

# SEACAT Profiler CTD

**SBE 19plus V2**



## SUMMARY

- Conductivity, Temperature, Pressure, and up to seven auxiliary sensors
- User-programmable mode: profiling at 4 Hz, or moored sampling at user-programmable intervals
- RS-232 serial interface, internal memory, and internal batteries (can be powered externally)
- Pump-controlled, T-C ducted flow to minimize salinity spiking
- Depths to 600 or 7000 meters
- Adds to Sea-Bird's SEACAT family, field-proven since 1987

## DESCRIPTION

The SBE 19plus V2 (Version 2) Seacat Profiler CTD measures conductivity, temperature, and pressure (depth) and provides high accuracy and resolution, reliability, and ease-of-use for a wide range of research, monitoring, and engineering applications. The pump-controlled, T-C ducted flow configuration minimizes salinity spiking caused by ship heave and allows for slow descent rates without slowing sensor responses, improving dynamic accuracy and resolving small scale structure in the water column.

Compared to the previous 19plus, 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. An optional Digiquartz® pressure sensor provides highest-accuracy pressure measurement. 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 19plus V2 samples continuously at up to 4 scans per second (4 Hz) (2 Hz with Digiquartz®), is battery-powered and self-recording, and is commonly used in the field without a computer, recording up to 1000 individual profiles. Data can be uploaded and processed later, as well as transmitted to a PC in real time for acquisition and display using SEASOFT software (cable length dependent on number of auxiliary sensors, sampling and baud rate, and cable properties). The 19plus V2 can supply power to 7 external sensors and log their outputs with each CTD scan. Nine D-size alkaline batteries provide up to 60 hours of continuous operation when logging C, T, and P at 4 Hz.

The 19plus V2 is easily integrated with an SBE 32 Carousel Water Sampler and is ideal for integration with the SBE 55 ECO Water Sampler. Both real-time and autonomous *auto-fire* operations are possible with any Sea-Bird CTD / Water Sampler system.

In moored mode, the 19plus V2 records time series measurements at user-programmable intervals (10 seconds to 4 hours). Moored mode is easily configured with setup commands and by removing the profiling T-C Duct and installing optional anti-foulant devices. (If profiling not needed, the 16plus V2 Seacat Recorder offers greater moored-mode flexibility.)

## CONFIGURATION, OPTIONS, AND ACCESSORIES

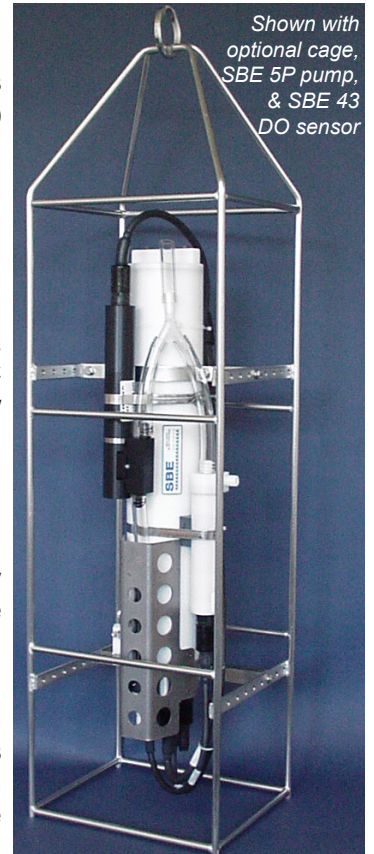
A standard 19plus V2 is supplied with plastic housing for depths to 600 meters, strain-gauge pressure sensor, 64 Mbyte FLASH memory, alkaline batteries, glass-reinforced epoxy bulkhead connectors, SBE 5M miniature pump with plastic housing, and T-C Duct.

Options and accessories include:

- Titanium housing for depths to 7000 meters, and SBE 5M miniature pump with titanium housing for depths to 7000 meters
- Wet-pluggable MCBH series connectors
- SBE 5P (plastic) or 5T (titanium) in place of SBE 5M for use with dissolved oxygen and/or other pumped sensors
- Digiquartz® pressure sensor
- Stainless steel protection cage
- Auxiliary sensors for Dissolved Oxygen, pH (Profiling only), fluorescence, radiance (PAR), light transmission, optical backscatter (turbidity)
- Plastic shipping case
- Nickel Metal Hydride (NiMH) batteries and charger
- Moored mode conversion kit with anti-foulant device fittings
- Load-bearing underwater cables for hand-hauled, real-time profiling
- SBE 36 CTD Deck Unit and Power/Data Interface Module (PDIM) for real-time operation on single-core armored cable up to 10,000 meters

## SOFTWARE

The 19plus 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.



