

Flexible Wavelength Selector

New tunable filter for imaging and illumination

Flexible Wavelength Selector (FWS)

Tunable filter for spectroscopy and spectral imaging



Automated FWS



High Resolution FWS



Basic FWS



CenterLine FWS



Custom Wavelength Selector

Ideal for

- Fluorescence microscopy
- Hyperspectral imaging
- Life sciences instrumentation
- Machine vision
- Laboratory research

Key product advantages

- Broad wavelength tuning
- Smoothly adjustable bandwidth (FWHM 1.5 nm – 16 nm)
- Large (up to 10 mm diam.) circular aperture
- High (10^5) out of band extinction
- Compact rugged optomechanical package
- In-line operation for easy integration
- No beam deviation or walk-off during tuning

Based on our patented TwinFilm™ technology, the Flexible Wavelength Selector is a uniquely compact opto-mechanical device that combines the wavelength tuning and bandwidth adjustment of a grating monochromator with the imaging advantages of a large aperture filter. With both high (10^6) out of band extinction and excellent (> 75%) transmission, the Flexible Wavelength Selector is a simple, turnkey solution for any imaging applications that require wavelength control, throughout the extended visible spectrum. Plus the in-line configuration, together with no wavelength associated displacement (neither deflection nor walk-off), means the FWS is simple to integrate with cameras, microscopes and other instruments.

The FWS features independent control of both center wavelength and bandwidth. Five models are offered based on fully automated (motorized) control, manual control, and fixed output operation.

Automated Flexible Wavelength Selector

This fully automated device incorporates two DC actuators to rotate the bandwidth and center wavelength controls. A simple to use, intuitive GUI and a set of serial commands enable straightforward integration by OEMs and end users.

Basic Flexible Wavelength Selector

The basic manual format features three knurled knobs-two for adjusting the center wavelength and the transmission bandwidth and one for compensating the beam direction offset. Basic models are ideal for microscopy applications, such as optogenetics, where the wavelength and the bandwidth can be rapidly adjusted and set.

CenterLine Flexible Wavelength Selector

The centerline manual format features two knurled knob-one for adjusting the center wavelength with a fixed bandwidth of around 20 nm and one for compensating the beam direction offset. Centerline models are ideal for machine vision systems and some microscopy applications, where the wavelength can be rapidly adjusted and set.

High Resolution Flexible Wavelength Selector

The high resolution manual format features two precision multi-rotation dials for adjusting the center wavelength and the transmission bandwidth. The third knob is used for compensating the beam direction offset. High resolution models are ideal for chemical imaging type applications, where the wavelength can be rapidly adjusted and set to an emission or absorption peak of the sample.

Custom Wavelength Selector

Fixed(non-adjustable) versions of this device combine off-the-shelf convenience with completely custom (bandwidth, center wavelength) performance for applications needing user-specified bandpass filters. These Custom Wavelength Selectors can usually be shipped in 48 hours or less after ordering.

Flexible Wavelength Selector Mono

The Flexible Wavelength Selector is a unique wavelength selection device that employs TwinFilm™ technology to deliver the tunability and adjustable bandwidth of a grating monochromator, together with the imaging advantages of a circular aperture filter. Mono models feature complete software control of wavelength and bandwidth via a USB link and simple software interface. Click [here](#) for videos and more information.

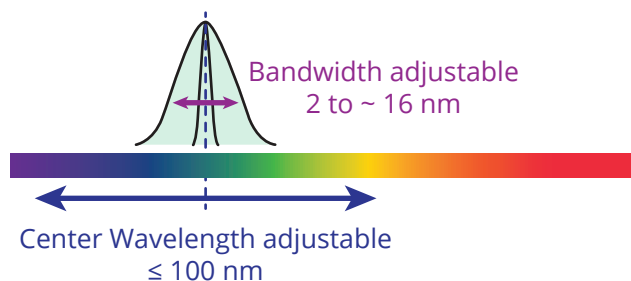
/ Optical Specifications

Transmission: > 75%
 Total Product Range (nominal): 350 ~ 900 nm
 Center Wavelength accuracy: ± 0.5 nm
 FWHM accuracy: ± 0.5 nm
 Extinction Coefficient: $OD_{avg} > 6$ (275 nm – 925 nm)
 Minimum step size of center wavelength: 0.2 nm
 Minimum step size of bandwidth: 1 nm
 Wavelength switching speed (nominal): 70 - 200 ms



