Quick Start Guide

Operation of Clarity LFC with Micro-Manager
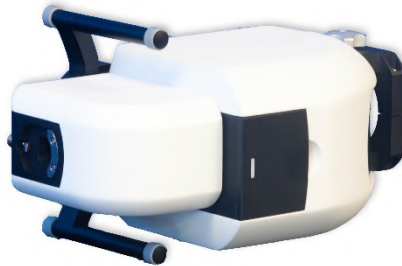
Version 1.1

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1. Introduction

Aurox Visionary software is a user-friendly interface allowing for basic operation of the Clarity LFC and Clarity HS laser free confocal systems.

For experimental procedures involving more complicated routines, or involving devices that are not compatible with the Visionary software, we recommend operation within Micro-Manager.[1]

2. System installation

This quick start guide assumes that the Clarity LFC or Clarity HS system is already connected to a suitable microscope, camera and light source and has been properly aligned. For further instructions on installing a Clarity LFC or HS system onto a microscope, please refer to the Aurox Clarity LFC Operating Manual.[2]

3. Software installation

3.1. Requisite Files

Currently, the plugin can only be used with a specific version of the Micromanager application. The appropriate version can be downloaded from the Micro-Manager website.[4]

The Micro-Manager Adapter and Micro-Manager Plug-in for Aurox Clarity LFC can be downloaded from the Aurox website.[3]

3.2. Aurox Micro-Manager Adapter Installation

Once Micromanager has been installed onto your PC, copy the content of the Aurox Micro-Manager Adapter folder to C:\Program Files\Micro-Manager-1.4.

3.3. Aurox Micro-Manager Plug-in Installation

Copy content of the Aurox Micro-Manager Plug-in folder to C:\ProgramFiles\Micro-Manager-1.4\mmplugins\On-The-FlyProcessors.

4. Hardware Configuration

Select Tools from the Micro-Manager toolbar. Select Hardware Configuration Wizard and tick the checkbox next to Create new configuration. If you have a configuration file that you wish to edit, tick the check box next to Modify or explore existing configuration as shown in Figure 1.
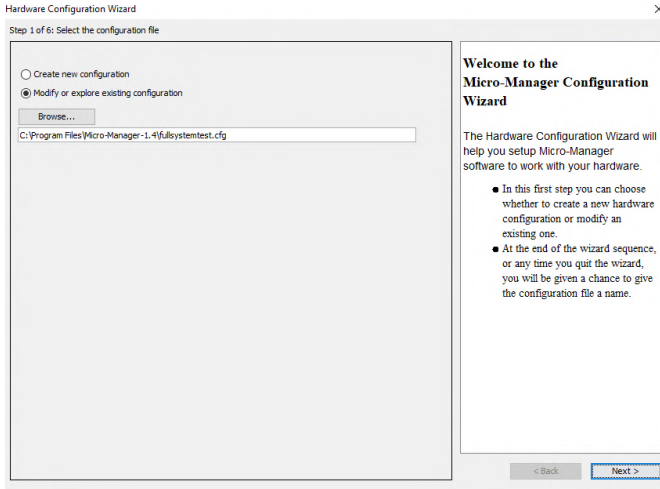

Figure 1- Hardware Configuration Window

Find the Aurox entry under Available Devices. Expand the menu and click on the Add button as shown in Figure 2.
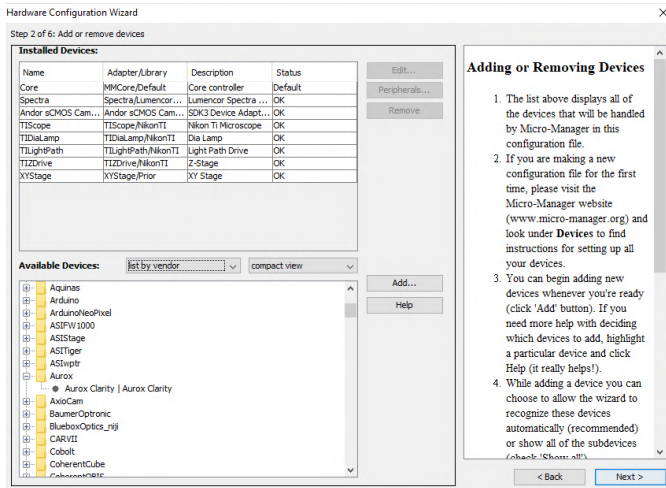

