



Quick Start Guide for Micro-Manager

IQS006- Rev 05

Issue Date: 14/01/2021

1 Integrated CoolLED Products:

- pE-2
- pE-300^{white}, pE-300^{ultra} & pE-340^{fura}
- 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):

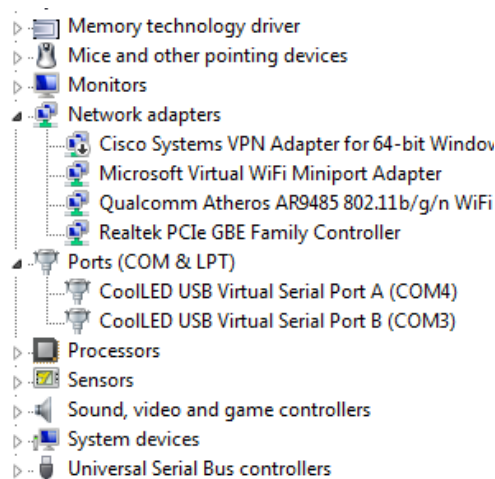
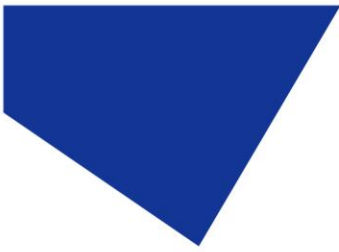


Figure 1: Device Manager with a pE-4000 installed.

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 Installing & Configuring your CoolLED Illumination System in Micro-Manager

3.1 Installation

1. By default, Micro-Manager includes the 'precisExcite' driver for the pE-2 and individual p'E-300' and 'pE-4000' drivers as part of the download package.
2. When Micro-Manager opens, navigate to the 'Tools' tab and then select 'Hardware Configuration Wizard'. This will open the below window:

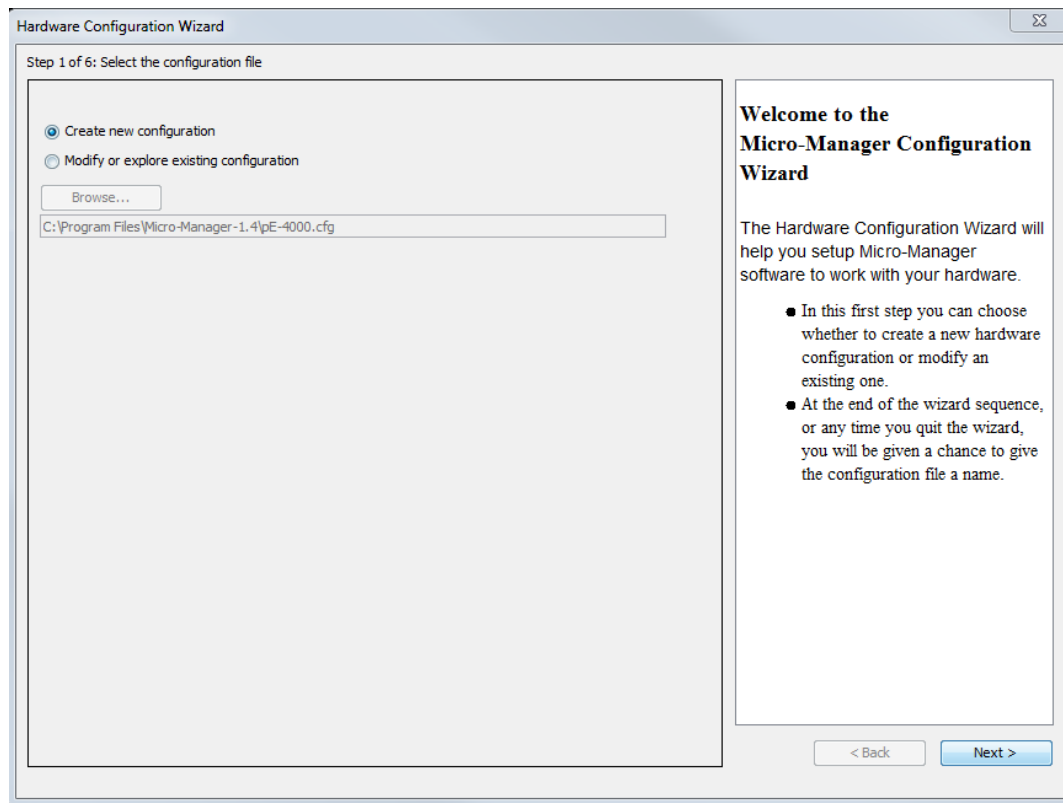


Figure 2: 'Hardware Configuration Wizard'

3. In Step 2 of the Wizard you will be given the option to add or remove devices in addition to the core Micro-Manager device. Navigate through the list and select the relevant CoolLED Illumination System (Note. The pE-2 is listed as 'precisExcite').

