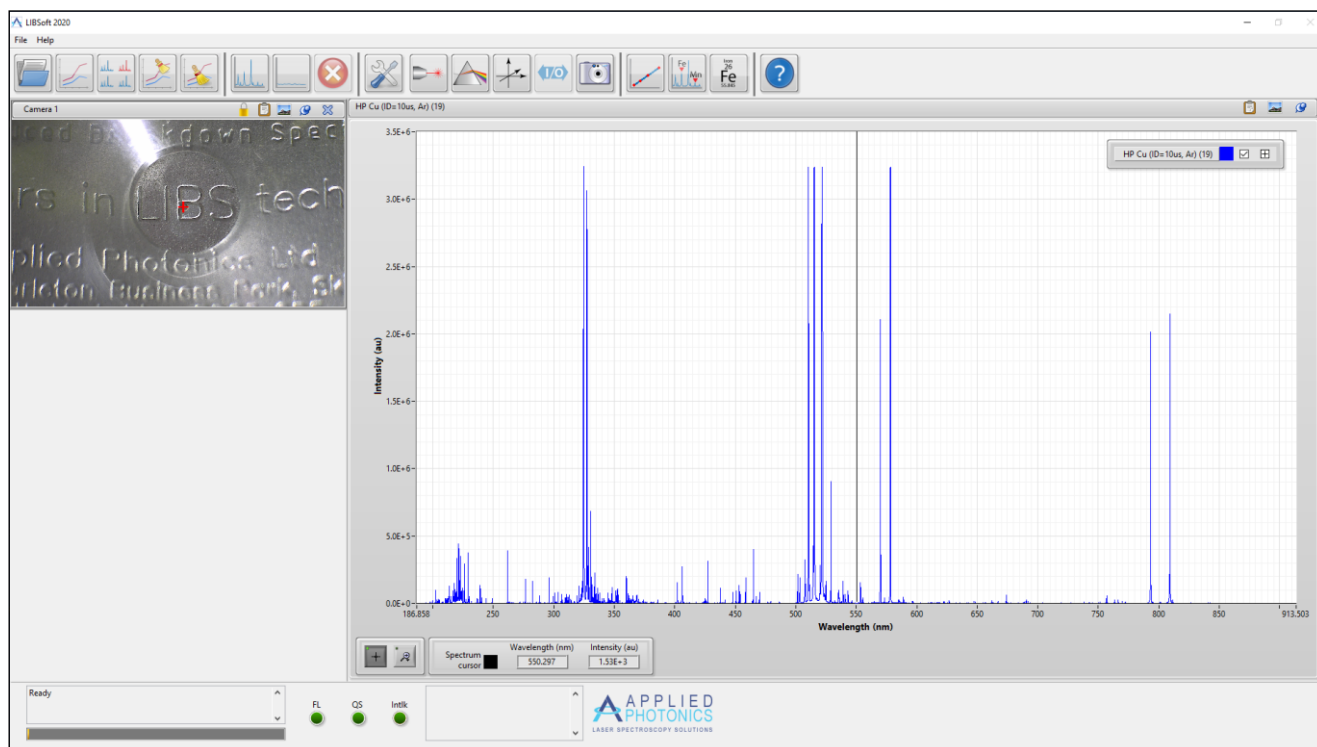


LIBS instrument configuration, control and analysis software

LIBSoft 2020 is an application developed to provide configuration and control of all functionality of Applied Photonics Limited's (APL's) range of modular LIBS instruments. The application has been updated as new hardware options – lasers, spectrometers, automated sample chambers, imaging kits, etc. – have been added to APL's LIBS products and can be configured to control different combinations of the LIBS hardware as specified by the user. Enhanced spectral analysis features have been added to the application providing a complete environment for both the acquisition and analysis of LIBS data.



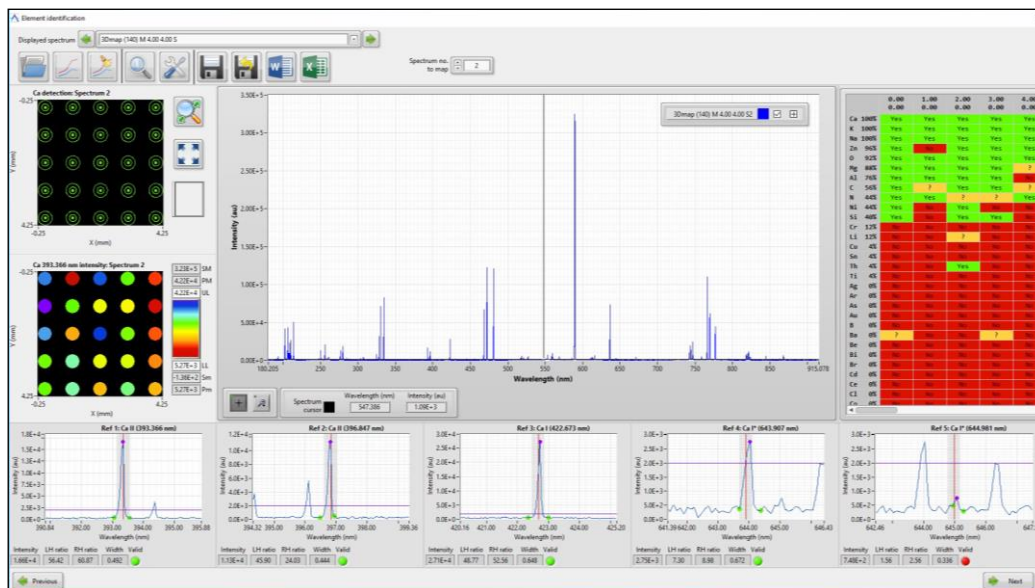
Two versions of *LIBSoft 2020* are available:

- ***LIBSoft 2020 Lite***: provides configuration and control of all system components and the acquisition, display and manipulation of both acquired and saved spectra
- ***LIBSoft 2020 Full***: includes all the features of *LIBSoft 2020 Lite* but adds enhanced spectrum analysis functionality including peak and element identification and the generation and application of quantitative calibrations

LIBSoft 2020 Full requires a USB key in order to activate and use these additional functions.

