

2SCM1-DC - July 20, 2020

Item # 2SCM1-DC was discontinued on July 20, 2020. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

TWO-CAMERA MOUNT FOR MICROSCOPES

- ▶ Mount Two Cameras for Two-Channel Imaging
- ▶ Compatible with Thorlabs' Cerna® Series and Other Microscopes
- ▶ Designed for Thorlabs' Scientific Cameras

2SCM1-DC Two Camera Mount on an Upright Microscope with Two 1500M-GE Scientific



[Hide Overview](#)

OVERVIEW

Features

- Microscope Adapter Allows Two Scientific Cameras to Image a Single Optical Input
- Ideal for Calcium Ratio Imaging and Electrophysiology
- Accepts 25 mm x 36 mm Dichroic Filters or Beamsplitters
- Accepts Standard Ø25 mm or Ø1" Filters on Outputs
- Fine Pitch Rotation and XY Adjustment for Image Registration
- 6 mm Coarse Focus Adjustment for Parfocalization
- Adapts to Most Standard Microscopes Using Thorlabs' Standard SM1 Interface (Microscope Camera Port Adapters Sold Separately)
- Use with ThorCam™ Image Overlay Plug-in

Thorlabs' Two-Camera Mount, designed to be used with Thorlabs' scientific cameras, can attach two cameras to a standard upright microscope, allowing simultaneous imaging of a single optical output. Typical applications include multispectral imaging using a dichroic beamsplitter; for more details please see the *Applications* tab. A rotation mount allows for 360° of rotational adjustment ($\pm 8^\circ$ fine adjustment) for the reflected camera while a translation mount gives 4 mm linear XY adjustment of the transmitted camera. Both camera ports have up to 6 mm of coarse focus adjustment by manually translating the cameras, allowing for parfocalization of both images.

The mount includes our Fluorescence Filter Cube, which is designed to hold a fluorescence filter set (dichroic mirror, excitation filter, and emission filter) as well as 25 mm x 36 mm plate beamsplitters or other optics (up to 1.1 mm thick). The filter cube consists of a base and top lid with an insert to hold filter set components and has a kinematic design for easy swapping between mounted filter sets without requiring realignment. The includes one top piece for mounting a filter set; DFM1T1 filter cube tops for mounting additional filter sets are sold separately below.

Microscope Compatibility

The input port of the 2SCM1-DC has external SM1 (1.035"-40) threading, and Thorlabs offers a line of microscope camera port adapters that will allow the 2SCM1-DC to be installed on many commercial microscopes. The 2SCM1-DC places the cameras at a distance of 4.04" to 4.16" (102.6 mm to 105.6 mm) from the camera port, which may be outside the parfocal distance of some microscopes, including inverted microscopes from Nikon and Olympus. For these microscopes, the 2SCM1-DC mount can be used if parfocality with the eyepieces is not needed.

The 2SCM1-DC mount will be parfocal with Thorlabs' Cerna® Series Microscopes and upright microscopes from Nikon and Olympus. For Olympus BX microscopes, Thorlabs offers the SM1A51 camera port adapter with SM1 threading. For both Cerna Series Microscopes and upright microscopes from Nikon, the 2SCM1-DC can be attached to the trinoc camera port using our SM1A58 camera port adapter.

Turnkey prealigned systems with cameras and three-way camera mounts are also available as custom items. Please contact ImagingSales@thorlabs.com for more details.

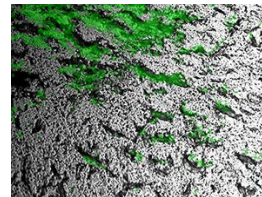
Suggested Compatible Optics

Fluorescence Imaging Filters
 (Dichroic Mirrors, Emission Filters, Excitation Filters)

Longpass and Shortpass Dichroic Mirrors

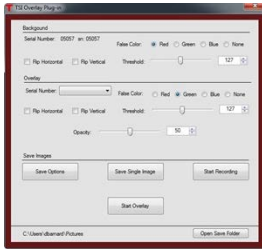
Hot and Cold Mirrors

Plate Beamsplitters



Click to Enlarge

The image above shows a live, simultaneous overlay of fluorescence and near-infrared Diod contrast images of a 50 µm brain section from a CX3CR1-GFP mouse. More details can be found on the *Applications* tab. Sample courtesy of Dr. Andrew Chojnacki, University of Calgary.



Click to Enlarge
Screenshot of ThorCam Overlay Plug-in

These camera ports are ideal for use with Thorlabs' scientific cameras, which have four 4-40 tapped holes on the front camera face for mounting to the 2SCM1-DC double camera ports.

Thorlabs' scientific cameras are based on high quantum efficiency, low-noise imagers, which make them ideal for multispectral imaging, fluorescence microscopy, and other high-performance imaging techniques. Both non-cooled and cooled versions are available. For more details about our camera families, please click on the links in the table to the right.

The ThorCam user interface provided with our scientific cameras includes a plug-in to allow for multiple live camera images to be overlaid into a real-time 2-channel composite, eliminating the need for frequent updates of a static overlay image. This live imaging method is ideal for applications such as calcium ratio imaging and electrophysiology. As seen to the left, the plug-in controls image threshold and opacity (Alpha) settings, and can apply false color to one of the two monochrome channels.