/ General Specifications

Dimensions: 48 x 92 x 64 mm
 Aperture Size: 10 mm
 Input Power: 12 V, 2A
 Data Interface: USB 2.0



Flexible Wavelength Selectors - Mono

Spectral Range ¹	Bandwidth	Item Number
358 - 400 nm	2 - 16 nm	FWS-Mono-380
395 - 447 nm	2 - 15 nm	FWS-Mono-425
447 - 501 nm	2 - 15 nm	FWS-Mono-475
496 - 561 nm	2 - 14 nm	FWS-Mono-530
555 - 628 nm	2 - 14 nm	FWS-Mono-595
621 - 703 nm	3 - 13 nm	FWS-Mono-665
700 - 790 nm	3 - 12 nm	FWS-Mono-745
784 - 900 nm	4 - 10 nm	FWS-Mono-845

based on maximum bandwidth¹

*All specifications subject to change without prior notice

Flexible Wavelength Selector Mono Laser Version

The Flexible Wavelength Selector is a unique wavelength selection device that employs TwinFilm™ technology to deliver the tunability and adjustable bandwidth of a grating monochromator, together with the imaging advantages of a circular aperture filter. Mono models feature complete software control of wavelength and bandwidth via a USB link and simple software interface. The laser version is compatible with beam size of up to 3 mm.

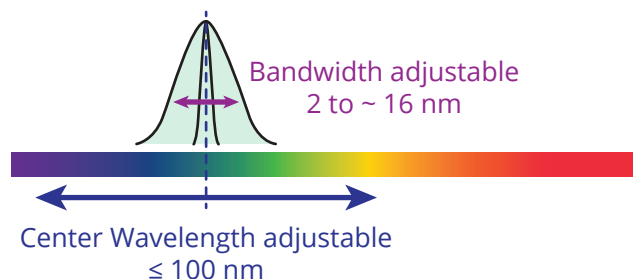
/ Optical Specifications

Transmission: > 75%
 Total Product Range (nominal): 350 ~ 900 nm
 Center Wavelength accuracy: ± 0.5 nm
 FWHM accuracy: ± 0.5 nm
 Extinction Coefficient: $OD_{avg} > 6$ (275 nm – 925 nm)
 Minimum step size of center wavelength: 0.2 nm
 Minimum step size of bandwidth: 1 nm
 Wavelength switching speed (nominal): 70 - 200 ms



/ General Specifications

Dimensions: 48 x 92 x 64 mm
 Aperture Size: 3 mm
 Input Power: 12 V, 2A
 Data Interface: USB 2.0



Flexible Wavelength Selectors - Mono Laser Version

Spectral Range ¹	Bandwidth	Item Number
358 - 400 nm	2 - 16 nm	FWS-Mono-380
395 - 447 nm	2 - 15 nm	FWS-Mono-425
447 - 501 nm	2 - 15 nm	FWS-Mono-475
496 - 561 nm	2 - 14 nm	FWS-Mono-530
555 - 628 nm	2 - 14 nm	FWS-Mono-595
621 - 703 nm	3 - 13 nm	FWS-Mono-665
700 - 790 nm	3 - 12 nm	FWS-Mono-745
784 - 900 nm	4 - 10 nm	FWS-Mono-845