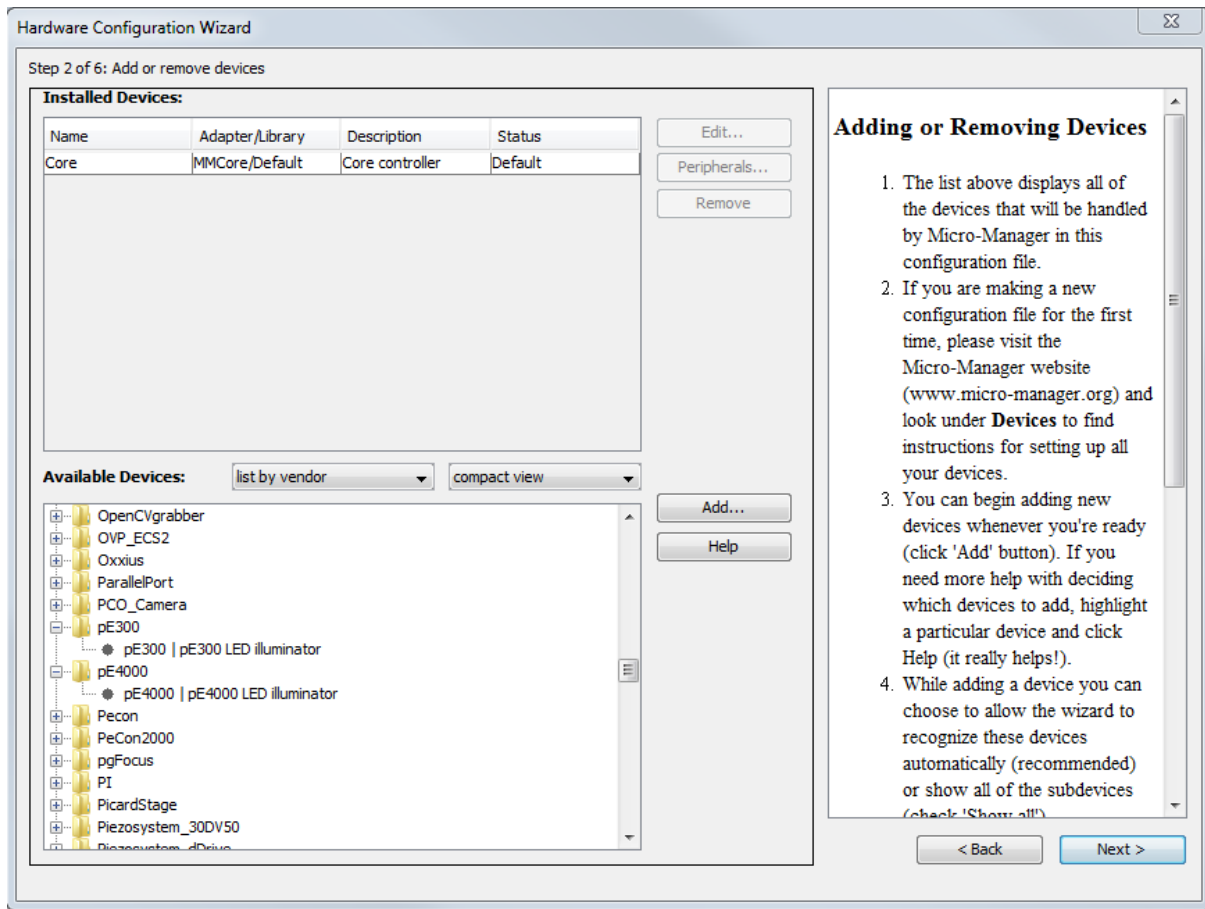
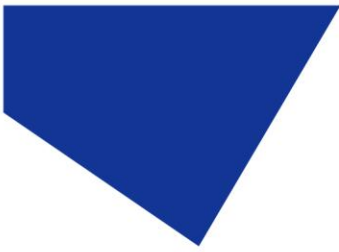


Figure 3: The pE-300 & pE-4000 as listed in 'Hardware Configuration Wizard'

