FPM 8220

Fiber Optic Power Meter

Product Features

- ±2.5% accuracy
- <±0.01 dB repeatability
- ±0.006 dB polarization dependent response
- Wavelength range of 800 nm to 1650 nm
- Remote commands compatible with ILX FPM-8210 and Agilent 8163B
- USB and GPIB remote interfaces
- User upgradable firmware
- LabVIEW® drivers

The FPM-8220 Fiber Optic Power Meter combines accurate, repeatable power measurements with low polarization dependence in a simple easy to use instrument for R&D or manufacturing testing of fiber optic components and systems.

Interchangeable fiber optic power measurements heads deliver repeatable results for measurements up to +30 dBm over a wavelength range of 800 nm to 1650 nm. The FMH-8715 and FMH-87107 fiber optic power measurement heads use integrating sphere technology to virtually eliminate sensitivity to laser polarization state or fiber orientation. The FMH-8705 detector provides easy to use measurements with wide dynamic measurement range from -85 dBm to +1.5 dBm. Connectorized, bare fiber, and ferrule only measurements are possible with a variety of adapters. ILX's patented BF-820 Bare Fiber Holder provides easy fiber positioning for repeatable bare fiber measurements.

Designed for automated systems, the FPM-8220 combines precision measurement with USB 2.0 and GPIB IEEE488.2 computer interfaces. For virtual instrument programming, LabVIEW® instrument drivers are available free of charge and can be downloaded from the ILX Lightwave website.

Precision fiber optic power meter

ILX Lightwave®
A Newport Corporation Brand

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PRECISION FIBER OPTIC MEASUREMENT

The FPM-8220 Fiber Optic Power meter and FMH-8700 Series Fiber Optic Measurement Head were designed to provide precise fiber optic measurement in demanding test and measurement applications for fiber optic components. The FPM-8220 Fiber Optic Power Meter incorporates a low noise picoammeter capable of measuring over a wide dynamic range with high stability and repeatability necessary for precise measurement. Designed for production environments, the FPM-8220 Fiber Optic Power Meter incorporates an intuitive front panel and includes GPIB and USB as standard remote interfaces.

By combining the FPM-8220 with one of the FMH-8700 Series Fiber Optic Measurement Heads, the system provides better than ±2.5% accuracy with ±0.01dB repeatability for precise fiber optic component power measurement.

The BF-820 Bare Fiber Holder completely encircles the fiber, prohibiting ambient light from interfering with power measurements.

EASE OF OPERATION

The front panel features a large 7-segment LED display with integrated dot matrix display. The large 7-segment LED display provides easy viewing of measured power across the lab and displays power in dBm, mW, or reference from a previous setting. The dot matrix display can display set wavelength, filter settings, and gain range, or bar graph. The front panel buttons are grouped by function for ease of setup.

STORE AND RECALL INSTRUMENT SETTINGS

For multiple test configurations, the FPM-8220 Fiber Optic Power Meter offers a store and recall feature. The store function allows you to save all the front panel settings for any given instrument configuration to a numbered bin. The recall function allows you to retrieve any of the saved configurations at any time through simple front panel button press or remotely through the GPIB and USB interfaces. An additional recall function allows the FPM-8220 to display the current connected measurement head's information and date of calibration. The store and recall functions save time in instrument re-configuration for different manufacturing runs or R&D experiments.

