

Prior LumeLED and uManager

The Prior LumenLED can be controlled in uManager when run under the filter wheel and shutter compatibility mode.

LumenLED and Compatibility Mode.

Connect up the LEDs and start the controller (see LumenLED manual). The PS3J100 controller should exhibit the following screen if the system is running in normal mode.



To configure the Prior controller run Prior Terminal (see Prior Terminal Setup) and send the following command

`LED,COMP,1`

Restart the controller, it should now boot up in Compatibility Mode and the PS3J100 controller should now show the following screen.



LED wavelength selection will emulate one filter wheel and LED intensity level will emulate another filter wheel. There will be one filter wheel position left to add an additional physical filter wheel.

Eg. Filter Wheel 1 - LED wavelength selection.

Filter Wheel 2 - LED Intensity Level Selection

Filter Wheel 3 – HF110 filter wheel. (not shown in above image)

Note as the Prior filter wheels are designed with 10 positions the possible intensity levels will be as follows;

1	= 100%	6	= 75%
2	= 95%	7	= 70%
3	= 90%	8	= 65%
4	= 85%	9	= 50%
5	= 80%	10	= 25%

The ON/OFF function of each LED will emulate the Prior shutter. If a physical shutter is present also select one of the available free shutter ports for the LumenLED.

Eg. Shutter 1 – HF202 shutter.
 Shutter 2 – LumenLED ON/OFF function
 Shutter 3 - Free

The Open command of the shutter will turn On the LED unit currently selected in the filter wheel. The Close command of the shutter will turn OFF the LED unit currently selected in the filter wheel.

LumenLED and uManager

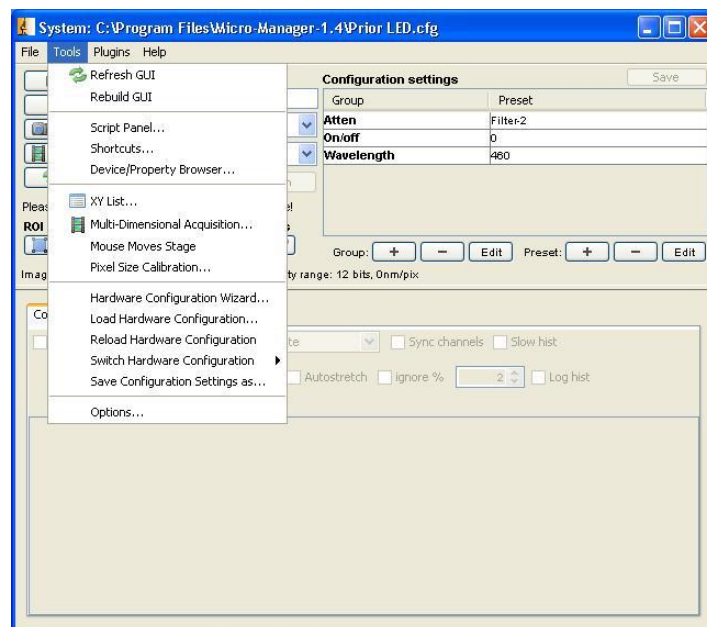
NOTE in this explanation we are using;

Shutter 1 – for LED On/Off.

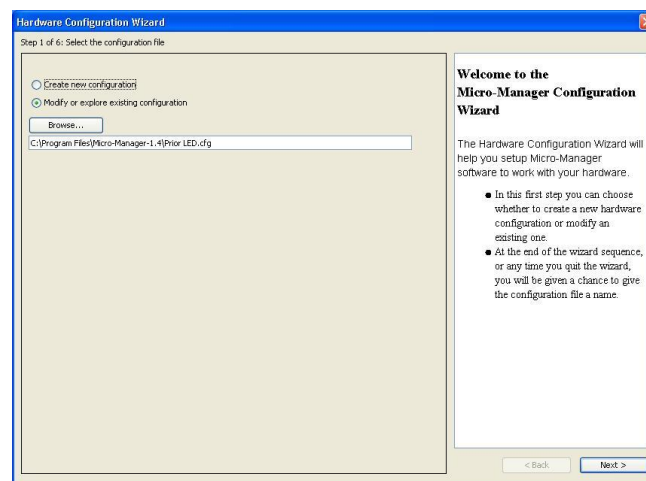
Filter Wheel 1 - for LED wavelength selection.

Filter Wheel 2 - for LED attenuation selection.

