

7.0 Operating instructions

International SeaKeepers Society

SeaKeeper 1000 Ocean monitoring system

Description

The system has two main components; a lower pump module and an upper computer module. Clean seawater is pumped from a through-hull intake pod through a Kynar distribution manifold within the pump module and then discharged, unmodified. The sensor attached to the manifold measures Temperature, Conductivity, Oxygen concentration, pH (acid-base properties) and Eh (oxidizing potential). It calculates salinity from the temperature and conductivity data. Another temperature sensor is mounted at the water intake to monitor ambient seawater temperature.

The upper module houses a Celeron computer running the Windows XP operating system, an INMARSAT std C communications system and power supplies for the seawater pump, INMARSAT and the meteorological station. Programs on the computer start automatically upon bootup to control the pump, configure the sensors, collect the data, and send data from the ship to the laboratory at the SeaKeepers server via satellite. At the present time, the pump is programmed to come on at bootup and run continuously. On some vessels the pump may instead be programmed to come on for preset intervals, if, for example, the discharge line is going into a holding tank instead of a direct discharge. There is a program which provides a software toggle switch to turn the pump off and on remotely while the computer remains on. Once every three hours, the INMARSAT will activate and send a data stream as an e-mail message to the SeaKeepers server. The data will be forwarded to the World Meteorological Organization for use in real time forecasting, and also be added to a research data base.

Software

The SCS program collects and stores the data in C:\Datalog. The files are automatically named by the date the file was opened. It also can display Real Time data in tabular or graphical format. It is started by a macro called SCSmenu3, which has a shortcut on the desktop and in the startup menu.

The relay control program controls the pump through a relay board. In the Relay Card Controller program the toggle switch will operate with a mouse click. The program automatically starts the pump about 2 minutes after the computer boots, or after the program is started from the desktop.

The SatComm program is a small DOS program that controls communications via the INMARSAT.

pcAnywhere: The SeaKeepers computer has pcAnywhere installed. It will come up in "host" mode as the computer boots up. From your networked computer you can use pcAnywhere in "remote control" mode to talk to the SeaKeepers computer. An icon (in the

remote control screen) in your computer is named SeaKeepers, which is set up to use TCP/IP communication and the SeaKeepers computer's name or IP address to connect.

Startup

Turn the computer on with the toggle switch inside at the top center front of the computer module, or external switch (depending on installation) It will boot up with pcAnywhere running in host mode. Systems running SatComm Version 4.1 and above will also be set to "autologon" as administrator, with the password *sk*. The system will start operating automatically on a pre-programmed time sequence.

Your networked computer can use pcAnywhere in remote control mode to connect with the SeaKeepers computer (there is a delay time of about 2 minutes before you can connect, while XP starts on the SeaKeepers computer) if you want to observe the data being collected. For a real time display on your computer, **minimize** the program windows that are open until you find the SCS tool bar, which is a small window with a set of buttons. Click the first button (RTD). Highlight 7plusmetcalcnew.sel from the left hand menu and then click on start. A table of current values for all the sensors will be generated, and will regularly update as new measurements are made, however the oceanographic sensor is programmed to only update and write to file at intervals, so the display may show intermittent warnings with red or yellow flags. This is not a sign of trouble. Click the box on the lower left of this window to turn off error checking. The weather data updates continuously.

There are tools in the display section of the tool bar to set up graphing of selected parameters if you would like to have a display with some time history. It is also possible to display the data in two types of gauges. Some examples of each type are available as saved formats on the computer, and customized formats are easy to develop. (See section 5.1 in the manual).

Shutdown

Connect to the SeaKeepers computer with your networked computer using pcAnywhere. From the start menu of the **SeaKeepers computer**, select Start, Shut Down, Shut down the computer. You do not need to shut down the individual programs. When the process is complete, the pcAnywhere session on your computer will terminate. You should then turn off the power to the SeaKeepers computer box. You will not be able to re-establish communications with the SeaKeepers computer until you power off the system and then turn it on again, because pcAnywhere will not be available.