# 819-WL Series

## Power and Wavelength Measurement Sensors

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The 819-WL series provide flexibility to measure both the optical power and wavelength of laser sources from the blue to the near infrared spectrum. These products incorporate Newport's unique power and wavelength capability, based on integrating sphere technology. The 819-SL-06-WL Silicon based sensor provides accurate power and wavelength measurement from 400 to 1100 nm up to 1W optical power. For longer wavelength applications in the IR region, the 819-IG-06-WL InGaAs based sensor is ideal for power and wavelength measurement from 950 to 1650 nm up to 1W optical power.

## Measure with Confidence

The 819-WL series sensors are calibrated to NIST traceable standards to ensure conformance to continuous traceability and ultimately your confidence in the sensor **measurements.**

## Simplify Optical Measurements

The integrating sphere design simplifies optical power measurements of laser sources by eliminating effects related to detector saturation, alignment beam profile, polarization, and back reflection. Integrating spheres are inherently insensitive to beam profiles, providing more flexibility for laser types and launch conditions. Filtered detectors on the interior of the sphere receive an equal distribution of incident light, ensuring that the calibration and resultant measurement accuracy are independent of the beam profile.

## Repeatable, Accurate Measurements

The detectors in the 819-WL series sensors are temperature-controlled to ensure that repeatable measurements are made independent of the measurement environment. Controlling the temperature of the detectors increases the signal-to-noise ratio, improving the accuracy of the measurements.

## Fiber-Coupled Flexibility

Each measurement sensor can be configured easily for fiber-coupled measurements. A choice of accessories is available for FC connectors and bare fiber applications with the appropriate adapter mounted to the front of the free-space entrance aperture.


Post holder and base sold separately

### Features

- Measures both power and wavelength for a broad range of applications from 400 to 1650 nm
- Automatically sets wavelength factor for consistently accurate power measurements
- Integrating sphere based measurements for polarization insensitivity
- NIST traceable measurements for reliable accuracy
- Temperature controlled photodetectors for un-matched stability
- Flexible inputs for both free-space and fiber coupled measurements

## Specifications[1]

| | 819-SL-06-WL | 819-IG-06-WL |
|---|---|---|
| **Wavelength Measurement** | | |
| Wavelength Range: | 400 to 1100 nm | 950 to 1650 nm |
| Accuracy:[2] | ± 1.2 nm | ± 1.2 nm |
| Detection (minimum power required): | -25 dBm; 3 µW | -25 dBm; 3 µW |
| Temperature Coefficient: | <-0.03nm/°C | <-0.03nm/°C |
| **Power Measurement** | | |
| Wavelength Range: | 400 to 1100 nm | 950 to 1650 nm |
| Power Range:[3] | -25 dBm to + 30 dBm<br>3 µW to 1 W | -25 dBm to +30 dBm<br>3 µW to 1 W |
| Damage Threshold, Integrating Sphere Surface: | 1 kW/cm^2 | 1 kW/cm^2 |
| Accuracy:[4] | ±4.5%[5] | ±5.0% |
| Analog to Digital Sampling Rate | 15 Hz | 15 Hz |
| Analog to Digital Resolution | 24 bits | 24 bits |
| Entrance Aperture: | 6 mm | 6 mm |
| Sensor Type: | Silicon | InGaAs |
| Linearity with Power Change | +1% | +1% |
| **Display - 1938-R or 2938-R Optical Meter (sold separately)** | | |
| Power Display | Watt, dBm | Watt, dBm |
| Wavelength Display | nm, $cm^{-1}$ | nm, $cm^{-1}$ |
| Display Resolution | 4 Digits (Power)<br>5 Digits (Wavelength) | 4 Digits (Power)<br>5 Digits (Wavelength) |
| **General** | | |
| Operating Temperature: | +15°C to +30°C | +15°C to +30°C |
| Storage Temperature: | -10°C to +50°C | -10°C to +50°C |
| Relative Humidity (non-condensing): | Max 85% | Max 85% |
| Compatible Connector Types: | FC, Bare Fiber | FC, Bare Fiber |
| Dimensions: | 69 mm (dia.) x 30 mm (thick) | 69 mm (dia.) x 30 mm (thick) |
| Weight: | 0.63 kg (1.39 lbs.) | 0.63 kg (1.39 lbs.) |

