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THORLABS

X-CITE 200 - June 22, 2016

Item # X-CITE 200 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: EPI-ILLUMINATION

- **Lamps and LEDs for Illuminating the Field of View Through the Objective**
- **Epi-Illuminator Modules Condition the Illumination and Hold Filter Cubes**
- **Filter Sets for Targeted Fluorophore Stimulation**
- **Breadboard Top for System Developers**

WFA2001
Single-Cube
Epi-Illuminator

Cerna Rig with Filter Cube Turret for Visible Epi-Fluorescence Studies

TLV-U-MF2
Filter Cube

CSA3000
Breadboard Top

Hide Overview

OVERVIEW

Features

- Epi-Illuminator Modules Hold One or up to Six Filter Cubes
- Breadboard Top for User-Designed Epi-Illuminators
- X-Cite Lamps for Broadband Illumination Throughout the Visible
- Thorlabs' LEDs Provide Intense Narrowband Illumination
- Filter Sets Optimized for the Excitation and Detection of Common Fluorophores

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.

Several components are used to construct the epi-illumination path of a Cerna microscope: the epi-illuminator module, the illumination source, filter cubes, and filter sets. These accessories guide light through the objective and aid in the generation of intense illumination across the field of view.

Epi-Illuminator Modules
Epi-illuminator modules couple light emitted by the illumination source into the optical path and onto the sample. To satisfy a range of experimental demands and budgets, we offer an epi-illuminator module that holds one filter cube as well as one that can accommodate up to six filter cubes. For system developers, we offer a breadboard top with 1/4"-20 or M6 x 1.0 taps for mounting your own epi-illumination designs.

Illumination Sources
Many illumination sources are compatible with Cerna systems, including DC-coupled, liquid light guide

Thorlabs' LEDs
Drivers for Thorlabs' LEDs

lamps; broad-spectrum LED lamps; and Thorlabs' LEDs. Liquid light guide lamps and broad-spectrum LED lamps provide broadband illumination throughout the visible portion of the spectrum, while Thorlabs' LEDs provide intense illumination within narrower wavelength ranges. Please note that the choice of epi-illuminator module limits the illumination source options available. Details are provided below.

Filter Cubes and Filter Sets

When loaded with excitation, emission, and dichroic filters, filter cubes condition the light that reaches the sample and direct light from the sample into the widefield viewing apparatus. They are held in the epi-illuminator module. Our six-cube epi-illuminator module offers a turret that makes it easy to switch between multiple cubes.

Each filter set consists of an excitation filter, an emission filter, and a dichroic mirror that together target a specific fluorophore. A selection of popular filter sets, which target BFP, Alexa Fluor® 488/GFP, mCherry, or tdTomato, is shown below. Filter sets for other fluorophores are available at our full web presentation. Our excitation and emission filters have dimensions of Ø25 mm, while our dichroic mirrors have dimensions of 25 mm x 36 mm. These are the industry-standard sizes, making Cerna microscopes compatible with filters from all major manufacturers.

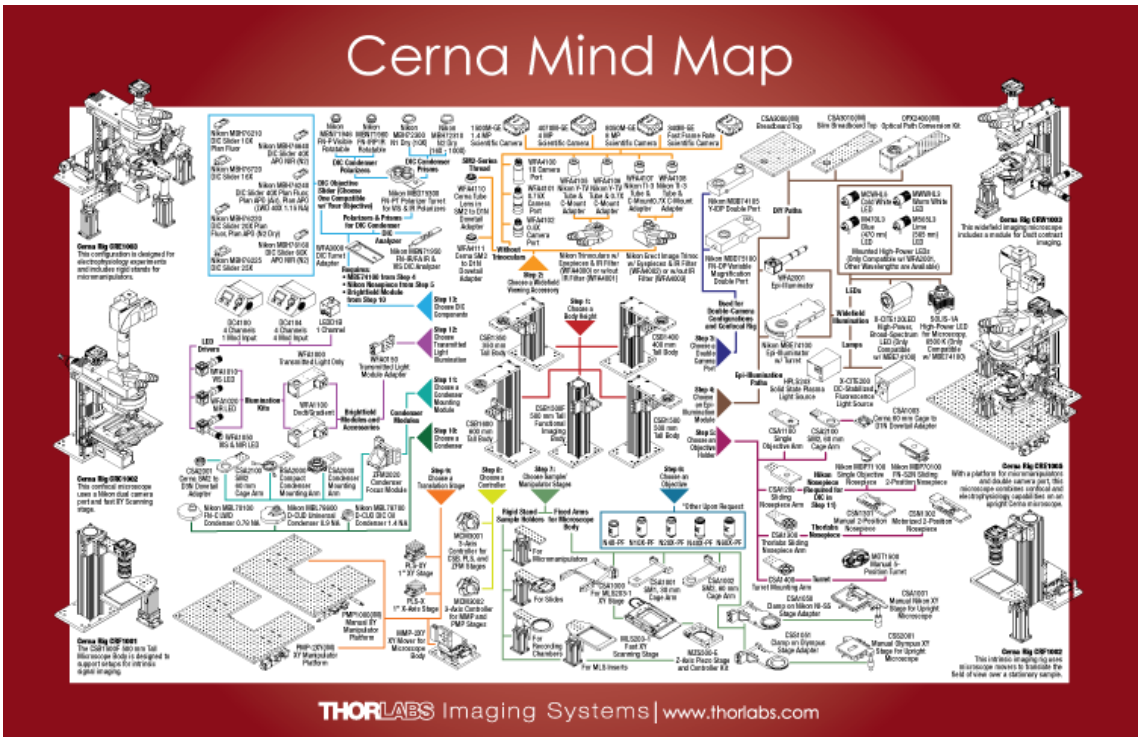
Cerna Components	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Overview	Microscope Body	Widefield Viewing	Epi-Illumination	Objectives and Objective Holders	Sample Holders	Motion Control	Trans-Illumination

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.

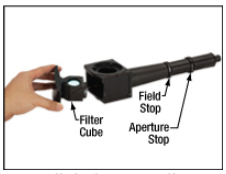
Click here or on the image below to download a printable PDF (6 MB). The epi-illumination accessories sold on this page correspond to Step 4 in the mind map.



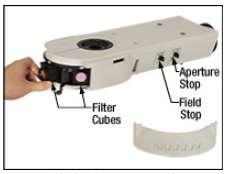
Hide Epi-Illuminator Modules and Filter Cubes

Epi-Illuminator Modules and Filter Cubes

- Couple Light from the Epi-Illumination Source into the Optical Path
- Tune Illumination Conditions at Sample using Field Stop, Aperture Stop, and Filter Cubes
- Single-Cube Epi-Illuminator: Targeted Illumination of a Single Fluorophore
- Six-Cube Epi-Illuminator: Visualize Multiple Fluorophores by Rotating a Turret



Click for Details
Filter Cube in Single-Cube Epi-Illuminator



Click for Details
Filter Cube Turret in Six-Cube Epi-Illuminator

Installation of a Filter Set and Filter Cube into the Single-Cube Epi-Illuminator

Cerna epi-illuminator modules are positioned on top of the microscope body, placing them in the optical path after the epi-illumination source and before the objective. They contain a port on the back that accepts either a lamp or an LED.

