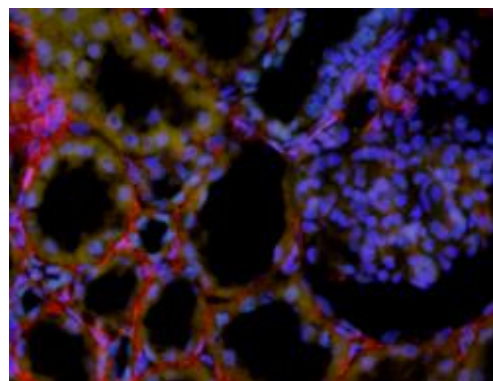
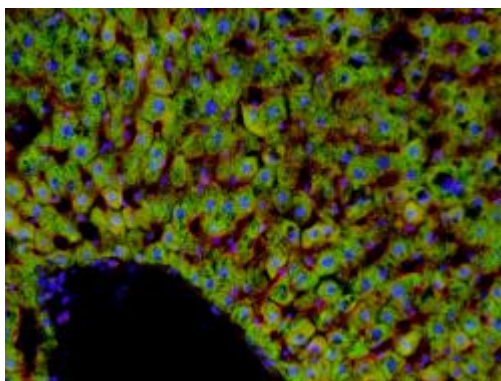
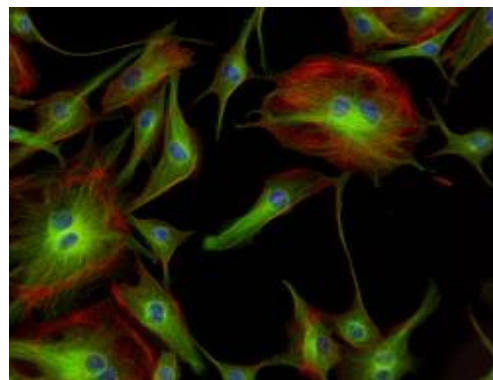
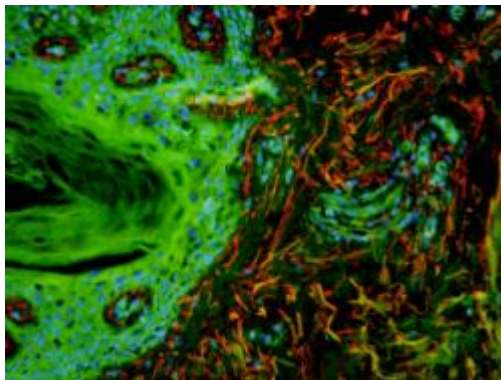
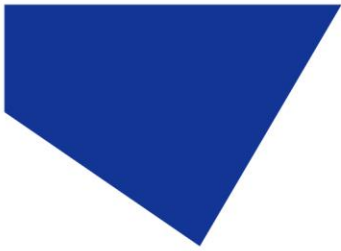


# User Manual

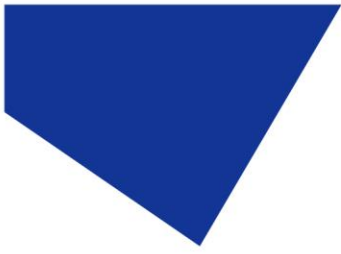
pE-100<sup>fiber</sup>





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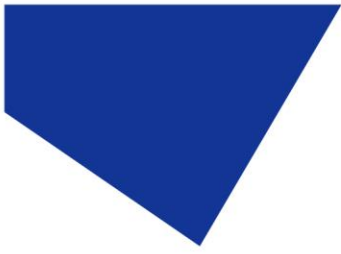
## 1. Introduction

CoolLED's pE-100 has been developed for applications requiring a single LED excitation wavelength. It is perfect for clinical applications such as research applications requiring precise intensity control and fast-switching, or for electrophysiology applications where light has to be delivered to a specific location. The user can select from 20 different LED wavelengths, ranging from the near-UV at 365nm to the near-IR at 770nm.

