



# iForenLIBS

## The ultimate tool for field GSR detection and shooting distance determination

### The LIBS technique

Laser Induced Breakdown Spectroscopy (LIBS) is a rapid chemical analysis technology that uses a short laser pulse to create a micro-plasma on the sample surface. This analytical technique offers many compelling advantages compared to other elemental analysis techniques.

- Direct analysis of all kind of materials in any status, either solid, liquid or gas.
- No sample preparation
- Immediate response
- Identification of all elements

### GSR detection

Gunshot residues (GSR) are particles produced when a firearm is shot. It is principally composed of burnt and unburnt particles from the explosive primer.

iForenLIBS can identify the chemical elements present in such particles (lead, antimony and barium). It provides an immediate and automatic response telling whether these elements are present or not on the surface analysed. iForenLIBS can perform a direct analysis in the field over clothes, skin, metals, plastic, walls or any other surface of interest.

### Shooting distance determination

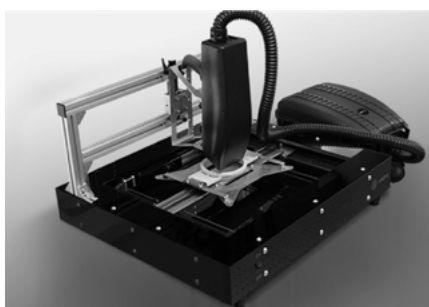
The distance from which a shot has been made can be of the highest relevance in a forensic investigation. The current techniques for its determination pose a high uncertainty and are subjective. iForenLIBS automatically scans the surface on which a shot was made and maps the relative concentrations. Artificial intelligence algorithms automatically provide an estimation of the shooting distance which is both reliable and repeatable.



### Field use

iForenLIBS is built in a ruggedized backpack which can be worn in the field. Thus, GSR on the clothes or skins of suspects, or metal residues from the bullet (Cu, Ni, Zn, Al, Ti, Sn) in intermediate impacts can be identified directly in the field with immediate results.

iForenlibs endow the ocular inspection staff with eyes in the field, allowing a more efficient search for evidences. It results in a lower number and higher relevance of the evidences sent to the laboratory.



### Desktop use

iForenLIBS can also be used as a desktop equipment. Placing its head on the platform the analysis becomes automatic. The platform can be used not only for the shooting distance determination, but for automating the analysis of any sample.

The user can configure the surface to inspect, the number of the laser shots and their frequency. iForenlibs will provide an estimation of the remaining time and do the work for you.



### LIBS for fools and for experts

iForenLIBS has been designed for its use by people with no experience in the technique. The user just needs to set what element he is looking for and the system will automatically provide a positive or negative result. However it is also possible to go deeper into the measurements and get more of it. The experienced user can see the spectra, and export them to text files for analysis with other tools. It is also possible to compare the spectra obtained in different measurements in order to determine whether two materials are the same. It is thus possible to use it for the determination of the origin of traces of paint or pieces of glass for instance.

#### iForenLIBS technical specifications

Laser	1064nm
Refrigeration	Air
Shooting rate	Up to 2Hz
Energy density	>6GW/cm <sup>3</sup>
Spectral range	230-970 nm.
Spectral resolution	0.08-0.2 nm.
Start up time	Less than 2 min.
Camera	5MP

#### Dimensions

Head	401 x 239 x 100 mm/3,7 Kg
Backpack	498 x 370 x 185 mm/12 Kg

#### Automatic platform technical specifications

Power	12 VDC
Communication	USB
Set up time	<15s
Maximum sample size	150 x 150 x 60 mm
Maximum sample weight	1kg
Precision	0.1 mm
Emergency stop	Yes
Height adjustable leveling feet	Yes

#### Dimensions

Body	87x 78 x 50 cm
Weight	8 kg

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