



# Quick Start Guide for MetaMorph

IQS005- Rev 03

Issue Date: 07/03/2023

## 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):

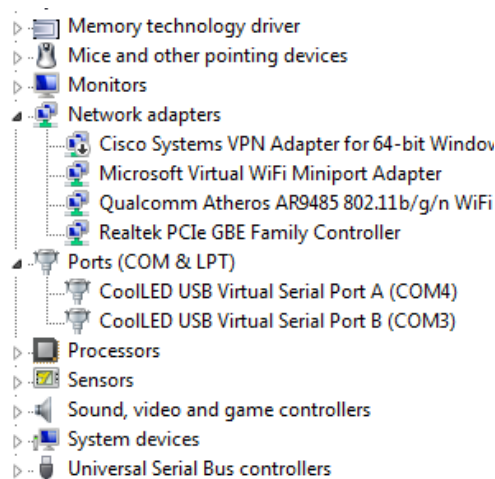


Figure 1: Device Manager with a pE-4000 installed.

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.

N.B. To install in MetaMorph, Windows must assign a COM port at or below COM9



### 3 Configuring a CoolLED Illumination System in MetaMorph

#### 3.1 Installing an Illumination System in MetaMorph

1. Firstly, open the 'Meta Imaging Series Administrator':

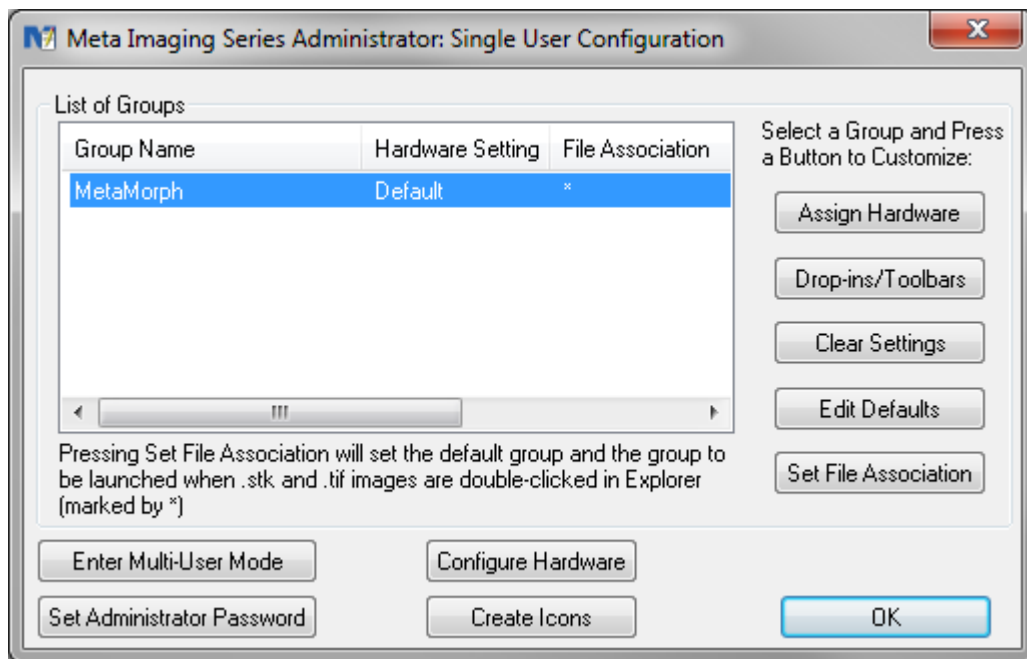


Figure 2: 'Meta Imaging Series Administrator' Window

2. Click on the 'Configure Hardware' button and then on the 'Install System Devices' button within the Configure Hardware screen.



Figure 3: 'Configure Hardware' Window

1. This will bring up the 'Install System Devices' Window. Click 'CoolLED pE' in the 'Available Hardware' and click 'Install >>'.