With a comprehensive range of microscope adaptors, the pE-100 can be fitted to most current and older microscopes. The result is a safe, convenient illumination system which will last for many years without any additional operating costs.

This manual should give you all the information required to install and operate your new illumination system.

Additional information can be found on our website at [www.cooled.com](http://www.cooled.com)



## 2. Safety Precautions

While LEDs are a much safer illumination system than the mercury and metal halide lamps that they replace in microscopy applications, precautions should still be taken with this product.

When operating or maintaining this product, please observe the following safety precautions at all times. Failure to do so may result in personal injury or damage to other items.

Please ensure that only the power supply and cord supplied are used with this equipment.

### 2.1.

UV light may be emitted from this product depending on the version/wavelength selected. Avoid eye and skin exposure. Never look directly into the light output beam from the Light Source or accessories. The emissions could damage the cornea and retina of the eye if the light is observed directly.

### 2.2.

Always ensure that the Light Source is securely attached to the microscope (either directly or with a light guide and collimator, depending on the version) prior to turning on the power. This will minimise the risk of injury and damage.

### 2.3.

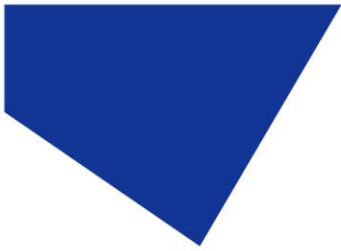
If for any reason the Light Source is to be operated when not attached to a microscope, all personnel should wear eye shielding and clothing to protect the exposed skin.

### 2.4.

Disconnecting the mains supply is achieved by unplugging the power cord from the power supply block or the Light Source. Only plug in the power cable, once the Light Source is attached to the microscope.

### 2.5.

There are no serviceable parts within the Light Source. Removing any of the screws and covers will result in the safety of the Light Source being impaired. The DC power supply unit should be inspected periodically throughout the lifetime of the system.



2.6.

Any electronic equipment connected to this product must comply with the requirements of EN/IEC 60950.

2.7.

To clean the exterior of the Light Source, use a slightly dampened cloth with a simple water/detergent solution only. Avoid the optical surfaces and lenses. Cleaning of optics should only be carried out using optical wipes and fluids. Please note that the DC power supply unit should be isolated prior to cleaning.

2.8.

This product conforms to the requirements of the Safety Standards as follows:

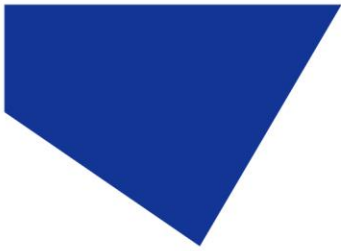
EN/IEC 61010-1:2010	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use.
EN62471:2008	Photo-biological Safety of Lamps and Lamp Systems/Guidance on manufacturing requirements relating to non-laser optical radiation safety. Risk Group 3.

<b>RISK GROUP 3</b>
WARNING UV emitted from this product. Avoid eye and skin exposure to unshielded product.
WARNING Possibly hazardous optical radiation emitted from this product. Do not look at operating lamp. Eye injury may result.
CAUTION IR emitted from this product. Avoid eye exposure. Use appropriate shielding or eye protection

*All warnings may not be applicable depending on the version/wavelength being used.*