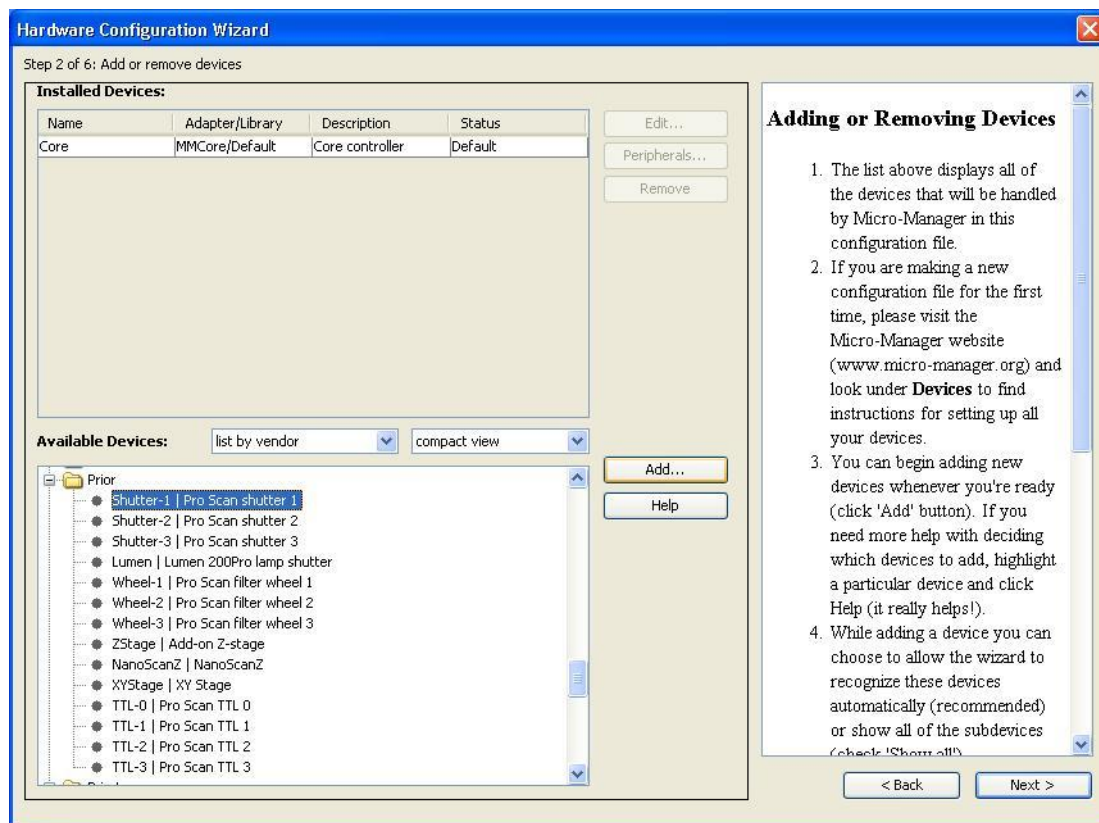
Start uManager and go to Tools menu -> Hardware Configuration Wizard.



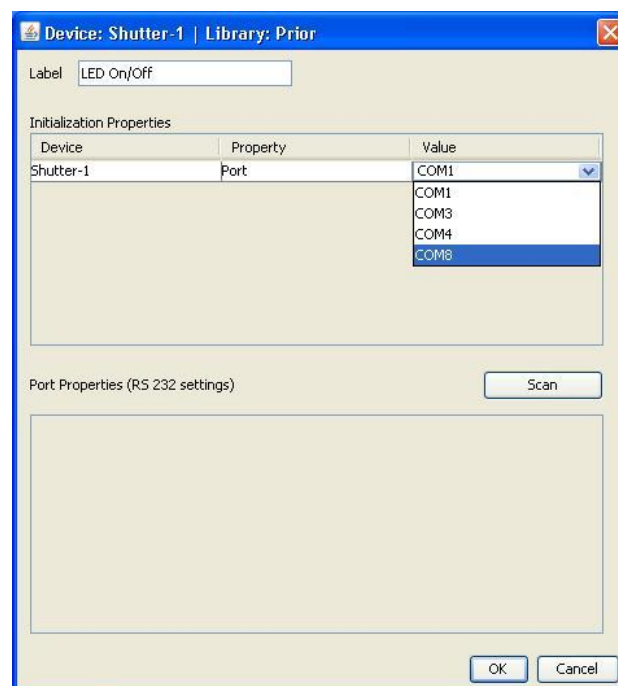
Select '*Create new configuration*' and click '**Next**'



Scroll Down to the Prior Folder under Available Devices.

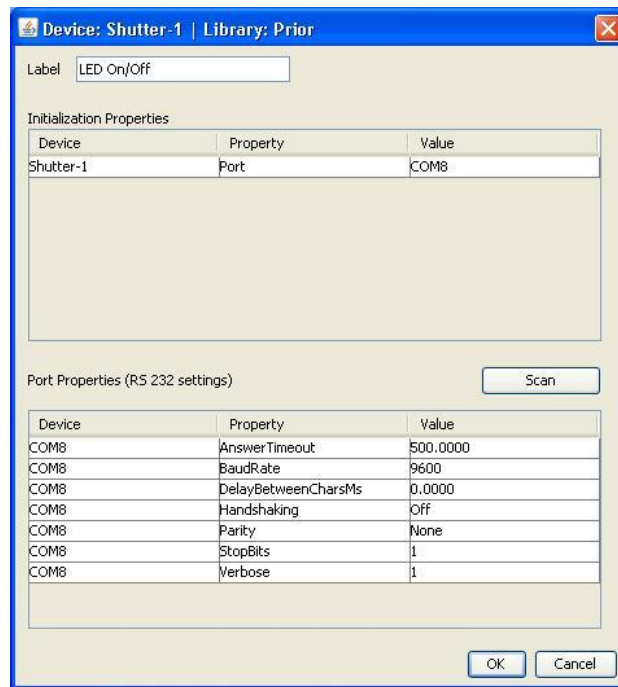


Select the following devices '**Shutter-1 | Pro Scan shutter 1**' and click '**Add**' and following screen will appear.

