SEACAT Thermosalinograph   SBE 21

The SBE 21 accurately determines sea surface temperature and conductivity from underway vessels. Data is simultaneously stored in memory and transmitted to a computer serial port, allowing independent data logging and real-time data acquisition. Typically mounted near the ship's seawater intake, the SBE 21 is connected to an AC-powered interface box positioned near the computer. The interface box provides power and an isolated data interface, and contains a NMEA 0183 port for appending navigation information to the data stream.

For corrosion resistance, only plastic, titanium, and the glass/platinum cell are exposed to seawater. Valves control seawater circulation and fresh water flushing. The sensor assembly is easily removed for cleaning and calibration.

SENSORS

The sensors are mounted in a PVC water jacket assembly:
- The platinum-electrode glass conductivity cell's unique internal-field geometry eliminates proximity effects; this feature is critically important for thermosalinographs, where the cell operates in a water jacket's confined volume. The internal-field cell makes possible the use of expendable anti-foulant devices (supplied). The same conductivity sensor and stable interface electronics have been used on thousands of SBE 16 / 16*plus* / 16*plus* V2 (moored) and SBE 19 / 19*plus* / 19*plus* V2 (profiling) SEACATs in use around the world today.
- The thermistor temperature sensor is stable and immune to shock and vibration. The interface electronics are the same as used in the SBE 16*plus* / 16*plus* V2 and SBE 19*plus* / 19*plus* V2 SEACATs.

AUXILIARY SENSORS

Bulkhead connectors are provided (standard) for optional auxiliary sensors:
- RS-232 interface allows an optional SBE 38 temperature sensor to interface with the SBE 21. The SBE 38, installed at the seawater intake (ideally located near the bow), measures sea surface temperature with minimal thermal contamination from the ship's hull.
- Four 0-5 volt A/D input channels allow optional auxiliary sensors to interface with the SBE 21. The channels are configured for four single-ended (standard) or two differential (optional) 0-5 volt inputs.

Acquisition and display of auxiliary sensor data is fully supported in our software.

OPERATION

The SBE 21 samples using one of the following user-programmable schemes:
- **Continuously at 4 Hz:** At pre-programmed 3- to 600-second intervals, the SBE 21 averages the sample data, stores the average in memory, and sends the average to the computer.
- **At pre-programmed intervals:** At pre-programmed 3- to 600-second intervals, the SBE 21 takes one sample, stores the sample in memory, and sends the data to the computer.

When the SBE 21 memory fills, real-time output continues after internal recording stops. When a computer cannot be dedicated to data logging, the SBE 21's internal memory permits autonomous operation with periodic downloading.