2.9. **EMC compliance**

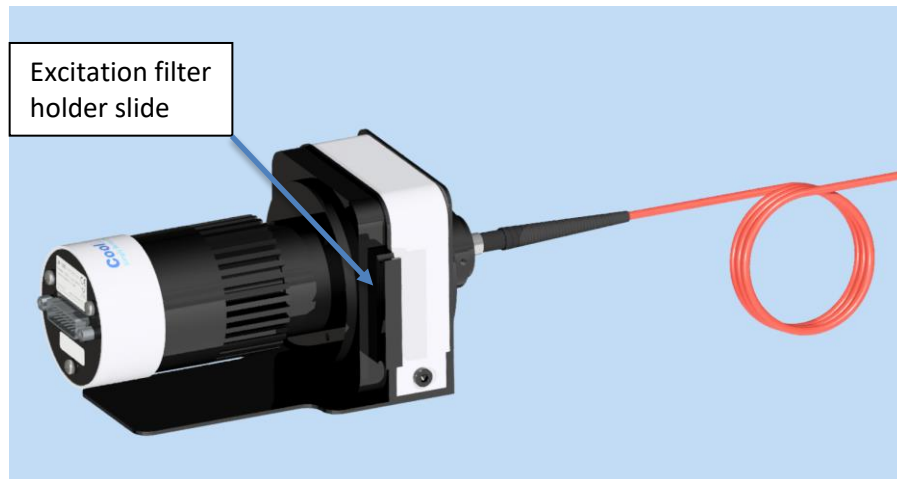
This product is tested to the requirements of standard IEC/EN 61326-1 concerning electromagnetic compatibility. This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.



### 3. pE-100<sup>fiber</sup> Version

#### 3.1.

The pE-100<sup>fiber</sup> version is available with an SMA connection for accepting a wide range of multimode fibres.

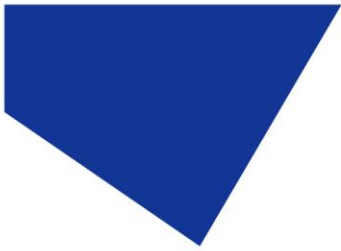


#### 3.2.

The pE-100<sup>fiber</sup> is fitted with an excitation filter holder slide. This accepts standard 25mm filters and allows filtering of the excitation light in the optical path before entering the fiber.

#### 3.3.

The Light Source will be optimised to deliver the maximum amount of light into the fiber. This means that there are no user adjustable parts.



## 4. Combined pE-100<sup>fiber</sup> Version

### 4.1.

As well as the single fiber version shown above, a dual wavelength version is also available. This is a fixed system and the wavelengths need to be specified at the time of ordering. A suitable dichroic mirror will be installed to combine the two wavelengths.

As with the single wavelength version, the Light Sources have been optimised to deliver the maximum amount of power into the fiber.

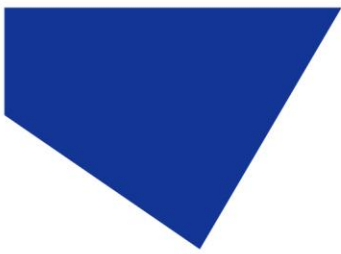


### 4.2.

Excitation filter holder slides are installed in the light path of both of the wavelengths to allow additional filtering.

### 4.3.

The Light Sources are operated in the same way as a standard pE-100 as shown in [Section 5](#) of this User Manual.

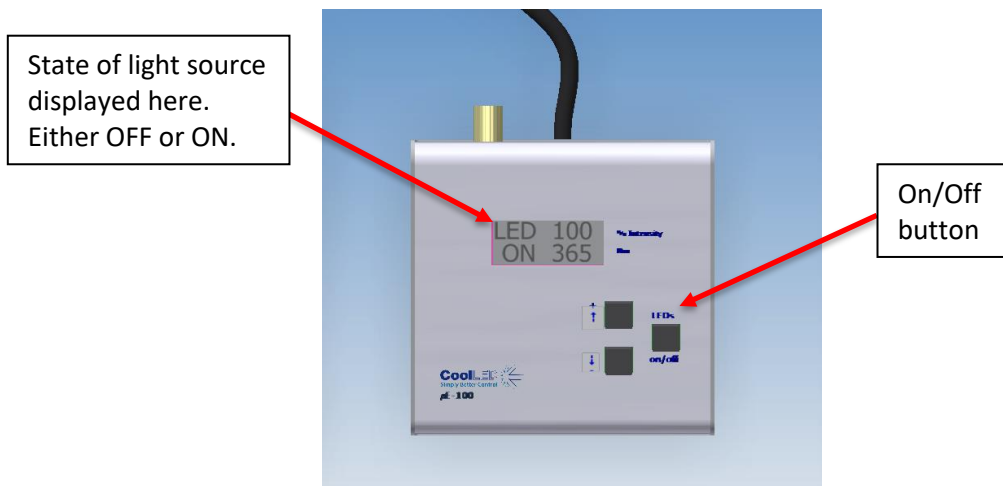


## 5. Operation – Manual Control

### 5.1.

Manual Control Pod Operation on/off.