Features of *LIBSoft 2020 Lite*

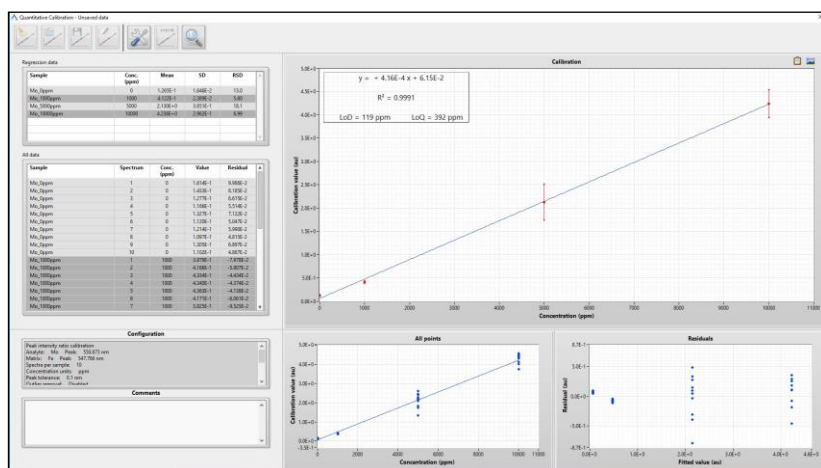
- Configuration and control of a range of lasers from manufacturers including Quantel and Litron
- Configuration and control of APL's SpectroModule-6 / -8 multi-channel LIBS spectrometers and Catalina Scientific EMU-65 high-resolution Echelle spectrometers
- Configuration and control of APL computer-controlled sample chambers with up to 3 axes of movement
- Integrated live video display of samples from APL imaging kits with up to two high-definition cameras
- Configuration and automated acquisition of spectra including the number of analysis locations and the required number of sample conditioning shots, accumulation shots and spectra to be acquired at each location
- Automated line and raster scans of the sample surface when used in conjunction with a computer-controlled sample chamber
- Display of acquired spectra including basic spectrum manipulation functions (comparison, zoom, wavelength/intensity measurements, copy to clipboard, save to image file, etc.)
- Saving of acquired spectra to simple text files for further analysis and manipulation either using *LIBSoft 2020 Full* or external applications such as Plasus SpecLine and Microsoft Excel



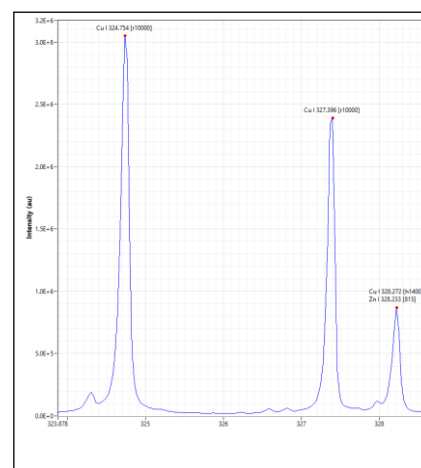
Element identification and mapping

Features of LIBSoft 2020 Full

- Spectral peak identification functionality using a built-in database derived from NIST atomic spectroscopy data
- Element identification functionality using a built-in database of spectral fingerprint data and algorithms developed by APL including:
 - Identification of the presence/absence of user-specified elements in a sample spectrum
 - Mapping of both the presence/absence of user-specified elements and the intensity of characteristic spectral peaks of those elements using spectra acquired from a scan of a sample
- Generation of quantitative calibration plots and the derivation of calibration equations, LoD and LoQ values, based on a range of calibration metrics, using spectra acquired from suitable matrix-matched samples
- Application of quantitative calibrations to spectra from unknown samples to derive analyte concentrations
- Application of peak and element identification and quantitative calibration functions to both saved spectra and online as spectra are acquired



Quantitative calibration



Peak identification

The **LIBSoft 2020** application can be installed and run on virtually any suitable computer running under Microsoft Windows. A monitor resolution of 1920 x 1080 is required to ensure accurate display of all application screens. An Intel i5 or i7 processor (or equivalent) and a minimum of 4GB of memory is recommended.

The required hardware interfaces depend on the specific components included in the modular LIBS instrument and include USB, serial and ethernet. The majority of components connect to the LIBS instrument computer via USB and a reasonable number of USB 3 ports is therefore recommended. LIBS instruments incorporating a Catalina Scientific EMU spectrometer require the installation of a proprietary interface card in the system computer and additional memory is recommended. APL can provide advice on the specification of PC required for a particular LIBS instrument configuration and can also provide a suitable computer with all required hardware and software pre-installed and tested (highly recommended).

A series of videos demonstrating the installation and use of LIBSoft 2020 can be found on our web site.

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Specifications subject to change without notice

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