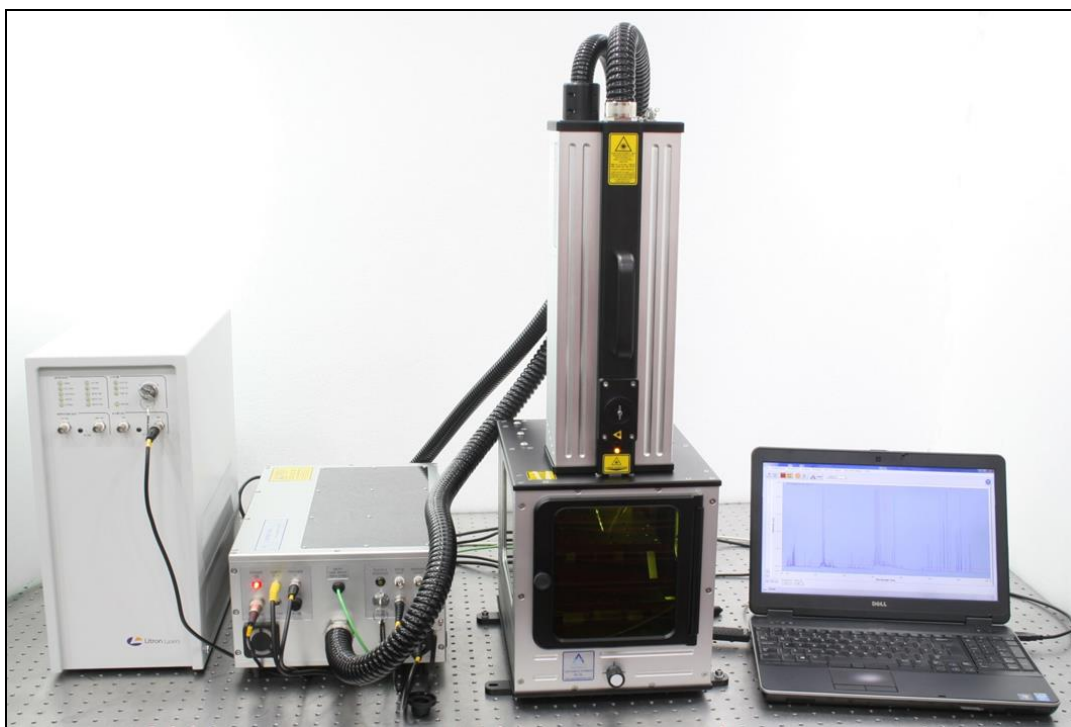


Laser-Induced Breakdown Spectroscopy (LIBS)

LIBSCAN Modular LIBS System Versatile, adaptable, upgradeable – for laboratory and field use



The LIBSCAN 150-10 is a modular design LIBS system which offers a highly versatile, adaptable and upgradeable product suitable for use either in a laboratory environment or in the field. The modular design is also particularly well-suited to research and development work and hence LIBSCAN 150-10 will be of value to organisations who wish to conduct their own LIBS R&D program and who may wish, for example, to integrate LIBSCAN 150-10 with an industrial process control application. LIBSCAN 150-10 is available with either six or eight plasma light collection channels and so therefore may be used with up to eight individual spectrometers. Various types of modular sample chamber are available for LIBSCAN 150-10 including ones equipped with computer-controlled, multi-axis sample stages.

Features

- Modular and versatile design, suitable for laboratory and field applications
- High efficiency plasma light collection optics (6-channel and 8-channel versions available)
- Laser: 150 mJ 1064 nm laser @ 10 Hz (or 120 mJ @ 20 Hz)
- Compatible with our range of modular sample chambers
- May be used without a sample chamber in Class 4 “open beam” mode
- LIBSCAN 150-10 head may be operated in any orientation
- Gas purge feature (for connection to external inert gas supply – argon, nitrogen, helium, air)
- Optional Imaging Kit (IMG-HR) – allows close-up colour high resolution (2.5 MP) images of the sample surface to be viewed on a monitor
- Up to eight spectrometer modules may be installed (approx. 182 – 1016 nm)
- LIBSoft™ data acquisition and control software with free upgrades for 2 years
- Requires a separate laptop or other suitable computer (contact us for minimum specification information)

