

SM2A7 - April 23, 2024

Item # SM2A7 was discontinued on April 23, 2024. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

ADAPTERS FOR OLYMPUS BX AND IX MICROSCOPES

- **Adapters for Epi-Fluorescence, Transmitted Illumination, Camera, Trinocular, Eyepiece, and Condenser Ports, as well as Trinoculars**
- **Modify Olympus BX and IX Microscopes Using Thorlabs' Optomechanical Components**



The SM1A51 Camera Port Adapter Used to Mount a Scientific-Grade CCD Camera on an Olympus IX Microscope

[Hide Overview](#)

OVERVIEW

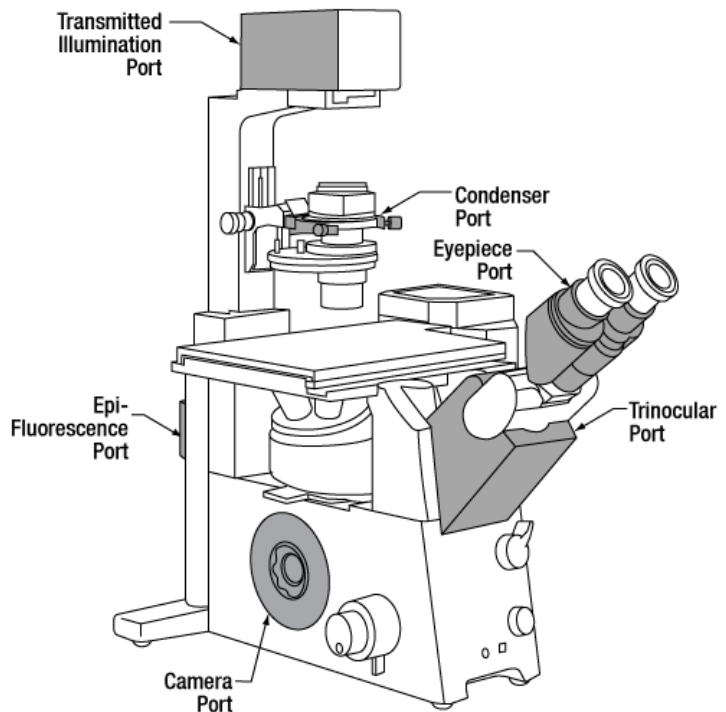
Features

- Extends Versatility of Thorlabs' Construction Systems to Olympus BX and IX Microscopes
- Provides Compatibility with SM1 Lens Tubes, SM2 Lens Tubes, and 30 mm and 60 mm Cage Systems
- Available for Epi-Fluorescence, Transmitted Illumination, Camera, Trinocular, Eyepiece, and Condenser Ports
- Contact Tech Support About Custom Adapters, Including Other Microscopes

Illumination Adapters

The SM2Y1 adapter allows Ø2" and Ø30 mm optics to be mounted inside an Olympus IX71 epi-fluorescence port, as well as externally SM2-threaded components. When used along with the LCP11(/M) adapter, the epi-fluorescence port also becomes 60 mm cage compatible, enabling the connection of various illumination sources, such as infrared (IR) and white LEDs, as well as complex light conditioning assemblies.

Thorlabs also offers multiple adapters for Olympus BX41,



Olympus IX71 Microscope

IX71, or IX73 transmitted illumination ports. These adapters provide rigid coupling to maintain long-term, stable alignment for the connection of laser beam combiners, LED light sources, and other mechanical and optical components.

Camera Port Adapter

The SM1A51 adapter is designed to allow SM1-threaded and 30 mm cage system components to be mounted to the camera port on an Olympus BX or IX microscope. This adapter is ideal for inserting custom optics, as well as our scientific CMOS cameras, into a microscope system.

Trinocular Port Adapter

The LCPY2 adapter is designed to connect custom widefield viewing and image detection setups to the trinocular port of an Olympus BX or IX microscope.

Trinocular Adapters

Olympus trinoculars can be integrated into DIY Cerna, Upright Nikon Eclipse, Nikon Eclipse Ti, or Nikon Eclipse Ti2 microscopes using the LCPN3 or LCPY3 adapters.