### Notes

Typical values provide supplemental information beyond guaranteed specification limits.
1. Unless otherwise noted, all specifications measured at 23°C ±3°C after one-hour warm-up period.
2. This instrument's wavelength measurement technology provides "power-averaged" wavelength (i.e., spectral contributions to which detectors are sensitive are measured). When measuring broadband or multiple peak signals, the performance will vary accordingly.
3. Typical photodiode response is linear over a 60 to 70 dB range between the effects of thermal noise and saturation of the diode. Newport's sensors are calibrated above the noise threshold and linearity is verified in order to produce an accurate calibration for optical power measurements to 1W.
4. Accuracy is based upon free-space calibration measurements, results may vary when utilizing the fiber-coupled accessories
5. Add ±0.5% for wavelengths below 600 nm. Add ±1.5% for wavelengths above 980 nm.

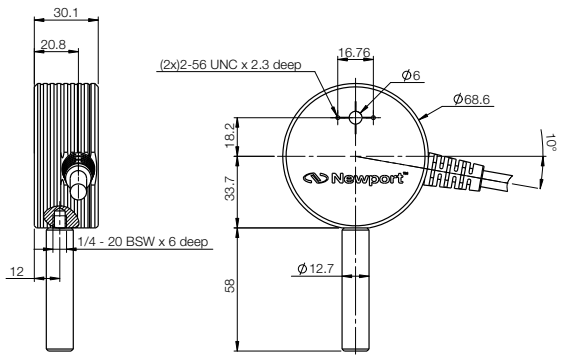

Electronics enclosure provides temperature stabilization to sensor, with built-in status LED.

819-WL sensor connected to 2938-R optical meter. Meter required and sold separately.

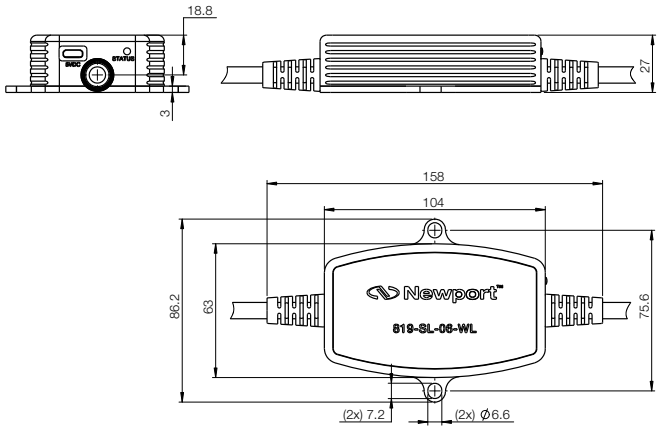
## Dimensional Drawing

819-06-WL

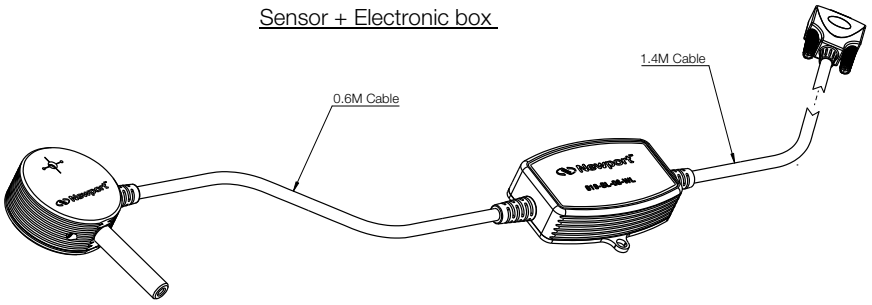
Sensor




Electronic box




Sensor + Electronic box




## Ordering Information

| | |
|---|---|
| 1938-R | Optical Power and Energy Meter, Benchtop, Single Channel |
| 2938-R | Optical Power and Energy Meter, Benchtop, Dual Channel |
| 819-SL-06-WL | Silicon Power/Wavelength Measurement Sensor, 1W, 400 to 1100 nm |
| 819-IG-06-WL | InGaAs Power/Wavelength Measurement Sensor, 1W, 950 to 1650 nm |

## Accessories

AO271 FC Adapter Assembly
BF820 Bare Fiber Holder (requires adapter kit)
AO122 Bare Fiber Adapter Kit
819-WL-PS USB Power Supply, 2.1A, 5VDC (required for two sensors on 2938-R meter)
819-WL-PS-CBL USB Cable, A to C, 1.5 meters (required for two sensors on 2938-R meter)

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DS-012501 819-WL Series-Pwr-Wavelength DS_01/25