# *Dynamic* Beam Stabilization

## Application highlights

Stabilization of laser beam position and direction

Adjustment of laser setups

Beam tracking with PSD

## Features

Closed-loop active control

No user actions required

For pulsed and cw lasers

Easy adjustment

High bandwidths up to 1 kHz

Works with very low laser powers (~50 nW)

No additional dispersion since detectors can be placed behind HR mirrors

Variable intensity gain

Safety features: low power switch-off, switch on activity delay, status signals, interlock

## Application examples

Stabilization of laser beams against thermal and mechanical drift

Compensation of laser beam pointing, vibrations, and shocks

Stabilization of beam coupling in MOPA setups

Stabilization of laser beams for material processing

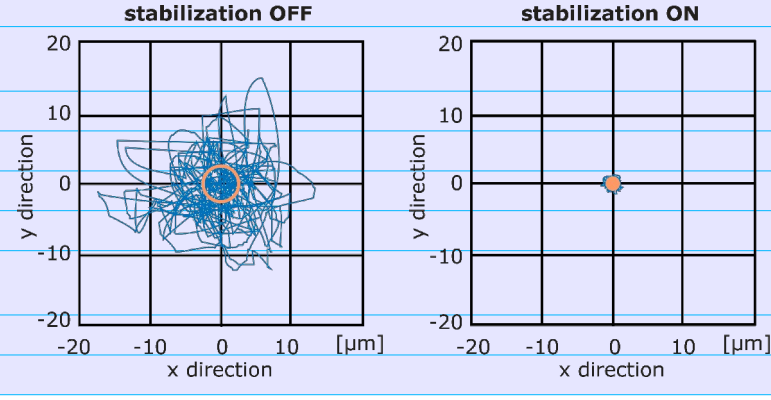
Adjustment of lasers in pump-probe experiments

Laser beam adjustment into hollow fibers

Stabilization of lasers that are distributed over several optical tables

Alignment of lasers onto common beam paths

Fast delivery of beams to changing applications




## System components

### Position detectors

| | Si 4-QD<br>visible | Si-PIN 4-QD<br>UV | Ge 4-QD<br>IR | Si PSD<br>visible (UV) |
|---|---|---|---|---|
| Wavelength | 320-1.100 nm | 190-1.000 nm | 800-1.800 nm | 400(200)-1.100nm |
| Detection area | 10 x 10 mm² | 3 x 3 mm² | Ø = 5 mm | 10 x 10 mm² |

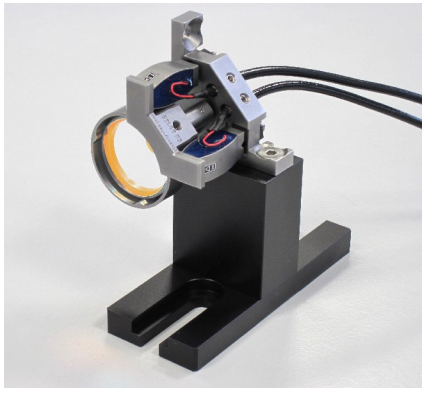
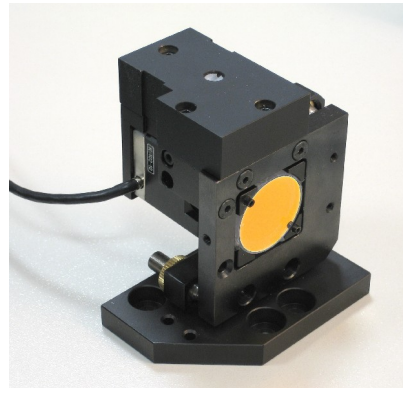
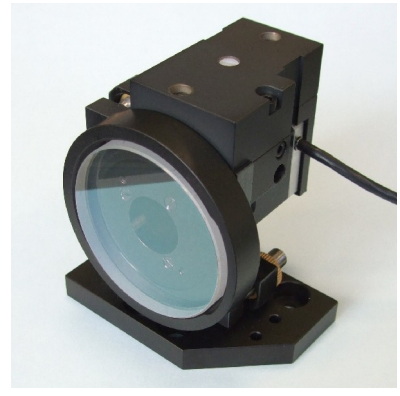
### Piezo-actuated steering mirrors

| | Type 1: PKS (K-700-31) | Type 2: PSH (K-102-10) | |
|---|---|---|---|
| Bandwidth | < 700 Hz | < 840 Hz | (measured with 1" mirrors, thickness: 0,125") |
| Maximum tilt | < 1 mrad (± 0.5 mrad) | < 2 mrad (± 1 mrad) | |

### Mechanical dimensions

| | |
|---|---|
| Controller housing | 147 x 471 x 331 mm³ |
| Detector housing (without base plate) | 60 x 35 x 30 mm³ |

## Options & accessories

| Mirror mount type 1 | Mirror mount type 2 | Adapters for large beam sizes |
|---|---|---|
|  |  |  |
| **Adapters for motorized mounts with large tilts** | **Fast position detectors** | **Laser shutters (with flexible controllers)** |
|  |  |  |

## Beam tracking

### Semi-automatic adjustment of experiments with PSDs and steering mirrors

If the beam position is an important parameter of your laser setup, use a new combination of our devices to optimize your application:

1. Place PSDs (position sensitive detectors) behind your mirrors
2. Change the target points on the PSDs by simply setting a position voltage
3. The steering mirrors will automatically track the beam direction
4. In that way, you can vary the laser beam direction with highest resolution until you have the optimal result

The system will then fix and stabilize the position with the best alignment.

## Customisation / OEM

- Vacuum adaption (thermal management and sealing)
- Additional electronics (sample & hold, pulse-picking, triggers, etc.)
- Mechanical modifications
- System integration

MRC-0511-0e

Any questions? Please feel free to contact us!


## Contact

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