Eyepiece Adapter

The SM2Y2 adapter replaces the lens element on an eyepiece of the microscope trinoculars, allowing custom image detection or viewing setups to be attached to the microscope.

Condenser Port Adapter

The SM2Y3 adapter connects a custom light conditioning assembly to the condenser holder of an Olympus BX or IX microscope.

Note: Thorlabs does not guarantee compatibility with other industry-standard microscopes not explicitly mentioned on this webpage.

Adapters for Industry Standard Microscopes
Cerna DIY Series
Leica DMI
Nikon Eclipse Ti (Inverted)
Nikon Eclipse Ti2 (Inverted)
Upright Nikon Eclipse
Olympus BX and IX
Zeiss Axioskop and Examiner

MICROSCOPE DOVETAILS

Introduction to Microscope Dovetails

Dovetails are used for mechanical mating and optical port alignment of microscope components. Components are connected by inserting one dovetail into another, then tightening one or more locking setscrews on the female dovetail. Dovetails come in two shapes: linear and circular. Linear dovetails allow the mating components to slide before being locked down, providing flexible positioning options while limiting unneeded degrees of freedom. Circular dovetails align optical ports on different components, maintaining a single optical axis with minimal user intervention.



This photo shows the male 95 mm dovetail on the microscope body and the female 95 mm dovetail on the CSA1002 Fixed Arm.



This photo shows the male D1N dovetail on the trinoculars next to the female D1N dovetail on the epi-illumination arm.

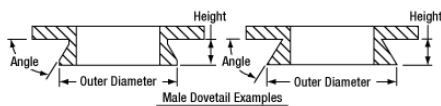
Thorlabs manufactures many components which use dovetails to mate with our own components or those of other manufacturers. To make it easier to identify dovetail compatibility, we have developed a set of dovetail designations. The naming convention of these designations is used only by Thorlabs and not other microscope manufacturers. The table to the right lists all the dovetails Thorlabs makes, along with their key dimensions.

In the case of Thorlabs' Cerna® microscopes, different dovetail types are used on different sections of the microscope to ensure that only compatible components can be mated. For example, our WFA2002 Epi-Illuminator Module has a male D1N dovetail that mates with the female D1N dovetail on the microscope body's epi-illumination arm, while the CSS2001 XY Microscopy Stage has a female D1Y dovetail that mates with the male D1Y dovetail on the CSA1051 Mounting Arm.

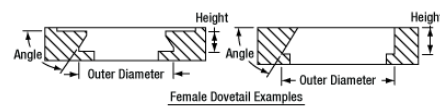
To learn which dovetail type(s) are on a particular component, consult its mechanical drawing, available by clicking on the red Docs icon (📄) below. For adapters with a female dovetail, the drawing also indicates the size of the hex key needed for the locking setscrew(s). It is important to note that mechanical compatibility does not ensure optical compatibility. Information on optical compatibility is available from Thorlabs' web presentations.

For customers interested in machining their own dovetails, the table to the right gives the outer diameter and angle (as defined by the drawings below) of each Thorlabs dovetail designation. However, the dovetail's height must be determined by the user, and for circular dovetails, the user must also determine the inner diameter and bore diameter. These quantities can vary for dovetails of the same type. One can use the intended mating part to verify compatibility.

In order to reduce wear and simplify connections, dovetails are often machined with chamfers, recesses, and other mechanical features. Some examples of these variations are shown by the drawings below.



Two examples of how circular male dovetails can be manufactured.



Two examples of how circular female dovetails can be manufactured.

Thorlabs Dovetail Reference ^a			
Type	Shape	Outer Dimension	Angle
95 mm	Linear	95 mm	45°
D1N	Circular	Ø2.018"	60°
D2N ^b	Circular	Ø1.50"	90°
D2NB ^b	Circular	Ø1.50"	90°
D3N	Circular	Ø45 mm	70°
D5N	Circular	Ø1.58"	90°
D6N	Circular	Ø1.90"	90°
D7N	Circular	Ø2.05"	90°
D1T	Circular	Ø1.50"	60°
D3T	Circular	Ø1.65"	90°
D1Y	Circular	Ø107 mm	60°
D2Y	Circular	Ø2.32"	50°
D3Y	Circular	Ø1.75"	90°
D4Y	Circular	Ø56 mm	60°
D5Y	Circular	Ø46 mm	60°
D6Y	Circular	Ø41.9 mm	45°
D1Z	Circular	Ø54 mm	60°
D2Z	Circular	Ø57 mm	60°
D3Z	Circular	Ø54 mm	45°

- These dovetail designations are specific to Thorlabs products and are not used by other microscope manufacturers.
- D2N and D2NB dovetails have the same outer diameter and angle, as defined by the drawings below. The D2N designation does not specify a height. The D2NB designation specifies a dovetail height of 0.40" (10.2 mm).

