



# Quick Start Guide for NIS Elements (Legacy)

IQS007- Rev 02

Issue Date: 25/05/2017

## 1 Integrated CoolLED Products:

- pE-2
- pE-300<sup>white</sup>, pE-300<sup>ultra</sup> & pE-340<sup>fura</sup>
- pE-4000

## 2 Setting up your CoolLED Illumination System COM Port via USB:

1. The CoolLED driver file should be downloaded from the CoolLED website:

<http://www.cooled.com/product-detail/imaging-software/>

N.B. This is a general driver for Windows machines and all USB controlled CoolLED Illumination Systems (pE-2, pE-300 Series & pE-4000).

2. Save the files (.inf and certification files) to a preferential location on your Computer (e.g. Desktop)
3. When the CoolLED Illumination System is plugged in, it will appear with a driver required warning (Yellow exclamation mark). Right click and 'update' the driver, pointing it to the previously downloaded directory containing the .inf file.
4. Once the CoolLED Illumination System has been successfully installed into Windows, check the Virtual COM ports assigned by going into Device Manager. The CoolLED Illumination System should be listed under 'Ports' (COM & LPT):

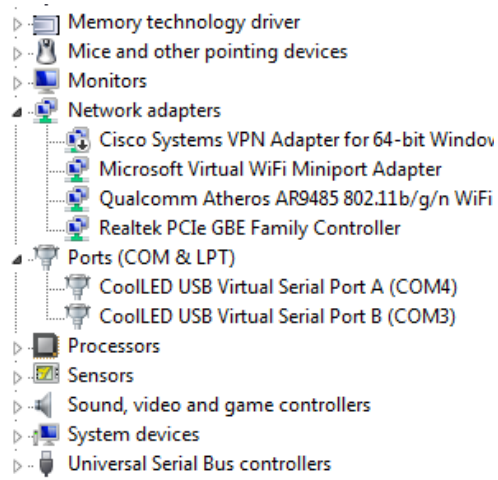
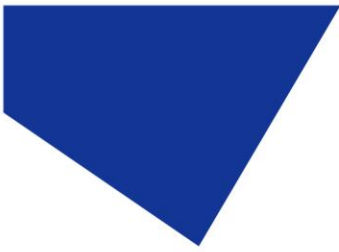


Figure 1: Device Manager with a pE-4000 installed.

Either COM port may be used for control. The creation of two COM ports is to allow for multiple uses (for example: one could be used for controlling the CoolLED Illumination System whilst the other is used for command testing). Additionally, it allows for ease of use if there is a COM port conflict.



