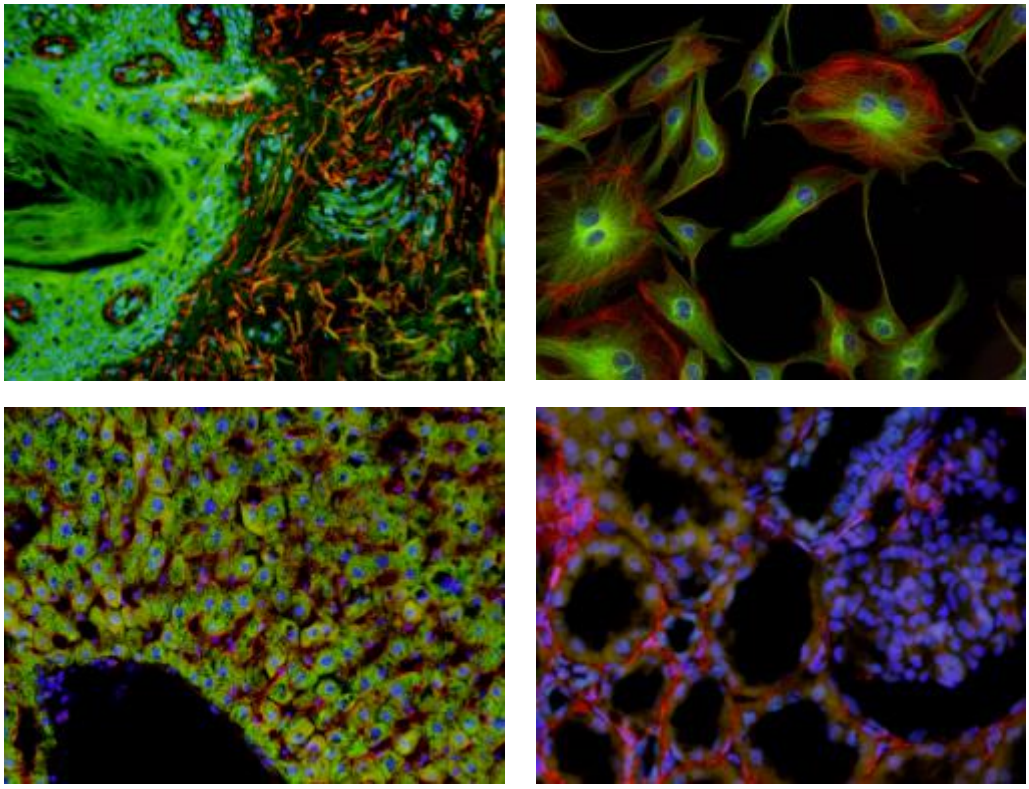
# User Manual

## pE-Combiner

## For epi-fluorescence microscopes



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# 1. Introduction

The pE-Combiner is designed to combine two CoolLED Illumination Systems (most commonly the pE-100) into a single optical path. This is done with an appropriate dichroic mirror that is matched to the wavelengths of the Light Sources being used. This is ideal for dual staining applications.
The pE-Combiner attaches directly to the microscope using CoolLED's modular adaptor ring system. This will allow the mechanical fixing rings to be interchanged by the user if necessary, to suit the majority of fixing methods used by the microscope manufacturers.

This User Manual should provide all the information required to setup and install the pE-Combiner.

Additional information may be found on our website at www.coolled.com.

# 2. Safety Precautions

The pE-Combiner does not pose any real safety risks itself, however as it is designed to be used with CoolLED's range of high intensity light sources the appropriate precautions should be taken.

## 2.1.

When installing the pE-Combiner, never switch on the Light Source until it has been securely fitted to the epi-fluorescence light port of the microscope. By following this basic safety rule, protection from the collimated light beam will be provided by the microscope itself, minimising risk of injury and damage.

## 2.2.

If for any reason the pE-Combiner is to be operated when not attached to a microscope, all personnel should wear eye shielding and clothing to protect the exposed skin.

## 2.3.

The pE-Combiner should never be operated with the external covers removed, as this will result in the safety of the unit being impaired.

