

PSR Series InGaAs/Si All Photodiode Array UV-VIS-NIR Full Range Portable Spectroradiometers

Technical Specifications

| | PSR-3500 | PSR-2500 | PSR-1900 |
|---|---|---|---|
| Spectral Range | 350-2500nm | 350-2500nm | 350-1900nm |
| Spectral Resolution | 3.5nm (350-1000nm) 10nm @ 1500nm 7nm @ 2100nm | 3.5nm (350-1000nm) 22nm @ 1500nm 22nm @ 2100nm | 3.5nm (350-1000nm) 10nm (1000-1900nm) |
| Spectral Sampling Bandwidth | 1.5nm (350-1000nm) 3.8nm @ 1500nm 2.5nm @ 2100nm | 1.5nm (350-1000nm) 6nm @ 1500nm 6nm @ 2100nm | 1.5nm (350-1000nm) 3.8nm @ 1500nm |
| Si Detectors | 512 element Si array (350-1000nm) | 512 element Si array (350-1000nm) | 512 element Si array (350-1000nm) |
| InGaAs Detectors (cooled) | 256 element extended wave- length array (970-1910nm) 256 element extended wavelength array (1900-2500nm) | 256 element extended wave- length array (970-2500nm) | 256 element extended wave- length array (970-1900nm) |
| FOV Options | 4°, 8°, or 14° lens, 25° fiber optic, diffuser, integrating sphere | 4°, 8°, or 14° lens, 25° fiber optic, diffuser, integrating sphere | 4°, 8°, or 14° lens, 25° fiber optic, diffuser, integrating sphere |
| Noise Equivalence Radiance 0.5 s integration time (4° lens) | 0.8x10 ⁻⁹ W/cm ² /nm/sr@400nm 1.2x10 ⁻⁹ W/cm ² /nm/sr@1500nm 1.2x10 ⁻⁹ W/cm ² /nm/sr@2100nm | 0.8x10 ⁻⁹ W/cm ² /nm/sr@400nm 1.5x10 ⁻⁹ W/cm ² /nm/sr@1500nm 1.8x10 ⁻⁹ W/cm ² /nm/sr@2100nm | 0.8x10 ⁻⁹ W/cm ² /nm/sr@400nm 1.2x10 ⁻⁹ W/cm ² /nm/sr@1500nm |
| Max Radiance @ 700nm (4° lens) | 1.0x10 ⁻⁴ W/cm ² /nm/sr | 1x10 ⁻⁴ W/cm ² /nm/sr | 1x10 ⁻⁴ W/cm ² /nm/sr |
| Calibration Accuracy (NIST Traceable) | ±5% @ 400nm ±4% @ 700nm ±7% @ 2200nm | ±5% @ 400nm ±4% @ 700nm ±7% @ 2200nm | ±5% @ 400nm ±4% @ 700nm |
| Minimum Scan Speed | 100 milliseconds | 100 milliseconds | 100 milliseconds |
| Wavelength Reproducibility | 0.1nm | 0.1nm | 0.1nm |
| Wavelength Accuracy | ±0.5 bandwidth | ±0.5 bandwidth | ±0.5 bandwidth |
| Communications interface | USB, Bluetooth- laptop or PDA compatible | USB, Bluetooth- laptop or PDA compatible | USB, Bluetooth- laptop or PDA compatible |
| Size | 8.5" x 11.5" x 3.25" | 8.5" x 11.5" x 3.25" | 8.5" x 11.5" x 3.25" |
| Tripod mounting | 2 each ¼-20 mounting holes provided | 2 each ¼-20 mounting holes provided | 2 each ¼-20 mounting holes provided |
| Weight | 7.3 lbs | 7.3 lbs | 7.3 lbs |
| Batteries | Two lithium ion; 7.4V | Two lithium ion; 7.4V | Two lithium ion; 7.4V |
| Battery Operation | Removable battery; minimum 2 hour operation | Removable battery; minimum 2 hour operation | Removable battery; min- imum 2 hour operation |
| On board memory | Storage of 500 spectra | Storage of 500 spectra | Storage of 500 spectra |



Portable Spectroradiometers for Solar and Environmental Studies

**The features you want- the high spectral
resolution and sensitivity you need!**

- ▶ Fast, full spectrum UV-VIS-NIR measurements- 350-2500nm with just one scan
- ▶ Superior field reliability- All 100% diode array optics with no moving gratings
- ▶ Autoexposure and dark current correction- no tedious optimization steps required
- ▶ Bluetooth interface- no cables to get in the way!
- ▶ High capacity Li-Ion Rechargeable batteries slide right into the unit- no heavy external batteries to carry around.
- ▶ Lightweight powder-coated aluminum case with low profile heat exchanger for added durability and temperature stability
- ▶ Software for both Windows-based laptops and Bluetooth compatible personal digital assistant (PDA) for maximum flexibility
- ▶ Membrane control panel for stand-alone operation without a computer connection- internal memory holds up to 500 scans!
- ▶ Field-switchable optics for varying target sizes & measurement modes