Figure 2 - Available Devices Window

Select the COM port to which Clarity LFC is attached by clicking on the pull-down menu and selecting Aurox-Clarity as shown in Figure 3. Click OK.
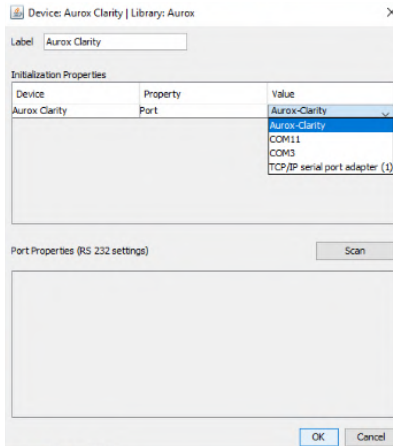

Figure 3 - Selecting Port Description

Aurox will now appear in the installed devices list as shown in Figure 4.

Add the other connected devices to the installed devices list. For further information about adding hardware in Micro-Manager, please refer to the Micro-Manager documentation.[1]

Click next to navigate through the remaining steps of the hardware configuration wizard and save your configuration file.
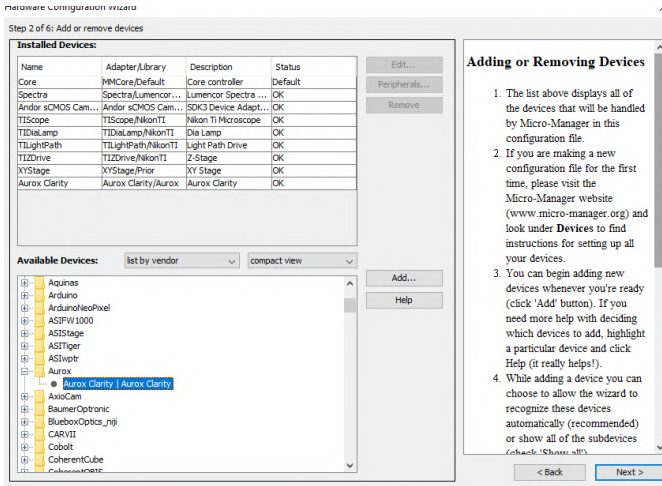

Figure 4 - Installed Device List

At this point you must set up your imaging channels

In the configuration settings window, shown in Figure 5, set up a group and presets for the colour channels you wish to use.in your experiment.
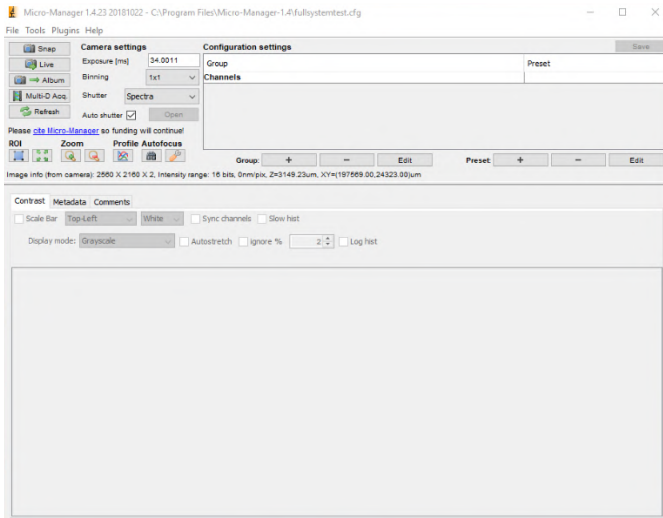

Figure 5 - Configuration Settings Window

In the group editor window, click + to create a new group. Select all functions you wish to use for that group of operations, as shown in Figure 6, then click OK. Ensure you select all functions relating to the Clarity device as well as light source channels and camera exposure time settings as a minimum.
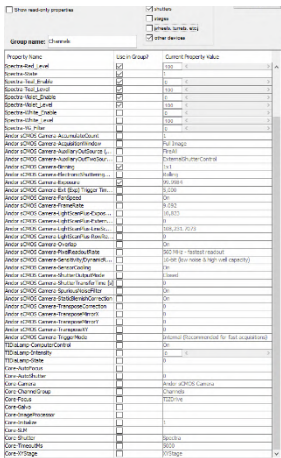

