COCHRAN CONSULTING, INC.
LIFEGUARD DIVE COMPUTER

FCC ID: LYP44556-05

The Lifeguard dive computer is a device that provides dynamic telemetry data and decompression data to sport and military SCUBA divers of all skill levels. Most of the time, the product will be comprised of a CPU Unit, a Display Unit, and an Analyst USB Module. There are variants that will be comprised of a CPU Unit and an Analyst USB Module. The Analyst USB Module is only used out of the water.

Description of Equipment:

Lifeguard CPU Unit – The battery powered CPU Unit is a combination microprocessor and very low power transmitter that transmits data to a receiver (Display Unit) using OOK/ASK modulated magnetic flux at 0.126 MHz. A ferrite rod and coil is the "antenna" and the "L" component of an L-C tank circuit tuned to the carrier frequency. The reception range is less than 2 meters. Unlike RF, the modulated magnetic flux is not hampered by submersion in water. The CPU Unit transmits data once each second while in an activated mode. The bulk of the CPU Unit circuitry is not powered (OFF) except when the Unit performs computations and transmits data (ON). A 0.032768 MHz oscillator runs all of the time while batteries are installed. While performing computations and transmitting, the microprocessor scales the 0.032768 MHz up to 4.030 MHz. There are three screw heads (Touch Contacts) on the outside of the case that provide RS-232 communications with a P.C. using the optional Analyst package, described below. These same Touch Contacts, using a finger and a coin, can be used to manually program configurations in the field. There may be 1 or 2 short cables with high-pressure transducers that connect to the regulator on the air/gas cylinder to provide pressure data to the microprocessor. There may be 1 short cable that provides 3 Partial Pressure of Oxygen sensors that are mounted in the breathing loop of a rebreather SCUBA system to provide oxygen content information to the microprocessor. There is also a depth and temperature sensor that is inaccessible to the user. The Lifeguard Recorder CPU Unit variant is identical to the Lifeguard CPU Unit except that it does not have the transmit coil and does not provide the means to field program the unit via the Touch Contacts. The Analyst package is mandatory for the Lifeguard Recorder CPU Unit.

Lifeguard Display Unit – The battery operated Display Unit is a combination microprocessor and receiver. A 0.032768 MHz oscillator runs all of the time while batteries are installed. While performing computations and receiving, the microprocessor scales the 0.032768 MHz up to 4.030 MHz. There are three screw heads (Touch Contacts) on the outside of the case that provide RS-232 communications with a P.C. using the optional Analyst package, described below . The Display Unit is programmed

and accessed in the same way as the CPU Unit. The Display Unit displays received data from the CPU Unit. In the event that the Display Unit fails to receive data from the CPU Unit during a dive it will flash the display to alert the diver that the displayed information is not current. However, using its own clock, it will update and display the current bottom time(elapsed time). There is planned a version of the Display Unit that has its own depth and temperature sensor and can act as an independent decompression computer, however, normally it will only display data received from its mated CPU Unit. The Recorder variant of the Lifeguard does not come with a Display Unit of any type.

Analyst – The Analyst is a custom RS-232 to USB adapter/software package for the CPU Unit and the Display Unit for interfacing with an USB port of a P.C. It has 3 spring contacts that are lined up with the 3 Touch Contacts of a CPU Unit or Display Unit. A hook-and-loop strap is used to hold the Analyst module in place. The package allows the diver to retrieve extensive information about previous dives and to tailor the programming of the Lifeguard for the next dive.