



SIGMA[®] LS

Laser Micromachining Subsystem

The SIGMA LS Laser Micromachining Subsystem is a femtosecond laser-integrated module designed for high-precision processing versatility. The small form factor and integration-ready design make SIGMA LS ideal for machine builders and system integrators, as well as contract manufacturers, job shops, and R&D laboratories.

SIGMA LS offers processing solutions for a broad range of femtosecond laser micromachining applications requiring optimal quality, minimal thermal effects, and high stability and dimensional accuracy – applications like precision milling, selective ablation, drilling, surface texturing, scribing, and marking.

With femtosecond laser options in IR or green wavelengths, multiple optical component combinations, and laser power levels up to 80 W, SIGMA LS can be designed with the optimal configuration for applications spanning the medical device, aerospace/defense, electronics, energy/battery, and automotive industries. All critical components are included to allow SIGMA LS to be integrated seamlessly into a production line machine or work cell, or to be used to support laser process prototyping and development.

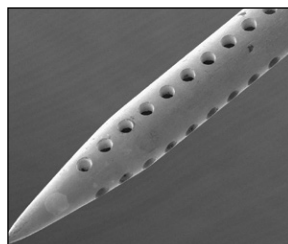
SUBSYSTEM INCLUDES

- Femtosecond laser
- Beam delivery optics
- Scan head
- Focus lens
- Camera
- Controller/software

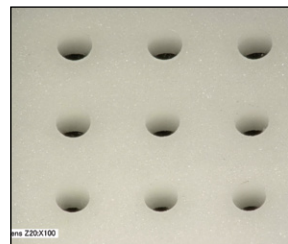
HIGHLIGHTS

- Ready-to-integrate subsystem with sensitive laser and optical components pre-installed
- Fully optimized laser process included
- Installation support and application training provided on-site
- Ideal for precision micromachining of metals, metal alloys, polymers, ceramics, and glasses
- Tooling and part handling guidance provided

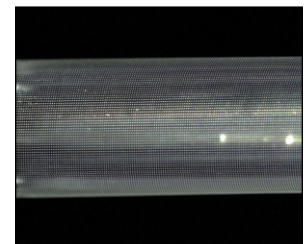
TYPICAL APPLICATIONS



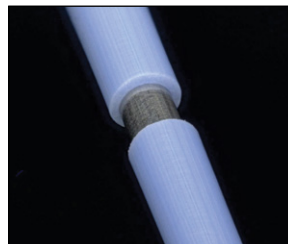
Hole drilling in stainless steel cannula



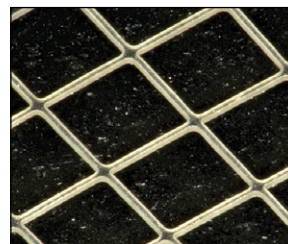
Hole drilling in ceramic microfluidics



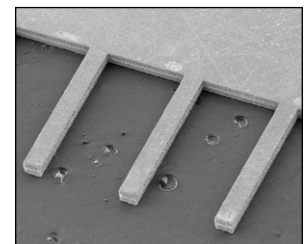
Texturing metals, polymers, ceramics



Selective polymer ablation on metal



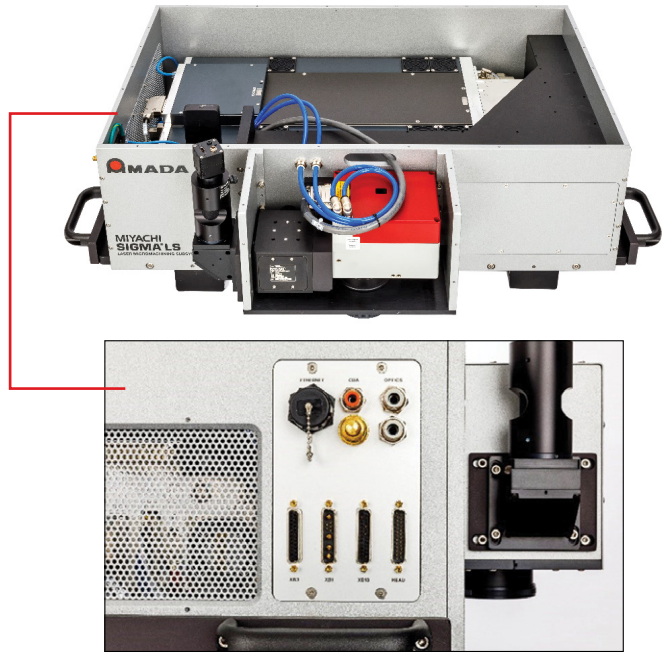
Micromachining polymer filter screen



Micromachining metal struts and filaments

KEY FEATURES AND COMPONENTS

- Femtosecond laser options from 5 W to 80 W
- IR or Green wavelength laser options
- Air-cooled or water-cooled laser options
- Easy-access utilities panel for communications with common industrial control systems
- Sensitive optical components contained in positive-pressure environment to prevent contamination
- Galvanometer scan head with multiple lens options for accurate, high-speed beam delivery
- Scanner and laser control software with GUI tailored to the application
- Optional fixed-optic focus head
- On-axis (through-the-lens) and off-axis vision options
- Rigid aluminum structure with protective sheet metal enclosure



Utilities panel for communications, cooling, and air-purge

TECHNICAL SPECIFICATIONS

Laser and Motion Parameter	Specification
Laser	Femtosecond laser options 5 W to 80 W; IR or Green wavelength
Focused Spot Size	< 10 μm achievable
Beam Delivery	Galvanometer 2D scan head options Fixed-optic focus head options
Tooling	Direction and concept testing provided upon request
Input Power	Laser + Scan Head: 100 - 110 VAC, 50/60 Hz, 12 A or 208 - 240 VAC, 50/60 Hz, 7 A Scan Controller: 85 - 240 VAC, 50/60 Hz, 2 A Chiller: (5 W and 6 W laser) – Air-cooled (no chiller) (20 W – 40 W laser) 110 - 110 VAC, 50/60 Hz, 10 A or 208 - 240 VAC, 50/60 Hz, 4 A (80 W laser) 100 - 115 VAC, 50/60 Hz, 11 A or 208 - 240 VAC, 50/60 Hz, 6.5 A
Communications	EtherNet/IP™, TCP/IP, RS-232, Direct I/O; configurable

Note: Input power, dimensions, weight, and communications protocols dependent on final system configuration.

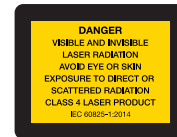
WEIGHT & DIMENSIONS

Model	Subsystem	Control Box (not shown)
Dimensions (D x W x H)	26.3 in (including scan head) x 37.5 in (with handles removed) x 14.1 in (including camera) (668.3 mm x 952.5 mm x 357.1 mm)	13.0 in x 19.0 in x 8.7 in (330.2 mm x 482.6 mm x 220.7 mm)
Weight	~ 255 lb (~116 kg)	~ 30 lb (~ 14 kg)



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