Compatible with Thorlabs' Scientific Cameras

- High Quantum Efficiency
- Low Read Noise
- Polarization Camera and Fast Frame Rate Cameras Available
- Asynchronous, Triggered, and Bulb Exposure Modes
- ThorCam GUI included
- Third-Party Software Support for LabVIEW®, MATLAB®, µManager, and Metamorph®

Scientific Cameras Selection Guide

sCMOS
2.1 MP
CMOS
2.3 MP
5.0 MP
5.0 MP Polarization Camera
8.9 MP
CCD
1.4 MP
4 MP
8 MP
200 Frames Per Second, VGA

[Hide Applications](#)

APPLICATIONS

Live Dual-Channel Imaging

Many life science imaging experiments require a cell sample to be tested and imaged under varying experimental conditions over a significant period of time. One common technique to monitor complex cell dynamics in these experiments uses fluorophores to identify relevant cells within a sample, while simultaneously using NIR or differential interference contrast (DIC) microscopy to probe individual cells. Registering the two microscopy images to monitor changing conditions can be a difficult and frustrating task.

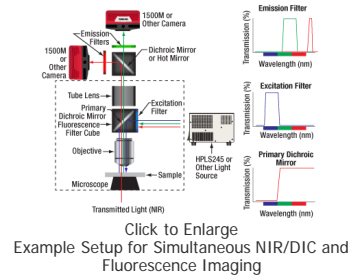
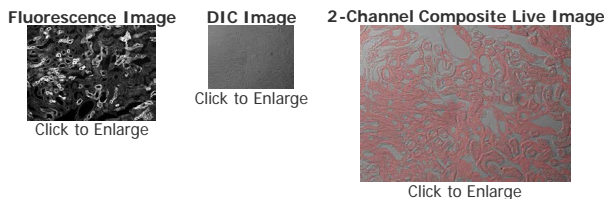
Live overlay imaging allows both images comprising the composite to be updated in real-time versus other methods that use a static image with a real-time overlay. Overlays with static images require frequent updates of the static image due to drift in the system or sample, or due to repositioning of the sample. Live overlay imaging removes that dependency by providing live streaming in both channels.

Using the ThorCam overlay plug-in with the two-way camera microscope mount, users can generate real-time two-channel composite images with live streaming updates from both camera channels, eliminating the need for frequent updates of a static overlay image. This live imaging method is ideal for applications such as calcium ratio imaging and electrophysiology.

Example Images

Simultaneous Fluorescence and DIC Imaging

The image sequence below shows mouse kidney cells imaged using a dichroic filter to separate the fluorescence and DIC signals into different cameras. These images are then combined into a two-channel composite live image with false color fluorescence by the ThorCam overlay plug-in.



Microaspiration Using a Micropipette

The image to the right shows a live, simultaneous overlay of fluorescence and DIC images. The experiment consists of a microaspiration technique using a micropipette to isolate a single neuron that expresses GFP. This neuron can then be used for PCR. This image was taken with our 1.4 Megapixel Cameras and our 2SCM1-DC Two-Camera Mount and shows the live overlay of fluorescence and DIC from the ThorCam plug-in. Image courtesy of Ain Chung, in collaboration with Dr. Andre Fenton at NYU and Dr. Juan Marcos Alarcon at The Robert F. Furchgott Center for Neural and Behavioral Science, Department of Pathology, SUNY Downstate Medical Center.



Click to Enlarge
In the image above, the pipette is visible in the DIC image as two lines near the center of the frame.

Simultaneous NIR Dot Contrast and Epi Fluorescence imaging

The image to the right shows a live, simultaneous overlay of fluorescence and near-infrared Dot contrast images of a 50 µm brain section

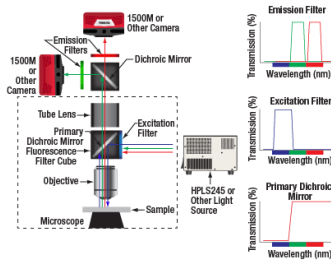


[Click to Enlarge](#)

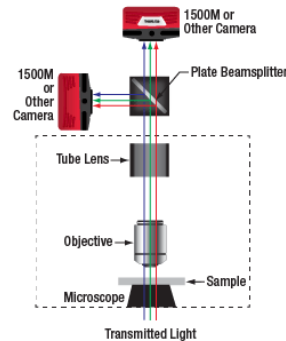
from a CX3CR1-GFP mouse, which has been immunostained for PECAM-1 with Alexa-687 to highlight vasculature. The Dotd contrast uses a quarter annulus and a diffuser to create a gradient of light across the sample that can reveal the structure of thick samples. The image was taken with our Scientific Cameras and our 2SCM1-DC Two-Camera Mount. Sample courtesy of Dr. Andrew Chojnacki, Department of Physiology and Pharmacology, Live Cell Imaging Facility, Snyder Institute for Chronic Diseases, University of Calgary.

