

LASER WAVELENGTH METER



A low-priced alternative for accurate laser wavelength measurement.

The 521 Series Laser Wavelength Meter from Bristol Instruments is for scientists and engineers who need to know the absolute wavelength of their CW laser, but do not need to know it to the highest accuracy available. The 521 system is a unique instrument that couples accurate laser wavelength measurement and affordability in a compact system.

Proven interferometer technology

The 521 Laser Wavelength Meter measures absolute wavelength of CW and quasi-CW lasers to an accuracy of ± 10 parts per million (± 0.01 nm at 1000 nm). This system uses Michelson interferometer-based technology that is similar to that used by the Bristol Instruments' model 621, the most precise laser wavelength meter available. The primary difference is that a Moiré scale is used as its built-in reference. This high-resolution scale provides the continuous calibration that is necessary to guarantee the accuracy of the wavelength measurement. For even greater confidence, the Moiré scale can be calibrated periodically using a simple procedure with any red HeNe laser input.

Broad wavelength coverage

Two versions of the 521 Laser Wavelength Meter are available to satisfy the needs of most experiments. The 521-VIS operates over the wavelength range of 400 to 1100 nm, and the 521-NIR has an operational wavelength range of 520 to 1700 nm.

Straightforward operation

The 521 Laser Wavelength Meter operates with a PC, running under Windows, via a USB interface. Software is provided to control measurement parameters and to report data, or the system can become part of an experiment using a library of commands for custom or LabVIEW programming. The laser under test enters the 521 system through a pre-aligned fiber-optic input connector to ensure optimum alignment. For free-beam lasers, the LC-1 Fiber-Optic Input Coupler is offered as a simple way to launch into fiber.

FEATURES

- Absolute wavelength measured to an accuracy as high as ± 0.005 nm
- Continuous calibration with a built-in wavelength reference
- Operation available from 400 nm to 1.7 μm
- Input power requirement as low as 5 μW
- Measurement rate of 10 Hz
- Convenient, pre-aligned fiber-optic input
- Integrates into experiment for automatic wavelength reporting and control



SPECIFICATIONS

521 Series

MODEL	521-VIS	521-NIR
LASER TYPE	CW and quasi-CW (repetition rate >10 MHz)	
WAVELENGTH		
Range	400 - 1100 nm	520 - 1700 nm
Absolute Accuracy ^{1, 2}	± 10 ppm ± 0.01 nm @ 1000 nm ± 0.1 cm ⁻¹ @ 10,000 cm ⁻¹ ± 3.0 GHz @ 300,000 GHz	
Repeatability ^{3, 4}	± 5 ppm (± 0.005 nm @ 1000 nm)	
Calibration ⁵	Continuous - built-in Moiré scale	
Display Resolution	6 digits	
Units ⁶	nm, cm ⁻¹ , GHz	
OPTICAL INPUT SIGNAL		
Maximum Bandwidth ⁷	100 GHz	
Minimum Input ^{8, 9}	10 μ W (400 nm) 5 μ W (750 nm) 35 μ W (1100 nm)	100 μ W (520 nm) 5 μ W (1100 nm) 20 μ W (1700 nm)
MEASUREMENT RATE	10 Hz	
INPUTS/OUTPUTS		
Optical Input	Pre-aligned FC/UPC connector (9 μ m core diameter) - optional free beam-to-fiber coupler	
Instrument Interface	High-speed USB interface with Windows-based display program Library of commands for custom and LabVIEW programming	
COMPUTER REQUIREMENTS	PC running Windows 7 or 8, at least 1 GB of available RAM, USB 2.0 (or later) port, monitor, mouse or other pointing device	
ENVIRONMENTAL ⁹		
Warm-Up Time	None	
Temperature	+15°C to +30°C (-10°C to +70°C storage)	
Pressure	500 - 900 mm Hg	
Humidity	$\leq 90\%$ R.H. at + 40°C (no condensation)	
DIMENSIONS AND WEIGHT		
Dimensions (H x W x L)	2.5" x 5.5" x 9.0" (64 mm x 140 mm x 229 mm)	
Weight	3.5 lbs (1.6 kg)	
POWER REQUIREMENTS	90 - 264 VAC, 47 - 63 Hz, 15 VA max	

(1) Defined as measurement uncertainty, or maximum wavelength error, using a coverage factor of 3 providing a confidence level of $\geq 99.7\%$.

(2) Traceable to accepted physical standards.

(3) Standard deviation for a 5 minute measurement period after the instrument has reached thermal equilibrium.

(4) Wavelength resolution is approximately two times repeatability.

(5) The Moiré scale should be calibrated periodically using a standard red HeNe laser.

(6) Data in units of nm and cm⁻¹ are given as vacuum values.

(7) Bandwidth is FWHM. When bandwidth is greater, wavelength accuracy is reduced.

(8) Sensitivity at other wavelengths can be determined from graphs that are available upon request.

(9) Characteristic performance, but non-warranted.



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.

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It's our Business to be Exact!

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