Single-Cube Epi-Illuminator
The WFA2001 Epi-Illuminator holds one filter cube (sold separately), making it best suited for setups that only require epi-fluorescence at a single wavelength. It is compatible with Thorlabs' LEDs with SM1 (1.035"-40) mounting threads, as well as with lamps that have Ø3 mm liquid light guides, such as the X-CITE 200. Its aperture and field stops are adjusted by rotating the knurled rings on the exterior of the housing, shown in the image to the right.

Six-Cube Epi-Illuminator
For setups that require the flexibility to target multiple fluorophores, we recommend the MBE74100 Epi-Illuminator, which houses a turret that readily switches between up to six filter cubes (sold separately). It is compatible with lamps that have a Nikon bayonet mount, such as the X-CITE 200 and X-CITE120LED. Its aperture and field stops are adjusted by pushing and pulling the tabs on the side of the housing, shown in the image to the right.

Compatibility
Please note that the WFA2001 single-cube and MBE74100 six-cube epi-illuminator modules are not compatible with all of our illumination sources. The table below shows which illumination sources the epi-illuminators will accept. These epi-illuminators also accept different filter cube models, so refer to the table for compatibility.

We offer Thorlabs-manufactured filter cubes and OEM filter cubes. Thorlabs' Filter Cubes are interchangeable with the OEM filter cubes and offer a number of design improvements, including simplified optic mounting and reduced dichroic mirror stress for improved imaging. Note that the OEM filter cubes utilize plastic in their construction, while Thorlabs' filter cubes have aluminum bodies. If Thorlabs and OEM cubes are mixed in a filter cube turret, it is important to place matching filter cubes opposing each other to maintain balance and prevent unnecessary wear.

If you would like to perform DIC imaging, choose the six-cube epi-illuminator (Item # MBE74100), as the single-cube epi-illuminator is not compatible with DIC imaging.

Installation
The top of the epi-illuminator module contains a D1N female dovetail and an M4 setscrew (2 mm hex) that together accept either trinoculars (Item # WFA4000) or

a camera tube (Item # WFA4100, WFA4101, or WFA4102). The bottom of the epi-illuminator module contains a D1N male dovetail that is secured to the Cerna microscope body, which contains a mating D1N female dovetail and an M4 setscrew (2 mm hex) to lock the dovetails together. Details on the installation of illumination sources are given below.

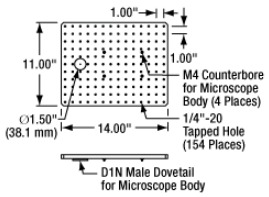
Options	WFA2001	MBE74100
Photo (Click to Enlarge)		
Number of Filter Cubes (Filter Cubes Sold Separately)	One	Up to Six
Interfaces for Illumination Sources	SM1 Threads Ø3 mm Hole	Nikon Eclipse Bayonet Mount
Compatible Illumination Sources (Sold Below)	Thorlabs' LEDs Liquid Light Guide Lamps	Broad-Spectrum LED Lamps Liquid Light Guide Lamps
Compatible with DIC Imaging	No	Yes
Compatible Filter Cube Item #	Thorlabs: TLV-U-MF2 OEM: MDFM-MF2	Thorlabs: TLV-TE2000 OEM: MDFM-TE2000

Part Number	Description	Price	Availability
WFA2001	**Single-Cube Epi-Illuminator (Filter Cube Not Included)**	**$1,661.18**	**Today**
MBE74100	**Nikon D-FL Epi-Illuminator for Six Filter Cubes (Filter Cubes Not Included)**	**$2,797.00**	**Lead Time**
TLV-U-MF2	**Customer Inspired!Microscopy Cube Assembly for Olympus AX, BX2, IX2**	**$441.00**	**Lead Time**
TLV-TE2000	**Customer Inspired!Microscopy Cube Assembly for Nikon TE2000, Eclipse Ti**	**$398.00**	**Today**
MDFM-MF2	**OEM Microscopy Cube Assembly for Olympus AX, BX2, IX2**	**$473.89**	**Today**
MDFM-TE2000	**OEM Microscopy Cube Assembly for Nikon TE2000, Eclipse Ti**	**$466.60**	**Today**

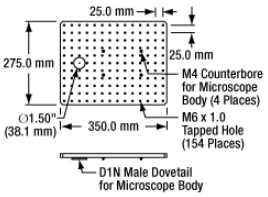
Hide Breadboard Top for Custom Epi-Illuminators

Breadboard Top for Custom Epi-Illuminators

- Build Your Own Epi-Illumination Pathway
- Ø1.5" Through Hole Centered on Optical Path
- 14" x 11" (350 mm x 275 mm) Surface Area



Click for Details
Drawing of Imperial Breadboard Top



Click for Details
Drawing of Metric Breadboard Top

These anodized aluminum breadboard tops allow system developers to integrate a custom-designed optical pathway into the top of a Cerna microscope. They can be used as an alternative to the WFA2001 and MBE74100 epi-illuminator modules, or they can be stacked on top of those modules. Each breadboard contains a Ø1.5" through hole that is centered on the microscope's optical path. The imperial version (Item # CSA3000) contains 154 1/4"-20 tapped holes at 1" spacings, while the metric version (Item # CSA3001) contains 154 M6 x 1.0 tapped holes at 25 mm spacings.

Installation

A D1N male dovetail and four M4 counterbored holes align the breadboard top to the Cerna microscope body. The microscope body contains a mating D1N female

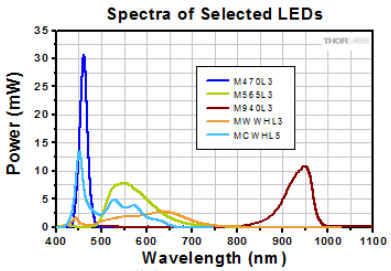
dovetail and an M4 setscrew (2 mm hex) to lock the dovetails together. The counterbored holes are not used when stacking the breadboard on top of an epi-illuminator module.

Part Number	Description	Price	Availability
CSA3001	Breadboard Top, M6 x 1.0 Taps	$992.15	Lead Time
CSA3000	Breadboard Top, 1/4"-20 Taps	$992.15	Today

Hide LEDs for Single-Cube Epi-Illuminator

LEDs for Single-Cube Epi-Illuminator

- Long Lifetimes (>10,000 Hours for LEDs Shown Here)
- Stable Output Intensity via Optimized Thermal Management
- Output can be Modulated with Suitable Driver
- Integrated EEPROM for Automated Driver Configuration
- Only Compatible with WFA2001 Single-Cube Epi-Illuminator



Click to Enlarge

These LEDs emit at important visible and NIR wavelengths and represent our most popular LEDs for the life sciences. We offer a much wider range of LEDs than the five presented here, at wavelengths from 280 nm to 1550 nm, all of which are compatible with Cerna rigs. For our full selection, please see their full web presentation.

Required Accessories
Please note that a driver, sold separately, is required to power the LED. Please refer to the LED Drivers section below for more information.

Compatibility with Epi-Illuminators
Our single-cube epi-illuminator module (Item # WFA2001) was specifically designed to accommodate these LEDs. These LEDs are not compatible with the six-cube epi-illuminator module (Item # MBE74100).

