WAVEMETER Laser Wavelength Meters

WA-1500 / WA-1000 Series

Most precise wavelength measurement available

- Accuracy of ± 0.2 ppm for WA-1500
- Accuracy of ± 1 ppm for WA-1000
- Continuous calibration with built-in wavelength standard
- Operation from 400 nm to 4 µm
- Displays wavelength, wave-number or frequency
- Convenient, pre-aligned fiber coupling
- Free space input for IR wavelengths
- Visible tracer beam to facilitate free space beam alignment

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The WA-1500 WAVEMETER® Laser Wavelength Meter measures the absolute wavelength of virtually any CW laser to the highest accuracy available, ± 0.2 ppm (± 0.0002 nm at 1000 nm). When the highest accuracy is not required, the WA-1000 is available as a lower cost alternative to provide an absolute wavelength accuracy of ± 1.0 ppm (± 0.001 nm at 1000 nm).

Proven WAVEMETER® technology

Both the WA-1500 and WA-1000 systems employ Burleigh's proven scanning Michelson interferometer-based WAVEMETER technology to determine the absolute wavelength of a laser by comparing its interference fringe pattern with that of a built-in HeNe laser wavelength standard. Unlike other wavelength meters, all factors that can affect the accuracy of the wavelength measurement are taken into account. For example, to measure absolute laser wavelength to the highest accuracy of ± 0.2 ppm, the WA-1500 uses a stabilized single-frequency HeNe laser, with a wavelength known to better than 0.025 ppm, as the internal standard. In addition, both systems use internal temperature and pressure sensors to give the necessary data to correct for any dispersion between the wavelengths of the built-in HeNe laser and the laser under test.

Choice of operational wavelength ranges

Three versions of the WA-1500 and WA-1000 are available for different wavelength ranges: visible (400-1100 nm), near infrared (600-1800 nm), and infrared (1.5-4 µm). Each version includes a photodetector and a beamsplitter optimized for its operational wavelength range. Conversion from one range to another is accomplished simply by replacing the photodetector and beamsplitter.

Convenient laser input for easy test set up

Both systems include two standard methods of laser input. A laser beam from an optical fiber enters through a standard FC/PC (FC/APC optional) connector on the front panel or a free space laser beam enters through an aperture on the side of the system. A flip mirror is used to switch from one input method to the other. The fiber-optic input is used primarily for visible and near infrared wavelengths. The free space aperture is necessary for infrared wavelengths when suitable optical fibers are not available. The fiber optic input is pre-aligned at Burleigh for optimum performance. For free space laser input, the internal reference HeNe laser beam is emitted from the input aperture as a weak visible tracer beam to facilitate alignment. The laser under test is simply superimposed on the tracer beam.

Easy to read display output

These WAVEMETER systems display either the wavelength (nm) or the wavenumber (cm^{-1}), as an air or vacuum value, or the frequency (GHz) of the laser under test. The resolution of the display depends on the accuracy to which the wavelength is measured. The highest display resolution is achieved when the laser's bandwidth is < 1 GHz for the WA-1500 and < 10 GHz for the WA-1000. As the laser bandwidth increases, the system automatically displays an appropriately reduced resolution. Therefore, only significant digits are displayed.

WA-1500 / WA-1000 WAVEMETER Specifications

	WA-1500	WA-1000
Wavelength		
Range		
VIS	400 - 1100 nm	
NIR	600 - 1800 nm	
IR	1.5 - 4 µm	
Absolute Accuracy [1]	± 0.2 ppm ± 0.0002 nm @ 1000 nm ± 0.002 cm^{-1} @ 10,000 cm^{-1} ± 0.06 GHz @ 300,000 GHz	± 1.0 ppm ± 0.001 nm @ 1000 nm ±0.01 cm^{-1} @ 10,000 cm^{-1} ± 0.3 GHz @ 300,000 GHz
Display Resolution	0.0001 nm 0.001 cm^{-1} 0.01 GHz	0.001 nm 0.01 cm^{-1} 0.1 GHz
Units	nm or cm^{-1}(vacuum or air), GHz	
Optical Input Signal		
Sensitivity	20 µW (VIS, NIR) 1 mW (IR)	
Maximum Input	2 mW (VIS, NIR) 100 mW (IR)	
Measurement Update		
Time (rate)	1 s (1 measurement/s)	0.25 s (4 measurements/s)
Inputs/Outputs		
Optical Input		
Fiber	FC/PC standard, FC/APC optional	
Free Space Beam	2 mm aperture	
Instrument Interface	RS-232 standard GPIB/IEEE-488 optional	
Analog Output	± 5 volts proportional to wavelength deviation	
Warm-up		
Nominal Time	7 minutes	N/A
Dimensions and Weight		
Dimensions (WxHxD)	15.3" x 8.0" x 11.5" (389 mm x 203 mm x 292 mm)	
Weight	25 lbs (11.3 kg)	
Power Requirements		
Voltage and Frequency	90 to 270 VAC, 50/60 Hz	

1. WA-1500 accuracy of ± 0.2 ppm is achieved when laser spectral bandwidth is less than 1 GHz (FWHM). WA-1000 accuracy of ± 1.0 ppm achieved when laser spectral bandwidth is less than 10 GHz (FWHM).

Burleigh 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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