DORGEAN
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Instrument Expert
Original factory packaging
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FEMTOCHROME®
RESEARCH, Inc.

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FR-103TPM AUTOCORRELATOR

Specifications

- Sensitivity $(P_{av}P_{pk})_{min}$: $10^{-4}W^2$
- 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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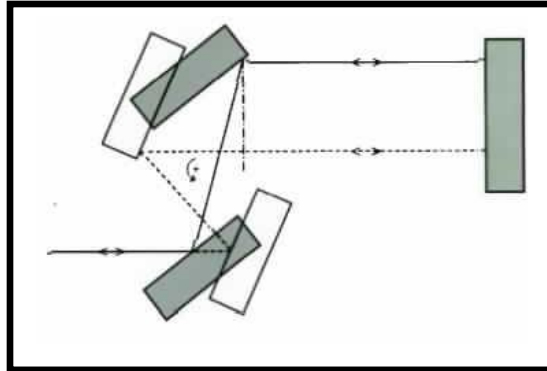
*   Z.A.Yasa and N.M.Amer, Optics Commun., V36, 406 (1981).

NONLINEAR PHOTOSENSOR MODULES

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

/700 → 700-1200nm
/1200 → 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.
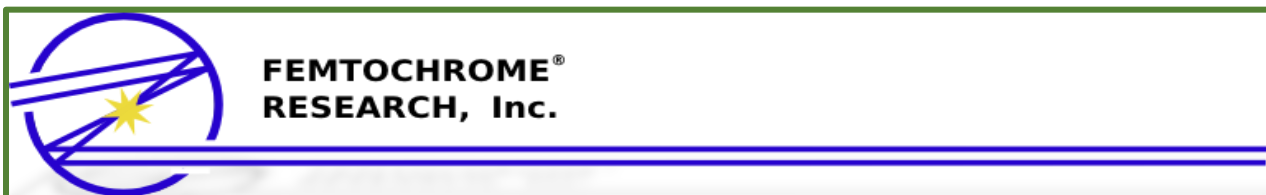
Whereas the uniformly rotating // mirrors is suitable for typically > 100kHz rep rate lasers, the latter
mode renders the unit suitable for 'real-time' autocorrelation for any rep rate > 500Hz. This is
particularly useful for kHz amplified lasers.

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 $Sech^2$)] 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 generally yields higher signal

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