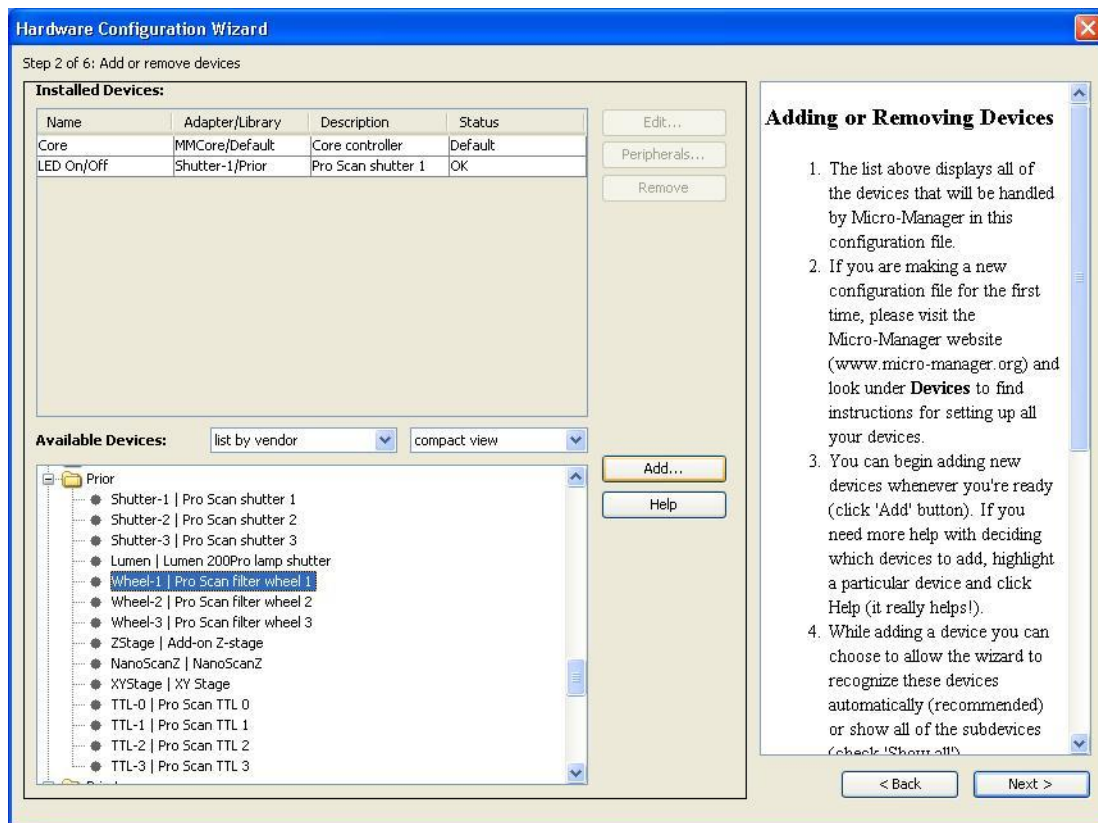


Change the label to identify the shutter as eg "**LED On/Off**".

Click on the white box under '**Value**' in '**Initialization Properties**' and select the correct COM port. Click '**OK**'.



Make sure the correct values are set for the Baud rate etc (see above).