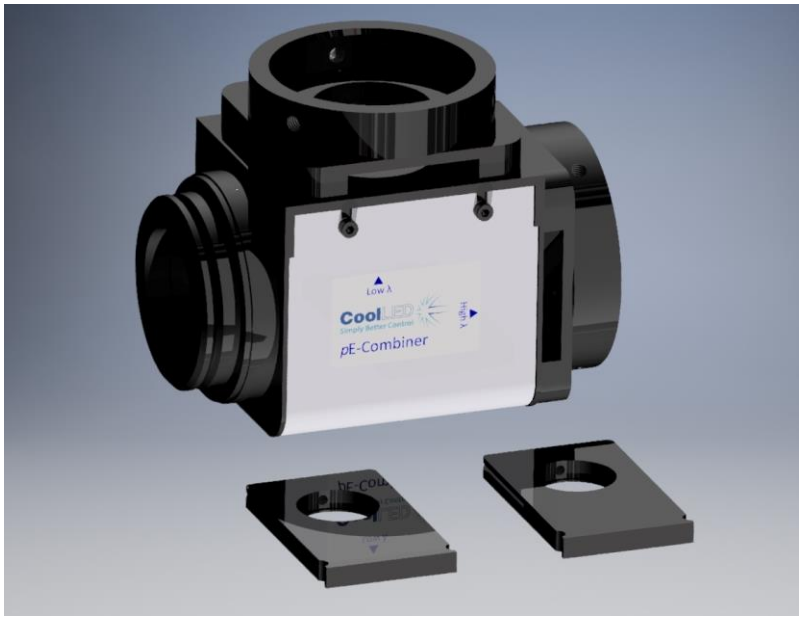
## 2.4.

To clean the exterior of the pE-Combiner, use a slightly dampened cloth with a simple water/detergent solution only. Avoid the optical surfaces. Cleaning of optics should only be carried out using optical wipes and fluids.

# 3. Getting Started – System Components

The CoolLED pE-Combiner is supplied with the following components:

- pE-Combiner
- Dichroic mirror (usually installed)
- Microscope adaptor rings (usually fitted)
- An allen key
- Excitation filter holder slides (if this configuration is selected)




If any components are missing or appear damaged, please contact CoolLED immediately.

# 4. Installation and Setup

## 4.1.

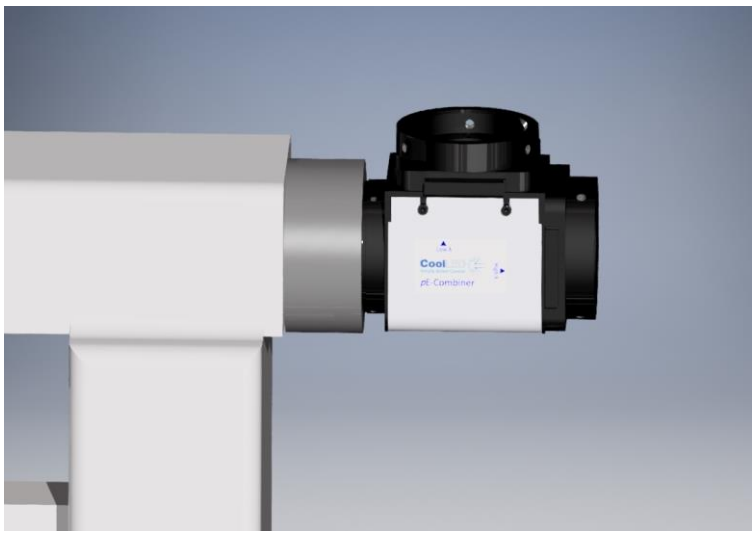
Carefully unpack the components from the shipping cartons.

## 4.2.

When ordered with CoolLED Illumination Systems where the intended microscope has been specified, the pE-Combiner will be supplied with the appropriate microscope adaptors and dichroic mirror fitted.
If the pE-Combiner is ordered separately the microscope information and the Light Source wavelengths being used will have to be specified.

## 4.3.

Fit the pE-Combiner to the epi-fluorescence port of the microscope and ensure that it is securely attached.



## 4.4.

Fit the microscope adaptors of the CoolLED Light Sources to the pE-Combiner (this method may differ depending on the microscope adaptor being used). Ensure that the Light Source is fitted to the correct port of the pE-Combiner, as indicated by the sticker on the outer cover.

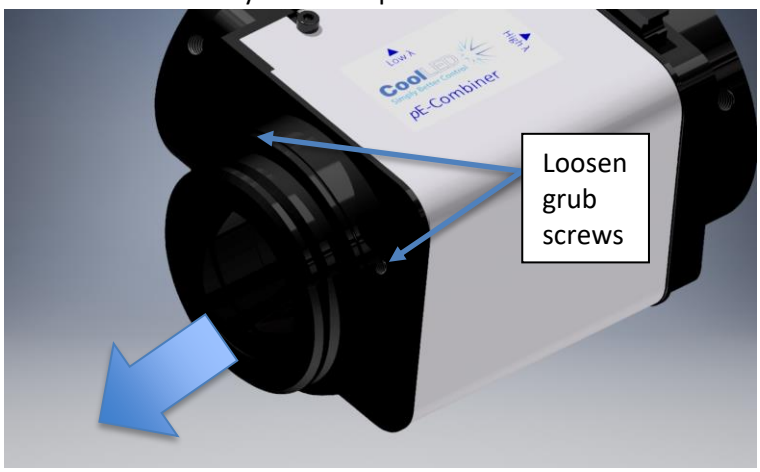
## 4.5.