### 3 Configuring a CoolLED Illumination System in NIS Elements

#### 3.1 Installation

1. Open NIS Elements, navigate to 'Devices' on the main toolbar and then click 'Manage Devices'

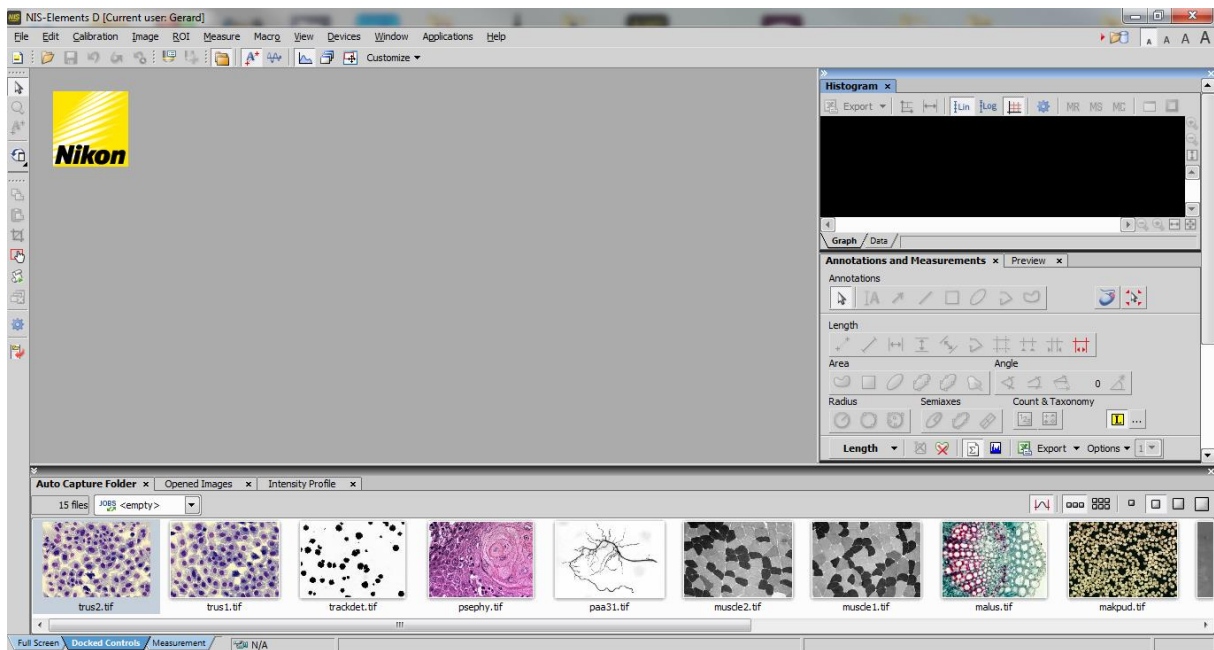


Figure 2: 'NIS Elements' main window

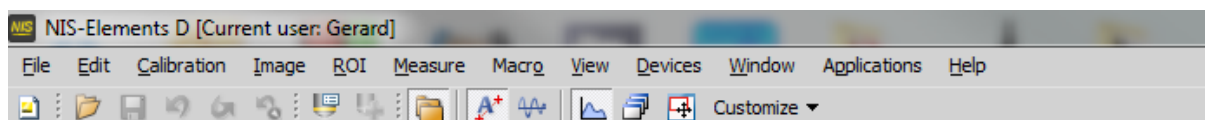


Figure 3: 'NIS Elements' main toolbar

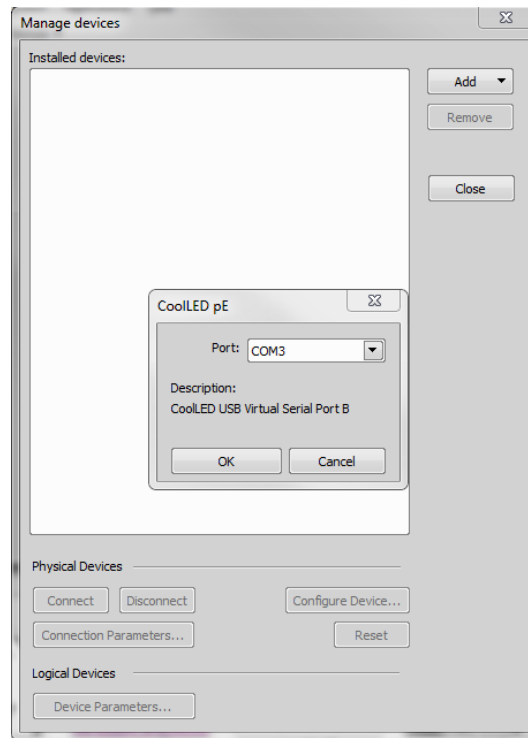
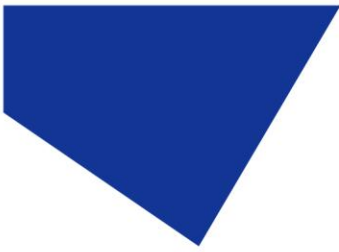


Figure 4: 'Manage Devices' Window

2. In the 'Manage devices' screen, click 'Add' and select the 'CoolLED pE' device. The correct COM port should automatically be selected. You can ensure that the COM port is correct by checking Device Manager. If the wrong COM port is displayed, it can be altered via the drop-down (See below).

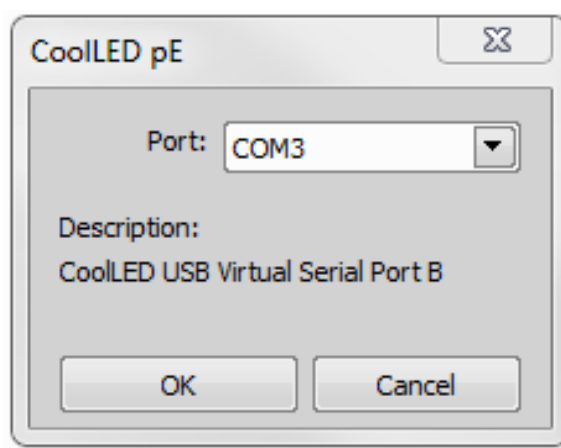


Figure 5: COM port selection via drop-down

3. Click 'OK'. You should see confirmation that the CoolLED Illumination System referred to as 'PrecisExcite' is 'connected' and can be controlled as a Multi-Laser and Shutter.

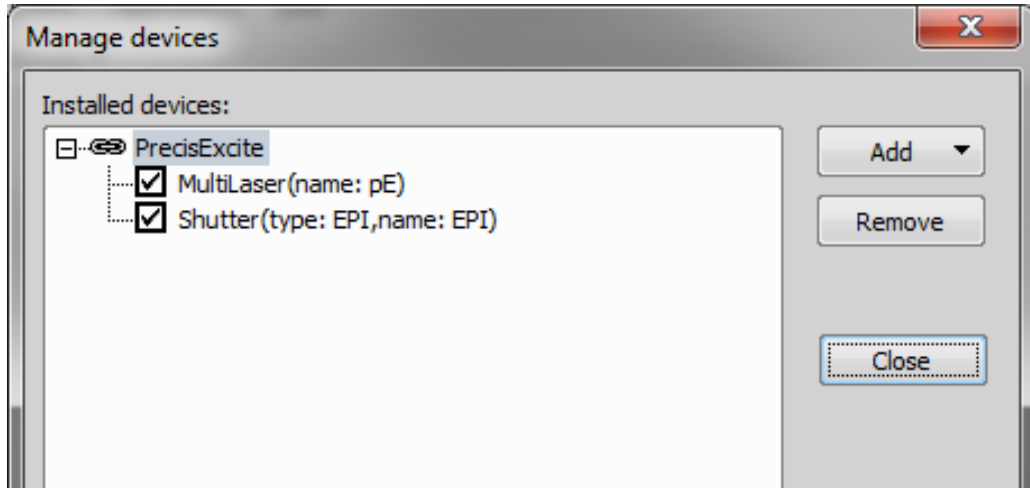


Figure 6: 'Manage Devices' window with 'precisExcite' connected

4. Next, click 'Configure Device'. The 4 wavelengths currently in place should be displayed as shown below. Ensure that the Simultaneous mode tick box is ticked; This is now the most common mode for CoolLED Illumination Systems and not checking this box can cause problems with multiple wavelength experiments. The values given in the type boxes under 'Name' can be edited as necessary.