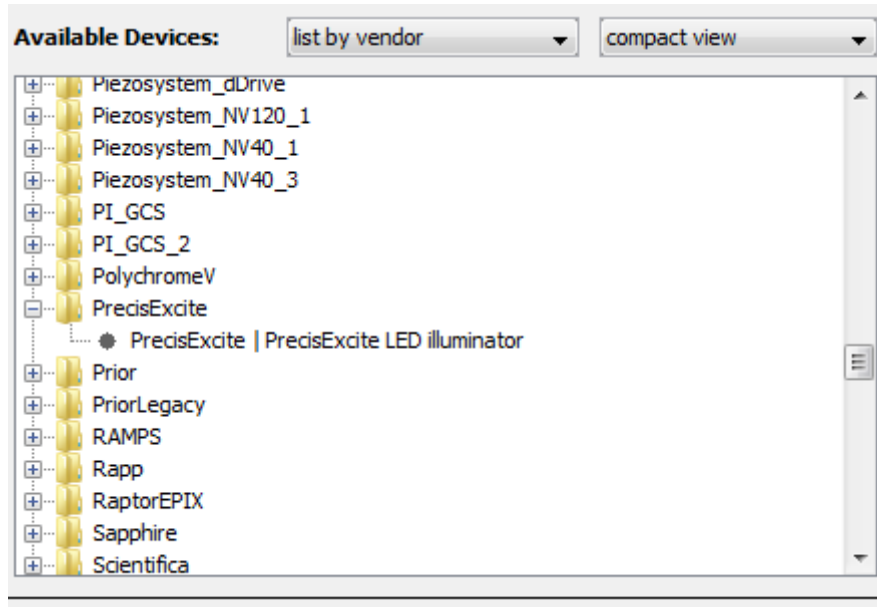


Figure 4: The 'precisExcite' (pE-2) as listed in 'Hardware Configuration Wizard'

4. After selecting the CoolLED Illumination System, another screen will pop up (See below). Ensure that you have selected the correct COM port for your device.

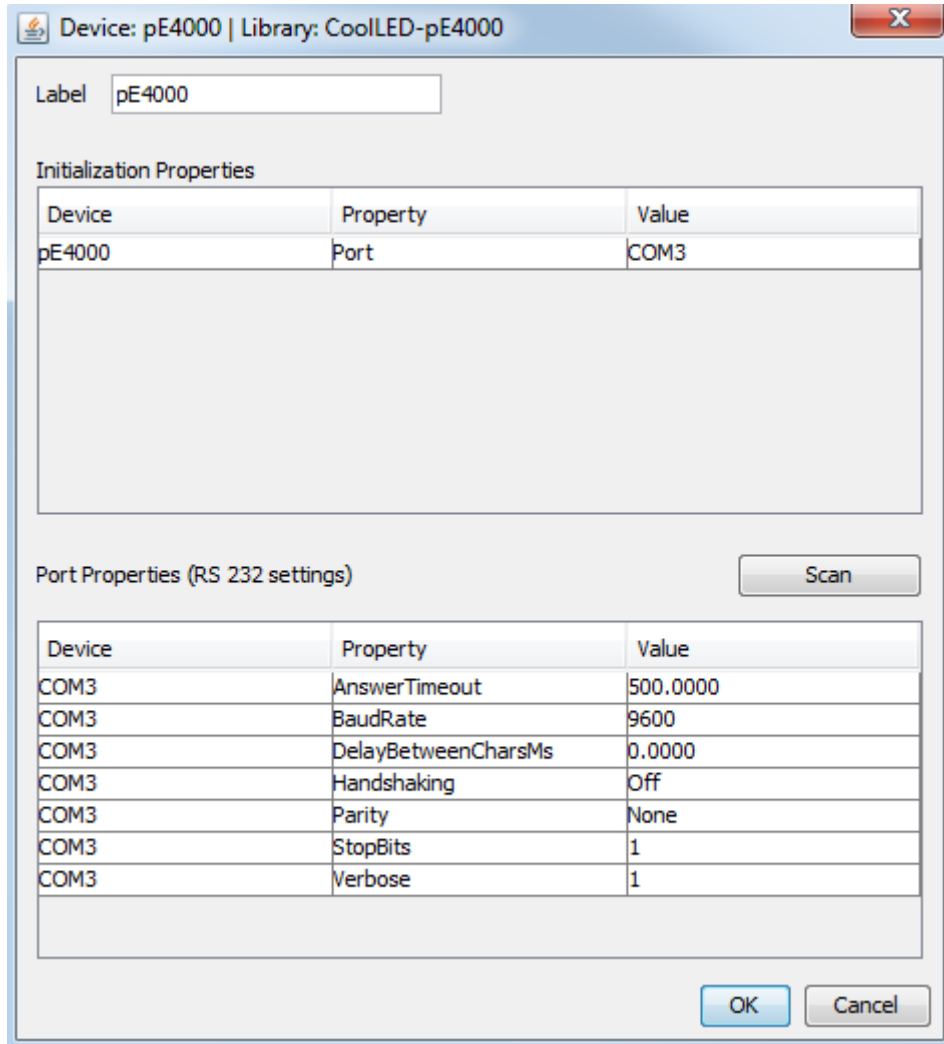
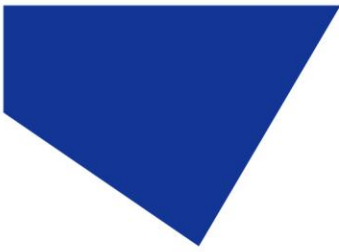
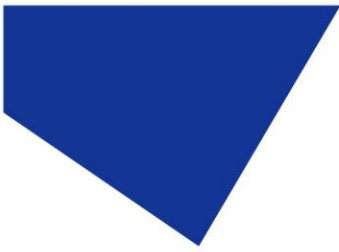


