

SEACAT C-T Recorder

SBE 16plus


The SBE 16plus SEACAT is a Temperature and Conductivity recorder (pressure optional) intended for moorings and other long-duration, fixed-site deployments. Compared to the original SBE 16 SEACAT, the 16plus offers the improved C, T, and pressure specifications of MicroCATs, and also includes larger memory (8 Mbyte vs 1) and four differentially-amplified A/D input channels (14-bit resolution vs 12). The 16plus is more power-efficient than old SEACATs: 9 alkaline D-cells will record 400,000 samples of C and T. Conditioned power (500 ma) is available for auxiliary sensors (dissolved oxygen, pH, turbidity, fluorescence, PAR, ORP, etc); their cabling is simpler and more reliable because there are two auxiliary input connector ports.



The SBE 16plus uses the same temperature and conductivity sensors proven in 5000 SEACATs and MicroCATs, and (optionally) a superior new micro-machined silicon strain gauge pressure sensor developed by Druck, Inc. Improvements in design, materials, and signal acquisition techniques yield a low-cost instrument with superior performance that is also easy to use. Calibration coefficients, obtained in our computer-controlled high accuracy calibration baths, are stored in EEPROM memory. They permit data output in ASCII engineering units (degrees C, Siemens/m, decibars, Salinity [PSU], sound velocity [m/sec.], etc.).

The SBE 16plus sample interval is soft-programmable in one-second increments ranging from 5 to 32,000 seconds. Between samples, the 16plus powers down, drawing only 30 microamps of current. Data are recorded in non-volatile FLASH memory for 38.4K baud upload after recovery.

Real-time monitoring is practical using the SBE 16plus' 3-wire RS-232C data output. The 16plus is well suited to networked sensor arrays where its operation can be triggered by satellite, radio, or hardwire telemetry equipment. Optional RS-485 (2-wire) and inductive modem (1-wire loop) interfaces allow multiple SEACATs to share a simple and robust telemetry cable.

CONFIGURATION AND OPTIONS

A standard SBE 16plus is supplied with:

- Plastic housing for depths to 600 meters
- 8 Mbyte FLASH RAM memory
- 9 D-size alkaline batteries
- XSG bulkhead connectors: 4-pin I/O and two 6-pin (two differential auxiliary A/D inputs each)
- Anti-foul attachments and expendable anti-foul devices

Options include:

- Titanium housing for use to 7000 meters
- Druck strain gauge pressure sensor
- Quartz pressure sensor
- RS-485 interface in place of RS-232
- Inductive modem interface in place of RS-232
- Optional bulkhead connectors for use with pump and SBE 38 (RS-232) secondary temperature sensor
- Sensors for oxygen, pH, fluorescence, light (PAR), light transmission, and turbidity
- SBE 5M or 5T pump for use with pumped sensors
- Lithium battery pack

SOFTWARE

The SBE 16plus is supplied with a powerful Win 95/98/NT software package that includes:

- SEATERM[®] — communication and data retrieval
- SBE Data Processing[®] — filtering, aligning, averaging, and display of CTD and auxiliary sensor data and derived variables



Sea-Bird Electronics, Inc.

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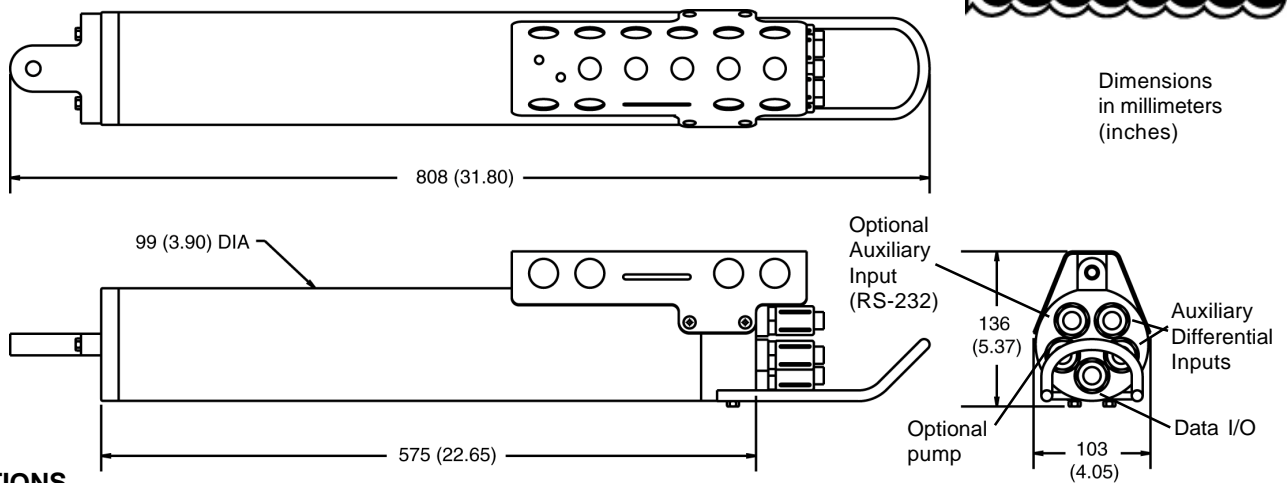
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SEACAT C-T Recorder