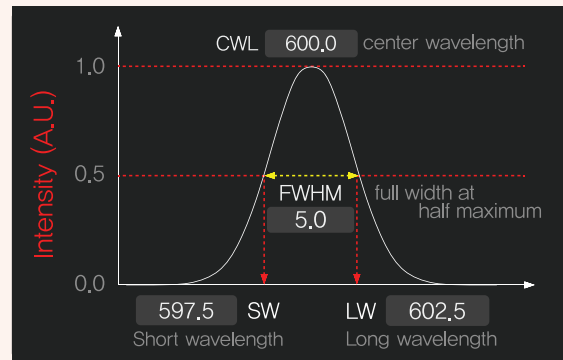
based on maximum bandwidth¹

***All specifications subject to change without prior notice**

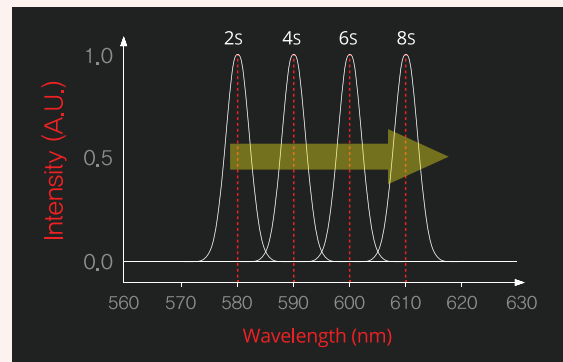
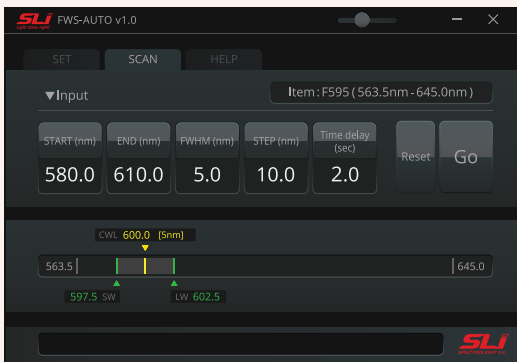
Flexible Wavelength Selector Mono

/ Software features

SET



SCAN



/ Application



Flexible Wavelength Selector Poly

The Flexible Wavelength Selector is a unique wavelength selection device that employs TwinFilm™ technology to deliver the tunability and adjustable bandwidth of a grating monochromator, together with the imaging advantages of a circular aperture filter. FWS Poly models feature complete software control of wavelength and bandwidth via a USB link and simple software interface.

/ Key product Advantages

- > **Adjustable center wavelength**
 - can be tuned or set as wide as ~500 nm.
- > **Adjustable bandwidth**
 - from 3 nm to 15 nm (nominal)
- > **Circular uniform aperture**
 - up to 10 mm

/ Optical Specifications

Transmission efficiency (nominal): greater than 75 - 85%

Wavelength accuracy (nominal): ± 0.5 nm

FWHM accuracy (nominal): ± 0.5 nm

Extinction coefficient: $OD_{avg} > 6$ (275 nm – 925 nm)

Minimum bandwidth (nominal)

@ 358 - 785 nm: 3 nm

@ 786 - 900 nm: 4 nm

Maximum bandwidth (nominal)

@ 358 - 535 nm: 15 - 16 nm

@ 536 - 695 nm: 13 - 14 nm

@ 696 - 900 nm: 10 - 12 nm

Minimum step size of center wavelength: 0.2 nm

Minimum step size of bandwidth: 1 nm

IR blocking range: OD 6 @ 930 - 1600 nm

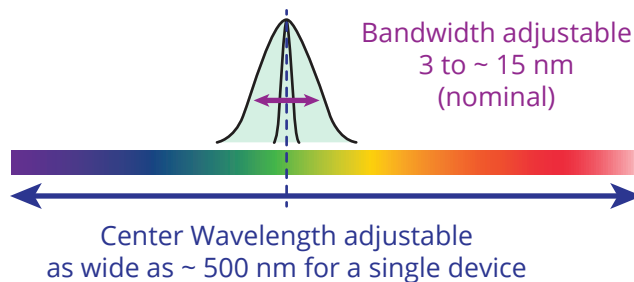
/ General Specifications

Dimensions: 170 x 129 x 200 mm

Aperture Size: 10 mm

Input Power: 12 V, 4A

Data Interface: USB 2.0



Flexible Wavelength Selector Poly

Spectral Range ¹	Item Number
358 - 487 nm	FWS-Poly-UV
358 - 628 nm	FWS-Poly-UV-Plus
447 - 628 nm	FWS-Poly-VIS
432 - 900 nm	FWS-Poly-VIS-Plus
555 - 900 nm	FWS-Poly-IR
Custom range	FWS-Poly-SP

¹ based on maximum bandwidth¹

Flexible Wavelength Selector Poly Laser Version

The Flexible Wavelength Selector is a unique tunable filter that employs TwinFilm™ technology to deliver the tunability and adjustable bandwidth of a grating monochromator, together with the imaging advantages of a circular aperture filter. FWS Poly models feature complete software control of wavelength and bandwidth via a USB link and simple software interface. The laser version is compatible with beam size of up to 3 mm.