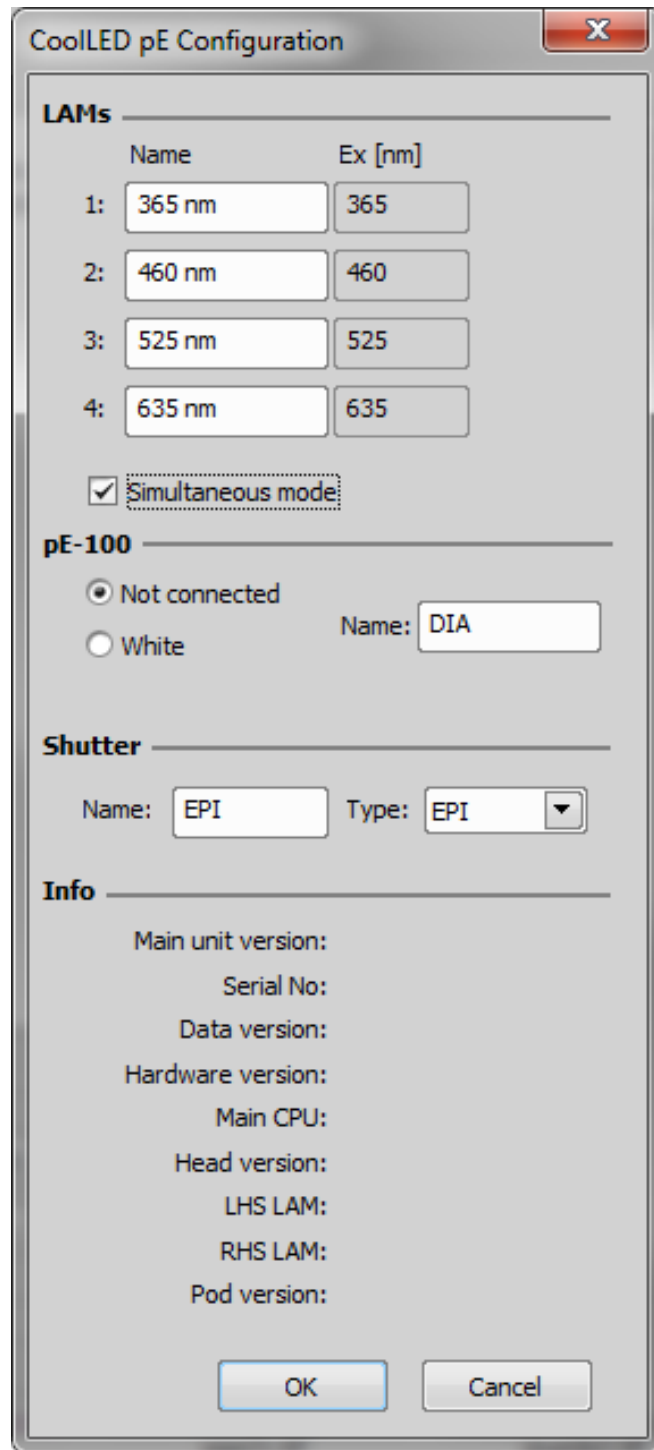
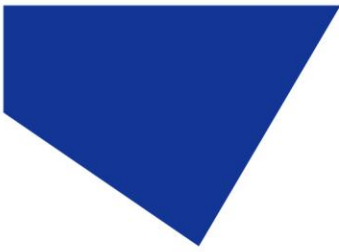
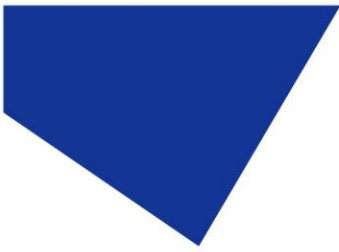


Figure 7: 'CoolLED pE Configuration' window

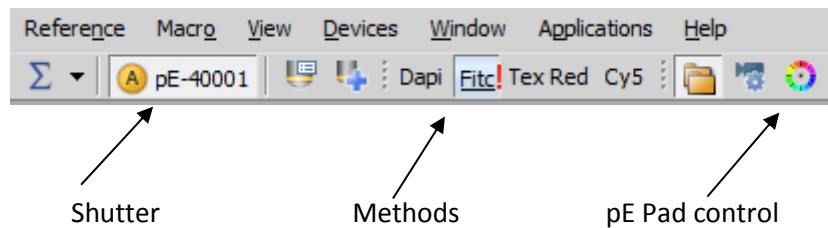
5. Click 'OK', which will return to the 'Manage Devices' Window. The CoolLED Illumination System is now installed and set up.



