

**Prior Scientific Help Guides and Installation Instructions**

**UPDATED 04 February 2016**

# **Lumen 1600 and 300 Software Control in CellSens®**

# Setting up the Lumen 300 and 1600

The Lumen 300 and 1600 can be set up via USB.

**Ensure that you read the manual of the product(s) in use in addition to this guide to ensure that the products are used effectively and safely.**

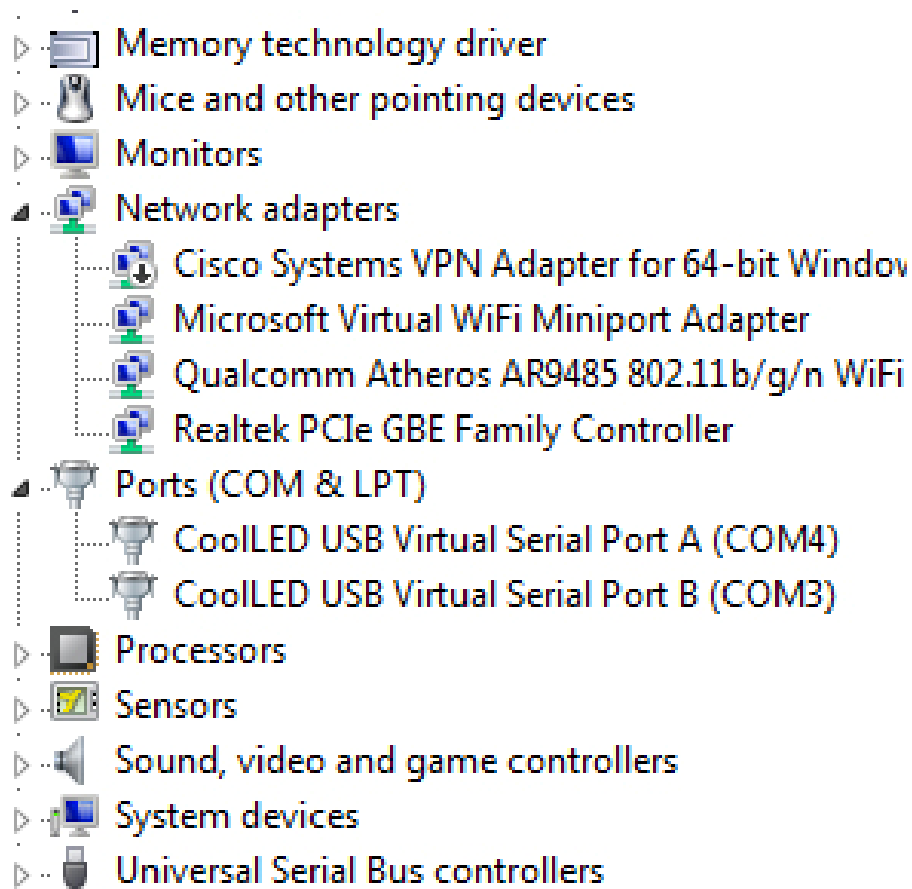
It is likely that you already have the drivers. If not, go to [LINK] and download them.

Save to a known location on your computer.

When the Lumen 1600 or 300 is plugged in via USB to your computer a warning will appear stating that a driver is required. Right click to update the driver and select the location of the downloaded files.

Once the device has been successfully installed into Windows look at the virtual COM Ports by going into windows device manager. Look within Ports (COM & LPT) and see which ports are assigned to the Lumen 300 or 1600. If two ports are present note that either may be used for control.

The ports will be named 'CoolLED USB Virtual Serial Port...'



