

**New**

## SPCM Connector Kits

For a quick and comfortable installation of Excelitas Single Photon Counting Modules (SPCMs), we offer two optomechanical connector kits. Both kits are suitable for the freespace bracket versions of the SPCMs and allow an easy and stable alignment of the focus on the detector area.

- Compatible with LINOS Microbench and LINOS Tube System C
- Wavelength region: 450-700 nm
- Adjustment of achromat for moving focal spot in z-direction
- Adjustment of mirror for moving focal spot in x-y-plane
- Set of parts for individual assembly

Product	Part No.
SPCM Connector Kit TC	G060412000
SPCM Connector Kit MB	G060413000

## SPCM Connector Kit TC

- Tube System with C-mount (1.00"-32) threading (LINOS Tube System C)
- Using freespace SPCM with fiber-coupled light
- Suitable for bracket type 2
- FC/PC or FC/APC connector for single-mode optical fiber
- Complete isolation of scattered light



Application example of the SPCM Connector Kit TC (Fiber and SPCM with bracket not included)

### Content of the SPCM Connector Kit TC

Qty.	Part No.	Description
1	G061667000	Adapter ring , C-mount - M23.2x0.75
1	G065225000	Adjusting tube C30 with locking collar
1	G065235000	Beam deflector cube C40
1	G063730000	Adjustable mirror Insert 30
1	G000699223	Cover cap with 30 mm diameter
1	G340523000	Plane mirror RAGV; D=22.4x31.5 d=3.5
1	G169013000	Focusing collimators MB 02 (with APC fiber adapter)
1	G038853000	FC fiber adapter (alternatively usable)

- For individual modifications all parts can be ordered separately

26

## SPCM Connector Kit MB

- Extremely stable 30 mm optical cage system (LINOS Microbench)
- For focusing collimated light beams on the detector area of freespace SPCM
- Suitable for both bracket types



Application example of the SPCM Connector Kit MB (SPCM with bracket not included)

### Content of the SPCM Connector Kit MB

Qty.	Part No.	Description
4	G061209000	Rod 75 mm
1	G061063000	Z-fine adjustment M
1	G063127000	Achromat VIS ARB2; D=18; F=40
1	G061081000	Cube 30
1	G063730000	Adjustable mirror insert 30
1	G340523000	Plane mirror RAGV; D=22.4x31.5 d=3.5
1	G061011000	Set of threaded pins M2.3x3, 150 ea.

- For individual modifications all parts can be ordered separately

## fle.X-Plate

**NEW Design**

The fle.X-plate is a monolithic adjustment unit with flexures, ideally suited for centering fibers, fiber-optics and spatial filters like pinholes, down to  $\mu\text{m}$ -accuracy and even sub- $\mu\text{m}$  level. It is available in 3 different versions.

Product	Part No.
fle.X-Plate XY Al	G067032000
fle.X-Plate XY Steel	G067021000
fle.X-Plate XY Diff	G067033000



fle.X-plate XY Al



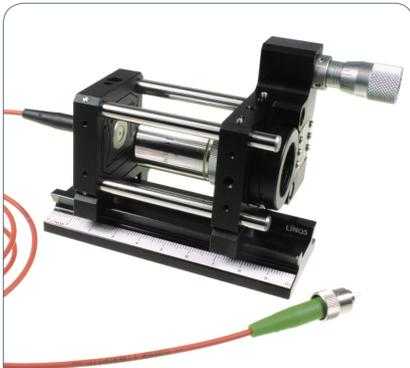
fle.X-plate XY Steel



fle.X-plate XY Diff

### Main features, common to all versions

- 0.5 mm full adjustment range for X and Y direction
- Central mounting bore with 12.5 mm in diameter
- Monolithic design, no moving parts
- Displacements based on short and special shaped flexures. No play, friction or hysteresis
- X and Y translations are coplanar. No unwanted movements causing tilts
- Fully centrosymmetric design with the "thermal center of gravity" at the mounting bore
- Pure X & Y translations without any parasitic effects like tilts
- Four M2.3 screws for fixing in the LINOS Microbench are included in delivery



#### Application example of our fle.X-plates:

Along with the FSMA fiber optic adapter the fle.X-plate holds the core of the fiber exactly in the focal spot of the focusing lens. The fle.X-plate allows a fine adjustment as well as a long term and temperature stability that is ideal for fiber coupling.

You can buy this complete component set (fiber not included): Q-Set Fiber Coupler, Part-No. G060408000

### fle.X-plate XY Steel and fle.X-plate XY Al

- Each translation is controlled by two screws, a pulling screw and a pushing screw
- Final super-fine adjustment is realized by controlling the final torque level of both screws, which action automatically secures the locking of the final setting at the same moment
- Extremely good long-term stability over a wide temperature range due to the monolithic and centrosymmetric design, the "thermal center of gravity" and the locking mechanism
- fle.X-plate XY Steel is made from hardened steel and ideal for permanent setups and production equipment. It offers highest precision, sensitivity and stability better than 1  $\mu\text{m}$
- fle.X-plate XY Al is made from anodized aluminum. Its sensitivity and stability is at  $\mu\text{m}$  level
- Both plates are delivered with tools for the adjustment screws

### fle.X-plate XY Diff

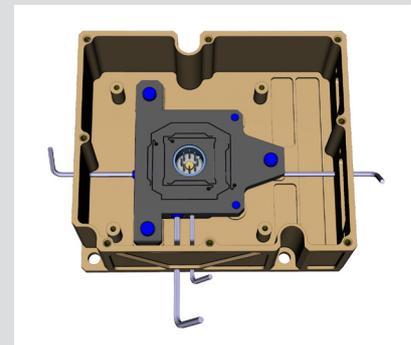
- XY-adjustment is achieved using two differential screws, while two strong springs eliminate the residual play of the differential screws
- The pitch is 0.1 mm per rotation
- Ideal for experimental setups and ease of use in the lab and for regular and quick adjustments

## Up to the sky

fle.X-plates with a slightly modified design were selected by the German Aerospace Center (DLR) for holding the detectors of the Laser Ranging Interferometer that is located in the GRACE-FO satellites. The GRACE-FO mission is a community project between the National Aeronautics and Space Administration (NASA) and the German Research Center for Geosciences (GFZ).

By measuring the varying distance between this twin satellites components of the earth's gravity field can be obtained which leads, inter alia, to a better observation of the melting of the polar caps.

For such particularly high requirements these fle.X-plates were made out of titanium but the pattern of the flexure was based upon the fle.X-plate itself.



CAD construction of modified titanium fle.X-Plate in a case housing a detector in its central hole.

## Adjustment guide for XY Steel/Al

- X and Y direction, each have two adjustment screws, one pulling screw and a smaller one pushing via a steel ball.
- Coarse to fine adjustment is done by adjusting both screws simultaneously at a rather low torque level, in order to arrive easily near the intended position within several  $\mu\text{m}$ 's.
- Subsequently this X or Y position is then gradually blocked by enlarging the torque levels of both screws to a much higher fixation level. By tuning the torque level of one screw or of both screws the position is being blocked for the long term but, simultaneously, can also being tuned down to sub- $\mu\text{m}$  finesse by means of the torque ratio between the two screws.
- Hertz' deformation by tuning the preload on a steel ball, rather than usual displacement from a spindle, is the basis of combining sub- $\mu\text{m}$  tuning with automatic blocking
- Usually securing of the final position is done subsequently with lock nuts, but this always influences the adjusted position. This problem is avoided by the automatic blocking mechanism of the fle.X plate.