/ Key product Advantages

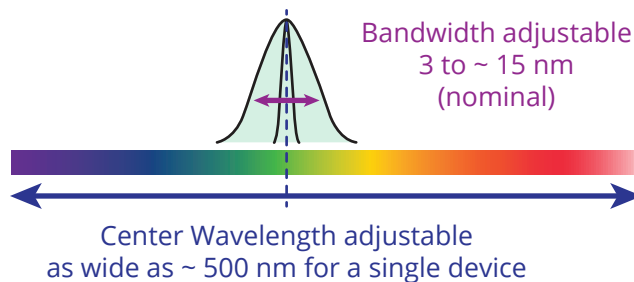
- > **Adjustable center wavelength**
 - can be tuned or set as wide as ~500 nm.
- > **Adjustable bandwidth**
 - from 3 nm to 15 nm (nominal)
- > **Circular uniform aperture**
 - up to 3 mm

/ Optical Specifications

Transmission efficiency: greater than 75 - 85 %
Wavelength accuracy (nominal): ± 0.5 nm
FWHM accuracy (nominal): ± 0.5 nm
Extinction coefficient: $OD_{avg} > 6$ (275 nm – 925 nm)
Minimum bandwidth
@ 358 - 785 nm: 3 nm
@ 785 - 900 nm: 4 nm
Maximum bandwidth (nominal)
@ 358 - 535 nm: 15 - 16 nm
@ 536 - 695 nm: 13 - 14 nm
@ 696 - 900 nm: 10 - 12 nm
Minimum step size of center wavelength: 0.2 nm
Minimum step size of bandwidth: 1 nm
Wavelength switching speed (nominal) : 70 - 800 ms
IR blocking range: OD 6 @ 930 - 1600 nm

/ General Specifications

Dimensions: 170 x 129 x 200 mm
Input Power: 12 V, 4A
Data Interface: USB 2.0



Flexible Wavelength Selector Poly

Spectral Range ¹	Item Number
358 - 487 nm	FWS-Poly-UV-LV
358 - 628 nm	FWS-Poly-UV-Plus-LV
447 - 628 nm	FWS-Poly-VIS-LV
432 - 900 nm	FWS-Poly-VIS-Plus-LV
555 - 900 nm	FWS-Poly-IR-LV
Custom range	FWS-Poly-SP-LV

¹ based on maximum bandwidth¹

Flexible Wavelength Selector

High Resolution, Basic and CenterLine

The Flexible Wavelength Selector is a unique tunable filter that employs TwinFilm™ technology to deliver the tunability and adjustable bandwidth of a grating monochromator, together with the imaging advantages of a circular aperture filter. Three manual models feature manual adjustment of the center wavelength, transmission bandwidth and beam offset compensation. For High Resolution (HR) and Basic (B) models the bandwidth can be manually adjusted from around 1.5 nm to 16 nm while for CenterLine (CL) it is fixed at ~ 16 nm.

/ Optical Specifications

Transmission: > 75%

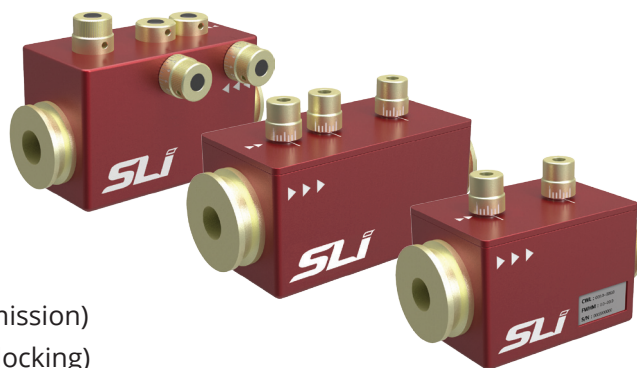
Wavelength Tuning Range: ≤ 100 nm

FWHM tunable range for HR, B (nominal): 1.5 nm ~ 16 nm

Extinction Coefficient: $OD_{avg} > 6$ (275 nm – 925 nm)