[Hide Epi-Fluorescence Port Adapter for Olympus IX71 Microscope](#)

Epi-Fluorescence Port Adapter for Olympus IX71 Microscope

Item #	SM2Y1
Photo	
Dovetail	Male D3Y ^a

The SM2Y1 port adapter connects to the epi-fluorescence port on certain Olympus IX71 microscopes. The image to the right shows what an epi-fluorescence port of an Olympus IX71 microscope should look like for the SM2Y1 to be compatible. If the microscope does not appear as pictured, then the port adapter will not work. If you are unsure about compatibility, please contact Tech Support.



Use the SM2Y1 epi-fluorescence port adapter with the LCP11(/M) cageplate to attach 60 mm cage systems.

The SM2Y1 features internal SM2 threading on one side and internal SM30

SM Threading	Internal SM2 (2.035"-40) Internal SM30 (M30.5 x 0.5)
Cage Compatibility	_b
Microscope Compatibility	Olympus IX71 Epi-Fluorescence Port

threading on the other, allowing it be integrated into an externally SM2-threaded illumination source or Ø30 mm optic. One SM2RR retaining ring is provided with the SM2Y1 and can be used to secure a Ø2" optic up to 1.10" (28.0 mm) thick against the internal lip of the adapter; thicker retaining rings (Item # SM2RRC) are available for high-curvature lenses, though the curvature will limit the usable mounting depth. Please contact Tech Support to ensure a proper fit. The other side of the adapter can be used for Ø30 mm optics up to 1.09" (27.7 mm) thick using two SM30RR retaining rings, which are available for purchase separately.

Please note that the SM2Y1 adapter can be paired with the LCP11(/M) cage plate for 60 mm cage system compatibility. First attach the LCP11(/M) to the SM2 threads of the SM2Y1, then secure the connected adapters to the epi-fluorescence port by way of the circular dovetail on the SM2Y1 (see image to the right for alignment details). For 30 mm cage compatibility, consider using the CP38T cage plate; note that the cage plate will reduce the clear aperture.

- This dovetail designation is specific to Thorlabs products; see the *Microscope Dovetails* tab for details.
- For 60 mm cage compatibility, add the LCP11(/M) cage plate (sold separately). The CP38T can be used for 30 mm cage compatibility, but will reduce the clear aperture.

Note: Thorlabs does not guarantee compatibility with other industry-standard microscopes not explicitly mentioned on this webpage.

Part Number	Description	Price	Availability
SM2Y1	Customer Inspired! Olympus IX71 Microscope Epi-Illumination Port Adapter, Male D3Y Dovetail, Internal SM2 and SM30 Threads (One SM2RR Retaining Ring Included)	\$110.65	Today

[Hide Transmitted Illumination Port Adapters for Olympus BX41, IX71, or IX73 Microscopes](#)

Transmitted Illumination Port Adapters for Olympus BX41, IX71, or IX73 Microscopes

These transmitted illumination port adapters provide compatibility for the Olympus BX41, IX71, and IX73 series microscopes with a range of Thorlabs' optomechanical products. The SM1A14B, SM2A7, LED4A1, and SM2A13 adapters fit inside the trans-illumination port, while the LCPY1(/M) sits flush against the port. Two SM2RR retaining rings are provided with the LCPY1(/M) and can be used to secure Ø2" optics up to 1.24" (31.6 mm) thick within the optical path; other retaining rings are available for purchase separately, including thicker retaining rings for high-curvature lenses. The LCPY1/M features a small dimple indicating it is a metric part.



