

# Seagauge Wave & Tide Recorder

**SBE 26plus**  


## SUMMARY

- Wave and Tide, Temperature, and (optional) Conductivity data
- RS-232 (optional RS-485) serial interface, internal memory, internal batteries
- Real-time tide data, wave data, and/or wave statistics, as well as fast upload of all data in memory upon recovery
- Large memory and low power requirements - 1.8-year deployment with alkaline batteries for a typical sampling scheme (with optional conductivity) of 11-minute tide measurements every 30 minutes and 8.5-minute, 4 Hz wave-burst samples eight times a day.

## DESCRIPTION

The 26plus combines Sea-Bird's non-volatile FLASH memory with a stable time base, precision thermometer, and Quartz crystal pressure sensor to provide wave and tide recording of unprecedented resolution and accuracy, along with high-quality temperature information. An input connector for an optional SBE 4M conductivity sensor is standard.

The 26plus integrates pressure samples to obtain water level measurements unaffected by wave action, and also independently burst-samples pressure at rates up to 4 Hz for wave amplitude calculation. Water level sampling interval and integration duration and wave burst sampling interval and duration are programmable. The tide interval is user-programmable over a range of 1 minute to 12 hours. The 26plus can continuously measure pressure (if equipped with Quartz pressure sensor), or can conserve battery power by removing power from the pressure sensor between tide measurements, with user-programmable pressure integration from 10 seconds to the entire tide interval. Temperature data is recorded with each tide integration. Waves are characterized by burst sampling with the number of samples per burst, burst interval, and burst integration time programmed by the user. The start and stop times for logging data are programmable, allowing complete setup in the lab before deployment.

The large memory and low power requirements permit frequent water level recording and highly detailed wave characterization. For example, with Quartz pressure sensor, standard alkaline batteries, and optional conductivity sensor, a 445-day deployment could include water level measurements every 30 minutes (integrating pressure for the entire 30 minutes) and an 8.5-minute, 4 Hz wave-burst (2048 samples) eight times a day; a 670-day deployment could be achieved if pressure integration is limited to 11 minutes for each water level measurement.

The 26plus stores data in memory, and can also output real-time tide data, wave data, and/or wave statistics. Binary upload capability at 115,200 baud allows for fast upload of the data in memory upon recovery. Firmware upgrades can be downloaded via the serial interface, without opening the instrument.

## CONFIGURATION AND OPTIONS

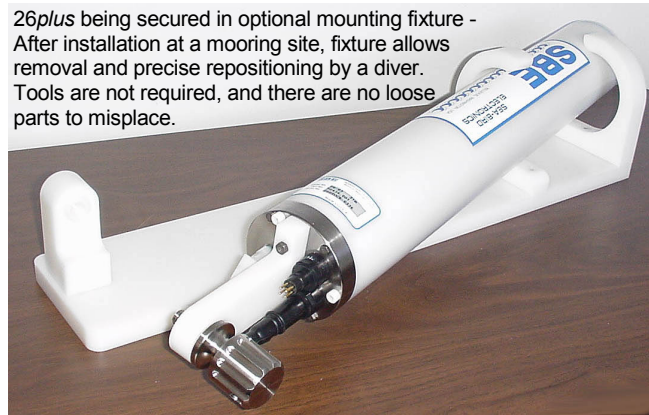
A standard SBE 26plus is supplied with:

- Plastic housing for depths to 600 meters (1960 feet)
- 20 meter (45 psia) Digiquartz<sup>®</sup> temperature-compensated pressure sensor
- Accurate temperature sensor – aged thermistor embedded in 26plus end cap
- Frequency-input channel and bulkhead connector for optional SBE 4M conductivity sensor
- 32 MB FLASH memory, 12 alkaline D-cell batteries (Duracell MN1300, LR20)
- Impulse glass-reinforced epoxy bulkhead connectors

Options include:

- Digiquartz temperature-compensated pressure sensor in ranges from 0.2 to 680 meters (15 to 1000 psia)
- Lower priced temperature-compensated strain gauge pressure sensor in ranges from 20 to 600 meters (45 to 880 psia), generally intended for wave sampling applications; will not provide highest quality tide data
- SBE 4M Conductivity sensor, interfaced via bulkhead connector and clamped to 26plus housing
- High accuracy external temperature sensor
- RS-485 full duplex interface in place of standard RS-232 interface
- Wet-pluggable (MCBH *Micro*) connectors in place of standard connectors
- Mounting fixture

26plus being secured in optional mounting fixture - After installation at a mooring site, fixture allows removal and precise repositioning by a diver. Tools are not required, and there are no loose parts to misplace.

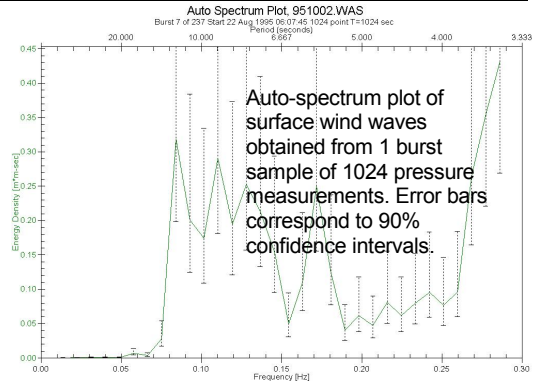


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# SBE 26plus

## SOFTWARE

The SBE 26plus includes SEASOFT® for Waves, a comprehensive package of Windows programs including deployment planning, instrument setup and data retrieval, plotting, auto-spectrum and time series analysis, and statistics reporting.



## SPECIFICATIONS

### Quartz Pressure (standard)

- Range: 9 ranges, from 0 - 0.2 m (15 psia) to 0 - 680 m (1000 psia)
- Accuracy: 0.01% of full scale (3 mm for 45 psia range\*)
- Stability: 0.02% of full scale/year (6 mm for 45 psia range\*)
- Hysteresis: 0.005% of full scale (1.5 mm for 45 psia range\*)
- Calibration: 0 psia to full scale pressure
- Resolution\*: Tide - 0.2 mm for 1-minute integration; 0.01 mm for 15-minute integration; Wave - 0.4 mm for 0.25-second integration; 0.1 mm for 1-second integration

\*Stated values in mm are for 45 psia pressure sensor. Scale for other ranges, multiplying by (actual sensor psia / 45 psia).

### Strain Gauge Pressure (optional)

- Range: 4 ranges, from 0 - 20 m (45 psia) to 0 - 600 m (880 psia)
- Accuracy: 0.1% of full scale (30 mm for 45 psia range\*)
- Stability: 0.1% of full scale/year (30 mm for 45 psia range\*)
- Hysteresis: 0.03% of full scale (9 mm for 45 psia range\*)
- Calibration: 0 psia to full scale pressure
- Resolution\*: Tide - 0.2 mm for 1-minute integration; 0.01 mm for 15-minute integration; Wave - 0.4 mm for 0.25-second integration; 0.1 mm for 1-second integration

\*Stated values in mm are for 45 psia pressure sensor. Scale for other ranges, multiplying by (actual sensor psia / 45 psia).

### Temperature [°C] (standard)

- Range: -5 to +35 Accuracy: 0.01
- Resolution: 0.001 Calibration: +1 to +32<sup>1</sup>

### High Accuracy Temperature [°C] (optional)

- Range: -5 to +35 Accuracy: 0.002
- Resolution: 0.0001 Calibration: +1 to +32<sup>1</sup>

### Conductivity [S/m] (optional)

- Range: 0 to 7 Accuracy: 0.001
- Resolution: 0.00002
- Calibration: 2.6 - 6 plus zero conductivity (air)<sup>1</sup>

<sup>1</sup>Measurements outside specified calibration ranges will be at slightly reduced accuracy due to extrapolation errors.

