



**FEMTOCHROME<sup>®</sup>**  
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## **FR-103TPM AUTOCORRELATOR**



### **Specifications**

- Sensitivity ( $P_{av}P_{pk}$ )<sub>min</sub> :  $10^{-4}W^2$
- Resolution: ~ 1fs
- Scan Range: > 50 ps
- Wavelength Range: 700–2200nm
- Interferometric
- Polarization Insensitive (TPC)\*
- Computer Interface (/CDA)
- Any pulse rep rate > 4Hz (w/CDA)

\* Vertical polarization provides higher R/T ratio for pellicle beamsplitters

The **FR-103TPM** is a compact autocorrelator for Two Photon Microscopy applications. It can be introduced into the beampath of the laser without affecting optical alignment. The NL photosensor of the FR-103TPM can be placed in any location of the optical set-up, in particular at the position of the sample. Its Computer Data Acquisition (/CDA) option provides an interface (USB), for the display and analysis of autocorrelation traces on a Windows PC.

The standard **FR-103TPM** works with any input pulse rep rate > 500Hz. [ This can be extended to any rep rate > 4Hz, by the addition of /SSO and /CDA options.]

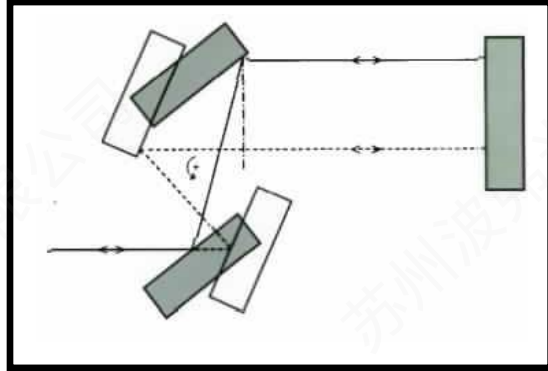
### **DISPERSION-FREE, HIGH RESOLUTION**

Dispersion is negligible in the **FR-103TPM**. Using high reflective metallic-coated optics [the only transmissive element is an ultrathin (<1um) pellicle beamsplitter], an unprecedented resolution of ~1fs is attained.

With its high resolution, the **FR-103TPM** is capable of measuring pulsewidths as low as ~ 5fs.

## ROTATING PARALLEL (//) MIRROR ASSEMBLY

Rapid scan, periodic optical delay is introduced by means of a parallel (//) mirror assembly.\* This unique mechanism results in uniform and error-free delay generation with interferometric resolution.



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

## NONLINEAR PHOTSENSOR MODULES

The NL detector module selections for the **FR-103TPM** are:

- /700 → 700-1200nm
- /1100 → 1200-2200nm

## SLOW SCAN OPERATION

There are two modes of operation of the **FR-103TPM**:

1. Uniform rotation of // mirrors( with a refresh rate typically ~2Hz)
2. Controlled movement such that the // mirrors slow down greatly (4 selectable speeds ) over a period when the pulses on the two arms of the Michelson Interferometer set up are overlapping. The // mirrors speed up beyond this range, to return quickly, for a repetition of the cycle.

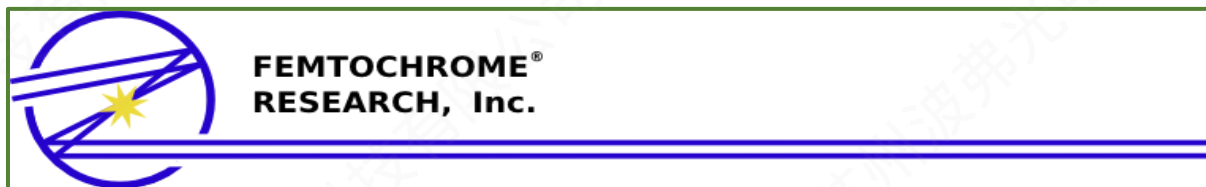
Whereas the uniformly rotating // mirrors is suitable for typically > 100kHz rep rate lasers, the latter mode renders the unit suitable for 'real-time' autocorrelation for any rep rate > 500Hz. This is particularly useful for kHz amplified lasers.

## COMPUTER DATA ACQUISITION (/CDA)

A data acquisition board is installed in the **FR-103TPM/CDA**, provides a USB interface with any PC w/ Windows OS. Its associated software allows traces to be displayed, analyzed [averaged and/or fit with typical pulseshapes (Gaussian and Sech<sup>2</sup>)] or saved.

## SPECIFICATIONS:

- \* Resolution: ~ 1fs
  - \* Scan Range: > 50ps
  - \* Sensitivity:  $[P_{av}P_{pk}]_{min}=10^{-4}W^2$
  - \* Wavelength Range: 700-2200nm
  - \* Interferometric
  - \* Polarization insensitive\*
  - \* Any rep rate > 4Hz (w/CDA)
  - \* Computer Interface (/CDA)
- \* Vertical polarization always yields higher signal due to better R/T ratio for pellicle beamsplitters



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