



*The Power of Precision*

**RELIABLE ACCURACY gives you greater confidence in your experimental results.**

*For applications such as high-resolution spectroscopy, photochemistry, cooling-trapping, and optical sensing, absolute laser wavelength information is critical. However, the exact wavelength of tunable lasers and laser diodes is not usually known a priori. Therefore, it is necessary to measure laser wavelength to ensure the most meaningful experimental results.*

*The best way to determine the absolute wavelength of CW lasers is with the 621 Laser Wavelength Meter. This system provides real-time wavelength information with an accuracy that is guaranteed by continuous calibration with a built-in wavelength standard. The result is the reliable accuracy that is required for the most demanding applications.*

## FEATURES

- Absolute laser wavelength measured to an accuracy as high as  $\pm 0.0001$  nm
- Continuous calibration with a built-in wavelength standard
- Operation available from 375 nm to 12  $\mu$ m
- Simultaneous measurement of total optical power to an accuracy of  $\pm 15\%$
- Measurement rate as high as 10 Hz
- Straightforward operation with PC using high-speed USB interface
- Easy to integrate into experiment for automatic wavelength reporting and control

# LASER WAVELENGTH METER 621 SERIES



## Highest guaranteed wavelength accuracy

The 621 Laser Wavelength Meter uses a proven Michelson interferometer-based design to accurately measure the absolute wavelength of CW lasers. Two versions are available. The model 621A is used for the most demanding experiments, measuring wavelength to an accuracy of  $\pm 0.2$  parts per million ( $\pm 0.0002$  nm at 1000 nm). For experiments that are less exacting, the model 621B is a lower-priced alternative with an accuracy of  $\pm 0.75$  parts per million ( $\pm 0.0008$  nm at 1000 nm).

## Continuous calibration for reliable accuracy

To achieve the reliable accuracy that is expected from Bristol Instruments, the 621 Laser Wavelength Meter is continuously calibrated with a built-in HeNe laser wavelength standard. The HeNe laser is an ideal reference source because its wavelength is well-known and fixed by fundamental atomic structure. To measure absolute wavelength to the highest accuracy of  $\pm 0.2$  parts per million, the 621A system uses a single-frequency HeNe laser that is stabilized using a precise balanced longitudinal mode technique. A standard HeNe laser is used as the wavelength reference in the model 621B.

## Broad wavelength coverage and convenient laser input

The model 621 is available in five broad wavelength configurations to satisfy virtually any experimental requirement. These ranges are the VIS (375 - 1100 nm), NIR (520 - 1700 nm), IR (1 - 5  $\mu$ m), MIR (4 - 11  $\mu$ m), and XIR (2 - 12  $\mu$ m).

A laser under test enters the VIS and NIR versions of the model 621 through a pre-aligned fiber-optic input connector to ensure optimum alignment and uncompromised accuracy. With fiber-optic input, the 621 system can be placed in an out of the way location, thereby conserving valuable "optical real-estate." Since fiber is not readily available for infrared wavelengths, the laser under test enters the IR, MIR, and XIR versions of the model 621 through a free-space aperture. To facilitate alignment, the internal HeNe reference laser is emitted from the input aperture as a visible tracer beam.

## Straightforward operation for greater productivity

The 621 Laser Wavelength Meter easily becomes part of an experiment to provide real-time wavelength information. The system operates with a PC running under Windows 7, Vista, or XP. Wavelength is calculated and then transferred to the PC using a high-speed USB interface. Software is provided to control measurement parameters and to report data in units of wavelength (nm), wavenumber ( $\text{cm}^{-1}$ ), or frequency (GHz). Every measurement or a running average can be displayed. In addition, wavelength data can be collected and saved to file, or transferred using a library of commands for custom or LabVIEW programming.

# SPECIFICATIONS

621A			621B		
LASER TYPE		CW only			
WAVELENGTH					
Range		VIS: 375 - 1100 nm NIR: 520 - 1700 nm IR: 1 - 5 μm		VIS: 375 - 1100 nm NIR: 520 - 1700 nm IR: 1 - 5 μm MIR: 4 - 11 μm XIR: 2 - 12 μm	
Absolute Accuracy <sup>1</sup>		± 0.2 ppm  ± 0.0002 nm @ 1000 nm ± 0.002 cm <sup>-1</sup> @ 10,000 cm <sup>-1</sup> ± 60 MHz @ 300,000 GHz		± 0.75 ppm (± 1 ppm for MIR and XIR)  ± 0.0008 nm @ 1000 nm ± 0.008 cm <sup>-1</sup> @ 10,000 cm <sup>-1</sup> ± 225 MHz @ 300,000 GHz	
Calibration		Continuous with built-in stabilized single-frequency HeNe laser		Continuous with built-in standard HeNe laser	
Display Resolution		9 digits		8 digits	
Units		nm or cm <sup>-1</sup> (vacuum), GHz			
POWER (VIS and NIR)					
Calibration Accuracy <sup>2</sup>		± 15%			
Resolution		2%			
Units		mW, μW, dBm			
OPTICAL INPUT SIGNAL					
Maximum Laser Bandwidth <sup>3</sup>		1 GHz		10 GHz	
Minimum Input <sup>4</sup>		VIS NIR IR MIR XIR	500 μW (375 nm) 300 μW (520 nm) 600 μW (1.0 μm) 400 μW (4.0 μm) 800 μW (2.0 μm)	30 μW (750 nm) 25 μW (1100 nm) 80 μW (3.0 μm) 200 μW (7.5 μm) 200 μW (7.0 μm)	75 μW (1100 nm) 50 μW (1700 nm) 800 μW (5.0 μm) 500 μW (11.0 μm) 1 mW (12.0 μm)
MEASUREMENT RATE		VIS / NIR IR / MIR / XIR	4 Hz 2.5 Hz	10 Hz 2.5 Hz	
INPUTS/OUTPUTS					
Optical Input		VIS / NIR IR / MIR / XIR	Pre-aligned FC/UPC connector (9/125 μm core diameter) - optional free beam-to-fiber coupler Collimated beam, 2-3 mm diameter aperture, visible tracer beam to facilitate alignment		
Instrument Interface		High-speed USB 2.0 interface with Windows-based display program Library of commands for custom and LabVIEW programming			
COMPUTER REQUIREMENTS		PC running Windows 7, Vista, or XP with 1 GHz or higher microprocessor, at least 1 GB of available RAM, USB 1.1/2.0 port, monitor (resolution 1200x800 or greater), mouse or other pointing device			
ENVIRONMENTAL <sup>5</sup>					
Warm-Up Time		< 15 minutes		None	
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 L)		VIS / NIR IR / MIR / XIR	5.0" x 6.5" x 15.0" (127 mm x 165 mm x 381 mm) 7.5" x 6.5" x 15.0" (191 mm x 165 mm x 381 mm)		
Weight		14 lbs (6.3 kg)			
POWER REQUIREMENTS		90 - 264 VAC, 47 - 63 Hz, 50 VA max			

- (1) Confidence level of  $3\sigma$  ( $\geq 99.6\%$ ) and traceable to an accepted physical standard.
- (2) Calibration wavelength for VIS version is 633 nm. Calibration wavelength for NIR version is 1533 nm.
- (3) Bandwidth is FWHM. When bandwidth is greater, wavelength accuracy is reduced.
- (4) Sensitivity at other wavelengths can be determined from a graph that is available upon request.
- (5) Typical.

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.



Call: **1-585-924-2620** for more information or  
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