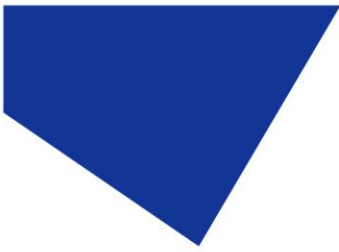
### 3.2 Configuration: Control of Nikon pE-4000 via Elements

1. Once set up in the software, the main toolbar can be used to control pE products:

Figure 8: The main toolbar with pE-4000 installed



















2. If 'shutter' is clicked, a 'Configuration' drop down appears with device parameters. In the below example for the pE-4000, it is called the 'CoolLED pE-4000 Configuration'.
3. The 'CoolLED pE-4000 Configuration' essentially allows set up for the 'pE Pad'; it allows selection of 4 different wavelengths to be used in the 'pE Pad', which is useful for trying different dyes or for generally testing the system. It should be noted that this 'Configuration' only allows the currently selected wavelengths to be changed; the actual switching on and off is done via 'pE Pad' or via the shutter



CoolLED pE-4000 Configuration ✕

**Wavelengths**

1	2	3	4
365 	460 	525 	635 
385 	470 	550 	660 
405 	490 	580 	740 
435 	500 	595 	770 

**Connection**

USB  
 USB + TTL In

**NIDAQ**

Card

TTL Line  
 Analog Line as TTL

1   
2   
3   
4

Enable Triggering:

**Shutter**

Name

**Firmware**

Main: 1.03.20  
Pod: 1.0.613  
Line 1: 1.0.249  
Line 2: 1.0.249  
Line 3: 1.0.249  
Line 4: 1.0.249

**Other**

HW: 1  
Data: 1.0

OK Cancel

Figure 9: 'CoolLED pE4000 Configuration'



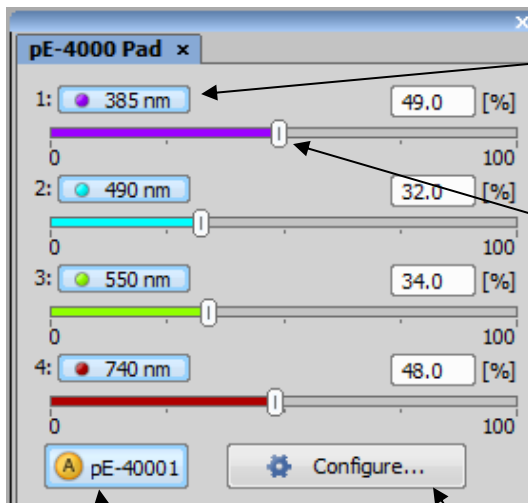


4. To use the 'pE Pad', click the icon on the toolbar:



Figure 10: 'pE Pad' icon

5. This will bring up the 'pE Pad' window, which can be used for live control as shown below:



- Clicking the icon containing the wavelength (in this example 385nm) will shutter the corresponding wavelength.
- The slider underneath is used to control intensity of the corresponding wavelength

Figure 11: 'pE Pad'

Global Shutter

The 'Configure' button will bring up the 'Device Parameters' window



## 4 Examples of Software Functionality:

### 4.1 'pE Pad' and its relation to the pE-Control Pod

1. The 'pE Pad' in NIS Elements is reflected by the Control Pod of the pE-4000.

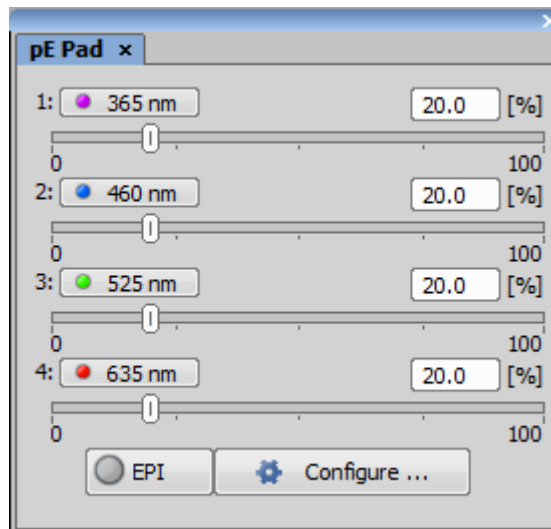


Figure 12: 'pE Pad' with no channels selected

- As previously stated, the wavelengths are selected by clicking on the boxes in which the wavelengths are written. The box containing the wavelength will fill with colour to signify that is selected and ready on/off activation using the 'EPI' button. The intensity on each channel is set using the sliders shown under each wavelength. After the EPI button is clicked on it will change colour and the intensity bars on the selected wavelengths will change from grey to coloured. This is shown in the below image with 365nm, 460nm and 635nm selected:

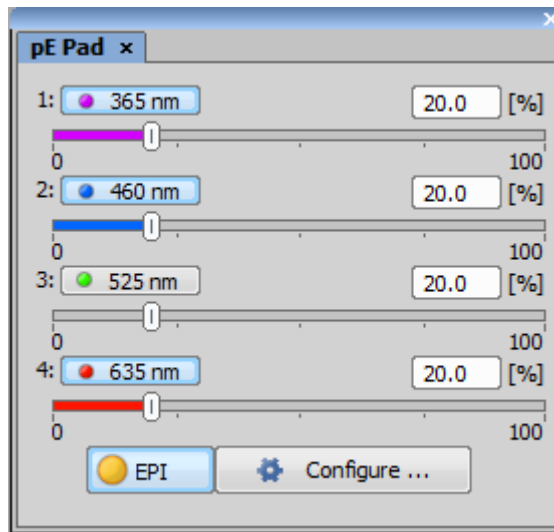
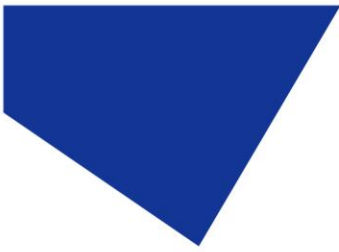


Figure 13: 'pE Pad' with all channels selected

- The corresponding pE-4000 control pod screen reflects this:

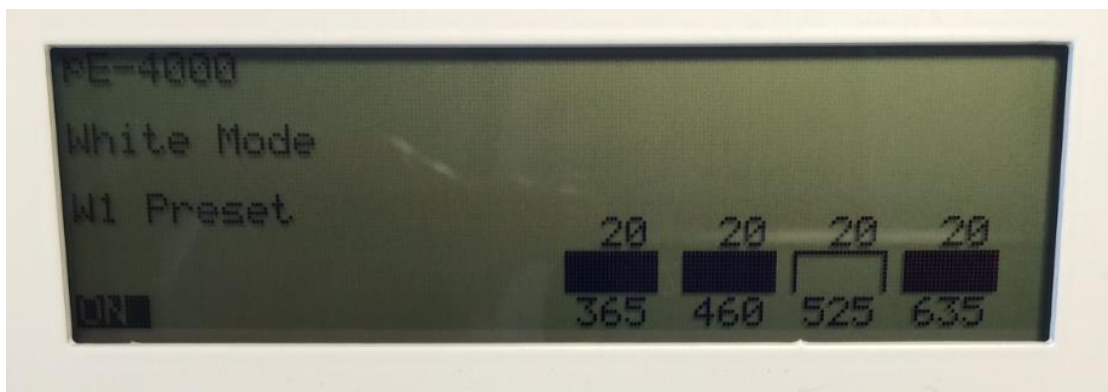
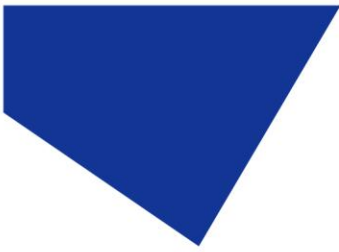


Figure 14: pE-4000 Control Pod

- In the pE-300<sup>white</sup>, the channels are named as letters instead of number to represent coloured regions of the white spectrum. These are UV or VIO (in the multiband version), BLU and GYR. Since the CoolLED control screen in NIS Elements only accepts numerical values, the pE-300<sup>white</sup> standard descriptions need to be modified when the product is intended to be used by NIS Elements.
- This modification changes the channel descriptions to 1UV or 1VI (in the multiband version) and 2B and 3GR. This means that NIS Elements will now see the numerical description of the three channels as 1, 2 and 3. The descriptive letter parts are ignored by the software.



- When a pE-300 Series system is connected to NIS Elements the control screen will open up automatically as shown below:

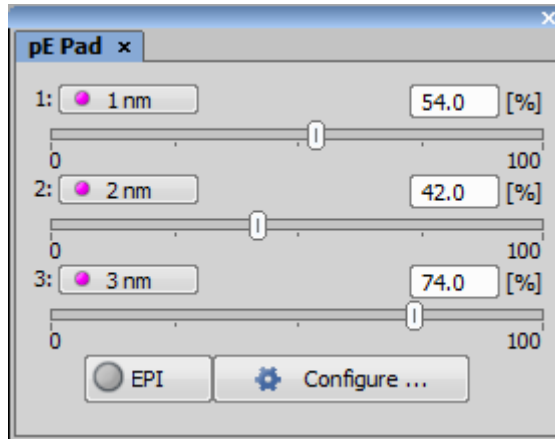


Figure 15: 'pE Pad' with a pE-300Series system connected

- By clicking 'Configure', the channels can be renamed as shown below:

