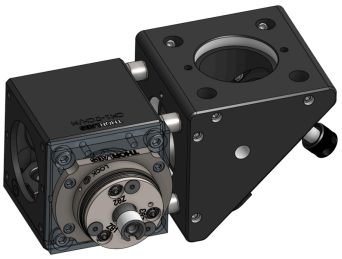
Assembly guide of Ex2pO

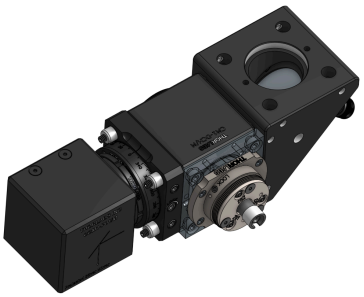
Step 1

1. Install the Elliptical Mirror (PFE10-P01) into the KCB1EC/M.
2. Install the Dichroic Mirror (NFD01-633) into the CCM1-P01/M.
3. Screw the SM1CP2 onto the side of the CCM1-P01/M.
4. Screw the adjust_plate_v2 onto the face of the CCM1-P01/M, opposite the SM1CP2.
5. Screw the Fiber Port (e.g. PAF2-7A or PAF2A-18A) into the adjust_plate_v2.
6. Screw the four ER025 rods into the CCM1-P01/M. Remove the remaining set screws.
7. Connect the CCM1-P01/M and the KCB1EC/M. Tighten the side screws on the KCB1EC/M.



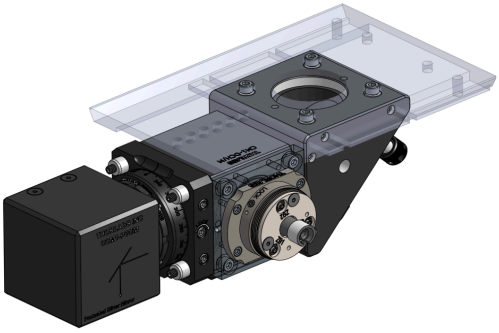
Step 2

8. Screw the ER05 rods into the face opposite the ER025 rods.
9. Pass the CRM1T/M over the ER05 rods and secure it.
10. Secure the CRM1T/M and CM1-DCH/M together using the SM1T4 (tighten firmly with the SPW502 spanner wrench).



Step 3

11. Remove all setscrews from the four ER025 rods.
12. Install this assembly on top of the KCB1EC/M. Tighten the side screws to secure it.
13. Secure plate_N1 from the top using #4-40 Low-head screws.
14. Install the blocking filter (e.g., FESH600 for 638 nm laser) in front of the detector.

