LIBS
Sci-Trace

Sci-Trace is a laboratory LIBS research setup consisting of an instrumentation cabinet and the LIBS Interaction Chamber mounted on an optical breadboard.

Cabinet provides space for multiple shelfs with LIBS instrumentation (laser head, spectrometers, power meters, calibration lamps, etc.) and rack-compatible components (control electronics, PC, laser PSU etc.).

Configurable spectroscopic system

Possibility of selecting desired combination of the interaction chamber, laser, detection system, specialized module and optomechanical accessories. Mutual compatibility guaranteed.

Designed by scientists for scientists

Designed to be opened and ready for various researcher `s extensions and experiments. Allows to fully concentrate on the LIBS method and its results rather than troubleshooting and system building.

Plug-in concept

Easy system expansion by the user, wide spectrum of modules: components of the interaction chamber, lasers, spectrometers, detectors, vacuum components etc. The user simply joins the new module into the setup and activates the corresponding software plug-in.

Capable and intuitive software

Integrated software for control of all the system elements, spectra capturing and spectra processing with still growing chemometric capabilities.

featuring
LIBS Interaction Chamber

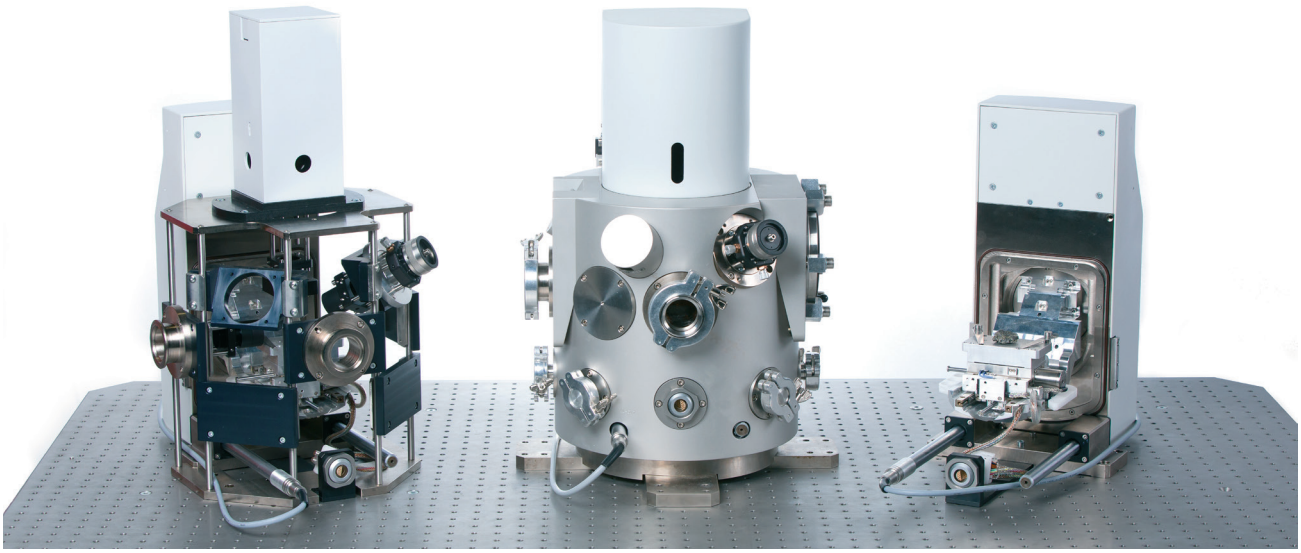
Sample area

Manipulator	**Motorized manipulator** *Movement range 60×80×45 mm, 2 µm resolution, High-Vacuum ready, including series of sample holders*
Interaction chamber	**Vacuum LIBS Interaction Chamber** *Airtight rigid body, 11 input ports aiming to a common center + 4 lateral input ports* [alt] **Open type - Cage chamber** *6 mounting ports aiming to a common center* [alt] **Manipulator stand**
Top optical breadboard	**Anodized Al-alloy board, M6 threaded holes, dimensions: 1304 × 829 × 8 mm** *Feedthroughs for cable management and laser beam delivery, USB connector panel, possible to mount corner rails for laser filter plates* [alt] Imperial threaded holes, magnetic steel board and different board dimensions upon request