Installation
The LED housing and the WFA2001 epi-illuminator both have internal SM1 (1.035"-40) threads. To connect the LED to the epi-illuminator, we provide with the WFA2001 an externally threaded SM1 coupler (Item # SM1T10), which includes two knurled locking rings that are tightened by hand.

Item #[a]	Color[b,c]	Output Power (Typical)[b]	Compatible Drivers
M470L3	Blue (470 nm)	710 mW	LEDD1B DC2200 DC4100 DC4104 (See Below for Details)
M565L3	Lime (565 nm)	979 mW	
M940L3	IR (940 nm)	1000 mW	
MWWHL3	Warm White (3000 K[d])	550 mW	
MCWHL5	Cold White (6500 K[d])	840 mW	
Full Web Presentation for LEDs			

- We offer a much wider range of LEDs than the four presented here, at wavelengths from 280 nm to 1550 nm, all of which are compatible with Cerna rigs. For our full selection, please see their full web presentation.
- Output power and nominal wavelength specs are only intended to be used as a guideline.
- For LEDs in the visible spectrum, the nominal wavelength indicates the wavelength at which the LED appears brightest to the human eye.
- Correlated Color Temperature.

Part Number	Description	Price	Availability
M470L3	Blue (470 nm) Mounted LED, 1000 mA, 650 mW (Min)	$268.00	Today
M565L3	Lime (565 nm) Mounted LED, 1000 mA, 880 mW (Min)	$211.00	Today
M940L3	IR (940 nm) Mounted LED, 1000 mA, 800 mW (Min)	$211.00	Today
MCWHL5	Cold White Mounted LED, 1000 mA, 800 mW (Min)	$193.00	Today

Hide LED Drivers

LED Drivers

These drivers supply intensity control and current for Thorlabs' LEDs.

Click to Enlarge

LEDD1B Features

- Sufficient Current and Voltage to Drive *Most* of Thorlabs' LEDs
- Allows Intensity Modulation of a Single LED
- Very Compact Footprint: 60 mm x 73 mm x 104 mm (W x H x D)

Click to Enlarge

DC2200 Features

- Sufficient Current and Voltage to Drive *Any* of Thorlabs' LEDs
- Allows Intensity Modulation of a Single LED
- Provides Automated LED Current Control
- Touchscreen Display

Click to Enlarge

DC4100 Features

- Sufficient Current and Voltage to Drive *Most* of Thorlabs' LEDs
- Allows Intensity Modulation of 4 LEDs Together
- Provides Automated LED Current Control
- LCD Display

Click to Enlarge

DC4104 Features

- Sufficient Current and Voltage to Drive *Most* of Thorlabs' LEDs
- Allows Independent Intensity Modulation of 4 LEDs
- Provides Automated LED Current Control
- LCD Display

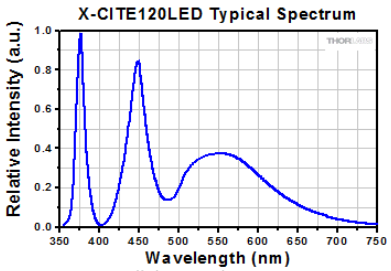
Specifications				
Item #	**LEDD1B**	**DC2200**	**DC4100**	**DC4104**
Number of LEDs	One	One	Up to Four	Up to Four
Current Output	1.2 A (Max)	10.0 A (Max)	1.0 A per Channel (Max)	1.0 A per Channel (Max)
Voltage Output	12 V (Max)	50.0 V (Max)	5 V (Max)	5 V (Max)
Modulation Frequency Using External Input	5 kHz (Max)	250 kHz (Max)	100 kHz (Max) (Simultaneous Across all Channels)	100 kHz (Max) (Independently Controlled Channels)
External Control Interface(s)	Analog (BNC)	USB 2.0 and Analog (SMA) (Includes SMA to BNC Cable)	USB 2.0 and Analog (BNC)	USB 2.0 and Analog (8-Pin)
Automated LED Configuration	No	Yes	Yes	Yes
Display	None	Touchscreen	LCD	LCD
Link to Full Web Presentation	Full Web Presentation	Full Web Presentation	Full Web Presentation	Full Web Presentation
Required Accessories	KPS101 Power Supply	None	DC4100-HUB Connector Hub	

Part Number	Description	Price	Availability
LEDD1B	**T-Cube LED Driver, 1200 mA Max Drive Current (Power Supply Not Included)**	**$293.00**	**Today**
KPS101	**15 V, 2.4 A Power Supply Unit for One K-Cube or T-Cube**	**$25.71**	**Today**
DC2200	**High-Power 1-Channel LED Driver with Pulse Modulation, 10.0 A Max, 50.0 V Max**	**$1,995.00**	**Lead Time**
DC4100	**4-Channel LED Driver, 1 Modulation Input, 1 A, 5 V**	**$2,580.00**	**Today**
DC4104	**Customer Inspired!4-Channel LED Driver, 4 Modulation Inputs, 1 A, 5 V**	**$2,840.00**	**Today**
DC4100-HUB	**Single LED Connector Hub for DC4100**	**$309.00**	**Today**

Hide Broad-Spectrum LED Lamp for Six-Cube Epi-Illuminator

Broad-Spectrum LED Lamp for Six-Cube Epi-Illuminator

- Long Lifetime (>25,000 Hours for LED)
- Stable Output Intensity and Automated Thermal Management
- Output can be Modulated via BNC Input, RS-232, or USB
- Only Compatible with MBE74100 Six-Cube Epi-Illuminator



Click to Enlarge

The X-CITE120LED is a broad-spectrum LED lamp that emits from 370 to 700 nm. Its broadband emission makes it best suited for setups that require the flexibility to stimulate fluorophores whose absorption wavelengths are spectrally separated. It is designed to be used in combination with filter cubes loaded into the MBE74100 six-cube epi-illuminator, which help condition the light from the lamp to target specific fluorophores. An output spectrum provided by the manufacturer is shown to the right.

A knobbed controller is included with this lamp for manual intensity control. The lamp will also accept external modulation signals provided via BNC, RS-232, or USB.

Compatibility with Epi-Illuminators
To use this lamp with a Cerna microscope, the MBE74100 six-cube epi-illuminator module is required. Our single-cube epi-illuminator module is not compatible with this lamp.

Installation
The lamphouse port is equipped with a Nikon Eclipse bayonet mount that is inserted into the MBE74100 epi-illuminator. The mating port on the epi-illuminator has a knurled locking ring that is rotated to lock the lamphouse in place.

Part Number	Description	Price	Availability
X-CITE120LED	Broad-Spectrum LED Lamp	$6,495.00	Lead Time

Hide Liquid Light Guide Lamps for Epi-Illuminators

Liquid Light Guide Lamps for Epi-Illuminators

These lamps use flexible cables known as liquid light guides (LLGs) to deliver broad-spectrum visible light into the epi-illuminator. Their broadband emission makes them best suited for setups that require the flexibility to stimulate fluorophores whose absorption wavelengths are spectrally separated. They are designed to be used in combination with filter cubes loaded into the epi-illuminator, which help condition the light from the lamp to target specific fluorophores.

