

µManager: Open Source Software for Microscope Image Acquisition: What can it do for you?

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Software controlling microscopes is a special case of robotic automation software. Image acquisition (through a camera or other sensor) needs to be synchronized with light exposure and sample positioning. Many different microscopes and microscope peripherals are available, each with their own computer interface. Writing software code to control these devices correctly is time consuming, and most biologists rely on closed source software sold by the microscope vendors, or in rare cases, by third parties. Microscope developers, on the other hand, often spend considerable effort writing their own code to accomplish novel image acquisition strategies and to achieve optimal hardware performance. Moreover, there is an increasing desire to closely couple image analysis with acquisition, demanding tight integration of analysis and acquisition software.

With the freely available, Open Source µManager software, we provide a platform that is both easy to use for biologists, and easily extendable by microscope developers. It has a simple user interface, running as an ImageJ plugin, that allows setting up complicated multi-dimensional acquisitions. µManager contains a device abstraction layer that isolates the code needed for a specific piece of equipment. Source code for devices has been contributed by more than 80 authors, and many microscopes, cameras, and related devices are supported. Several companies maintain the software code interfacing to their devices, ensuring high quality support. Besides extending hardware support, the software's functionality can be extended by writing scripts, and by writing plugins that can draw on both the supported hardware and user interface functionality.

In this tutorial, I will cover the following subjects:

- Overview of the software: basic functionality of an already configured system.
- Hardware configuration: How to tell the software what hardware is attached, make useful shortcuts, configure channels and calibrate pixel size.
- Scripting: Examples of simple (Beanshell) scripts to automate tasks and prototype more complex image acquisition strategies.

I will be available after the tutorial to discuss other subjects such as how to write device adapter code, and how to write plugins for µManager.

If you plan to attend, please download and install both versions 1.4 and 2.0 for Mac or Windows from <https://micro-manager.org>, so that you can follow along on your own laptop. Please note that µManager is no longer developed in our laboratory, but now maintained and support by the company Open Imaging (<http://open-imaging.com>).



µManager

Open Source Microscopy Software