

## SM1Z - June 25, 2021

Item # SM1Z was discontinued on June 25, 2021. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

### Z-AXIS TRANSLATION MOUNTS

- ▶ Translate Ø1" Optics Along Optical Axis
- ▶ 30 mm Cage Compatible or Post Mountable Options
- ▶ SM1-Threaded (1.035"-40) Optic Cell

The SM1Z is Part of the KT310  
Spatial Filter System



**SM1Z**  
Cage-Compatible Z-Axis  
Translation Mount



**SM1ZP**  
Post-Mountable Z-Axis  
Translation Mount



[Hide Overview](#)

#### OVERVIEW

Thorlabs offers two Z-axis translation mounts that provide precise positioning of optical components along the optical axis. These mounts accept Ø1" (25.4 mm) optics directly or optics mounted inside lens tubes with external SM1 (1.035"-40) threading.

The SM1Z has four through holes for compatibility with our 30 mm cage systems. In contrast, the SM1ZP(M) has 8-32 (M4) taps on the side and 8-32 (M4) and 1/4"-20 (M6) taps on the bottom, allowing it to be post mounted on any Ø1/2" or Ø1" post.

[Hide Cage Overview](#)

#### CAGE OVERVIEW

##### Cage System Overview

The Cage Assembly System provides a convenient way to construct large optomechanical systems with an established line of precision-machined building blocks designed for high flexibility and accurate alignment.

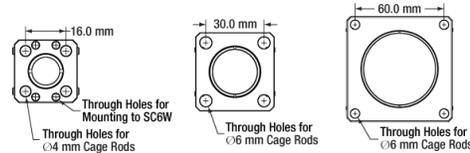
##### 16 mm, 30 mm, and 60 mm Cage System Standards

Thorlabs offers three standards defined by the center-to-center spacing of the cage assembly rods (see image below). The 16 mm cage, 30 mm cage, and 60 mm cage standards are designed to accommodate Ø1/2", Ø1", and Ø2" optics, respectively. Specialized cage plates that allow smaller optics to be directly

inserted into our larger cage systems are also available.

## Standard Threads

The flexibility of our Cage Assembly System stems from well-defined mounting and thread standards designed to directly interface with a wide range of specialized products. The three most prevalent thread standards are our SM05 Series (0.535"-40 thread), SM1 Series (1.035"-40 thread), and SM2 Series (2.035"-40 thread), all of which were defined to house the industry's most common optic sizes. Essential building blocks, such as our popular lens tubes, directly interface to these standards.



An example of the standard cage plate measurements determining cage system compatibility.

| Standard Cage System Measurements |               |               |                |
|-----------------------------------|---------------|---------------|----------------|
| Cage System                       | 16 mm         | 30 mm         | 60 mm          |
| Thread Series                     | SM05          | SM1           | SM2            |
| Rod to Rod Spacing                | 16 mm (0.63") | 30 mm (1.18") | 60 mm (2.36")  |
| Total Length                      | 25 mm (0.98") | 41 mm (1.60") | 71.1 mm (2.8") |

| Cage Components                         |       |   |
|---|-------|---|
| Cage Rods                               | 16 mm | These rods are used to connect cage plates, optic mounts, and other components in the cage system. The SR Series Cage Rods are compatible with our 16 mm cage systems, while the 30 mm and 60 mm cage systems use ER Series Cage Rods.  |
|   | 30 mm |   |
|   | 60 mm |   |
| Cage Plates                             | 16 mm | These serve as the basic building blocks for a cage system. They may have SM-threaded central bores, smooth bores sized for industry standard optics or to accommodate the outer profile of our SM Series Lens Tubes, or specialized bores for other components such as our FiberPorts.   |
|   | 30 mm |   |
|   | 60 mm |   |
| Optic Mounts                            | 16 mm | Thorlabs offers fixed, kinematic, rotation, and translation mounts specifically designed for our Cage Systems.  |
|   | 30 mm |   |
|   | 60 mm |   |
| Cage Cubes                              | 16 mm | These cubes are useful for housing larger optical components, such as prisms or mirrors, or optics that need to sit at an angle to the beam path, such as beamsplitters. Our cage cubes are available empty or with pre-mounted optics.   |
|   | 30 mm |   |
|   | 60 mm |   |
| Post and Breadboard Mounts and Adapters |       | Mounting options for cage systems can be found on our Cage System Construction pages. Cage Systems can be mounted either parallel or perpendicular to the table surface.  |
| Size Adapters                           |       | Cage System Size Adapters can be used to integrate components from different cage system and threading standards.   |
| Specialized Components                  |       | Thorlabs also produces specialized cage components, such as Filter Wheels, a HeNe Laser Mount, and a FiberPort Cage Plate Adapter, allowing a wide range of our products to be integrated into cage-mounted optical systems. Explore our Cage Systems Visual Navigation Guide to see the full range of Thorlabs' cage components. |

[Hide Z-Axis Translation Mount, 30 mm Cage Compatible](#)

### Z-Axis Translation Mount, 30 mm Cage Compatible

- ▶ Compatible with 30 mm Cage Systems
- ▶ Mount Ø1" Optics up to 0.28" (7.1 mm) Thick
- ▶ Flexure Design Provides 2.0 mm (0.079") of Travel
- ▶ Actuator Knob Graduated in 1 µm Increments
- ▶ SM1-Threaded (1.035"-40) Bore is Compatible with Our SM1 Lens Tubes



Click to Enlarge  
SM1Z Mount Used in  
the KT310 Spatial Filter  
System

Thorlabs' SM1Z Translation Mount offers repeatable Z-Axis travel within a 30 mm cage system. It includes two SM1RR retaining rings for holding a Ø1" (25.4 mm) optic up to 0.28" (7.1 mm) thick. This allows for compensation of focusing errors in applications such as fiber alignment or spatial filtering within a cage system, as shown in the image to the right, or for applications that require fine adjustment along the optical axis.