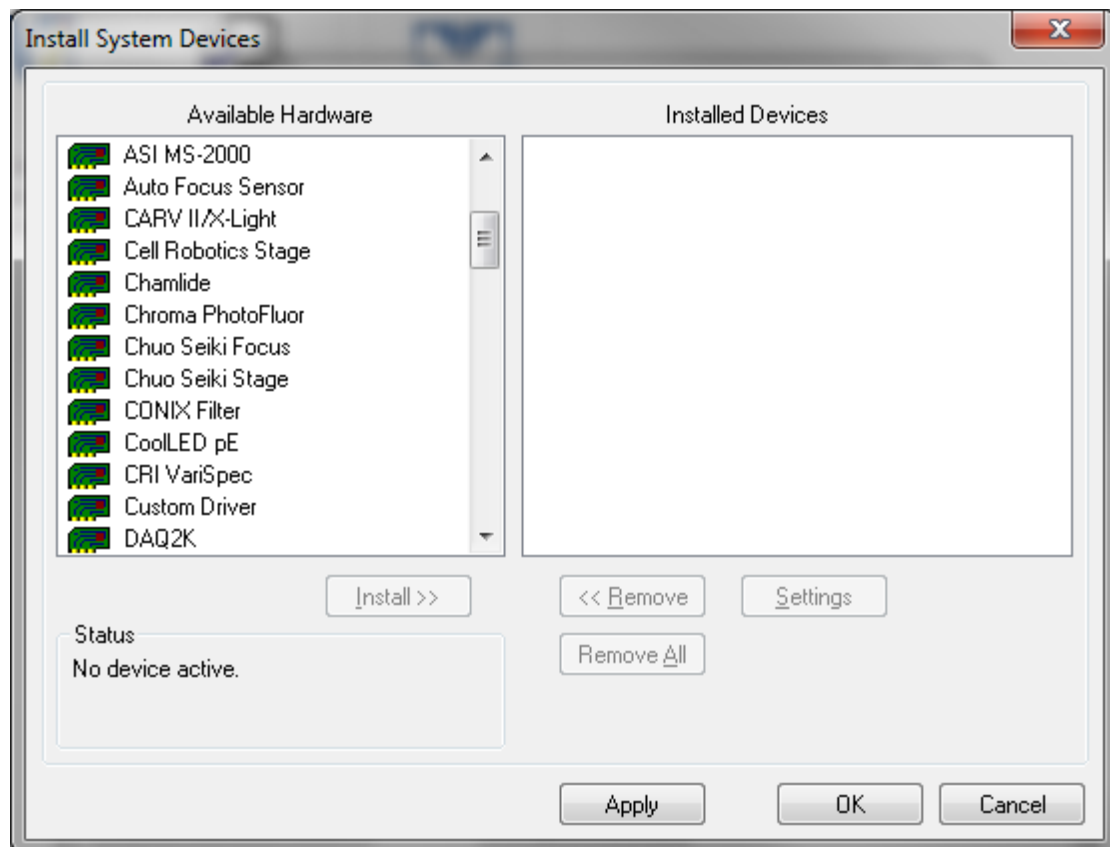


Figure 4: 'Install System Devices' Window



- MetaMorph should automatically recognise which CoolLED Illumination System is connected and will install the correct number of wavelengths and intensities appropriately. However, if MetaMorph has not recognised the COM port that your pE product is attached to, a 'Connection Not Available' pop-up such as the following will appear:

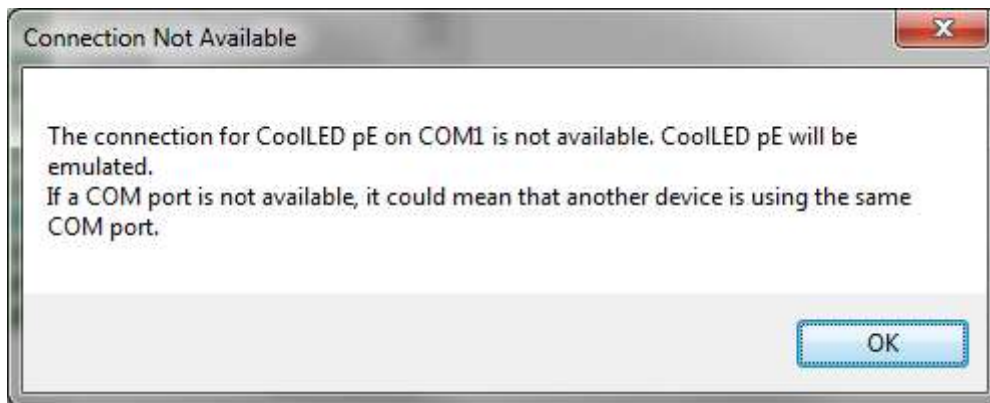


Figure 5: Pop-up that appears as a result of no COM port connection

Clicking on OK will give the following screen showing that the device is now in 'EMULATION MODE':

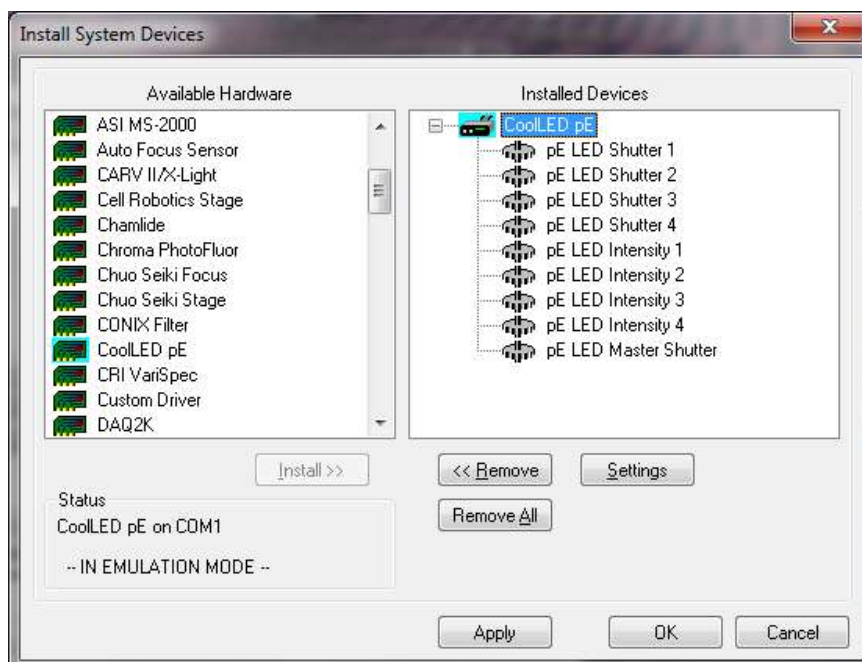


Figure 6: CoolLED Device in 'EMULATION MODE'



In order to fix this, click 'Settings' and then navigate to the 'Connection Settings' tab. In 'Connection Settings', there is a 'COM Port' drop down. From this, select the correct COM Port that was previously shown to be assigned in the Device Manager window. Then uncheck the 'Operate Device in emulation mode' tick- box and press 'OK'

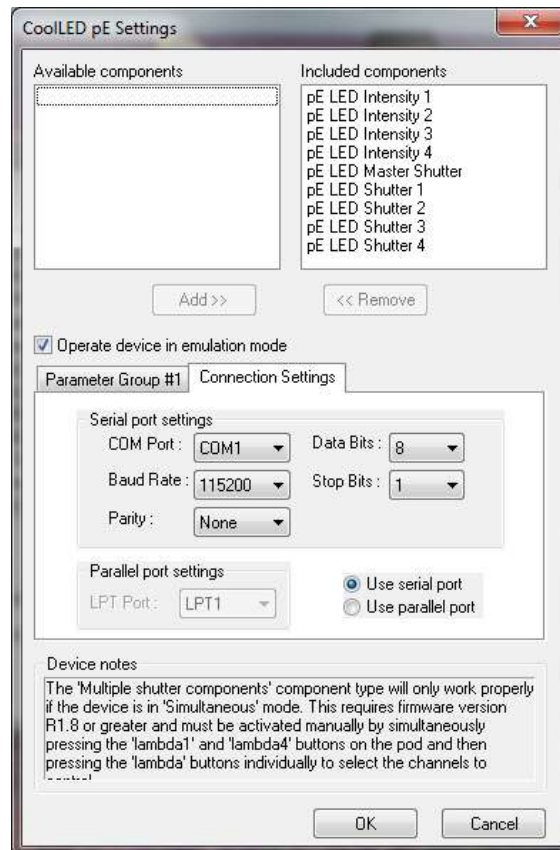


Figure 7: 'Connection Settings' for adjusting COM Port.