# Using the Lumen 300 or 1600 with CellSens

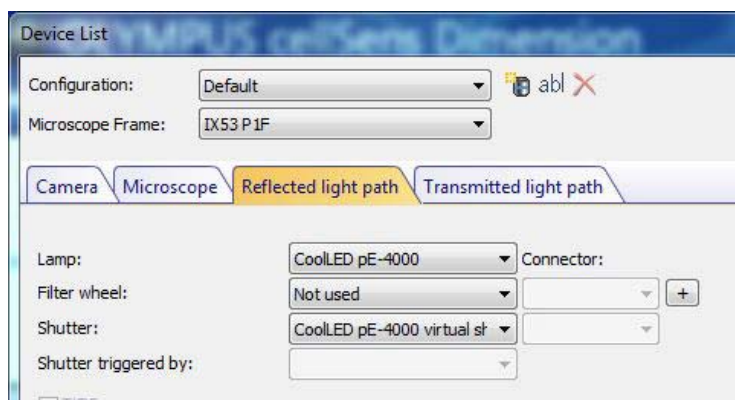
## Using the Lumen 1600 with CellSens

Note that:

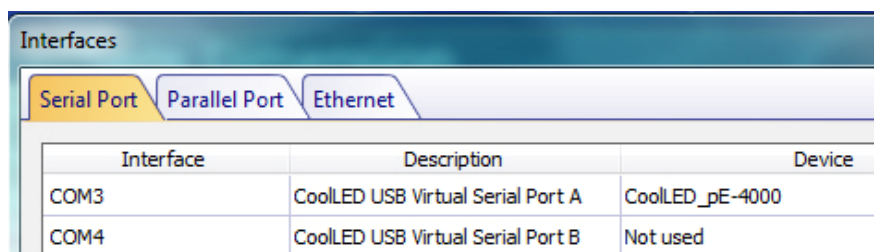
- 1) If not done already, the COM Ports must be set up as described earlier
- 2) This requires CellSens at version 1.14 or later

In the 'Acquire/Devices' menus select

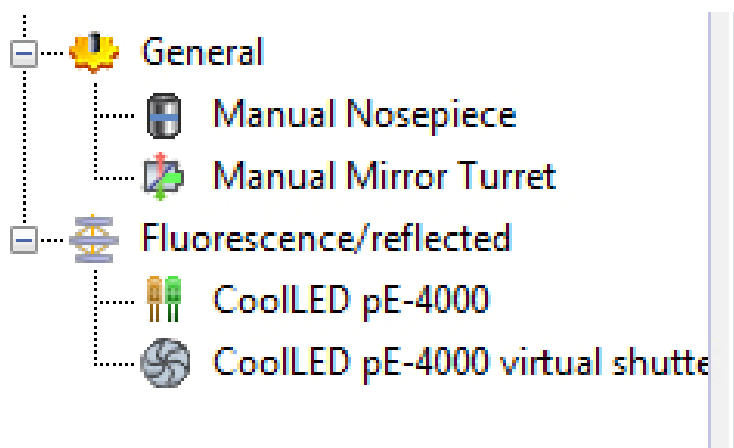
- 'CoolLED pE-4000' from the 'Lamp' menu in the 'Reflected Light Path' tab.
- 'CoolLED pE-4000 virtual shutter' under 'Shutter' in the same tab.



Click on 'Interfaces' and assign one of the COM ports to the unit.



The Lumen 1600 and virtual shutter will appear as below to be used in the customisation menu.