Connecting the LCPY1(/M) to the Transmitted Illumination Port

Note: Thorlabs does not guarantee compatibility with other industry-standard microscopes not explicitly mentioned on this webpage.

Item #	SM1A14B	SM2A7	LED4A1	SM2A13 ^a	LCPY1(/M)
Photo					
Dovetail	Male D2Y ^b				
SM Threading	Internal SM1 (1.035"-40)	Internal SM2 (2.035"-40)	External SM2 (2.035"-40)	External SM2 (2.035"-40)	Internal SM2 (2.035"-40)
Cage Compatibility	30 mm Cage (4-40 Tap, 4 Places)	-	-	-	60 mm Cage (Ø6 mm Bore, 4 Places)
Microscope Compatibility	Olympus BX41, IX71, and IX73 Transmitted Illumination Ports				
Anodization	Black	Black	Silver	Black	Black
Post Mounting Hole	-	-	-	-	8-32 (M4)


- Note when mounting a Solis[®] High-Power LED on the Olympus IX71 microscope's transmitted illumination port, a Ø2" lens tube at least as long as Item # SM2L05 is needed in conjunction with the SM2A13 adapter to prevent mechanical clashing.
- This dovetail designation is specific to Thorlabs products; see the *Microscope Dovetails* tab for details.

Part Number	Description	Price	Availability
	Customer Inspired! Olympus BX41, IX71, or IX73 Microscope Trans-Illumination Port Adapter, Male D2Y Dovetail, Internal		

LCPY1/M	SM2 Threads, 60 mm Cage Compatibility, M4 Tap	\$191.01	Today
SM1A14B	Olympus BX41, IX71, or IX73 Microscope Trans-Illumination Port Adapter, Male D2Y Dovetail, Internal SM1 Threads, 30 mm Cage Compatibility	\$87.82	Today
SM2A7	Olympus BX41, IX71, or IX73 Microscope Trans-Illumination Port Adapter, Male D2Y Dovetail, Internal SM2 Threads	\$109.88	Lead Time
LED4A1	Olympus BX41, IX71, or IX73 Microscope Trans-Illumination Port Adapter, Male D2Y Dovetail, External SM2 Threads, Silver Anodized	\$75.14	Today
SM2A13	Olympus BX41, IX71, or IX73 Microscope Trans-Illumination Port Adapter, Male D2Y Dovetail, External SM2 Threads, Black Anodized	\$109.88	7-10 Days
LCPY1	Customer Inspired! Olympus BX41, IX71, or IX73 Microscope Trans-Illumination Port Adapter, Male D2Y Dovetail, Internal SM2 Threads, 60 mm Cage Compatibility, 8-32 Tap	\$191.01	Today

[Hide Camera Port Adapter for Olympus BX or IX Microscopes](#)

Camera Port Adapter for Olympus BX or IX Microscopes

Item #	SM1A51
Photo	
Dovetail	Male D6Y
SM Threading	Internal SM1 (1.035"-40)
Cage Compatibility	30 mm Cage (4-40 Through Tap, 4 Places)
Microscope Compatibility	Olympus BX and IX Camera Ports

The SM1A51 is designed so that custom-built optical systems or detectors based on Thorlabs' components may be attached to the camera port of Olympus BX or IX Microscopes.

The SM1A51 features internal SM1 threading for Ø1" Lens Tubes and 4-40 tapped through holes on 30 mm centers for attaching cage rods. Our Scientific Cameras with internal C-mount threads can be adapted to SM1 threading using a C-Mount to SM1 adapter (Item # SM1A39), available separately. To achieve proper parfocality, we recommend using a Ø1" lens tube with 3" thread depth (Item # SM1L30) with the Olympus BX or IX microscopes and camera port adapters. In addition, an SM1-threaded dust cover (Item # SM1CP2) is included to keep the port closed when not in use.

Note: Thorlabs does not guarantee compatibility with other industry-standard microscopes not explicitly mentioned on this webpage.

