



# POL

## 1200 SERIES HIGH-SPEED POLARIZATION CONTROLLER

ADVANCED SPECIFICATION SHEET

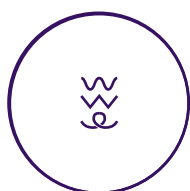
AVAILABLE IN PXI

[quantifiphotonics.com](https://quantifiphotonics.com)

# The 1200 Series Polarization Controller delivers extremely high speed automated polarization control for polarization dependent testing procedures in high-volume manufacturing environments.

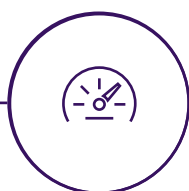
It will quickly and accurately allow the user to measure critical polarization characteristics of components both in wafer-level testing and component testing. With three operating modes, it is a versatile instrument, capable of supporting the product lifecycle from R&D, to validation and manufacturing.

As a compact, single-slot PXIe module, it can be integrated with our range of optical and electrical test modules to build flexible, scalable and high-density test systems.



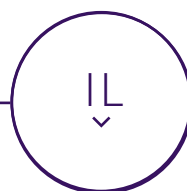
## Three operating modes

A flexible and capable instrument with three modes of operation: Scan and Optimize, Manual and Depolarize.



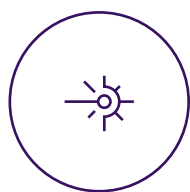
## High-speed operation

Extremely fast signal optimization for polarization dependent testing.



## Low insertion loss

Design ensures exceptionally low insertion loss.



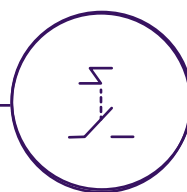
## High optical power handling

The unit is capable of handling up to 500 mW of optical power (+25 dBm).



## Full software control

No need to adjust paddles or tension screws, use SCPI or gRPC programming commands, LabVIEW, or our intuitive browser-based GUI.



## Comprehensive triggering capabilities

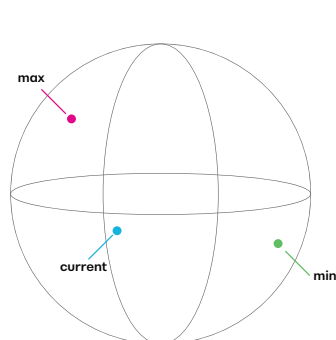
Control the behavior of the instrument in PXI with input triggers. The instrument also provides output triggers that can be used to synchronize instruments such as our optical power meters or tunable lasers.

## TARGET APPLICATIONS

- Silicon photonics device testing
- Polarization dependent testing
- Versatile polarization control instrument

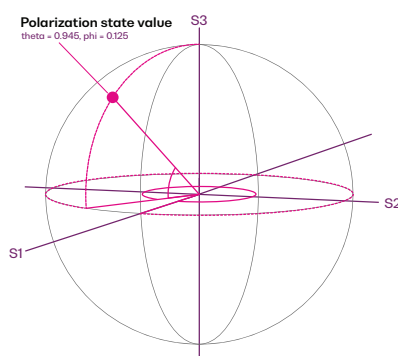
Unlike manual polarization controllers, the 1200 Series Polarization Controller utilizes two digitally-controlled electro-optic crystals to position the polarization state at any point on the Poincaré sphere.

### Three modes of operation



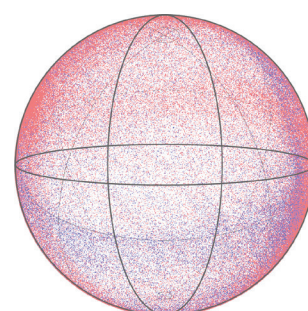
#### 1. Scan and optimize:

The POL-1201 automatically scans, adjusts and optimizes the polarization based on a feedback signal to minimize or maximize loss due to polarization in under 10ms.



