

INSTALLATION INSTRUCTIONS FOR
THE FIBEROPTIC LIGHT SCRAMBLER ON
NIKON DIAPHOT 300 MICROSCOPES
FOR TRANSMITTED LIGHT

PLEASE READ THIS BEFORE SCRAMBLER INSTALLATION

Your microscope should already be set up for **Koehler Illumination**.

Scrambler Installation requires a **VOM or Multimeter** that reads Ohms. To set up this system quickly and efficiently **you must use the LOP** (light output photodiode), a device made by Technical Video, Ltd. specifically for maximizing light throughput in the system. Your LOP was calibrated using an HBO 100W mercury lamp. Your readings may vary depending on arc lamp life, filters, etc.

NOTE: The Scrambler requires accurate alignment to function properly. Realignment will be necessary only when replacing the arc lamp bulb. Installation instructions must be followed or guarantee is void. Unpack and inspect the parts. **Please do not move knobs or make adjustments until called for in the instructions as they have been approximately set at the factory.** If you experience any problem please call, fax or email Technical Video, Ltd. We will be happy to assist you.

*If the Fiberoptic and the lenses have been installed in your Scrambler Input Module, please follow the instructions from Part 1 "Now secure the Input Module to the tripod..." *

IF the lenses and fiberoptic are not installed unloop and uncoil the fiber. Leave the protective bags on the fiberoptic ends. Note that the **lamp end is red banded**. Do not reverse ends! **Never** sharply bend the fiber. The ends are optically polished flat surfaces and should not be touched. Treat them as you would any lens. If it becomes necessary to clean, place a drop of acetone on lens tissue and draw it across the surface.

The Input end of the Fiberoptic within the Module has been installed with a new heat dissipating device called Fintip. Please contact us if it is necessary to remove the fiberoptic.

1. INPUT MODULE

The Input Module has been grooved to aid in heat dissipation. Twist and pull the WHITE Z-axis knob completely out. Insert the collector lens (see schematic drawing) into the MODULE, with the small lens end toward the fiberoptic holder, until the slot in the lens housing is visible in the Z-knob hole.

Then, put

the Z- knob end pin in the slot and turn it so that the lens is in the approximate middle of its travel.

Open the tripod legs fully and lock. *Now secure the INPUT MODULE to the tripod using the 1/4"

tapped hole in the body. Loosen the tripod lock knob and rotate the Input Module **so that the lamphouse will be mounted over the long leg of the tripod for stability.** Secure the tripod locks firmly!

2. LAMP SET UP

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IMPORTANT! Wear UV blocking eye protection glasses! An arc lamp is required. Leave the existing collector lens in the lamphouse. Now turn on the lamp. Align the arc so the mirror image is not directly on the cathode. This precaution will prolong lamp life. Keep the mirror image toward the anode but **do not** make a double image; a slightly elongated image will keep the bulb temperature down.

Next adjust the lamp collector lens to focus the electrodes at infinity or a surface 15-25 feet (3M to 5M) away. Mount the lamphouse to the Input Module. *(We recommend turning the arc lamp on no more than 30 minutes before use and shutting it off when through in order to conserve bulb life.)*

3. CURVE CALIBRATOR ROD

Always insert the fiber through the hole on the "dimpled" side of the CCR.

- a. First, remove the ziploc bag and the lock collar from the black-sleeved output end of the fiberoptic.
- b. Thread the fiber end through the outermost hole at one end of the CCR.
- c. Slide the CCR along the fiber a distance of about 30" (76 cm).
- d. Thread the fiber end through the closer hole at the opposite end of the CCR.
- e. Pull and gently work the fiber through this hole until it forms an approximate semi-circle of 2 1/8" (5.4 cm.) radius, measured from the **CCR surface**.
- f. Thread the fiber through the closer hole at the opposite end .
- g. Adjust the loop to 2 1/8 (54 mm.) height, as in Step 4 .
- h. Thread the fiber through the last hole; adjust the loop to 2 1/8"; replace the S.S. lock collar.

The following graphic illustrates the fiberoptic properly threaded through a CCR. The CCR forces the fiber through three right angle bends when viewed axially. The CCR broadens the plateau of the projected light and makes the already nearly flat illumination from the fiberoptic even more uniform.