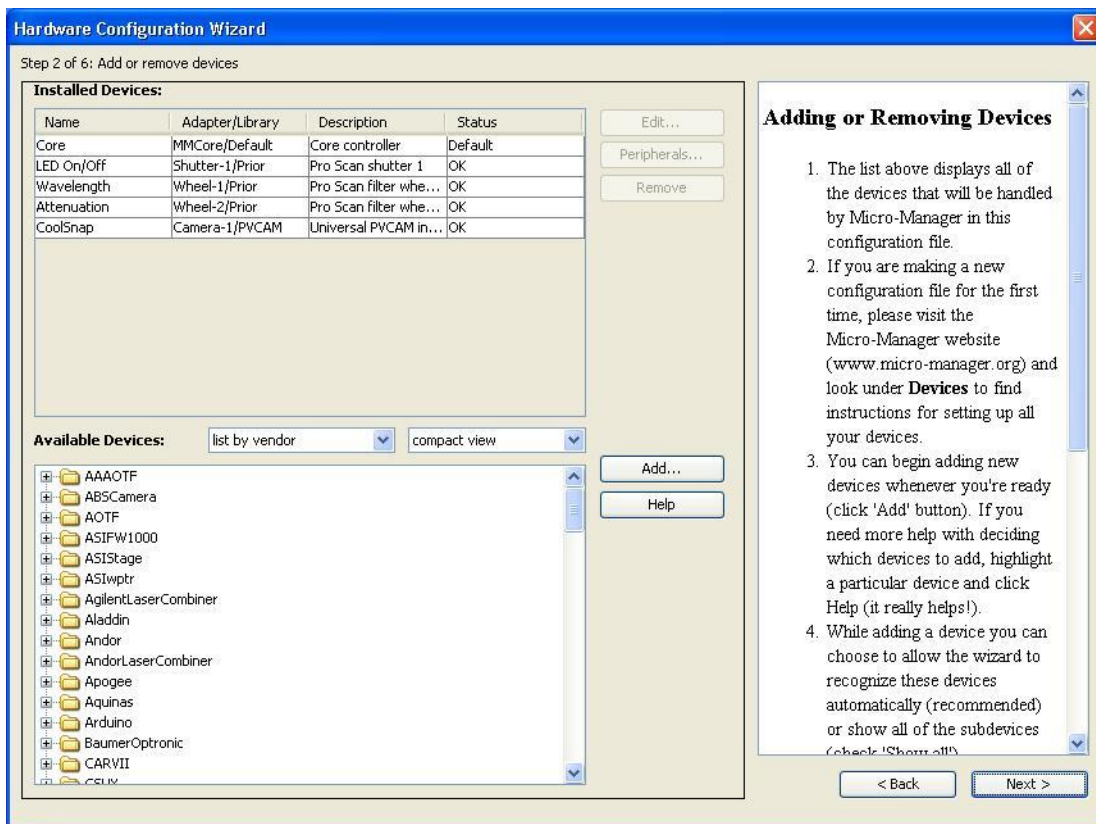
Select the following devices '**Wheel-1 | Pro Scan filter wheel 1**' and click 'Add'.

Set up the correct COM ports as with the Shutter.

Change the label to a name that identifies the function of the wheel, eg "**Wavelength**".

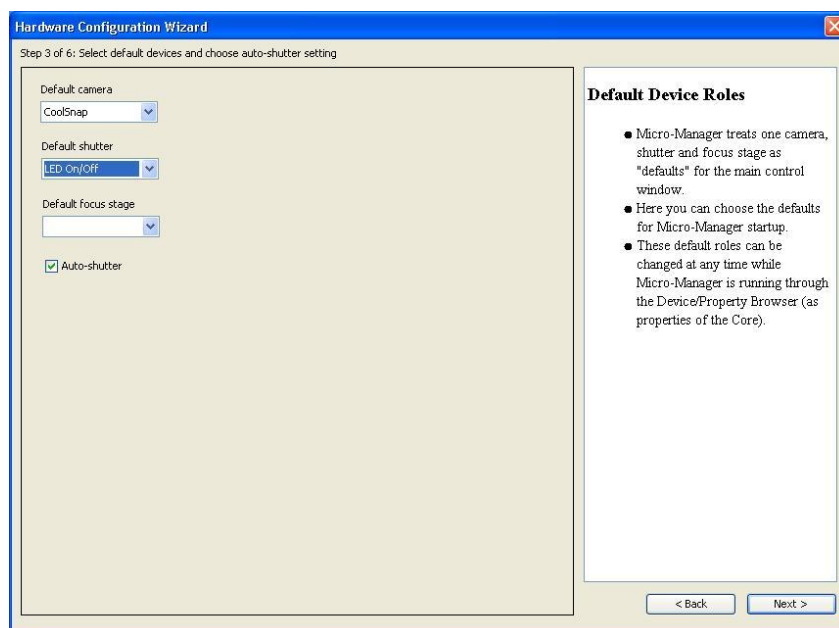
Repeat the above steps to add a second Filter Wheel and Label this accordingly, eg “*Attenuation*”.

The following devices should now be added to the ‘**Installed Devices**’ list. The Status should read ‘**OK**’ if the software has managed to successfully connect to the hardware.



Remember at the point to add any other Prior equipment (eg stages, shutters, filter wheels) and any other external hardware (eg microscopes, cameras etc), before moving onto the next step. In this example a CoolSnap camera was also added.

Click ‘**Next**’ to continue to the following screen



Here you can select the “*Default Devices and Choose auto-shutter setting*”.

The LED On/Off can be set to be the “*Default Shutter*”.

