

OPTOSCAN Monochromator

Rapid switching illumination system

DATASHEET

The Optoscan monochromator from Cairn Research is the only instrument of its type to offer control of both centre wavelength and optical bandwidth with millisecond time resolution.



Combined with our signal processing modules and optical hardware it forms the heart of a powerful standalone microphotometry system. Considerable effort has also been applied to making it the ideal illumination source for fluorescence imaging. At Cairn we see ourselves predominately as hardware designers and system integrators so we have chosen not to develop our own imaging software and have instead sought to ensure compatibility with the excellent range of applications available on the market. Optoscan control is currently implemented in a wide range of commercial packages including MDS MetaFluor/Morph, RSI Neuroplex, Micromanager and Winfluor. Because we are system integrators as well as hardware manufacturers we are able to provide turnkey solutions based on most of the applications below and have sufficient knowledge of all of them to offer comprehensive support. To summarise, if your application requires fast, flexible and automated illumination control then the Cairn Optoscan may well be the instrument of choice.

KEY BENEFITS

- Sub-millisecond control of centre wavelength with microsecond precision
- Sub-millisecond bandwidth control allows spectral and intensity optimisation at each wavelengths
- Can be used with mixed Hg/Xe lamps as well as Xe lamps to take advantage of spectral peaks
- Modular design means that the light source can be used independently as a white light source if required
- Light guide couplings to all popular microscopes
- External iris diaphragm for manual intensity control
- Built in fast electronic shuttering on all versions

APPLICATIONS

- Ratiometric photometry
- Fluorescence imaging
- Optical scanning
- Photolysis

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Imaging illumination system



SYSTEM OPTIONS

The monochromator has electronic or micrometer controlled input and exit slits.

Standard broad spectral range diffraction grating for maximum throughput, or low inertia version for reduced switching times (but lower optical throughput).

Alternative diffraction gratings blazed for different wavelengths (as required).

The Optosource has been specifically designed for the Optoscan and can drive a full range of Xe and mixed Xe/Hg lamps from 75-150W.

CONTROLLER OPTIONS

USB control – the most powerful and cheapest way to control the Optoscan is via our embedded USB controller.

Direct control – the Optoscan can also be controlled directly using analogue signals. To facilitate this we offer a complete package including a DAC card, power supply, cables, software drivers and dll library. This package works seamlessly with most commercial imaging packages to provide completely flexible illumination control in both acquisition and scan modes.

Microprocessor control – for photometry and general purpose illumination the Optoscan can be controlled from a front panel keypad and display (or via a PC serial port using the emulator program provided). This control unit allows a full range of built in stepwise and scanning illumination options, and also provides the timing signals necessary to drive Cairn photometry modules (if appropriate).

FULL SPECIFICATION

- Optical configuration – enhanced Czerny-Turner configuration with fast F/2 light collection and off-axis parabolic mirrors to minimise aberrations
- Diffraction grating – 1200 line ruled grating blazed for broad UV/visible range, 1800 and 2000 line holographic gratings for demanding applications
- Wavelength resolution – 300-800nm specified with 0.5nm resolution @ ± 1.5 nm accuracy
- Bandwidth resolution – 0-30nm specified with 0.1nm resolution @ ± 0.2 nm accuracy
- Wavelength switching – 200nm transition <1.5ms, 50nm transitions in <1ms
- Bandwidth switching – Typical transition times of <1.5ms for both input and exit slits
- Digital shuttering (TTL) – Typically <2ms depending on bandwidth

Dimensions (mm)	Depth	Width	Height
Optoscan monochromator	230	180	180