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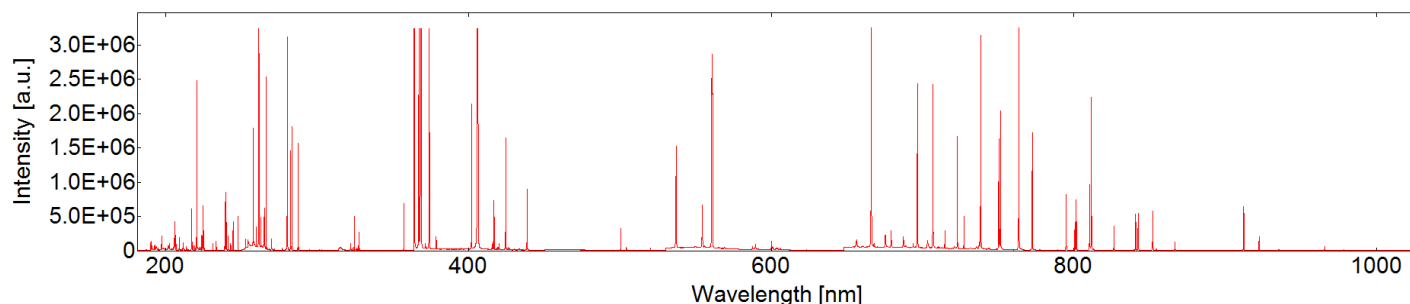
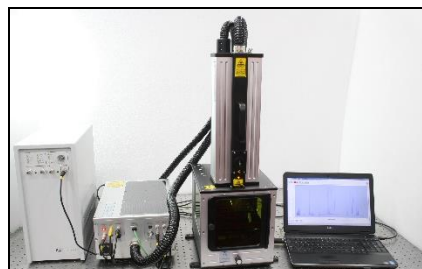
General Specifications

Technology:	Laser-Induced Breakdown Spectroscopy
Laser source:	Q-switched Nd:YAG operating at 1064 nm
Laser pulse energy:	Up to 150 mJ (LIBSCAN 150-10) or 120 mJ (LIBSCAN 120-20) user adjustable
Laser pulse duration:	4 – 8 nanoseconds
Laser PRF:	Up to 10 Hz (LIBSCAN 150-10) or up to 20 Hz (LIBSCAN 120-20) user adjustable
Optical spectrograph:	Up to eight spectrometer channels may be installed. Spectrometer channel 1: 182 nm – 254 nm, DUV detector coating, FWHM = approx. 0.04 nm Spectrometer channel 2: 252 nm – 312 nm, DUV detector coating, FWHM = approx. 0.04 nm Spectrometer channel 3: 311 nm – 361 nm, DUV detector coating, FWHM = approx. 0.05 nm Spectrometer channel 4: 360 nm – 454 nm, FWHM = approx. 0.07 nm Spectrometer channel 5: 453 nm – 530 nm, FWHM = approx. 0.09 nm Spectrometer channel 6: 529 nm – 648 nm, FWHM = approx. 0.09 nm Spectrometer channel 7: 647 nm – 853 nm, FWHM = approx. 0.14 nm Spectrometer channel 8: 852 nm – 1016 nm, FWHM = approx. 0.14 nm

Each spectrometer channel is equipped with a linear CMOS array detector of 4096 pixels. Spectrometers may be externally triggered (by Q-switch TTL pulse from laser power supply). Trigger jitter is 21 ns (typical). Delay time (with respect to laser Q-switch pulse) is 0.86 μ s – 1.0 ms, adjustable in 0.01 μ s increments via LIBSoft. Integration time is 9 μ s to 1.0 s, adjustable in 1 μ s increments via LIBSoft. Slit width 10 microns. 16 BIT, 6 MHz A/D converter. Spectrometer sensitivity is 218,000 counts/ μ W per ms integration time. Signal/Noise is 335:1. Stray light is 0.19% to 1.0% depending on grating. Specifications quoted by the manufacturer Avantes BV www.avantes.com

Approx. dimensions:	LIBSCAN head: 565 L x 195 W x 175 H mm, weight: ~9 kg Spectrometer console (6-channel): 410 L x 280 W x 180 H mm, weight: ~10 kg Spectrometer console (8-channel): 480 L x 300 W x 180 H mm, weight: ~11 kg Laser power supply: 380 L x 200 W x 430 H mm, weight ~21.5 kg
Umbilical:	Approximately 1.7 m between LIBSCAN 150-10 head and instrument console
Sample interface:	Via use of modular sample chamber or via use of LIBSCAN head alone (i.e. "open beam" path to sample)
Sample chambers:	See our website for details of range of modular sample chambers
System software:	Data acquisition, processing and recording via user-friendly LIBSoft™ software
Data connectivity:	USB 3.0
Power requirements:	LPU 350: 100 – 240 VAC, 50-60 Hz, 850 VA Spectrometer console: 12 VDC (2.5A) via plug-in power supply
Product classification:	Class 1 laser product when used with any of our modular sample chambers

Example configurations



Example spectrum of high-purity lead with argon purge gas (50-shot accumulation, 10 μ s delay, 100 mJ laser pulse energy)