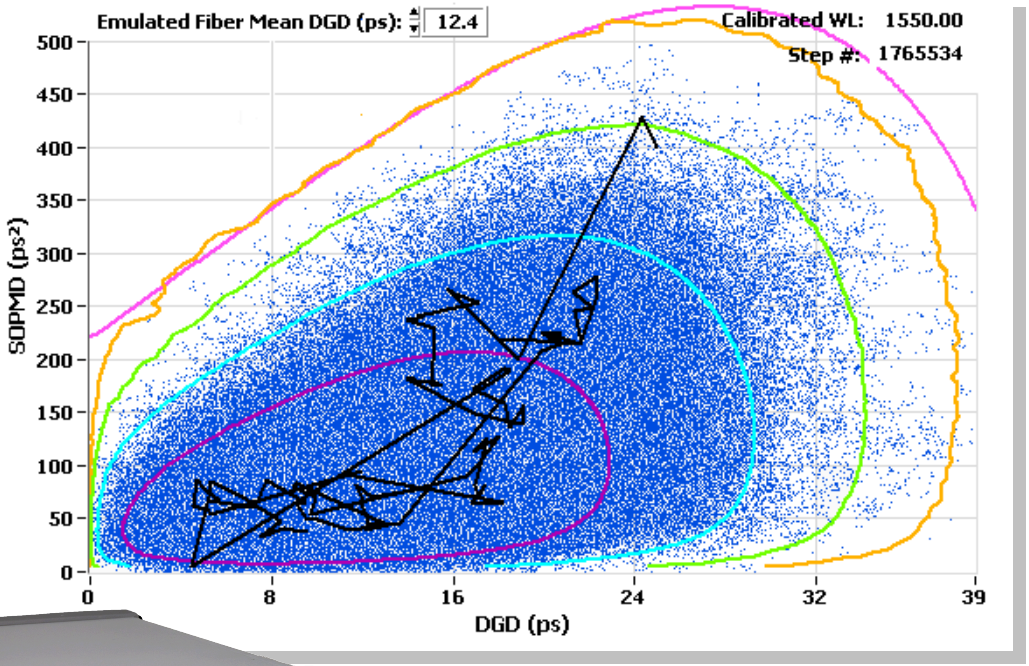
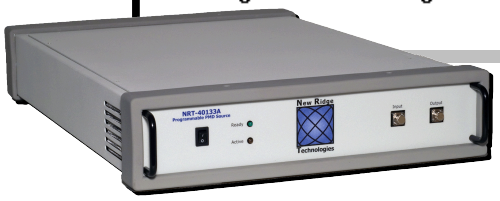
New Ridge Technologies

Programmable PMD Randomizer

NRT-PMDR

- 'JPDF-walker' emulates PMD dynamics and PMD statistics for both DGD and SOPMD
- Emulation of a wide range of mean PMD values
- Software enhancement/upgrade: compatible with all New Ridge Technologies' PMD Sources
- The only PMD emulator that calculates and 'knows' its PMD state at all times





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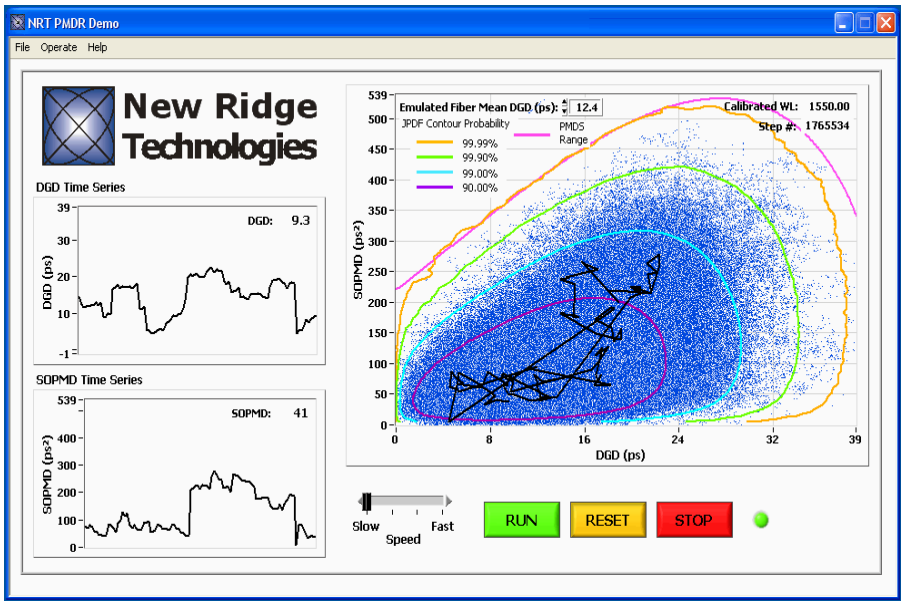
NRT-PMDR

The NRT PMD Randomizer, NRT-PMDR, is a new software application that turns your New Ridge Technologies' PMD source into a PMD emulator unlike any other. The NRT-PMDR is the first deterministic emulator. It is different from other emulators as the NRT-PMDR calculates a random walk of 1st and 2nd-order PMD states according to the Joint Probability Density Function statistics before updating the generated PMD outputs. With the NRT-PMDR, direct paths connect consecutive PMD states in the (DGD, SOPMD) plane.