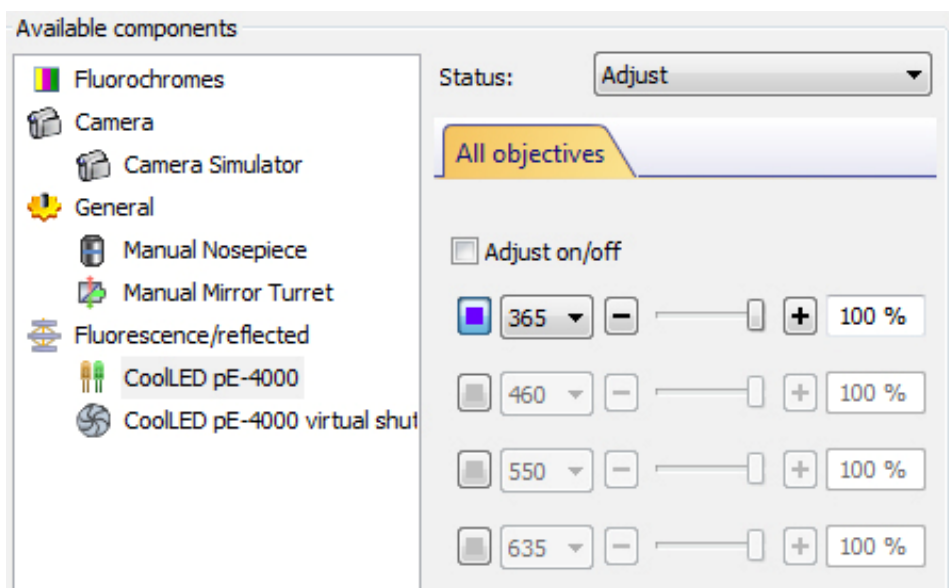
CellSens can be used to set up methods and procedures, e.g. for DAPI. Consult CellSens product information for more details.

The wavelength and intensity of the Lumen 1600 can be selected.

More than one wavelength can be switched on, and these can be at different intensities.

The shutter can be used as 'use for acquisition', which means that the LED(s) will only be switched on when the camera is in live mode or when acquiring an image, and off at other times.

This can be useful for protecting samples such as live cell.



For rapid use within the software multiple buttons can be set as required as seen below.



Currently, for experiments under experiment manager and process manager, CellSens does not allow switching via USB between wavelengths in the same channel, although this can be done whilst using the microscope buttons of softkeys menu.

An example of manual control within the software is shown below.

The screenshot shows the 'Microscope Control' window with three main sections: 'Shutters', 'Observation Methods', and 'Device Units'. The 'Shutters' section has a 'Reflected' label and an 'Open' button. The 'Observation Methods' section contains a grid of buttons for different methods and wavelengths, including 'BF', '635', '660', '740', '770', and a 'Fluo 3 Col' section with buttons for '365', '405', '385', '435', '460', '470', '490', '500', '525', '550', '580', and '595'. The 'Device Units' section includes a 'Manual Mirror Turret' dropdown and a 'CoolLED pE-4000' section with four rows of controls for wavelengths 405, 460, 525, and 635, each with a color-coded button, a dropdown, and a percentage value (67%, 42%, 84%, and 100% respectively). At the bottom, there are three tabs: 'Experi...', 'Proce...', and 'Micro...'. Three green callout boxes with arrows point to specific elements: 'Shutter is global' points to the 'Open' button; 'Observation methods can be set up – e.g. BF, Phase 10x, Phase 20x, DAPI FITC, etc.' points to the '770' button; and 'Or just single parameters like the LED wavelengths shown here.' points to the '470' button.

Microscope Control

Shutters

Reflected

Open

Shutter is global

Observation Methods

BF 635 660

740 770

Observation methods can be set up – e.g. BF, Phase 10x, Phase 20x, DAPI FITC, etc.

Fluo 3 Col

365 405 385

435 460 470

490 500 525

550 580 595

Or just single parameters like the LED wavelengths shown here.

Device Units

Manual Mirror Turret

CoolLED pE-4000

405 67 %

460 42 %

525 84 %

635 100 %

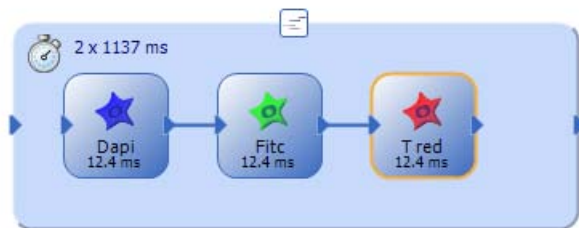
Experi... Proce... Micro...

