Polarization Dependent Loss Multimeter

20 ms measurement speed, 450-2400 nm, High PDL accuracy

DATASHEET

Return to the Webpage

The PDLM Polarization Dependent Loss Multimeter is based on three electro-optical crystal and an advanced maximum and minimum search method to provide Accurate PDL and DOP measurement in less than 20ms. The PDLM features fast measurement, large measurement dynamic range, bright display, and an analog output port for easy integration in automated measurement stations. The PDLM provide high PDL measurement accuracy of less than 0.05dB over both large and small value. covers a wide wavelength range from 1260 to 1620 nm without wavelength calibration. Integration with a laser source is an option, especially to include a tunable c-band laser for wavelength dependent loss measurement. PDLM comes with USB, Ethernet, GPIB and RS-232 interfaces and is ideal for fast, accurate characterization of the wavelength dependence of passive devices, especially silicon photonic devices, DWDM and fiber sensor components, in manufacturing environments as well as in laboratories. Multiple channel system in 1U rack package with single interface of Ethernet or RS232 is available.

Features

- 20 ms measurement speed
- 450 to 2500nm
- Tunable laser source integration
- Wide wavelength range
- High PDL accuracy
- Analog PDL output
- Bright LED display
- Power meter function

Applications

- PDL vs. wavelength measurement
- DWDM device characterization
- Fiber sensor component characterization

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength Range	1260		1620	nm
Resolution		0.01		dB
PDL Accuracy [1], [2], [3]		± (0.01 + 5% of PDL)		dB
PDL Repeatability [1]		± (0.005 + 2% of PDL)		dB
PDL Dynamic Range [4]	0		45	dB
IL Accuracy [1], [5]		± (0.01 + 5% of IL)		dB
IL Repeatability [1]		± (0.005 dB + 2% of IL)		dB
IL Dynamic Range [4]	0		45	dB
Optical Power Range (at DUT output port)	-40		+6	dBm
Optical Power Accuracy		±0.25		dB
Wavelength Calibration for Power Measurement	1260 to 1360 and 1440 to 1620			nm
Measurement Speed (for input > -30 dBm)		30 ms/measurement		dB
Operating Temperature	0		50	°C
Storage Temperature	-20		70	°C
Front Panel Display	OLED graphic display			
Optical Connector Type	Light source and DUT input: APC DUT output: Free space adapter			
Analog Output	0 to 4V PDL monitor voltage (0 to 3.5V linear with PDL, 4V indicates power low) User-configurable PDL range			
Power Supply	100 – 240 VAC, 50 – 60 Hz			
Communication Interfaces	USB, Ethernet, RS-232, and GPIB			
Dimensions	2U, 19” half rack width 14" (L) x 8.5" (W) x 3.5" (H)			

Notes:

[1]. For 10 sample average.
[2]. At 23 ± 5°C.
[3]. Accurate PDL measurement also depends on test setup. Optimize your test environment with suggestions from General Photonics’ PDL measurement application note.
[4]. For input power ≥0 dBm.
[5]. In power meter measurement mode with user-defined reference

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:

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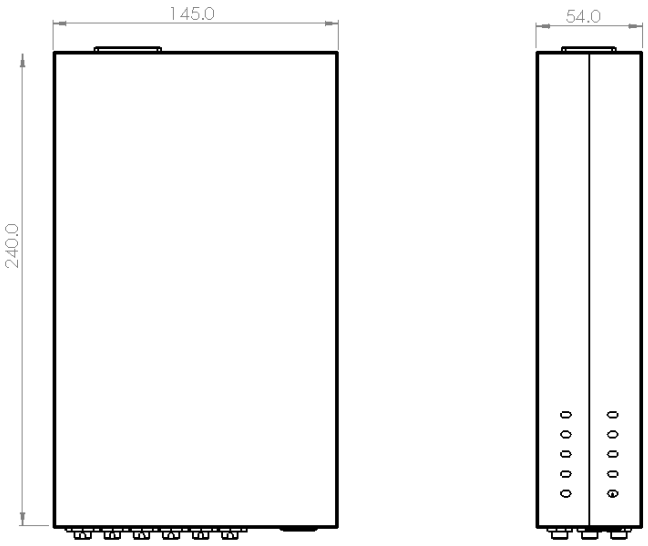
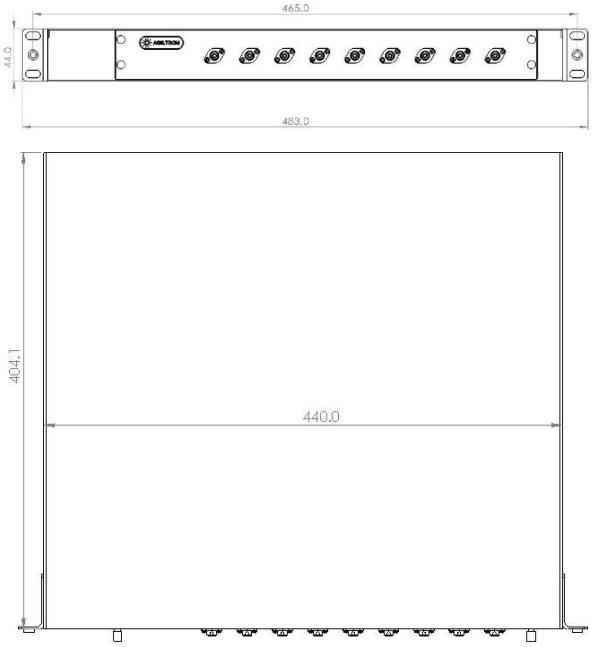
Mechanical Dimensions (Unit: mm)