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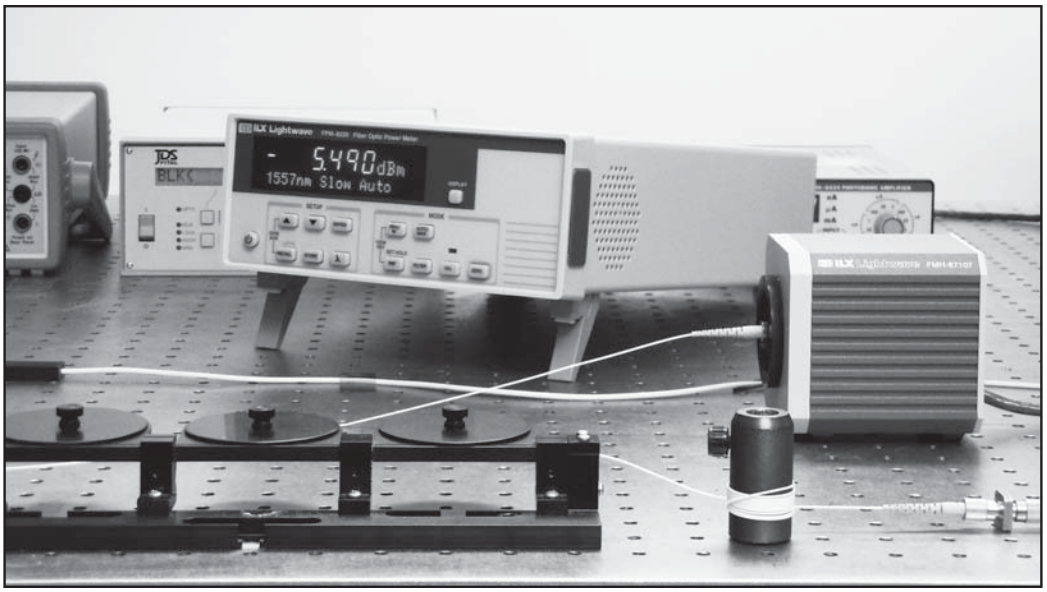

OPTICAL MEASUREMENT HEAD TO FIT YOUR APPLICATION

The FMH-8700 Series Fiber Optic Measurement Heads have the calibration stored in the connector to allow rapid interchanging of measurement heads during different test setups. The measurement heads cover a wavelength range of 800nm to 1650nm with a power range of -85 dBm to +30 dBm.

COMPATIBLE WITH A VARIETY OF FIBER OPTIC CONNECTORS

ILX Lightwave adapters accommodate the most common fiber optic connectors. The change from bare to connectorized fiber is simple. The connector adapters locate the fiber ferrule in exactly the same place as the bare fiber end face, giving comparable results.

The patented BF-820 Bare Fiber Holder is designed to hold and position a common telecom fiber. Inside the BF-820, opposing V-guides facilitate correct fiber positioning. Outside, knurled finger grips enable single-handed maneuvering of the fiber holder.

REMOTE INTERFACE

Remote instrument operation is available on the FPM-8220 through an IEEE488.2 GPIB interface or USB 2.0 interface. All instrument controls and functions are accessible through the interfaces for easy remote programming and control in automated test systems where repeatable and accurate test sequencing, measurements, and data handling are required. The FPM-8220 can replace the FPM-8210 and Agilent 8163A in automated setups by providing compatible with FPM-8210 and related Agilent 8163A remote commands.

PUT OUR EXPERTISE TO WORK

ILX Lightwave is an industry leader in Photonic Test and Measurement. Our products are not only renowned for their reliability, quality, and value; they're backed by industry-leading after sales support. For more information about the FPM-8220 and our complete family of optical power meters, call us today or visit our website at www.ilxlightwave.com.

ORDERING INFORMATION

FPM-8220	Fiber Optic Power Meter
FMH-8705	Fiber Optic Measurement Head, 1.5 dBm, InGaAs
FMH-8715	Fiber Optic Measurement Head, 20 dBm, InGaAs
FMH-87107	Fiber Optic Measurement Head, 30 dBm, InGaAs
BF-820	Bare Fiber Holder (Requires CA-120)
CA-100	FC Adapter
CA-120	Bare Fiber Adapter Ring
CA-150	SC Adapter
CA-20001	LC Adapter
CA-250	Bare Ferrule Adapter
RM-143	Rack Mount Kit, FMH Measurement Head
RM-144	Single Rack Mount Kit
RM-145	Dual Rack Mount Kit