At the bottom of the dialogue the wavelengths can be switched on and off and different intensities set. This reflects the wavelengths selected via the pod, softkeys or buttons created at the top of the menu.

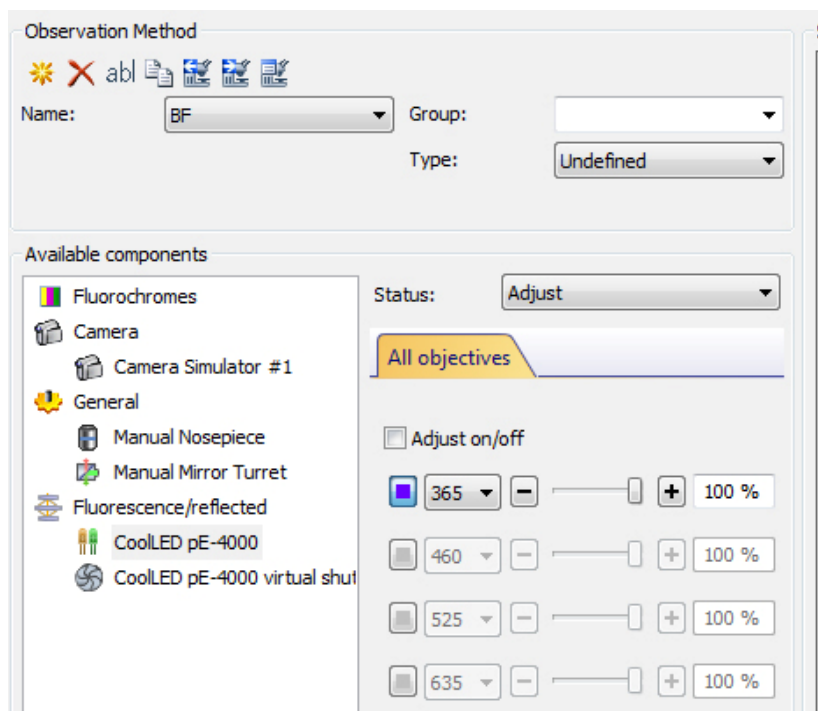
The experiment manager can run up to four channels.

However, currently there is no support for USB switching within channels.

Methods can be saved and reloaded, which allows methods to be used as templates, which speeds up day to day setting up of experiments. For example, a method involving the wavelengths 365/470/580 (or DAPI/FITC/Tex Red) can be easily set up as an experiment and reloaded to be used again, perhaps with minor modifications (e.g. different exposure times).



Currently there are some minor issues with the Device Customisation Settings – these may be corrected in future versions of CellSens.



To get around this is to complete the settings for a method, but do not save immediately. Create the next method, and when ALL have been completed, then save.

There is no need to tick the Adjust On/Off button – this can cause resetting.

An example procedure is shown below:

**DAPI – 365 nm method.**

Name method 'DAPI'. Select the Lumen 1600 as described above, and turn on the 365 nm wavelength at the correct intensity.

Select the Virtual Shutter and ensure that it is used for acquisition.

Select the other parameters – e.g. camera, objectives etc.

Now, name a method 'DAPI 405' and select the Lumen 1600, turning on the 405 nm wavelength at the desired intensity.

Select the Virtual Shutter and ensure that it is used for acquisition.

Select the other parameters – e.g. camera, objectives etc.

When all the methods are completed, save – this creates softkeys and method buttons.

