

Controlling the SPECTRA Light Engine with Olympus cellSens Software

Equipment Required

1. SPECTRA Light Engine [1]
2. National Instruments USB-6501 Digital I/O Device
3. Lumencor 9-channel TTL breakout cable (29-10156) [2]
4. Olympus cellSens software

Notes

[1] The CELESTA Light Engine can also be controlled by cellSens using the methods described in this installation note.

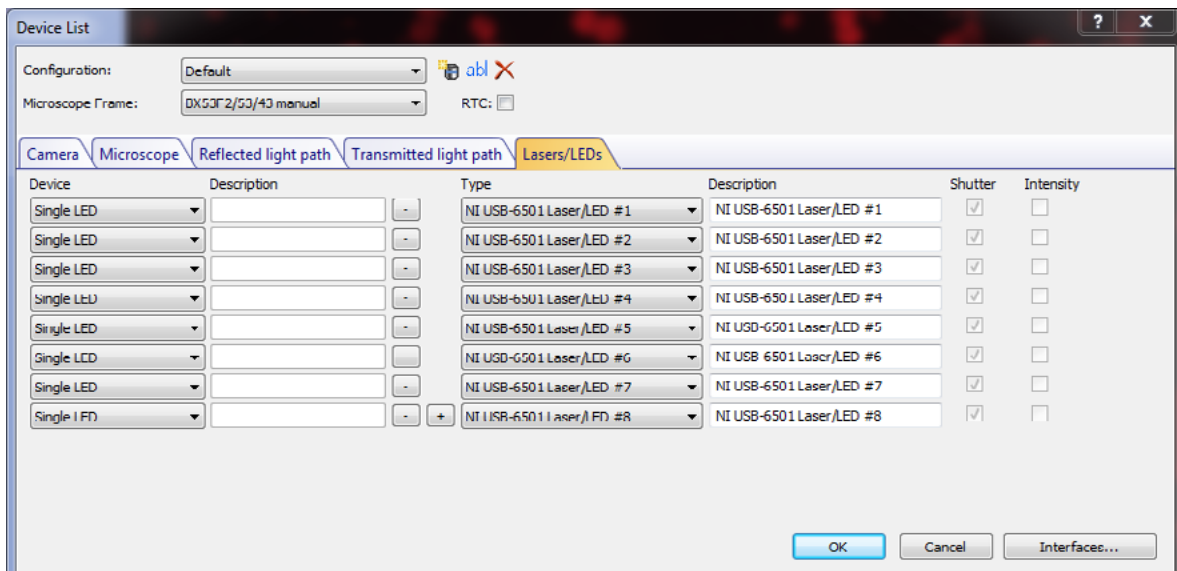
[2] The USB-6501 digital outputs must be connected to individual BNC female terminals for connection to the TTL breakout cable. The connection scheme is shown in Table 1. Alternatively, a breakout cable with a DB15HD connector compatible with the SPECTRA TTL port may be wired directly to the USB-6501 output ports.

