

# OPTOLED Light Source

## Instantaneous wavelength switching

DATASHEET

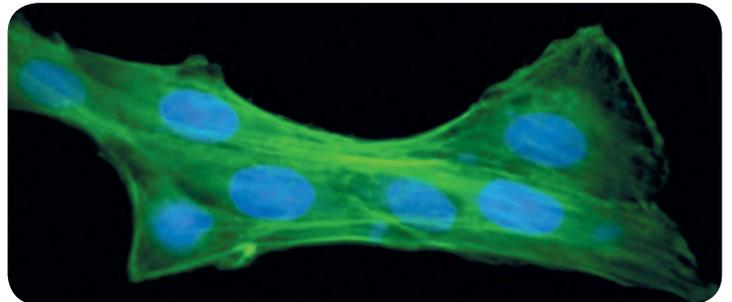
Ultra stable, ultra bright, modular illuminator for epifluorescence and transmitted light microscopy, macroscopy & optogenetics.



High intensity LEDs are now available across the visible spectrum extending into both the ultraviolet and infrared. Their fast switching, longlife, high stability, variable intensity and lower power consumption make them ideal for both fluorescence and transmitted light microscopy. The Cairn OptoLED system has been designed to best exploit this new technology whilst maintaining compatibility with arc lamp and laser illumination sources.

### APPLICATIONS

- Multi-wavelength fluorescence microscopy
- Visible/IR transmitted light microscopy
- Optogenetics using fibres or epi-illumination
- Macro fluorescence imaging/Optical Mapping
- Flash photolysis
- High speed Fura-2 calcium imaging



### KEY BENEFITS

- High intensity
- Optical feedback for near perfect intensity and wavelength stability
- Instantaneous vibration-free switching
- Long life (should never need replacing)
- Variable intensity – no need for ND filters
- Minimal unwanted infrared (heat) output
- Fully modular system accommodates an ever-expanding range of emitters



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## Near perfect stability

### SUMMARY

The Cairn OptoLED is capable of driving two LEDs independently, over a wide range of currents. For pulsed illumination, switching times of less than 100 nanoseconds are achievable, and digital control inputs to support this mode of operation are provided. The standard operating current range, which is set either by a front panel control or by an external control voltage, is 0-5 amps (A). In addition, digital inputs are provided to switch each LED on and off independently, with rise and fall times of less than 100 nanoseconds. Additional sockets are provided to allow additional synchronisation with the camera to reduce phototoxicity or motion artefacts. Each channel has a meter, which displays the applied current. The Cairn OptoLED also comes with an optical feedback function because although the light output from an LED tends to be more stable than that from other sources, it is somewhat temperature dependent. During pulsed operation with duty cycles of more than a few milliseconds, optical feedback prevents the consequent variation in LED temperature and effective wavelength through the cycle from causing the light output to change during the pulse.



### FULL SPECIFICATION

- Typical optical power at specimen >15mW at 470nm
- Fluorescence LED heads available at 355nm\*, 365nm, 385nm, 405nm, 440nm\*\*, 455nm, 470nm, 490nm, 505nm, 525nm, 550nm\*\*, 565nm, 590nm, 617nm, 627nm and white with multi-element LED heads for transmitted light
- Single, dual, triple and quad couplings available for Nikon, Olympus, Leica and Zeiss microscopes
- TTL-controlled switching and voltage-controlled intensity modulation accessed via BNC connections
- Maximum output current 1A, 2A or 5A, selectable by internal jumper links
- Optical switching times <100nsec
- Response time to change external analogue input <10µsec
- Response time of optical feedback circuit <50µsec
- External analogue control voltage range 0 to +10V

Dimensions (mm)	Depth	Width	Height
Power supply	280	304	65
Remote control slider	87	144	35
LED head	46	46	73

\* post-filter feedback allows stable high Ca<sup>2+</sup> Fura-2 imaging

\*\* filtered high power white LED