## Using the Lumen 300 with Olympus CellSens

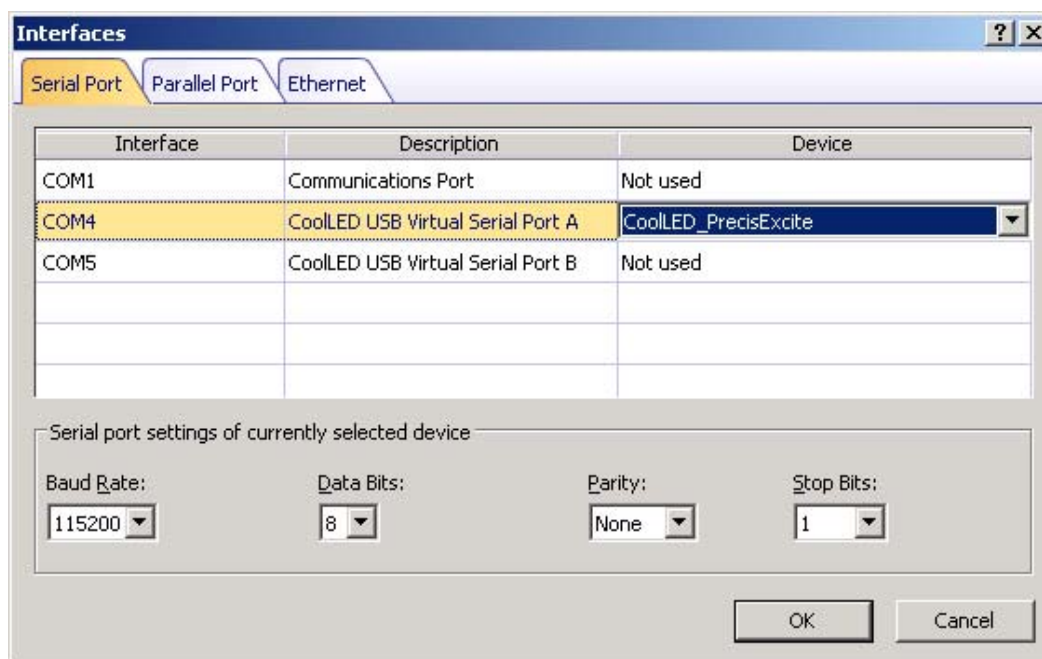
**Note that:**

- 1) If not done already, the COM Ports must be set up as described earlier
- 2) This method can also be used to drive the Lumen 1600; but without the full 16 wavelength selection.

Open CellSens and go to Acquire → Devices → Interfaces

Use the drop down menu to select the Device assigned to the COM Port as in the following picture and press 'OK'.

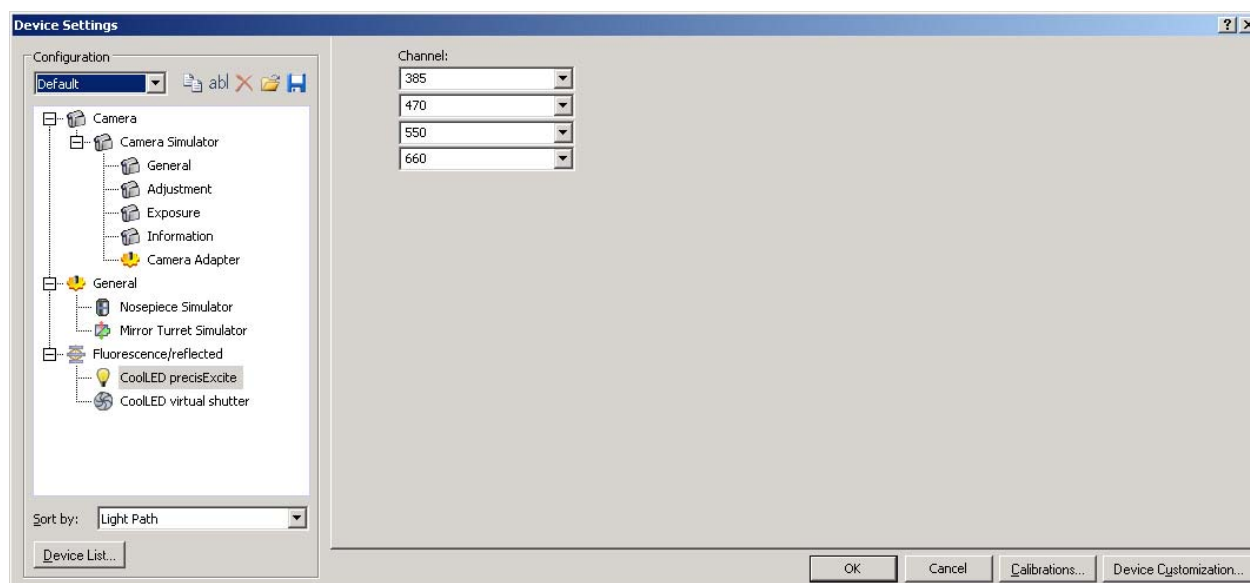
**Note that the legacy driver is identified as 'CoolLED\_PrecisExcite'.**





