

## ASD Wide-Resolution Field Spectroradiometer

The field spectroradiometer is a specialized instrument designed to measure radiance and reflectance spectra in the visible through short-wave regions of the electromagnetic spectrum. It can be carried in a backpack or used in a field equipment buggy.

### **Uses:**

This instrument measures a continuous spectrum that is viewed as reflectance spectrum with the software used on a separate laptop to control the instrument and measurement data collection. The reflectance spectrum measured in the field is used as a chemical fingerprint to identify and map materials in multispectral and hyperspectral remote sensing imagery. The unit has been used to develop spectral libraries for vegetation, soils, rocks, surface water, and other materials. It analyses earth materials to help guide appropriate reclamation actions. The unit has been used for waste-rock uranium determinations, analysis of coal refuse for potentially toxic-forming material, and reconnaissance for rare earth elements associated with systems that passively treat acid mine drainage. The wide resolution unit is designed for high quality field measurements for the purpose of ground verification of satellite and airborne remote sensing measurements. The instrument is often used along with another instrument, a field x-ray fluorescence spectrometer, to refine surface maps of specific elements, such as but not limited to, iron, potassium, selenium, lead, mercury, and manganese.

### **Maintenance:**

The field spectroradiometer instrument is designed for field use, but it requires careful handling due to its sensitive components, particularly the fiber optic cable. Several performance checks must be done before using the instrument to insure proper operation and quality measurement data. The fiber optic cable, VNIR and SWIR sensors, contact probe, foreoptics, and reference panels must be in working condition before using the instrument. The instrument is controlled by a separate laptop and the connection from the instrument to the laptop is achieved via Wireless IP connection or a hardwired LAN cable. In the field, the instrument also uses a connection to an external GPS/GNSS system (such as the Bad Elf or EOS Arrow Gold GNSS antenna) to record location information for each spectral measurement.

### **Check-out & contact information:**

Due to the high cost of the device, only authorized and trained personnel may operate this item. The instrument is available for loan subject to the availability of WR staff to accompany the equipment and train the prospective user. Advanced coordination is required for concurrent overhead remote sensing during field spectral measurements. Contact Kristin Brown at (303)236-3410 or at [kbrown2@osmre.gov](mailto:kbrown2@osmre.gov) for more information.