Part Number	Description	Price	Availability
SM1A51	Olympus BX or IX Microscope Camera Port Adapter, Male D6Y Dovetail, Internal SM1 Threads, Black Anodized, 30 mm Cage Compatibility	\$96.22	Today

[Hide Trinocular Port Adapter for Olympus BX or IX Microscopes](#)

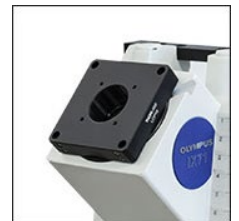
Trinocular Port Adapter for Olympus BX or IX Microscopes

Item #	LCPY2
Photo	
Dovetail	Male D5Y ^a
SM Threading	Internal SM30 (M30.5 x 0.5)
Cage Compatibility	30 mm Cage (4-40 Tap, 4 Places) 60 mm Cage (Ø6 mm Bore, 4 Places)
Microscope Compatibility	Olympus IX and BX Trinocular Ports

The LCPY2 Trinocular Port Adapter allows custom widefield viewing setups to attach to an Olympus IX or BX Microscope. This adapter utilizes a male D5Y dovetail adapter to connect to the trinocular port of the microscope; see the *Microscope Dovetails* tab for details. This adapter can only be attached by first removing the microscope's trinoculars (see image to the right).

This adapter features internal SM30 threading for Ø30 mm lens tubes; two SM30RR retaining rings are included to secure an optic inside the adapter. Through holes with side-located locking 8-32 setscrews (5/64" [2 mm] hex) can be used to attach Ø6 mm cage rods for 60 mm cage systems. The side opposite the dovetail has 4-40 tapped holes on 30 mm centers for compatibility with 30 mm cage systems.

Note: Thorlabs does not guarantee compatibility with other industry-standard microscopes not explicitly mentioned on this webpage.





LCPY2 Adapter Attached to Exposed Trinocular Port

a. This dovetail designation is specific to Thorlabs products; see the *Microscope Dovetails* tab for details.

Part Number	Description	Price	Availability
LCPY2	Olympus BX or IX Microscope Trinocular Port Adapter, Male D5Y Dovetail, Internal SM30 Threads, 30 mm Cage Compatibility	\$117.49	Today

[Hide Trinocular Adapters for Olympus Microscope Trinoculars](#)

Trinocular Adapters for Olympus Microscope Trinoculars

Item #	LCPN3	LCPY3
Photo		
Dovetail ^a	Female D5Y Male D1N ^b	Female D5Y
SM Threading	Internal SM30 (M30.5 x 0.5)	-
Cage Compatibility	60 mm Cage (Ø6 mm Bore, 4 Places)	30 mm Cage (4-40 Tap, 4 Places) 60 mm Cage (Ø6 mm Bore, 4 Places)
Microscope Compatibility	Olympus Trinoculars	

Thorlabs offers two adapters that interface with Olympus trinoculars to incorporate them into custom microscope systems. The LCPN3 and LCPY3 Trinocular Adapters utilize a female D5Y dovetail to connect to an Olympus trinocular via a side-located M4 x 0.7 setscrew (5/64" [2 mm] hex). Please note that the trinoculars must be detached from the microscope itself prior to mounting these adapters.

The LCPN3 adapter features internal SM30 (M30.5 x 0.5) threading for Ø30 mm lens tubes, providing a clear aperture of Ø1.10" (Ø27.9 mm); two SM30RR retaining rings are included to secure an optic inside the adapter. A male D1N dovetail is included on the side opposite the female D5Y dovetail, allowing for integration with the trinocular port on an Upright Nikon Eclipse, Nikon Eclipse Ti, Nikon Eclipse Ti2, or Cerna Microscope. Four through holes, each with two side-located locking setscrews (5/64" [2 mm] hex), can be used to attach Ø6 mm cage rods for 60 mm cage systems.

The LCPY3 adapter is unthreaded with a clear aperture of Ø1.26" (32.0 mm). It features four through holes with side-located locking M4 x 0.7 setscrews (5/64" [2 mm] hex) that can be used to connect 60 mm cage systems and integrate into Cerna microscope systems. Additionally, the side opposite the dovetail has 4-40 tapped holes on 30 mm centers for compatibility with 30 mm cage systems.

Note: Thorlabs does not guarantee compatibility with other industry-standard microscopes not explicitly mentioned on this webpage.

- Additional information on dovetails is available in the *Microscope Dovetails* tab.
- The LCPN3 adapter features an additional male D1N dovetail to connect to the trinocular port of a Nikon Eclipse (Upright, Ti, and Ti2) or Cerna microscope.