3. Having been returned to 'Install Systems Devices', click 'OK' once more to return to the 'Configure Hardware' screen.



Figure 8: 'Configure Hardware' Window

4. Next, click 'Configure Devices'. This will bring up 'User Settings for "Default" hardware configuration'. Having already installed the CoolLED Illumination System, it should appear underneath 'Available Devices'. Click 'Add >>' button to add the CoolLED Illumination System. You should now get a screen as below, whereby the 'CoolLED pE' is listed under 'Claimed Devices'.

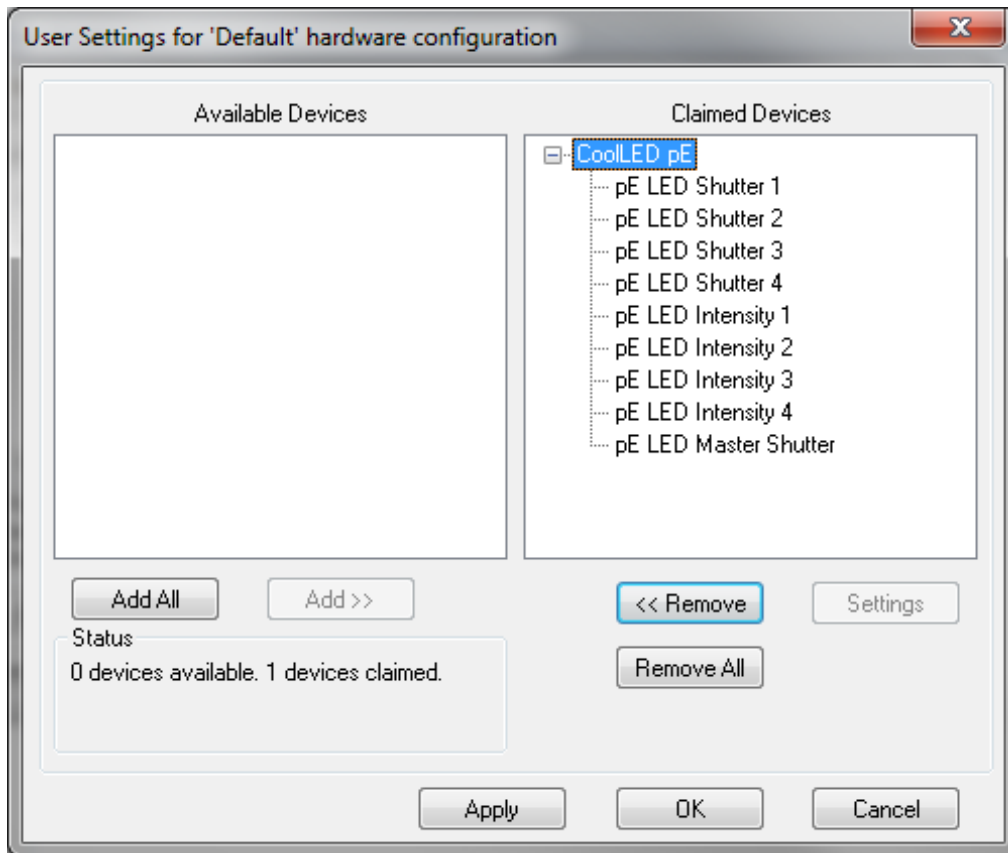


Figure 9: CoolLED pE Installed and 'claimed' in MetaMorph

5. With the system now installed, click 'OK' to leave this screen and then again on 'Configure Hardware' screen. Finally click on 'OK' to exit 'Meta Imaging Series Administrator'.
6. MetaMorph itself can now be opened.





### 3.2 Configuring a CoolLED Illumination System in MetaMorph

1. After opening up MetaMorph, you can reach the CoolLED Illumination System in two ways. One method is by navigating go to 'Devices' and then 'Device control' (See below). You can then navigate to the 'configure' tab before clicking 'configure illumination'.



Figure 10: 'Device Control' Window

Alternatively, you can select the 'Configure Illumination' icon on the toolbar:



Figure 11: 'Configure Illumination' icon

2. Either of these options will lead to 'Configure Illumination'. The below image conveys how this window will appear if a pE-4000 is used:

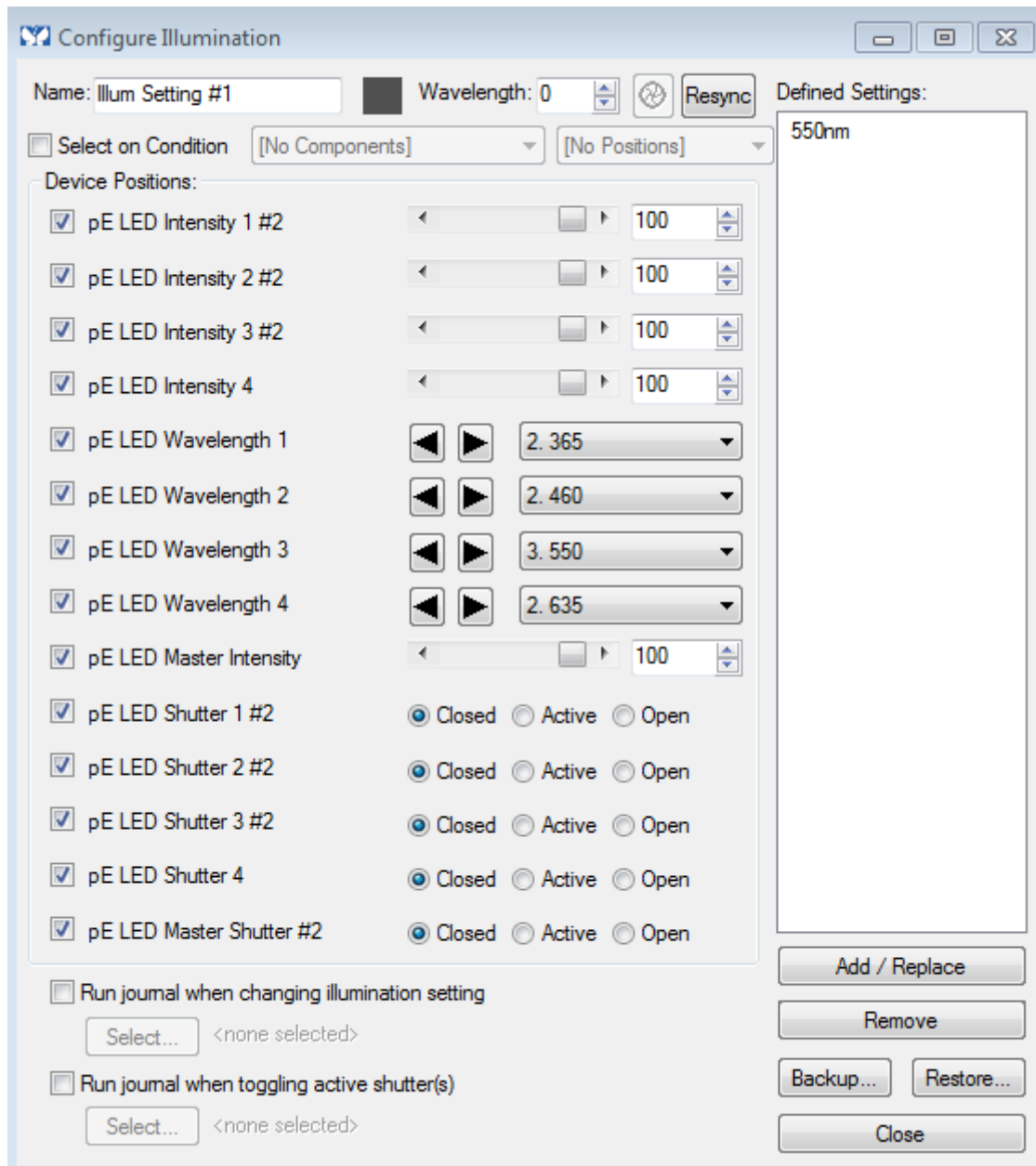


Figure 12: 'Configure Illumination' window

1. The tick boxes down the left-hand side of the window relate to whether the intensity, wavelength or shutter of each LED channel can be altered or not. The intensity values can be changed using the slider, whilst the wavelength of each channel can be changed via the drop down.
2. Each channel can also be put into the Closed, Active or Open state using the pE LED Shutter 1-4:



- When Closed: The given channel will not be switched on when the shutter icon is pressed.
- When Active: The given channels will be switched on when the shutter icon is clicked on.
- When the Open: The channel will switch on regardless of the shutter icon status.
- The global shutter is available as the 'Master shutter' at the bottom of the window, or as an icon at the top of the 'Configure Illumination' window:



Figure 13: 'Shutter' icon

N.B. Changes of channel intensity using the on-screen sliders will be updated immediately on the CoolLED Control Pod. If changes of intensity are made to a given channel using the Control Pod, the 'Resync' button on the 'Configure Illumination' screen can be used to update MetaMorph.



## 4 Examples of Software Functionality:

### 4.1 'Defined Settings'

- In 'Configure Illumination', you can select any wavelength and intensity and create a 'Defined Setting' for it which will be saved and can be reloaded; in the below example 550 nm has been created by selecting 'pE LED Intensity 3', 'pE LED Wavelength 3', whilst only the 'pE LED Shutter 3' is active. It is possible to set up 'Defined Settings' with several wavelengths if applicable.