Figure 5 :Device Configuration for the pE-4000

- There are a number of parameters listed in 'Port Properties'. These will default to working parameters and generally should be left alone.
(It is possible to alter these, and this will affect the performance of Micro-Manager. To this end, we recommend that for the most stable performance the 'AnswerTimeout' should be between 50 and 500, and the 'BaudRate' should be 57600.)



6. Ensure that you have added all of the relevant devices for your configuration (camera, stages etc.) and continue to click next through the 'Hardware Configuration Wizard' until you reach Step 6; here you can save your configuration to be re-loaded at any time. After this click 'Finish'.

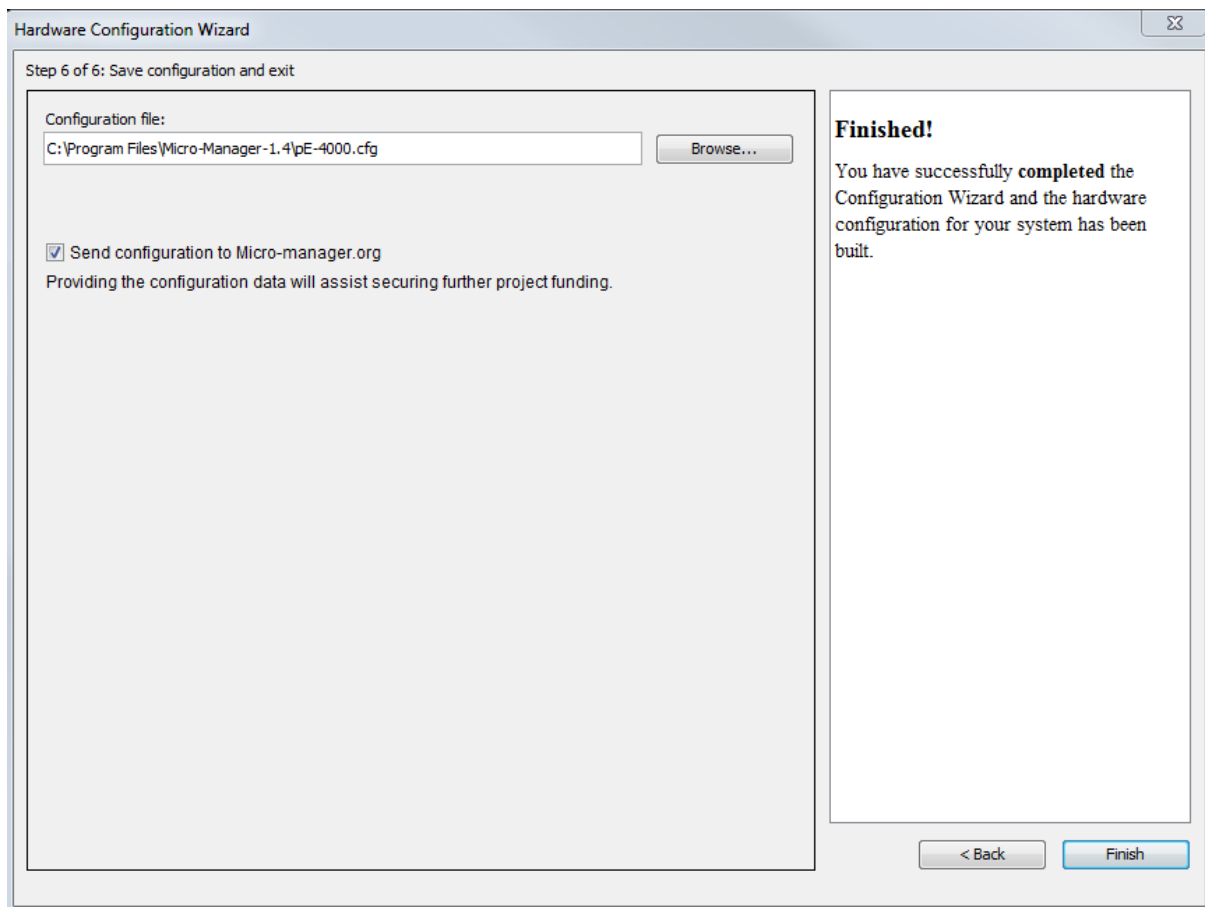
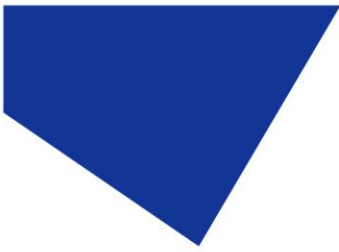