Microscope end (Black)

Lamphouse end (Red)

4. USING THE LOP

PLEASE DO NOT not remove the red tape or move the X and Y screws of the Input Module until **instructed!** The fiberoptic has been carefully precentered at the factory; setting up the Scrambler System correctly involves bringing the arc into alignment with the pre-centered fiberoptic, not vice-versa.

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Put the LOP that is attached to the fiberoptic into the jack on your digital ohmmeter. Next, loosen the fiber locking screw on the Fiber holder of the Input Module. Slowly move the fiber into the Module while observing the ohmmeter for lowest ohms (maximum throughput). Lock the fiber in place when you read the lowest Ohms setting. Now turn the white Z-axis knob of the Input Module lens to fine tune this adjustment.

Next make **all adjustments** that are available **on the lamphouse** until you get the lowest ohms reading. Find the 'center' of each adjustment. Repeat the previous adjustments on the Input Module and the lamphouse twice more to "tweak" the system. A difference of 0.1 ohm makes a significant difference! Remove the red tape carefully and if you have done the foregoing correctly you will only have to adjust the X and Y knobs very slightly to maximize throughput. Your ohms reading should now approximate the "test" reading done at the factory if you are using an HBO100 W/2 arc lamp.

When you have maximized the light throughput then slide the lock collar on the red Input fiber ferrule until it seats against the fiber holder and tighten it; if there is a need to remove the fiberoptic it will then be reseated in the same place. Remove the free end of the fiber from the LOP, and aim it at a smooth surface 6" to 8" away. You should see a virtually flat white disk of light with a very narrow shadow around the periphery.

5. OUTPUT MODULE

Aim the Output Module towards a smooth surface 8 to 12 feet away and slowly insert the fiber tip until it is at the focal point of the lens. At the focal point the perimeter of the projected disk of light will be sharp and clear. Secure the fiber with the locking screw. Slide the lock collar against the fiber holder and secure it. Fine tune the focus with the white Delrin Z-knob.

6. DIAPHOT 200/300 SPECIFICS

Next remove the ground glass from the light path. Also remove the slider lens on the upper arm. Install the additional lens that came with your 1.4 na condenser onto the back of the condenser. Now fit the tungsten lamphouse on the microscope and adjust for Koehler illumination. Make certain to set the condenser position. Now remove the tungsten lamphouse and completely open the original field diaphragm. Leave this open when using the Scrambler. Install the modified adapter #84086 with the new field diaphragm into the microscope port. Leave about 8mm of the adapter's slot showing and then secure it; do not fully insert it! Next install the #76340 Auxiliary lens under the arm, above the condenser. Snug up the three set screws. Now connect the Output Module to the #84086 adapter and secure it.

7. KOEHLER OR CRITICAL ILLUMINATION?

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Fine adjust the condenser aperture diaphragm and fiber tip to be in focus and then set the new field diaphragm and specimen to Koehler illumination. On some setups it may also be necessary to slightly move the condenser to critical illumination, to just fill the condenser aperture. This takes you out of true Koehler illumination, but optimizes image resolution.

8. MAXIMIZE ILLUMINATION THROUGHPUT

To **maximize** illumination throughput, use the LOP and fine-tune the X, Y and Z Scrambler INPUT MODULE adjusters and the lamp and mirror adjusting screws. Careful adjustment of all variables will result in maximum effectiveness of the Scrambler. Critical **coaxial** alignment of the arc, its collector lens, the INPUT MODULE collector lens, and the fiber tip will optimize uniformity of the illumination. If you move the lamp and change the particular degree and curvature of the fiber the flatness and intensity will vary slightly.

9. FILTER WHEELS, ELECTRONIC SHUTTERS, ETC.

Filter wheels, electronic shutters, diaphragms and other light attenuators should be mounted between the lamphouse and the INPUT MODULE. This is the proper location in the path to attenuate the light; in the case of filter wheels it also removes any vibration from the microscope.

If you have any problems call 360-379-6828 or email to support@technicalvideo.com for technical support. We will be happy to assist you.