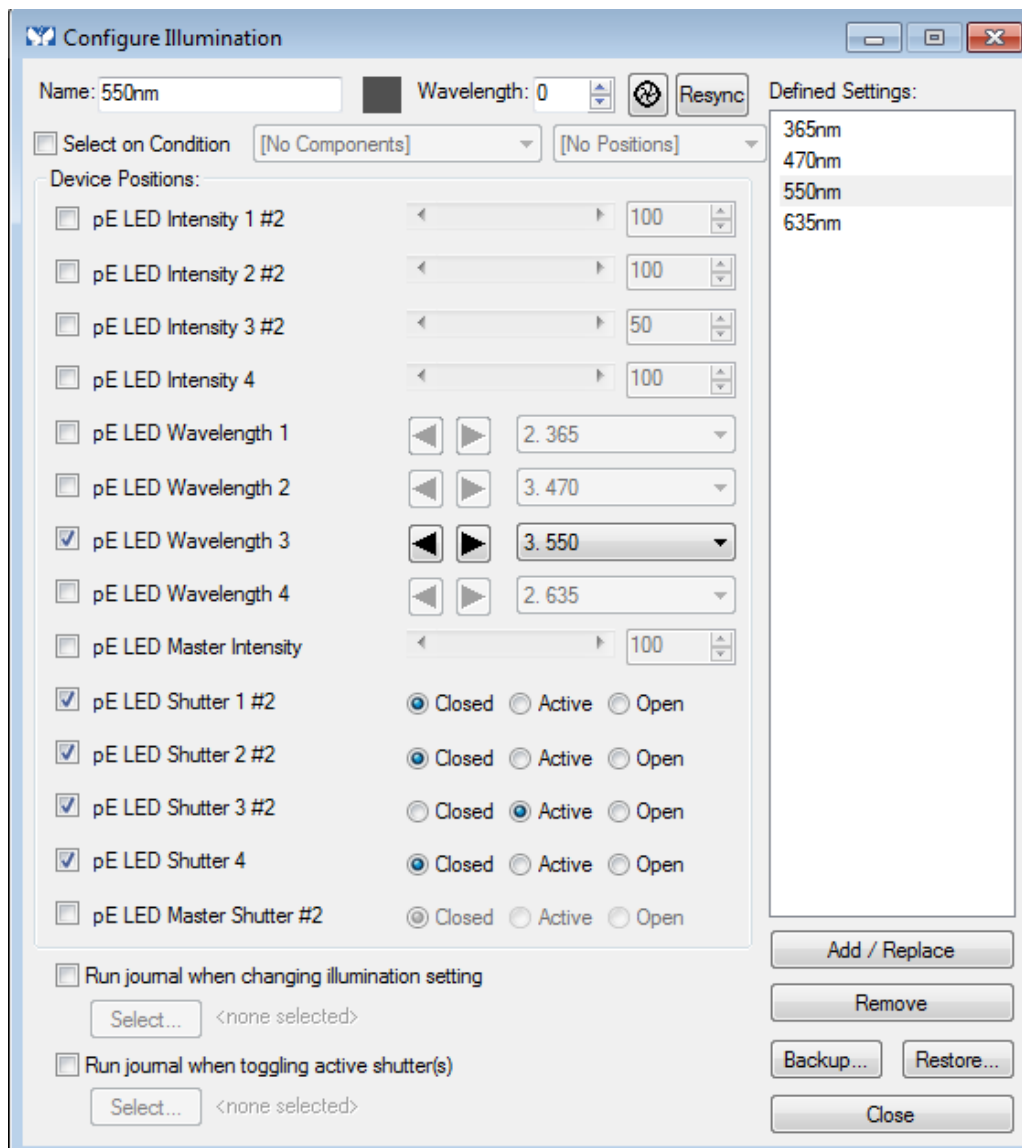


Figure 14: 'Configure illumination' window with a 'Defined Setting' of 550 nm



## 4.2 Multi-Dimensional Acquisition

1. If you have set up several 'Defined Settings', you can run 'Multi-Dimensional Acquisition' to sequentially image using them. In the below example 365 nm, 470 nm, 550 nm and 635 nm have been created.

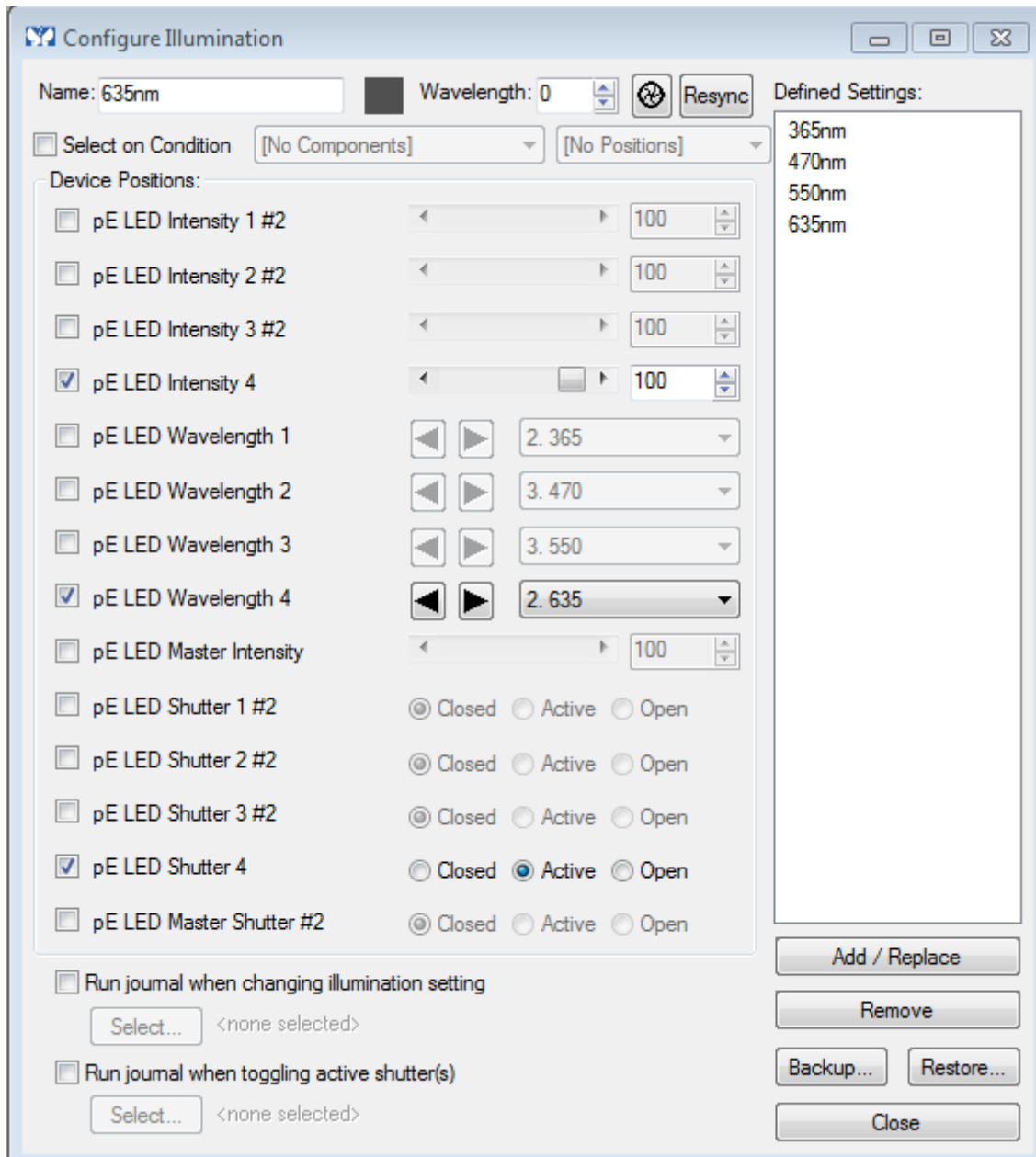


Figure 15: 'Configure Illumination' Window with several 'Defined Settings'