Figure 6: The final screen of the 'Hardware Configuration Wizard'



3.2 Configuration

1. It is possible to view all of the variables that can be controlled by Micro-Manager in the 'Device Property Browser'. In the below example, a pE-4000 is displayed. In the 'Device Property Browser' it is also possible to view the Firmware of your unit in the 'Description' value. This feature is available on the pE-300 and pE-4000.

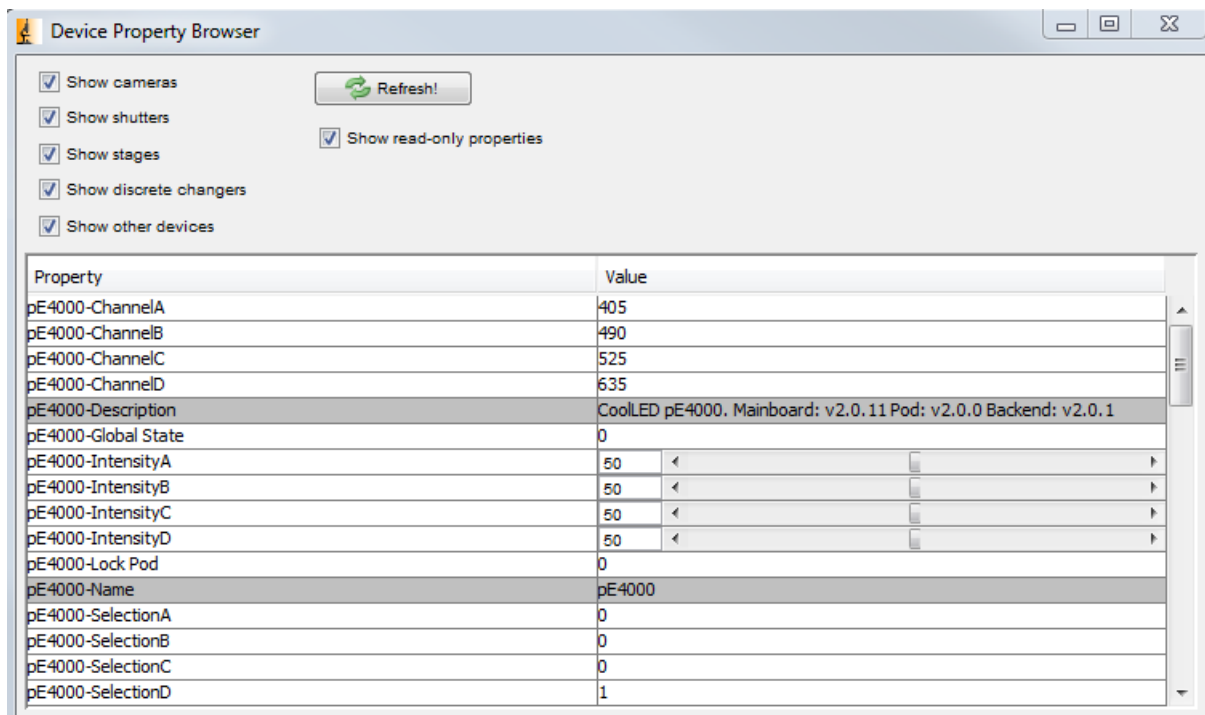


Figure 7: 'Device Property Browser'

2. You can create a 'Group' with any number of these values by clicking the Group '+' icon on the main screen:



Figure 8: 'Groups' & 'Presets'

Doing so will bring up the 'Group Editor' Screen (See below).

