FEMTOCHROME®
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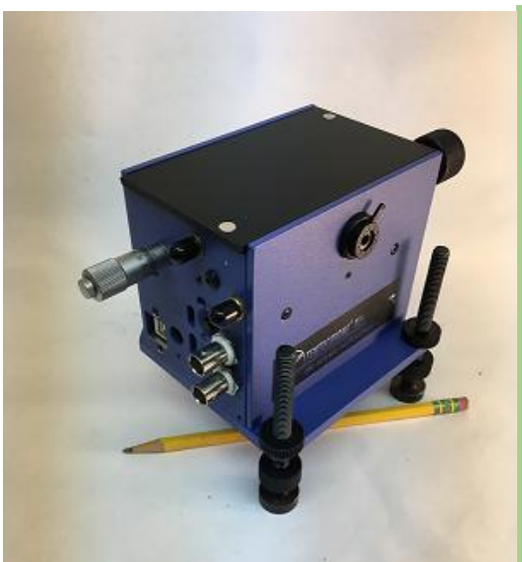
FR-103MC FEMTOSECOND DETECTOR



Specifications

- Sensitivity $(P_{av}P_{pk})_{min}$:$10^{-4}W^2$
- Resolution: ~ 1fs
- Scan Range: > 50 ps
- Wavelength Range: 200–3400nm
- Interferometric
- Polarization Insensitive*
- Free-Space/Fiber-Coupled (/FA)
- Computer Interface
- Any pulse rep rate > 4Hz (w/CDA)

The **FR-103MC** is a low cost, palm-size interferometric Autocorrelator utilizing TPC (Two Photon Conductivity). Its collinear Michelson interferometer geometry yields interferometric autocorrelations. Ideal for OEM applications, the **FR-103MC** is suitable for a pulsewidth range of 5fs – 15ps. It is easy-to-use with good sensitivity and excellent resolution.

Optional Fiber Adapter (/FA) renders the **FR-103MC** alignment free for FC fiber-coupled inputs.

It can be supplied with the Computer Data Acquisition (/CDA) option, for the display and analysis of autocorrelation traces on a PC.

The **FR-103MC** is suitable for any input pulse rep rate >4Hz with the /SSO and /CDA options.

(The standard version is suitable for any pulse rep rate >500Hz.)

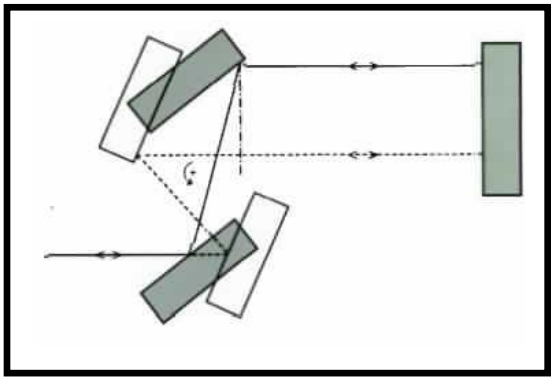
DISPERSION-FREE, HIGH RESOLUTION

Dispersion is negligible in the **FR-103MC**. 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-103MC** 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-103MC** are:

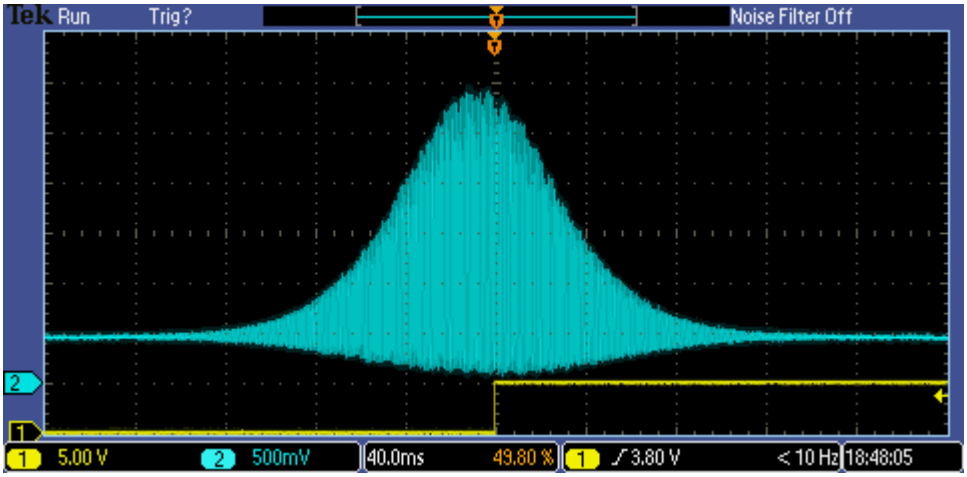
/200 -► 200-300nm
/300 -► 300-400nm
/400 → 400-700nm
/700 → 700-1200nm
/1200 → 1200-2200nm
/2200 → 2200-3400nm

SLOW SCAN OPERATION

There are two modes of operation for the delay generating // mirrors of the **FR-103MC**:

1. Uniform rotation (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 // mirror assembly speeds up beyond this range, to return quickly, for a repetition of the cycle.

Whereas the uniformly rotating // mirrors mode is suitable for typically > 100kHz rep rate lasers, the latter mode renders the **FR-103MC** suitable for 'real-time' autocorrelation for any rep rate > 500Hz. This is particularly useful for kHz amplified lasers.



Fringe resolved trace of a 450fs pulse at 1552nm, w/FR-103MC operated in the SS/SP3 mode.

FIBER ADAPTER OPTION (/FA)

An optional gimbal mount with a collimator can be installed over the variable input aperture of the **FR-103MC**, for easy connection of fiber-coupled beams. Factory aligned, repeated connections without a need for realignment is facilitated. The /FA is easily removable for a free-space input beam. Its standard adapter is FC [FC/PC or FC/APC]. For operation at 1550nm, a PM-DSF patchcord can be attached to the /FA. The collimator of the /FA is focus adjustable to obtain good collimation if its use at greatly different wavelengths is needed. A $\lambda/2$ plate holder is also provided within the /FA assembly, for the user to install one for his wavelength of operation, if needed for polarization control.

COMPUTER DATA ACQUISITION (/CDA)

A data acquisition board installed in the **FR-103MC**/CDA provides a USB interface with a Windows PC. 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: 200-3400nm
* Interferometric
* Polarization insensitive*
* Any rep rate > 4Hz (w/CDA)
* Free space/ Fiber coupled (/FA)
* Computer Interface (/CDA)

* Vertical polarization yields higher signal due to generally better R/T ratio w/ pellicle beamsplitter

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