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THORLABS

MBD75100 - June 22, 2016

Item # MBD75100 was discontinued on June 22, 2016. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

CERNA COMPONENTS: WIDEFIELD VIEWING

- ▶ **Locate and Record Regions of Interest**
- ▶ **Trinoculars Provide Convenient Sample Viewing**
- ▶ **Double Camera Ports Separate Visible and NIR Signals**

Cerna Rig with Dedicated Visible and NIR Cameras



WFA4000
10X Trinoculars



WFA4101
0.75X Camera Tube



340M-GE
Fast-Frame-Rate Camera



[Hide Overview](#)

OVERVIEW

Features

- Trinoculars with 10X Eyepieces
- Scientific Cameras Record the Field of View
- Camera Tubes with Magnification Ranges from 1X to 0.5X
- Double Camera Ports Allow Two Cameras to be Attached Simultaneously

Trinoculars and scientific-grade cameras visualize and record sample images in the visible and near-infrared (NIR) regions of the spectrum. NIR light is particularly useful for trans-illumination modalities such as brightfield illumination, DIC imaging, and DotD contrast, as it provides improved transmission in tissue compared to visible light.

In Cerna microscopes, camera tubes are used to image the field of view (FOV) onto the camera sensor. In order to provide a balance between the size of the FOV displayed on the camera and the resolution of the microscope, we offer these camera tubes in several magnifications. For our complete selection and compatibility details, please read below.

A maximum of two cameras can be installed on a Cerna microscope simultaneously. If you would like a dual-camera setup, we offer double camera ports. These components contain optics that direct visible light and near-infrared light to separate, independently configurable cameras, adding a significant amount of experimental flexibility.

Note that the field of view will be illuminated using our epi-illumination accessories, which include liquid light guide lamps, visible LEDs, and near-infrared LEDs. For brighter illumination, our widefield viewing accessories can also be augmented by our standalone halogen lamps.

Cerna Application Support

[Contact Us](#)

Thorlabs has engineers, application specialists, and a sales team available to discuss the various Cerna options and to work with you to create a system that is optimized for your unique experimental requirements. If you would like to be contacted by a member of our team, please let us know by emailing ImagingSales@thorlabs.com.

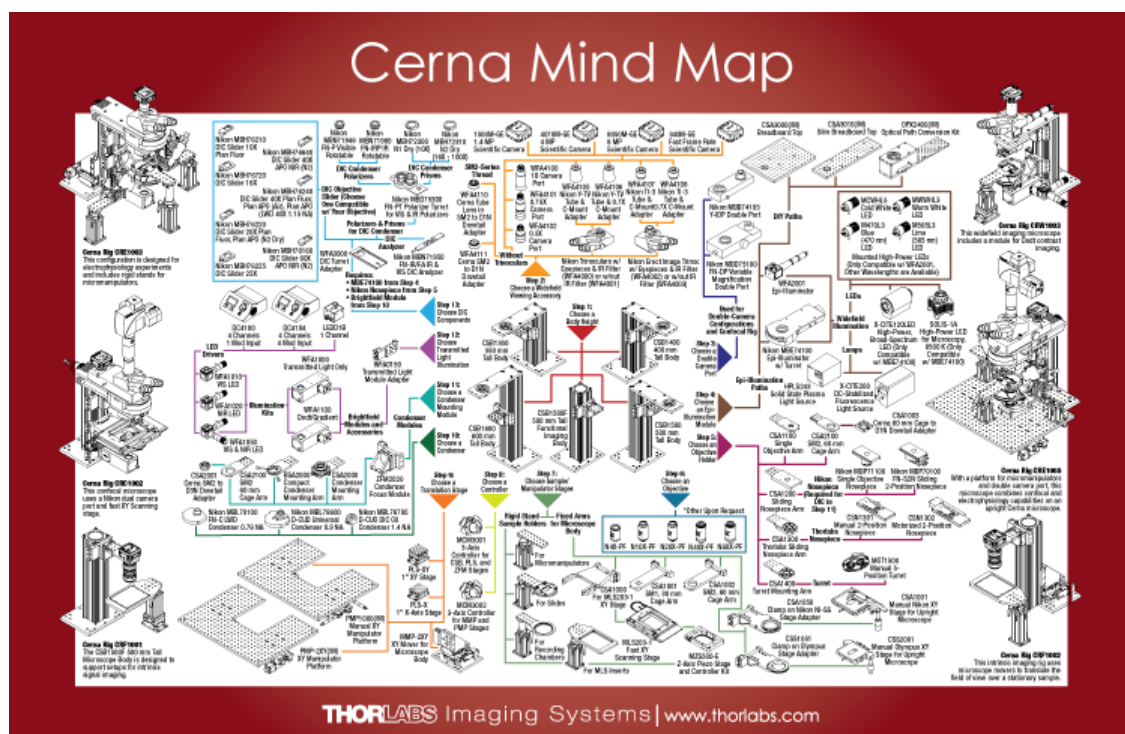
Cerna Components	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Overview	Microscope Body	Widefield Viewing	Epi-Illumination	Objectives and Objective Holders	Sample Holders	Motion Control	Trans-Illumination

