

Experience with a Commercial, Custom-Fit, LED illuminator For an Older Microscope

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Vendor – retrodiode.com. They sell their products through eBay and supply custom fitted solutions for various, older, makes & models of scopes (e.g. Leitz, AO, Nikon, B&L, Wild, etc.)¹.

My Particular Scope – A Leitz Ortholux I. I was never satisfied with the light output of the original 30-watt, 6-volt incandescent lamp. So, several years ago, with the help of a skilled fellow hobbyist, I switched to a custom-built adapter for a fiber optic replacement solution using a 150-watt, 21-volt halogen lamp. This supplied adjustable, high-intensity illumination and has served me well.

Reason for a Change: I needed to clean-up and down-size my microscope 'kit' and space, and the fiber optic illuminator, light pipe, custom adapter, and Ortholux lamp attachment, occupied a lot of room. LED was the obvious choice – many hobbyists have already switched – and I opted for an off-the-shelf solution.

What does Retrodiode Offer for My Scope?

Off-the shelf? 10-watt, 800 lumen, 5500K color temperature, LED.

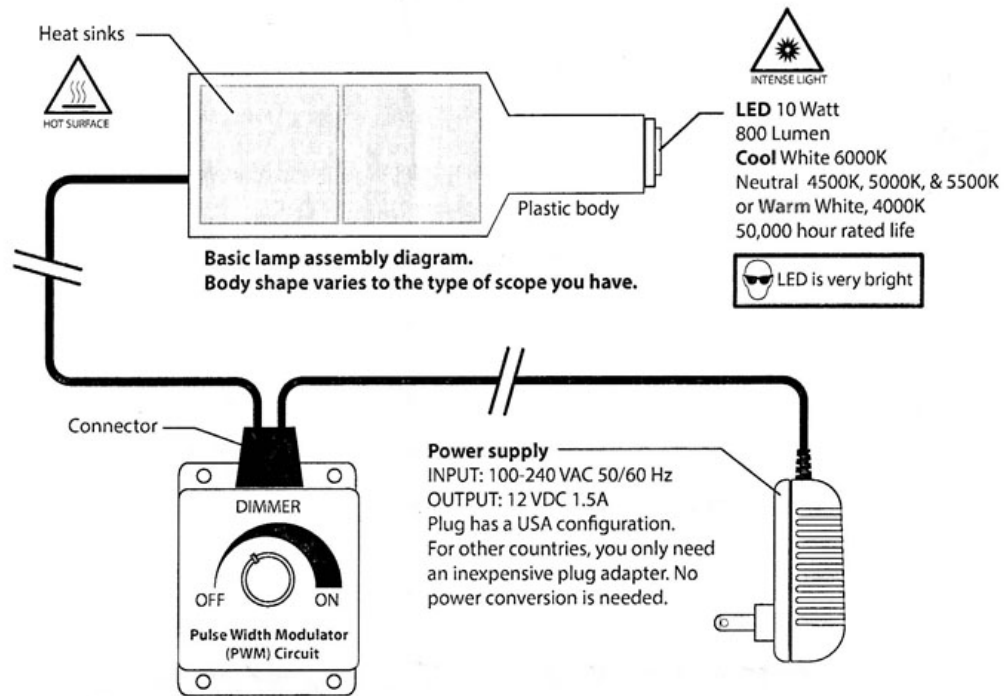


Above: LED illuminator and heat sink before insertion to the Ortholux light tunnel.

¹ Note: I have no relationship with, or even knowledge of, the owners of retrodiode.

I thought it no harm to include here a partial image from the vendor's instruction sheets since it displays a lot of information in a compact format:

Backed by a 1 year warranty against failure



WARNINGS!



The heat sinks of your LED kit provide air cooling for the electronics in the lamp. They can get very warm. Avoid touching the heat sinks while in operation. Keep the entire lamp away from anything that may be affected by heat. Do not cover or restrict contact with the air.

