

LIGHTIGO

FireFly

Workhorse
for fast elemental analysis

What is FireFly?

FireFly is an analytical instrument for rapid multi-elemental analysis and chemical imaging. It utilises the Laser-Induced Breakdown Spectroscopy (LIBS) - one of today's most promising techniques of elemental analysis.

With FireFly, you can easily apply the key benefits of LIBS technology in your elemental analysis application.

Applications

LIBS is fast and flexible, sensitive to the most of the chemical elements with detection limits of 1-100 ppm. Potential applications are:

- Metallic, geology, plastic or biology materials
- Elemental imaging (mapping)
- Depth profiling of multiplayer materials
- Toxic / heavy metals detection
- Markers and nanoparticles detection



Equipment

- Motorised 3-axis stage, resolution: <math><1 \mu\text{m}</math>
- Microscopy sample view
- Motorised laser spot size changing
- Gas purge and extraction
- Up to 100 Hz repetition rate

Geology



Biology



Plastics



Metals



Specification

Standard configuration of the FireFly system are listed below. Key components are configurable to get either a basic system for educational purposes or the advanced fast chemical imaging LIBS system. Modifications based on customer needs upon request.

Sample	Sample size	Max 100 × 100 × 50 mm (irregular shape allowed)
	Sample holders	For general use: Universal clamp holder For standard pellets: 12 × 12 mm 2 × 30 mm 1 × 50 mm
Motorised Stage	Travel (X × Y × Z)	100 × 100 × 50 mm
	Resolution	0.08 μm (micro step) / 5 μm (full step)
	Speed	20 mm/s ¹⁾
Sample View	Primary camera	CMOS (max 55 fps), Field of View: 1.5 mm, for sample view
	Secondary camera	CMOS (max 55 fps), Field of View: 100 mm, for stage view
	Illumination	LED ring, 4-segment
Laser Focusing	Lens	Air-spaced achromatic doublet, focal length: 30 mm
	Spot size	Motorised in a range of 10–150 μm ²⁾
Laser	Type	Diode Pumped Nd:YAG, 1064 nm (optionally 532 or 266 nm)
	Pulse Energy	70 mJ (1064 nm), 35 mJ (532 nm), 12 mJ (266 nm) ²⁾
	Repetition rate	20–100 Hz ²⁾
Spectrometer and Detector	Single-channel	190–435 nm, resolution 0.15 nm, 50 Hz
	Multi-channel	200–900 nm ³⁾ , 2-6 channel, resolution 0.2 nm ³⁾ , 100 Hz
	Echelle	180–800 nm, resolution 0.1–0.45 nm, 50 Hz
Digital Pulse Generator	Channels	Up to 8 + 2, type: SMB
	Modes	Single Pulse, Continuous, External, Gated, Duty Cycle, etc.
	Parameters	10 ns resolution, 5 ns precision, output level 3.3/5 V
Gas Modules	Gas Purge	Continuous or Triggered purging
	Gas Extraction	Standard ISO-KF adaptor for connecting the external system
Dimensions and Weight	W × D × H	720 × 845 × 1474 mm
	Weight	300 Kg

¹⁾ Depending on set resolution ²⁾ Depending on a laser type ³⁾ Various spectral range and resolution available