The lens carriage is internally SM1 (1.035"-40) threaded and is translated using the precision micrometer actuator, which is graduated in 1 µm increments. The micrometer can be actuated using the knurled knob or a 5/64" (2 mm) hex key. Coarse movement is achieved by sliding the SM1Z along the rods of a 30 mm cage assembly. Once positioned, four 4-40 setscrews apply locking force to the cage rods, firmly holding the mount in place. The threaded carriage allows for thicker optics to be mounted to the SM1ZP using our SM1 lens tubes.

Additionally, the SM1Z mount is a component of the KT310 Spatial Filter System, as shown in the photo to the right. In this application, the SM1Z is used to hold an aspheric lens that focuses laser light into a pinhole.

For cage assemblies requiring a longer translation range along the optical axis, Thorlabs offers the CT1 stage capable of a full 1/2" (13 mm) of travel.

| Item # | Optic Size Accommodated | Maximum Optic Thickness | Travel          | Travel per Revolution | Optic Mounting                                    | Mounting   |
|--------|-------------------------|-------------------------|-----------------|-----------------------|---|--|
| SM1Z   | Ø1"                     | 0.28" (7.1 mm)          | 2.0 mm (0.079") | 50 µm/rev             | 2 SM1RR Retaining Rings<br>SM1 (1.035"-40) Thread | Through Holes with Side-Located Locking Screws for 30 mm Cage System |

| Part Number | Description                                     | Price    | Availability |
|-------------|---|----------|--------------|
| SM1Z        | Z-Axis Translation Mount, 30 mm Cage Compatible | \$205.60 | Lead Time    |

[Hide Z-Axis Translation Mount. Post Mountable](#)

### Z-Axis Translation Mount, Post Mountable

- ▶ Post-Mountable via 8-32 (M4) and 1/4"-20 (M6) Taps
- ▶ Mount Ø1" Optics up to 0.28" (7.1 mm) Thick
- ▶ Flexure Design Provides 2.0 mm (0.079") of Travel
- ▶ Actuator Knob Graduated in 1 µm Increments
- ▶ SM1-Threaded (1.035"-40) Bore is Compatible with Our SM1 Lens Tubes



Click to Enlarge  
1/4"-20 Mounting Tap  
Being Used to Mount the  
SM1ZP from Bottom on  
a Ø1" Post



Click for Details  
8-32 Tap Being Used to  
Mount the SM1ZP from  
Side on  
a Ø1/2" Post

Thorlabs' SM1ZP(M) Translation Mount offers repeatable, flexure-actuated, Z-axis travel. It includes two SM1RR retaining rings for holding a Ø1" (25.4 mm) optic up to 0.28" (7.1 mm) thick. This allows for compensation of focusing errors in applications such as fiber alignment or spatial filtering.

The lens carriage is internally SM1 (1.035"-40) threaded and is translated using the precision micrometer actuator, which is graduated in 1 µm increments. The micrometer can be actuated using the knurled knob or a 5/64" (2 mm) hex key. This threaded carriage allows for thicker optics to be mounted to the SM1ZP using our SM1 lens tubes, as shown in the image to the right. When mounted from the bottom, the center of the lens carriage is 2.00" (50.0 mm for SM1ZP/M) from the top of the post, while when mounted on its side, it is 0.68" (17.1 mm) from the top of the post.

The mount contains three 8-32 (M4) taps and two 1/4"-20 (M6) taps on its base as well as two 8-32 (M4) taps on its side for mounting onto any Ø1/2", Ø1", or Ø1.5" Post, as shown in the images above.

| Item #   | Optic Size Accommodated | Maximum Optic Thickness | Travel                           | Travel per Revolution | Optic Mounting                                    | Mounting  |
|----------|-------------------------|-------------------------|----------------------------------|-----------------------|---|---|
| SM1ZP(M) | Ø1"                     | 0.28" (7.1 mm)          | 2.00 ± 0.07 mm (0.079" ± 0.003") | 50 µm/rev             | 2 SM1RR Retaining Rings<br>SM1 (1.035"-40) Thread | Side: Two 8-32 (M4) Taps<br>Bottom: Three 8-32 (M4) and Two 1/4"-20 (M6) Taps |

| Part Number | Description   | Price    | Availability |
|-------------|---|----------|--------------|
| SM1ZP/M     | Z-Axis Translation Mount, Post Mountable, M6 and M4 Taps        | \$205.60 | 5-8 Days     |
| SM1ZP       | Z-Axis Translation Mount, Post Mountable, 1/4"-20 and 8-32 Taps | \$205.60 | Today        |