[Hide Cerna Mind Map](#)

CERNA MIND MAP

The Cerna Series Mind Map is a visual tool for selecting the modules that make up a complete Cerna microscope. Created as a supplement to the information provided directly on our website, it lays out both the required and optional components in a single 11" x 17" printed sheet. We have designed it to be used as a flowchart, starting from the red arrow at the center of the document and following the steps in order.

Click here or on the image below to download a printable PDF (6 MB). The widefield viewing accessories sold on this page correspond to Steps 2 and 3 in the mind map.



[Hide Trinoculars](#)

Trinoculars



- ▶ See Visible Light in the Field of View
- ▶ Eyepieces Provide 10X Magnification and Rotate for Coarse Focusing Adjustment
- ▶ Adjustable Interpupillary Distance

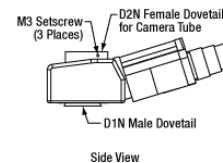
Trinoculars let you see the field of view. These trinoculars contain an optical port on the top, which is designed to accept a camera tube that is connected to a scientific camera. Attaching a camera (sold separately) lets you examine the field of view on a computer and save it to disk for later reference.

The total magnification through the eyepieces is the objective magnification multiplied by 10X. In contrast, the total magnification at the camera is the product of the objective magnification and the camera tube magnification.

In order to protect the viewer's eyes, these trinoculars contain a filter that blocks NIR light. Please note that this filter also prevents NIR signals from reaching any camera that is mounted on top of the trinoculars.

Installation

As illustrated in the drawing to the right, the bottom of the trinoculars' housing connects to the Cerna epi-illuminator module or the double camera ports sold below using a D1N male dovetail. The optical port on the top of the housing has a D2N female dovetail that mates to the WFA4105 and WFA4106 camera tubes using three setscrews (2 mm hex).



Side View
Click to Enlarge Drawing of Trinoculars

Part Number	Description	Price	Availability
WFA4000	Nikon Trinoculars with 10X Eyepieces	\$2,850.00	Today

[Hide Camera Tubes](#)

Camera Tubes



Camera tubes are required accessories for installing a camera into a Cerna microscope. They contain optics that image the sample onto the camera sensor.

In order to balance the size of the field of view (FOV) displayed on the camera against the resolution of the microscope, our camera tubes are offered in several magnifications from 1X to 0.5X. Greater magnification increases the resolution, but it also decreases the size of the FOV.

The most popular choice is 1X magnification, as it matches the design field of view (FOV) of the widefield objective.

Compatibility

Most Cerna setups use the WFA4000 Trinoculars sold above. If this includes your setup, then use the WFA4105 Camera Tube if you want fixed 1X magnification, or use the WFA4106 Camera Tube if you want fixed 0.7X magnification.

