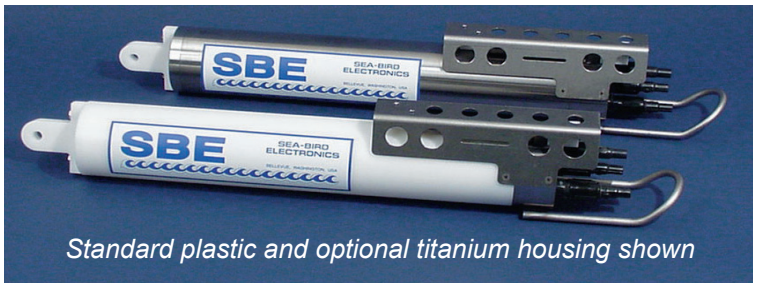
SEACAT C-T Recorder

SBE 16*plus* V2

SUMMARY

- Conductivity, Temperature, Pressure (optional), and up to seven auxiliary sensors, at user-programmable intervals (10 seconds to 4 hours).
- RS-232 serial interface (RS-485 optional), internal memory, and internal batteries (can be powered externally).
- Expendable anti-foulant devices and optional pump for maximum bio-fouling protection.
- Depths to 600, 7000, or 10,500 meters.
- Adds to Sea-Bird's SEACAT family, field-proven since 1987.



Standard plastic and optional titanium housing shown

DESCRIPTION

The SBE 16*plus* **V2** (Version 2) SEACAT Recorder measures temperature and conductivity (pressure optional) and provides high acccuracy and resolution, reliability, and ease-of-use on moorings and other long-duration, fixed-site deployments. Compared to the previous 16*plus*, the V2 incorporates an electronics upgrade and additional features, with six differentially amplified A/D input channels, one RS-232 data input channel, and 64 MB FLASH memory. Data can be output in XML as well as ASCII and HEX formats. Firmware upgrades can be downloaded through the communications port, without opening the instrument.

The SBE 16*plus* V2 uses the same temperature and conductivity sensors (and optional strain-gauge or Digiquartz® pressure sensor) proven in 10,000 SEACATs and MicroCATs. The unique internal-field conductivity cell permits the use of expendable anti-foulant devices, for long-term bio-fouling protection.

Calibration coefficients, stored in memory, permit data output in ASCII engineering units (degrees C, Siemens/m, decibars, salinity [PSU], sound velocity [m/sec.], etc.). The sample interval, ranging from 10 to 14,400 seconds, is user-programmable in 1-second increments. Between samples, the SBE 16*plus* V2 powers down, drawing only 20 microAmps. Nine alkaline D-cells provide power for 355,000 samples of C and T. Conditioned power (500 mA) is available for auxiliary sensors (dissolved oxygen, turbidity, fluorescence, PAR, etc.). Data is recorded in memory for 38.4K baud upload after recovery.

Real-time monitoring is practical using the SBE 16*plus* V2 3-wire RS-232C data output. The 16*plus* V2 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, OPTIONS, AND ACCESSORIES

A standard SBE 16*plus* V2 is supplied with plastic housing for depths to 600 meters, 64 Mbyte FLASH memory, alkaline batteries, glass-reinforced epoxy bulkhead connectors, and expendable anti-foulant devices

Options and accessories include:
- Titanium housing for depths to 7000 or 10,500 meters
- Strain-gauge or Digiquartz® pressure sensor
- RS-485 half-duplex interface in place of RS-232
- Inductive modem interface in place of RS-232 / RS-485 (see SBE 16*plus*-IM V2 datasheet for details)
- Auxiliary sensors for dissolved oxygen, fluorescence, radiance (PAR), light transmission, and optical backscatter (turbidity)
- SBE 5M miniature pump for pumped conductivity; SBE 5P or 5T pump for pumped conductivity and pumped auxiliary sensor(s)
- Wet-pluggable MCBH series connectors
- Battery pack kit for lithium batteries (lithium batteries **not** supplied by Sea-Bird)

SOFTWARE

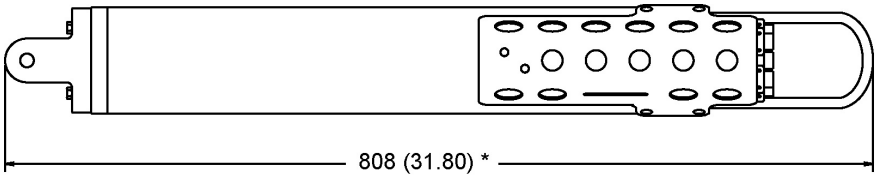
The SBE 16*plus* V2 is supplied with a powerful Windows 2000/XP software package, SEASOFT© V2, which includes programs for communication and data retrieval, real-time data acquisition and display, and data processing (filtering, aligning, averaging) and plotting of CTD and auxiliary sensor data and derived variables.