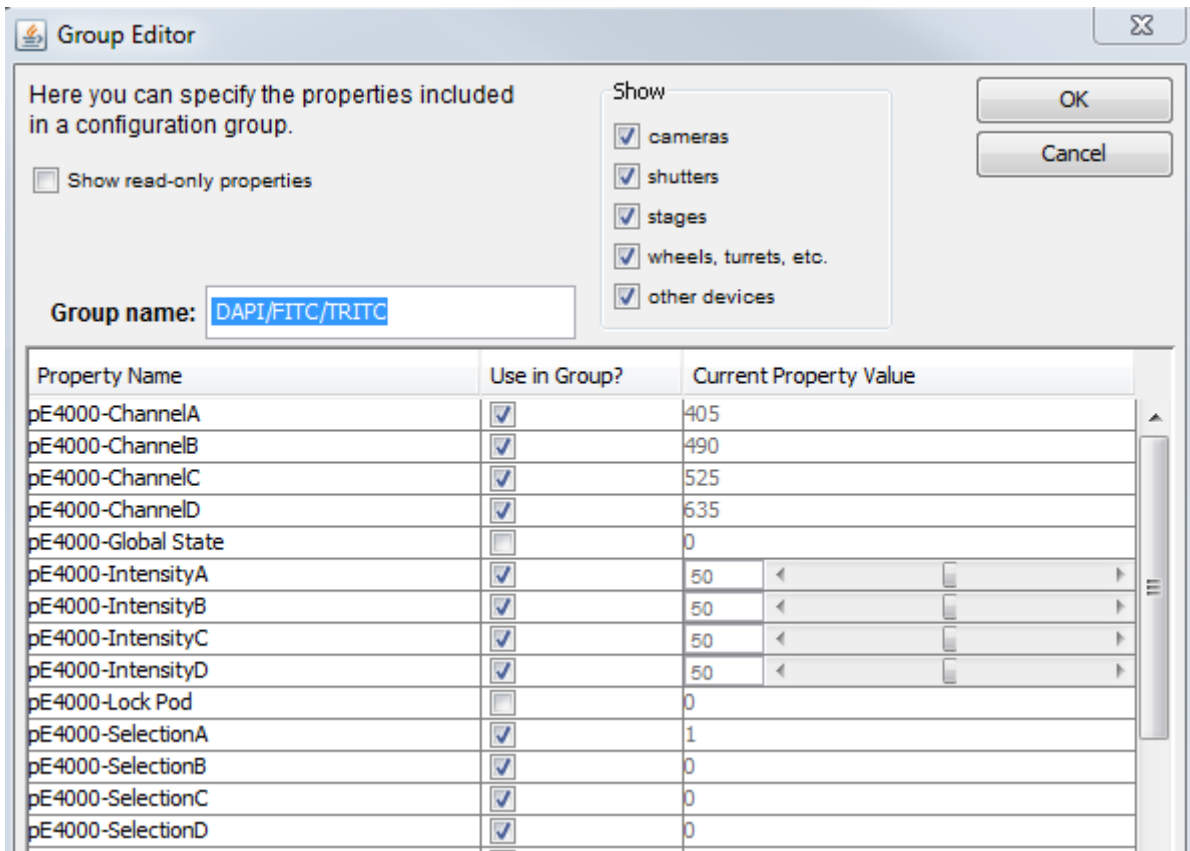


Figure 9: 'Group Editor'

3. After selecting the group of variables from this screen you can create presets for it using the second '+' icon. In doing this you could for example create different presets for each Wavelength you would like to use, meaning that you can switch between them sequentially in 'Multi-Dimensional Acquisition'.