Compatibility with Epi-Illuminators
The lamps shown here are compatible with both the WFA2001 single-cube and MBE74100 six-cube epi-illuminator modules.

Click to Enlarge

Click to Enlarge

HPLS243 Features

- Output Spectrum: 400 - 700 nm
- Intensity is Variable from 0% to 100% via Soft-Touch Front Panel
- External Control via USB 2.0
- >10,000 Hour Lifetime (After 10,000 Hours, the Intensity will be 50% of the Original Intensity)
- Includes Ø3 mm, 1.2 m (4') Long LLG
- Requires LLG3A5-A Collimating Adapter when used with MBE74100 Epi-Illuminator
- Link to Full Web Presentation

Installation

Our WFA2001 single-cube epi-illuminator ships with an adapter that directly accepts the LLG; simply insert the LLG and secure it using the included thumbscrew.

The back of the MBE74100 six-cube epi-illuminator contains a port that accepts Nikon Eclipse bayonet mounts. Connect our LLG3A5-A collimating adapter (sold separately) to the LLG, securing the adapter with the included 4-40 setscrew (0.050" hex). Then insert the adapter to the mating port on the epi-illuminator, rotating the knurled ring to lock it in place.

X-CITE 200 Features

- Output Spectrum: 340 - 800 nm
- Intensity is Variable from 0% to 100% Using Knob
- External Control via BNC Input
- >2,000 Hour Minimum Lifetime; >2,500 Hour Typical Lifetime
- Includes Ø3 mm, 5' (1.5 m) Long LLG

Installation

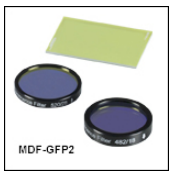
Our WFA2001 single-cube epi-illuminator ships with an adapter that directly accepts the LLG; simply insert the LLG and secure it using the included thumbscrew.

The back of the MBE74100 six-cube epi-illuminator contains a port that accepts Nikon Eclipse bayonet mounts. Connect the collimating adapter included with the X-CITE 200 to the LLG, securing the adapter with the provided thumbscrew. Then insert the adapter to the mating port on the epi-illuminator, rotating the knurled ring to lock it in place.

Part Number	Description	Price	Availability
HPLS243	**Plasma Light Source with Ø3 mm, 4 ft (1.2 m) Liquid Light Guide**	**$3,920.00**	**Today**
X-CITE 200	**DC-Coupled Lamp with Liquid Light Guide**	**$6,495.00**	**Today**
LLG3A5-A	**Ø3 mm LLG Collimating Adapter, Nikon Eclipse Ti, ARC: 350-700 nm**	**$407.00**	**Today**

Hide Filter Sets

Filter Sets



- Used for Epi-Fluorescence Studies
- Tune Light from the Illumination Source to Detect Specific Fluorophores with Widefield Viewing
- Each Set Consists of an Excitation Filter, an Emission Filter, and a Dichroic Mirror
- Available Target Fluorophores: BFP, Alexa Fluor® 488/GFP, mCherry, and tdTomato
- Other Filter Sets at our Complete Web Presentation

Filter Transmission Spectra		
Item #	**Target Fluorophore**	**Transmission Graph (Click for Plot)**
MDF-BFP	BFP	
MDF-GFP2	Alexa Fluor® 488 GFP	
MDF-MCHA[a]	mCherry	
MDF-MCHC[b]	mCherry	
MDF-TOM	tdTomato	

Epi-fluorescence filter sets are inserted into filter cubes (sold above) to condition the light emitted by the illumination source for the detection of specific fluorophores. The filters shown here are designed for four popular fluorophores: BFP, Alexa Fluor® 488, mCherry, or tdTomato. Each set consists of an excitation filter, an emission filter, and a dichroic filter. Their transmission curves are given in the table to the right.

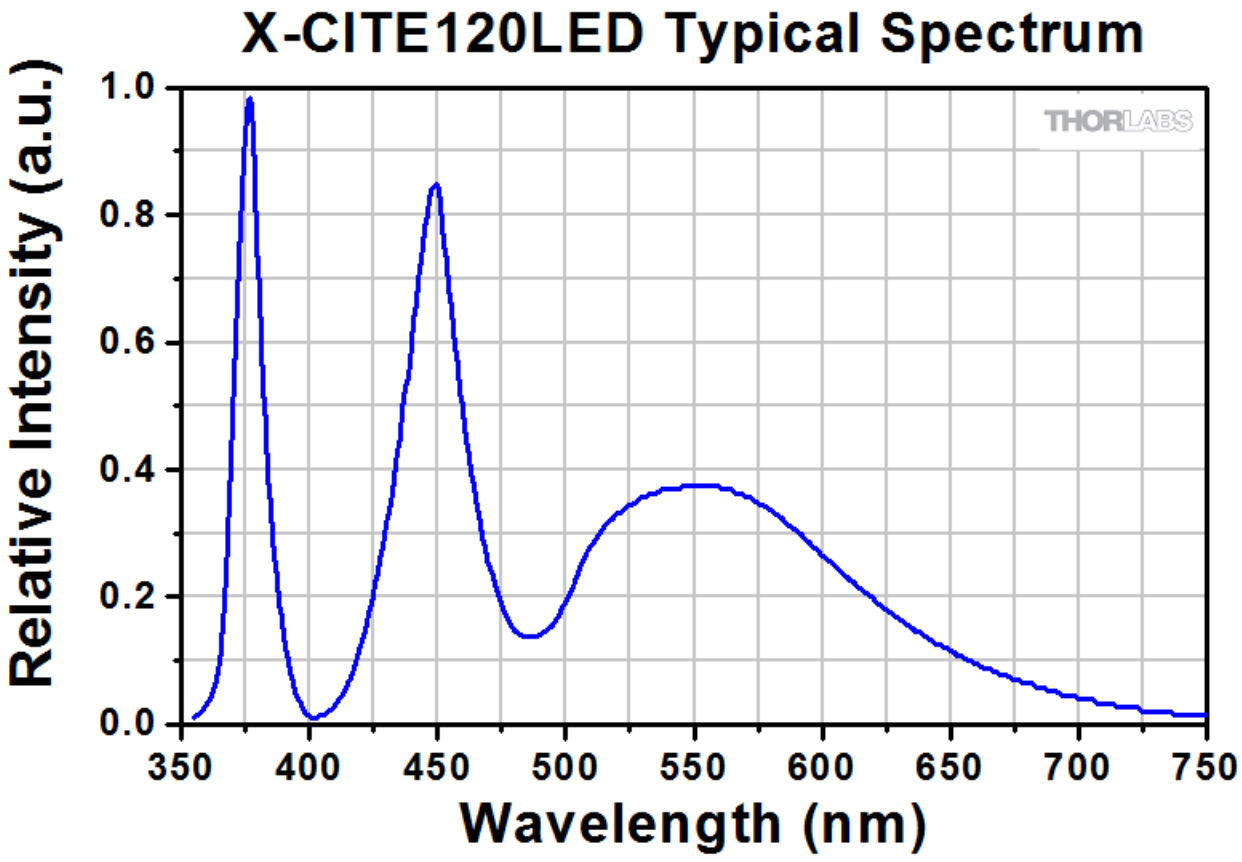
- This filter set's excitation range is centered around 578 nm, making it well matched to typical LEDs.
- This filter set's excitation range is centered around 562 nm, making it well matched to typical lamps.