If your setup does not have trinoculars, then choose the WFA4100, WFA4101, or WFA4102 Camera Tube for 1X, 0.75X, or 0.5X magnification, respectively. As shown in the photo to the right, these camera tubes include a zoom housing (Item # SM1ZM) that provides fine focusing adjustment for the camera.

If you are planning to attach a second camera using the MBD75100 Variable Magnification Double Camera Port (sold below), the second camera does not require a camera tube.

Installation

The top of each camera tube has external C-Mount (1.000"-32) threading that accepts the scientific cameras sold below, as well as cameras from most major manufacturers. The bottom of the WFA4100, WFA4101, and WFA4102 camera tubes has a D1N male dovetail that connects directly to the epi-illuminator module. In contrast, the bottom of the WFA4105 and WFA4106 camera tubes has a D2N male dovetail that connects to the WFA4000 trinoculars sold above.

Quick Summary		
Item #	Magnification	Compatibility
WFA4100	1X	Used without Trinoculars
WFA4101	0.75X	
WFA4102	0.5X	
WFA4105	1X	Used with Trinoculars
WFA4106	0.7X	



Click to Enlarge
Fine Focus Adjuster on
Camera Tube (Available on
Item #'s WFA4100, WFA4101,
and WFA4102)

Part Number	Description	Price	Availability
WFA4100	1X Camera Tube	\$965.99	Today
WFA4101	0.75X Camera Tube	\$645.59	Today
WFA4102	0.5X Camera Tube	\$396.39	Today
WFA4105	Nikon Y-TV 1X Camera Tube with C-Mount	\$387.00	Today
WFA4106	Nikon Y-TV 0.7X Camera Tube with C-Mount	\$764.00	Today

[Hide Camera Port Adapter](#)

Camera Port Adapter



- ▶ Extends Versatility of Thorlabs' Construction Systems to Thorlabs' Cerna Microscopes
- ▶ Provides Compatibility with SM1 Lens Tubes, SM2 Lens Tubes, and 30 mm Cage Systems

The SM1A58 is designed so that custom-built optical systems or detectors based on Thorlabs' components may be attached to the camera ports with D2N dovetails on Thorlabs' Cerna Series Microscopes.

The SM1A58 features internal SM1 (1.035"-40) threading for Ø1" Lens Tubes, external SM2 (2.035"-40) threading for Ø2" Lens Tubes, and 4-40 tapped holes on 30 mm centers for attaching cage system rods. Since Thorlabs' USB CCD and CMOS cameras are provided with a C-Mount to SM1 adapter, our cameras can also be easily integrated into microscope systems for general imaging applications. For demanding imaging applications, our Scientific CCD Cameras can be attached directly to the internal SM1 threads of the SM1A58 using the SM1A39 external C-Mount to external SM1 adapter, available separately. Popular camera options for use with Cerna microscopes are sold below.

Our SM1 or SM2 lens tubes can be used to place the camera at the correct parfocal distance. For the D2N dovetail on the WFA4000 trinoculars, the camera sensor should be placed at a distance of 4.15" from the camera port; this can be achieved with a combination of the SM1A58 adapter, SM1T10 SM1 lens tube coupler, SM1L30 3" long SM1 lens tube, and SM1A9 C-Mount to SM1 adapter. When used with the rear camera port of the MBB74105 double camera port, the camera sensor should be at a distance of 1.15" from the camera port; this can be achieved with a combination of the SM1A58 adapter, SM1T10 SM1 lens tube coupler, and SM1A9 C-Mount to SM1 adapter. The space between the SM1A58 adapter and the camera can also be used for inserting custom optics and mechanical assemblies such as filter wheels or our two-camera mount.

Alternately, the SM1A58 adapter can be attached to the top of the WFA4105 camera tube if the c-mount adapter is removed by loosening the three setscrews. In this case, a 0.5" lens tube should be used to place a camera or other detector at the proper parfocal distance.

In addition, an SM1-threaded dust cover (Item # SM1CP2) is included to keep the port closed when not in use.



