

International SeaKeepers Society Ocean and Weather Monitoring System

Introduction and Overview

The SeaKeepers Ocean & Weather monitoring system collects data on the ocean and atmosphere that is of critical value to weather forecasters, oceanographers and scientists around the world working in many different scientific disciplines. These groups include the United Nation's World Meteorological Organization (WMO), The International Ocean Commission (IOC), the United States National Oceanic and Atmospheric Administration (NOAA), the National Weather Service (NWS), the National Aeronautic and Space Administration (NASA) and researchers at leading universities such as the Scripps Institution of Oceanography (SIO) and the University of Miami's Rosenstiel School of Marine & Atmospheric Science (RSMAS). All these institutions and scientists, as well as many others, will have ready access to the data being gathered and transmitted by the SeaKeepers system.

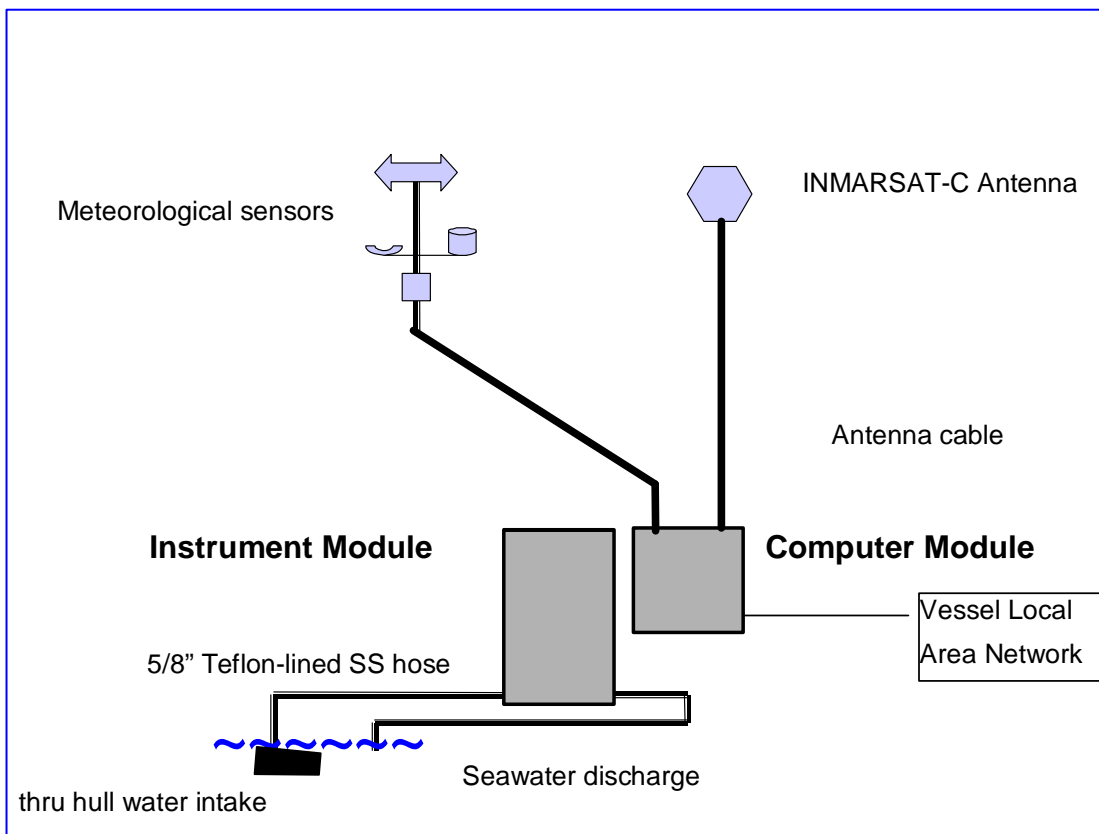


Figure 0.1 Schematic of the major SeaKeepers system components

A schematic of the SeaKeepers monitoring system is shown in Figure 0.1, above. There are four major components:

- (1) One through-hull water intake and discharge system consisting of a scoop, intake valve, discharge valve and a containment vessel,
- (2) Two equipment enclosures – a computer module and an instrumentation module,
- (3) One meteorological (MET) station,
- (4) One INMARSAT Std C transceiver (integrated into an Antenna).