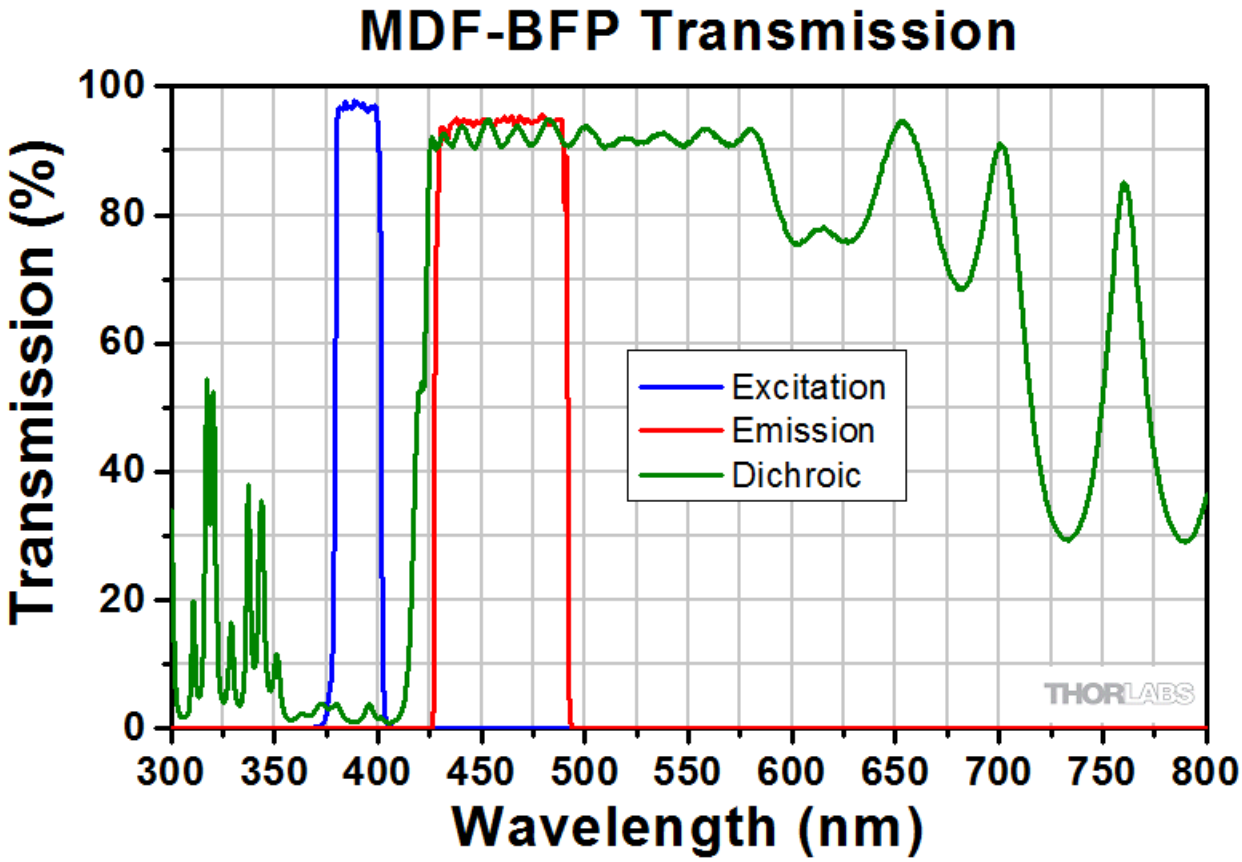
Our filters come in the industry-standard sizes. For excitation and emission filters, the standard dimensions are Ø25 mm, while for dichroic mirrors, the standard dimensions are 25 mm x 36 mm. This allows Cerna microscopes to be compatible with filters from all major manufacturers.

It is important to install the filters in the right position in the filter cube to maximize signal generation and collection efficiency. The excitation filter should face horizontally, toward the epi-illuminator module; the emission filter should face vertically, toward the trinoculars and/or scientific camera; and the side of the dichroic filter with the dichroic coating, which is marked at the factory, should be oriented download, toward the sample.

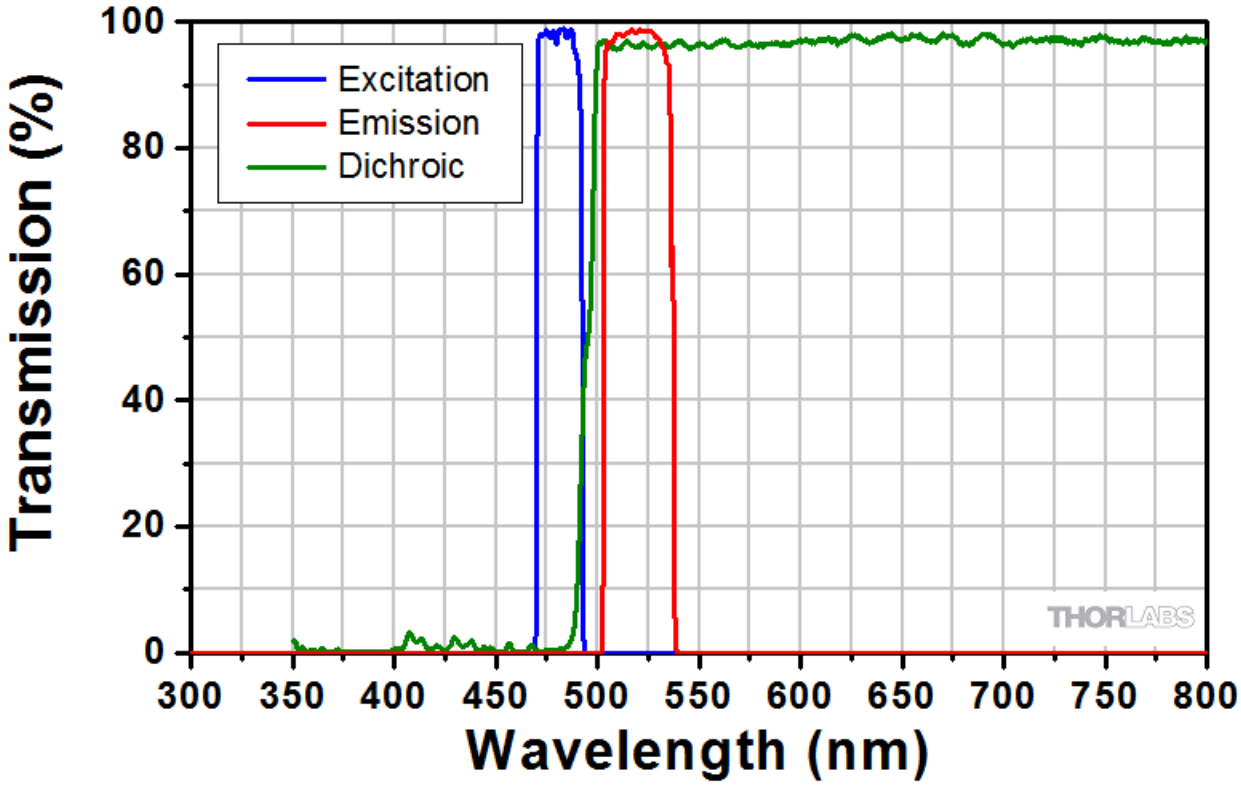
Part Number	Description	Price	Availability
MDF-BFP	BFP Excitation, Emission, and Dichroic Filters (Set of 3)	$625.00	Today
MDF-GFP2	Alexa Fluor® 488 Excitation, Emission, and Dichroic Filters (Set of 3)	$785.00	Today
MDF-MCHA	mCherry-A Excitation, Emission, and Dichroic Filters for LEDs (Set of 3)	$785.00	Today
MDF-MCHC	mCherry-C Excitation, Emission, and Dichroic Filters for Lamps (Set of 3)	$785.00	Today
MDF-TOM	tdTomato Excitation, Emission, and Dichroic Filters (Set of 3)	$785.00	Today

