

## **A portable spectrometer's accessory to measure reflectance of undisturbed soil in the field under all conditions (Ramot)**

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### **THE NEED and TECHNOLOGY**

Field spectroscopy has become a growing field in recent years. What was historically the domain of aerial and spatial photography calibration, and geological enthusiasts, has been gaining much interest. Its applications span from soil studies and deposit excavations to remote sensing applications in crop monitoring, environmental watch, and road and bridges upkeep. For truly passive and remote sampling of soil and other surfaces, a very accurate, stable and repeatable method is required. Such method should be independent of time of day, weather and operator skills. Up until now there was no solution to meet all these requirements. The revolutionary SoilPro spectrometer accessory is the first technology to combine the best in previously used techniques to produce a solution supreme to all, with its interchangeable components making it highly modular and a great fit for OEM manufacturers.

### **ADVANTAGES**

- 1) Large surface area measured in a controlled environment – combining Bare Fiber and Contact Probe advantages.
- 2) Not dependent on time of day (can be operated at night time), weather, and unknown geometry.
- 3) Does not require a skilled operator.
- 4) Does not disturb the measured surface – a true in-situ measurement, like Bare Fiber, vs the surface changing position produced by the Contact Probe.
- 5) Requires a single measurement of the area – vs. repeating measurements in adjacent small patches and averaging for Contact Probe.
- 6) Less sensitive to local soil-surface distribution than Contact Probe.
- 7) High accuracy – SoilPro's signal-to-noise ratio (SNR) is higher than both averaged and single use Contact Probe measurements.
- 8) Highly repeatable results – almost ten times better repeatability score than the Contact Probe.
- 9) Modularity – all optical and electronical components are interchangeable, allowing for OEM integration, and various product lines, and customizations.
- 10) High similarity to the results obtained with Bare Fiber vs. the Contact Probe – due to the large surface area measured in both techniques.

### **POTENTIAL APPLICATION**

Field spectrometry has been gaining notice in recent years due to advancements in light and cheap sensors for passive and remote measurements.

Field spectrometers are used in:

1. Aerial and satellite imaging – calibration of multispectral, superspectral and hyperspectral sensors.
2. Agriculture technologies– crop monitoring, single leaf gathering and characterization.
3. Remote sensing operations for different applications.
4. Geological and geophysical – soil, rock, and sand sample gathering and characterization. Can be useful for identifying different deposits such as minerals and oil.
5. Electro optical – used for calibration of panels, and illumination bodies.
6. Ecology - environmental watch
7. Potential for new markets such as construction and traffic – concrete and asphalt for monitoring of roads and bridges.

### **PATENTS**

Pending

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