The CoolLED Light Source should be optimized on the pE-Combiner using the method stated in the designated product User Manual.
There may be occasional instances where the additional optical path length added by the pE-Combiner will move the Light Source out of the range of necessary adjustment to achieve an evenly illuminated field of view. If this is the case, please contact CoolLED support (support@coolled.com) to find out if an optical adjustment is required.

# 5. Changing Microscope Adaptor Rings (pE-Combiner output)

## 5.1.

If the microscope adaptor requires changing, loosen the grub screws and remove the currently fitted adaptor.



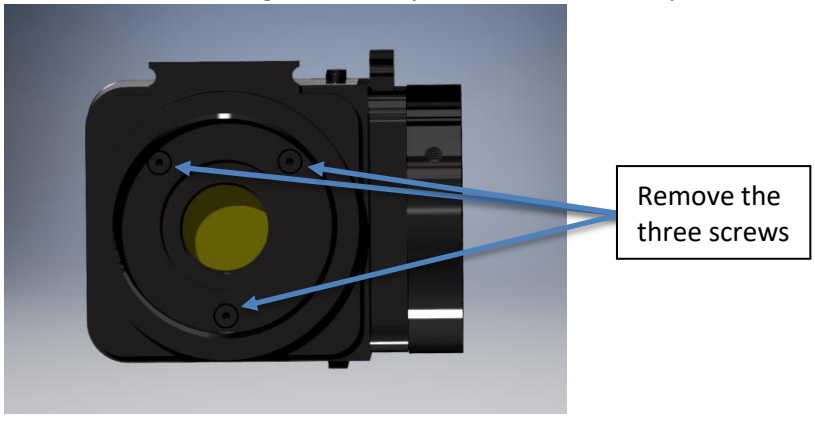

## 5.2.

Fit the alternative adaptor ring and gently tighten the grub screws. Ensure care is taken not to over tighten the grub screws as this may result in damage to the adaptor ring.

# 6. Changing Microscope Adaptor Rings (pE-Combiner input)

## 6.1.

If the input adaptors on the pE-Combiner require changing, remove the three hex screws using an allen key and remove the adaptor.



### 6.2.

Align the alternative adaptor with the screw holes (there is a correct orientation). Secure the adaptor in place with three hex screws.

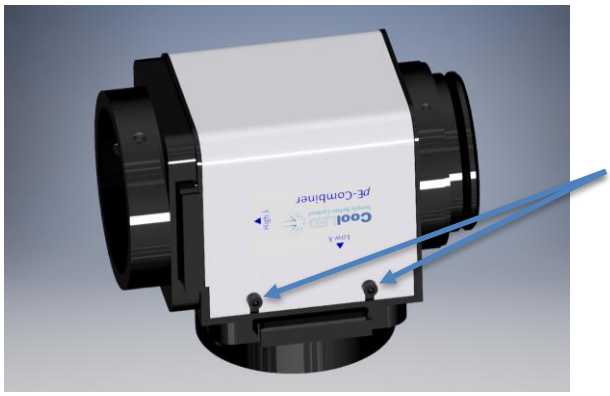
Ensure that screws of the correct length are used. Excessively long screws may interfere with the internal optics and screws that are too short will not allow the adaptor to be secured in place.

## 7. Changing the dichroic mirror

It may be necessary to change the installed dichroic mirror within the pE-Combiner to allow Light Sources of different wavelengths to be combined. Listed below are instructions detailing the exchange process.

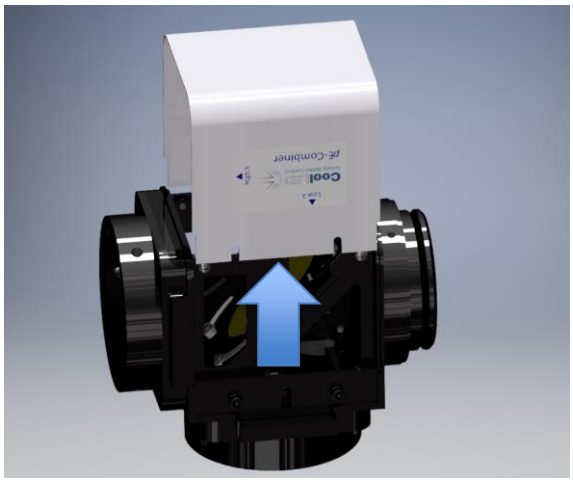
### 7.1.