#### 2. Manual:

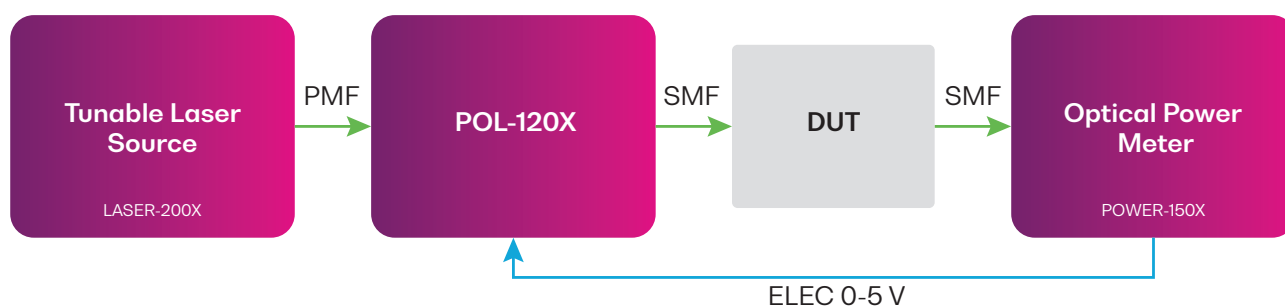
Set the desired polarization of your signal by manually adjusting the 2 control angles.



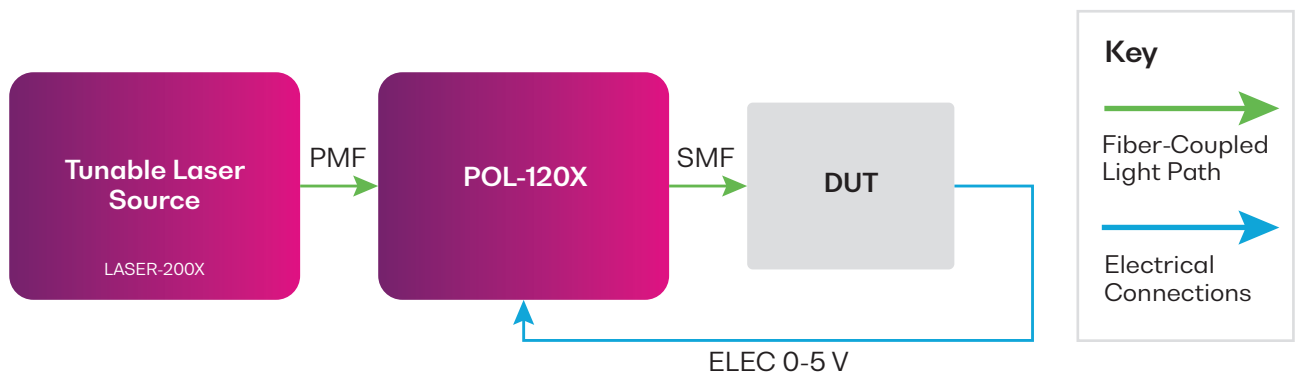
#### 3. Depolarize (scramble):

Rapidly depolarize your signal. In this mode, the state of polarization is varied rapidly to generate a distribution approaching random coverage of the entire Poincaré sphere.

### EXAMPLE TEST SETUPS FOR SCAN AND OPTIMIZE MODE



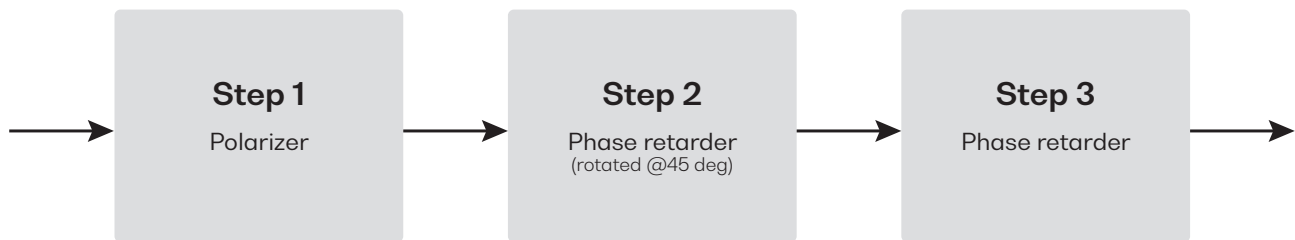
**Figure 1:** In this setup, a Quantifi Photonics Laser-200X swept tunable laser (with PM output) and Power-150X optical power meter with analogue output are used to run the Scan & Optimize mode on the DUT. The Power-150X passes an electrical signal to the POL-1201 via the front panel's RF input.