Click ‘**Next**’ to continue

Hardware Configuration Wizard
Step 4 of 6: Set delays for devices without synchronization capabilities

Name	Adapter	Delay [ms]
LED On/Off	Shutter-1	0.0
Wavelength	Wheel-1	0.0
Attenuation	Wheel-2	0.0

Setting Device Delays

- Some devices will execute a command but don't signal to Micro-Manager when execution has completed.
- These devices may require a delay before Micro-Manager can issue the next command. For example, after commanding a shutter to open, Micro-Manager may need a delay (to wait for the shutter to be fully open) before sending the camera a "snap image" command.
- You have three options to determine this delay time:
 - If you are unsure whether a device needs a delay, leave the parameter at 0 ms.
 - Refer to the Device Support page in the Micro-Manager website and look for information on delay settings under your particular device.

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The “*Set delays for devices without synchronization capabilities*”.

Leave all the values to 0.0ms. Click ‘**Next**’ to continue.

Hardware Configuration Wizard
Step 5 of 6: Define position labels for state devices

State devices

- Wavelength
- Attenuation

State	Label
0	LED 405
1	LED 490
2	LED 525
3	LED 590
4	Filter-5
5	Filter-6
6	Filter-7
7	Filter-8
8	Filter-9
9	Filter-10

Read

Reset

Assigning labels

- At left are 'State devices' such as filters, objective turrets, etc., which have discrete positions.
- Here assign labels corresponding to each position so that you can easily identify them during use. For example, Position 1, Position 2... could be labeled as Cy3, Cy5...
- Select the device in the left-hand list and edit the corresponding position labels in the right-hand list.

Note:

- The **Read** button will read labels for the selected device directly from the hardware.
- The **Reset** button will reset the labels of the selected device to the values they had when you entered this page.

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The properties of the filter wheels can be set in **“Define Position Labels for State Devices”**
Under Wavelength type in the wavelength properties for each of your LEDS. Note 0 is Filter wheel position 1.

Under the Attenuation type in the properties for the LED attenuation settings. See image below.

The screenshot shows the 'Hardware Configuration Wizard' window at Step 5: Define position labels for state devices. On the left, a list of 'State devices' includes 'Wavelength' and 'Attenuation', with 'Attenuation' selected. The main area contains a table with 'State' and 'Label' columns. The 'State' column lists values from 0 to 9, and the 'Label' column lists corresponding percentages from 100% to 25%. To the right of the table are 'Read' and 'Reset' buttons. Further right, a text box titled 'Assigning labels' provides instructions on how to use the table and buttons. At the bottom right, there are '< Back' and 'Next >' buttons.

State	Label
0	100%
1	95%
2	90%
3	85%
4	80%
5	75%
6	70%
7	65%
8	50%
9	25%

Assigning labels

- At left are 'State devices' such as filters, objective turrets, etc., which have discrete positions.
- Here assign labels corresponding to each position so that you can easily identify them during use. For example, Position 1, Position 2... could be labeled as Cy3, Cy5...
- Select the device in the left-hand list and edit the corresponding position labels in the right-hand list.

Note:

- The **Read** button will read labels for the selected device directly from the hardware.
- The **Reset** button will reset the labels of the selected device to the values they had when you entered this page.

Click **‘Next’** to continue.

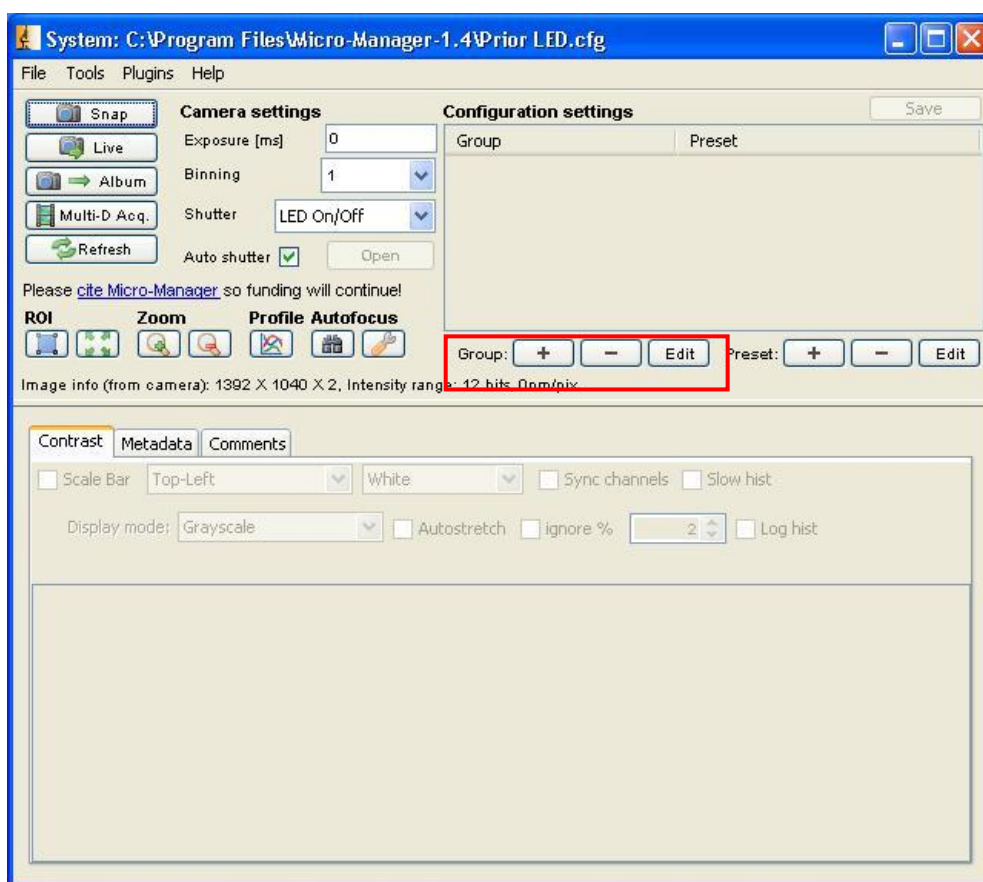
The screenshot shows the 'Hardware Configuration Wizard' window at Step 6: Save configuration and exit. On the left, there is a 'Configuration file:' label followed by a text box containing the path 'C:\Program Files\Micro-Manager-1.4\Prior LED.cfg' and a 'Browse...' button. Below this is a checkbox labeled 'Send configuration to Micro-manager.org' with the text 'Providing the configuration data will assist securing further project funding.' On the right, a text box titled 'Finished!' contains a congratulatory message. At the bottom right, there are '< Back' and 'Finish' buttons.