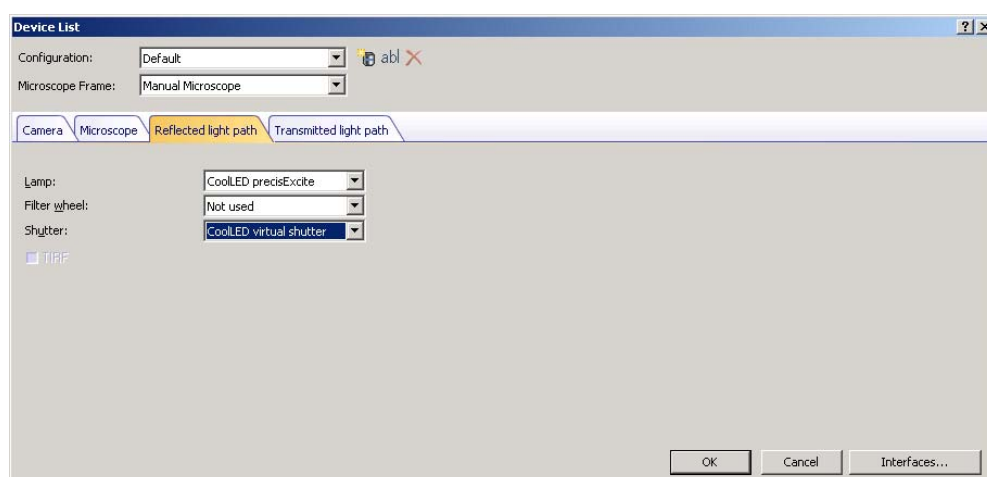
Now go to acquire -> Devices -> Device settings.

You should see the 'PrecisExcite' and 'Virtual Shutter' shown within 'Fluorescence /Reflected' on the left hand pane as in the image below. The currently selected wavelengths should also be displayed.

