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SeaKeeper 1000 Available for Licensing

The SeaKeeper 1000 automated modular ocean and atmospheric monitoring system, with data logging and transmission, is now being offered as a standardized platform for sensors from diverse manufacturers.

The SeaKeeper 1000 is fully automated, has extremely low operating costs, and is suitable to a wide variety of near-surface monitoring situations. The nearly 50 installs to date include private luxury yachts, cruise ships, large ferry boats, freighters, sea buoys, research piers, a lighthouse, and a USCG icebreaker. In the last year NOAA has purchased systems through the divisions of the National Data Buoy Center (NDBC), part of the NWS, for three and six meter buoys, and the National Marine Sanctuaries Program, for its new monitoring vessels.

The developer of this innovative platform, The International SeaKeepers Society, is a non-profit marine environmental organization. It initially conceived the SeaKeeper 1000 as a proprietary design, and a component of a private data network. "The SeaKeepers Society is a group of international leaders and conscientious citizens who are concerned about the state of the marine environment," said CEO John Englander. "Our first project was the creation of the SeaKeeper 1000, with the express purpose of generating precise yet cost-effective ocean data for scientific monitoring and modeling. We are pleased to have made a substantial contribution to both oceanographic and climate research."

The Society recently agreed to make its sensor interface and overall architecture available via free licensing. "The cost of research and development of the SeaKeeper 1000 monitoring system was a gift from our members to the world. With its decision the board is simply making sure this gift is used as widely and efficiently as humanly possible," said Board Chairman Don Tomlin. Another reason for making this decision, Tomlin said, was that the Society was increasingly being viewed as a seller of monitoring equipment. "We want to make very clear that the only business we're in is the business of restoring and protecting the oceans," he added.

At a trade show in London, the modular sensor interface, now identified as the FSIS (Ferrybox Sensor Interface Standard), was announced as a possible new global format. Technical Director Geoff Morrison explained, "It is virtually a 'plug and play' design for interchangeable sensors including a physical mount, as well as connectors for water sampling, electrical power and data."

Numerous manufactures are already making sensors compatible with the SeaKeeper 1000 including Idronaut, Seabird Electronics, Seapoint, Satlantic, and Envirotech. Sensors are also under development at Falmouth Scientific, MOTE Marine Laboratory, Pro-Oceanus Systems,

SK1000 with Doors

Turner Designs, and Wet labs. The typical met sensors are manufactured by R.M. Young, Inc.

Main Features of the SeaKeeper 1000

- Fully automated with extremely low operating expenses
- No consumables in standard sensors, allowing very long service intervals
- Flow-through rather than "in situ" sensors
- Modular design allows multiple

sensors to be put in the "box"

- Simultaneously records surface oceanographic and meteorological data with GPS location and time/date stamp
- On-board data logging records measurements every minute, with a large storage capacity (usually several years of data at a one-minute logging rate) using a standard pc computer
- Data is typically transmitted every three hours by means of one of several satellite systems, and in some installations via cell phone, land line, Internet or radio frequency telemetry
- High precision sensors, accurate to climatological precision, from diverse third party manufacturers
- Originally designed for 110/220 Volt applications, with a low-power configuration available
- Robust yet relatively compact design

The SeaKeeper 1000 needs very little supervision or human intervention. The design criteria aimed to require service calls only a few times a year; since its first deployment this goal his has not only been met, but often exceeded. Compared to conventional oceanographic monitoring, agencies using these autonomous systems save significantly on labor costs.

Although some installations direct data through dedicated networks, in most cases the SeaKeepers system feeds data into the GTS (Global Telecommunications System) gateway, and is assimilated as part of the venerable VOS (Volunteer Observing Ships) program.

There are four design features that make the SeaKeeper 1000 especially noteworthy and helped the Society win the prestigious Tech Museum Intel Award for International Environmental Technology:

1. By converting traditional "in situ" sensors into flow-through designs housed in a cabinet, the sometimes delicate sensors are less vulnerable to being damaged by the ocean environment and do not require deployment by divers.

2. The bio-fouling typical of "in situ" ocean instrumentation is dramatically reduced due to the sensors being in a dark environment. Additionally, there is a daily antifouling cycle where a chlorine solution is generated by the SeaKeeper 1000 system at its seawater inlet.

3. The interchangeable, modular sensors are a totally new innovation, in contrast to the traditional situation in which each manufacturer of ocean instruments have their own shape, size, power, and data requirements.

4. The self contained, "packaged" design, from the through-hull water intake and the flow-through sensors to the data archiving and data transmission, is a revolutionary improvement in the cost, size, and convenience of near-surface ocean monitoring.

To achieve the highest level of cost-effectiveness and precision in its data collection, SeaKeepers has recently inaugurated its own calibration laboratory. "One of my first priorities when I joined SeaKeepers was to increase the accuracy and relevancy of our data by ensuring that we met the highest standards of calibration and validation," said Englander. "The lab was assembled thanks to the generosity of SeaKeepers members and several donations of high-quality surplus equipment by government agencies and scientific institutions." Morrison describes the new cal lab "as a world class facility in which we can calibrate temperature and salinity to the third decimal place."

SeaKeepers is now actively soliciting commercial firms to adapt to its FSIS standardized sensor interface. Standardizing surface water monitoring equipment will provide enormous impetus to manufacturers to develop new and repackage existing sensors. "There's really no need for every university or agency to re-invent the ocean monitoring wheel," Englander explained. "By encouraging the use of the freely licensed SeaKeeper system as a standard for the ocean-monitoring community, we make this kind of data collection less expensive, expand the market for new sensors, and contribute to the greater good of an enhanced global ocean-observing system."

Technical inquiries about the SeaKeeper 1000, the standardized FSIS sensor interface, or about system specifications should be directed to Geoff Morrison, 954-766-7100 ext 115, or morrison@seakeepers.org.