Finished!

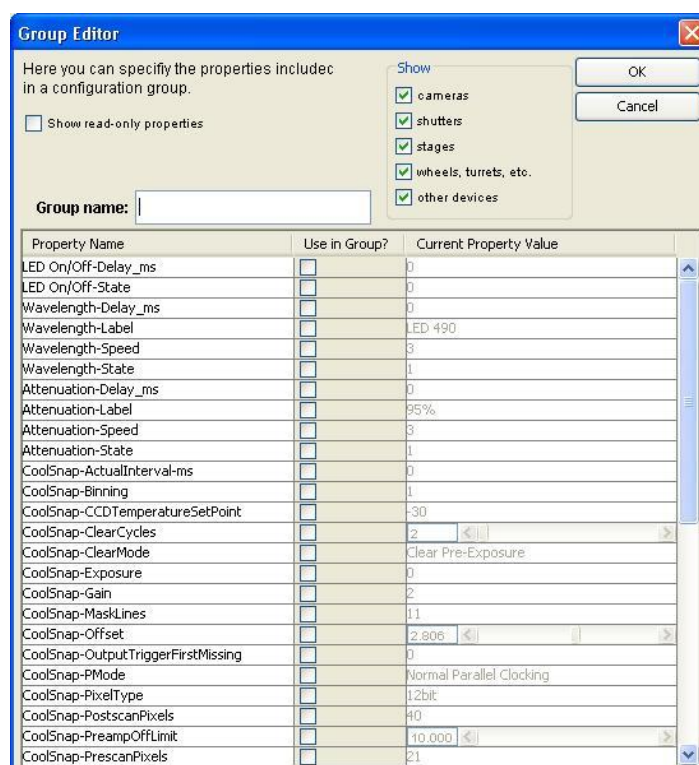
You have successfully **completed** the Configuration Wizard and the hardware configuration for your system has been built.

Save your configuration and click **‘Finish’**

Working with Prior LumenLEDs inside uManager



To get quick access to changing wavelength and attenuation of the LEDS it is best to set up Groups. Click on the + sign to add a new Group.



Under the **'Show'** section select only "wheels, turrets etc".

Here you can specify the properties included in a configuration group.

☐ Show read-only properties

Group name:

Show

- ☐ cameras
- ☐ shutters
- ☐ stages
- ☒ wheels, turrets, etc.
- ☐ other devices

OK

Cancel

Property Name	Use in Group?	Current Property Value
Wavelength-Delay_ms	<input type="checkbox"/>	0
Wavelength-Label	<input checked="" type="checkbox"/>	LED 490
Wavelength-Speed	<input type="checkbox"/>	3
Wavelength-State	<input type="checkbox"/>	1
Attenuation-Delay_ms	<input type="checkbox"/>	0
Attenuation-Label	<input type="checkbox"/>	95%
Attenuation-Speed	<input type="checkbox"/>	3
Attenuation-State	<input type="checkbox"/>	1

Under Use in Group select Wavelength-Label and give a name to Group Name eg "Wavelength"
Click OK

Click on the + sign at add another Group

Under the **'Show'** section select only "wheels, turrets etc".

Here you can specify the properties included in a configuration group.

