QUANTIFI PHOTONICS®
A Teradyne Company

POL

1200 SERIES
HIGH-SPEED POLARIZATION CONTROLLER

ADVANCED SPECIFICATION SHEET

AVAILABLE IN PXI

quantifiphotonics.com

FEATURES

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, CohesionUI.

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.

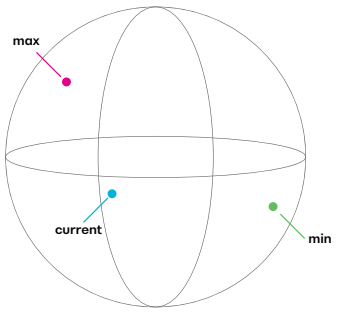
TARGET APPLICATIONS

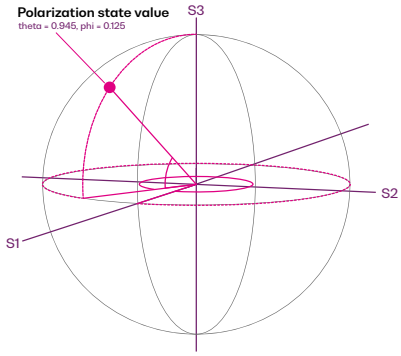
- Silicon photonics device testing
- Polarization dependent testing
- Versatile polarization control instrument

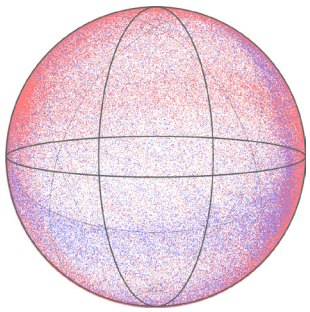
CONTROLLING THE POLARIZATION

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:

Automatically scan, adjust and optimize the polarization based on a feedback signal to minimize or maximize loss due to polarization in under 10 ms.

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

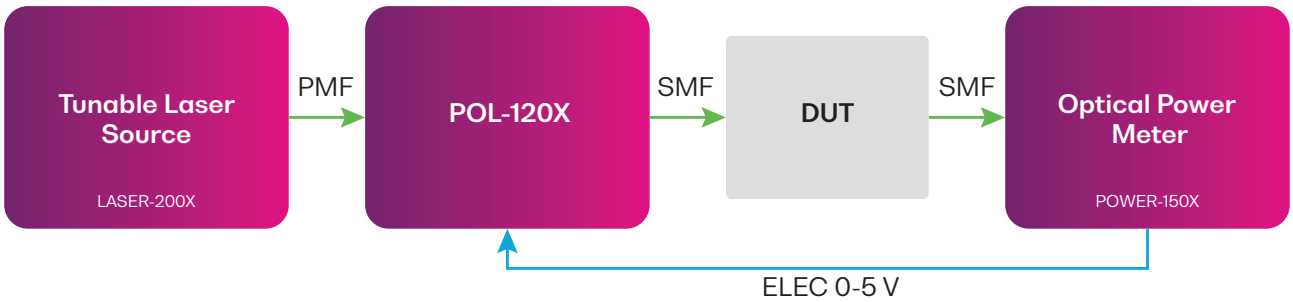


Figure 1: In this setup, a Quantifi Photonics Laser-200X swept tunable laser (with PM output) and Power-150X optical power meter with analogue output are used to run the Scan & Optimize mode on the DUT. The Power-150X passes an electrical signal to the POL-1201 via the front panel's RF input.

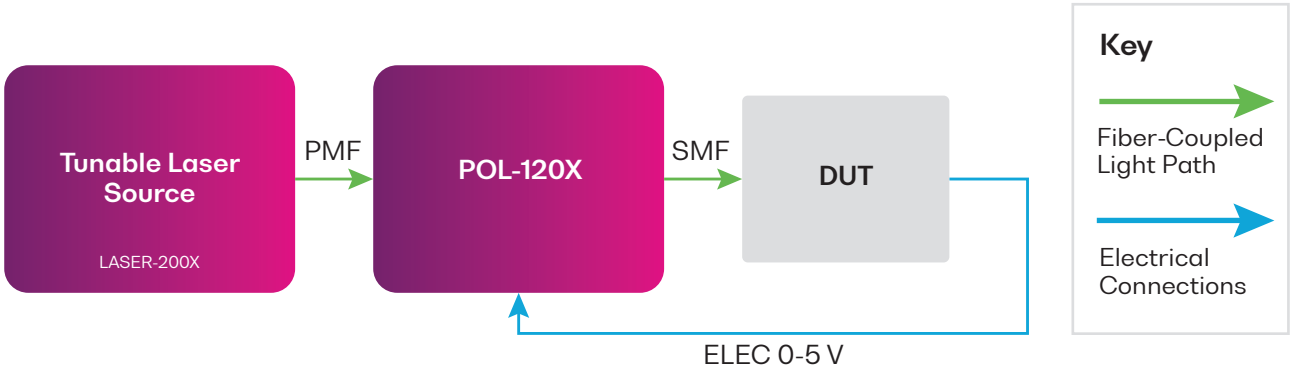
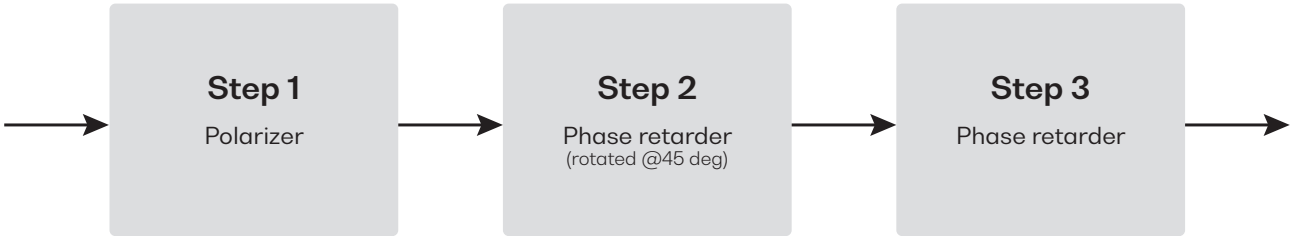