A screen-shot of the NRT-PMDR user interface. The trajectory of the last 100 states are shown by the black trace. The blue dots are the previous 1,765,534 states. On the right side are real-time 1st and 2nd-order PMD strip charts.

Other emulators arbitrarily vary couplers and birefringent sections to generate randomly changing PMD states. These emulators may reproduce PMD statistics but are indeterminate, incapable of calculating their PMD state.

By contrast, only the NRT-PMDR, provides time series output of the emulated 1st and 2nd-order PMD states. The time series, including a time stamp, can be saved to a file for further analysis or correlation with bit-error rate degradations of the component/system undergoing PMD testing and characterization.

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NRT-PMDR

Key Features

- Uses NRT's unique and patented Coherent PMD generation technology
- Simple Graphic User Interface
- Dynamically varies PMD state
- Displays all generated states and trajectory of recent states
- Displays times series of DGD vs time
- Displays times series of SOPMD vs time
- Generates PMD time series file
- Four dynamic PMD transition speeds
- Self-calibration to transponder wavelength

The NRT-PMDR software is compatable with all of New Ridge's PMD Sources: the NRT-10033A, NRT-40133A, NRT-40095A or NRT-96083X. Moreover, each NRT-PMDR can be set to emulate a wide range mean PMD fibers, making it multiple emulators in one! Just enter the mean PMD to emulate, and run.

PMDS compatibility	NRT-10033A	NRT-40133A	NRT-40095A	NRT-96083X
Mean PMDs Emulated (recommended)	10 ps* – 36 ps	2.5 ps* – 9 ps	3.5 ps* – 13 ps	3.5 ps* – 33 ps
State-to-State PMD Transition Rate	Four speeds: 2, 4, 10 & 20 seconds per state			
Data Output	DGD, SOPMD and Time Stamp in comma separated text file (PMDS settings and calibration wavelength in header)			

**The upper PMD limits are determined by the birefringence in the unit. The lower limits are suggestions based on deviations of the SOPMD distribution from the theoretical expectation. The DGD distributions are accurate even below these lower bounds.*

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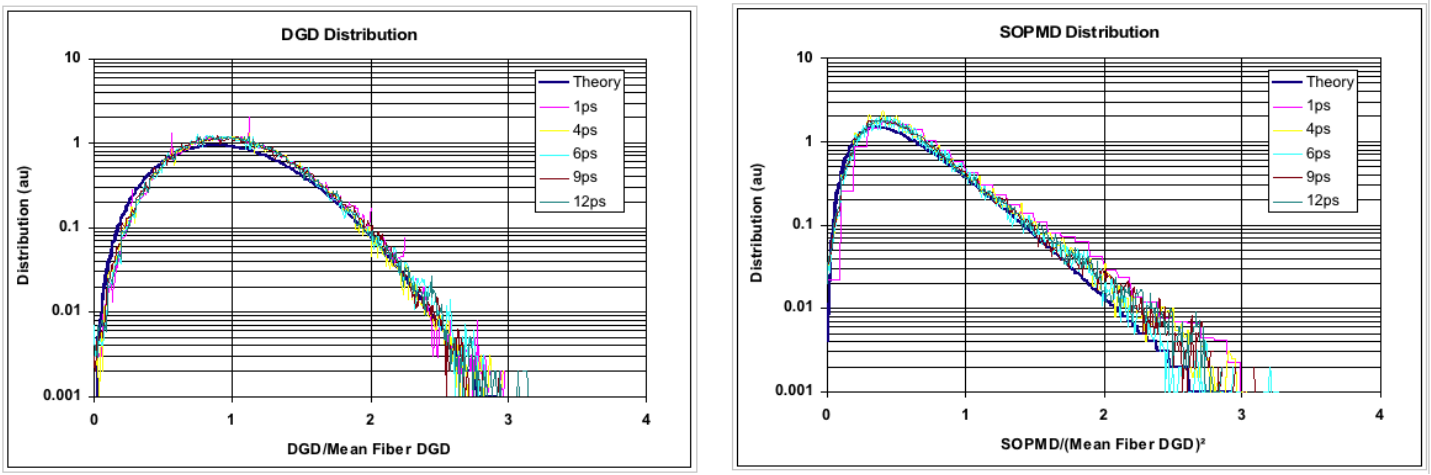
NRT-PMDR

In the figures below the NRT-PMDR's random walk distributions for 1st and 2nd-order PMD are compared to the theoretical distributions for several different mean fiber PMD values (on the NRT-40095A). The results for mean fiber PMD values of 1ps, 4ps, 6ps, 9ps and 12ps are shown in the figure, together with the theoretical model. These graphs prove the validity of the NRT random walk model and code accuracy.



Random-walk distributions for fiber mean PMD values of 1ps, 4ps, 6ps, 9ps and 12ps together with the theoretical model. In order to compare all the mean fiber PMD values on the same graph, a normalized scale is used on the x-axis for the DGD and SOPMD distributions.

New Ridge Technologies, the worldwide leader in PMD tolerance testing of transponders and systems

For more information contact us: pmdr@newridgetech.com or call: (410) 753-3055