

Solar Light's innovative Model 521 MICROTOPS II<sup>®</sup> is a 5 channel hand-held ozonometer for measuring total ozone column easily, accurately and dependably per standard WMO configuration. It measures direct solar ultraviolet radiation at 3 discrete wavelengths within the UVB range, as well as total water vapor and aerosol optical thickness (AOT) using the 936 and 1020 nanometer channels. This meter features 2% accuracy, which is comparable to much larger and more expensive instruments. Popular options include a rugged carrying case and Garmin GPS receiver to facilitate field operation. Research professionals worldwide rely on the Microtops II<sup>®</sup> for its unparalleled combination of accuracy, portability, and durability.



### Applications

- Weather Stations
- Scientific and Educational Studies
- Pollution Monitoring
- Ozonometry
- Environmental Monitoring

### Features and Benefits

- High Accuracy
- Easy To Use
- Fully Portable
- Instantaneous Results
- Non-Volatile Memory
- Low Cost
- USB Interface
- Made in USA

### Carry Case Features

- Well padded, durable construction
- Adjustable shoulder strap
- Pouch for notepad, pencils, etc.
- Velcro strap to attach GPS carrying case
- MICROTOPS II<sup>®</sup> is fully operable while inside case



| S/N  | DATE    | TIME     | LAT.  | LONG   | ALT. | PRES. | SZA  | S305 | S312  | S320  | SIG940 | SIG1020 | OZ305_312 | OZ312_320 | OZONE | WATER | AOT 1020 |
|------|---------|----------|-------|--------|------|-------|------|------|-------|-------|--------|---------|-----------|-----------|-------|-------|----------|
| 3103 | x/xx/xx | 15:06:00 | 40.01 | -75.13 | 20   | 1018  | 65.4 | 1.82 | 27.9  | 55.01 | 58.95  | 132.36  | 216.5     | 241.8     | 243   | 1.04  | 0.086    |
| 3103 | x/xx/xx | 15:06:11 | 40.01 | -75.13 | 20   | 1018  | 65.4 | 1.81 | 27.8  | 54.71 | 58.8   | 132.2   | 216.7     | 241.7     | 242.8 | 1.04  | 0.087    |
| 3103 | x/xx/xx | 15:06:23 | 40.01 | -75.13 | 20   | 1018  | 65.4 | 1.8  | 27.91 | 54.77 | 58.82  | 131.32  | 217.7     | 241.4     | 242.5 | 1.03  | 0.089    |
| 3103 | x/xx/xx | 17:48:32 | 40.01 | -75.13 | 20   | 1014  | 62.6 | 1.56 | 20.9  | 35.55 | 20.85  | 48.42   | 228.4     | 245.1     | 245.8 | 0.96  | 0.56     |
| 3103 | x/xx/xx | 17:48:43 | 40.01 | -75.13 | 20   | 1014  | 62.6 | 1.39 | 19.13 | 34.96 | 18.49  | 43.01   | 230.5     | 244.9     | 245.5 | 0.94  | 0.614    |

| OPTICAL CHANNELS        | STRAY LIGHT                      |
|-------------------------|----------------------------------|
| 340 ± 0.3nm, 2nm FWHM   | 340nm: 1E-6 <650nm; 1E-5 <1.0µm  |
| 380 ± 0.4nm, 4nm FWHM   | 380nm: 1E-6 <650nm; 1E-5 <1.0µm  |
| 440 ± 1.5nm, 10nm FWHM  | 440nm: 1E-5 <1.0µm               |
| 500 ± 1.5nm, 10nm FWHM  | 500nm: 1E-6 <1.1µm; 1E-5 <1.2µm  |
| 675 ± 1.5nm, 10nm FWHM  | 675nm: 1E-6 <1.1µm; 1E-5 <1.2µm  |
| 870 ± 1.5nm, 10nm FWHM  | 870nm: 1E-6 <1.1µm; 1E-5 <1.2µm  |
| 936 ± 1.5nm, 10nm FWHM  | 936nm: 1E-6 <1.1µm; 1E-5 <1.2µm  |
| 1020 ± 1.5nm, 10nm FWHM | 1020nm: 1E-6 <1.1nm; 1E-5 <1.2µm |

| SPECIFICATIONS               |  |
|------------------------------|--|
| <b>Resolution</b>            | 0.01W/cm <sup>2</sup> on 305nm Channel |
| <b>Dynamic Range</b>         | >300,000                               |
| <b>Viewing Angle</b>         | 2.5°                                   |
| <b>Precision</b>             | 1-2%                                   |
| <b>Non-linearity</b>         | max 0.002% FS                          |
| <b>Operating Environment</b> | 0 to 50°C, No Precipitation            |
| <b>Computer Interface</b>    | USB                                    |
| <b>Power Source</b>          | 4xAA Alkaline Batteries                |
| <b>Weight</b>                | 21 oz. (600 grams)                     |
| <b>Size</b>                  | 4"W x 8"H x 1.7"D (10x20x4.3 cm)       |