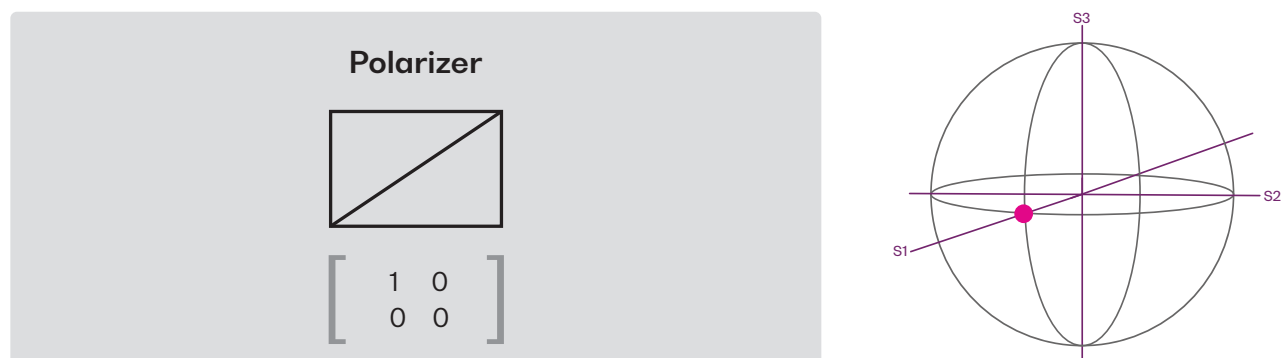
**Figure 2:** In this setup, the user's DUT incorporates a photo-detector and can pass the electrical signal back to the POL-1201's Trigger Input without the need for an additional optical power meter.

## HOW IT WORKS

The Pol-120x sets the state of polarization (SOP) via a three-step process.



**Step 1:** Polarization aligned to the slow axis, S1.

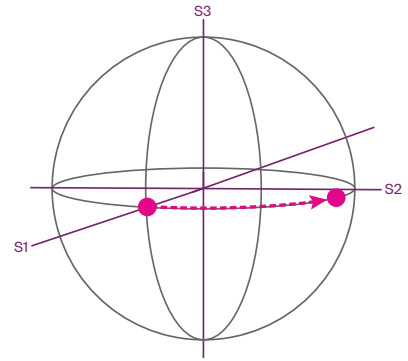


**Step 2:** Theta ( $\Theta$ ) rotates the SOP along the azimuth from S1 position.

### Phase retarder

Rotated @45 deg

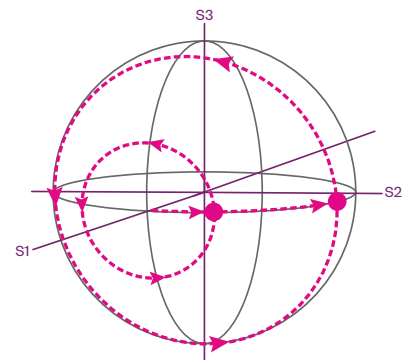
$$\begin{bmatrix} \cos(\pi/4) & -\sin(\pi/4) \\ \sin(\pi/4) & \cos(\pi/4) \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & \exp(i\Theta) \end{bmatrix} \begin{bmatrix} \cos(\pi/4) & \sin(\pi/4) \\ -\sin(\pi/4) & \cos(\pi/4) \end{bmatrix}$$



**Step 3:** Phi ( $\Phi$ ) rotates the SOP around the S1 axis to reach the desired position.

### Phase retarder

$$\begin{bmatrix} 1 & 0 \\ 0 & \exp(i\Phi) \end{bmatrix}$$



## USER EXPERIENCE

## Simple, intuitive control with COHESIONUI™

COHESIONUI makes it simple to control our PXI instruments from any device running a modern web browser. Its cutting-edge design offers a sleek modern interface, cross device compatibility, customizable views and remote network access.



## CHOOSE YOUR FORM FACTOR

### PXIe – MODULAR

Our expanding range of PXIe optical test solutions are used by customers in mixed-signal test and measurement systems, reducing complexity, lowering the cost of test and accelerating time to market.