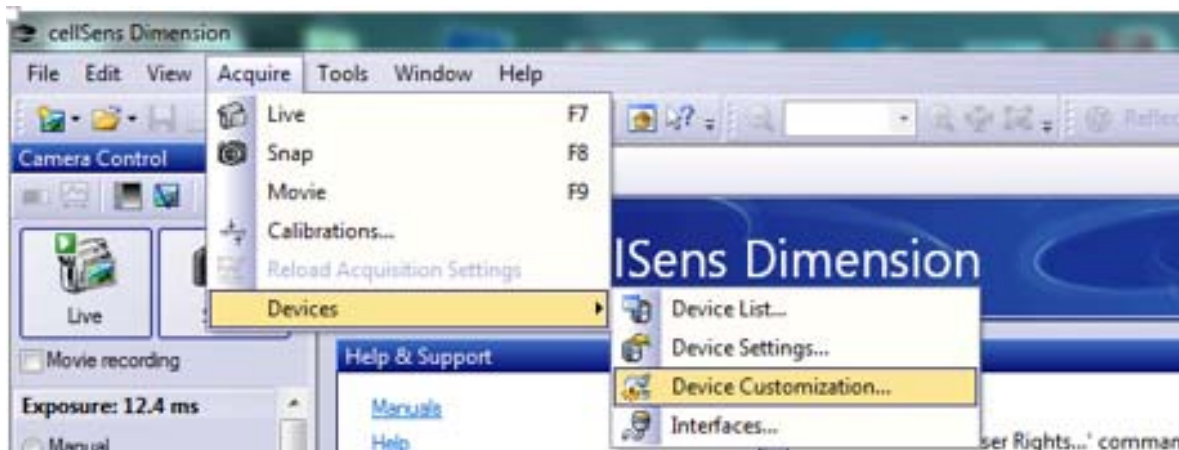


Currently the system is loaded as these 4 channels (selected via the Pod). To recognise new wavelengths from the pod the software must be restarted. If you do not see the devices as above, click on the device list in the bottom left hand corner. This will bring up the following screen within which you should choose the reflected light path. Now you can use the drop down menus to choose the lamp and shutter as shown.

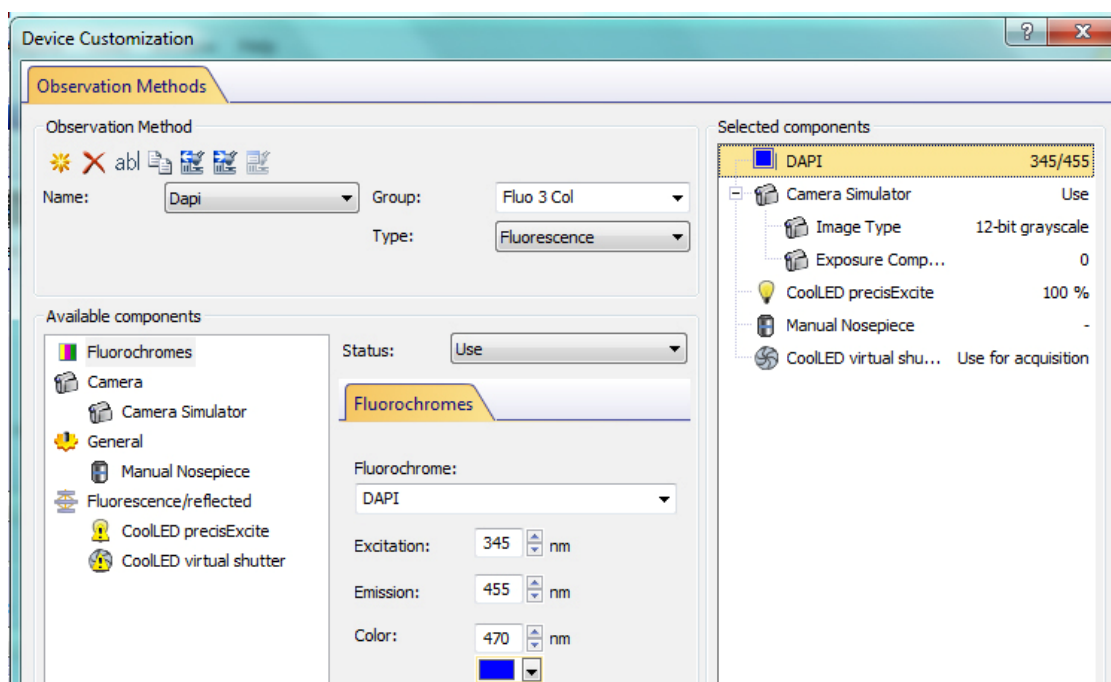
Note that the virtual shutter is important for smooth operation of the Lumen 1600 and Lumen 300 with the legacy driver.