Benchtop



1U Rack Mount



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

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Ordering Information (Part Number)

	☐	☐☐	☐	☐	☐	☐☐	☐
Prefix	**Laser Source**	**Channel**	**Wavelength**	**Package**	**Interface**	**Fiber Type**	**Connector** [1]
PDLM-	None =N Tunable C-band = T 1550nm =5 1310nm= 3 1060nm = 1 780nm =7 850nm =8 450nm =4 550nm =5 Special =0	Single = A1 Dual = A2 3 = A3 4 = A4 5 = A5 6 = A 5 10 = 10 12 = 12	1260-1650 = 1 1060 = 1 1310 = 3 2000 = 2 650 = 6 780 = 7 850 = 8 350 = B 450 = C 520 = D Special = 0	Benchtop =1 1URack =2	RS232 =1 USB =2 Ethernet =3 GPIB = 4	SM28 = 01 ***Select below***	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 6 LC/PC = 7 Special = 0 LC/APC =8

[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.

Fiber Type Selection Table:

01	**SMF-28**
02	
03	
04	**SM450**
05	**SM1950**
06	**SM600**
07	**780HP**
08	**SM800**
09	**Hi980**
10	**Hi1060**
11	**SM400**
12	**Hi980**
13	

Application Notes

Fiber Core Alignment
Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness
Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power
Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

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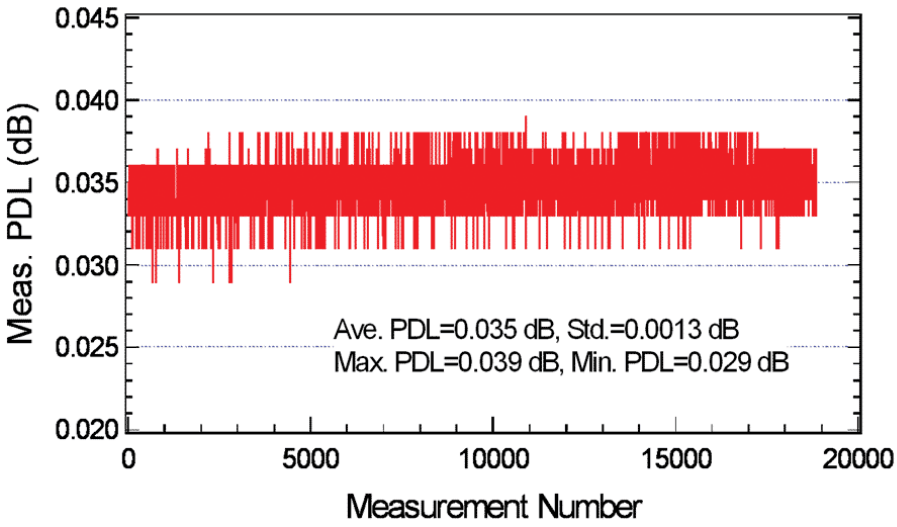
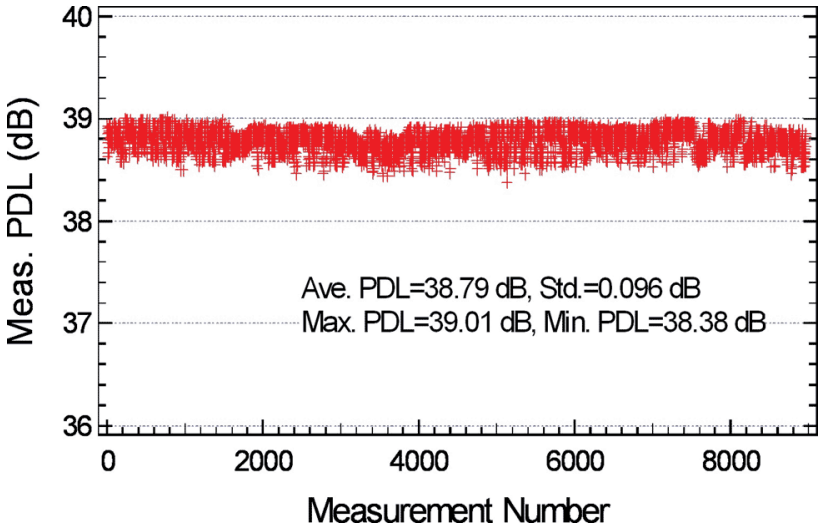
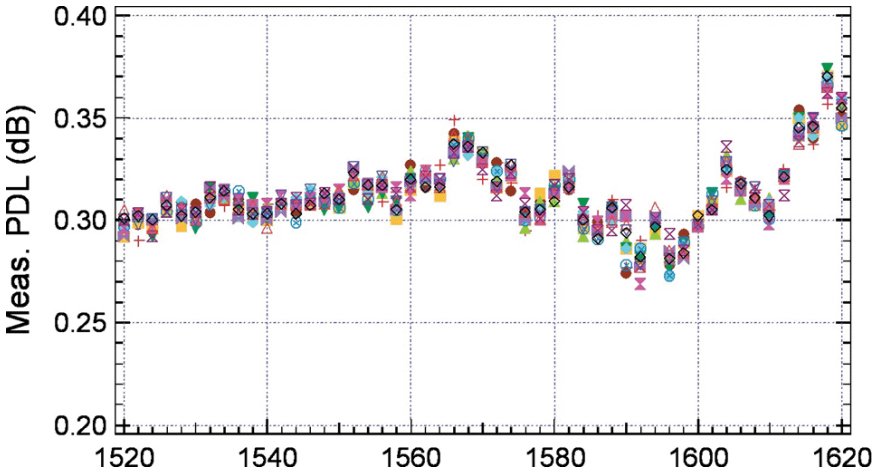
Typical Performance Data:



Measurement of a low PDL sample: APC Connector

Measurement of high PDL sample: Polarizer





Wavelength scan and multiple (12) scan repeatability

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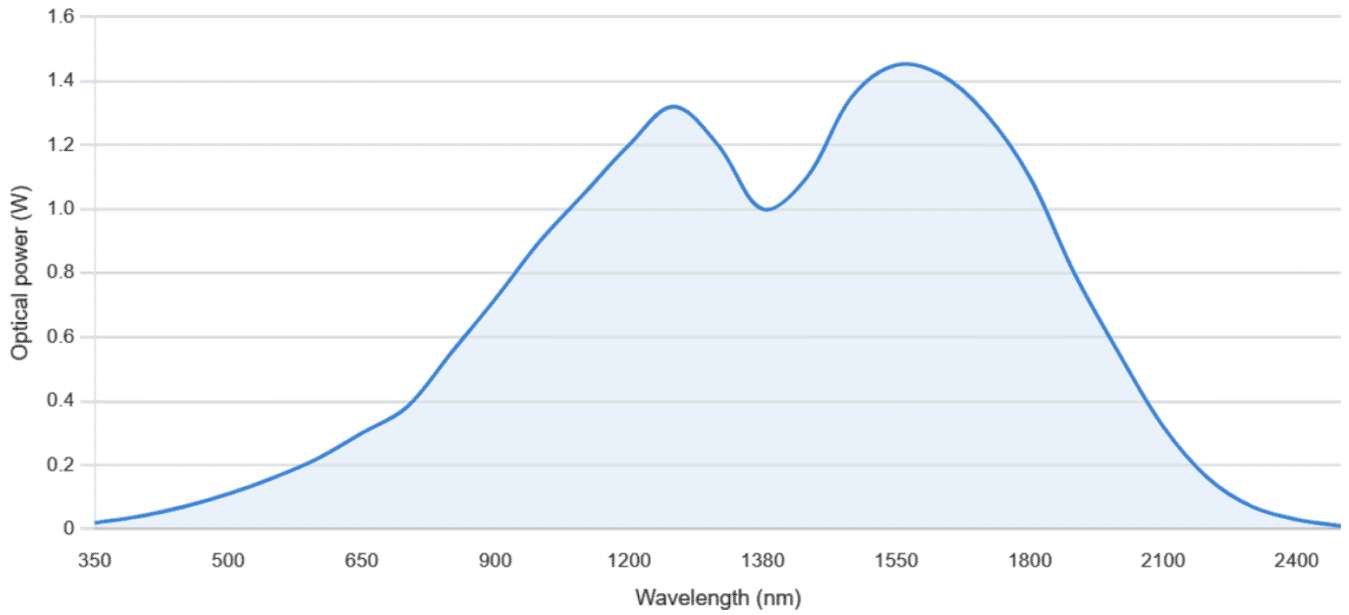
Regular Single Mode / Polarization Maintaining Fiber Optical Power Handing vs Wavelength



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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