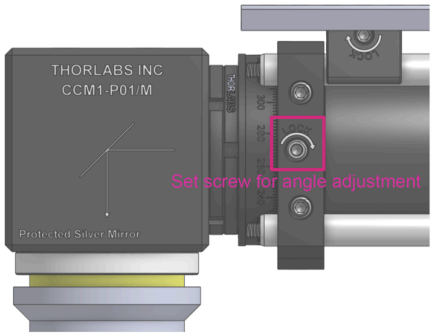


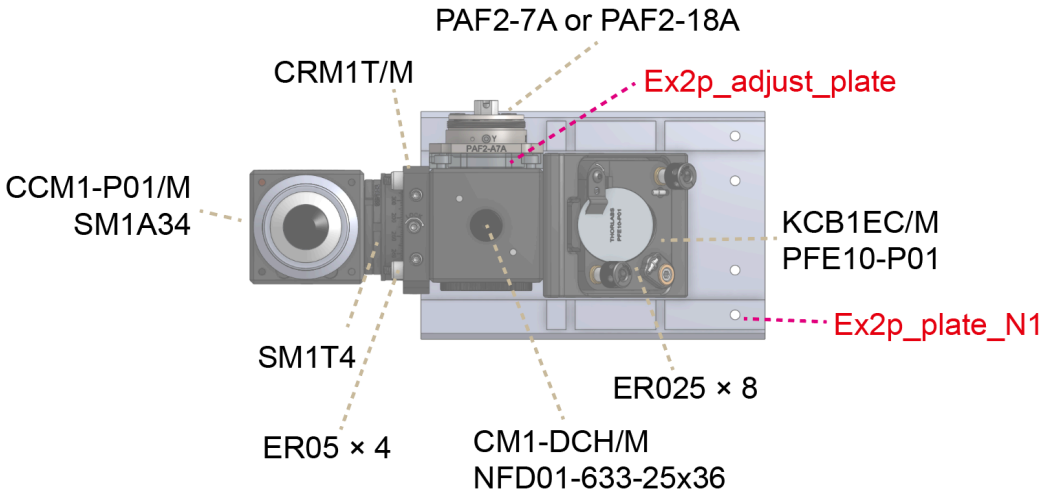
Step 4

15. Secure the main unit to the microscope.
16. Secure the laser beam profiler or IR viewer target to the CM1-DCH/M (a laser beam profiler is recommended).
17. Center the scan mirrors of the two-photon microscope.
18. Open the shutter and emit the IR laser. Adjust the mirror on the KCB1EC/M so that the laser is centered on the laser beam profiler. Continue adjusting until the laser remains centered even when the distance along the optical axis to the laser beam profiler changes.
19. Close the shutter to stop the IR laser.
20. Insert the fiber for the 1P (one-photon) laser into the PAF2-7A/PAF2A-18A. Adjust the screws on the PAF2-7A/PAF2A-18A so that the 1P laser is centered on the laser beam profiler. Additionally, adjust the collimation if necessary.

Notes:

- Be careful not to touch the adjustment screws on the KCB1EC/M.
- Briefly check the alignment before an experiment.
- When tilting the objective lens, loosen the lock screw(s) on the CRM1T/M, adjust the angle as needed, and then secure it.





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Parts list

Company	Product ID	#	Detail
Thorlabs	SM1A34	1	SM1A34 - Adapter with External SM1 Threads and Internal M32 x 0.75 Threads
	CCM1-P01/M	1	CCM1-P01/M - 30 mm Cage Cube-Mounted Protected Silver Turning Mirror, M4 Tap
	SM1T4	1	SM1T4 - SM1 (1.035"-40) Coupler, External Threads, Fixed Shoulder and Locking Ring
	CRM1T/M	1	CRM1T/M - Cage Rotation Mount for Ø1" Optics, SM1 Threaded, M4 Tap
	ER05-P4	1	ER05-P4 - Cage Assembly Rod, 1/2" Long, Ø6 mm, 4 Pack
	CM1-DCH/M	1	CM1-DCH/M - 30 mm Cage Cube with Dichroic Filter Mount (Metric)
	SM1CP2	1	SM1CP2 - Externally SM1-Threaded End Cap
	ER025	8	ER025 - Cage Assembly Rod, 1/4" Long, Ø6 mm
	KCB1EC/M	1	KCB1EC/M - Right-Angle Kinematic Elliptical Mirror Mount with Smooth Cage Rod Bores, 30 mm Cage System and SM1 Compatible, M4 and M6 Mounting Holes
	PFE10-P01	1	PFE10-P01 - 1" Protected Silver Elliptical Mirror, 450 nm - 20 µm
	FESH0600	1	FESH0600 - Ø25.0 mm Shortpass Filter, Cut-Off Wavelength: 600 nm
	PAF2A-18A	1	PAF2A-18A - FiberPort, FC/APC, f=18.4 mm, 350 - 700 nm, Ø3.01 mm Waist
Semrock	NFD01-633-25x36	1	633 nm StopLine® notch laser dichroic beamsplitter
DIY parts	plate_N1	1	https://github.com/rysk-t/ex2p/tree/main/Ex2pO_parts
	adjust_plate_v2	1	https://github.com/rysk-t/ex2p/tree/main/Ex2pO_parts
Other	#2-56 cap screws	4	
	#4-40 low head cap screws	8	
	SPW502	1	SPW502 - Spanner Wrench for Slotted SM05, SM1, and C-Mount Locking Rings