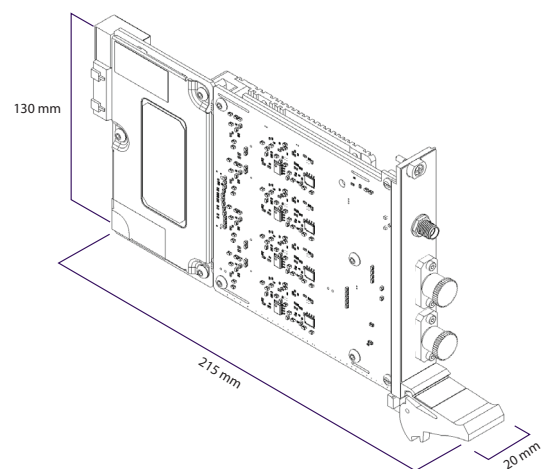
- Multi vendor, open standard with over 2500 PXI modules available
- Advanced timing and synchronization capabilities across instruments
- Low latency, high performance processing and fast data throughput
- Design and build scalable, high channel count systems
- Small footprint and lower power consumption



## POL TECHNICAL SPECIFICATIONS



POL-1201-1-FC-PXIe



## POL TECHNICAL SPECIFICATIONS

General Specifications	PXI
Bus connection	PXIe
Optical connectors	FC/PC, SC/PC, FC/APC and SC/APC
Slot count	1
Dimensions (HxWxD)	130 x 20 x 215 mm   5.1 x 0.8 x 8.5 inches
Weight	~ 1 kg   ~2.2 lbs
Storage temperature range	-40 °C to 70 °C   -40 °F to 158 °F
Operating temperature range	5 °C to 45 °C   41 °F to 113 °F

Power Specifications	PXI
AC input voltage range	Please refer to the latest PXI Express Hardware Specifications published by the PXI Systems Alliance.
AC input current	
AC frequency range	
DC output voltage	
DC output current max	
Dimensions (LxWxH)	

Model Number	1201	1202
Number of channels	1	1
Fiber type	PMF Input, SMF output	PMF Input, SMF output
Operating wavelengths	1260 - 1360 nm	1530 - 1565 nm
Damage power	+ 25 dBm	+ 25 dBm
Insertion loss <sup>2</sup>	< 1.3 dB	< 1.3 dB
Return loss <sup>2</sup>	> 50 dB	> 50 dB
PDL <sup>2</sup>	TBD	TBD
PMD	TBD	TBD
Scramble modes	Sinusoid, triangular, random, manual	Sinusoid, triangular, random, manual
Max frequency of each waveplate	100 kHz	100 kHz
SOP accuracy	± 0.5 degrees	± 0.5 degrees
SOP repeatability	± 0.1 degrees	± 0.1 degrees
RF input impedance	50 and 1M ohms (SW configurable)	50 and 1M ohms (SW configurable)
RF voltage input range	0 to 5 V	0 to 5 V
RF damage threshold	< 0 and > 6 V	< 0 and > 6 V
RF input frequency response	300 kHz	300 kHz

### Notes

- Specifications are valid at 23 °C ± 3 °C.
- Excluding connectors.

## ORDERING INFORMATION



## WARRANTY INFORMATION

This product comes with a standard 1 year warranty.



## EXTENDED WARRANTIES AND CALIBRATION PLANS

With an **extended warranty and calibration plan** you'll spend more time focused on your priorities and less time worrying about maintenance.

Your choice: add a **3 or 5 year extended warranty** when you buy.



### Guarantee performance

Ensure your equipment is operating at the best it can be for reliable and accurate results.

### Lower cost of ownership

Lock in savings and maximise your testing budget with a lower base cost of ownership.

### Peace of mind

Spend less time worrying about maintenance and more on generating results.

## CALIBRATION PLANS FOR ADDITIONAL DISCOUNTS

Order a **calibration plan** when purchasing your Quantifi Photonics instruments and get additional discounts.

### 10% Discount

On calibrations ordered at the time of purchase.

### 25% Discount

Add on an extended warranty and receive a 25% discount on calibrations.

