



## Rolls-Royce SeaHorse™

Wave-powered water column profiling

Rolls-Royce SeaHorse™ utilizes surface wave energy to move a sensor platform up and down a mooring wire.

SeaHorse™ permits a complete vertical profile to be obtained with a single sensor, eliminating the need for multiple sensors on the mooring line. Also, the sensor platform can be pre-programmed to dwell at depth for set periods of time.

SeaHorse™ can be configured to carry a variety of payloads including CTD, optical and acoustic sensors.

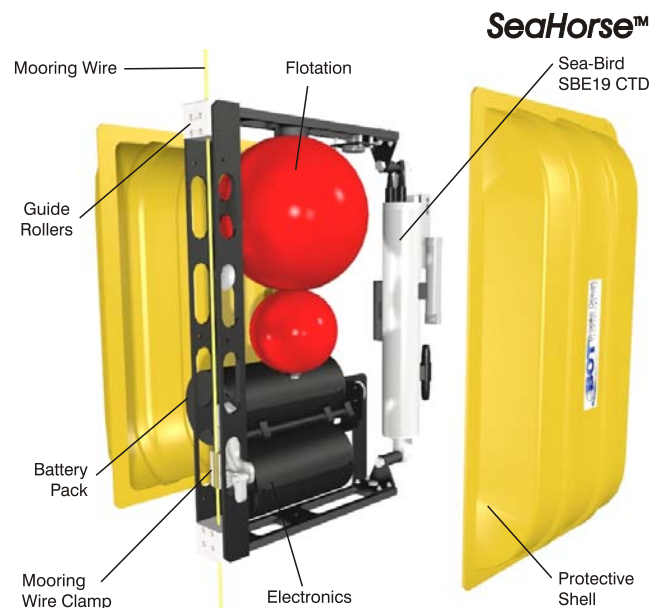


The SBE 19 CTD from Sea-Bird Electronics is standard equipment on the SeaHorse. Most sensors capable of being piggybacked on the SBE19 can be employed on the SeaHorse.

Rolls-Royce SeaHorse™ uses a ratchet system controlled by an onboard microprocessor to harness the natural energy of waves and transfer it into motion. This ratchet system can be set to glide freely or engaged to set the profiler in motion. The profiler can climb down to depth, wait for a pre-programmed length of time and then float along the mooring wire towards the surface by disengaging the gripper mechanism. During the profiling motion, the onboard microcomputer logs sensor data in memory. The profiler will operate reliably, even in very calm conditions (as little as 15 centimetre wave height at 2 second period will cause the profiler to activate).

### Features and benefits

- Coastal Water and Open Ocean Use - extracts energy from waves as small as 15cm allowing for use in lakes, coastal waters and open seas
- Longer Deployments - harnesses energy from wave action for the profiler motion, so the power for sensors and data collection electronics utilize the full battery payload
- Multi-Sensor Capabilities - complete data profiles using a single sensor suite
- Less Mooring Maintenance - cleans the mooring wire continuously as it travels along it





This photo shows the typical size of vessel required for shallow to medium-water deployments.

Rolls-Royce SeaHorse™ adapts to all sorts of mooring scenarios. The basic SeaHorse profiler can operate in water depths up to 200 metres. More shallow-water deployments can be carried out with a minimum of handling equipment and manpower.

Rolls-Royce Canada Limited is continuing development on an inductive modem telemetry option for the SeaHorse system.



Programming the SeaHorse is accomplished with a laptop computer prior to deployment. Programming involves the input by the operator of parameters such as time between profiles and timeouts for data recording. The laptop must be equipped with either a serial 9-pin comm port or a USB-to-9-pin serial adapter.

Data retrieval can also be accomplished with the laptop. This mobility allows the data to be downloaded on the spot or at a later time back in the lab.



SeaHorse being deployed in 150 metres from the CCGS Parizeau at Station 2 on the Halifax Line.

SeaHorse was developed jointly with the Bedford Institute of Oceanography, Ocean Physics Division, Department of Fisheries and Oceans Canada.



Fisheries and Oceans Canada Pêches et Océans Canada

\*U.S. Patent No. 5,644,077

## Specifications

### System Specifications

**Depth:** Up to 200 m (deeper models available by special order)  
**Wave Height:** Operates with as little as 15 cm @ 2 sec. period

**Surface Buoy Options:**  
 - Standard Surface Buoy  
 - Inflatable Buoy

### Profiler Specifications

**Length:** 37" (94 cm)  
**Width:** 28" (61 cm) - includes SBE19 in standard configuration  
**Depth:** 14.5" (37 cm)  
**Mass:** 120 lb. (54 kg) - dry weight with SBE19  
**Available Sensors:** Please consult factory for details  
**Data Link to Surface Buoy:** - Acoustic  
 - Inductive (under development)



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