

## OPTICAL WAVELENGTH METER

## 228 Series



### Affordable wavelength testing of optical transceivers.

The 228 Series Optical Wavelength Meter from Bristol Instruments is the most affordable method to measure the wavelength of tunable transmitter lasers used in WDM applications. With features such as high accuracy, 10 Hz measurement rate, and a broad operational range of 700 to 1650 nm, the model 228 provides precise, efficient, and versatile wavelength testing to satisfy the requirements needed for the production of laser transceivers.

Two versions of the 228 Optical Wavelength Meter are available. The model 228A is the most precise, providing an accuracy of  $\pm 0.3$  pm. For less exacting test requirements, the model 228B is a lower-priced alternative with a wavelength accuracy of  $\pm 1.0$  pm. Continuous calibration with a built-in wavelength standard ensures the utmost confidence in the test results.

The rugged design of the 228 Multi-Wavelength Meter provides long-term reliable operation, backed by a five-year warranty on all parts and labor. This results in less downtime and the lowest cost of ownership available.

### Key Features:

- Wavelength accuracy as high as  $\pm 0.3$  pm.
- Continuous calibration with a built-in wavelength standard.
- Measurement confidence level of  $\geq 99.7\%$ .
- Traceable to NIST standards.
- Power measured to an accuracy of  $\pm 0.5$  dB.
- Measurement rate of 10 Hz.
- Broad operational range of 700 to 1650 nm.
- Interfacing via SCPI using USB, Ethernet, or GPIB.
- Rugged design for manufacturing environments.
- Five-year warranty covers all parts and labor.

# SPECIFICATIONS

228 Series

MODEL	228A	228B
<b>OPTICAL SIGNAL</b> <sup>1</sup>	CW only	
<b>WAVELENGTH</b>		
Range	700 – 1650 nm (182 – 429 THz)	
Accuracy <sup>2,3</sup>	± 0.2 parts per million (± 0.3 pm at 1550 nm)	± 0.65 parts per million (± 1.0 pm at 1550 nm)
Repeatability <sup>4,5,6</sup>	± 0.03 parts per million (± 0.05 pm at 1550 nm)	± 0.1 part per million (± 0.15 pm at 1550 nm)
Calibration	Continuous - built-in stabilized single-frequency HeNe laser	Continuous - built-in standard HeNe laser
Display Resolution	0.00001 nm	0.0001 nm
Units <sup>7</sup>	nm, cm <sup>-1</sup> , THz	
<b>POWER</b>		
Calibration Accuracy	± 0.5 dB (± 30 nm from 1310 and 1550 nm)	
Linearity <sup>6</sup>	± 0.3 dB (700 – 1600 nm)	
Polarization Dependence	± 0.5 dB (700 – 1600 nm)	
Display Resolution	0.01 dB	
Units	dBm, mW, μW	
<b>OPTICAL INPUT SIGNAL</b>		
Maximum Bandwidth <sup>8</sup>	1 GHz (8 pm at 1550 nm)	10 GHz (80 pm at 1550 nm)
Sensitivity <sup>6,9</sup>	1250 – 1650 nm: -30 dBm (1 μW) 1000 nm: -25 dBm (3 μW) 700 nm: -10 dBm (100 μW)	
Maximum Power	+ 10 dBm (displayed level), + 18 dBm (safe level)	
Return Loss	35 dB (UPC connector), 50 dB (APC connector)	
<b>MEASUREMENT RATE (TIME)</b>	10 Hz (0.1 s)	
<b>MEASUREMENT MODES</b>	Wavelength and power Maximum, minimum, delta (max-min) of wavelength and power over time Current, start, drift (current-start) of wavelength and power over time	
<b>INPUTS/OUTPUTS</b>		
Optical Input	9/125 μm single-mode fiber (FC/UPC or FC/APC)	
Instrument Interface	Library of commands (SCPI) via USB 2.0, Ethernet, and optional GPIB	
<b>ENVIRONMENTAL</b> <sup>6</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)	
<b>DIMENSIONS AND WEIGHT</b>		
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)	
<b>POWER REQUIREMENTS</b>	90 - 264 VAC, 47 - 63 Hz, 80 VA max	
<b>WARRANTY</b>	5 years (parts and labor)	

- (1) Maximum amplitude noise of 1%.
- (2) Defined as measurement uncertainty, or maximum wavelength error, with a confidence level of ≥ 99.7%.
- (3) Traceable to an NIST standard (SRM 2517a).
- (4) For 228A, standard deviation for a 10 minute measurement period.
- (5) For 228B, standard deviation for a 1 minute measurement period. Long-term measurement variations are  $\pm 0.4$  ppm.
- (6) Characteristic performance, but non-warranted.
- (7) Data in units of nm and cm<sup>-1</sup> are given as vacuum values.
- (8) Bandwidth is FWHM.
- (9) Performance at other wavelengths can be determined from graphs that are available upon request.



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