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WAVEMETER Optical Wavelength Meters

WA-1650/1150/1100

To meet the growing demand for access to larger volumes of digital information, telecommunications operators increase system capacity using dense wavelength division multiplexing (DWDM). Both active DWDM components such as transmission lasers, and passive components such as multiplexers, demultiplexers and add/drop filters, thin film filters and fiber gratings, must be accurately characterized with respect to absolute wavelength.

Applications

- Characterize active DWDM components
  - Accurate wavelength analysis of transmitters (DFB lasers, tunable lasers and VCSELs)
- Calibrate passive DWDM component test equipment and test stations
  - Accurate wavelength calibration of optical spectrum analyzers (OSAs)
  - Accurate wavelength calibration of discretely tunable and swept wavelength tunable lasers

Features

- Absolute optical wavelength measured to the highest guaranteed accuracy of ± 0.3 pm
- Continuous calibration with built-in wavelength standard
- Accurate absolute wavelength measurement to a 3σ (≥ 99.6%) confidence level
- Operation with CW, modulated and SONET/SDH signals

The recognized standard for absolute wavelength measurement

The most precise wavelength characterization of DWDM components

Since introducing the first WAVEMETER® wavelength meter in 1980, Burleigh has continually provided the most technically advanced optical wavelength measurement capability available. The WA-1650/1150 and WA-1100 WAVEMETER optical wavelength meters provide the highest accuracy wavelength measurement, and are designed specifically for the precise characterization of DWDM components in manufacturing environments.

The WAVEMETER Advantage

These systems employ Burleigh's proven scanning Michelson interferometer-based WAVEMETER technology to determine the absolute wavelength of a laser under test 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 wavelength measurement are accounted for in order to achieve the highest absolute wavelength accuracy of ± 0.3 pm (WA-1650). When the highest accuracy is not required, a lower cost alternative is available (WA-1150 or WA-1100), providing an absolute wavelength accuracy of ± 1.5 pm. The absolute wavelength measurement specification has a confidence level of 3σ, which means that ≥ 99.6% of measurements fall within specification limits. To ensure accuracy of wavelength measurements, all WAVEMETER optical wavelength meters are traceable to NIST recognized standards.

Total optical power measured simultaneously

To provide a more complete analysis of an optical source, these WAVEMETER systems simultaneously measure the total power of an optical input signal. The absolute accuracy of this power measurement is ± 0.5 dB and can be reported in units of dBm or watts.

Measures CW, modulated and SONET/SDH optical signals

The advanced signal processing design of the WA-1650 and WA-1150 system is capable of operating with CW, modulated and SONET/SDH optical signals. The WA-1100 system uses a different signal processing technique to provide the fastest update rate of 10 Hz for CW signals only.

Special design for manufacturing environment

Several design considerations specific to the needs of DWDM component manufacturers have been incorporated into these optical wavelength meters. With a built-in HeNe laser wavelength standard, each system's accuracy is maintained over long periods of time without the need for calibration. A rugged benchtop or rack mounted package minimizes any detrimental effects from a typical manufacturing environment.

Features and Performance Summary

		WA-1650	WA-1150	WA-1100
Wavelength				
	Range		700 - 1650 nm (181 - 428 THz)	
	Absolute accuracy [1, 2]	± 0.3 pm	± 1.5 pm	± 1.5 pm
	Display resolution	0.0001 nm	0.001 nm	0.001 nm
	Units		nm (vacuum), GHz	
Power				
	Absolute accuracy		± 0.5 dB (at ± 30 nm from 1310 and 1550 nm)	
	Resolution		± 0.05 dB	
	Linearity		± 0.3 dB	
	Display resolution		0.01 dB	
	Units		dBm, mW, µW	
Optical Input Signal				
	Sensitivity (1200-1600 nm) [3]	-40 dBm (0.1 µW)	-40 dBm (0.1 µW)	-30 dBm (1 µW)
	Sensitivity (700-1650 nm)	-30 dBm (1 µW)	-30 dBm (1 µW)	-20 dBm (10 µW)
	Maximum input level		+10 dBm (10 mW)	
	Maximum safe level		+18 dBm (63 mW)	
Measurement Update				
	Time (rate)	1 s (1 measurement/s)	1 s (1 measurement/s)	0.1 s (10 measurement/s)
Inputs/Outputs				
	Optical input		9/125 µm fiber FC/UPC or FC/APC SC/UPC or SC/APC ST/UPC	
	Instrument interface		GPIB (IEEE-488.2), RS-232, LabVIEW, LabWindows	
Environmental				
	Nominal warm-up time	7 minutes	N/A	N/A
	Temperature		+15° to +30° C (-10° to +70° C storage)	
	Pressure		500 - 900 mm Hg	
	Relative humidity		≤ 90% R.H. at +40° C (no condensation)	
Dimensions and Weight				
	Dimensions (H x W x D)		3.5" x 17.0" x 16.50" (89 mm x 431.8 mm x 419.1 mm)	
	Weight	18 lbs (8.18 kg)	17 lbs (7.65 kg)	16.50 lbs (7.50 kg)
Power Requirements				
	Voltage and frequency		90 to 260 VAC, 50/60 Hz	

1. Absolute wavelength accuracy to 3σ (≥ 99.6%) confidence level and traceable to NIST recognized standard
2. For linewidths < 10GHz for WA-1100
3. Measurement repeatability is reduced when input < -35dBm

Shaded area represents common information

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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