Cut-on Transition Width: 2% – 3% (from blocking to transmission)

Cut-off Transition Width: 2% – 3% (from transmission to blocking)



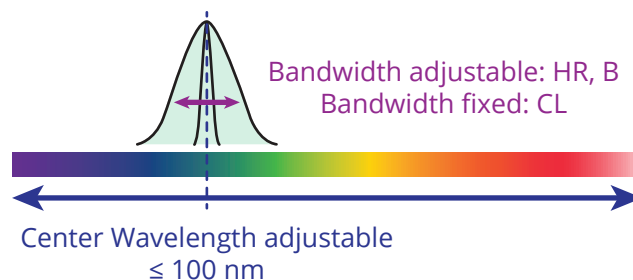
/ General Specifications

Dimensions: 40 mm x 76 mm x 40 mm (Medium)

32 mm x 57 mm x 32 mm (Small)

Aperture Size : up to 10 mm (Medium)

up to 5 mm (Small)



Product No. :
FWS - X - X - ###

Type

H : High Resolution
B : Basic
CL : CenterLine

Size

M : Medium
S : Small

Flexible Wavelength Selectors

Spectral Range	Product Number
358 - 400 nm	FWS-X-X-380
395 - 447 nm	FWS-X-X-425
447 - 501 nm	FWS-X-X-475
496 - 561 nm	FWS-X-X-530
555 - 628 nm	FWS-X-X-595
621 - 703 nm	FWS-X-X-665
700 - 790 nm	FWS-X-X-745
784 - 900 nm	FWS-X-X-845

Custom Wavelength Selectors

Custom performance in a cost-effective format that **ships in only 72 hours**



CWS-CL-M-A



CWS-B-M



CWS-CL-M

Ideal for

- Fluorescence microscopy – excitation and detection
- Machine vision – optimized illumination and detection
- Forensics – filter your light source or camera for maximum trace visibility
- Multi – spectral imaging-large uniform aperture

Key product advantages

- Custom bandpass performance
- Ships in 48 hours
- Customer defined bandwidth – FWHM from 1.5 nm–20 nm
- Customer defined center wavelength – from 350 nm to 900 nm
- Up to 80% in-band transmission efficiency
- High (10^6) out of band extinction
- Large (up to 10 mm diam.) circular aperture
- Compact rugged optomechanical package
- Optional mounts for simple integration

Based on our patented TwinFilm™ technology, Custom Wavelength Selectors are simple, rugged, optomechanical devices that are factory set to your exact specifications without the usual time and cost associated with obtaining custom bandpass filter performance. You specify the center wavelength and the bandpass (FWHM) and, in most cases, we prepare and ship these units within 72 hours of receiving your specifications-it really is that fast!

These Custom Wavelength Selectors are ideal for any imaging, microscopy, or illumination application that can benefit from bandpass performance which is optimally shaped, e.g., to match the emission profile of a new fluorophore, or to match the emission spectrum of a fluorochrome that is shifted slightly due to factors such as the particular excitation wavelength being used. They can also be used to produce monochromatic light from a collimated, broadband light source, such as the Mighty Light Beam from Spectrolight, for microscopy and other monochromatic illumination applications.

The traditional method of getting custom bandpass performance is to design and fabricate a thin film optic. While thin film custom optics can be a good solution for high volume OEMs, the lead time and cost involved make them impractical for single units, or even very small batches, or where delivery times need to be days rather than weeks or months. A mismatched filter can lead to cross-talk between detection channels, poor signal-to-noise and other data problems. Get the exact match you need in just days with Spectrolight's Custom Wavelength Selector.

