



**The Power of Precision** in Wavelength Measurement

## LASER WAVELENGTH METER

## 671 Series

**Reliable accuracy gives you greater confidence in your experimental results anywhere from the visible to mid-IR.**

Wavelength information is critical for applications such as high-resolution laser spectroscopy, photochemistry, cooling/trapping, and optical sensing. The best way to accurately measure laser wavelength is with the 671 Series Laser Wavelength Meter. This system uses a proven Michelson interferometer-based design to measure the wavelengths of CW lasers to an accuracy as high as  $\pm 0.2$  parts per million. Continuous calibration with a built-in wavelength standard guarantees the reliable accuracy that is required for the most meaningful experimental results.



### KEY FEATURES

- Wavelength accuracy as high as  $\pm 0.0001$  nm.
- Continuous calibration with a built-in wavelength standard.
- Exceptional repeatability results in wavelength resolution as high as 0.03 pm.
- Operation available from 375 nm to 12  $\mu$ m.
- Simultaneous measurement of optical power.
- Input power requirement as low as 10  $\mu$ W.
- Straightforward operation with PC using USB or Ethernet interfaces.
- Convenient pre-aligned fiber-optic input for visible and near-IR wavelengths.
- Free-space aperture input with visible alignment aid for IR and mid-IR wavelengths.
- Display software provided to control measurement parameters and report wavelength data.
- Convenient tablet/smartphone application reports measurement data anywhere in the laboratory.
- Automatic data reporting using custom or LabVIEW programming eliminates the need for a dedicated PC.

**It's Our Business to be Exact!**

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# SPECIFICATIONS

# 671 Series

MODEL	671A	671B
<b>LASER TYPE</b>	CW and quasi-CW (repetition rate > 10 MHz)	
<b>WAVELENGTH</b>		
Range	<b>VIS:</b> 375 - 1100 nm <b>NIR:</b> 520 - 1700 nm <b>IR:</b> 1 - 5 $\mu\text{m}$	<b>VIS:</b> 375 - 1100 nm <b>NIR:</b> 520 - 1700 nm <b>IR:</b> 1 - 5 $\mu\text{m}$ <b>MIR:</b> 1.5 - 12 $\mu\text{m}$
Accuracy <sup>1, 2</sup>	$\pm 0.2$ ppm $\pm 0.0002$ nm @ 1000 nm $\pm 0.002$ cm <sup>-1</sup> @ 10,000 cm <sup>-1</sup> $\pm 60$ MHz @ 300,000 GHz	$\pm 0.75$ ppm ( $\pm 1$ ppm for MIR) $\pm 0.0008$ nm @ 1000 nm $\pm 0.008$ cm <sup>-1</sup> @ 10,000 cm <sup>-1</sup> $\pm 225$ MHz @ 300,000 GHz
Repeatability <sup>3, 4, 5</sup>	<b>VIS / NIR:</b> $\pm 0.03$ ppm ( $\pm 0.03$ pm @ 1 $\mu\text{m}$ ) <b>IR:</b> $\pm 0.06$ ppm ( $\pm 0.2$ pm @ 3 $\mu\text{m}$ )	$\pm 0.1$ ppm ( $\pm 0.1$ pm @ 1000 nm)
Calibration	Continuous - built-in stabilized single-frequency HeNe laser	Continuous - built-in standard HeNe laser
Display Resolution	9 digits	8 digits
Units <sup>6</sup>	nm, $\mu\text{m}$ , cm <sup>-1</sup> , GHz, THz	
<b>POWER (VIS/NIR) <sup>7</sup></b>		
Calibration Accuracy	$\pm 15\%$	
Resolution	2%	
Units	mW, $\mu\text{W}$ , dBm	
<b>OPTICAL INPUT SIGNAL</b>		
Maximum Bandwidth <sup>8</sup>	1 GHz	10 GHz
Minimum Input <sup>9, 10</sup>	<b>VIS:</b> 20 - 250 $\mu\text{W}$ <b>NIR:</b> 10 - 580 $\mu\text{W}$ <b>IR:</b> 65 - 750 $\mu\text{W}$	<b>VIS:</b> 10 - 110 $\mu\text{W}$ <b>NIR:</b> 10 - 250 $\mu\text{W}$ <b>IR:</b> 65 - 750 $\mu\text{W}$ <b>MIR:</b> 120 - 925 $\mu\text{W}$
<b>MEASUREMENT RATE</b>	4 Hz (VIS / NIR)    2.5 Hz (IR)	10 Hz (VIS / NIR)    2.5 Hz (IR / MIR)
<b>INPUTS/OUTPUTS</b>		
Optical Input <sup>11</sup>	<b>VIS / NIR:</b> Pre-aligned FC/UPC or FC/APC connector (9 $\mu\text{m}$ core diameter) - optional free beam-to-fiber couplers <b>IR / MIR:</b> Collimated beam, 2-3 mm diameter aperture, visible tracer beam to facilitate alignment	
Instrument Interface	USB and Ethernet interface with Bristol's Windows-based display program, and browser-based display application Library of commands (SCPI) for custom and LabVIEW programming using any PC operating system	
<b>COMPUTER REQUIREMENTS <sup>12</sup></b>	PC running Windows 7, 8, or 10, 1 GB available RAM, USB 2.0 (or later) port, monitor, pointing device	
<b>ENVIRONMENTAL <sup>10</sup></b>		
Warm-Up Time	< 15 minutes	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)	
<b>DIMENSIONS AND WEIGHT</b>		
Dimensions (H x W x L) <sup>13</sup>	<b>VIS / NIR:</b> 5.6" x 6.5" x 15.0" (142 mm x 165 mm x 381 mm)	<b>IR / MIR:</b> 7.5" x 6.5" x 15.0" (191 mm x 165 mm x 381 mm)
Weight	14 lbs (6.3 kg)	
<b>POWER REQUIREMENTS</b>	90 - 264 VAC, 47 - 63 Hz, 50 VA max	
<b>WARRANTY</b>	5 years	

- (1) Defined as measurement uncertainty, or maximum wavelength error, with a confidence level of  $\geq 99.7\%$ .
- (2) Traceable to accepted physical standards.
- (3) For 671A, standard deviation for a 10 minute measurement period after the instrument has reached thermal equilibrium.
- (4) For 671B, standard deviation for a 1 minute measurement period after the instrument has reached thermal equilibrium.
- (5) Long-term measurement variations due to longitudinal mode drift of the HeNe reference laser are  $< \pm 0.4$  ppm.
- (6) Wavelength resolution is approximately two times repeatability.
- (7) Data in units of nm,  $\mu\text{m}$ , and cm<sup>-1</sup> are given as vacuum values.
- (8) The IR and MIR versions do not measure absolute power. An intensity meter displays relative power.
- (9) Bandwidth is FWHM. When bandwidth is greater, wavelength accuracy is reduced.
- (10) Sensitivity at specific wavelengths can be determined from graphs that are provided in the 671 Series Product Details brochure.
- (11) Characteristic performance, but non-warranted.
- (12) IR and MIR required beam height is  $5.4 \pm 0.25$ ".
- (13) For use with Bristol's Windows-based display program. Interface via SCPI can be done using any PC operating system.
- (14) IR and MIR instrument height is adjustable ( $7.25 \pm 0.25$ ") for alignment purposes.



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.