Figure 6 - Group Editor Window

In the Preset editor, click + to create a new preset, as shown in Figure 7, and select the light source and exposure time parameters as well as the Clarity filter cube and disk position and click OK.
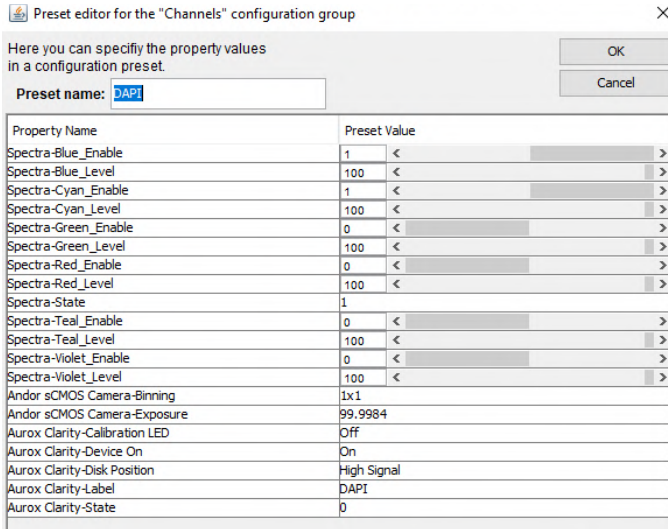
Save your configuration.

Figure 7 - Preset Editor Window

The example shown in Figure 7 has specified a channel with the Blue and Cyan LED's of the light source turned on at 100%, a camera exposure time of 100 ms and the Clarity device set in High Signal/Low Sectioning mode. The Clarity device is set to position 0 which is the filter first cube in the turret, in this case the DAPI filter cube.

5. Plugin Usage

In order to use the plug-in go to the Micro-Manager Plug-ins pull down menu, then On-The-Fly Processors and select Aurox Clarity as shown in Figure 8.
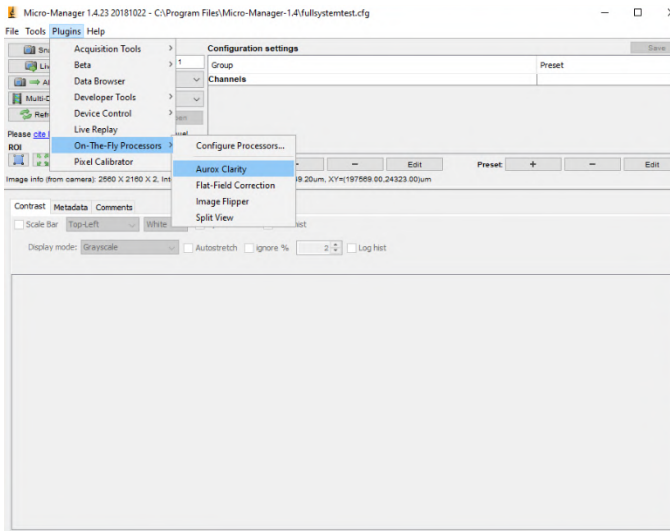

Figure 8 - Aurox Clarity On-The-Fly Processor

A Clarity plug-in window will appear. In the set-up pull-down menu, shown in Figure 9, select the appropriate OpenCL vendor you wish to use (Nvidia or Intel) and computer processor you wish to use (CPU or GPU).
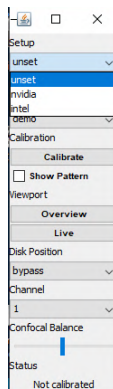

Figure 9 - Choosing OpenCL Vendor

In the Operation section, use the pull-down menu to select Clarity as shown in Figure 10

NOTE: the next steps assume that the Clarity device is correctly installed and aligned on the microscope. For further instructions on inistallation of a Clarity device onto a microscope, please refer to the Aurox Clarity Operating Manual.[2]
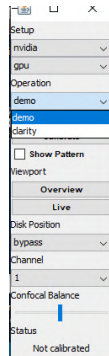

