



# femtoControl

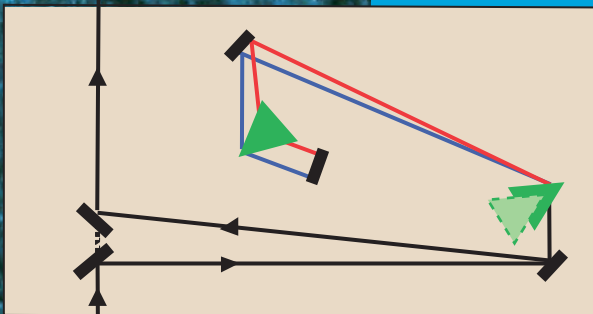
*femtoControl* is a compact motorized dispersion control unit for optimization of the duration of femtosecond laser pulses in the spectral range of Ti:Sapphire lasers<sup>1)</sup>.

Femtosecond pulses which pass through any kind of optical material experience dispersion that can lead to temporal broadening of the ultrashort pulses with subsequent reduction in peak power. Thus, the experimental conditions are changed and degraded.

*femtoControl* compensates for material dispersion by applying the inverse amount of dispersion to the pulse. This is generated by a pair of prisms on motorized translation stages allowing continuous adjustment of the pulse width.

1) For other laser systems please contact A·P·E

- Ideal for multi-photon Microscopy
- Wide range of dispersion
- User-friendly adjustment and operation
- Zero-GVD function
- Automatic prism drive corresponding to stored GVD curves



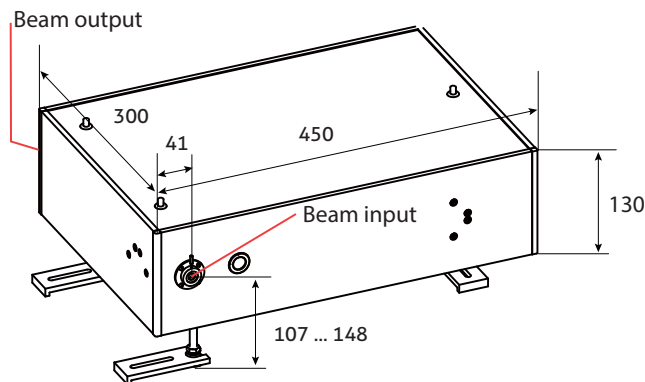
|                                       |  |       |                         |
|---------------------------------------|--|-------|-------------------------|
| Wavelength range                      | 680 ... 1080 nm  |       |                         |
| Beam diameter                         | < 4 mm   |       |                         |
| Input polarization                    | linear / horizontal (polarization rotator optional)  |       |                         |
| Laser repetition rate                 | any  |       |                         |
| Bandwidth (for complete compensation) | < 12.5 nm @ 800 nm<br>( $\approx$ 75 fs transform limited Gaussian pulse; higher bandwidth on request) |       |                         |
| Transmission                          | > 90 % @ 800 nm  |       |                         |
| Dispersion range                      |  | min   | max                     |
|                                       | 700 nm:  | 0 ... | - 23000 fs <sup>2</sup> |
|                                       | 800 nm:  | 0 ... | - 13000 fs <sup>2</sup> |
|                                       | 900 nm:  | 0 ... | - 8000 fs <sup>2</sup>  |
|                                       | (more dispersion on request)   |       |                         |
| Additional internal beam path         | 1.67 m   |       |                         |

## Option

- Dispersion management in combination with A·P·E autocorrelator Carpe

## Dimensions (in mm)

|                      |                            |
|----------------------|----------------------------|
| Control electronics: | 130 x 55 x 100 (W x H x D) |
| Optical unit:        | see below                  |



## Application Example

A transform limited Gaussian input pulse of 100 fs at 800 nm sent into a multi-photon microscope experiences a dispersion of typically 13000 fs<sup>2</sup> from the glass of the microscope lens system. This broadens the pulse to 380 fs at the sample position and thus reduces the peak power by a factor of 3.8. By placing the *femtoControl* in front of the microscope the pre-compensation of the dispersion can be adjusted such that the pulse width of 100 fs is maintained after passing through the microscope.

At 700 nm a broadening of up to 645 fs, and at 900 nm of up to 245 fs can be compensated, respectively, for a 100 fs transform limited pulse.

### Contact:

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