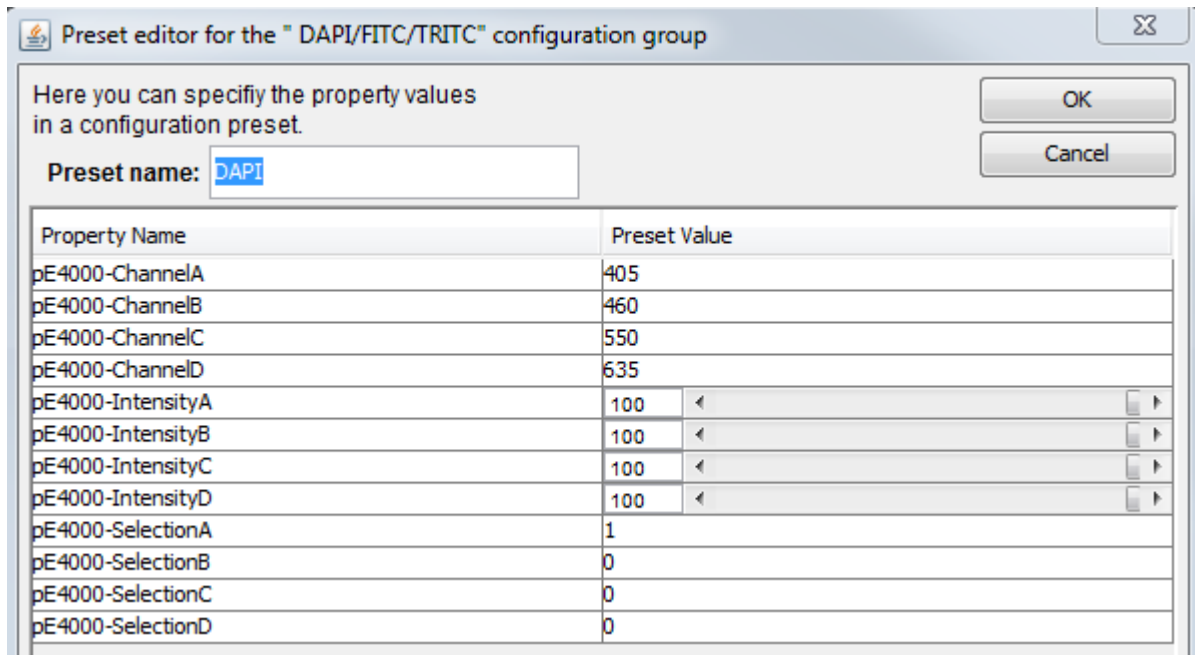
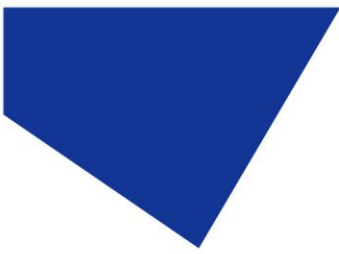


Figure 10: 'Preset Editor': An example using the pE-4000



4 Examples of Software Functionality:

4.1 Multi-Dimensional Acquisition

In 'Multi-Dimensional Acquisition', it is possible to create a sequence of images by adding a selecting a group (in this example DAPI/FITC/TRITC) and then individually pressing 'New' to add each preset. When you then set your time parameters and click 'Acquire!', these wavelengths will switch sequentially.

