

# H13N-1185 EC Sense: An Open-Source Electrical Conductivity Meter Based on the Wenner Method



Monday, 9 December 2024



13:40 - 17:30



Hall B-C (Poster Hall) (Convention Center)

## Abstract

Electrical Conductivity (EC) serves an important role in environmental sensing due to the measurement's ability to indicate a variety of factors about the testing environment. In history, EC has been utilized as a key metric in hydrological and agricultural research applications. Environmental behaviors such as pollutant concentration in waterways, fertilizer runoff from agricultural landscapes, and saltwater/freshwater mixing in tidal estuaries have all been quantified using measurements of EC. In its most simple form, an EC meter treats the unknown environment as a resistor. According to Ohm's Law, a current passed through a resistance produces a voltage proportional to the magnitude of the resistance. A known current, flowing between two electrodes in the environment, will thus produce a voltage proportional to the resistance of the test medium. However, biological fouling and corrosion (among other factors) negatively affect long-term environmental studies. To rectify these drawbacks at low cost, a four-electrode sensing circuit has been developed for EC measurement applications. Designed for the Wenner and Schlumberger methods of conductivity measurement, and requiring minimal footprint, "EC Sense" is a direct replacement for many commercial conductivity meter instruments.

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