The pE-100 is easily controlled from the manual Control Pod. LEDs are switched on and off by pressing the 'on/off' button.

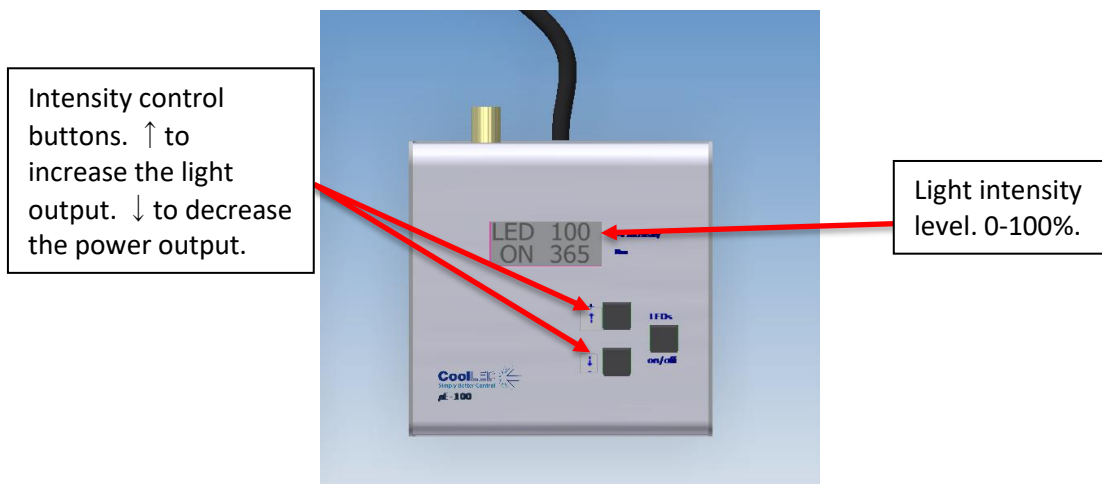


### 5.2.

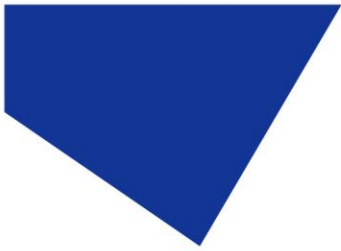
At start-up the Light Source will revert to the same settings that were set when it was last powered down. New Light Sources are supplied with the settings as shown.

### 5.3.

Adjust the intensity of the Light Source by pressing the up and down intensity buttons. This is displayed in 1% steps between 20% and 100%. Between 0% and 20% this figure is displayed in 0.2% intensity steps.







## 6. Remote Operation – TTL

### 6.1.

The pE-100 can be controlled remotely via a TTL signal.

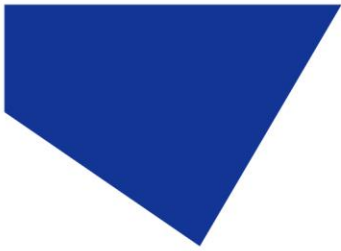
### 6.2.

TTL control uses the single BNC socket on the reverse of the Control Pod.



