LIGHTIGO

# FireFly

Workhorse
for fast elemental analysis




## What is FireFly?

FireFly is an analytical instrument for rapid **multi-elemental analysis** and **chemical imaging**.

FireFly utilises the Laser-Induced Breakdown Spectroscopy (LIBS) - one of today's most promising technique 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: <1 µm
- Microscopy view with objective turret
- Motorised laser spot size changing
- Motorised wavelength switching
- Gas purge and extraction
- Up to 100 Hz repetition rate

Geology



Biology



Plastics



Metals



# FireFly specification

Table contains a list of generally available system parameters. Individual values may differ depended on the particular configuration.

| | | |
|---|---|---|
| **Motorised Stage** | **Travel** | 100 × 100 × 70 (X × Y × Z) mm. |
| | **Parameters** | <1 µm micro step / 5 µm full step, speed up to 20 mm/s. |
| **Sample handling** | **Sample size** | Max 100 × 100 × 70 mm (irregular shape allowed). |
| | **Sample holders** | For general use: Universal clamp holder.<br>For standard pellets: 12 × 12 mm \| 2 × 30 mm \| 1 × 50 mm. |
| **Sample View** | **Sample view** | Plan Apo objectives on motoroized objective turret |
| | **Stage view** | Varifocal objective, Global shutter +Trigger-In. |
| **Laser Focusing** | **Objective** | Macro lens, long depth of focus, f = 75 mm, AR for 266/532/1064 nm.<br>Aspherical micro-focus lens, f = 20 mm, AR for 266/532/1064 nm. |
| | **Spot size** | Motorised in a range of ~ 20–150 µm. |
| **Laser** | **Type** | Diode-Pumped Solid State, 5 ns, up to 100 Hz |
| | **Wavelength** | 1064 nm (60 mJ) \| 532 nm (30 mJ) \| 266 nm (12 mJ) |
| | **Features** | Motorised wavelength switching and energy regulation. |
| **Detection** | **Spectrometers** | Czerny-Turner or Echelle; 180-1100 nm, resolution < 0.05 nm. |
| | **Detectors** | CCD/CMOS or intensified detectors, up to 100 Hz full frame,<br><10 ns gate width. |
| **Synchronisation** | **Output** | TTL output for synchronizing external devices, precision < 10 ns. |
| **Gas Modules** | **Gas Purge** | Continuous or triggered inert gas purging (gas input required). |
| | **Gas Extraction** | Active gas/dust extraction system with changeable filters. |
| **Accessories** | **Calibration lamp** | Hg-Ar line lamp (independent unit). |
| **Control** | **Hardware** | PC, LCD, keyboard, mouse. |
| | **Software** | Control software + Lightigo ImageLab SW<br>Interactive spectra / chemical map browser, user profiles, multispot / lin-escan / mapping modes, measurement guides, elements database: NIST + LIBS, chemometrics, etc. |
| **Technical Data** | **Mains Supply** | 110-240V 50/60Hz 10A. |
| | **Protection** | Interlock system on doors, laser filters on windows. |
| | **Working environment** | Indoor, 10-30 °C. |
| **Dimensions and Weight** | **W × D × H** | 720 × 940 × 1500 mm. |
| | **Weight** | 300 kg. |

LIGHTIGO
LIGHT UP YOUR RESEARCH

**Lightigo s.r.o**
Producer of the analytical instruments based on the Laser-Induced Breakdown Spectroscopy

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