2. Navigate to 'Apps', and click 'Multi-Dimensional Acquisition' The below window will appear:

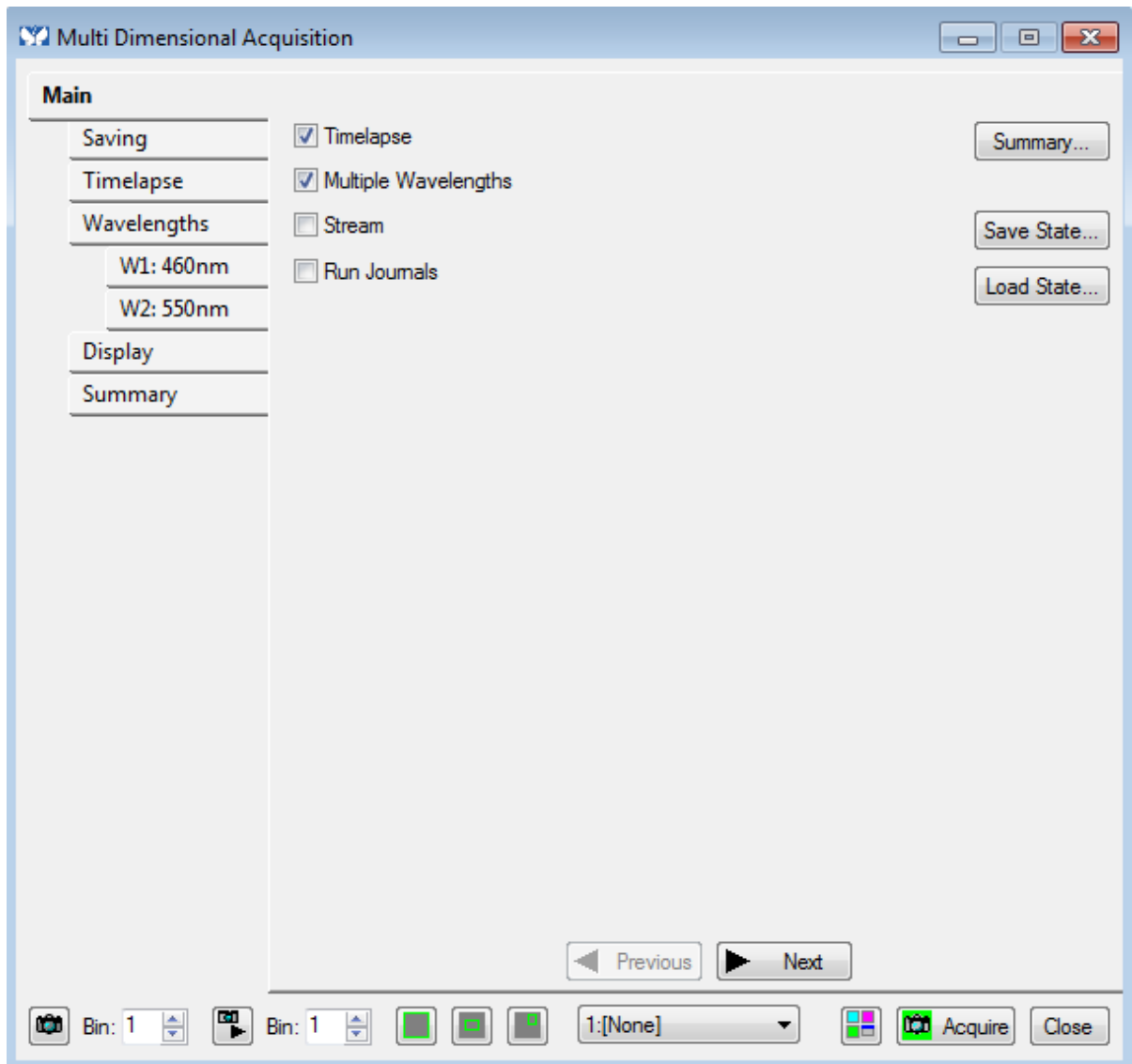


Figure 16: 'Multi-Dimensional Acquisition' window

- From here, you can select to run a 'Timelapse' and choose whether to use multiple wavelengths via tick boxes.



4. Navigating to the 'Saving' tab gives an opportunity to review the directory to which the data will be saved:

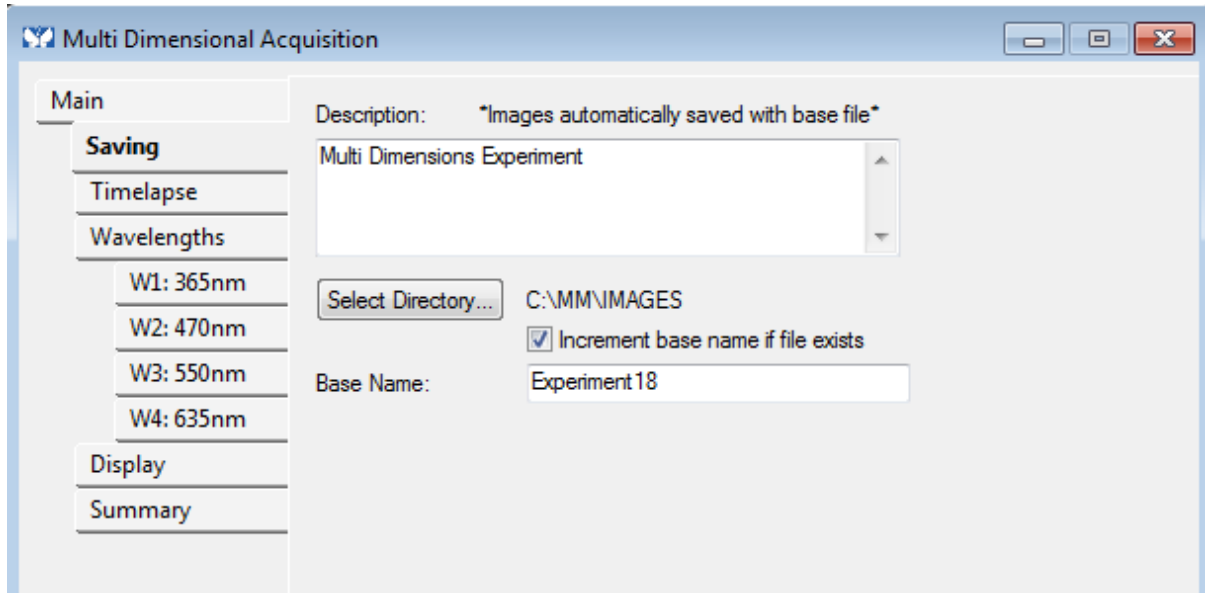


Figure 17: 'Saving' tab in 'Multi-Dimensional Acquisition'