**Sea-Bird Electronics, Inc.**

13431 NE 20th Street, Bellevue, Washington 98005 USA

Website: [www.seabird.com](http://www.seabird.com)

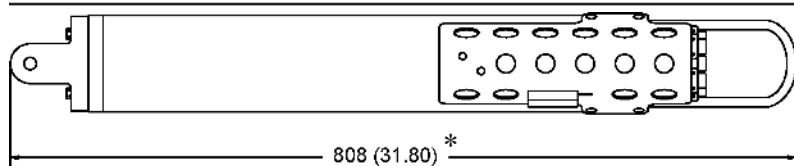
E-mail: [seabird@seabird.com](mailto:seabird@seabird.com)

Telephone: +1 425-643-9866

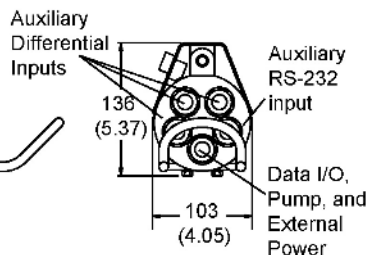
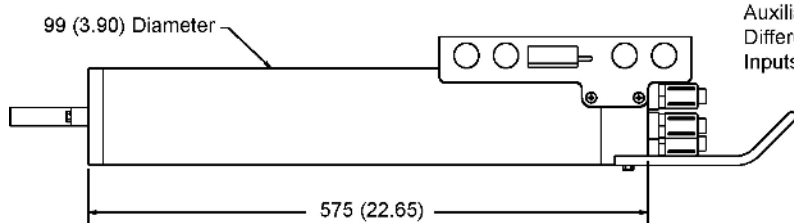
Fax: +1 425-643-9954

# SEACAT Profiler CTD

**SBE 19plus V2**



\*Note: 19plus V2 with optional Quartz pressure sensor is 190 mm (7.5 inches) longer than shown in drawing.



Dimensions  
in millimeters  
(inches)

## SPECIFICATIONS

	Measurement Range	Initial Accuracy	Typical Stability	Resolution
<b>Conductivity (S/m)</b>	0 to 9	0.0005	0.0003/month	0.00005 (most oceanic waters; resolves 0.4 ppm in salinity) 0.00007 S/m (high salinity waters; resolves 0.4 ppm in salinity) 0.00001 S/m (fresh waters; resolves 0.1 ppm in salinity)
<b>Temperature (°C)</b>	-5 to +35	0.005	0.0002/month	0.0001
<b>Pressure - Strain Gauge</b>	0 to 20/100/350/600/1000/2000/3500/7000 meters	0.1% of full scale range	0.1% of full scale range/year	0.002% of full scale range
<b>Pressure - Quartz</b>	0 to 20/60/130/200/270/680/1400/2000/4200/7000/10,500 meters	0.02% of full scale range	0.02% of full scale range/year	0.0025% of full scale range

### Memory

64 Mbyte non-volatile FLASH memory

### Data Storage

Recorded Parameter	Bytes/Sample
T + C	6
pressure - <i>strain gauge</i> or <i>Quartz</i>	5
each external voltage	2
auxiliary RS-232 sensor	sensor dependent

### Real-Time Clock

32,768 Hz TCXO accurate to  $\pm 1$  minute/year

### Internal Batteries

9 alkaline D-cells (Duracell MN1300, LR20) provide 60 hours profiling;  
optional 9-cell NiMH battery pack provides 40 hours profiling per charge

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

### Power Requirements

Sampling	70 mA	
Pump	SBE 5M: 100 mA	Optional SBE 5T or 5P: 150 mA
Communications	65 mA	
Quiescent	20 $\mu$ A	

### 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 in air\*, Weight in water\*

Acetal Copolymer *Plastic* housing, 600 m (1950 ft), 7.3 kg (16 lbs), 2.3 kg (5 lbs)

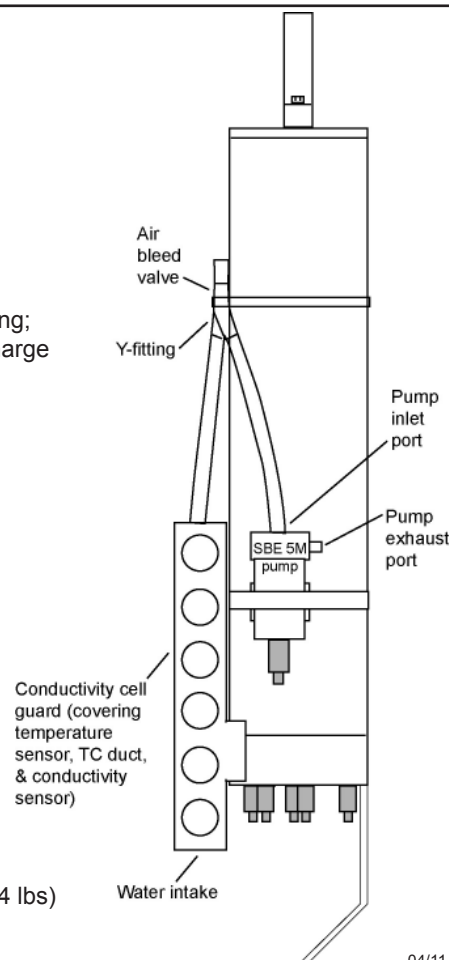
3AL-2.5V *Titanium* housing, 7000 m (22,900 ft), 13.7 kg (30 lbs), 8.6 kg (19 lbs)

\*Weights listed are without pump; pump adds (in air) 0.3 to 0.7 kg (0.6 to 1.5 lbs), depending on pump model selected. See pump brochures for details.

### Optional Cage

(for 19plus V2 with strain-gauge pressure) 1016 x 241 x 279 mm (40 x 9.5 x 11 in.), 6.3 kg (14 lbs)

(for 19plus V2 with Digiquartz pressure) 1219 x 241 x 279 mm (48 x 9.5 x 11 in.)



04/11



**Sea-Bird Electronics, Inc.**

13431 NE 20th Street, Bellevue, Washington 98005 USA

Website: [www.seabird.com](http://www.seabird.com)

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

Telephone: +1 425-643-9866

Fax: +1 425-643-9954