Click to Enlarge
The SM1A58 Camera Port Adapter Used to Mount a Thorlabs' Scientific Camera on a Cerna Series Microscope Trinoculars

Part Number	Description	Price	Availability
SM1A58	Upright Nikon Eclipse and Thorlabs Cerna Series Microscope Camera Port Adapter, Internal SM1 Threads, External SM2 Threads, 30 mm Cage Compatibility	\$74.00	Today

[Hide Double Camera Ports](#)

Double Camera Ports



- ▶ Allows Two Cameras to be Attached to the Microscope
- ▶ Useful in All Trans-Illumination Modalities
- ▶ Available with Fixed or Variable Magnification for the Rear Port

Double camera ports let you simultaneously attach two cameras to the microscope. They direct visible light to the front camera and near-infrared light to the rear camera, using a slider to choose which camera receives the signal. The use of two separate cameras, which independently detect the signals from the sample, adds a significant amount of experimental flexibility. For example, the front camera can be used for epi-fluorescence and the rear camera can be used for transmitted light imaging. Many transmitted light imaging modalities benefit from near-infrared light's increased transmission in tissue compared to visible light. Alternatively, the two cameras can simply be configured with two different emission filters, allowing two signals to be spectrally separated and detected independently.

The MBB74105 Double Camera Port provides fixed magnification for the front and rear cameras. In contrast, the MBD75100 Double Camera Port offers fixed magnification for the front camera and variable magnification of 0.35X, 2X, or 4X for the rear camera. The magnification is varied by rotating a knob on the right side of the housing.

Required Accessories

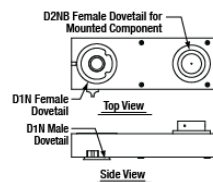
The MBB74105 fixed magnification double camera port requires one camera tube, sold above, for each camera. The choice of camera tube depends upon what magnification you want and whether you want trinoculars. In contrast, the MBD75100 variable magnification double camera port requires a camera tube, sold above, for the front camera only, since the rear camera connects directly to the MBD75100 double camera port.



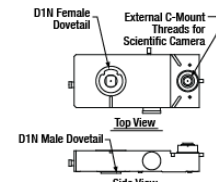
Click to Enlarge
Slider on the Side of the MBB74105 Directs Light to One Camera or the Other



Click to Enlarge
Knob on the Front of the MBD75100 Directs Light to One Camera or the Other



Click for Details
Drawing of MBB74105 Double Camera Port



Click for Details
Drawing of MBD75100 Double Camera Port

Installation

As illustrated by the drawings to the right, the bottom of the double camera port's housing has a D1N male dovetail that mates to the epi-illuminator module. The top of the double camera port's housing has two optical ports: one for the front camera and one for the rear camera. For the front camera, a D1N female dovetail and an M4 setscrew (2 mm hex) are provided that together accept either a camera tube (Item # WFA4100, WFA4101, or WFA4102) or trinoculars (Item # WFA4000). For the rear camera, the MBB74105 has a D2N female dovetail and an M4 setscrew (2 mm hex) for mounting a WFA4105 or WFA4106 camera tube, while the MBD75100 has external C-Mount (1.000"-32) threading that connects directly to the scientific camera.

Part Number	Description	Price	Availability
MBB74105	Nikon Y-IDP Fixed Magnification Double Camera Port (Camera Tubes Not Included)	\$2,010.00	Lead Time
MBD75100	Nikon FN-DP Variable Magnification Double Camera Port (Camera Tube Not Included)	\$8,519.00	Lead Time

[Hide Scientific Cameras](#)

Scientific Cameras

Scientific cameras allow the field of view to be viewed at a computer and saved for later reference. Viewing your sample from a computer also enables remote sample positioning using our motion control accessories, keeping your hands away from sensitive setups. The total magnification at the camera is the product of the objective magnification and the camera tube magnification.

The CCD cameras shown below represent the most popular choices for Cerna microscopes. Our complete range of scientific cameras includes options with higher resolution.