Visit the *Cerna Components: Epi-Illumination* page for pricing and availability information:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=8565

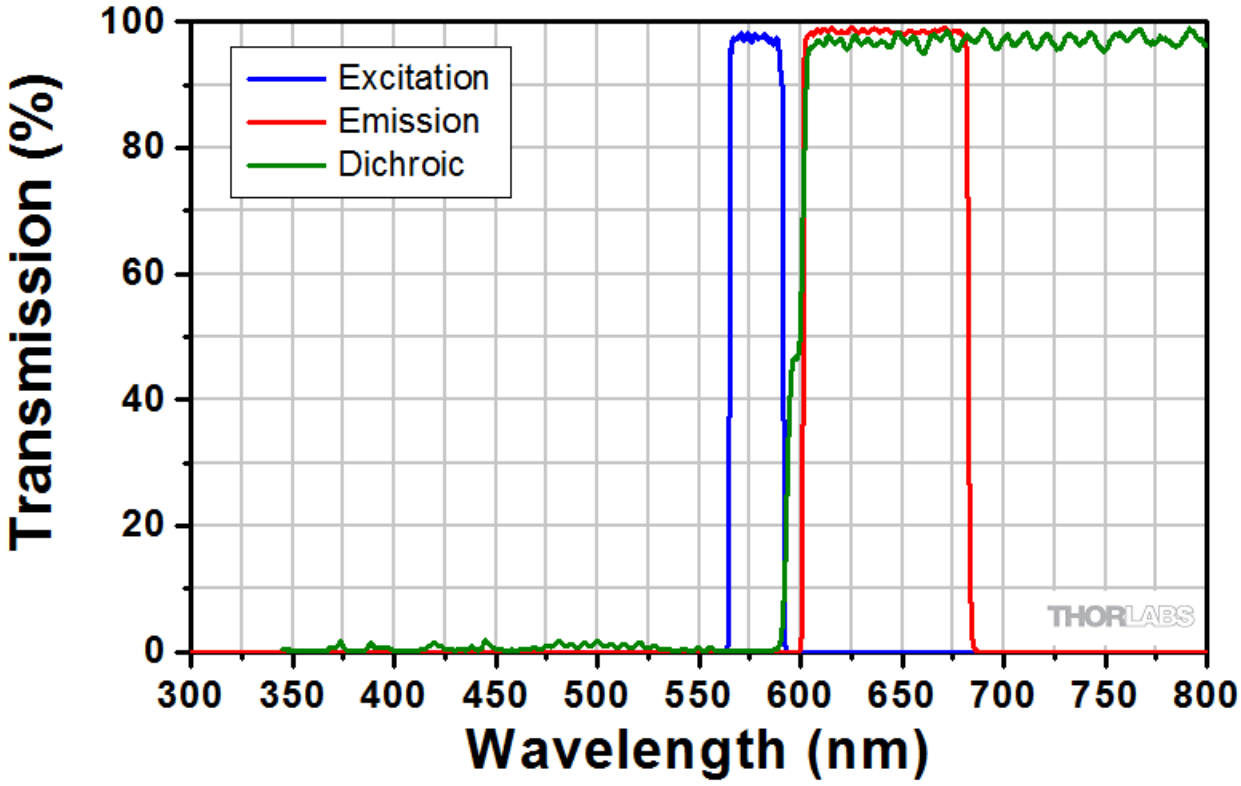

X-CITE120LED Typical Spectrum
Relative Intensity (a.u.)
1.0
0.8
0.6
0.4
0.2
0.0
350
400
450
500
550
600
650
700
750
Wavelength (nm)
THORLABS


MDF-BFP Transmission
Transmission (%)
100
80
60
40
20
0
300
350
400
450
500
550
600
650
700
750
800
Wavelength (nm)
Excitation
Emission
Dichroic
THORLABS