Loosen the four screws that secure the outer case using an allen key.



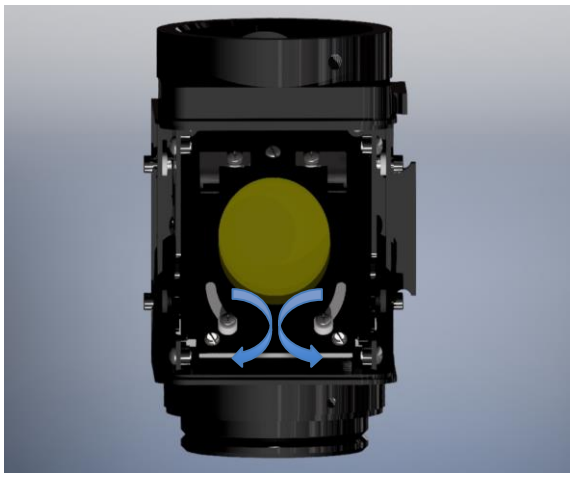
### 7.2.

Remove the outer case.



7.3.

Rotate the retaining springs so that they are no longer securing the dichroic mirror plate. The dichroic mirror can now be removed. Take care not to touch the surface of the mirror.



7.4.

Install new mounted dichroic mirror, positioning the bottom of the plate first making sure the mirror sits flush on the surface. Ensure that the retaining springs are moved out of the way at this stage to avoid obstruction.

7.5.

Rotate the retaining springs into position to secure the dichroic mirror into place.

7.6.

Re-fit the outer case and secure in place by gently tightening the four screws with an allen key.

# 8. pE-Combiner versions

Two versions of the pE-Combiner are available to purchase.

## 8.1.

The standard pE-Combiner allows the combination of two Light Sources.


## 8.2.

The Advanced version of the pE-Combiner is fitted with filter slots. These will accept standard 25 mm filters and will allow additional filtering of the excitation light before it enters the microscope.

# 9. Routine Care and Maintenance

## 9.1.

The pE-Combiner will require little or no maintenance throughout its life. There are no field serviceable parts so there is no need for disassembly.

## 9.2.

Cleaning of the external surfaces can be carried out with a mild soap and water solution used to lightly dampen a lint-free cloth. Ensure that no liquid is allowed to enter the product. Avoid optical surfaces.

## 9.3.

Cleaning of optical surfaces may be necessary if debris or finger prints accidentally come into contact with the lens during installation.

## 9.4.

In the first instance remove any loose debris with an air duster (aerosol or rubber blower)

## 9.5.

Fingerprints or other liquid type contaminants should be removed using standard lens cleaning procedures. Do not flood the lens surfaces with fluid as liquid could enter the product and cause damage.

# 10. Product Specifications

| | |
|---|---|
| pE-Combiner: | 81.4 mm(w) x 89.9 mm(d) x 80.45 mm(h)<br>Weight: 0.94 kg |
| pE-Combiner (with ex filters): | 86.1 mm(w) x 101.8 mm(d) x 87.95 mm(h)<br>Weight: 1.24 kg |

# 11. Product Options and Order Codes

See website (Microscope Illuminators | LED Illumination Systems | CoolLED) for full details of product options and order codes.

# 12. Warranty and Repairs

Please refer to CoolLED's current Warranty Policy available on our website https://www.coolled.com/support/coolled-warranty/. Although warranty terms are fixed at the time of ordering according to the terms and conditions of sale in place, the Warranty Policy may be subject to periodic change so please check to avoid confusion.

For any warranty queries or in the event of the product developing a fault, make contact with support@coolled.com for further assistance. You shall be asked to provide your microscope make and model, the product serial number and a brief description of the issue. You shall then be issued with a Support Case to manage your issue.

# 13. Compliance and Environmental

For current compliance statements and environmental information please refer to our website https://www.coolled.com/support/environment/

## 13.1. CoolLED's Recycling Program

At CoolLED, we recognize the importance of preserving the global environment. We are proud to provide a Recycling Program that enables CoolLED customers and end-users to send back used CoolLED Light Sources for recycling, free of charge.

Together we can reduce the burden on our environment through responsible disposal and recycling of End-of-Life Light Sources. You can help us by filling in our online contact form and providing us with your contact details and the serial number of the CoolLED Light Source that you wish to return and we will collect it free of charge.

If you are taking delivery of a replacement CoolLED Light Source, why not send the old one back in the packing box of the new one?

# 14. Contact Details

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UK

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