Mighty Light

A compact source of low-noise white light with versatile output modules

The Mighty Light is a compact white light source that is ideal for microscopy, spectroscopy, machine vision, and spectral imaging applications. The Mighty Light integrates a tungsten halogen bulb and power supply with a control board that delivers uniquely low-noise output. A series of pre-aligned bolt-on accessories allow the broadband output to be coupled into a fiber or fiber bundle, homogenized and collimated, directly coupled into a microscope, or integrated with our unique Wavelength Selector devices to create a tunable, monochromatic beam.

/ Specifications

Type of Lamp: Tungsten-Halogen

Lamp Power Output: ~ 2 W

Power Stability: $\pm 0.5\%$

Bulb Lifetime: ~ 1000 hours

Color Temperature : 2900 K

Dimensions: 125 mm x 75 mm x 70 mm

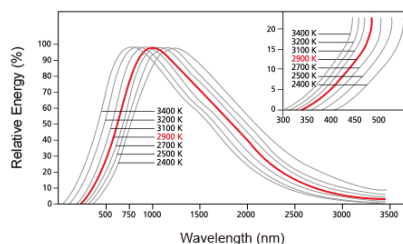
Electric Requirement : 100-240 V AC, 50-60 Hz

Power Supply : 9V DC at 2A

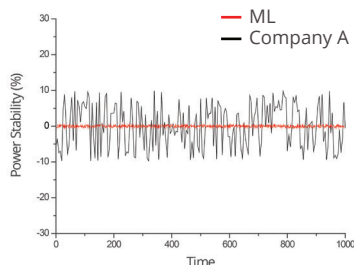


Mighty Light
ML

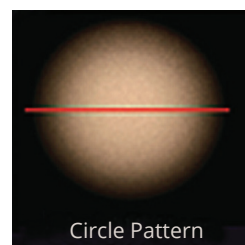
/ Main Features



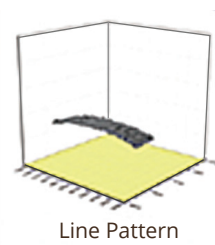
Broad continuous spectrum



Low noise output : ($\pm 0.5\%$)



Circle Pattern



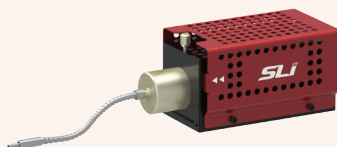
Line Pattern

Uniform intensity when collimated

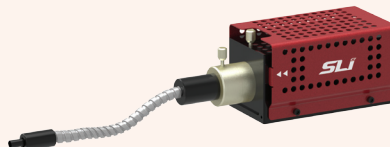
Accessories



Collimator
ML-CA



Fiber Adapter
ML-FA



Light Guide Adapter
ML-LGA



ML-Wavelength Selector

Mighty Light Plus

The Mighty Light Plus (MLP) is a broadband light source that provides 10X higher spatial brightness than competitive sources: delivering up to 7 watts of collimated output from a 10 mm diameter flexible light guide. Useful output spans 350 nm to >2500 nm and the low-noise output power is smoothly adjustable from 0 - 100 %. Applications include microscopy, white light interferometry, machine vision, and precision inspection.

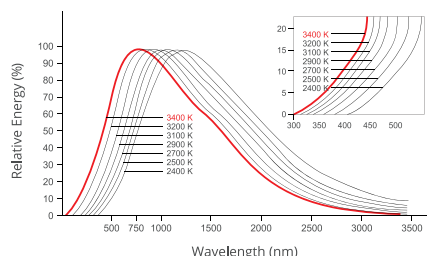
/ Specifications

Type of Lamp: Tungsten Halogen
Power Output: ~ 7 W (10 mm light guide)
Power Stability: +/- 0.5 %
Bulb Lifetime: ~500 hours
Color Temperature: 3400 K
Dimensions: 340 x 160 x 140 mm
Power control knob : 0 – 100 %
Power Supply : 24 V DC at 13 A