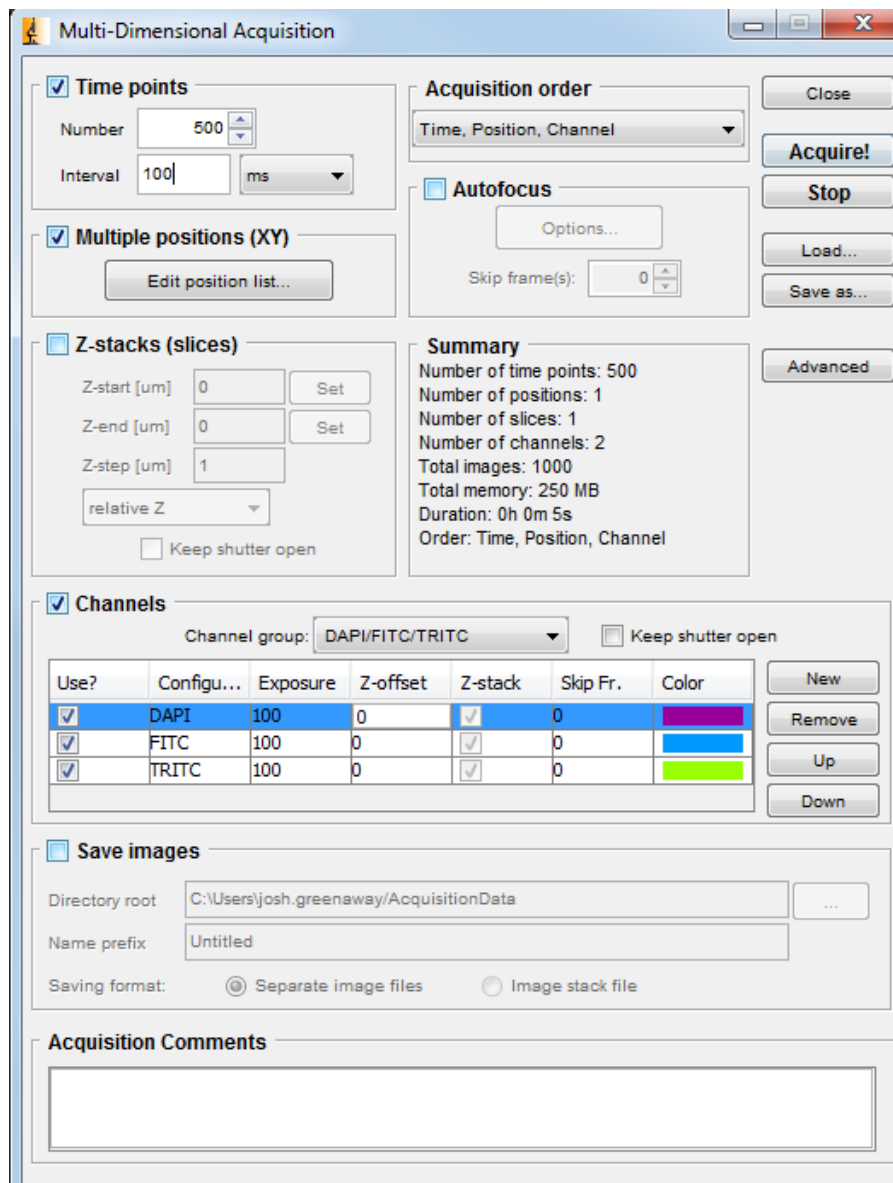
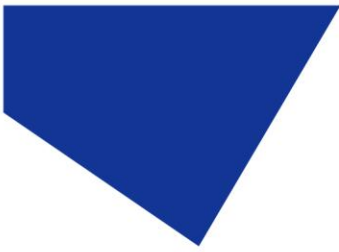
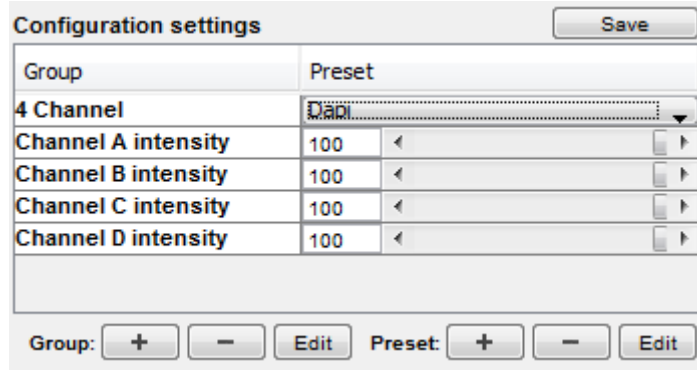


Figure 11: 'Multi-Dimensional Acquisition' setup



4.2 Live Intensity Variation

For Live Intensity Variation, you can create a 'group' with only one value; such as intensity with a slider, as shown below:



The screenshot shows a 'Configuration settings' dialog box with a 'Save' button in the top right. It contains a table with two columns: 'Group' and 'Preset'. The 'Group' column has a dropdown menu currently showing '4 Channel'. The 'Preset' column has a dropdown menu currently showing 'Dip'. Below the table, there are four rows, each representing a channel's intensity: 'Channel A intensity', 'Channel B intensity', 'Channel C intensity', and 'Channel D intensity'. Each row shows a value of '100' and a slider control. At the bottom of the dialog, there are two sets of controls: 'Group:' with '+', '-', and 'Edit' buttons, and 'Preset:' with '+', '-', and 'Edit' buttons.

Group	Preset
4 Channel	Dip
Channel A intensity	100
Channel B intensity	100
Channel C intensity	100
Channel D intensity	100

Figure 12: A possible configuration setting for Live Intensity Variation.

This means you can alter the intensity live, and still switch back to the values in the other group (In this example the '4 Channel' group).