Figure 10 - Selecting Clarity Device in Plug-in

To check alignment, click on the overview button and click live to show a live image of the full sensor of the camera, as shown in Figure 11 or select the Show pattern Check box to show the arrangement of the Clarity calibration pattern as shown in Figure 12.
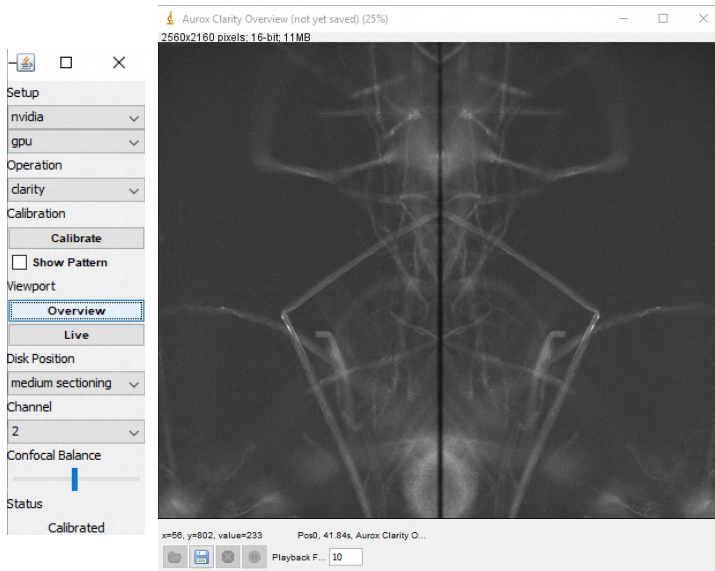

Figure 11 - Live Full Sensor Mode

Once alignment is verified, click on calibrate and the Clarity device will cycle through a self-calibration procedure.

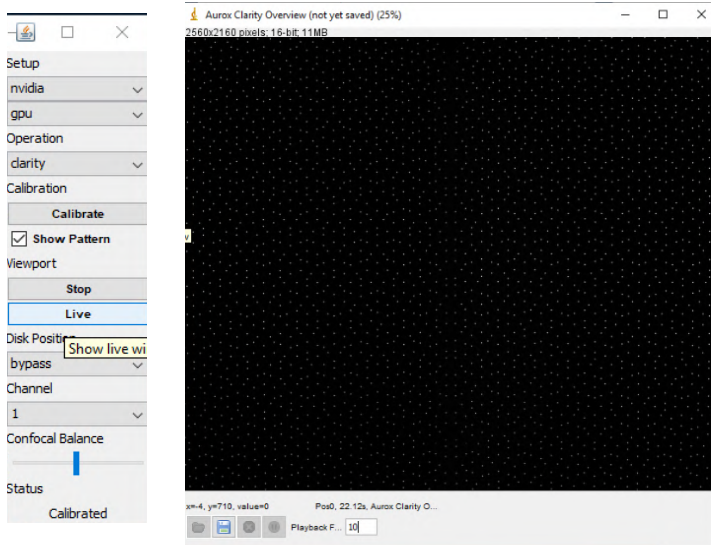Once calibration is complete at the bottom of the plug-in window, status will be updated to 'calibrated'

Figure 12 - Calibration Pattern

Select the desired disk position from the pull down menu and select the desired filter cube from the pull down menu. Click on Live to show a live image and focus your sample as shown in Figure 13.

Proceed to Micro-Manager acquisition protocol to set up your experiment. For further details on setting up an acquisition protocol, please refer to the Micro-Manager documentation.[1]
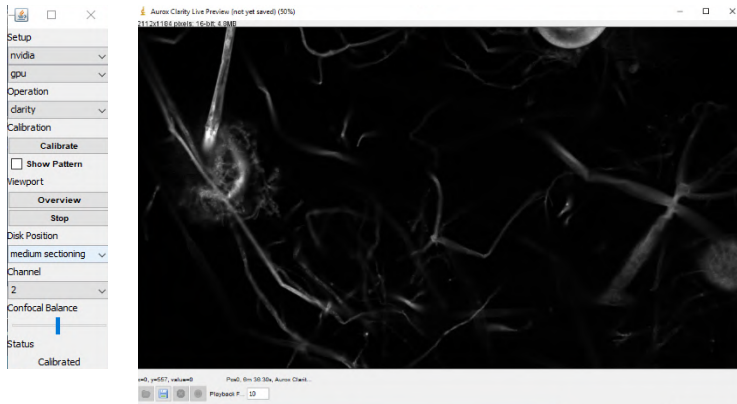

Figure 13 - Live Confocal Sample View

6. References and links

1. www.Micro-manager.org
2. http://www.aurox.co.uk/aurox-confocal-microscope-downloads-manuals.php
3. http://www.aurox.co.uk/aurox-confocal-microscope-downloads-software.php
4. http://valelab4.ucsf.edu/~MM/nightlyBuilds/1.4/Windows/MMSetup_64bit_1.4.23_20181022.exe