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Specifications

	FMH-8715	FMH-87107	FMH-8705
Wavelength Range:	800 to 1650 nm	800 to 1650 nm	800 to 1650 nm
Power Range:	-70 to +20 dBm	-60 to +30 dBm	-85 to +1.5 dBm
Damage Threshold:[1]	+40 dBm <1 min.	+40 dBm <1 min.	+10 dBm
Accuracy[2,3,4]	±2.5% ±100 pW	±2.5% ±1 nW	±3.5% ±2 pW
Polarization Dependent Response:[5]	±0.006 dB	±0.006 dB	----------
Measurement Repeatability:[6]	<±0.01 dB	<±0.01 dB	----------
Noise:	≤ 100 pW p-p	≤ 1 nW p-p	< 2 pW p-p
Temperature Coefficient:[3]	<0.2% / °C	<0.2% / °C	<0.2% / °C
Linearity:[7]	±0.02 dB	±0.02 dB	±0.02 dB
	-35 to +20 dBm	-35 to +30 dBm	-60 to +1.5 dBm
Connector Port Effect Factor:[8]	1.02 typical	1.02 typical	NA
Connector Port Effect Error:[8]	±1.10%	±1.10%	NA
Beam Displacement Error:[9]	<±0.1% / mm	<±0.1% / mm	<±0.5% / mm
	(±0.025% typical)	(±0.025% typical)	(±0.125% typical)
Beam Divergence Error:[10]	±0.175%	±0.175%	±1.5%
Optical Measurement:	Integrating sphere with detector		Detector
Entrance Aperture:	5 mm	5 mm	3 mm
Numerical Aperture:	<0.4 NA	<0.4 NA	<0.4 NA
Sensor Type:	InGaAs	InGaAs	3.0 mm InGaAs
Connector Types:[11,12]	FC, SC, LC, bare fiber, bare ferrule		
Output Connector	DB-26 High Density, male		

GENERAL

Size:	86 x 86 x 100 mm (3.4" x 3.4" x 3.9")
Weight (8715/87107):	0.98 kg.; 2.15 lbs.
Weight (8705):	0.8 kg.; 1.75 lbs.
Operating Environment:	0°C to 40°C
Storage Environment:	-25°C to 65°C
Compliance:	RoHS, CE

GENERAL (FPM-8220)

Input Connector:	DB-26 high density, female
Power:	90 - 126 VAC, 50/60 Hz
	207 - 253 VAC, 50/60 Hz
GPIB Interface:	IEEE-488.2
USB Interface:	2.0
Compliance:	RoHS, CE
Warm Up:	1 hour to rated specifications
Dimensions:	330mm x 216mm x 90mm
	13" x 8.5" x 3.5"
Weight:	3.24 kg; 7.1 lbs.
Operating Environment:	5°C to 45°C
Storage Environment:	-25°C to 65°C

NOTES

1. Limit 40 dBm exposure to ≤ 1 minute to avoid thermal damage.
2. Reference Conditions: Input power level 10 µW continuous wave (CW), averaging time 1s, ambient temperature 21ºC ±3ºC, humidity 15 - 85% non-condensing, spectral width of source < 14 nm FWHM, user setting of wavelength must correspond to actual source center wavelength ±1 nm. Recommended calibration period 1 year.
3. Accuracy quoted for reference temperature of 21ºC ±3ºC. Assume ±5% accuracy at the limits of the operating temperature range 0ºC < T < 40ºC due to temperature coefficient.
4. Wavelength must not be equal to any water vapor absorption line.
5. Polarization Dependent Response (PDR) is a variation in meter response associated with changes in input polarization state. Measured at constant wavelength (1580 nm) and power (~0.5 dBm)
6. Fiber Input Repeatability measured by the variation in response from removing and replacing a connectorized single mode fiber into the detector head. Does not include bare fiber adapter.
7. Linearity is the variation from an actual measurement to an expected measurement over decades of optical input power. Valid across range limits when measured in auto-range mode.
8. Connector Port Effect is the maximum percent variation in optical integrating sphere transmission influenced by the reflectivity of different fiber optic connectors. This is calculated as follows.

$$CPE = \pm \frac{MAX(SFC, SSC, SLC, SBFA) - MIN(SFC, SSC, SLC, SBFA)}{2 * AVG(SFC, SSC, SLC, SBFA)}$$

Where SFC, SSC, SLC, SBFA are the signal levels measured when using the various fiber optic connectors.

9. Beam Displacement Error is the measurement uncertainty caused by an offset of the fiber connector offset from the center of the input aperture. Typical value includes machine tolerance stack up between center of the aperture and input fiber when fiber adapter is used. Does not include bare fiber adapter.
10. Beam Divergence Error is a calculated uncertainty based on the measured angle sensitivity of the measurement head. Value applies to input beams ≤0.40 A.
11. Adapters available for FC, SC, LC, and Bare Fibers.
12. Bare fibers can be supported with ILX Lightwave BF-820 or Agilent 81000BA bare fiber holders. ILX Lightwave BF-820 fiber holders are designed for fiber diameter 125 µm (250 µm and 900 µm buffer).

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