Part Number	Description	Price	Availability
LCPN3	Customer Inspired! Nikon Eclipse (Ti, Ti2, or Upright) and Cerna Microscope Trinocular Port Adapter, Olympus Microscope Trinocular Adapter, Male D1N Dovetail, Female D5Y Dovetail, Internal SM30 Threads, 60 mm Cage Compatibility	\$115.18	Today
LCPY3	Olympus BX or IX Microscope Trinocular Adapter, Female D5Y Dovetail, 30 mm and 60 mm Cage Compatibility	\$117.30	Today

[Hide Eyepiece Port Adapter for Olympus BX or IX Microscopes](#)

Eyepiece Port Adapter for Olympus BX or IX Microscopes

Item #	SM2Y2
Photo	
Microscope Connection	Ø1.18" Eyepiece Tube
SM Threading	Internal SM1 (1.035"-40) External SM2 (2.035"-40)

The SM2Y2 Eyepiece Port Adapter allows custom-built optical detection systems to attach to the eyepieces on the trinoculars of an Olympus IX or BX Microscope. This adapter replaces the lens element on the eyepiece that sets the image plane focus at the the back of the eyes (see image to the right). Because of the drop-in nature of the adapter, take care the attached system does not overbalance the 40 g eyepiece adapter when it is inside the trinoculars. Thorlabs recommends no more than 0.5 lbs at a distance of 5" from the adapter; the maximum torque to avoid rotation is 16.96 N•mm.

This adapter features 1.19" (30.2 mm) of internal SM1 threading for Ø1" lens tubes or optics, external SM2 threading for Ø2" lens tubes, and 4-40 tapped through holes on 30 mm centers for compatibility with a 30 mm cage system. The adapter includes two 0.08" thick



Two SM2Y2 adapters replace the lens elements of the trinocular eyepieces.

Cage Compatibility	30 mm Cage (4-40 Through Tap, 4 Places)
Microscope Compatibility	Olympus BX and IX Eyepiece Ports

SM1RR retaining rings to secure an optic inside the adapter.

Note: Thorlabs does not guarantee compatibility with other industry-standard microscopes not explicitly mentioned on this webpage.

Part Number	Description	Price	Availability
SM2Y2	Olympus BX or IX Microscope Eyepiece Port Adapter, Internal SM1 and External SM2 Threads, 30 mm Cage Compatibility	\$104.82	Today

[Hide Condenser Port Adapter for Olympus BX or IX Microscopes](#)

Condenser Port Adapter for Olympus BX or IX Microscopes

Item #	SM2Y3
Photo	
Dovetail	Male D4Y ^a
SM Threading	Internal SM2 (2.035"-40) External SM2 (2.035"-40)
Cage Compatibility	30 mm Cage (4-40 Through Tap, 4 Places)
Microscope Compatibility	Olympus BX and IX Condenser Ports

The SM2Y3 Condenser Port Adapter allows custom condenser configurations to attach to an Olympus IX or BX Microscope. The adapter utilizes a male D4Y dovetail to connect to the condenser holder of the microscope; see the *Microscope Dovetails* tab for details.

This adapter features internal and external SM2 threads for Ø2" lens tubes, achromatic doublets, or other optics as well as 4-40 tapped through holes on 30 mm centers for compatibility with a 30 mm cage system. One SM2RR retaining ring is included to secure a flat or mounted optic against the internal lip of the adapter, such as a filter or iris. The adapter lip limits the clear aperture to Ø1.5".

Note: Thorlabs does not guarantee compatibility with other industry-standard microscopes not explicitly mentioned on this webpage.



The back of the SM2Y3 adapter has internal SM2 threads and 4-40 taps for 30 mm cage compatibility.



SM2Y3 Adapter Attached to Condenser Holder of Olympus IX71

- a. This dovetail designation is specific to Thorlabs products; see the *Microscope Dovetails* tab for details.

Part Number	Description	Price	Availability
SM2Y3	Olympus BX or IX Microscope Condenser Port Adapter, Male D4Y Dovetail, Internal and External SM2 Threads, 30 mm Cage Compatibility	\$98.71	Today