Click to Enlarge

340M-GE Features

- ▶ Fast 200.7 fps Frame Rate
- ▶ 1/3" Sensor Format (5.92 mm Diagonal)
- ▶ High Dynamic Range: Up to 14-Bit Digital Output
- ▶ Includes Gigabit Ethernet Cable and Card for Host PC
- ▶ Link to Full Web Presentation



Click to Enlarge

1500M-GE Features

- ▶ Large 1392 x 1040 Pixel CCD Sensor
- ▶ 2/3" Sensor Format (11 mm Diagonal)
- ▶ High Dynamic Range: 12-Bit Digital Output
- ▶ Includes Gigabit Ethernet Cable and Card for Host PC
- ▶ Link to Full Web Presentation



Click to Enlarge

4070M-GE Features

- ▶ Large 2048 x 2048 Pixel CCD Sensor
- ▶ 4/3" Sensor Format (11 mm Diagonal)
- ▶ High Dynamic Range: Up to 14-Bit Digital Output
- ▶ Includes Gigabit Ethernet Cable and Card for Host PC
- ▶ Link to Full Web Presentation



Click to Enlarge

DCU224M Features

- ▶ Ideal for Locating the Sample within the Field of View
- ▶ Large 1280 x 1024 Pixel CCD Sensor
- ▶ 1/2" Sensor Format (7.62 mm Diagonal)
- ▶ Includes USB 2.0 Cable for Host PC
- ▶ Link to Full Web Presentation

Item #	340M-GE	1500M-GE	4070M-GE	DCU224M
Primary Feature	Fast Frame Rate	High Quantum Efficiency: 60% at 500 nm	Large Field of View	Lightweight
Sensor Type	On Semi / Truesense KAI-0340 Monochrome CCD	Sony ICX285AL Monochrome CCD (Grade 0)	On Semi / Truesense KAI-04070M Monochrome CCD	Sony ICX205AL
Sensor Format	1/3" (5.92 mm Diagonal)	2/3" (11 mm Diagonal)	4/3" Format (21.4 mm Diagonal)	1/2" (7.62 mm Diagonal)

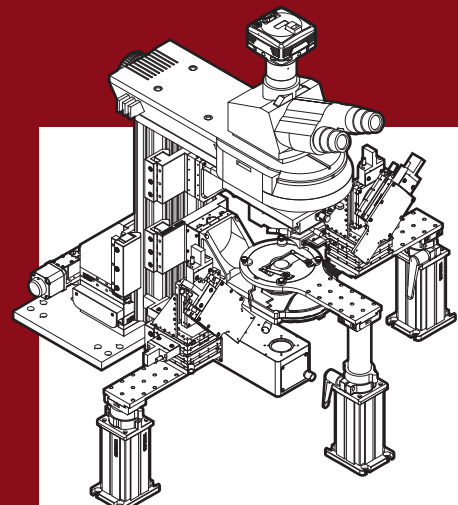
Number of Active Pixels	640 x 480 Pixels	1392 x 1040 Pixels	2048 x 2048 Pixels	1280 x 1024 Pixels
Pixel Size	7.4 μm x 7.4 μm	6.45 μm x 6.45 μm	7.4 μm x 7.4 μm	4.65 μm x 4.65 μm
Frame Rate (Max)	200.7 fps	23 fps	25.8 fps	15 fps
Host PC Interface	Gigabit Ethernet (Cable and PCI Express Card Included)			USB 2.0 (Cable Included)
Digital Output	Single Tap: 14 Bit Dual Tap: 12 Bit	12 Bits	Single Tap: 14 Bit Dual Tap: 12 Bit	8 Bits
Mass	750 g (1.65 lbs)			96 g (0.21 lbs)

Part Number	Description	Price	Availability
340M-GE	Fast Frame Rate VGA Monochrome Scientific Camera with Standard CCD Sensor, GigE	\$4,400.00	Today
1500M-GE	1.4 Megapixel Monochrome Scientific CCD Camera, Standard Package, GigE Interface	\$5,100.00	Today
4070M-GE	4 Megapixel Monochrome Scientific CCD Camera, Standard Package, GigE Interface	\$6,000.00	Today
DCU224M	CCD Camera, 1280 x 1024 Resolution, B&W, USB 2.0	\$2,184.00	Today