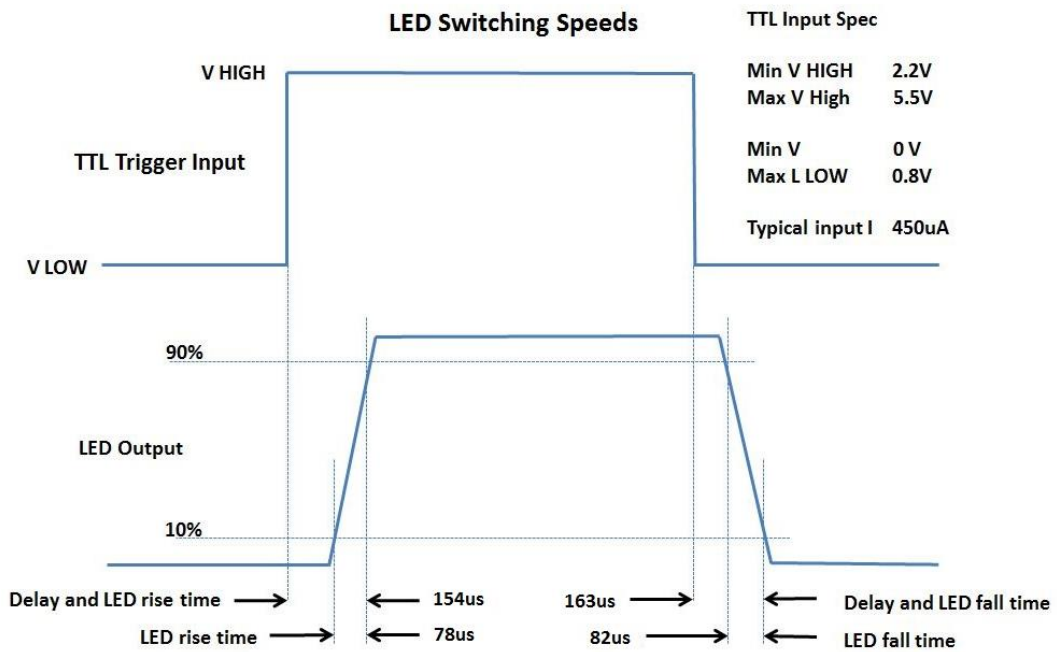
### 6.3.

The TTL signal controls the on/off function of the Light Source. A TTL 'high' will cause the LEDs to be on, independent of the state of the on/off button. The intensity of the LEDs are manually set on the Control Pod.



6.4.

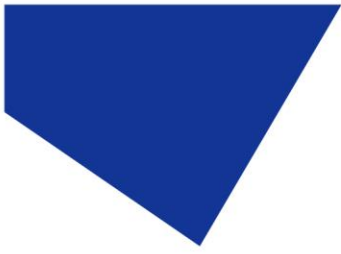
The TTL input circuit has been designed to maximise the switching speed of the LEDs to give the user precise control of the excitation light reaching the sample.



*Note: Switching speeds vary slightly depending on LED wavelength and the intensity that is used.*

6.5.

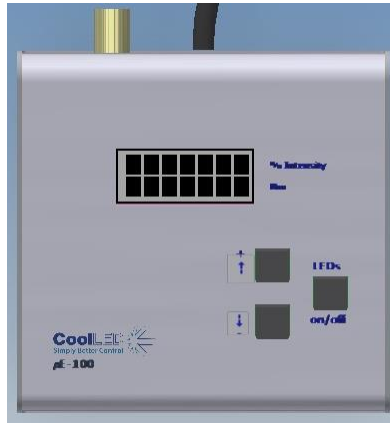
With fast repetitive switching, the Control Pod display will not be able to respond at the same speed and so can get out of synch. If after a train of pulsing, the display on the Control Pod indicates that the LEDs are on while they are actually off, simply press the 'on/off' button to reset the display correctly.



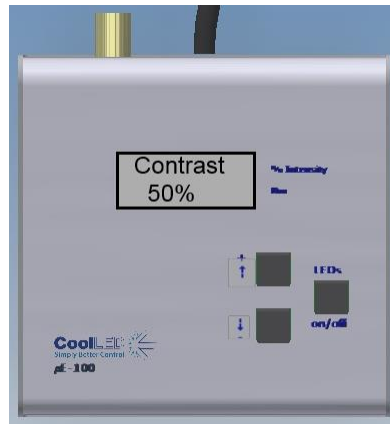
## 7. Settings/Additional Information

### 7.1.

Display Backlight and Contrast settings.

