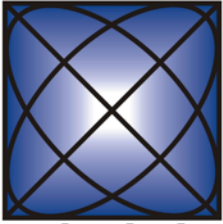


New Ridge



Technologies

Polarization Control Platform

NRT-2500

Versatile Polarization Platform for multiple lab purposes

Scramble, Spin & Randomize Polarization

Set Polarization

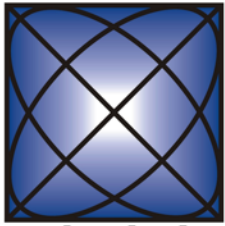
Very fast, robust & endless Polarization Tracking

Coherent detection

Polarization De-multiplexing of Dual-Polarization signals

Customizable for new applications





Polarization Control Platform

NRT-2500

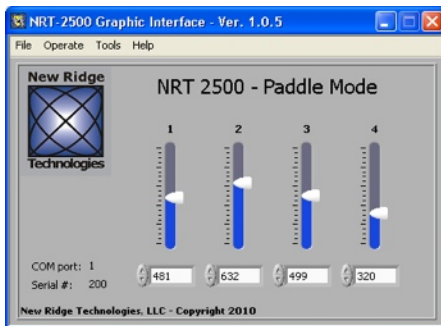
Versatile Polarization Platform for Multiple Lab Applications

NRT's polarization control platform combines an integrated-optic Lithium Niobate (LiNbO₃) waveguide polarization-controller device for super-fast polarization response driven by a customizable DSP/FPGA platform for functional flexibility. Together they enable NRT to provide a wide range of polarization operations in one product. The five functions currently offered are.

1. Set Polarization

This is perhaps the most common polarization control operation used in the lab. The NRT-2500 provides the electronic equivalent of 4 Lefevre fiber-optic paddles to align the pump to the probe or the signal to the local oscillator, maximize light through a polarization element, or polarization-demultiplex optical communication signals.

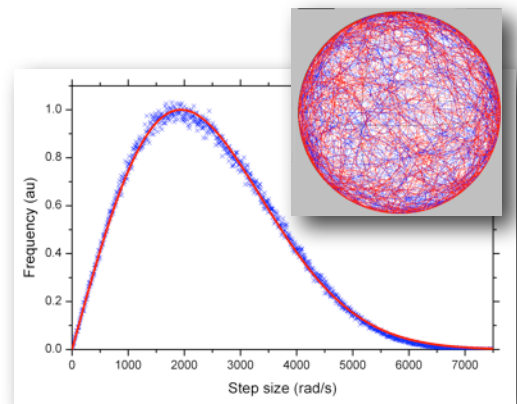
Each 'electronic paddle' is controlled through the user interface to set the polarization where you need it. Move the sliders or enter a values from 0 to 1000.



2. Polarization Scrambler

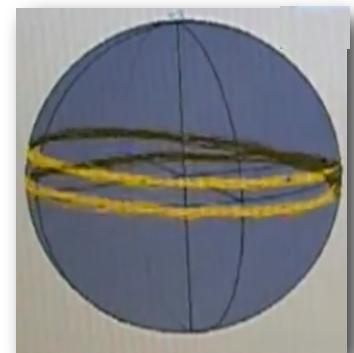
The NRT State of Polarization (SOP) Scrambler provides full and uniform coverage of the Poincaré Sphere characterized by a stochastic Rayleigh distribution of SOP speeds. This mode is invaluable for testing the robustness of polarization tracking and locking schemes.

The NRT-2500's Scrambler repeatably generates this well-known stochastic analytic distribution of SOP speeds. No more guessing about the coverage of the Poincaré sphere or the distribution of SOP change rates. Just enter the desired Rayleigh distribution scrambling rate and you're on your way.



3. Polarization Spinner

New generation coherent PM-QPSK transceivers, for 40G and 100G communications systems, require verification testing to assure they will operate reliably even when the SOP changes extremely rapidly. The new Spinner Mode simulates a 1/2-waveplate, rotating the SOP up to 50 kHz (>300,000 rad/sec for linearly polarized light), controllably, repeatably and endlessly to stress these transceivers.