5. Navigating to the 'Timelapse' tab will allow alteration of Duration and Time Interval for acquisition:

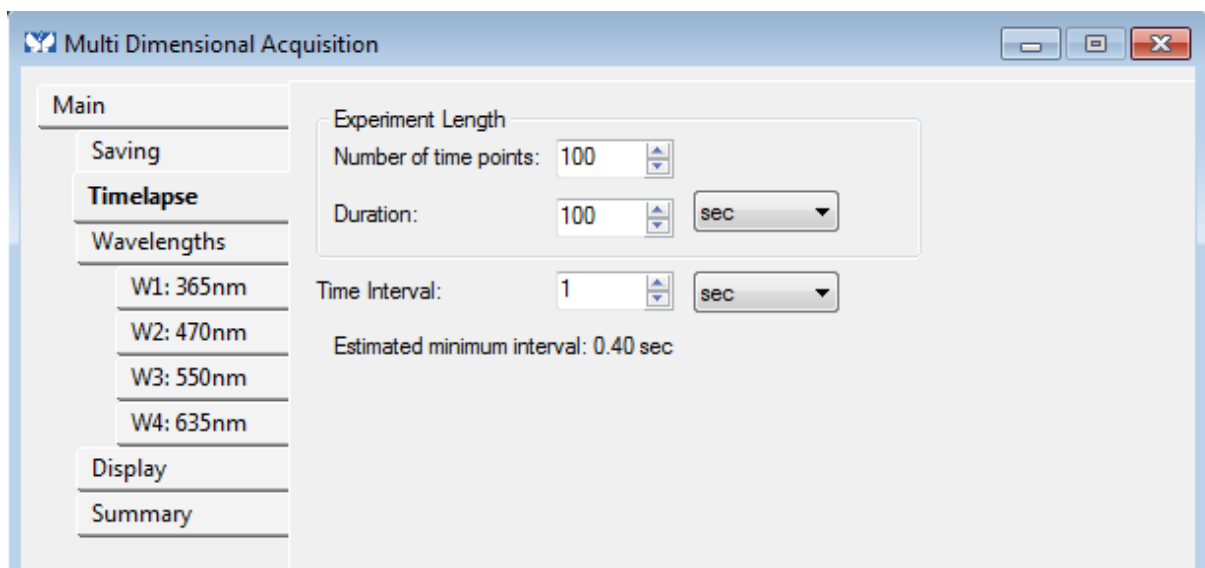


Figure 18: 'Timelapse' tab in 'Multi-Dimensional Acquisition'



To select the number of wavelengths, navigate to the 'Wavelengths' tab:

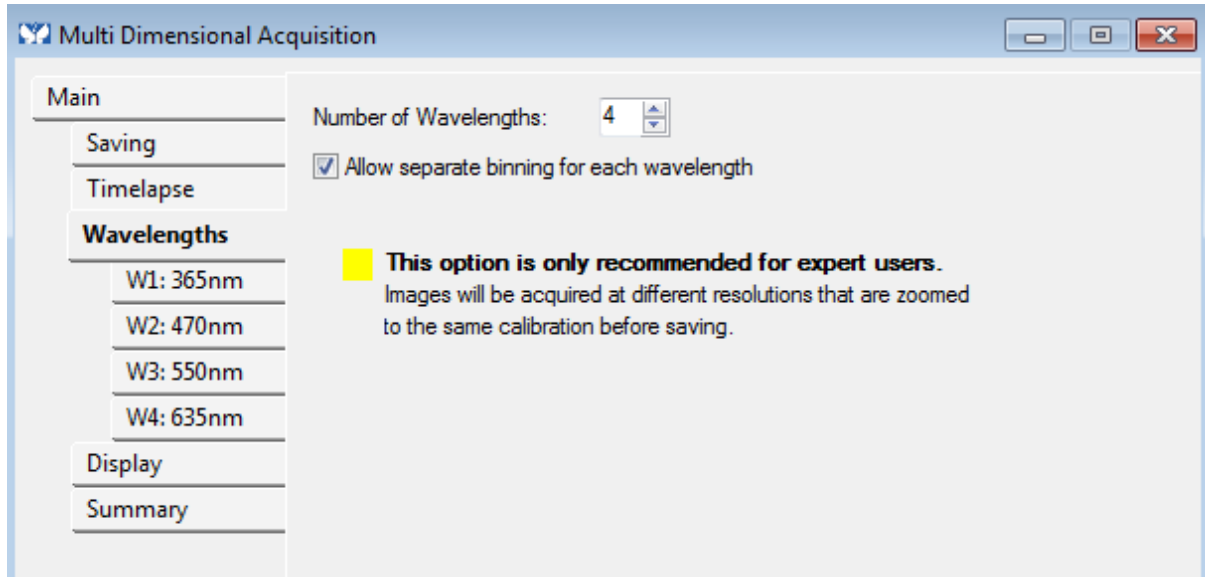


Figure 19: 'Wavelengths' tab in 'Multi-Dimensional Acquisition'

6. Selecting each of these sub-tabs (such as W2 in the below example) gives further customisation of acquisition of that particular wavelength:

