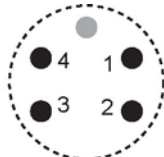
Telephone: (425) 643-9866

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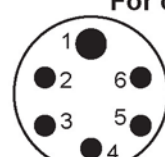
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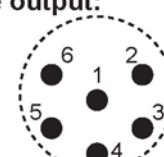
**Standard 4-pin Connector**  
XSG-4-BCL-HP



**Optional 4-pin Wet-Pluggable Connector**  
MCBH-4MP (WB), TI  
(3/8" length base, 1/2-20 thread)



**6-pin Connector**  
AG-306-HP



**Optional 6-pin Wet-Pluggable Connector**  
MCBH-6MP (WB), TI  
(3/8" length base, 1/2-20 thread)

| Pin | Signal                         |
|-----|--------------------------------|
| 1   | Ground                         |
| 2   | RS-232 receive (from computer) |
| 3   | RS-232 transmit (to computer)  |
| 4   | 8-30 VDC power in              |

For optional voltage output:

| Pin | Signal                         |
|-----|--------------------------------|
| 1   | Ground                         |
| 2   | RS-232 receive (from computer) |
| 3   | RS-232 transmit (to computer)  |
| 4   | Pressure output voltage +      |
| 5   | Pressure output voltage -      |
| 6   | 8-30 VDC power in              |

## SPECIFICATIONS

**Measurement Range** 0 to 20 / 100 / 350 / 600 / 1000 / 2000 / 3500 / 7000 meters  
(expressed in meters of deployment depth capability)

**Initial Accuracy** 0.1% of full scale range

**Typical Stability** 0.05% of full scale range per year

**Resolution** 0.002% of full scale range  
(D/A resolution for optional 0 -5 volt output: 16 bit)

**Power Requirements** 8 - 30 VDC

**Housing Material** 3AL/2.5V Titanium

**Depth Rating** 7000 meters (22,900 feet)

### Weight

*In air* 0.7 kg (1.5 lbs)  
*In water* 0.4 kg (0.9 lbs)

05/08



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