| REFERENCES |  |
|------------|--|
| 1          | Atmosphere Poster (363K) Presented at Quadrennial Ozone Symposium Charlottesville, Virginia, USA June 4-13 1992 Daniel Berger, Marian Morys  |
| 2          | Ultraviolet radiation as applied to photoclimate therapy at the Dead Sea (114K) A.I. Kudish, PhD, D. Abels, MD, and M. Harari, MD - International Journal of Dermatology 2003, 42, 359-365                               |
| 3          | A Comparison of the New Filter Ozonometer MICROTOPS II <sup>®</sup> with Dobson and Brewer Spectrometers at Hohenpeissenberg (108K) U. Kohler - Reprint from Geophysical Research Letters                                |
| 4          | Absolute Measurement and Modelization of 305.5 nm Direct Spectral Solar Radiation in Rosario, Argentina(43K) Work published in Spanish in "Avances en Energias Renovables y Medio Ambiente", Vol. 2, 11.53-11.56 (1998). |
| 5          | A Comparison of Spectroradiometers to Radiometers for UV Radiation Measurements (43K) Daniel Berger  |
| 6          | Ship-Based Sun Photometer Measurements Using Microtops Sun Photometers Porter et al, Journal of Atmospheric and Oceanographic Technology, Vol. 18, 765-774, 2001.  |

SL/Meters/Microtops-521\_06/2017

### Highlights

- **High Accuracy** - Highest grade filters are embedded in solid cast aluminum housing to ensure accurate, stable optical alignment. Low noise electronics allow high linearity, resolution and dynamic range.
- **Ease of Use** - No computer knowledge is necessary to make measurements. Just aim the meter at the sun, align the image of the sun with the cross-hairs and push the button. In few seconds the measurement will be completed and the result stored in memory.
- **Portability** - A small hand-held device is all you need to perform measurements. No additional computer is necessary.
- **Instantaneous Results** - The Aerosol optical thickness calculation algorithms are programmed in the MICROTOPS II and the final results of all stored scans can be conveniently viewed on the LCD. The raw data is also stored to allow retrospective adjustments of algorithms.
- **Non-Volatile Memory** - The raw data collected by the MICROTOPS II, as well as calculated results are stored in non-volatile memory. Each data point is annotated with date, time, site coordinates, solar angle, altitude, pressure and temperature.
- **Low Cost** - By implementing the latest technology, instrument cost has been brought well below that of comparable sunphotometers, without sacrificing accuracy or features.
- **Computer Interface** - Connection to a PC through a USB interface enables transfer of collected data. MICROTOPS Organizer, a Windows-based software automates data retrieval and archiving.

Since 1967, Solar Light Company, Inc. has been recognized worldwide as America's premier manufacturer of Precision Solar Simulators and Light Sources, Light Measurement Instrumentation, UV Transmittance Analyzers, Meteorological Instrumentation, and Digital and Analog Sensors. Our advanced line of UV, visible, and IR radiometers and light meters measure laboratory, industrial, environmental, and health related light levels with NIST traceable accuracy. Column ozone, aerosol, and water vapor thickness measurements, in addition to long-term global ultraviolet radiation studies all over the world are performed using our atmospheric line of instrumentation. Solar Light also provides NIST traceable spectroradiometric analyses, calibrations for light meters and light sources, accelerated ultraviolet radiation degradation testing of materials, and OEM instrumentation and monitors. Please visit our website for more details, specifications, and pictures!



**State Of The Art Solar Simulators** available in 150-1000+ watt UV or AM variations for a variety of applications including PV Cell Testing, Materials Testing, Pre-Irradiation for In Vitro Broad Spectrum Sunscreen Testing, SPF Testing, and much more.



**Multi-Functional Professional Grade Radiometers** available with and without data logging, and compatible with over 130 Solar Light PMA-Series Sensors to measure UV, Visible and IR wavelengths. Specialty Meters also available to measure UV Radiation, SUV/UVA, Scotopic/ Photopic Spectra, and much more.



**Advanced NIST-Traceable Sensors** for accurate measurement of UVA, UVB, UVA+B, UVC, Visible, IR, Photostability, Temperature, and Custom Wavelength – well over 130 models in both digital and analog configurations, all compatible with our Radiometers.



**Ultraviolet Transmittance Analyzers** available as complete integrated turnkey systems to meet the latest ISO24443 requirements.



**Handheld Ozonometers and Sunphotometers** for fast and dependable Column Ozone, Aerosol, and Water Vapor Thickness measurements, in addition to long-term global ultraviolet radiation studies.