Table 1

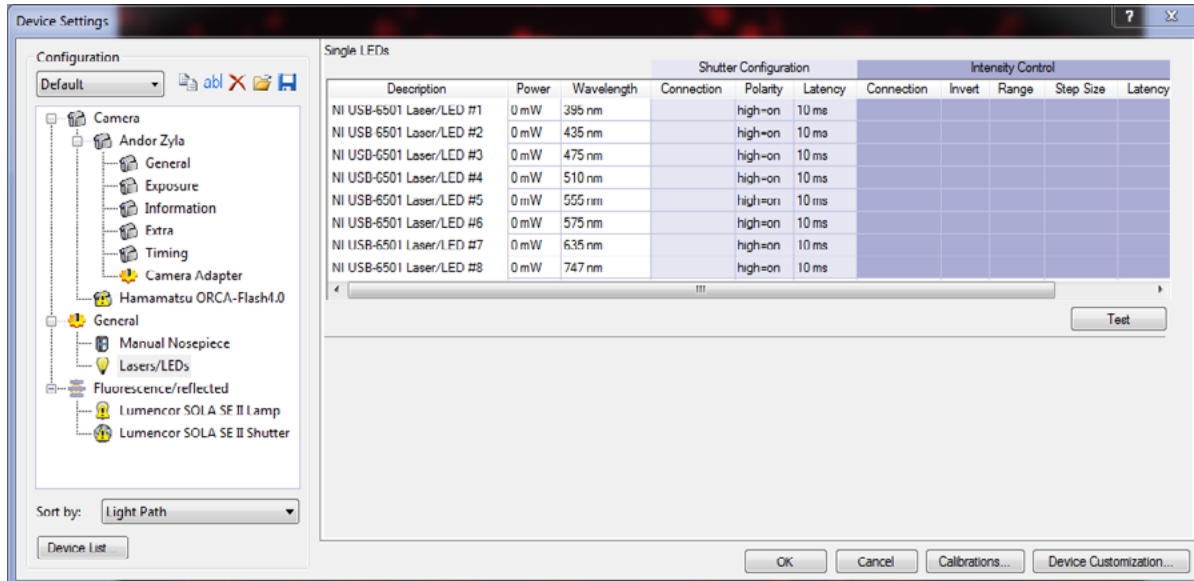
USB-6501 Digital Output	SPECTRA III Output Channel	DB15HD PIN#
P1.0	Violet	13
P1.1	Blue	12
P1.2	Cyan	3
P1.3	Teal	11
P1.4	Green	2
P1.5	Yellow	15
P1.6	Red	1
P1.7	nIR	14
# Pins 6,7,8,10 = Ground		

Set Up

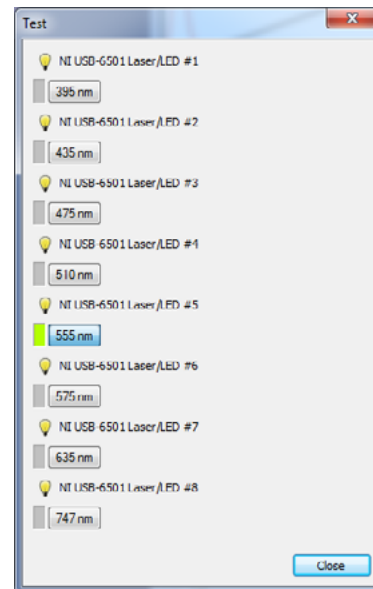
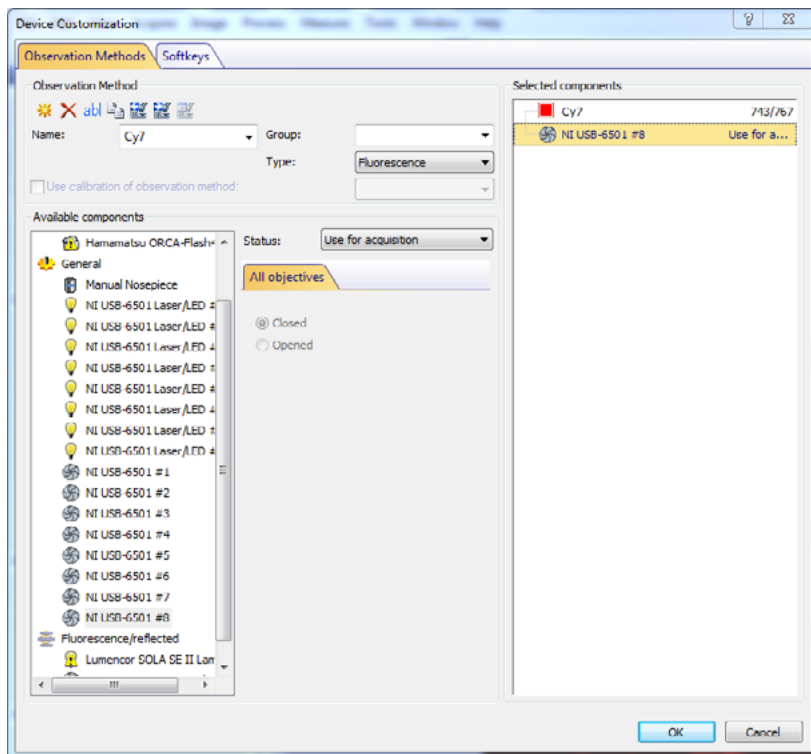
1. Connect the USB B port of the USB-6501 to the host computer [1]. Connect the TTL port of the SPECTRA to the USB-6501 digital outputs as described above.
2. Start Olympus cellSens and power on the SPECTRA Light Engine. Make sure that the output end of the liquid light guide or optical fiber connected to the Light Engine is safely directed into an enclosed optical path.
3. Navigate to Acquire>Devices>Device List.
4. On the Lasers/LEDs tab, set up the configuration shown in the screenshot below [2].