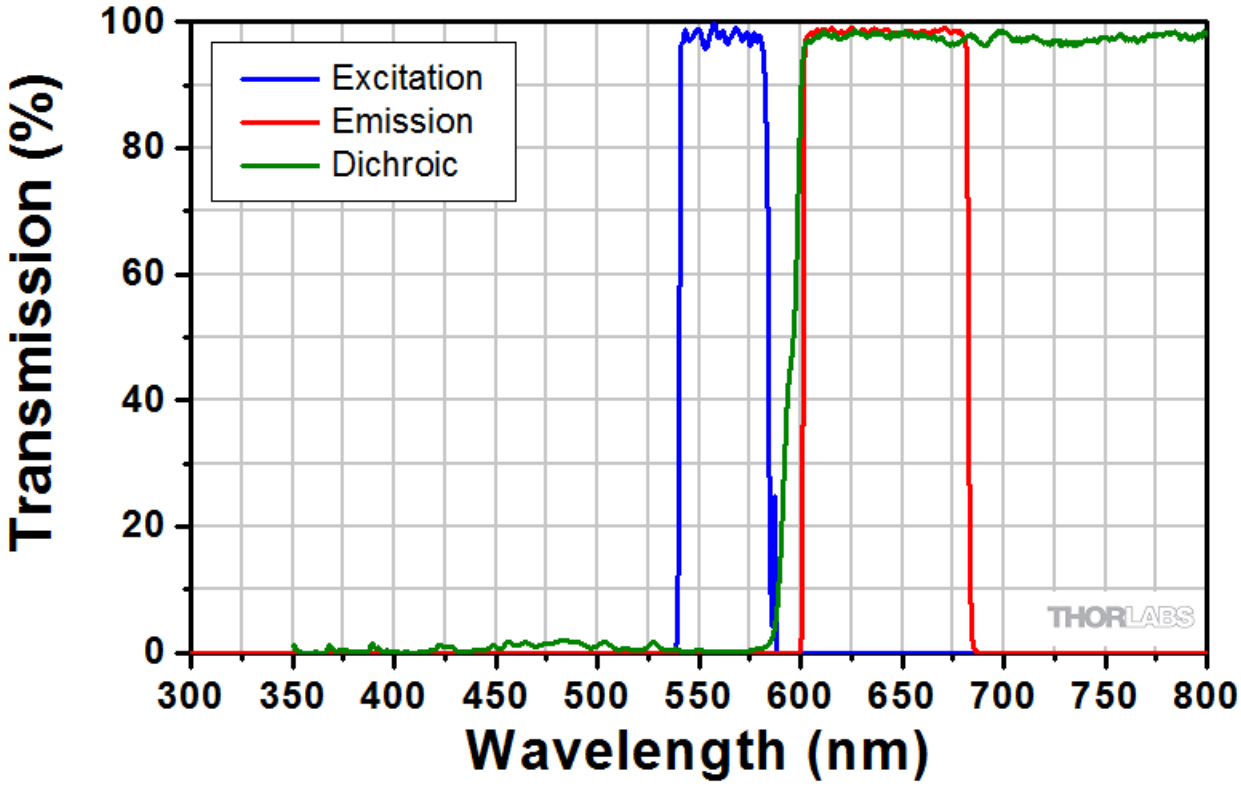
MDF-GFP2 Transmission



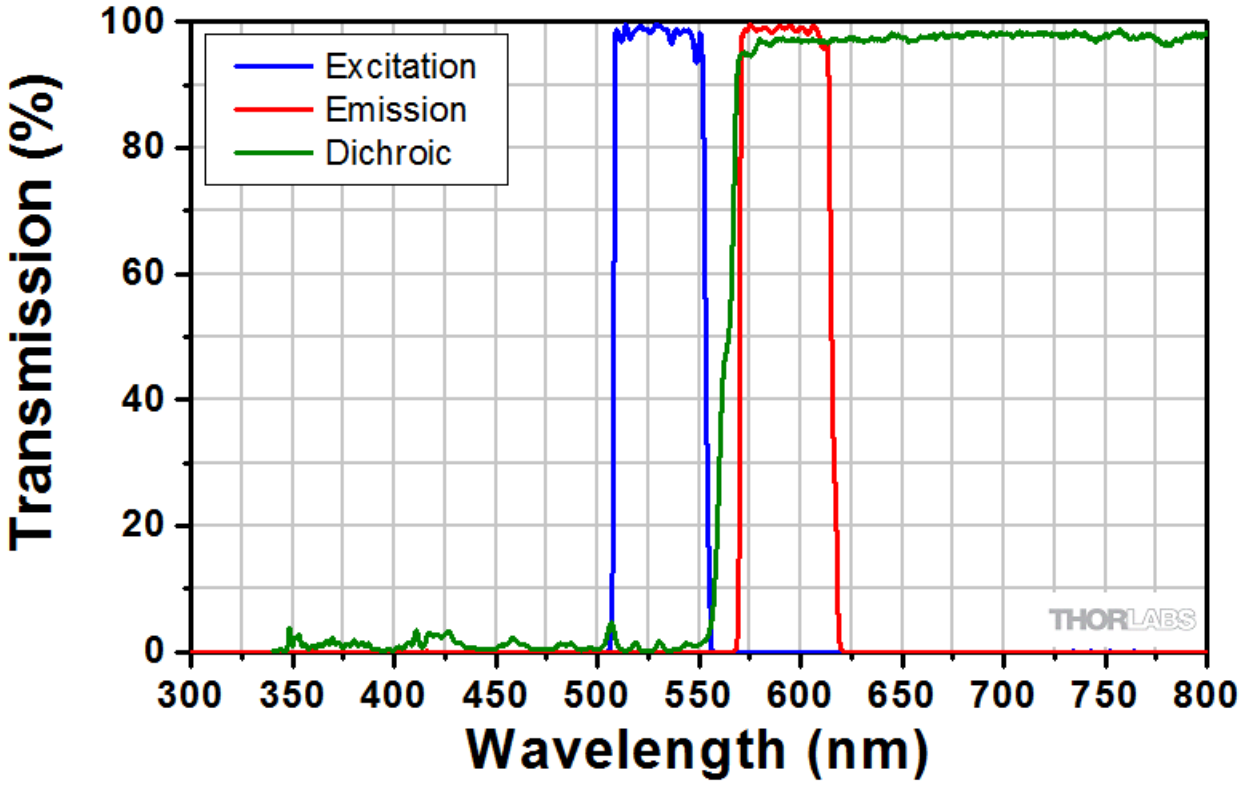
MDF-MCHA Transmission



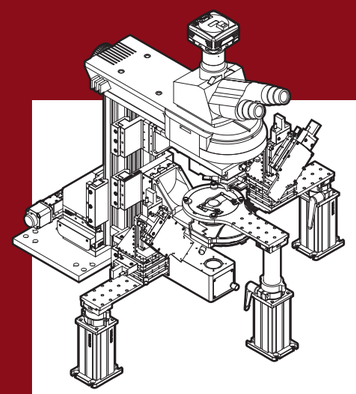
MDF-MCHC Transmission



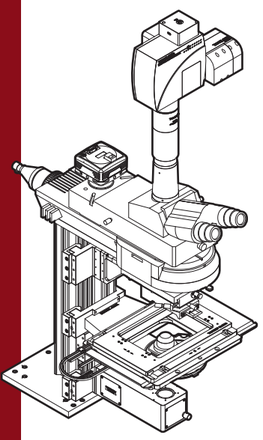
MDF-TOM Transmission



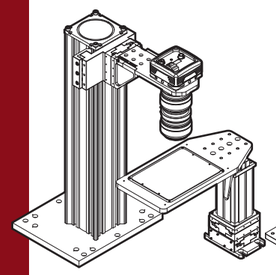
Cerna Series Microscopy Platform



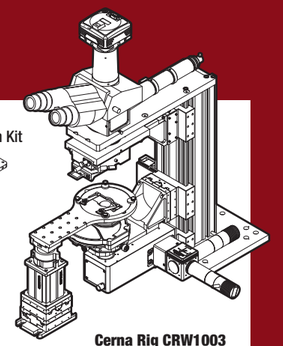
Cerna Rig CRE1003
This configuration is designed for electrophysiology experiments and includes rigid stands for micromanipulators.



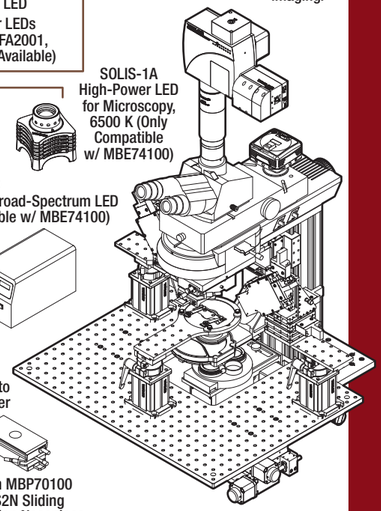
Cerna Rig CRC1002
This confocal microscope uses a Nikon dual camera port and fast XY Scanning stage.



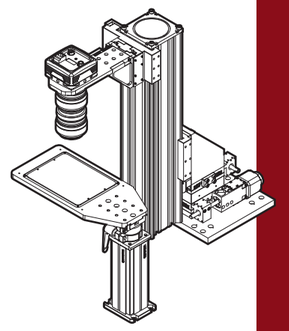
Cerna Rig CRF1001
The CSB1500F 500 mm Tall Microscope Body is designed to support setups for intrinsic signal imaging.