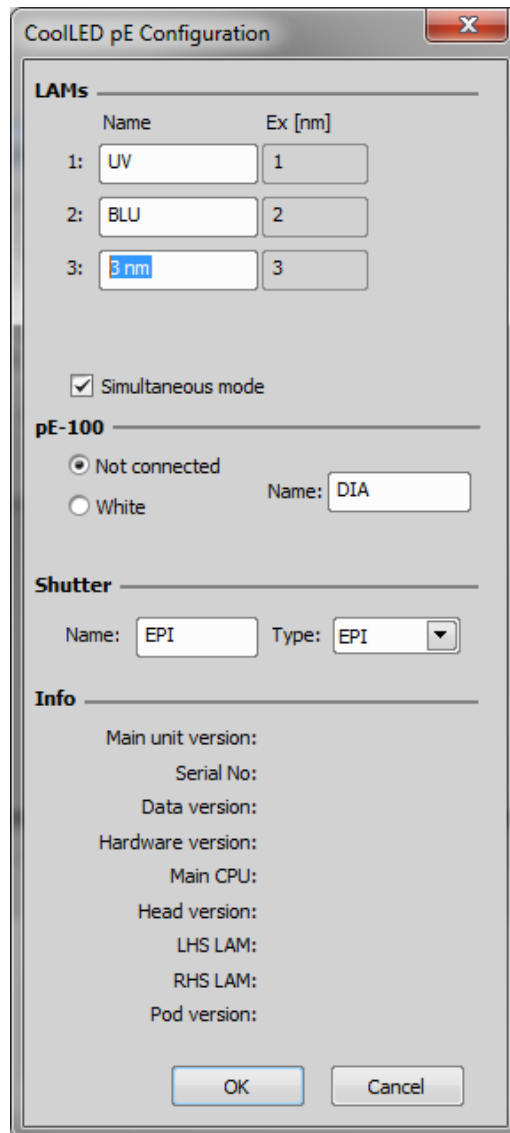


Figure 16: 'CoolLED pE Configuration' with altered LAM names

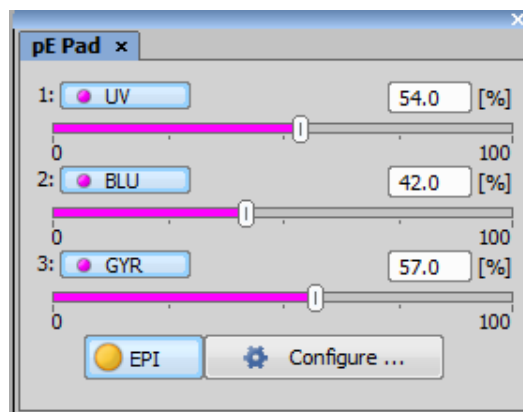
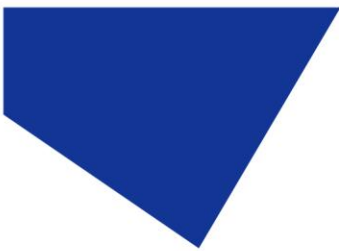


Figure 17: 'pE Pad' with altered names to replicate pE-300 Series Control Pod



## 4.2 Time Lapse using USB acquisition

To set up a CoolLED Illumination System for Time lapse in NIS Elements:

1. Click 'Acquire', and then 'Multi- Channel Set Up '.
2. Next, click 'Set up', and then 'Define New'; this will allow the setup of new dyes and Illumination settings in the 'New Optical Configuration' window:

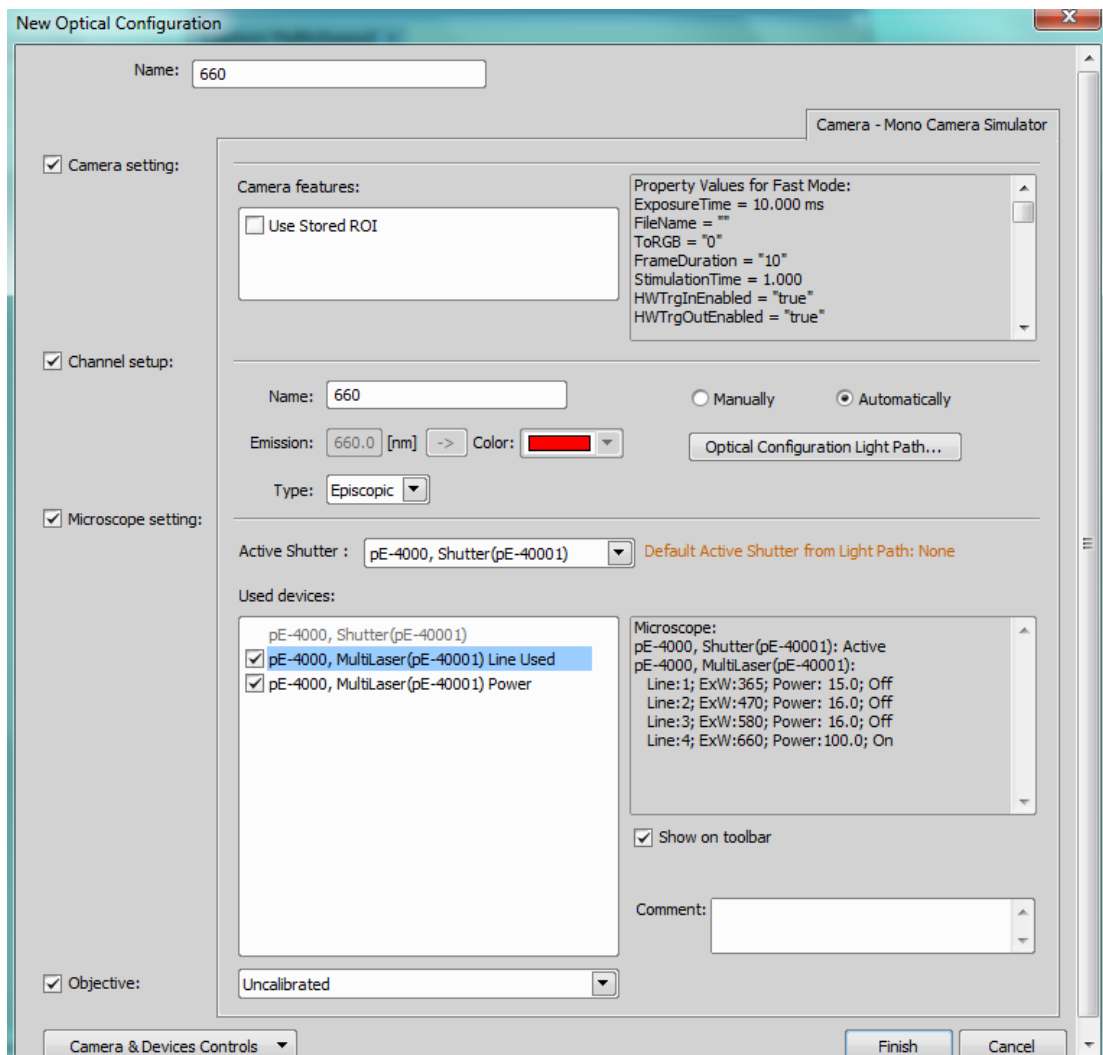


Figure 18: 'New Optical Configuration' window



3. Once the new settings are complete, click 'Finish' to save the Dye and it will be available for use in the toolbar and for further acquisition methods.



Figure 19: Saved dyes or 'Methods' as viewed from the Toolbar

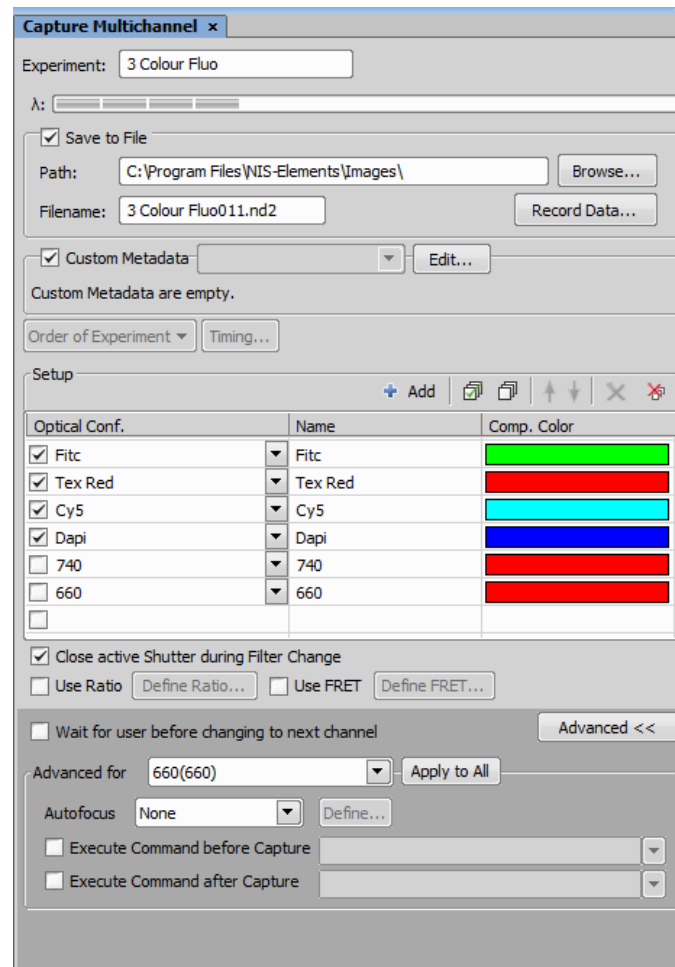


Figure 20: The saved dyes or 'Methods' as viewed in the 'Capture Multichannel' window

4. Next, click 'Applications', and then 'Define/Run ND acquisition'.
5. In the 'ND Acquisition' window, select the 'Lambda' tab and tick the selected LAMs for use in the Experiment:

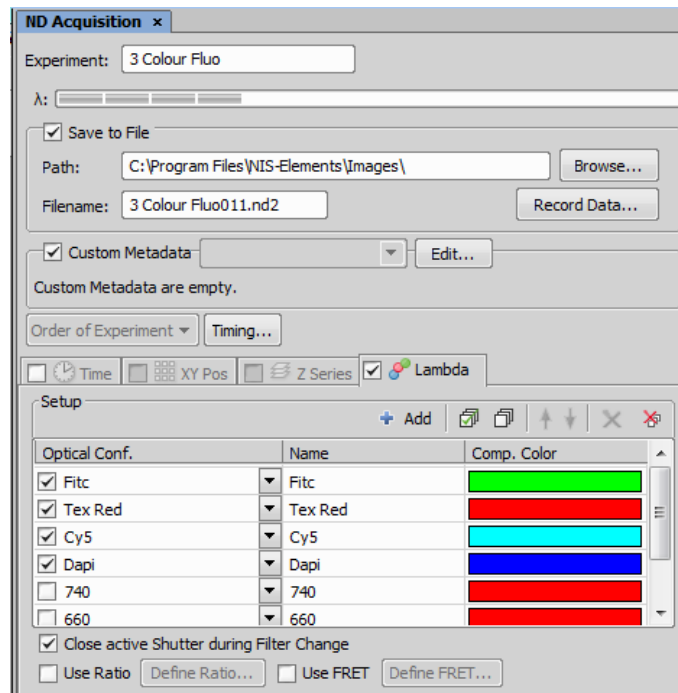
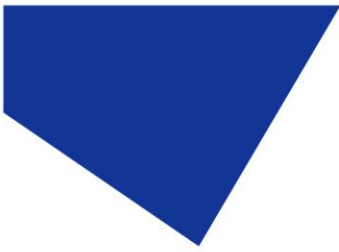


