



The Power of Precision

MULTI-WAVELENGTH METER 428 SERIES

Test your DWDM signals with the confidence that results from reliable accuracy

Bristol Instruments, a leader in optical wavelength measurement technology, now offers a family of multi-wavelength meters for testing DWDM signals. The 428 Series Multi-Wavelength Meter simultaneously measures wavelength, power, and OSNR in order to fully characterize DWDM components and DWDM transmission systems.

The model 428 combines high accuracy and exceptional reliability to achieve the most meaningful test results. What's more, straightforward operation and rugged design satisfy the needs of both the R&D scientist and the manufacturing engineer.

FEATURES

- Measures wavelength and power of up to 250 optical signals
- Optical wavelength measured to an accuracy as high as ± 0.3 pm
- Continuous calibration with a built-in wavelength standard
- Wavelength accuracy guaranteed to a confidence level of 3σ ($\geq 99.6\%$)
- Automatic calculation of OSNR and channel spacing
- Rugged design for manufacturing environments



Simultaneous wavelength, power, and OSNR measurement

The 428 Series Multi-Wavelength Meter combines proven Michelson interferometer-based technology with fast Fourier transform analysis. This results in the ability to measure the wavelength and power of up to 250 discrete optical signals. Wavelength is measured to an accuracy as high as ± 0.3 pm and power is measured to an accuracy of ± 0.5 dB. In addition, the 428 system can automatically calculate optical signal-to-noise ratio (OSNR) to greater than 40 dB.

Highest guaranteed wavelength accuracy

Two versions of the 428 Series Multi-Wavelength Meter are available. The model 428A is used for the most demanding testing requirements, measuring wavelength to the highest accuracy of ± 0.3 pm. For less exacting test requirements, the model 428B is a lower-price alternative with a wavelength accuracy of ± 1.2 pm.

The wavelength accuracy of the 428 system is maintained over long periods of time because it is continuously calibrated with a built-in HeNe laser wavelength standard. This results in a confidence level of 3-sigma, meaning that $\geq 99.6\%$ of the measurements will fall within the specified accuracy limits. To verify this performance, every 428 system is rigorously tested with laser sources that are traceable to NIST-accepted physical standards.

Designed for productivity and convenience

Operation of the 428 Series Multi-Wavelength Meter is straightforward and requires virtually no learning curve.

The optical signal enters the model 428 through an FC/UPC or an FC/APC fiber-optic connector on the front panel. The system's high sensitivity results in an input power requirement of only $0.1 \mu\text{W}$ (-40 dBm). Automatic electronic gain control instantly adjusts the photodetector signal for optimum performance.

The controls of the 428 system are user-friendly and conveniently located on the front panel along with the measurement display. The wavelength, power, and OSNR data can be reported in a variety of formats. Data from a specific optical channel can be displayed, or lists of data from all channels, sorted by wavelength or power, can be displayed. The measurement information can also be sent directly to a PC using SCPI via a high-speed USB or an Ethernet interface.

The system is packaged in a rugged bench-top or rack-mounted chassis for use in typical laboratory or manufacturing environments.

SPECIFICATIONS

		428A	428B
WAVELENGTH			
Range	1270 - 1650 nm (182 - 236 THz)		
Absolute Accuracy ¹	± 0.2 parts per million (± 0.3 pm at 1550 nm)	± 0.75 parts per million (± 1.2 pm at 1550 nm)	
Differential Accuracy ²	± 0.15 parts per million	± 0.5 parts per million	
Minimum Resolvable Separation ²	15 GHz, equal power lines input		
Display Resolution	0.0001 nm	0.0001 nm	
Units	nm or cm ⁻¹ (vacuum or standard air), THz		
POWER			
Calibration Accuracy	± 0.5 dB, at ± 30 nm from 1310 and 1550 nm		
Flatness ²	± 0.2 dB (1270 - 1600 nm), 30 nm from any wavelength		
Linearity ²	± 0.3 dB (1270 - 1600 nm), lines above -30 dB		
Polarization Dependence	± 0.5 dB (1270 - 1600 nm), ± 1.0 dB (1600 - 1650 nm)		
Display Resolution	0.01 dB		
Units	dBm, mW, μW		
OPTICAL DYNAMIC RANGE			
Signal to Noise Ratio ² (lines above -25 dBm)	> 40 dB with 100 averages, 100 GHz channel spacing > 35 dB with 100 averages, 50 GHz channel spacing		
OPTICAL INPUT SIGNAL			
Sensitivity	Single line input Multiple lines input ²	-40 dBm (1270 - 1600 nm), -30 dBm (1600 - 1650 nm) 30 dB below total input power, but not less than single line input sensitivity	
Maximum Power	Displayed level Safe level	+ 10 dBm, sum of all lines input + 18 dB, sum of all lines input	
Return Loss	UPC connector APC connector	35 dB 50 dB	
Maximum Number of Lines	250		
MEASUREMENT CYCLE TIME			
Time (Rate)	1 s (1 Hz)		
MEASUREMENT MODES			
Data Mode	Single channel, list by wavelength table, list by power table		
Delta Mode	Delta wavelength from ITU grid, delta wavelength and power from reference channel		
Drift Mode	Maximum, minimum, drift (max-min) of wavelengths and powers over time Current, start, drift (current-start) of wavelengths and powers over time		
INPUTS/OUTPUTS			
Optical Input	9/125 μm single-mode fiber (FC/UPC or FC/APC)		
Instrument Interface	SCPI via USB 2.0 and Ethernet		
ENVIRONMENTAL			
Warm-Up Time	< 15 minutes	None	
Temperature ²	+15°C to +30°C (-10°C to +70°C storage)		
Pressure ²	500 - 900 mm Hg		
Humidity ²	≤ 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" (88.9 mm x 431.8 mm x 381.0 mm)		
Weight	17 lbs (7.65 kg)		
POWER REQUIREMENTS			
Voltage and Frequency	90 to 260 VAC, 50/60 Hz		
Power	80 VA max		

(1) Confidence level of 3σ (≥99.6%) and traceable to NIST-accepted physical standards.

(2) 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.

CLASS 1 LASER PRODUCT
COMPLIES WITH
21 CFR 1040.10 AND 1040.11



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