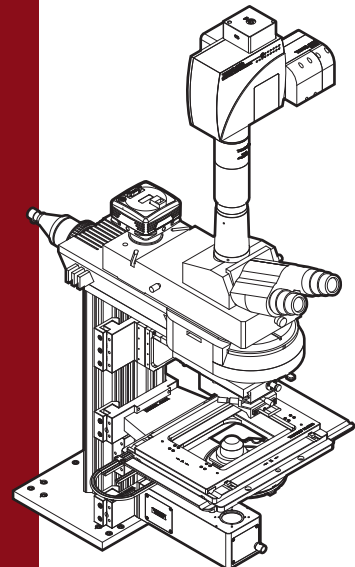
Visit the *Cerna Components: Widefield Viewing* page for pricing and availability information:

https://www.thorlabs.com/newgrouppage9_pf.cfm?objectgroup_id=8564

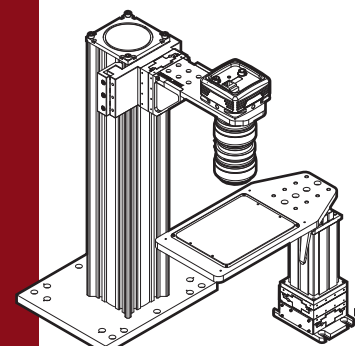
Cerna Series Microscopy Platform



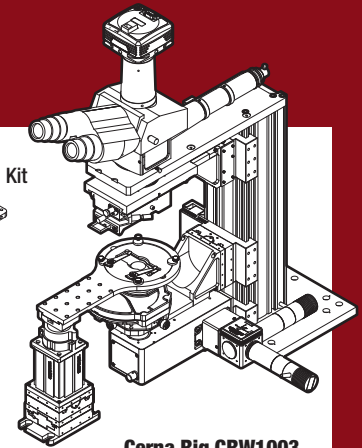
Cerna Rig CRE1003
This configuration is designed for electrophysiology experiments and includes rigid stands for micromanipulators.



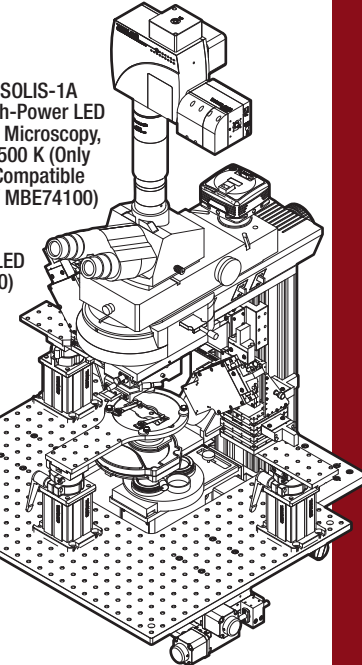
Cerna Rig CRC1002
This confocal microscope uses a Nikon dual camera port and fast XY Scanning stage.



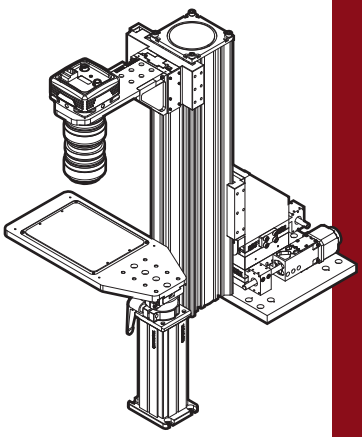
Cerna Rig CRF1001
The CSB1500F 500 mm Tall Microscope Body is designed to support setups for intrinsic signal imaging.



Cerna Rig CRW1003
This widefield imaging microscope includes a module for Ddot contrast imaging.



Cerna Rig CRE1005
With a platform for micromanipulators and double camera port, this microscope combines confocal and electrophysiology capabilities on an upright Cerna microscope.



Cerna Rig CRF1002
This intrinsic imaging rig uses microscope movers to translate the field of view over a stationary sample.