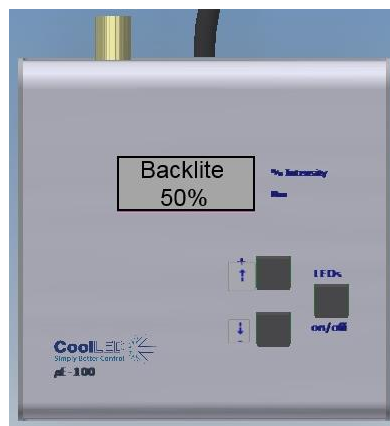


Upon switching on the Pod a chequered pattern shall appear on the display. If any button is pressed at this stage then you shall be taken through a setup sequence.



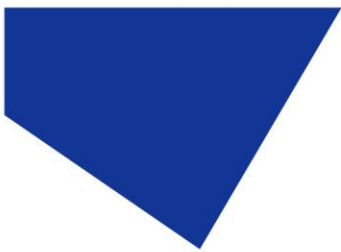
The first option displayed is the contrast adjustment. The contrast setting can be adjusted using the two arrow buttons. This is adjusted in 5% increments.

After having set the contrast press the On/Off button once to continue.



The next screen displayed shall be the Backlight adjustment. The Backlight can be adjusted using the two arrow buttons. This is adjusted in 5% increments.

After having set the backlight press the On/Off button once to continue.



## 7.2.

### System Information



To display the system information complete the steps described in Section 7.1.

The first screen shown displays the firmware version of the system.

Using the arrow buttons, information will be displayed about the head code, the head temperature, the sink temperature and the sink voltage.

After having viewed the system information press the On/Off button once to continue.

## 7.3.

### LED usage information



The system automatically records the total time that the LEDs are on.

To view this information complete Sections 7.1 & 7.2. The system displays a figure in hours.

Once the LED usage information has been viewed press the On/Off button to continue. This button press will return you to the standard operation display.

## 8. Routine Care and Maintenance

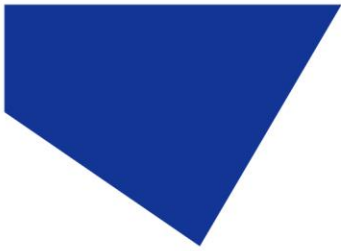
### 8.1.

The pE-100 requires little or no maintenance throughout its life. There are no field serviceable parts so there is no need to remove the covers.

### 8.2.

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 through vents and panel edges. Avoid optical surfaces.





## 10. Product Options and Order Codes

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

## 11. Warranty and Repairs

Please refer to CoolLED's current Warranty Policy available on our website [CoolLED Warranty - CoolLED](#). 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@cooled.com](mailto:support@cooled.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.

## 12. Compliance

### 12.1. WEEE

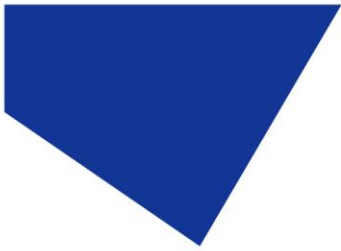
All qualifying products that are subject to the WEEE Directive and supplied by CoolLED are compliant with the WEEE marking requirements. Such products are marked with the "crossed out wheellie bin" WEEE symbol and in accordance with European Standard EN 50419.

CoolLED Certificate No: WEEE/GB4236XX

### 12.2. RoHS

Based on information obtained from our component suppliers, this statement certifies that ALL products manufactured and supplied by CoolLED Ltd are in compliance with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (also known as "RoHS").

This declaration is correct to the best of CoolLED Ltd knowledge, information and belief at the date of its release.



### 12.3. 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?

## 13. Contact Details

CoolLED Ltd  
Unit 3  
Westmarch Business Centre  
River Way  
Andover  
Hampshire  
SP10 1NS  
UK

Phone           +44 (0)1264 323040     (Worldwide)  
                    1-800-877-0128       (USA + Canada)

Email           [info@cooled.com](mailto:info@cooled.com)

Online          [www.cooled.com](http://www.cooled.com)