Automatic Extinction Ratio Meter

400-2500nm

DATASHEET

Return to the Webpage

The PERM is a benchtop polarization extinction ratio meter designed for precise measurement of polarization extinction ratio (PER) and polarization angle in polarization-maintaining (PM) fibers, making it ideal for testing PM components and connectors. It supports wavelength ranges from 400 nm to 2500 nm and features a front-panel connection port compatible with FC/PC (narrow- and wide-key), FC/APC (narrow- and wide-key), LC/PC, and SC/PC connectors, with adaptors. Additionally, it has an adaptor option for measuring bare fibers. A push-button operation initiates measurements, displaying PER and misalignment angle, while USB connection enables remote operation and data recording via a user-friendly GUI.

The PERM operates using a rotating polarizer in front of a photodiode detector. The photodiode measures input light intensity as a function of the polarization axis alignment between the rotating polarizer and the input light. A peak optical power is detected when the rotating polarizer aligns with the input polarization axis, while a minimum power is detected when the axes are perpendicular. The ratio of these two values determines the polarization extinction ratio. Unpolarized or circularly polarized light results in a low extinction ratio near 1, indicating minimal linear polarization contrast.

Features

- Accurate
- 400-2500nm

Applications

- Photonics Research
- Development Applications
- Manufacturing
- Quality Control
- Quality Assurance

Specifications

Parameter		Min	Typical	Max	Unit
Wavelength Range	PERM5	900	1550	1600	nm
	PERM7	400	700	900	
	PERM2	1600	2000	2500	
Maximum Input Power @Peak Wavelength	PERM5		13		dBm
	PERM7		13		
	PERM2		8		
PER Range @Peak Wavelength	PERM5 PERM7	0 to 40 dB (for +13 dBm to -12 dBm) 0 to 30 dB (for -12 dBm to -27 dBm) 0 to 20 dB (for -27 dBm to -37 dBm)			
	PERM2	0 to 40 dB (for +8 dBm to -12 dBm) 0 to 30 dB (for -12 dBm to -27 dBm) 0 to 20 dB (for -27 dBm to -37 dBm)			
Polarization Angular Resolution		0.1° (Display), 0.01° (USB)			
PER Resolution		0.1 dB (Display), 0.01 dB (USB)			
PER Accuracy			<0.5		dB
Accuracy of Polarization Angle			<0.5		°
Measuring Speed			approx. 10		Hz
Connector Type		M12 x 0.5 Thread for Exchangeable Adapters: Wide-Key FC/PC, Narrow-Key FC/PC, Wide-Key FC/APC, Narrow-Key FC/APC, LC/PC, SC/PC			
Interface		USB Type B			
AC Input		Universal, 110 V to 220 V, 50/60 Hz			
Power On Warm Up Time		1 min			
Operating Temperature		5		40	°C
Storage Temperature		-20		40	°C
Relative Humidity		Max 80% up to 31°C, Decreasing to 50% at 40°C			

* All technical data are valid at 23 ± 5°C and 45 ± 15% rel. humidity (non condensing)

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Rev 01/30/25

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Dimensions

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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DATASHEET

Operation Instruction/Manual

- **Selecting a Light Source** For accurate high-PER device testing, a polarization-maintaining (PM) light source with stable and high PER is essential. Many PM fiber laser sources experience PER drift over time, affecting measurement reliability. Agiltron's highly stable PM laser sources provide PER >30 dB, ensuring consistent and precise measurements.
- **Connecting the Light Source to the PERM** The PERM input connector is compatible with FC/PC and FC/APC. For other connector types, use the included adaptors to establish a proper connection.
- **Initiating PER Measurement** Press the Start button to begin measurement. The PER value and angle misalignment relative to the slow axis will be displayed.
- **Measuring a Bare PM Fiber** Mount the Bare Fiber Adaptor and insert the fiber into the PERM. Note: The polarization angle will not be accurate in this configuration.

Accessories

Bare Fiber Adaptor

$380

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DATASHEET

Ordering Information (Part Number)

	☐	AA	1	1	☐	1	☐	☐
Prefix	**Wavelength**	**Type**		**Configuration**	**Bare Fiber Adaptor**	**Connector[1]**	**Converter**	**Adaptor**
PERM-	900-1650 = 5 1600-2500 = 2 400-900 = 7 357-403 = 3 220-350 =2 Special = 0				None = 0 Yes = 1	FC/PC/APC = 1 Special = 0	LC/PC = 4 LC/APC = 5 SC/PC = 6	None = N

* Module contains driver and power supply.

[1]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

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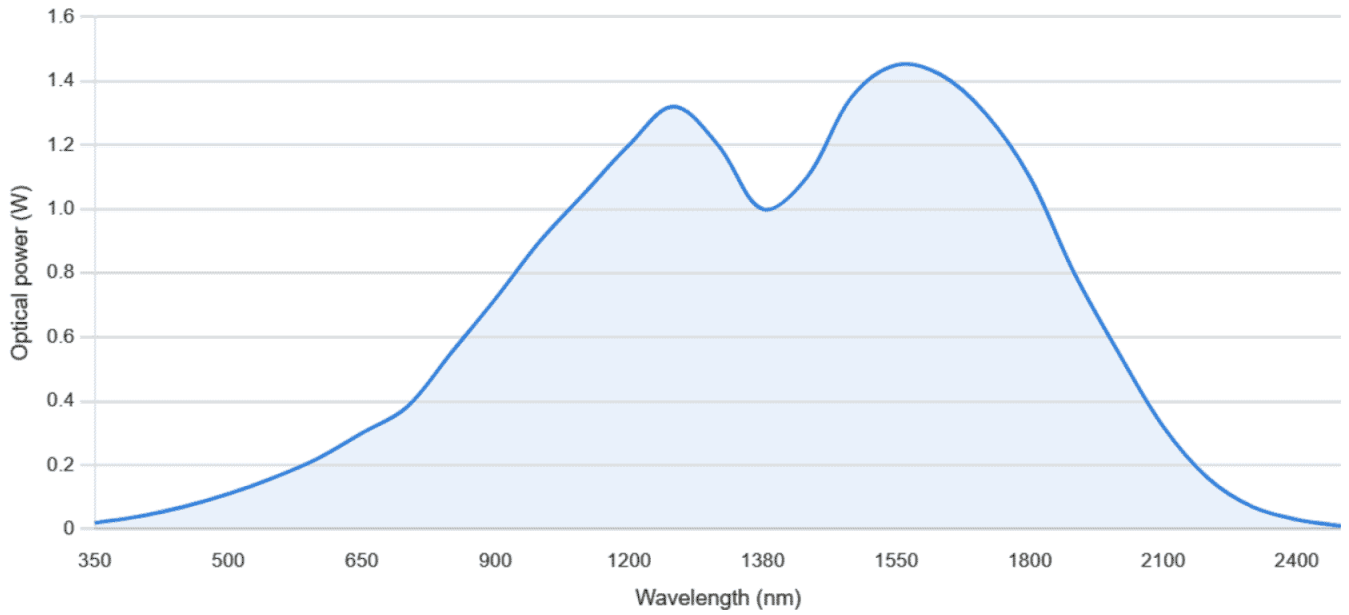
Regular Single Mode / Polarization Maintaining Fiber Optical Power Handing vs Wavelength



Single mode fiber optical power is limited by nonlinear effects in addition to absorption that increase loss and generate heat. The curve shows the approximate safe CW power envelope for standard single-mode fiber. Actual limits depend on fiber design, core size, length, and laser characteristics. Specialty fibers can significantly increase the power limit.

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