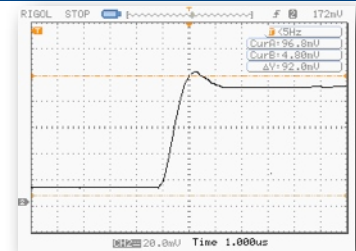


Polarization Control Platform

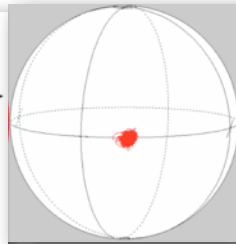
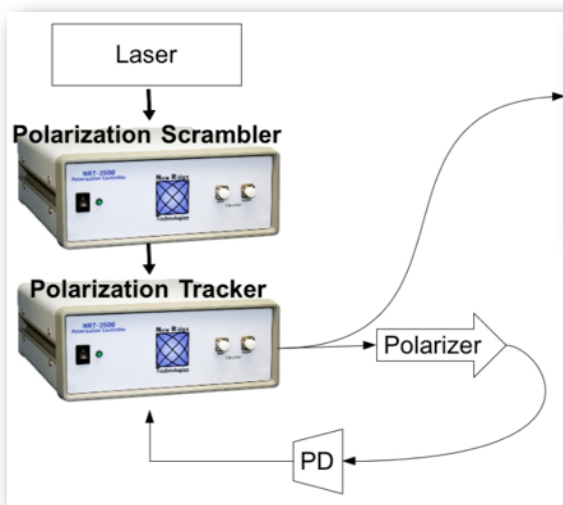
NRT-2500

4. Polarization Randomization

The NRT-2500 Polarization Randomizer mode randomly 'jumps' the output SOP about the Poincaré sphere every (user-input) time interval, or when triggered by externally. The trigger mode is useful for loop experiments to change the SOP at every pass through the loop.



5. Fast Robust and Endless Polarization Tracker



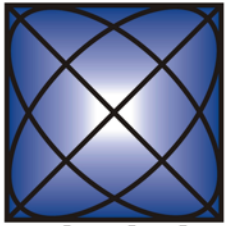
NRT's unique tracking algorithm enables virtually perfect SOP tracking with no dropouts or 'glitches' for your new applications and prototypes. The NRT-2500's open architecture allows you to optimize the performance for your specific application:

- Create a unique error signal from four A/D converter inputs
- Optimize algorithm parameters with tracker optimization program

New Ridge has leveraged >4 years of time and effort in the tracker, and has packaged it all together for you. This tracking technology is so robust it was qualified for network deployment at multiple carriers around the world after proving its 'five-9s' tracking capabilities.

Examples of NRT-2500 Applications

1. Optical Polarization Demultiplexing
2. PMD tolerance testing of transponders
3. Optical polarization demuxing
4. Testing electronic pol-demultiplexing
5. Optical PMD compensation
6. Coherent detection



Polarization Control Platform

NRT-2500

Key specifications¹

Insertion Loss	< 3 dB
PDL	< 0.3 dB
Optical return Loss	> 50 dB
Optical Power Handling	< 20 dBm
Operating Wavelength	1.55 microns (C- and L-bands)
Optical Connectors	FC/UPC, FC/APC, SC
Scrambling mode (SOP Speed distribution) parameters ²	$r_{mode} \equiv b^{0.5} > 3,400$ radians/second, with $\langle r \rangle \equiv 1.25r_{mode}$, $r_{max} \sim 3.76r_{mode}$
Spinner Mode rate	50 kHz (or >300,000 rad/sec for SOP aligned in S_1 - S_2 plane)
SOP Slew speed	~1.4 microseconds (up to 1,500,000 radians/second) ³
Tracking Speed (closed loop in tracking mode)	~20 microseconds ⁴
Power Supply	12 VDC from 100-240 VAC, 50 – 60 Hz wall AC-DC converter
Communication Interfaces	Ethernet, RS-232 (monitor points)
Dimensions	H=4.04" (102.6 mm), W=10.12" (257 mm), D=12.32" (313mm)

1. Subject to change at any time by New Ridge Technologies, LLC.

2. For a Rayleigh distribution: r_{mode} is the statistical mode of the distribution, $\langle r \rangle$ is the mean SOP change, and 99.9% of all SOP changes occur before $r_{max} = 3\langle r \rangle \sim 3.76r_{mode}$

3. For $\pi/2$ radian SOP transitions in 1 μ s.

4. This speed is feedback/update algorithm loop time based on reading A/DCs and DSP speed and updating polarization controller voltages. The feedback signal level and customization of the algorithm may slow system response.

***Do you have a polarization control problem or function the NRT-2500 can solve?
Then please contact us to discuss implementation.***

New Ridge also welcomes licensing of the NRT-2500's design and tracking algorithm for OEM solutions.

For more information about the NRT-2500

NRT2500@newridgetech.com

or call: +1-410-753-3055