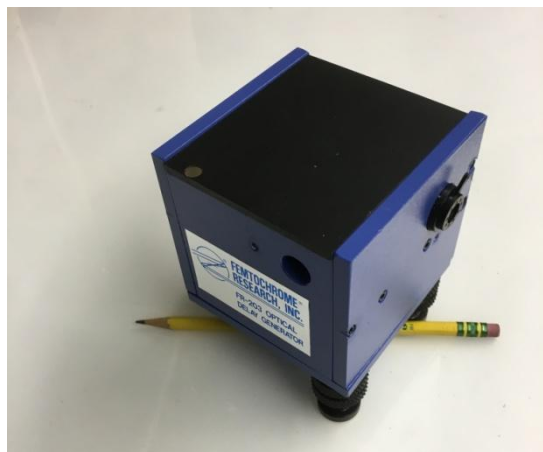




**FEMTOCHROME<sup>®</sup>**  
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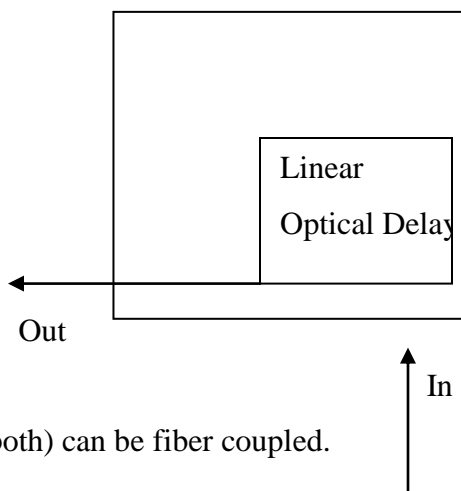
## FR-203 OPTICAL DELAY GENERATOR



An optical beam traversing a uniformly rotating pair of parallel (//) mirrors encounters a time varying delay \*. This is a versatile method of rapid scan, error-free, linear optical delay generation.

The **FR-203** is a useful tool for all applications requiring periodic linear optical delay, such as time resolved spectroscopy, and time domain ultrafast terahertz spectroscopy. A large optical delay with interferometric precision is generated at high repetition rates, with unprecedented accuracy.

The **FR-203** is easy-to-use by virtue of its alignment insensitive design. Its metallic, high reflection coated optics yields dispersion-free broadband operation with good (>85%) throughput, throughout the visible and NIR spectrum.



Optionally, either port (or both) can be fiber coupled.

\* Z.A.Yasa and N.M.Amer, Optics Commun., V36, 406 (1981)

The delay generated by the // mirrors is a sinusoidal function of the rotation angle (time). With only small angles being covered, linearity is excellent. Furthermore, the exact mathematical transformation relating optical delay versus time can be readily implemented numerically. Hence, the **FR-203** features error-free optical delay with perfect linearity.

In its uniform rotation mode with high angular momentum, the delay generated by the // mirrors is free of any position (time) uncertainty which can be encountered when a retroreflector is moved in a linear direction back and forth. In this latter case, the acceleration/deceleration of the retro mass may result in a change in its response to the driving mechanism, such errors growing with time and affecting long term reliability.

The motion of its delay generating mechanism (// mirrors) being uniform (no acceleration /deceleration), such errors are non-existent with the **FR-203**.

An analog reference signal output of the **FR-203**, refers to the beginning of the scanned delay range.

Three versions of the **FR-203** are available:

**FR-203/130ps....** 130ps delay range/ (low/high) duty cycle (10%/>50%)

**FR-203/400ps....** 400ps delay range/low duty cycle (~ 6%).

**FR-203/900ps...** 900ps delay range/high duty cycle (~ 50%).

High duty cycle modes have low refresh (repetition) rate (~1Hz). The refresh rate for the low duty cycle modes is typically 5Hz.<sup>1</sup>

## **SPECIFICATIONS:**

- \* Resolution: <1fs
- \* Scan Range: 130ps/400ps/900ps
- \* Wavelength Range: 400-5000nm
- \* Fiber Coupled/ Free Space

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<sup>1</sup> Higher repetition rates can be specified on a custom basis.