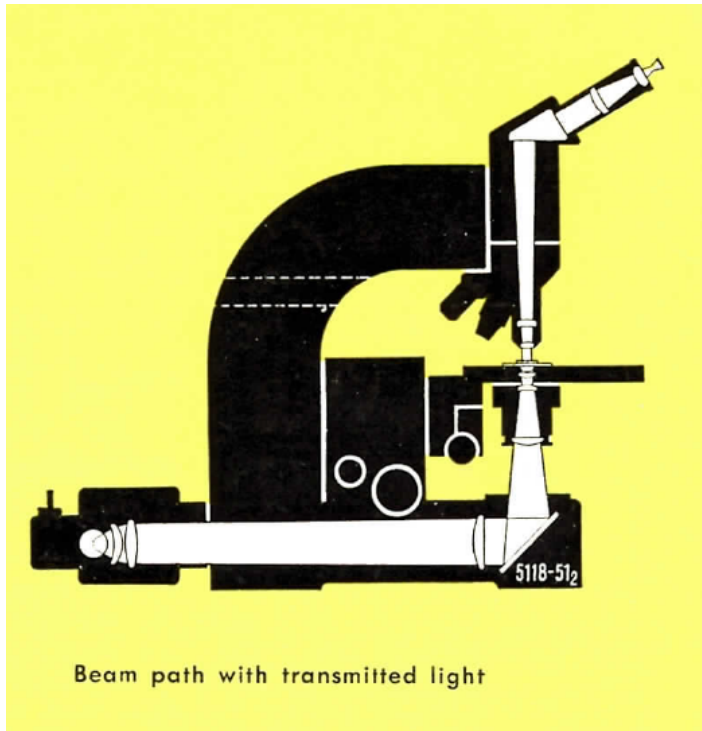


The LED light source has no harmful UV rays or IR wavelength. But, is an extremely bright light source.

This electronic product is intended for indoor use. Keep away from water and extreme humidity.



Installation of the device is similar to your original scope's light source. If your scope has a port or a dovetail mount, the lamp will plug in the same way as the original bulb and socket. For more information, visit: www.retrodiode.com



Above: Light path diagram from the Ortholux I manual.

In their solution for the Ortholux I, the LED unit replaces the whole lamp assembly so that the collector lenses in front of the old bulb position are gone. It also puts the LED light source forward, and 1.5 inches into the Ortholux's light tunnel. It fits easily, but snugly – the fit is excellent.



Above: Side and back views of the unit 'in place', on the Ortholux.

The LED unit has a diffuser (and lens) as did the original Leitz lamp attachment (not shown in the Leitz manual diagram above).



Above: Diffuser and lens.

The electronics are encased in plastic. In the pictures on eBay, the heat sink appeared to be white plastic and I wondered how that was going to work. But no, it is aluminum, and over a 2-hour session (at 'full-on') the sink does get very warm to the touch, although not so much as to pose a hazard².

The dimmer has a click/stop 'off' position³, and of course, continuously variable 'on', and I find that I do not need it 'full-on' to give plenty of light for any of BF, DF, or Phase. It also has a foam, sticky tape strip that allows you to attach it to the scope in a convenient place. I attached mine to the 'ARISTOPHOT' stand instead.

² Five minutes after turn-off, after a 2-hour session, the sink is back to near room temperature.

³ The point being you know when you have turned it off. There is satisfying click, and feel, when you enter or leave the 'off' position.



Above: Dimmer 'stuck' to the ARISTOPHOT stand.

At 5500K, I no longer needed a daylight correction filter – it *is* daylight⁴ – and so I put the 80B filter that had covered the light port during the incandescent and halogen illumination days back into its storage case.

And, the 50,000-hour rating means I should never have to buy another lamp again and that's 'one less thing' to worry about⁵.

Of course, the unit is silent and that is a big change from my earlier fiber optic solution where the fan of the fiber optic illuminator worked hard to keep the 150-watt halogen lamp and surroundings at a safe temperature.

Summary

⁴ 'Daylight' being 5000K – 6000K. See [here](#).

⁵ The original 30-watt bulbs for the Ortholux (i.e. USHIO 8110) had become hard to find, let alone at a reasonable price. The lamps for the fiber optic illuminator (i.e. USHIO EKE) are still readily available and affordable (i.e. around \$6 USD) and so lamp cost/availability was not part of the decision – space was.

Category	Pros	Cons	Comments
Light output	More than adequate		The fiber optic set-up <i>did</i> supply more light, but much more than I ever needed
Cost		\$160 USD ⁶	
Space	Very compact		
Noise	Silent		The fiber optic illuminator fan sound was noticeable
Light color	No filter needed		
Lamp life	50,000-hour rating		The fiber optic illuminator lamp had a 200-hour rating

Comments to the author, Steve Neeley, are welcomed: email psneeley AT xmission DOT com.

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⁶ This is less expensive than my earlier fiber optic solution that included the fiber optic illuminator (used), the light pipe (used), and the custom, milled, adapter.