Input Collimator For Nikon Microscopes

Set Up Instructions

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Lumencor's Nikon (PN 82-10062) collimator is designed for optimized connection of a Lumencor light engine to a Nikon microscope illumination input port via a 3 mm liquid light guide (LLG). The collimator has been designed to provide control over the size of the illuminated area at the sample plane. This design allows the user to maximize the illumination intensity and uniformity for the field of view (FOV) of the eyepiece or camera sensor by adjusting the relative positions of two achromatic lenses within the collimator. The two slide adjustments must be made in tandem. The longer lens position slide adjustment (Figure 1) determines the distance between the two lenses. The shorter light guide (LG) slide adjustment (Figure 2) sets the distance between the LLG terminus and the first lens. Below are instructions for achieving the smallest and largest uniformly illuminated areas within the FOV. The optimum procedure for all alignments is to focus the image of the LLG on the back aperture of the objective. This is most readily achieved using a Bertrand lens. If your microscope does not have a Bertrand lens, remove the eyepiece to obtain an image of the back aperture of the the objective.

1. Carefully unpack the collimator, avoiding contact with the surface of the lenses.
2. Attach the collimator to the light input port of the microscope via the mounting interface (Figure 1).
3. Insert the liquid light guide into the collimator as shown in Figure 1. Secure the light guide by tightening the recessed set screw, accessed via the narrow slot in the collimator body (Figure 1), using a 1.5 mm hexagonal wrench.

FOR SMALL AREA UNIFORM ILLUMINATION: STEPS 4-6

4. Move the lens position slide adjustment (Figure 1) as far away from the microscope body as permitted by its range of travel (~4.2 cm). Move the light guide position adjustment (Figure 2) as far towards the microscope body as as permitted by its range of travel (~1.2 cm).
5. From this position, move the light guide position slide adjustment away from the microscope body until in focus. Once in focus, tighten both position adjustment locking screws.
6. If necessary, slide the light baffle collar (Figure 1) over the adjustment slots to eliminate light leaks.

Figure 1

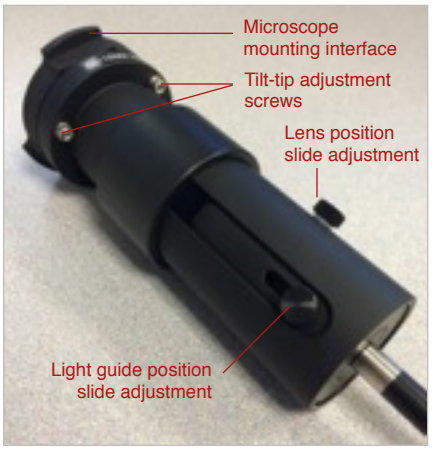

Figure 2

INPUT COLLIMATOR FOR NIKON MICROSCOPES

Set Up Instructions (cont.)

FOR LARGE AREA UNIFORM ILLUMINATION: STEPS 7-9

7. Move the lens position slide adjustment (Figure 1) as far towards the microscope body as permitted by its range of travel (~4.2 cm). Move the light guide position adjustment (Figure 2) as far away from the microscope body as permitted by its range of travel (~1.2 cm).
8. From this position, move the light guide position slide adjustment towards the microscope body until in focus. Once in focus, tighten both position adjustment locking screws.
9. If necessary, slide the light baffle collar (Figure 1) over the adjustment slots to eliminate light leaks.

AXIAL ALIGNMENT FOR ALL ILLUMINATION CONDITIONS:

10. The collimator can be directed to center the illumination in the FOV and thereby align the collimator output axially with microscope's optical train. Three 2.5 mm hexagonal screws on the front face of the collimator (Figure 2) should be loosened individually in 1/2 turn increments which will tip and tilt the collimator.

NOTES:

- Asymmetry of the illuminated area may occur if either the field diaphragm, aperture stop or a misaligned filter cube is obscuring the optical path. Make sure the diaphragm and aperture stop are out of the optical path of the microscope during the alignment of the collimator, and that the filter cube (if used) is properly seated.
- Many microscopes do not fully support the new large sensors with pixel arrays of the order 2000 x 2000. In these cases, intensity in the peripheral regions of the illuminated area will fall off from the maximum value on the order of 10% to 20%. Flat fields will be present in the centermost regions of the illuminated area.
- Liquid light guides commonly create circular rings in the image field. These patterns can be minimized by careful placement and orientation of the light guide.

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