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

Nikon MBH76210 DIC Slider 10X Plan Fluor
Nikon MBH76640 DIC Slider 40X APO NIR (N2)
Nikon MBH76720 DIC Slider 16X
Nikon MBH76240 DIC Slider 40X Plan Fluor, Plan APO (Air), Plan APO (LWD 40X 1.15 NA)
Nikon MBH76220 DIC Slider 20X Plan Fluor, Plan APO (N2 Dry)
Nikon MBH76160 DIC Slider 60X APO NIR (N2)
Nikon MBH76225 DIC Slider 25X

Nikon MBN71946 FN-P Visible Rotatable
Nikon MBN71960 FN-IRP IR Rotatable
Nikon MBH72300 N1 Dry (10X)
Nikon MBH72310 N2 Dry (16X - 100X)

DIC Condenser Polarizers
DIC Condenser Prisms
DIC Objective Slider (Choose One Compatible w/ Your Objective)
Nikon MBD75300 FN-PT Polarizer Turret for VIS & IR Polarizers
Polarizers & Prisms for DIC Condenser
DIC Analyzer
WFA3000 DIC Turret Adapter
Nikon MBN71950 FN-IR/FA IR & VIS DIC Analyzer

Requires:
- **MBE74100 from Step 4**
- **Nikon Nosepiece from Step 5**
- **Brightfield Module from Step 13**

Step 14: DIC Components

DC4100 4 Channels 1 Mod Input
DC4104 4 Channels 4 Mod Input
LEDD1B 1 Channel
LED Drivers
WFA1010 VIS LED
WFA1020 NIR LED
WFA1050 VIS & NIR LED
Illumination Kits

WFA0150 Transmitted Light Module Adapter
Step 13: Transmitted Light Illumination
Brightfield Modules and Accessories
WFA1000 Transmitted Light Only
WFA1100 Dodt/Gradient
ZFM2030 Mid-Height Condenser Focus Module
Step 12: Condenser Mounting Module
Mounting Arms
ZFM2020 Condenser Focus Module
Step 11: Condenser

CSA2001 Cerna SM2 to D3N Dovetail Adapter
CSA2100 SM2 60 mm Cage Arm
BSA2000 Compact Condenser Mounting Arm
CSA2000 Condenser Mounting Arm
Nikon MBL70100 FN-C LWD Condenser 0.78 NA
Nikon MBL78600 D-CUD Universal Condenser 0.9 NA
Nikon MBL78700 D-CUO DIC Oil Condenser 1.4 NA

SM2-Series Thread
WFA4110 Cerna Tube Lens in SM2 to D1N Dovetail Adapter
WFA4111 Cerna SM2 to D1N Dovetail Adapter

1500M-GE 1.4 MP Scientific Camera
4070M-GE 4 MP Scientific Camera
8050M-GE 8 MP Scientific Camera
340M-GE Fast Frame Rate Scientific Camera

WFA4100 1X Camera Port
WFA4101 0.75X Camera Port
WFA4102 0.5X Camera Port
WFA4105 Nikon Y-TV Tube & C-Mount Adapter
WFA4106 Nikon Y-TV Tube & 0.7X C-Mount Adapter
WFA4107 Nikon TI-3 Tube & C-Mount Adapter
WFA4108 Nikon TI-3 Tube & 0.7X C-Mount Adapter

Without Trinoculars
Nikon Trinoculars w/ Eyepieces & IR Filter (WFA4000) or w/out IR Filter (WFA4001)
Nikon Erect Image Trinoc w/ Eyepieces & IR Filter (WFA4002) or w/out IR Filter (WFA4003)

Step 2: Widefield Viewing Accessory

Step 1: Body Height
CSB1350 350 mm Tall Body
CSB1400 400 mm Tall Body
CSB1600 600 mm Tall Body
CSB1500F 500 mm Tall Functional Imaging Body
CSB1500 500 mm Tall Body

CSA3000(/M) Breadboard Top
CSA3010(/M) Slim Breadboard Top
OPX2400(/M) Optical Path Conversion Kit

Nikon MBB74105 Y-IDP Double Port
Nikon MBD75100 FN-DP Variable Magnification Double Port
Used for Double-Camera Configurations and Confocal Rig
Step 3: Double Camera Port

DIY Paths
WFA2001 Epi-Illuminator
Nikon MBE74100 Epi-Illuminator w/ Turret
Epi-Illumination Paths

MCWHL5 Cold White LED
MWWHL3 Warm White LED
M470L3 Blue (470 nm) LED
M565L3 Lime (565 nm) LED
Mounted High-Power LEDs (Only Compatible w/ WFA2001, Other Wavelengths are Available)
LEDs
Widefield Illumination
SOLIS-1A High-Power LED for Microscopy, 6500 K (Only Compatible w/ MBE74100)
X-CITE120LED High-Power, Broad-Spectrum LED (Only Compatible w/ MBE74100)
Lamps
HPLS243 Solid State Plasma Light Source
X-CITE200 DC-Stabilized Fluorescence Light Source

Step 4: Epi-Illumination Module
CSA1100 Single Objective Arm
CSA2100 SM2, 60 mm Cage Arm
CSA1003 Cerna 60 mm Cage to D1N Dovetail Adapter

Step 5: Objective Holder
Nikon MBP71100 Single Objective Nosepiece
Nikon MBP70100 FN-S2N Sliding 2-Position Nosepiece
CSA1200 Sliding Nosepiece Arm
Nikon Nosepiece (Required for DIC in Step 11)
CSN1301 Manual 2-Position Nosepiece
CSN1302 Motorized 2-Position Nosepiece
CSA1300 Thorlabs Sliding Nosepiece Arm
Thorlabs Nosepiece
MOT1500 Manual 5-Position Turret
CSA1400 Turret Mounting Arm
Turret
PFM450E 450 µm Travel Piezo Stage
Requires CSA1100, CSN1301, CSN1302, or MBP7110 from Step 5

Step 6: Piezo Stage for Fast Z-Stacks

Step 7: Objective
N4X-PF N10X-PF N20X-PF N40X-PF N60X-PF *Other Upon Request

Step 8: Sample/Manipulator Stages
Rigid Stand Sample Holders
Fixed Arms for Microscope Body
For Micromanipulators
For Slides
For Recording Chambers
For MLS Inserts
CSA1000 For MLS203-1 XY Stage
CSA1001 SM1, 30 mm Cage Arm
CSA1002 SM2, 60 mm Cage Arm
MLS203-1 Fast XY Scanning Stage
MZS500-E Z-Axis Piezo Stage and Controller Kit

Step 9: Controller
MCM3001 3-Axis Controller for CSB, PLS, and ZFM Stages
MCM3002 3-Axis Controller for MMP and PMP Stages

Step 10: Translation Stage
PLS-XY 1" XY Stage
PLS-X 1" X-Axis Stage
MMP-2XY XY Mover for Microscope Body
PMP1000(/M) Manual XY Manipulator Platform
PMP-2XY(/M) XY Manipulator Platform

CSA1050 Clamp on Nikon NI-SS Stage Adapter
CSA1001 Manual Nikon XY Stage for Upright Microscope
CSS1051 Clamp on Olympus Stage Adapter
CSS2001 Manual Olympus XY Stage for Upright Microscope