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THORLABS

MPM-BCU - March 7, 2017

Item # MPM-BCU was discontinued on March 7, 2017. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

MULTIPHOTON BEAM CONDITIONER

- ▶ Automated Control of Laser Power and Beam Diameter
- ▶ Fully Integrated into the ThorImageLS™ Software



MPM-BCU

Controller and Power
Supply Included



[Hide Overview](#)

OVERVIEW

Features

- Full Software Integration
- Automated Power Ramp Function for Creating Z-Stacks
- 1/4" (M6) Holes in Base Allow Mounting to a Standard Optical Table

The Multiphoton Beam Conditioner allows the user to optimize a laser beam for use in a multiphoton imaging system. The beam conditioner automates both the attenuation and expansion of the laser beam. Thus, the user can optimize these parameters directly from the ThorImageLS™ graphical user interface. The beam conditioner also comes with a standalone GUI interface for integration into custom imaging systems.

The diameter of the laser beam output from the beam conditioner can be continuously varied from 1 to 4 times the diameter of the input laser beam to match the back focal aperture of the objective selected. After setup, getting the correct beam diameter is as simple as selecting the objective lens being used from a drop-down menu in the ThorImageLS or standalone GUI. The power of the laser at the sample can be adjusted to be any value between 0% and 100% (the purity of the input polarization state limits the minimum power value). The power can be varied either through the software interface pictured or through the top panel controls on the included external controller for the variable attenuator.

The software reads the variable attenuator controller, so it updates the GUI no matter which method of control used (software or the knob on the controller).

Specifications

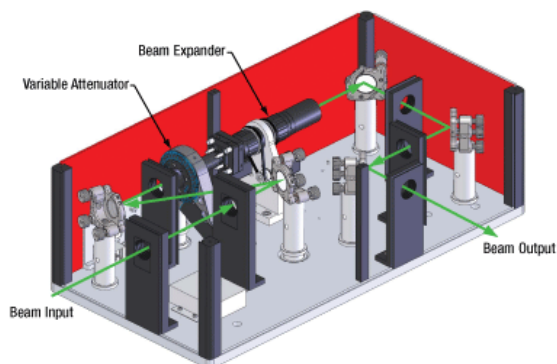
Specifications	
Wavelength Range	680 - 1400 nm
Beam Expansion	1X - 4X
Attenuation	0% to 100% at Sample
Input Beam Height ^a	4.75" (121 mm)
Output Beam Height	4.5" (114 mm)
Dimensions (L x W x H)	21.25" x 10.75" x 7" (540 mm x 273 mm x 178 mm)

a. An input beam height of 4.25" (108 mm) is also available by contacting ImagingSales@thorlabs.com.

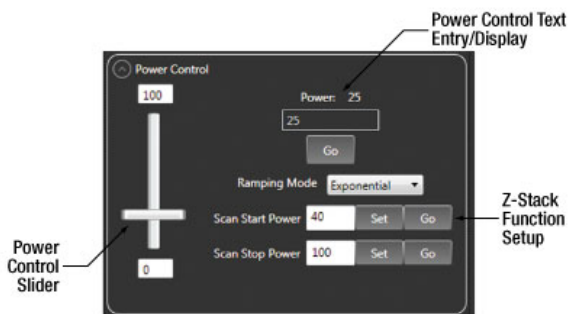
The software also provides a power ramping function (see the screen shot) that allows the user to increase the laser power as the system images deeper into a sample. This is done to compensate for scattering losses and intensity reductions from PSF (point spread function) degradation as the image depth in the sample increases. The power ramp works in conjunction with the Z-stack function to create three-dimensional images of a sample. To create an image, set the top plane of the Z-stack and the power in the top plane with the attenuator tab. Then focus through the sample and define the bottom plane and the power required at the bottom plane so that both the top and bottom planes produce similar signal levels. The software then applies an exponential fit of the power ramp to the Z-stack when the image is acquired. This Z-stack function is provided with Thorlabs' multiphoton imaging systems; otherwise, the MFC1 can be utilized to create the Z-stacks.

The standard MPM-BCU can accommodate an input beam height of 4.75"; a beam height of 4.25" is available by contacting ImagingSales@thorlabs.com. When the beam conditioner is used in an imaging system with a femtosecond laser source, both the attenuation optics and the beam expander will broaden the pulse due to dispersion. This unit features SM1 (1.035"-40) threaded input and output apertures that allow the user to easily enclose the beam paths using Thorlabs' Ø1" lens tubes.

Multiphoton Beam Conditioner Light Path



Click to Enlarge



Click to Enlarge

Screen shot from ThorImageLS, our imaging system software, which shows the power control and Z-stack setup for the MPM-BCU. By selecting the magnification of the Objective Lens (not shown), the MPM-BCU will automatically adjust the beam diameter.