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Total Fluid Conductivity Sensor System and Method

Researchers at the University of South Florida have invented a type of toroidal inductive sensor for measuring the conductivity of a fluid using radio frequency techniques.

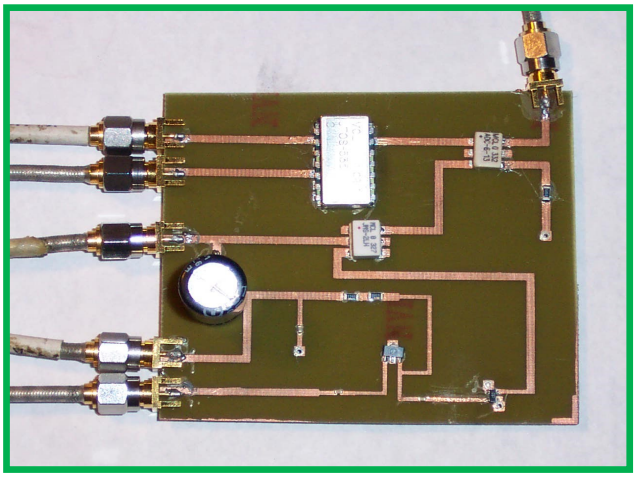
Sensors deployed for environmental monitoring face a very challenging task to ensure reliable data output. The ocean is an example of an environment in which salinity, temperature and pressure conditions result in a corrosive medium, making the task of monitoring difficult. Conductivity, temperature and depth (CTD) data of the ocean are important parameters for oceanographic research applications and are used to determine salinity of the ocean water. The main problem associated with conventional methods of measuring is corrosion and fouling of the metal electrodes in contact with the fluid. Hence, there exists a need for a miniaturized corrosion resistant conductivity sensor that can be used for under water applications.

Researchers at USF have developed a technology that provides an apparatus and method for measuring the conductivity of a fluid employing the differential radio frequency phase detection between two embedded toroidal coils. The sensor provides high resistance to corrosion in the fluid with the use of the radio frequency. The present invention also provides an embedded sensor that can be easily packaged, fitted to a buoy and deployed underwater and is not prone to corrosion and fouling. An integrated thermistor mounted on the coil allows for temperature monitoring and can be used for compensation. The design of the conductivity sensor in accordance with the present invention allows for low power consumption.

ADVANTAGES:

- **Provides high resistance to corrosion**
- **Easy packing and fitting to a buoy for underwater deployment**
- **Low power consumption**

A Noncorrosive Low Power Conductivity Sensor



Schematic Depicting the Sensing Circuitry

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University of South Florida | Technology Transfer Office
813.974.0994 (office) | 813.974.8490 (fax)
patents@research.usf.edu
http://www.usf.edu/research-innovation/pl/