SOFTWARE

SEASOFT©-Win32, our complete Windows 2000/XP software package, is included at no charge. Its modular programs include:
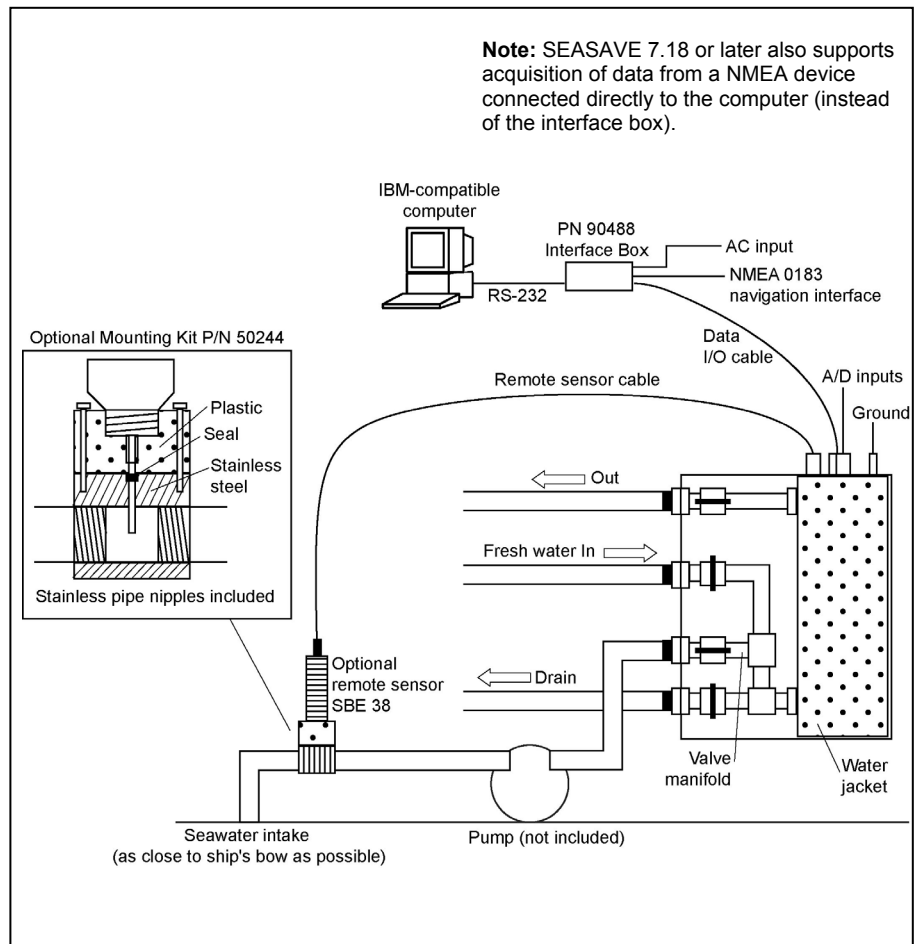- SEATERM© – communication and data upload from memory
- SEASAVE© – real-time data acquisition, display, and plotting of CT and auxiliary sensor data and derived variables (salinity, density, sound velocity, etc.)
- SBE Data Processing© – filtering, averaging, and plotting of CT and auxiliary sensor data and derived variables

MECHANICAL INSTALLATION

The PVC base or back plate may be drilled for mounting to the ship. Seawater connections (for normal use) and fresh water connections (for cleaning) are PVC pipes with 1-inch (25.4-mm) U.S. standard NPT threads. Mating female fittings are provided, and can easily be adapted to locally available pipe sizes. A stainless steel and plastic in-line pipe mount is available for safe below-waterline installation of the remote temperature sensor.

MEMORY & DATA FORMAT

The SBE 21 has an 8 Mbyte FLASH RAM memory. Each sample of temperature and conductivity uses 4 bytes. Remote temperature (if enabled) adds 3 bytes per sample, and each optional A/D voltage adds 1.5 to 2 bytes. Inter-record headers, written each 1000 samples, contain sample numbers, data pointers, and time/ date from the SBE 21's internal real-time clock.

Note: SEASAVE 7.18 or later also supports acquisition of data from a NMEA device connected directly to the computer (instead of the interface box).

PN 90488 SEACAT/SEALOGGER RS-232 & NAVIGATION INTERFACE BOX

A 100-250 VAC-powered interface box supplies isolated DC power, provides an optically-coupled RS-232 standard interface to the user's computer, and permits the appending of navigation data via a NMEA 0183 interface port. Each sample (including primary and remote temperature, conductivity, and analog voltages) is transmitted via the interface box, where navigation information (converted to a uniform format from a wide range of receiver types) is appended prior to transfer to the computer. A 10-meter cable for connecting the SBE 21 to the interface box, AC power cord, and 1.5-meter cable for connecting the interface box to the computer are also supplied.

SPECIFICATIONS

	Range	Accuracy	Resolution
Conductivity (S/m)	0 to 7	0.001	0.0001
Temperature, primary (°C)	-5 to +35	0.01	0.001
Temperature, SBE 38 remote (°C)	-5 to +35	0.001	0.0003

Sample interval	3 seconds or longer in steps of 1 second
Water jacket volume	approximately 5 liters
Recommended flow rate	approximately 1 liter per second
Water jacket pressure limit	3.45×10^5 decibars (50 psi)
Dimensions	577 high x 483 wide x 229 mm (22.7 x 19.0 x 9.0 in.)
Shipping weight	41 kg (90 lbs)

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