Sea-Bird Electronics, Inc.
13431 NE 20th Street, Bellevue, Washington 98005 USA
Website: www.seabird.com
E-mail: seabird@seabird.com
Telephone: +1 425-643-9866
Fax: +1 425-643-9954

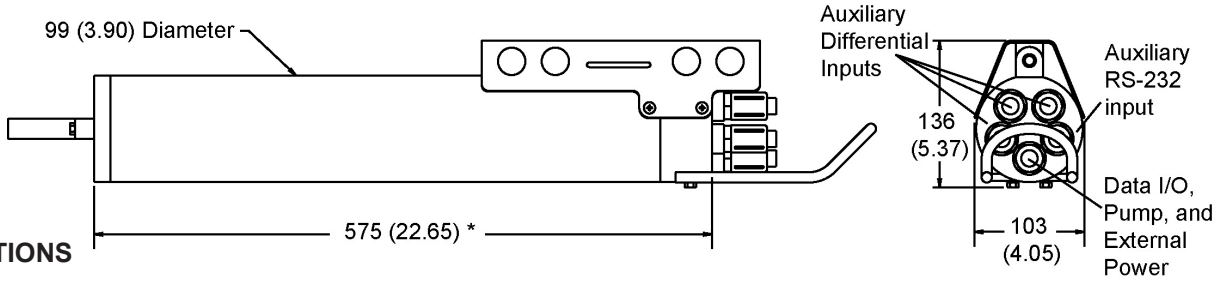
SEACAT C-T Recorder

SBE 16*plus* V2

Dimensions in millimeters (inches)



* Note: 16*plus* V2 with optional Quartz pressure sensor is 190 mm (7.5 inches) longer than shown in drawing.



SPECIFICATIONS

Measurement Range

Temperature	-5 to +35 °C
Conductivity	0 to 9 S/m
Pressure (optional)	Strain-gauge 0 to 20/100/350/600/1000/2000/3500/7000 meters Quartz 0 to 20/60/130/200/270/680/1400/2000/4200/7000/10,500 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

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

Resolution

Temperature	0.0001 °C
Conductivity	0.00005 S/m typical
Pressure (optional)	Strain-gauge 0.002% of full scale range Quartz — depends on sample integration time; 0.0006% of full scale range for 1-second integration

Memory 64 Mbyte non-volatile FLASH memory

Data Storage

Recorded Parameter	Bytes/Sample
T + C	6
pressure - *strain-gauge* or *Quartz*	5
each external voltage	2
auxiliary RS-232 sensor	sensor dependent
date and time	4

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

Internal Batteries 9 alkaline D-cells

External Power Supply 9 - 28 VDC; consult factory for required current

Battery Endurance [1]

CT only	355,000 samples
CTD only	240,000 samples
CTD & 5M pump	140,000 samples

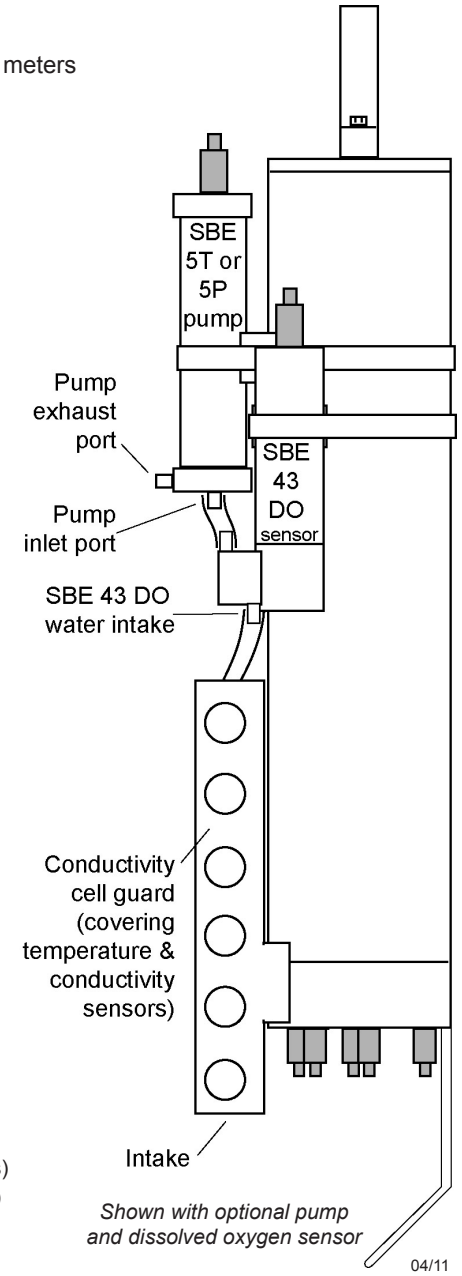
[1] With Duracell MN1300 cells. Dependent on sampling scheme.

Auxiliary Sensors

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

Housing Materials — Depth Rating — Weight

Acetal Copolymer *Plastic* housing — 600 meter (1950 feet) — *in air* 7.3 kg (16 lbs); *in water* 2.3 kg (5 lbs)
3AL-2.5V *Titanium* housing — 7000 meter (22,900 feet) — *in air* 13.7 kg (30 lbs); *in water* 8.6 kg (19 lbs)
6AL-4V *Titanium* housing — 10500 meter (34,400 feet)



Shown with optional pump and dissolved oxygen sensor

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Sea-Bird Electronics, Inc.
13431 NE 20th Street, Bellevue, Washington 98005 USA
Website: www.seabird.com

E-mail: seabird@seabird.com
Telephone: +1 425)-643-9866
Fax: +1 425-643-9954