

The Cairn Optoflash is the latest member of our OptoLED family, and is intended primarily for the very exciting emerging application of optogenetics but can also be used for flash photolysis.

Our well-established previous experience with LED technology has enabled us to bring a fully developed product to market very quickly, as we have needed to address only those requirements that are specific for optogenetics.



We have decided to make the Optoflash a single-channel design, rather than being able to drive two LEDs independently as the OptoLED does. However, the price difference does take this into account, and multiple units can easily be stacked if required. Also note (and see further below) that a single Optoflash may be capable of driving multiple optical fibres at the same time.

Key Benefits

Flash duration controllable from 50µsec-100msec by internal timer

Durations of arbitrary length via external control

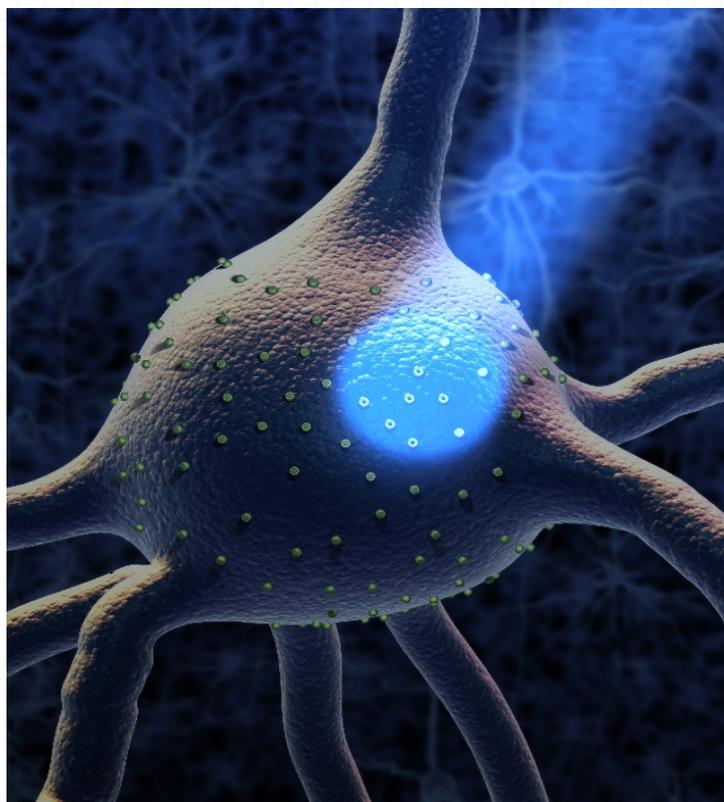
Flash rise and fall times less than 0.1 µsec

Optical monitor output, with optional optical feedback

Coupling system for optical fibres up to 1mm diameter

>30mW/mm² using a 200µm fibre when continuously driven by 470nm LED

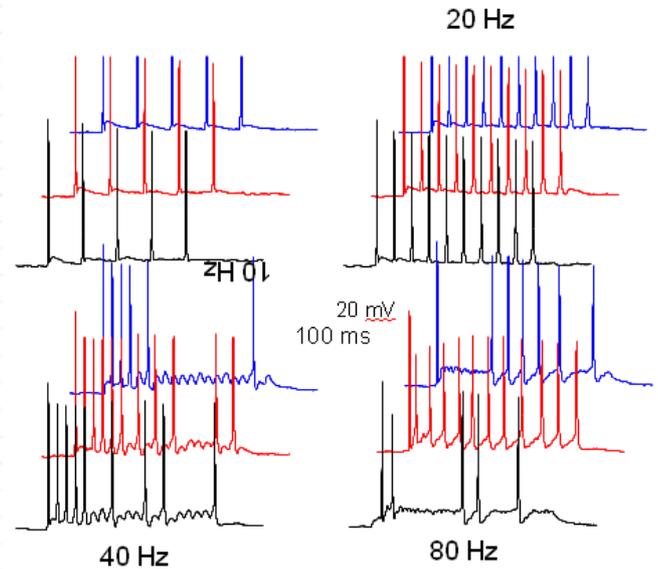
Protection network allows at least 2x over-driving for short pulses



Images courtesy of - Ed Boyden, McGovern Institute for Brain Research at MIT, Sputnik Animation

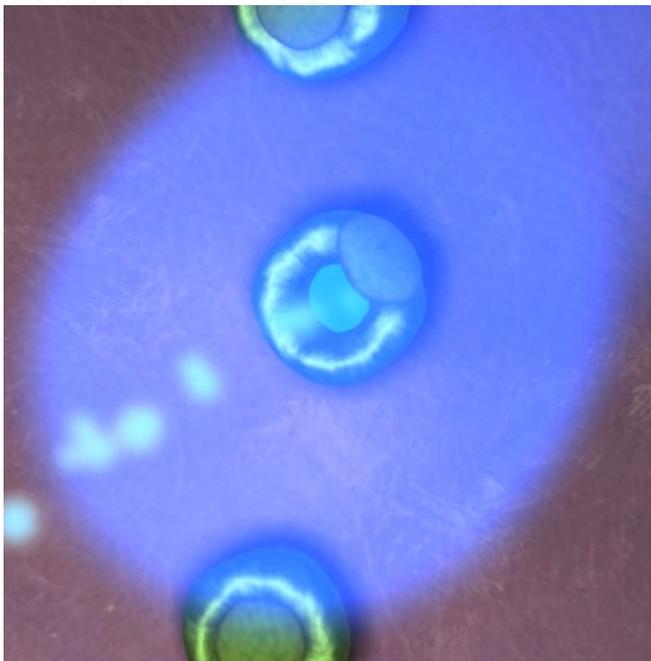
Optoflash development

The developments for the Optoflash application are basically twofold. First, although the Optoflash can be set for continuous illumination if required, it incorporates a front panel controlled timer, which generates flashes anywhere from 50 microseconds to 100 milliseconds, via either a front panel switch or an external trigger input. Alternatively, flashes of arbitrary duration can be generated, either under manual or external control. An optical monitor output is also provided, and just as for proven OptoLED design, it can optionally be used to drive a feedback system to guarantee a constant optical output during a pulse.



Voltage data collected using our LED products

Channelrhodopsin activation



The second development is a coupling system for coupling our standard LED head design into a range of optical fibres, of diameter from 0.1 to 1mm. For fibres less than 1mm diameter, simultaneous illumination of multiple fibres by a single LED is supported. A high-efficiency optical relay system is used to focus light from the LED onto the fibre entrance. Our LED protection networks safely allow a certain degree (depending on the LED) of over-driving during pulsed illumination such as that during a flash. The optical relay system also has provision for inclusion of filtering to limit the bandwidth of the LED if required.

Fibre ends can in principle be finished in a variety of ways - please ask for details.

And of course the Optoflash can be coupled into any microscope, using exactly the same accessories as for the OptoLED.

Dimensions	Depth	Width	Height
<i>Power supply</i>	<i>176mm</i>	<i>196mm</i>	<i>66mm</i>
<i>LED head</i>	<i>46mm</i>	<i>46mm</i>	<i>73mm</i>