Agilent MLC400
Monolithic Laser Combiner

Laser-Based Illumination System For Microscopy/Cell Biology

Data Sheet

The Agilent MLC400 monolithic laser combiner

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.

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

Long-life DPSS and diode lasers are combined in a compact footprint with a high-power, single-mode output fiber and controlled by the AOTF. A pass-through option for external light sources is available offering even greater flexibility for researchers. And, the MLC400 is upgradeable allowing users to add laser lines as their research needs change.

Microprocessor Controller

The MLC400 incorporates a DSP-based microcontroller that can be used to drive external devices including a wide array of imaging hardware. Instructional packets are created in the imaging software and downloaded directly to the microcontroller. This bypasses the host computer, significantly reducing the overall cycle time and increasing the image acquisition rate. Trigger pulses from the microcontroller are directed to specific hardware devices based upon the packet's command sequence and timing model.

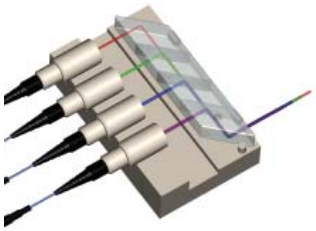
Four 0-10V 16-bit analog outputs and one camera sync input are incorporated on the rear panel of the MLC400 enabling high-speed synchronization for fast image acquisition.

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	20 mW nominal, 15 mW minimum
High-Power Version	35 mW nominal, 30 mW minimum (488, 561, 640 nm) 20 mW nominal, 15 mW minimum (405 nm)
Power stability	± 1% over 1 hour at 20 °C
Modulation	4 uS rise time, 30 dB dark state (analog)/50 dB dark state (digital)
Output coupling	Single port FC/APC connector
Output polarization Extinction Ratio	17 dB
Mechanical dimensions	12 inch x 24 inch x 9 inch (W x D x H)
Electronic interface	Analog: 0 – 5V Digital: TTL, USB
Software interface	Micro-manager A software development kit (SDK) is available for interfacing the Agilent MLC to third-party software applications
Operating Temperature/ Humidity:	+10 to +35 °C / 50% to 80% RH at 40 °C
Storage Temperature:	-20 to +60 °C
Warranty	12 months



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

Optical systems solutions from Agilent Technologies

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