Other Configurations

The 2SCM1-DC two-camera mount can also be utilized with other optics sharing the same 25 mm x 36 mm x 1 mm size of a standard dichroic mirror. The schematic to the left below suggest a two-camera imaging system designed for dual wavelength fluorescence imaging with a dichroic mirror. In the right schematic, a 50:50 plate beamsplitter can be used to split the signal evenly; this is useful, for example, for imaging the sample using two different cameras simultaneously.



[Click to Enlarge](#)
Example Setup for Dual Wavelength Fluorescence Imaging Using a Dichroic Mirror

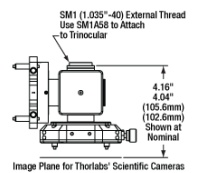


[Click to Enlarge](#)
Example Setup for Dual Wavelength Fluorescence Imaging Using a 50:50 Plate Beamsplitter

[Hide Two-Camera Mount for Upright Microscopes](#)

Two-Camera Mount for Upright Microscopes

- ▶ Microscope Adapter Allows Two Scientific Cameras to Image a Single Optical Input Simultaneously
- ▶ Optics Not Included
- ▶ Fine Pitch Rotation and XY Adjustment for Image Co-Registration
- ▶ 6 mm Coarse Focus Adjustment for Parfocalization of Cameras
- ▶ Compatible with our Cerna® Series Microscopes (See Image to the Right)



[Click for Details](#)
Mechanical Diagram of the 2SCM1-DC Double Camera Port



[Click to Enlarge](#)
The 2SCM1-DC is connected to an SFM microscope with the WFA4110 adapter, which includes a tube lens that focuses the image from the objective onto the cameras. [APPLIST]

The 2SCM1-DC mount has an SM1-threaded input port for installation on many commercial microscopes. The mount places the cameras at the appropriate parfocal distance when used with Thorlabs' Cerna® Series Microscopes as well as upright microscopes from Nikon and Olympus. For Olympus BX microscopes, Thorlabs offers the SM1A51 camera port adapter with SM1 threading. For both Cerna Series Microscopes and upright microscopes from Nikon, the 2SCM1-DC can be attached to the trinoc camera port using our SM1A58 camera port adapter.

Thorlabs' scientific cameras can be mounted using Ø6 mm cage rods. Thorlabs CCD cameras can be mounted directly, as their 4-40 tapped holes are spaced for 60 mm cage systems. Thorlabs CMOS cameras can be mounted using the LCP4S 30 mm to 60 mm cage plate adapter (sold below). The thin 4 mm profile of this adapter is required to position the camera's image plane within the adjustable focus range of the mount.

Part Number	Description	Price	Availability
2SCM1-DC	Two-Camera Mount for Upright Microscopes	\$1,909.62	Lead Time

[Hide SM1-Threaded 30 mm to 60 mm Cage Adapter, 0.16" Thick](#)

SM1-Threaded 30 mm to 60 mm Cage Adapter, 0.16" Thick

- ▶ Couples 30 mm and 60 mm Cage Systems
- ▶ Centered SM1 (1.035"-40) Tapped Hole
- ▶ Counterbore Holes for 30 mm Cage Mounting
- ▶ Through Holes for 60 mm Cage Mounting

The LCP4S Cage Adapter facilitates the mounting of our compact scientific cameras on 60 mm cage components (see image to the right), including our 2SCM1-DC two-camera mount for microscopes. The thin profile of the plate is required to position the image plane of the cameras within the adjustable focus range of the mount.

This adapter also provides a convenient means for coupling 30 mm and 60 mm cage assemblies via our Ø6 mm ER cage rods. The centered SM1 (1.035"-40) tapped hole is compatible with our SM1-threaded optomechanical components (SM1RR retaining rings sold separately). Each of the outer through holes for 60 mm cage rods is accompanied by a side-located locking 4-40 setscrew, which can be secured using a 0.05" (1.3 mm) hex key. The inner holes for 30 mm cage compatibility are counterbored for use with 4-40 x 3/16" cap screws which are sold separately (SH4S019 recommended). This cage adapter does not have a tapped hole for post mounting due to the thin profile.



[Click to Enlarge](#)
LCP4S Adapter Mounted to Quantalux® sCMOS Camera for Compatibility with 60 mm Cage Components

Part Number	Description	Price	Availability
LCP4S	Customer Inspired! 30 mm to 60 mm Cage Plate Adapter, 4 mm Thick	\$40.00	Today

[Hide Additional Dichroic Filter Inserts](#)

Additional Dichroic Filter Inserts

Additional DFM1T1 inserts allow for different filters to be swapped in and out of our 2SCM1-DC two camera mount. The kinematic design creates a repeatable alignment stop so that the system will not require realignment after the inserts are switched. The image to the right shows a fluorescence filter set being installed in the DFM1T1.



Click to Enlarge
 Each filter cube insert can hold a fluorescence filter set: one dichroic mirror, one excitation filter, and one emission filter.

Part Number	Description	Price	Availability
DFM1T1	Kinematic 30 mm Cage Cube Insert for Fluorescence Filter Sets, Right-Turning	\$270.53	5-8 Days