**Real-time clock:** Quartz TCXO watch-crystal type 32,768 Hz; accuracy ± 2 ppm (5 sec/month). Battery-backed for minimum 2-year operation without main batteries installed.

**Memory:** 32 MB Flash RAM

### Data storage (per sample):

- Tide with temperature and time: 9 bytes
- Tide with temperature, conductivity, and time: 12 bytes
- Wave burst: 3 bytes

### Power Supply:

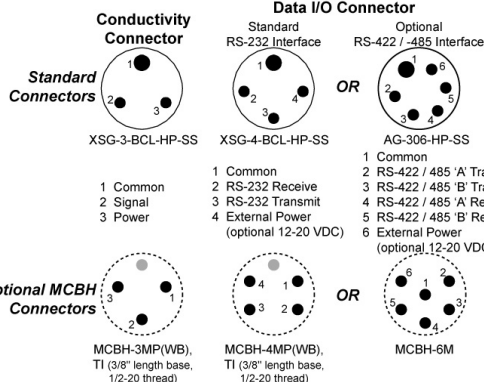
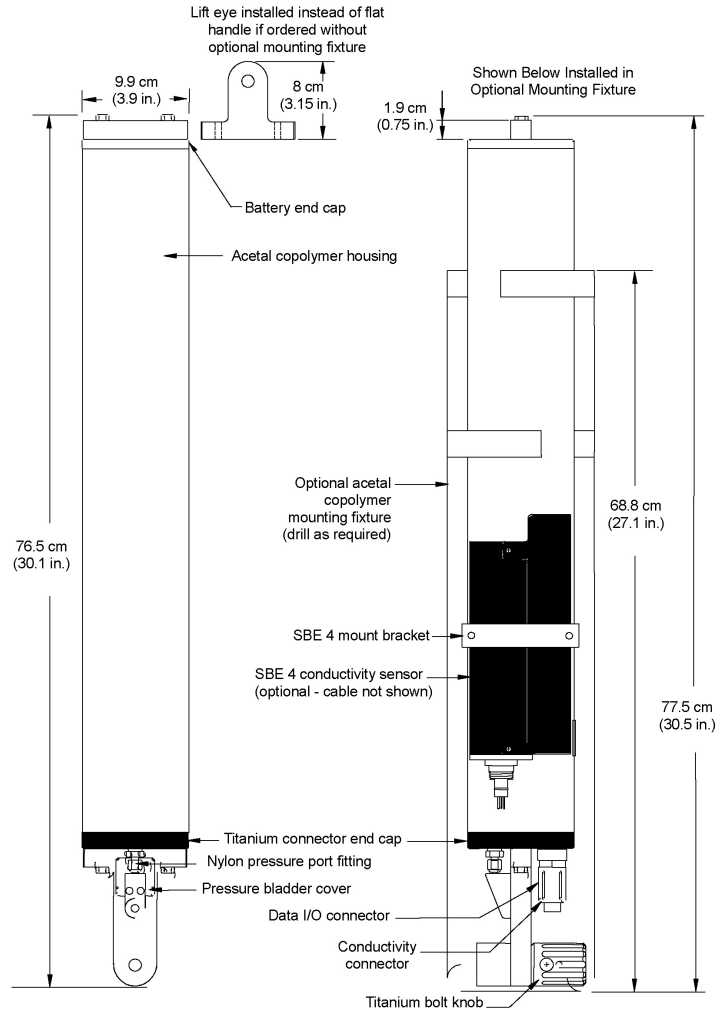
**Internal:** 12 alkaline D cells, Duracell MN 1300, LR20 (standard) or 6 lithium DD cells (Electrochem BCX85-3B76-TC)

**External (optional):** 12 - 20 VDC

**Housing:** Acetal copolymer plastic to 600 m

### Weight (with alkaline batteries):

- Plastic housing 6.8kg (15 lbs) in air; 6.8kg (15 lbs) in water
- Mounting fixture 3.6kg (8 lbs) in air; 1.4kg (3 lbs) in water



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