☐ Show read-only properties

Group name:

Show

- ☐ cameras
- ☐ shutters
- ☐ stages
- ☒ wheels, turrets, etc.
- ☐ other devices

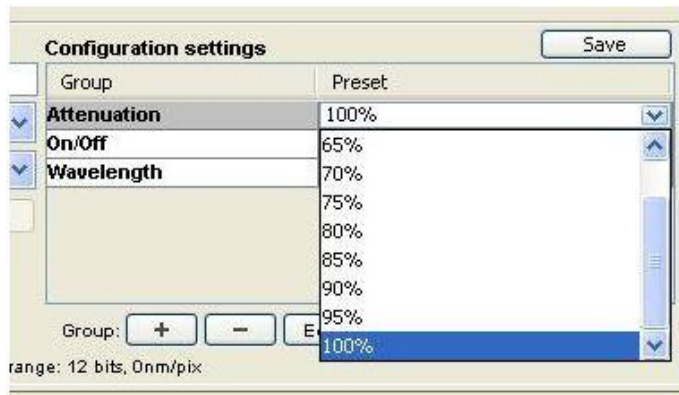
OK

Cancel

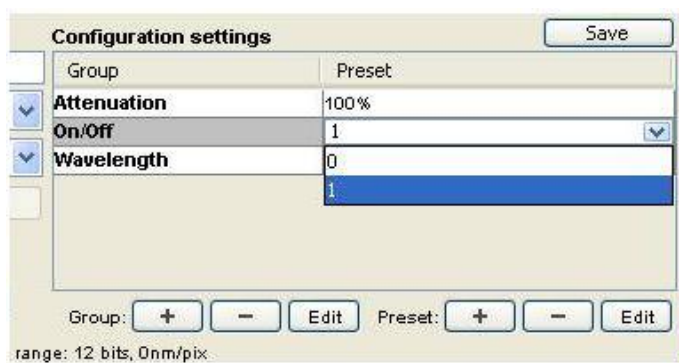
Property Name	Use in Group?	Current Property Value
Wavelength-Delay_ms	<input type="checkbox"/>	0
Wavelength-Label	<input type="checkbox"/>	LED 490
Wavelength-Speed	<input type="checkbox"/>	3
Wavelength-State	<input type="checkbox"/>	1
Attenuation-Delay_ms	<input type="checkbox"/>	0
Attenuation-Label	<input checked="" type="checkbox"/>	95%
Attenuation-Speed	<input type="checkbox"/>	3
Attenuation-State	<input type="checkbox"/>	1

Under Use in Group select Attenuation-Label and give a name to Group Name eg "Attenuation"
Click OK

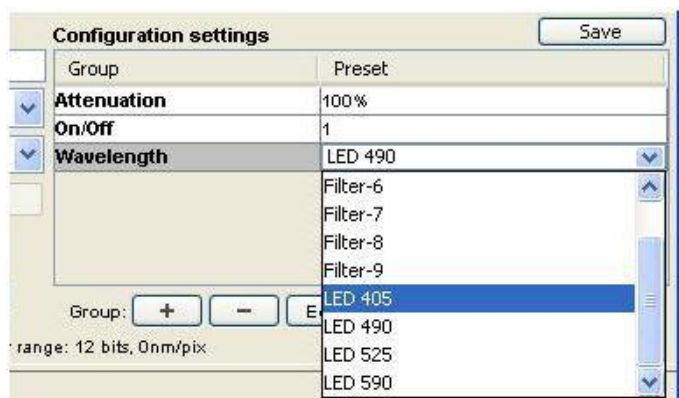
Now you can quickly select the properties of the LEDS



