

OPTICAL WAVELENGTH METER

238 Series



Wavelength measurement from 700 to 1650 nm

The 238 Series Optical Wavelength Meter from Bristol Instruments is designed for the precise wavelength characterization of tunable transmitter lasers, DFB lasers, and VCSELs used in applications such as fiber-optic communications, data storage, and 3D sensing. Features such as reliable accuracy, broad wavelength coverage, straightforward operation, and rugged design satisfy the needs of both the R&D scientist and the manufacturing engineer.

Two versions of the 238 Optical Wavelength Meter are available. The model 238A is the most precise, providing an accuracy of ± 0.3 pm. For less exacting test requirements, the model 238B is a lower-priced alternative with a wavelength accuracy of ± 1.0 pm. Continuous calibration with a built-in wavelength standard ensures the utmost confidence in the test results.

Operation of the 238 Optical Wavelength Meter is straightforward. The optical signal enters the model 238 through an FC (UPC or APC) fiber-optic connector on the front panel. A convenient front panel touch-screen controls the 238 system and displays the measured wavelength and power. The measurement data can also be sent to a PC using a library of SCPI commands via standard USB or Ethernet interface, or an optional GPIB interface. The rugged design of the 238 Optical Wavelength Meter provides long-term reliable operation that is backed by a five-year warranty covering all parts and labor.

Key Features:

- Wavelength accuracy as high as ± 0.3 pm.
- Continuous calibration with built-in wavelength standard.
- Measurement confidence level $\geq 99.7\%$.
- Traceable to NIST standards.
- Power measured to an accuracy of ± 0.5 dB.
- Broad operational range of 700 to 1650 nm.
- Measurement rate of 15 Hz.
- Convenient touch-screen display reports measurement data in a variety of formats.
- Interfacing via SCPI using USB, Ethernet, or GPIB.
- Rugged design for manufacturing environments.
- 5-year warranty covers all parts and labor.

SPECIFICATIONS

MODEL	238A	238B
OPTICAL SIGNAL ¹	CW only	
WAVELENGTH		
Range	700 – 1650 nm (182 – 429 THz)	
Accuracy ^{2,3}	± 0.2 parts per million (± 0.3 pm at 1550 nm)	± 0.65 parts per million (± 1.0 pm at 1550 nm)
Repeatability ^{4,5,6}	± 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 ⁷	nm, cm ⁻¹ , THz	
POWER		
Calibration Accuracy	± 0.5 dB (± 30 nm from 1310 and 1550 nm)	
Linearity ⁶	± 0.3 dB (700 – 1600 nm)	
Polarization Dependence	± 0.5 dB (700 – 1600 nm)	
Display Resolution	0.01 dB	
Units	dBm, mW, μW	
OPTICAL INPUT SIGNAL		
Maximum Bandwidth ⁸	1 GHz (8 pm at 1550 nm)	10 GHz (80 pm at 1550 nm)
Sensitivity ^{6,9}	1000 – 1650 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	
MEASUREMENT RATE (TIME)	15 Hz (0.07 s)	
INPUTS/OUTPUTS		
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	
ENVIRONMENTAL ⁶		
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 D)	3.5" x 17.0" x 15.0" (89 mm x 432 mm x 381 mm)	
Weight	17 lbs (7.65 kg)	
POWER REQUIREMENTS	90 - 264 VAC, 47 - 63 Hz, 80 VA max	
WARRANTY	5-year (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 238A, standard deviation for a 10 minute measurement period.
- (5) For 238B, standard deviation for a 1 minute measurement period. Maximum long-term measurement variation < ± 0.4 ppm.
- (6) Characteristic performance, but non-warranted.
- (7) Data in units of nm and cm⁻¹ 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.

