Bristol Instruments

The Power of Precision in Wavelength Measurement

LASER WAVELENGTH METER 871 Series

Fastest, most reliable method to accurately measure the wavelength of pulsed and CW lasers

The 871 Laser Wavelength Meter from Bristol Instruments is the best way to measure the absolute wavelength of both pulsed and CW lasers and OPOs. By combining proven Fizeau etalon technology with automatic calibration, the reliable accuracy needed for the most meaningful experimental results is ensured. What's more, a sustained measurement rate of 1 kHz enables the wavelength characterization of every single pulse for most lasers. And, the resulting time resolution of 1 ms provides the most detailed analysis of tunable lasers.

KEY FEATURES

- Operates with both pulsed and CW lasers.
- Wavelength measured to an accuracy as high as ± 0.2 parts per million (± 60 MHz at 1000 nm).
- Automatic calibration with a built-in wavelength standard.
- Operation available from 375 to 1700 nm.
- Minimum input as low as 20 nJ (20 µW at 1 kHz).
- Pre-aligned fiber-optic input eliminates the need to manually optimize the interference signal.
- Asynchronous operation with automatic pulse detection.
- Fastest sustained measurement rate of 1 kHz results in time resolution of 1 ms.
- Built-in PID controller for precise laser stabilization.
- Straightforward operation with PC using USB or Ethernet interfaces.
- Windows-based software provided to control measurement parameters and to report wavelength data.
- Convenient tablet/smartphone application to report wavelength data anywhere in the laboratory.
- Automatic wavelength reporting using custom or LabVIEW programming eliminates the need for a dedicated PC.

It's Our Business to be Exact!

(585) 924-2620
bristol-inst.com
info@bristol-inst.com

SPECIFICATIONS — 871 Series

MODEL	871A	871B
LASER TYPE	Pulsed and CW	
WAVELENGTH		
Range	**VIS:** 375 - 1100 nm **NIR:** 650 – 1700 nm	
Accuracy [1, 2]	± 0.2 ppm (single-mode fiber) ± 0.0002 nm @ 1000 nm ± 60 MHz @ 300,000 GHz	± 0.75 ppm (single-mode fiber) ± 0.0008 nm @ 1000 nm ± 225 MHz @ 300,000 GHz ± 1 ppm (multi-mode graded-index fiber ≤ 62.5 µm diameter) ± 0.001 nm @ 1000 nm ± 300 MHz @ 300,000 GHz
Repeatability [3, 4]	± 0.05 ppm ± 0.00005 nm @ 1000 nm ± 15 MHz @ 300,000 GHz	± 0.1 ppm ± 0.0001 nm @ 1000 nm ± 30 MHz @ 300,000 GHz
Calibration [5]	Automatic with built-in wavelength standard	
Display Resolution	9 digits	8 digits
Units [6]	nm, µm, cm^{-1}, GHz, THz	
OPTICAL INPUT SIGNAL		
Maximum Bandwidth (FWHM)	1 GHz	10 GHz
Minimum Input [7, 8, 9, 10]	**VIS:** 0.6 µJ (375 nm) 0.08 µJ (700 nm) 10.4 µJ (1100 nm) **NIR:** 1.2 µJ (650 nm) 0.08 µJ (1100 nm) 0.04 µJ (1600 nm)	**VIS:** 0.15 µJ (375 nm) 0.02 µJ (700 nm) 2.6 µJ (1100 nm) **NIR:** 0.6 µJ (650 nm) 0.04 µJ (1100 nm) 0.02 µJ (1600 nm)
MEASUREMENT RATE	1 kHz	**VIS:** 500 Hz **NIR:** 1 kHz
INPUTS/OUTPUTS		
Optical Input [11]	Pre-aligned FC/PC fiber connector (optional free beam-to-fiber coupler)	
Instrument Interface	USB and Ethernet interface with Bristol's Windows-based display program Browser-based display application Streaming via RS-422 (internal or external TTL trigger) Internal data storage for up to 1 million measurements Library of commands (SCPI) for custom and LabVIEW programming using any PC operating system PID controller (± 5 V output)	
COMPUTER REQUIREMENTS [12]	PC running Windows 7, 8, or 10, 1 GB available RAM, USB 2.0 (or later) port, monitor, pointing device	
ENVIRONMENTAL [7]		
Warm-Up Time	< 15 minutes	
Temperature	+15°C to +30°C (-10°C to +70°C storage)	
Pressure	500 - 900 mm Hg	
Humidity	≤ 90% R.H. at +40°C (no condensation)	
DIMENSIONS AND WEIGHT		
Dimensions (H x W x D)	3.5" x 17.0" x 15.0" (89 mm x 432 mm x 381 mm)	
Weight	17 lbs (7.65 kg)	
POWER REQUIREMENTS	90 - 264 VAC, 47 - 63 Hz, 50 VA max	

(1) Defined as measurement uncertainty, or maximum wavelength error, using a coverage factor of 3 providing a confidence level of ≥ 99.7%.
(2) Traceable to accepted physical standards.
(3) Standard deviation for a 10 minute measurement period after the instrument has reached thermal equilibrium.
(4) Wavelength resolution is approximately two times repeatability.
(5) For VIS version, stabilized single-frequency HeNe laser. For NIR version, laser diode locked to acetylene absorption (NIST Special Publication 260-133).
(6) Data in units of nm, µm, and cm^{-1} are given as vacuum values.
(7) Characteristic performance, but non-warranted.
(8) Required minimum energy from a single laser pulse. Greater sensitivity is achieved by increasing the length of the measurement window to allow for the integration of a greater number of laser pulses.
(9) Required minimum power is approximated by multiplying the required minimum energy by the selected measurement rate.
(10) Sensitivity at other wavelengths can be determined from graphs that are available upon request.
(11) Visual inspection and optimization of the interference fringe pattern is not required.
(12) For use with Bristol's Windows-based display program. Interfacing via SCPI can be done using any PC operating system.

CLASS 1 LASER PRODUCT

CE

Bristol Instruments reserves the right to change the detail specifications as may be required to permit improvements in the design of its products. Specifications are subject to change without notice.

BRISTOL INSTRUMENTS, INC (585) 924-2620 bristol-inst.com info@bristol-inst.com

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