Wavelength Intensity Levels

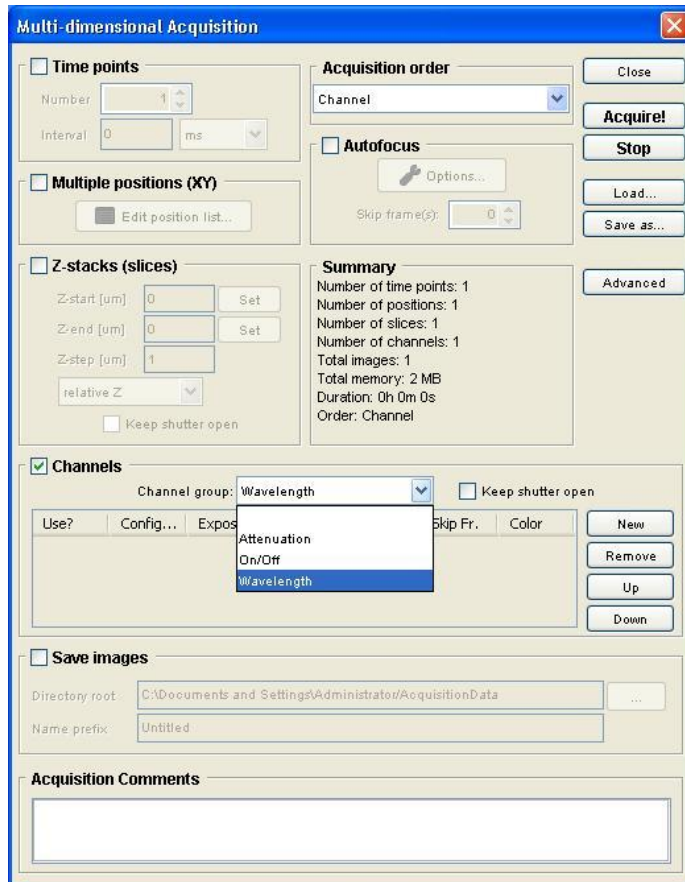
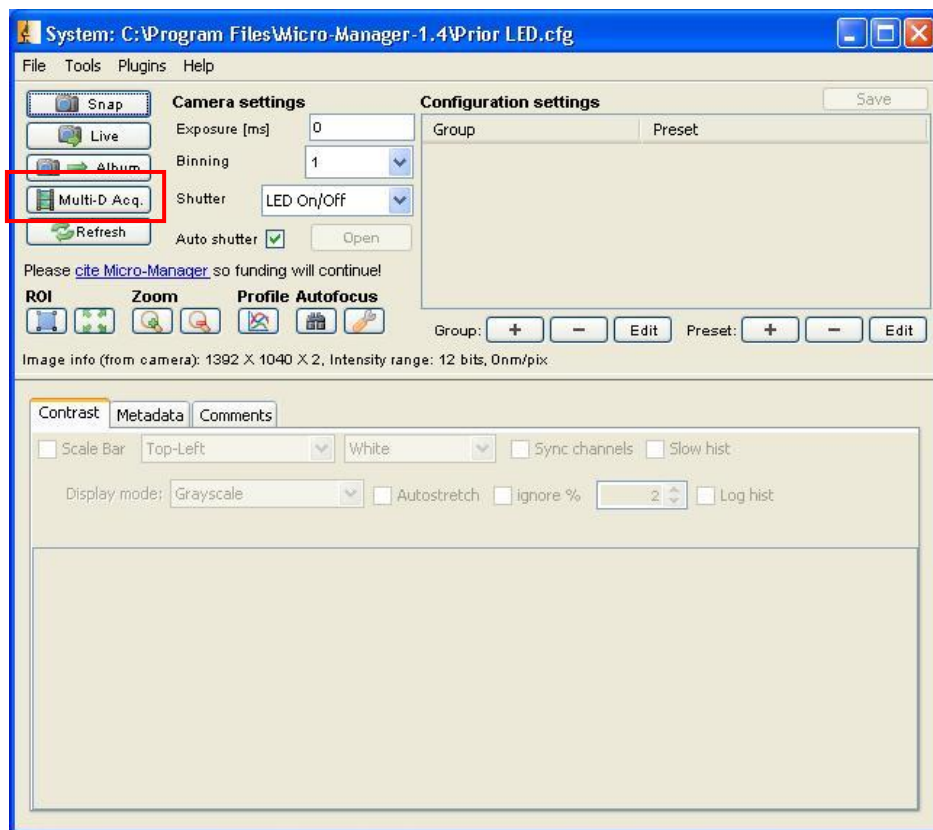


LED ON = 1 OFF = 0

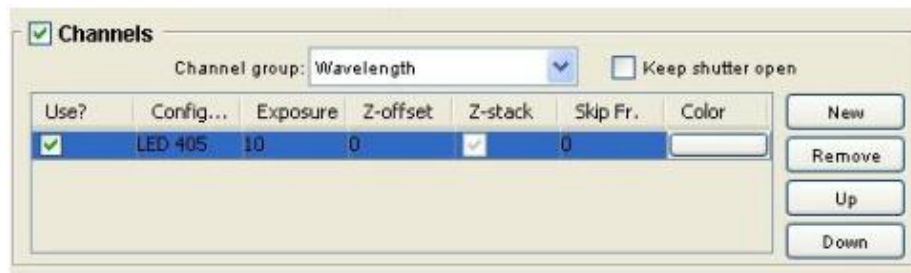


LED Wavelength Selection.

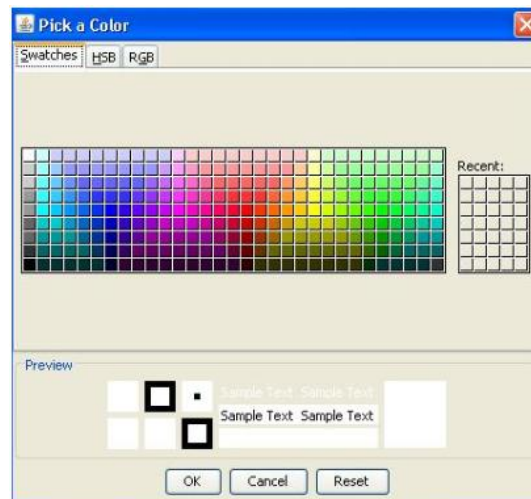
Using Multi Dimension Acquisition



- Use Channels Window to add multi wavelength to your experiments.
- Under Channel Group select 'Wavelength'
- Click New to add a new channel
- A new channel will now be added into the 'Channels' box.
- Here you can pick your LED wavelength, eg LED 405, LED 490, LED 525, LED 590



Click on the white box below 'Color' to assign and image colour to your channel.



Complete the above process to add as many channels as you wish.