LIBS instruments

[alt] *alternative configuration* [opt] *optional feature*

Pulsed laser	**Lamp-pumped (LPSS) Nd:YAG** *532nm, 200 mJ, 8 ns, 20 Hz, compact design* [alt] Diode-pumped Nd:YAG (DPSS) [opt] Double pulsed feature [opt] Other Nd:YAG wavelengths available (1064nm, 532 nm, 355nm, 266 nm) [opt] Up to 800 mJ at 1064 (FPSS, single-pulsed)
Spectrometer	**Echelle, 190-1100 nm** *Focal length 120 nm, f/4, resolving power up to 5000 λ/FWHM* [alt] Czerny-Turner, multiple gratings on turret, USB control, multiple output
Detector	**EMCCD, 180-1100 nm** *1004 x 1002 px, 20 Hz, min 10 µs exposuretime* [alt] iCCD detector, 1024 x 1024 px, 180-850 nm, USB [alt] Deep-UV CCD detector (Chamber mounted)
Digital Delay Generator	**4 output, 5 ns time resolution** [alt] 8 output, 5 ns time resolution
Accessories	Calibration lamp - continuous spectrum: Deuterium-Halogen Calibration lamp - line spectrum: Mercury-Argon Guiding laser, DPSS 532 nm, 4 mW Laser safety glasses, 35% visible light transmission, OD 7+ (190-534 nm), OD 6+ (925-1070 nm)

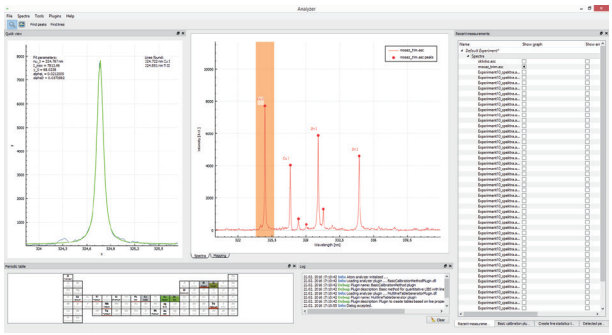


Extension modules

Pressure regulating system (PRS)	Setting the pressure in the chamber in the range 1-1300 mbar (a), Ar, He, CO_2, etc
Gas jet and exhaust module	Cleaning the sample, creating local atmosphere of inert gas, pulse mode
Deep-UV CCD detector module	Chamber port-mounted for detecting the emission lines in the region bellow 200 nm
Motorized defocusing module	Chamber internal module for defocusing the laser beam by moving the focusing lens
Plasma imaging module	Chamber port-mounted module with triggered CMOS camera (global shutter)
Magnetic field module	Chamber internal module for confining the plasma in the magnetic field
Liquid LIBS module	Chamber internal module for analyzing the liquids
Laser power meter module	Realtime recording the laser energy value
Laser attenuator module	Controling the laser energy while keeping the laser to operate at its most stable output power

Software capabilities

Manipulator movement
Sample view, laser autofocus
Chemical mapping, depth profiling
Control of connected LIBS instruments (lasers, detectors, DDGs, etc.)
Spectra capturing and manipulation
Identification of emission lines and chemical elements
Database of elements (spectra captured by LIBS)
Calculations of plasma parameters (temperature, electron density)
Creation of calibration curves



Instrumentation cabinet

Internal shelf system for LIBS instruments	**2 anodized Al-alloy shelfs, M6 threaded holes** *for mounting the laser head / spektroscope / optomechanics* [alt] Other number of shelfs upon request
Internal rack system for control electronics	**19-inches rack, height 16U** *Installed control electronics, control PC, laser PSU, DDG, PSR*
Safety elements	Interlock system on chamber door and cabinet door Laser beam hidden in tubes
I/O panel	**2x HDMI (dual monitor support), LAN, GAS inlet, Gas outlet, Vacuum pump output, Mains**
Control panel	**Emergency STOP, key ON/OFF, electronics ON/OFF, PC ON/OFF, USB**
Housing and construction	Al profile frame covered by steel plates Cooling fans, noise dumpening materials 4 doors: 2 for rack systam, 2 for shelf system 4 wheels with rectractable stands
Dimensions & Weight	1314 × 851 × 1471 mm, 330 kg (in the default configuration)
Power requirements	~230 V, 50 Hz, 16 A