Figure 21: The 'Lambda' tab in the 'ND Acquisition' window

6. Next, navigate to the 'Time' tab to select the loop control:



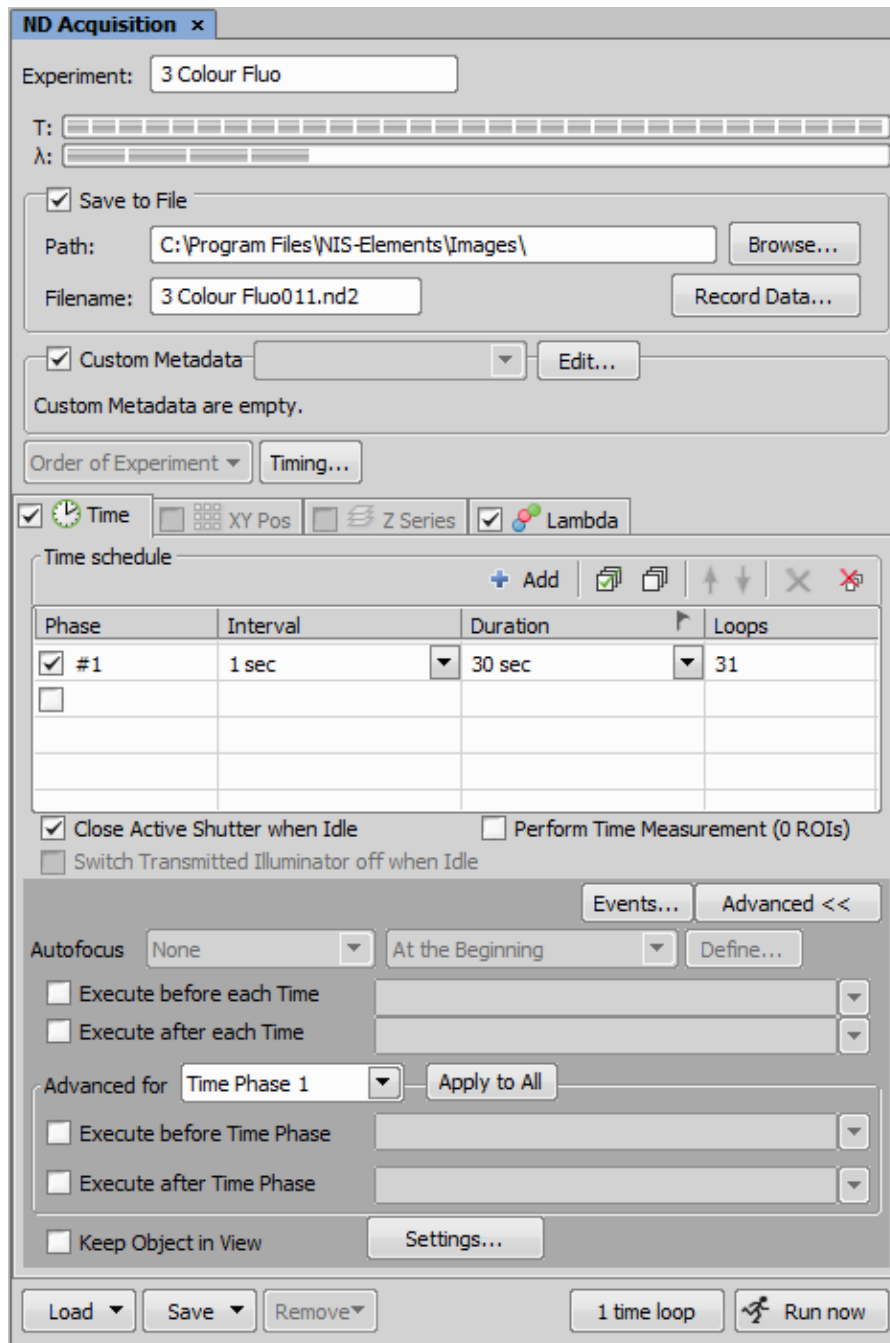
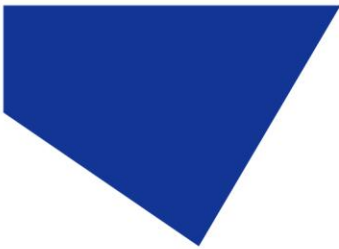


Figure 22: The 'Time' tab in the 'ND Acquisition' window

7. Finally, click 'Run Now' to begin acquisition.