



# Xtender™ COLLIMATED EMISSION-PORT ADAPTER

For many imaging applications, it is necessary to utilize devices such as filter wheels and LCTFs on the emission port of a microscope. The beam emerging from the microscope emission port, however, is coming to a focus. Optical devices are often placed in the focusing beam, thereby producing a series of errors, including:

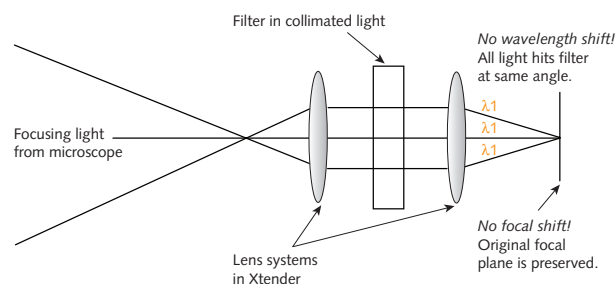
## PARFOCALITY

Anytime a flat piece of glass (e.g., an emission/barrier filter) is inserted in a focusing beam, the beam will no longer focus at its original location; instead, the location of the focal plane will be shifted. The amount of shift will depend on the thickness of the filter as well as the index of refraction of the glass used to make the filter. This focal-shift error destroys parfocality between the detector and the eyepiece. *However, when collimated light passes through an emission filter, the focal plane is not shifted.*

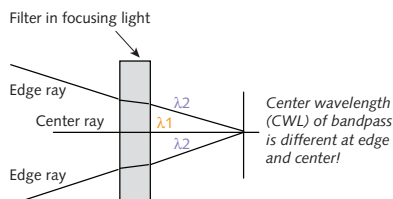
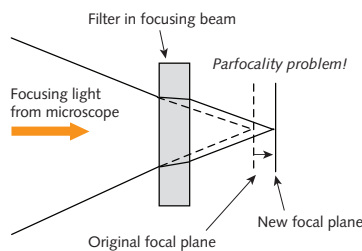
## BANDPASS VARIATION

It is a well-known fact that the bandpass of a filter varies with the angle at which light hits it. When a filter is placed in a focusing beam, the light at the edge of the beam hits the filter at a different angle than the light at the center of the beam. As a result, there is a variation in the center wavelength (CWL) of the filter bandpass for different parts of the beam. *However, when collimated light passes through a filter, all rays strike at the same angle, eliminating bandpass shift.*

## THE SOLUTION...



Correct emission imaging with the Xtender!



→ Angle of incidence changes from edge to center.

## XTENDER BENEFITS

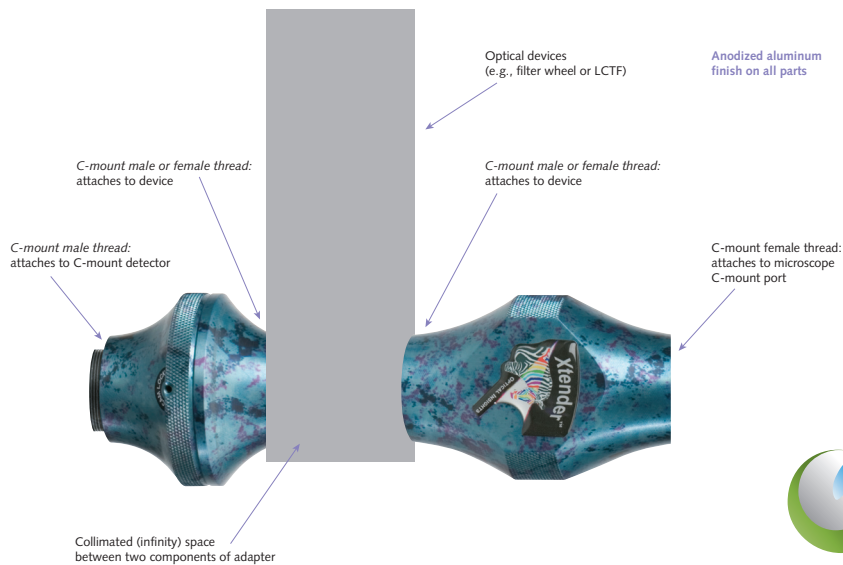
- Two-piece optical adapter creates collimated (infinity) space at emission port of microscope, thus allowing addition of other optical devices without sacrificing performance or introducing optical aberrations
- Provides "extra space" at microscope emission port for installation of instrumentation such as filter wheels and liquid-crystal tunable filters (LCTFs)
- Flexible enough for use with a variety of optical devices with C-mounts
- Fits in between many microscopes and CCDs

## XTENDER SPECIFICATIONS

Detector options Attachment thread Max diagonal dimension <sup>1</sup>	C-mount (male) 12 mm
Microscope attachment options	C-mount (female)
Device attachment options	C-mount (male and female)
Efficiency	~96%
Wavelength sensitivity	400 to 800 nm
Spatial resolution <sup>2</sup>	~0.4 microns
Weight	1.2 lbs
Dimensions	2.5" x 8.0"
Operating temperature	-10 to 50°C

Specifications may change without notice.

1. without experiencing measurable image distortion
2. assumes 100x, 1.6 NA microscope objective



## MAG BIOSYSTEMS

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