

# POLARIZATION MANAGEMENT MODULES

## Dynamic Polarization Scrambler/Controller – PolaRITE™ II



General Photonics' all-fiber dynamic polarization controller (patented) is specially designed for original equipment manufacturers (OEM) for integration into their fiber optic network modules and test equipment. The all fiber construction practically eliminates insertion loss and back reflection. The device can be used as a fast electronic-driven polarization controller to convert any input polarization to any desired output polarization, or as a polarization scrambler to randomize the output polarization state. Low insertion loss, low back reflection, low cost, compact size, and fast response time are just a few of the desirable features of this device.

### Specifications:

Intrinsic Insertion Loss	0.05 dB
Return Loss	> 65 dB
Wavelength	1260 -1650 nm standard, others specify
Rise and Fall Time	30 $\mu$ s max.
3dB Bandwidth	20 kHz min.
Scrambling Frequencies (at 23 °C) <sup>1</sup>	60, 100, 130, 160 kHz (Consult data sheet for the exact scrambling frequencies of each unit)
$V_{\pi}$ at DC (at 23 °C)	35 volts max. @ 1550nm
Retardation/Actuator	4 $\pi$ min.
$V_{\pi}$ at Scrambling Frequencies <sup>1</sup> (at 23°C and 1550nm)	7 volts max. at 60 kHz 6 volts max at 100 kHz 3.6 volts max at 130 kHz 12 volts max at 160 kHz
Max. Activation Loss	0.01 dB (P grade), 0.05 dB (A grade) with 0-150VDC applied to all axes
Polarization Mode Dispersion	0.05 ps
Operating Temperature	-25 ~ 80 °C
Storage Temperature	-40 ~ 85 °C
Fiber Pigtail	9/125 $\mu$ m single mode fiber standard, others specify
Electrical Interface	8 pin (25 mil. square) with 100 mil. pitch connector
Dimensions	3.12" $\times$ 0.91" $\times$ 0.75" (4 axis - controller) 3.93" $\times$ 0.91" $\times$ 0.88" (4 axis - scrambler)
Maximum Applied Voltage	150 volts

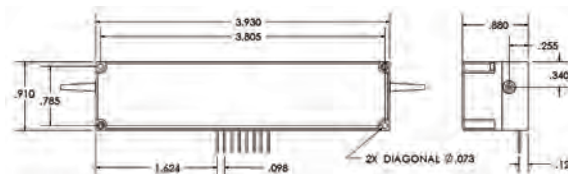
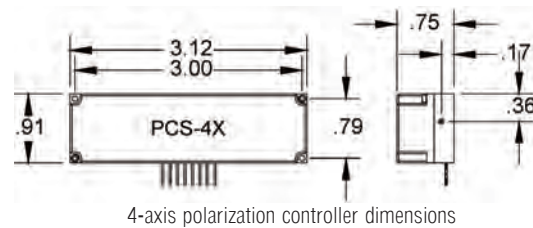
Note: Values are referenced without connectors  
1. scrambler only

### Features:

- No intrinsic insertion loss
- No intrinsic back reflection
- Works with any wavelength
- Compatible with any single mode optic fiber
- Compact, ideal for integration in modules
- Fast response time

Tech Info: pp. 93, 98  
App note: p. 128  
FAQ: p. 167

### Dimensions:

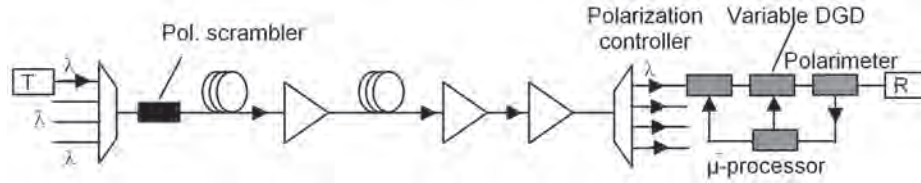


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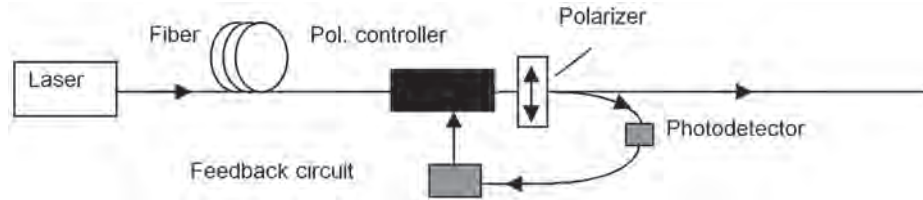
## Dynamic Polarization Scrambler/Controller – PolaRITE™ II

Applications:

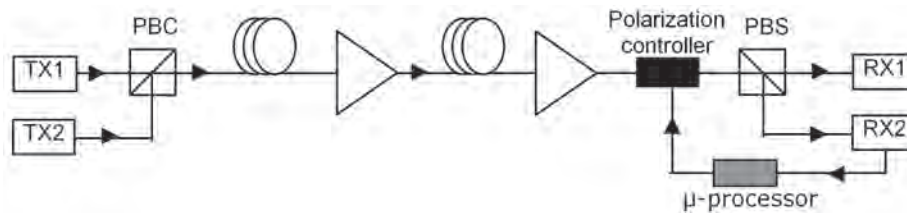
- Polarization Mode Dispersion (PMD) compensation



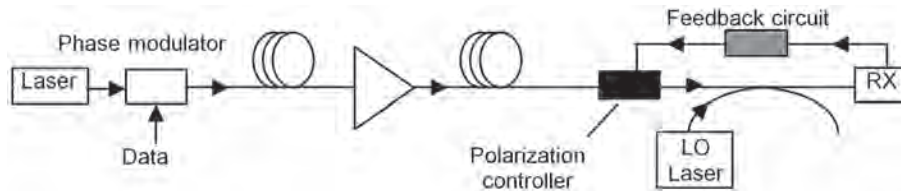
- Polarization stabilization



- Polarization demultiplexing



- Coherent communications



- PMD emulation
- PDL (polarization dependent loss) measurement
- PDL elimination in optical instruments, such as optical spectrum analyzers
- Automatic polarization stabilization for E/O modulator and interferometers
- Reduction of EDFA polarization dependent gain
- Improvement of signal-to-noise ratio in long-haul transmission systems
- Output stabilization in fiber laser systems



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Typical Performance Data:

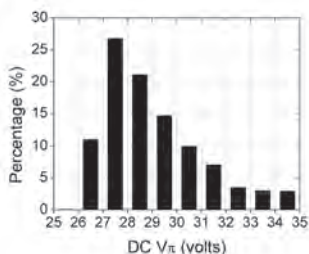


Figure 1. Histogram of DC V<sub>π</sub>. In most cases, DC V<sub>π</sub> is less than 30 volts

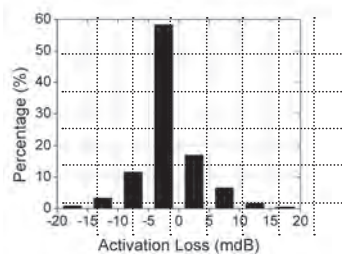


Figure 2. Histogram of activation loss. In most cases, activation loss is less than 0.01 dB.

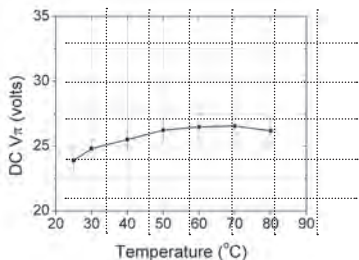


Figure 3. DC V<sub>π</sub> as function of operating temperature.

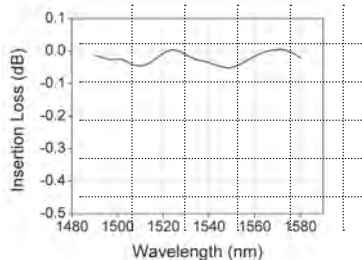
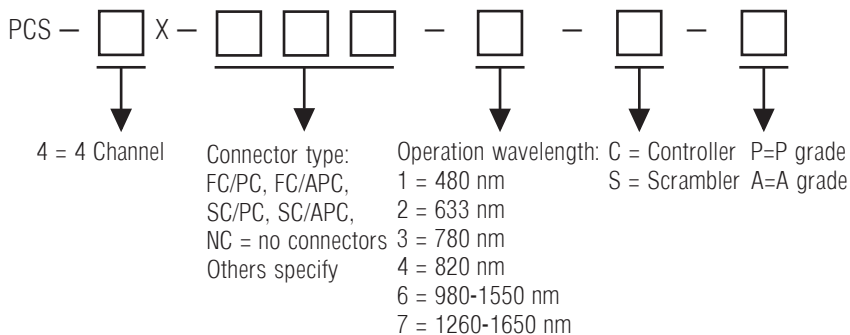


Figure 4. Insertion loss vs wavelength

Ordering Information:



Drivers:

- PCD-001 p. 85
- MPD-001 p. 87

Notes: 1260-1650nm and 980-1550 nm are the standard wavelength ranges for this product. Please contact General Photonics for information on other wavelength options. Please specify P grade or A grade if activation loss is important for your application.

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