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Transform Your Microscope into an Automated High-Speed Imaging System Without the Need for Complex Software

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Abstract

Using LEDs for fluorescence microscopy has been increasing in popularity in recent years, replacing old mercury lamp technology. LEDs offer many benefits over mercury, including a much-increased lifetime, more specified wavelengths, repeatability of irradiance at the sample plane, and the ability to be able to turn on and off with no warm up or cool down times.

The ability to turn on and off in this fashion allows for quick triggering, which make LEDs the perfect light source for applications that require very fast acquisition. One way to achieve the quick triggering is by using TTL control, which can typically give triggering times in the region of tens of microseconds. Often TTL control requires one TTL out connection to be connected to a single TTL input. In the case of LEDs this would mean one TTL connection for each LED, so if using several LEDs in a single experiment this would mean having external hardware that has enough connections to control each of these LEDs.

The pE-800 from CoolLED has a single TTL connection that can be used to control all eight LEDs within the system in the order specified by the operator, by using the Sequencer Runner function. This means there is no requirement for expensive external hardware, and the eight wavelengths can be controlled by a research camera for example.

In this workshop we will present the benefits of LEDs over traditional mercury technology as well as introducing the pE-800 and its triggering capabilities, which can give speeds of up to 7 µs on/ off time. In addition, the Sequencer Runner function will be demonstrated on the pE-800 explaining how to control the eight LEDs from just a single TTL connection.