Over time and with regular use, all optical parts and connectors require re-calibration and maintenance to guarantee accurate and reliable performance. We recommend Quantifi Photonics optical instruments are re-calibrated every 12 months. With an instrument calibration performed by Quantifi Photonics technicians you receive:

- Comprehensive calibration to factory specifications
- End-to-end inspection to ensure all instrument functions are working and connectors are clean
- Firmware, software and documentation updates
- Certificate of calibration which includes detailed test results

## How to do I secure my extended warranty or calibration plan?

Contact your Quantifi Photonics sales representative or email [sales@quantifiphotonics.com](mailto:sales@quantifiphotonics.com)

Extended warranties and calibration plans must be ordered at the time of purchase and are available only for Quantifi Photonics' products. The 25% calibration discount only applies to calibrations while the product is covered by the extended warranty period.

Our portfolio of optical & electro-optical test modules is rapidly expanding to meet a wide range of customer requirements and applications.

#### Tunable Laser Sources

Versatile telecom laser sources with full tunability across C or L bands. Narrow 100 kHz linewidth, up to 16.5 dBm of power, optional whisper mode to disable frequency dither.



#### Fixed Wavelength Laser Sources

Highly customizable laser platform. Select required wavelength, power and fiber type for a customized solution.



#### Swept, Tunable Continuous Wave Laser

Swept, tunable continuous wave (CW) laser source with 0.01 dB power stability and 400 nm/s high-speed scan rate for R&D and production testing.



#### Superluminescent Diode Broadband Light Source

Super-luminescent LED light source with high output power, large bandwidth and low spectral ripple and various wavelengths.



#### Optical-to-Electrical Converter

High bandwidth, broadband O-to-E converter. Available in a range of configurations; choose from 1 or 2 channels, AC or DC coupling and various conversion gain and operating wavelength ranges.



#### Variable Optical Attenuator (VOA)

Fast attenuation speed with low insertion loss and built-in power monitoring. Operates in fixed attenuation or constant output power modes. Models support SMF, MMF and PMF connector types.



#### Polarization Controller & Scrambler

High-speed automated polarization control with broad wavelength coverage from 1260nm to 1650nm, low insertion loss and back reflection. Full remote control via intuitive GUI, LabVIEW or SCPI.



#### Optical Power Meters

Fast terminating or inline monitoring of optical signal power from -60 to +10 dBm across 750 - 1700 nm wavelengths. Model with logarithmic analog output for applications such as silicon photonics fiber alignment.



#### Bit Error Rate Tester (BERT)

4 or 8-channel Pulse Pattern Generator and Error Detector at rates up to 29 Gbps for the design, characterization and production of optical transceivers and opto-electrical components.



#### Optical Spectrum Analyzer (OSA)

Cost-effective, spectral measurement in a compact module with built-in analysis for: SMSR, OSNR & spectral width. Targeted wavelengths for specific applications in O band, C band & L band.



#### Passive Component Integration

Integrate passive optical components of your choice such as WDM couplers, splitters, band-pass filters, PM beamsplitters and circulators. Models support SMF, MMF and PMF.



#### Passive Component Storage

Protect and store your own passive fiber optic components such as splitters, connector adaptor patchcords, WDM couplers, and isolators in one handy module.



#### Photonic Doppler Velocimeter (PDV)

Purpose-built module for Photonic Doppler Velocimetry (PDV). A circulator, two VOAs and a passive coupler all built into one compact module.



#### Optical Switch

Proven reliability and fast switching time. Wide variety of switch configurations: 1x4, 1x16, 16x16 and more. Models support SMF, MMF and PMF.



PXI – MODULAR SYSTEM

MATRIQ – COMPACT BENCHTOP

See our website for more details  
[quantifotonics.com/products](https://quantifotonics.com/products)

# Test. Measure. Solve.<sup>TM</sup>

Quantifi Photonics is transforming the world of photonics test and measurement. Our portfolio of optical and electrical test instruments is rapidly expanding to meet the needs of engineers and scientists around the globe. From enabling ground-breaking experiments to driving highly efficient production testing, you'll find us working with customers to solve complex problems with experience and innovation.

**To find out more, get in touch with us today.**

<b>General Enquiries</b>	<a href="mailto:sales@quantifiphotonics.com">sales@quantifiphotonics.com</a>
<b>Technical Support</b>	<a href="mailto:support@quantifiphotonics.com">support@quantifiphotonics.com</a>
<b>Phone - NZ</b>	+64 9 478 4849
<b>Phone - USA</b>	+1-800-803-8872

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