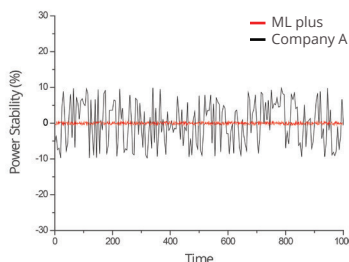


Mighty Light Plus
MLP

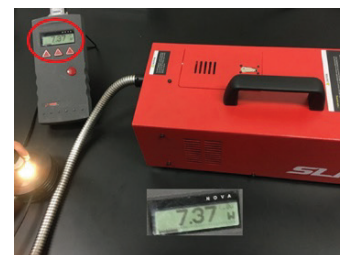
/ Main Features



Broad continuous spectrum



Low noise output : ($\pm 0.5\%$)



High output power

Accessories



Mighty Light Plus (MLP) with
Light Guide Collimator (LGA-CA-S)

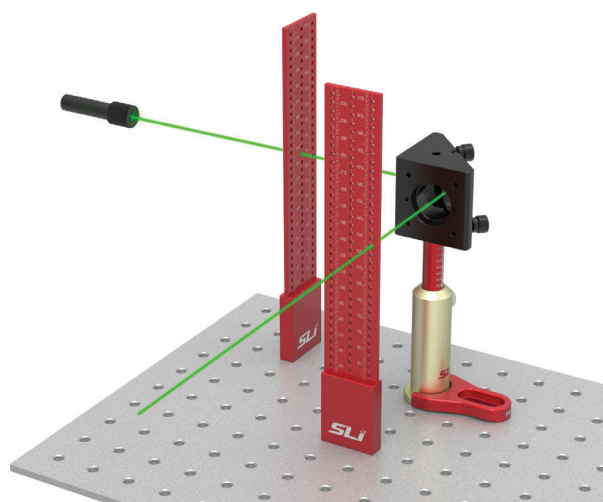
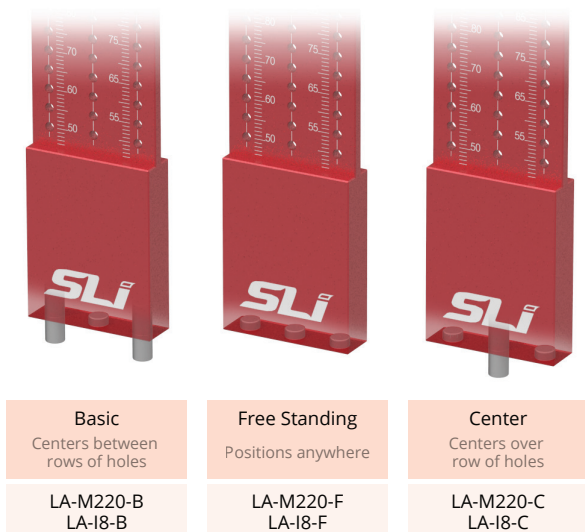


Mighty Light Plus (MLP) with Light Guide
Wavelength Selector Adaptor (LGA-WS-0).

Light Aligner

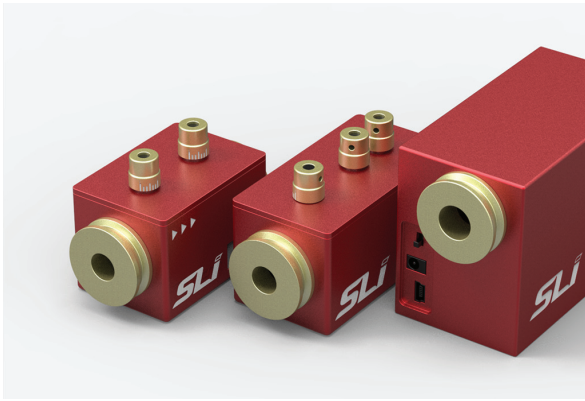
The Light Aligner is a unique and handy pocket tool that solves the common problem of aligning an opto-mechanical system on a breadboard or optical table. The Light Aligner is an anodized metal ruler that can be temporarily but accurately placed on any optical table, breadboard or metal surface. It is available either with or without registration pins in its magnetic base. This allows for either complete freedom in its placement, or precise registration of a beam either over or between the mounting hole pattern on a table or breadboard. Both metric and imperial (inch) versions are available. Optional extensions double the maximum height.