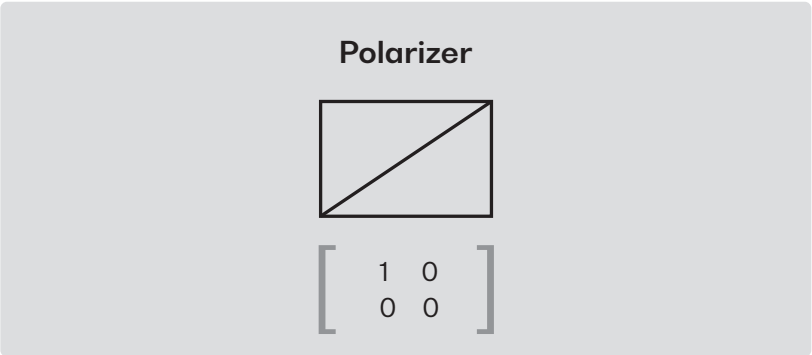
Figure 2: In this setup, the user's DUT incorporates a photo-detector and can pass the electrical signal back to the POL-1201's Trigger Input without the need for an additional optical power meter.

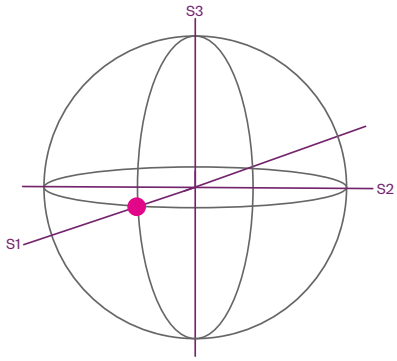
HOW IT WORKS

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



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



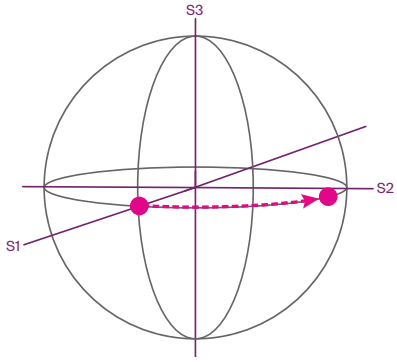


Step 2: Theta (Θ) rotates the SOP along the azimuth from S1 position.

Phase retarder

Rotated @45 deg

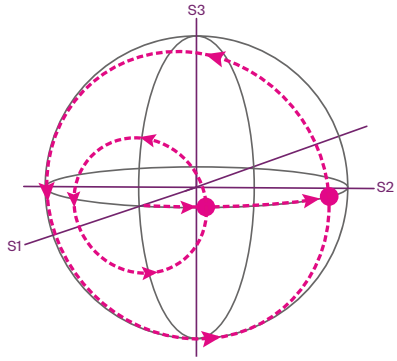
$$\begin{bmatrix} \cos(pi/4) & -\sin(pi/4) \\ \sin(pi/4) & \cos(pi/4) \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & \exp(i\Theta) \end{bmatrix} \begin{bmatrix} \cos(pi/4) & \sin(pi/4) \\ -\sin(pi/4) & \cos(pi/4) \end{bmatrix}$$