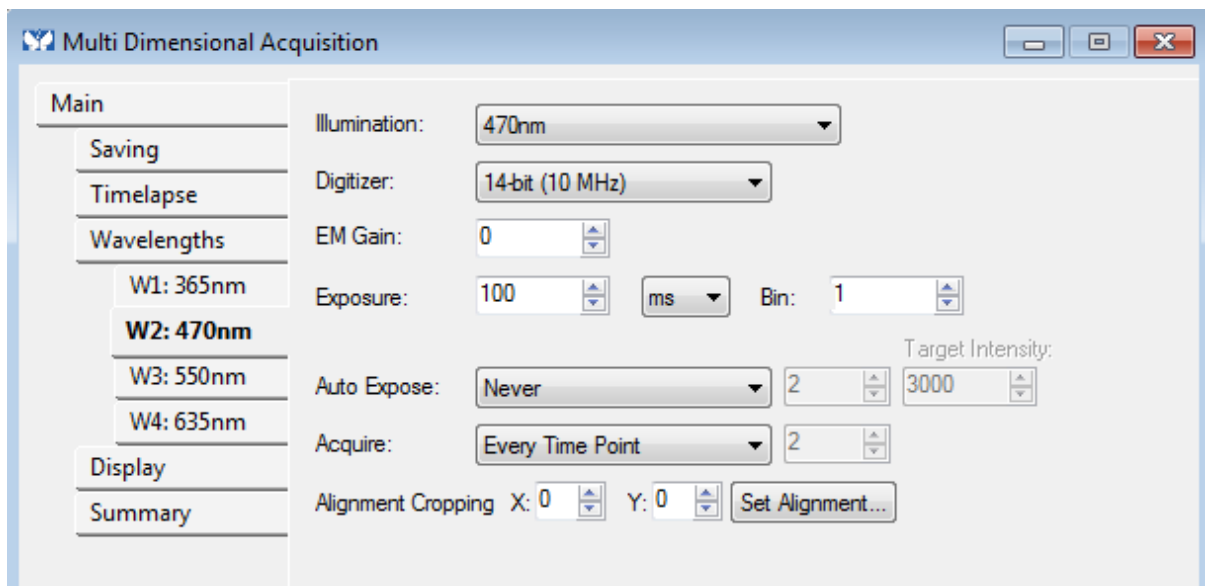


Figure 20: 'W2' tab in 'Multi-Dimensional Acquisition'





- When the experiment is ready for launch, navigate to the summary tab; this will give an opportunity to review. With this reviewed, click 'Acquire' to begin acquisition.

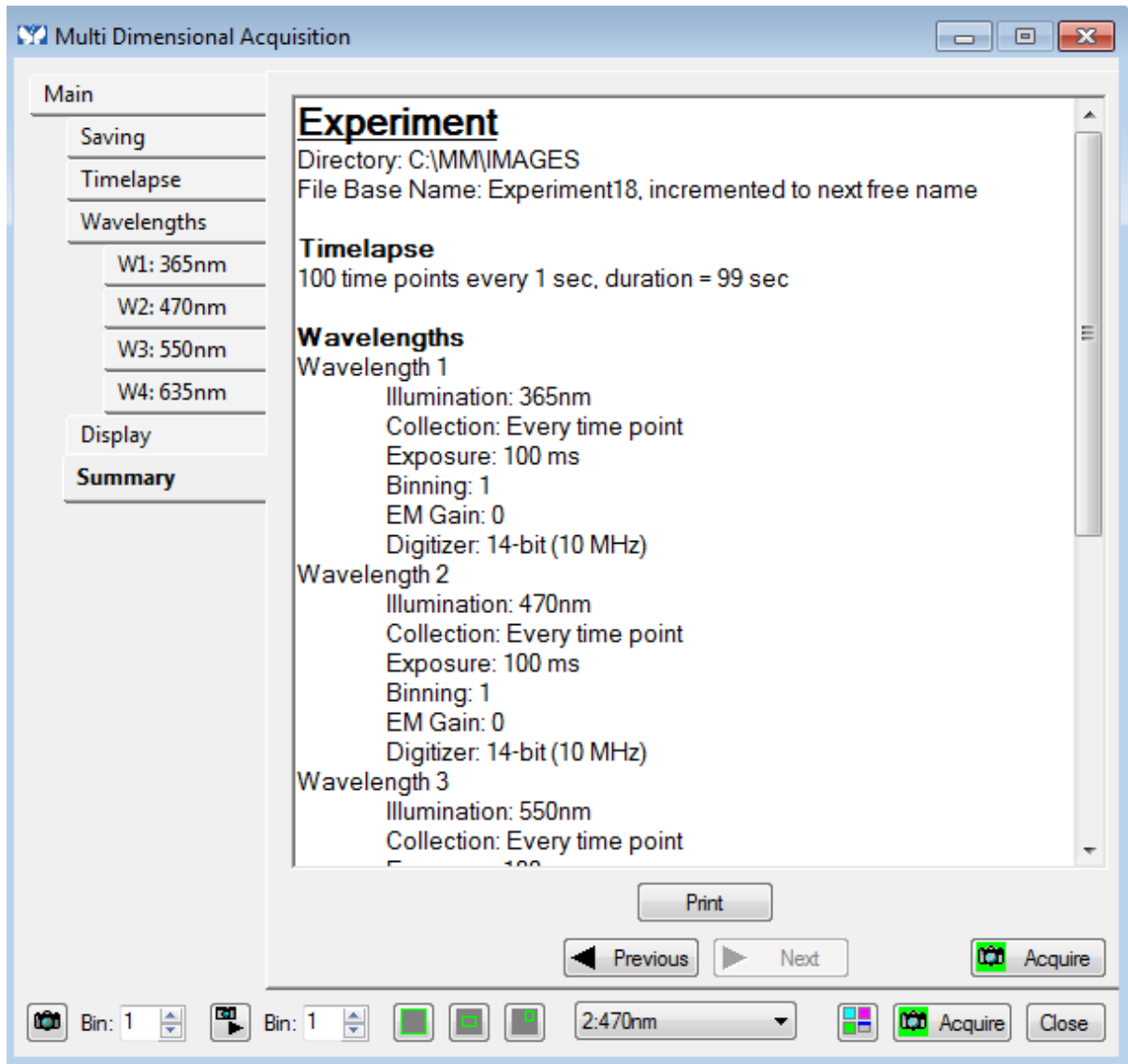


Figure 21: 'Summary' tab in 'Multi-Dimensional Acquisition'