/ Features

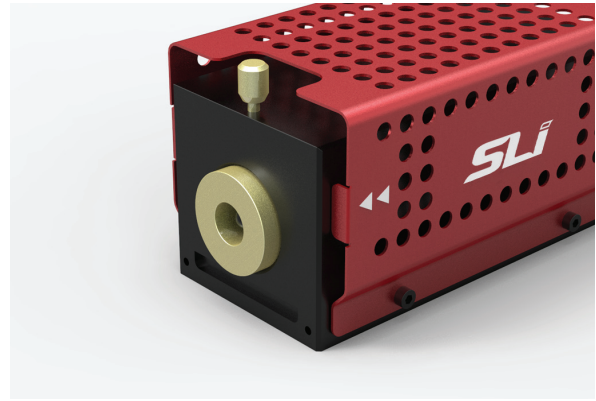


/ General Specifications

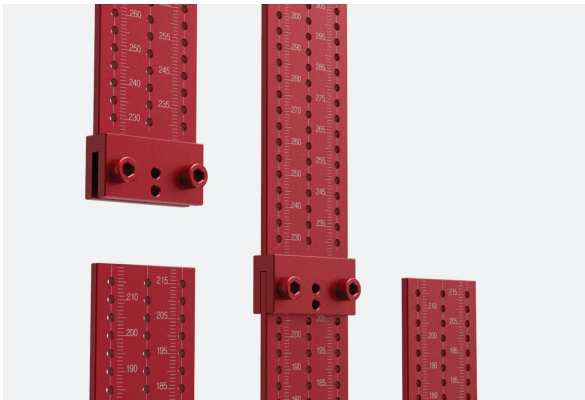
Type	Item Number	Detail
Basic	LA-I8-B	35 mm x 8.6 in. , \varnothing 2.5 mm / Two poles, magnetic base, Imperial markings
	LA-M220-B	35 mm x 220 mm , \varnothing 2.5 mm / Two poles, magnetic base, Metric markings
Center	LA-I8-C	35 mm x 8.6 in. , \varnothing 2.5 mm / One pole, magnetic base, Imperial markings
	LA-M220-C	35 mm x 220 mm , \varnothing 2.5 mm / One pole, magnetic base, Metric markings
Free	LA-I8-F	35 mm x 8.6 in. , \varnothing 2.5 mm / No pole, magnetic base, Imperial markings
	LA-M220-F	35 mm x 220 mm , \varnothing 2.5 mm / No pole, magnetic base, Metric markings
Extender	LA-I8-E	35 mm x 7.5 in. , \varnothing 2.5 mm / Extender, two screws, Imperial markings
	LA-M220-E	35 mm x 190 mm , \varnothing 2.5 mm / Extender, two screws, Metric markings



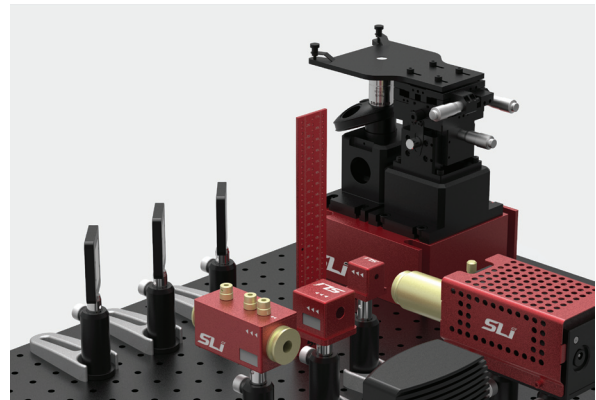
Wavelength Selectors



Light Sources



Optical Components



Systems

Spectrolight, Inc.	19800 MacArthur Blvd. Suite 300, Irvine, CA 92612 U.S.A. Website : www.spectrolightinc.com E-mail : info@spectrolightinc.com
Sales	Phone : (949) 800-7780 E-mail : sales@spectrolightinc.com
Technical Support	Phone : (949) 800-5117 E-mail : support@spectrolightinc.com
OEM Sales	Phone : (949) 800-7780 E-mail : sales@spectrolightinc.com