Generally, Founding Members and sponsors bear the costs of installing the SeaKeepers Ocean & Weather Monitoring System. A SeaKeepers representative, however, is always available by phone and/or e-mail to help supervise the installation and answer any questions. A SeaKeepers representative is also sent to the vessel to commission the module once it has been installed.

Specifications

Containment vessel

- Diameter: 9 inches (22.86 cm).
- Total height: 25 inches (63.5 cm).
- See Figures 2.3 and 2.4. The containment vessel is part of the gate valve and through-hull assembly. Approximately 12 inches (30.5 cm) additional vertical clearance is required during installation.

Module Dimensions

- *Computer module:* 18 x 16 x 10 inches (h, w, d)
(45.72 x 40.64 x 25.4 cm)
- *Instrument Module:* 30 x 16 x 10 inches
(76.2 x 40.64 x 25.4 cm)
- Modules may be mounted side by side or one above the other, see diagram later for spacing to permit the inter-wiring connectors. Additional space is required for the mounting brackets and for the plumbing interconnections at the lower right of the instrument module. See Cable Runs Item 4 in this section, Section 1.2, and page 2-5.

Power requirements

- 110 or 240 Volts at less than 500 watts, preferably supplied through an uninterruptible power supply (UPS). If the location of the modules is not convenient to access, a remote switch or breaker will be useful.

Through hull fitting

- For clean seawater access.

Water through-put

- Approximately 5 gallons (19 liters) of seawater per minute, necessitating a direct discharge overboard.

Network access

- The computer provided with the SeaKeepers system has a 10/100M Ethernet card installed with an RJ45 connector. Operation of the system is autonomous and does not require a vessel-supplied computer. However a computer networked to the SeaKeepers computer running Symantec pcAnywhere remote control software (supplied by SeaKeepers) will facilitate access to data on-board the vessel.

Environment

- The system supplied is designed to operate in a shipboard environment. The computer module may be ventilated to help prevent overheating, and should not be exposed to salt air, water or excessive humidity. The rated maximum operating temperature of the computer is 55°C / 130°F. This is the absolute maximum and not the temperature at which the computer will operate continuously.

Location

- Preferred locations for the instrument enclosures are either the bow thruster compartment or the engine room / engineers control room. Instrumentation enclosures should be mounted close to the through hull fitting (see discussion in Section 1, Planning).
- The through-hull penetrations need to be located in a position forward of any gray, black or heated water discharges and approximately 2 meters below the water line. The water discharge should be directly overboard. The flow rate of the system is high enough to stress the capacity of holding tanks, even if salt water is tolerated.
- The meteorological station and INMARSAT std C antenna need to be placed in an unobstructed area. See discussion in chapters 1 & 3.