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

Phase retarder

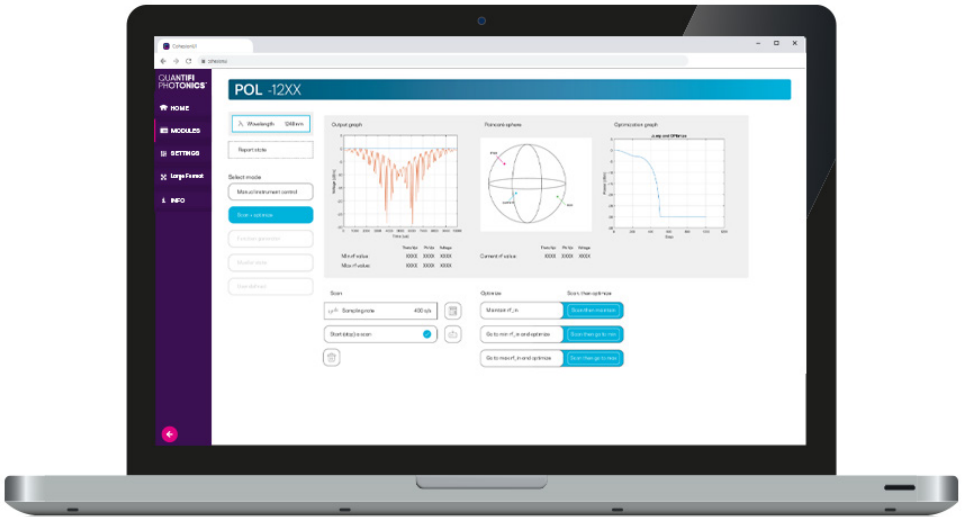
$$\begin{bmatrix} 1 & 0 \\ 0 & \exp(i\Phi) \end{bmatrix}$$



USER EXPERIENCE

Simple, intuitive control with COHESION**UI**™

Cohesion**UI** 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

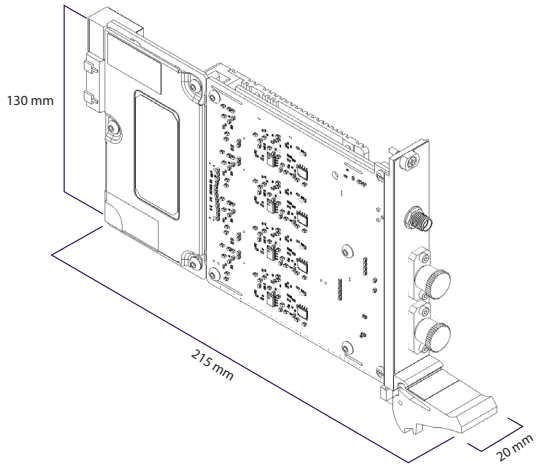
PXIe – MODULAR

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



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[1]	1202[1]
Number of channels	1	1
Fiber type	PMF Input, SMF output	PMF Input, SMF output
Operating wavelengths	1260 - 1360 nm	1520 - 1620 nm
Damage power	+ 25 dBm	+ 25 dBm
Insertion loss[2]	< 1.5 dB	< 1.3 dB
Return loss[2]	> 50 dB	> 50 dB
PDL[2]	< 0.1 dB	< 0.1 dB
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

1. Advanced specifications as of May 2026 and subject to change; valid at 23 °C ± 3 °C.
2. Excluding connectors.

ORDERING INFORMATION

POL - XXXX - 1 - XX - PXIE

Model number
1201 = 1260 - 1360 nm
1202 = 1520 - 1620 nm

Connector type
FC = FC/PC
FA = FC/APC
SC = SC/PC
SA = SC/APC

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.

Add a **3 or 5 year extended warranty** when you purchase your Quantifi Photonics instruments.

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**

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.

For more details visit **quantifiphotonics.com/products**

Tunable Laser Source

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 Source

Highly-customizable DFB or FP laser sources available in a wide range of wavelengths and powers up to 24 dBm. Supports SMF, MMF and PMF.

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.

External Laser Small Form-Factor Pluggable (ELSFP)

Uses ELSFP-compliant pluggable modules to provide 8 channels of CW optical power at 1310 nm from 20 to 25 dBm.

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. Support SMF, MMF and PMF.

Polarization Controller & Scrambler

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

Optical Power Meter

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

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.

Optical-to-Electrical Converter

High bandwidth, broadband O-to-E converter. Choose from 1 or 2 channels, AC or DC coupling and various conversion gain and operating wavelength ranges.

Optical Switch

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

Photocurrent Amplifier

Versatile photodiode amplifier to measure photocurrent in photonic integrated circuit (PIC) applications. Digital and analog measurement.

Digital Sampling Oscilloscope (DSO)

Digital equivalent-time sampling oscilloscope (DSO) with high-quality precision timebase and low jitter mode, available in 1 or 2 channels in a compact benchtop instrument.

Clock Recovery Instrument (CDR)

Clock recovery instrument for the QCA Series. Low jitter design and precise phase-locking provide a reliable, scalable solution for high-speed communication testing.

Erbium-Doped Fibre Amplifier (EDFA)

High power Erbium-Doped Fiber Amplifier for signal power amplification in C and L bands with various control modes, including automatic gain control.

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.

Passive Component Integration

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

Test.
Measure.
Solve.™

Quantifi Photonics provides test solutions to help customers unlock scalable and cost-effective high-volume manufacturing of photonic integrated circuits (PICs), co-packaged optics and pluggable optics. The company's portfolio includes a wide range of photonic test instruments, and digital sampling oscilloscopes, available as benchtop or the industry-standard PXI format to support cost-effective, high-throughput design verification testing and high-volume manufacturing.

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

General Enquiries	sales@quantifiphotonics.com
Technical Support	support@quantifiphotonics.com
Phone - NZ	+64 9 478 4849
Phone - USA	+1-800-803-8872

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