

Agilent MLC400 Monolithic Laser Combiner

Laser-Based Illumination System For Microscopy/Cell Biology

Data Sheet

Overview

The Agilent Technologies MLC400 monolithic laser combiner is designed for fluorescence and confocal microscopy research applications. It offers a reliable light source at multiple wavelengths, with minimal downtime for maintenance and alignment because the system leaves the factory aligned, and it stays that way. The result is a laser-based illumination system for cell biology that is stable, reliable and easy-to-use.

With stable illumination the imaging time is extended and photobleaching is slowed because cell exposure to light is minimized. Independent on/off control of each laser extends laser lifetime. An acousto-optic tunable filter (AOTF) provides fast switching between different combinations of wavelengths and powers. And, the MLC400 is upgradeable allowing users to add laser lines as their research needs change.

Applications

Confocal and fluorescence techniques including:

- TIRF
- FISH
- PALM
- FRAP
- FLIP
- STORM
- FRET

Stable, reliable and easy-to-use

Environmental changes that commonly occur in laboratories, such as temperature, air flow, and benchtop vibration, are no longer an issue with the MLC400. The beam-combining optics and beam-steering optics in the MLC400 are fully integrated with the beam delivery architecture resulting in an instrument that reliably delivers stable power day-after-day without realignment. The MLC400's compact design comes in a small benchtop footprint making it suitable in laboratory situations where space is often at a premium.

Multiple beam-combining optics are assembled into a single optical structure using Agilent's proprietary complex monolithic optic (CMO) technology that allows them to be permanently aligned before they leave the factory. The CMO design reduces the number of exposed beam-combination surfaces that are subject to contamination and require cleaning in the lab. A proprietary fixed mounting system keeps the beam-steering optics permanently aligned and the beam is delivered to the microscope by a single-mode, polarization-maintaining fiber-coupled delivery system.



The Agilent MLC400 monolithic laser combiner

Microprocessor controller

The MLC400 incorporates a microcontroller that communicates with the AOTF controller and can be used to drive external devices that include a wide array of imaging hardware. Instructional packets that contain a user defined command sequence can be created in the imaging software and then downloaded directly to the microcontroller. The MLC400 can be enabled to respond to incoming trigger signals with a predetermined sequence of laser line outputs and output signals that can be directed to specific hardware devices. By bypassing the host computer the image acquisition rate can be increased and overall cycle time can be reduced.

Four 0-10V 16-bit analog outputs and one camera sync input are incorporated on the rear panel of the MLC400 enabling high-speed synchronization for fast image acquisition.



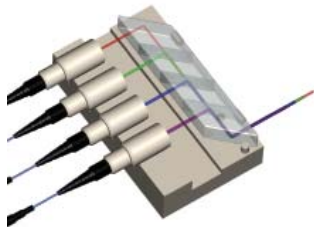
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Features and benefits

Monolithic optical assembly	Temporal and environmental alignment stability – you get more consistent results and longer sample lifetime
Permanent factory alignment	You do not need to deal with maintenance and realignment – you save time
Protected beam-combination optical surface	Critical dielectric interfaces stay free from most contamination – no more cleaning optics
Flexible and upgradeable	The system works with you as your research needs change
Compact size	Fits neatly into your laboratory space

Specifications

Wavelengths	405, 488, 561, 640 nm
Number of channels	2, 3, or 4
Low-power version	15 mW minimum , range 15 - 25 mW
High-power version	45 mW minimum , range 45 - 55 mW (488, 561 nm) 35 mW minimum, range 35 - 45 mW (640nm), 15 mW minimum , range 15 - 25 mW (405 nm)
Power stability	± 2% over 1 hour at 20 °C
Modulation	4 uS rise time, 50 dB dark state (digital)
Output coupling	Single port FC/APC or FC/UPC connector
Output polarization	17 dB
Extinction ratio	
Mechanical dimensions	12 inch x 24 inch x 9 inch (W x D x H)
Electronic interface	Analog input: 0 – 5V Digital input: TTL USB analog output 4X: 0 - 10V External trigger: TTL
Software interface	Micro-manager A software development kit (SDK) is available for interfacing the Agilent MLC to third-party software applications
Operating temperature	+15 to +30 °C
Storage temperature	0 to +50 °C
Warranty	12 months



The Agilent CMO technology and fiber delivery system are at the heart of the MLC400

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

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