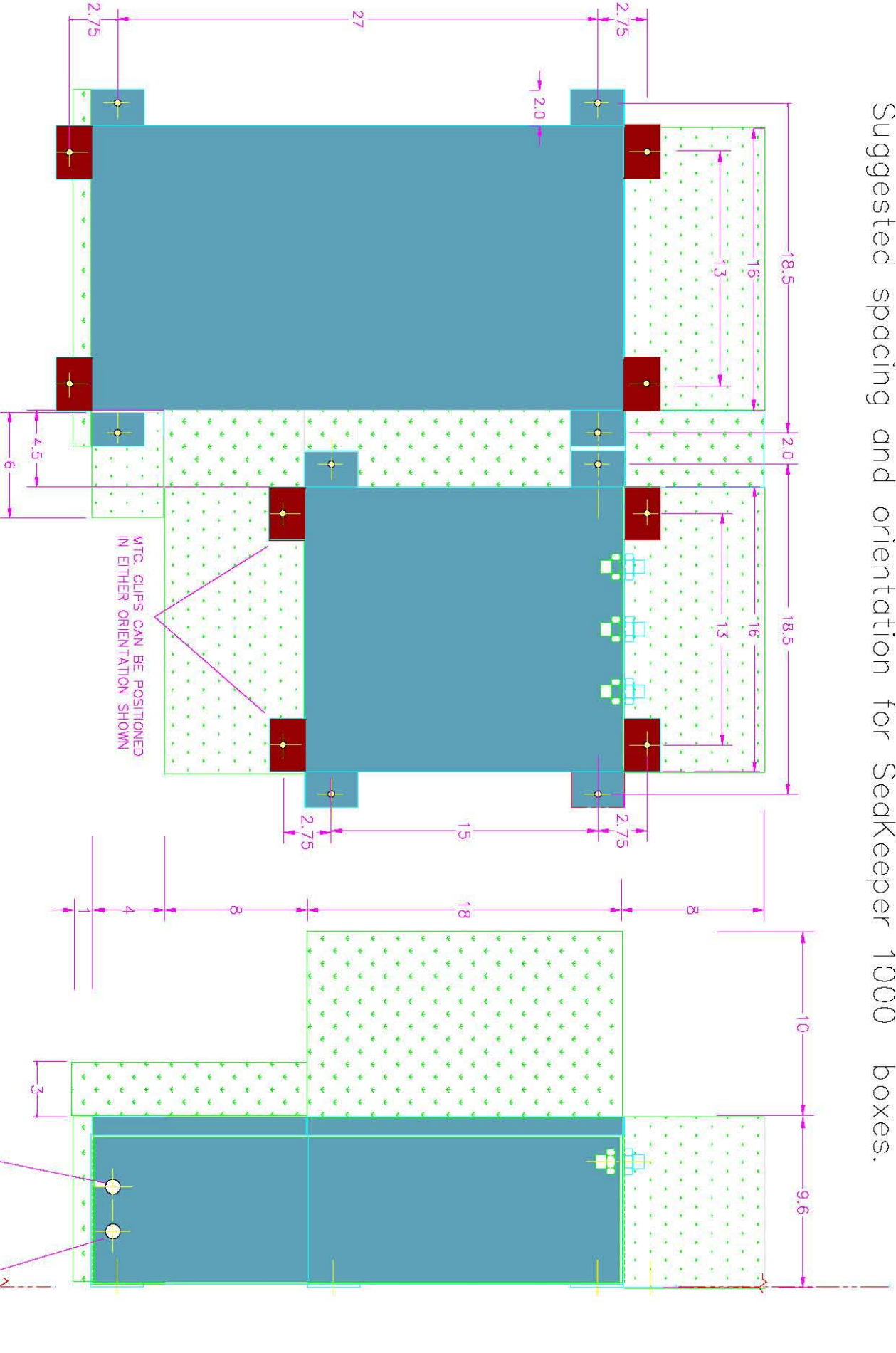
Cable runs

1. Cable from the computer module to the mast or suitable location for the INMARSAT std C antenna.
 - Thrane and Thrane. 20m cable
 - The supplied 19 conductor 20 meter cable will either be terminated at the computer module or an intermediate Junction box.
2. Cable from the computer module to the met sensors on the mast or some suitably exposed location, four pair shielded CAT5 instrumentation cable.(Belden 9503 supplied)
3. A network cable terminated with a RJ45 connector from the computer module to a shipboard network node (CAT5 cable).

In the event that the distance between the INMARSAT transceiver / antenna and the computer module is greater than 20 meters SeaKeepers will provide a junction box and a length of TRICAB 8 pair cable to interconnect the junction box and the computer module. This cable will have enough conductors to run the met data lines (3) the INMARSAT data lines (5) and a LAN drop with 4 data lines. The remaining conductors may be used to supply 24 Volts to the met sensors and on a short cable run the INMARSAT transceiver also but on a long cable run we shall request that the vessel supply 24 Volts to the junction box where we can source 2 to 3 Amps.

4. Under normal circumstances, the computer and instrumentation modules are mounted close to each other and to the through-hull fitting. If it is necessary to separate the modules, then they should be located such that cables may readily be run between them. Their separation should not exceed 33 feet (10 m) due to the limitations of RS232 communications and voltage loss on power cables to pump and antifouling device.
5. A multi-conductor cable is supplied to connect between the through-hull containment vessel and the instrument module. This cable will connect to a remote platinum resistance thermometer and the remote fail-safe rotary valve. The cable provides an additional two conductors to implement the electrical Chlorine generator.

Suggested spacing and orientation for SeaKeeper 1000 boxes.



MTG. CLIPS CAN BE POSITIONED IN EITHER ORIENTATION SHOWN

DRAIN WATER OUTLET 1/2-14 NPTM
TEST WATER INLET 1/2-14 NPTM

Space to be kept clear for cabling and hoses





Figure 0.3 The SK1000™ Instrument (left) and Computer Enclosures (right) (Modules).