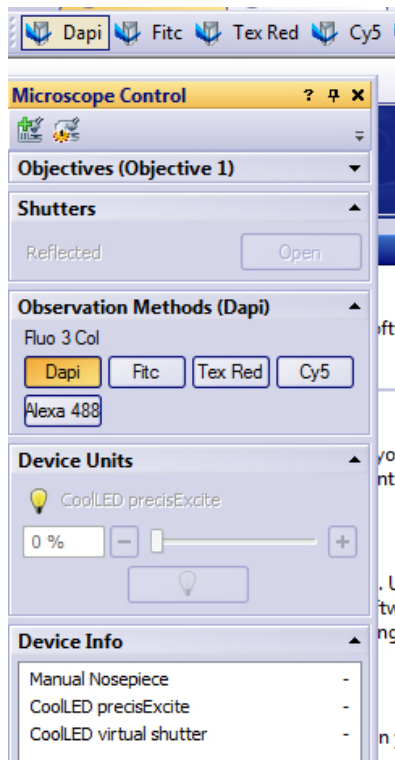
Go to 'Device Customisation' (as below) to set up groups for e.g. Multi-acquisition and methods – e.g. DAPI, FITIC, Texas Red, Cy5, etc.



Here you can set up Name, Camera Settings, Mic Settings, etc. The wavelength and (importantly) the virtual shutter can be selected. Ensure the shutter is selected as 'use for acquisition' and the wavelength selected as on (usually at 100%)

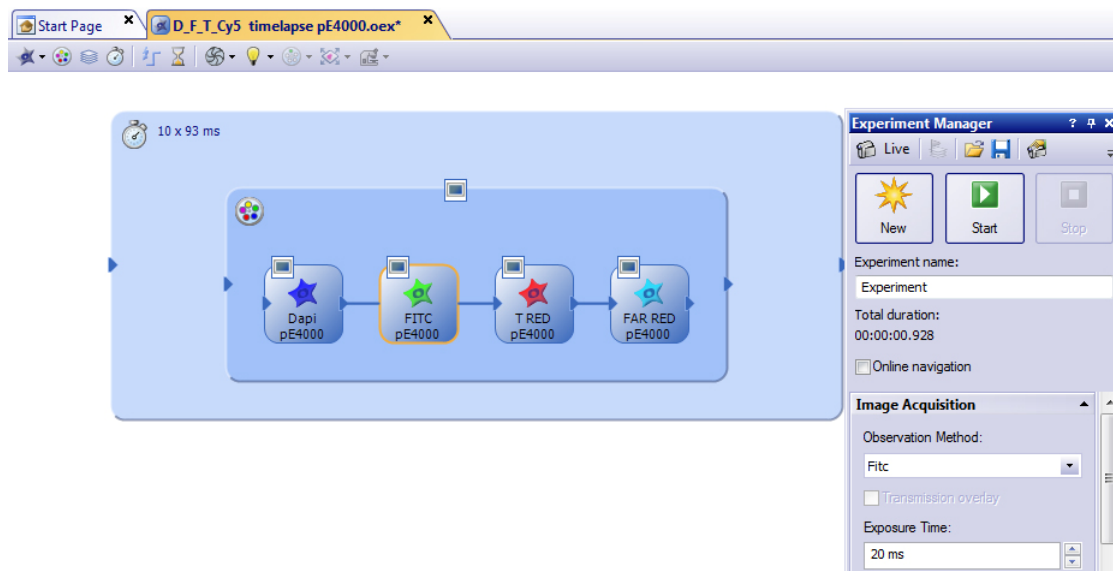


This sets up method buttons in the microscope control and in the main toolbar as follows:



It should be noted that clicking on a method (e.g. DAPI) turns on the DAPI LED and turns off all others which are illuminated.

Once the methods have been created they can then be used in the experiment manager:



**Note that:**

- **No simultaneous illumination is available when using the older legacy driver.**
- **Putting more than one wavelength on at the same time from the Pod control can lead to the CellSens software being slow and unresponsive. This may lead to a hardware error being displaced: “Device Error: Hardware is not available...”**
- **Using the available cellSens tools (especially using the virtual shutter for acquisition in methods, checking that softkeys are correctly set up and avoiding putting multiple wavelengths on at once will give smooth control.**
- **The wavelengths displayed on cellSens are picked up when the software is started up. If the wavelengths are changed (as is possible on the Lumen 1600) cellSens will not update with the new in position wavelengths but will run with channel control.**