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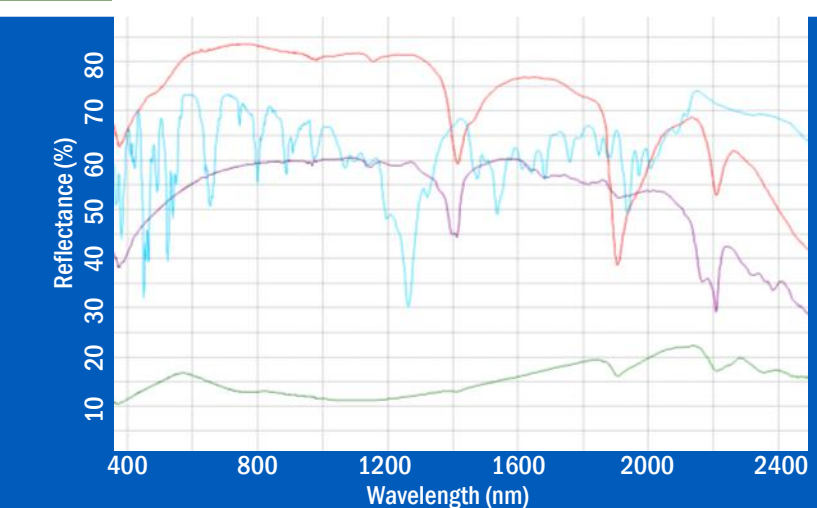
Fast, full featured and flexible

All PSR Series Spectroradiometers feature NIST-traceable calibration and autoexposure control for easy one-touch spectral radiance & irradiance measurements.

SPECTRAL EVOLUTION PSR Series Spectroradiometers use firmly attached diffraction grating-based internal optics with multiple photodiode array detectors. This ensures both high sensitivity and resolution without having to use light-robbing internal fiber optics, ultra-narrow slits or moving gratings & prisms that can get knocked out of alignment. PSR Series Spectroradiometers can collect spectra in as little as 100 milliseconds. The exclusive DARWin SP Data Acquisition Module included with each unit allows for full featured instrument control. All data files are stored as ASCII text and are compatible with many 3rd party software programs for further data manipulation. LABVIEW drivers are also available (please inquire). In the screen shot below, soil reflectance measurements were taken using the PSR-3500 field portable spectroradiometer using its standard 4 degree field of view lens from a distance of 1 meter at an exposure time of 1 second (blue trace). Solar radiance of the reflected light (red trace) was also captured in the same measurement. Soil scan was taken on site at the Railroad Valley Playa in Nevada on June 22, 2011; latitude 38.50971, longitude -115.70020, GPS time 8:21:05PM.

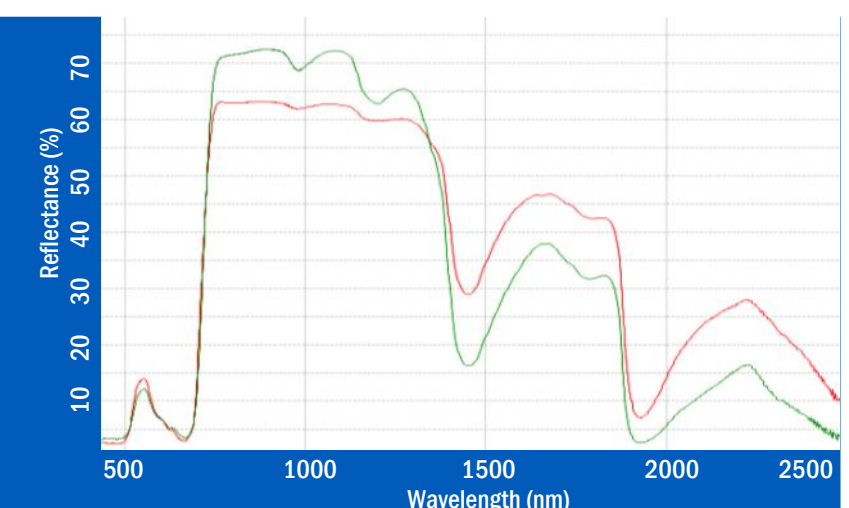


SPECTRAL EVOLUTION PSR Series Portable Spectroradiometers come with full controls and a removable Lilon battery (a) for stand-alone data acquisition of up to 500 spectra without a computer. Weighing in at less than 8 pounds, all PSR Series units are small, lightweight and easy to carry and use. Units come with a hand strap and include reinforced hardware for shoulder straps (b) or for tripod mounting (c). Units can be ordered with a screw mount FOV lens (4, 8 or 14°) or with a removable fiber optic attachment to use with an illuminating reflectance probe (b, d) or integrating sphere (optional). For true portability, PSR Series Spectrometers can also be ordered with a lightweight backpack (d) or foam padded travel case with or without wheels. All PSR Series Spectroradiometers have both USB and wireless Bluetooth connectivity for remote sensing applications. For easy data processing in the field, we also offer the Getac PS236 ruggedized PDA (d). The PS236 features built in SiRFstar III GPS, 3 megapixel autofocus camera, e-compass, altimeter and high visibility 480x640 pixel VGA display. Each Getac PS236 comes fully loaded with our exclusive DARWin CE Mobile-compatible software package to view and tag scans and control the spectrometer via wireless Bluetooth interface.



Mineral Reflectance Studies

Reflectance of kaolinite (purple), illite (green), montmorillonite (red) and SRM-1920 (cyan) was measured and charted simultaneously using the DARWin SP Data Acquisition Module. PSR Series Spectroradiometers can collect spectra in as little as 100 milliseconds. The exclusive DARWin SP Data Acquisition Module included with each unit allows for full featured instrument control and data handling and is compatible with UNSCRAMBLER for further data manipulation. LABVIEW drivers are also available (please inquire).



Leaf Reflectance

Rhododendron decorum (green trace) and *Acer saccharum* (red trace) leaf reflectance were measured using a SPECTRAL EVOLUTION PSR-3500 Spectroradiometer using the companion SPECTRAL EVOLUTION ILM-105 Fiber Optic Illumination Module fitted with an optional 1 meter bifurcated fiber optic cable. The graphs were generated using the easy-to-use DARWin SP Data Acquisition and Analysis software included with each PSR-Series Spectroradiometer. DARWIN SP allows users to plot multiple scans on the same graph for easy comparison and analysis. All units feature automatic exposure control and auto-shutter for simple operation.