

Agilent Polychrome 5000 – Fast Monochromator for Fluorescence Microscopy

Data Sheet

General Information

The Agilent Polychrome 5000 is an ultra-fast and versatile switching monochromator for fluorescence microscopy. It provides the flexibility to adjust the excitation wavelength in order to optimize an experiment even under non-standard or unknown conditions. It offers speed, stability and brightness to acquire the best possible data from living cells.

Polychrome 5000 is particularly suitable for experiments

- where a weak signal or labelling is expected,
- where flexible adjustment of the excitation wavelength is needed e. g. to optimize an experiment under non-standard or unknown conditions,
- where bandwidth must be changeable at a given wavelength or
- when full shuttering (output intensity equals zero) is required.



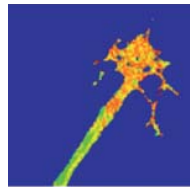
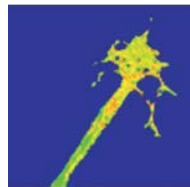
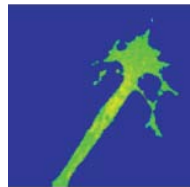
Key Benefits

Brightness and light efficiency

The Polychrome 5000 uses a quartz fiber-optic light guide with optimized coupling units (epi-fluorescence condensers) especially designed for each microscope system, leading to more light in the object plane where it is needed.

As a result a maximum of the light delivered by the lamp reaches the sample object.

This is an essential advantage e. g. when implementing experiments with weakly labeled structures.



Variable wavelength selection

Unlike filter-based systems, the monochromator-based Polychrome 5000 system is not limited to a few distinct wavelengths. A flexible selection of any wavelength between 320 nm and 680 nm is possible, so the optimum excitation wavelength in experiments with non-standard or unknown conditions can be achieved.

High stability of light source

Only scientific-grade lamps, such as those used in the Agilent Polychrome 5000, warrant a stability with short and long-term p/p fluctuations that are typically 0.4%.

This leads to the most optimized signal-to-noise ratio.

Compared to Cermex-based systems or consumer-grade lamps, the Agilent Polychrome 5000 lamp provides up to 10 times more stability.

Fast wavelength scanning speed

The fully digital galvanometer control in the Agilent Polychrome 5000 makes it possible to switch wavelengths in milliseconds.

Switching between the two excitation wavelengths of 340 and 380 nm takes less than 1 ms, and the largest wavelength jump of 400 nm has a transition time of < 1.6 ms.



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Low cost-of-ownership and long lamp lifetime

The Xenon lamp used in the Polychrome 5000 lasts 2 times longer than others and costs 2 times less.

Unlike liquid light-guides, the quartz fiber light guide of Polychrome 5000 keeps the light transmission efficiency high over its entire life cycle.

Intelligent and fast control

The intelligent controller in the Agilent Polychrome 5000 has all the brains it takes to run complex experiments by itself. All actuators in your Agilent Polychrome 5000 are controlled by this unit. Communication between the controller and the PC is done via RS-232 (a USB adapter for RS-232 is available).

The Agilent controller can be triggered or serve as a precise trigger-source within a series of predefined steps in an imaging or photometry experiment.

The Agilent Polychrome 5000 intelligent controller can be programmed with Agilent Software, as well as major imaging software programs.

Alternatively the wavelength can be controlled by an analog voltage.

Applications

The Polychrome 5000 is a suitable light source for real-time live cell imaging experiments such as

- high-speed ratio imaging,
- GFP imaging to distinguish a variety of fluorophores,
- FRET to detect faint signals,
- photometry with very high time resolution or
- wide field and TIRF.

Specifications

Parameter	Value
Monochromator	Scanner mounted diffraction grating
Wavelength range	320 nm to 680 nm
Scanning speed	Up to 400 nm/ms
Scanner controller type	Digital
Half-power bandwidth	14 nm
Motorized bandwidth (optional)	2 nm -15 nm, 1 nm resolution
Motorized Intensity (optional)	0% - 100%, 10% resolution
Output power	> 10 mW (@470 nm @ 14 nm BW, with new lamp)
Optical fiber	UV/Vis quartz/quartz fiber, NA 0.22, length 2 m or 3 m
Light source	150 W Xenon high stability lamp
Interfaces	Voltage, RS232, trigger in and trigger out
Control voltage range	-10 V to +10 V
Operating voltage	110 V - 120 V, 220 V - 240 V, 50/60 Hz, 3.15 A max
Dimensions	42 cm x 24 cm x 21 cm
Operating temperature range	15°C – 30°C
Weight	9.5 kg
Software included	Polychrome 5000 Control Software, SDK
SDK language support	C/C++, Java, C#/.NET, LabView

Features

- Continuous variable bandwidth control (optional)
- Variable intensity control 0 – 100% (optional)
- Long life expectancy for bulb and light guide
- Stand-alone and compact – no external control box needed
- UV/Vis enhanced at no extra charge
- Easy optical coupling to standard microscopes – also fits in your existing setup

www.agilent.com/chem/microscopy

Product specifications and descriptions in this document subject to change without notice.

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