5. Navigate to Acquire>Devices>Device Settings.
6. Select Lasers/LEDs in the device tree and set up the configuration shown in the screenshot below.



7. Connect the Light Engine LAN port to the computer using the RJ45 ethernet cable provided. Open the Light Engine GUI in any web browser following the instructions in Lumencor Installation Note [54-10046](#). On the GUI Settings tab, set TTL inputs = Enabled and TTL polarity = Positive.
8. In cellSens, press the Test button on the Device Settings panel. Pressing the labeled enable buttons on the Test panel (shown on the right) will turn on the respective light output channels, registered by illumination of the source enabled indicator LED on the front panel of the Light Engine.
9. Navigate to Acquire>Devices>Device Customization.
10. For each of the eight SPECTRA light output channels, set up an observation method as shown in the screenshot below. Ensure that the status setting for the shutter component is set to “use for acquisition”.

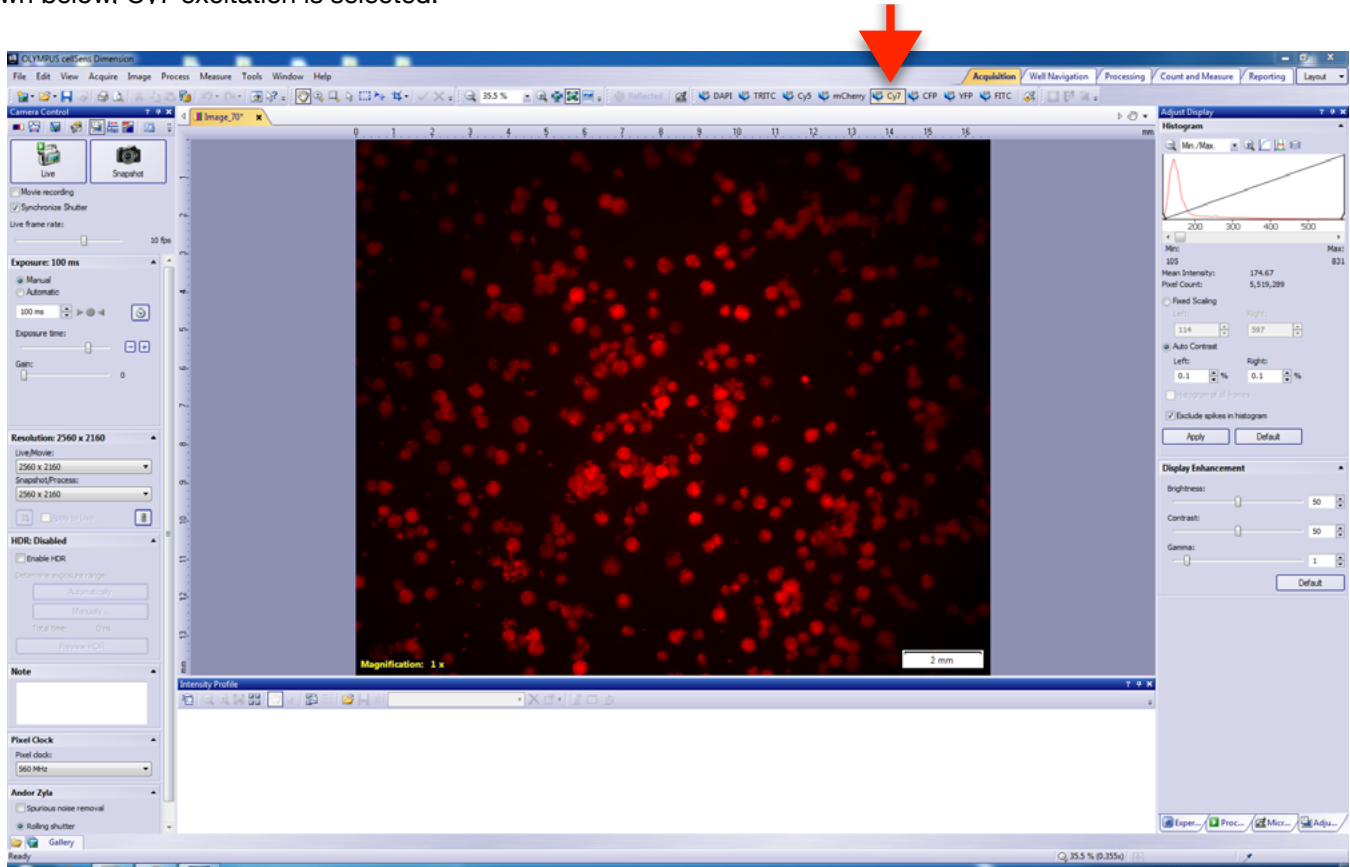


Notes

- [1] Download and install the USB-6501 drivers from <https://www.ni.com/en-us/support/downloads/drivers/download.ni-daqmx.html#428058>
- [2] The microscope frame setting is non-critical.

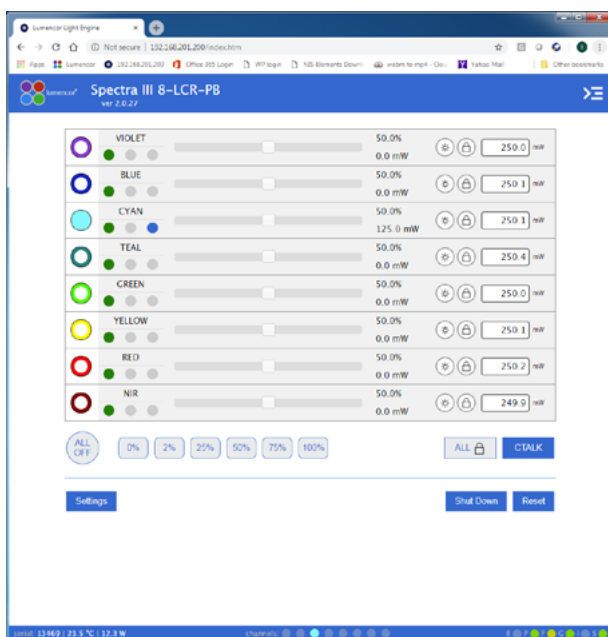
Operation

1. Select the appropriate observation method for the fluorophore of interest on the cellSens taskbar. In the example shown below, Cv7 excitation is selected.



2. To acquire image data, press Live or Snapshot.

3. Light output intensity is controlled independently by the sliders in the Light Engine GUI accessed via a LAN connection and a web browser application [1].



Notes

[1] Leave the ON/OFF radio buttons in the GUI in the OFF (unfilled) position when using TTL control of SPECTRA channel selection and ON/OFF status.