Dimensions
in millimeters
(inches)

SPECIFICATIONS

Measurement Range

Temperature -5 to +35 °C
 Conductivity 0 to 9 S/m
 Pressure (optional) Strain-gauge 0 to 20/100/350/1000/3500/7000 meters
 Quartz 0 to 60/130/200/270/680/1400/2000/4200/7000 meters

Initial Accuracy

Temperature 0.005 °C
 Conductivity 0.0005 S/m
 Pressure (optional) Strain-gauge 0.1% of full scale range
 Quartz 0.02% of full scale range

Typical Stability (per month)

Temperature 0.0002 °C
 Conductivity 0.0003 S/m
 Pressure (optional) Strain-gauge 0.1% of full scale range
 Quartz 0.02% of full scale range

Resolution

Temperature 0.001 °C
 Conductivity 0.00005 S/m typical
 Pressure (optional) Strain-gauge 0.002% of full scale range
 Quartz 0.001% of full scale range

Memory

Data Storage	Recorded Parameter	Bytes/Sample
	T + C	6
	strain-gauge pressure	5
	Quartz pressure	5
	each external voltage	2
	date and time	4

Real-Time Clock 32,768 Hz TCXO accurate to ±1 minute/year

Internal Batteries 9 alkaline D-cells (lithium batteries optional)

Power Endurance ¹

CT only 400,000 samples
 CTD only 270,000 samples
 CTD & 5M pump ² 200,000 samples

¹ With Duracell MN1300 cells. Quiescent current of 30 µA accounts for only 2 % of battery capacity per year.

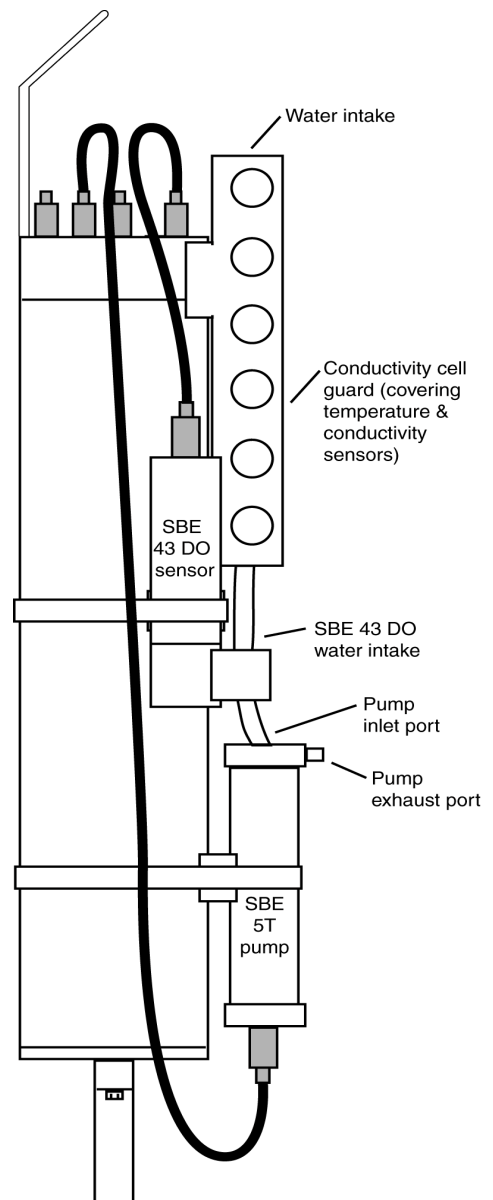
² Pump running 0.5 second to flush cell only.

Auxiliary Voltage Sensors

Auxiliary power out up to 500 mA at 10.5 - 11 VDC
 A/D resolution 14 bits
 Input range 0-5 VDC

Housing Materials/Depth Rating/Weight

Acetal Copolymer Plastic housing / 600 meter (1950 feet) / 7.3 kg (16 lbs)
 3AL-2.5V Titanium housing / 7000 meter (22,900 feet) / 13.7 kg (30 lbs)



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