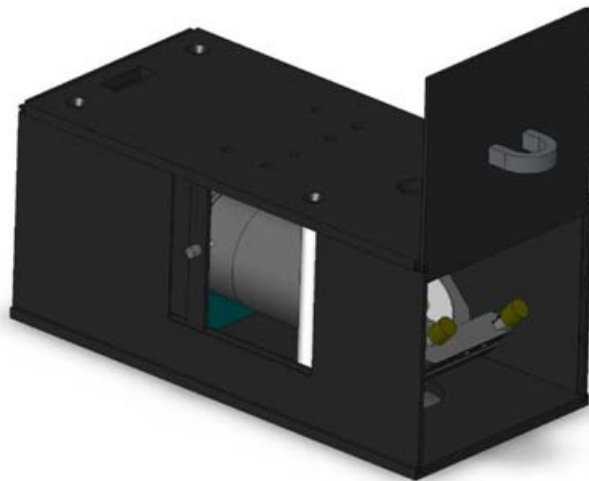


LIBS Imaging Module Installation and Operation Instructions

Description

The Ocean Optics LIBS Imaging Module consists of a PixeLINK™ Megapixel FireWire Camera (black and white or color) in a box mounted in between the LIBS laser and the LIBS Sample Chamber (LIBS-SC) as they are stacked on top of each other. This product is designed to enable you to precisely adjust the laser to focus on the exact spot on the sample that you wish to analyze. The LIBS Imaging Module also comes with PixeLINK software for the camera to capture high quality images on your PC. The camera is connected to the PC by a single FireWire interface and all camera functions are controlled by the PixeLINK software. The LIBS Imaging Module was designed to work only with the LIBS Sample Chamber (LIBS-SC).

Laser-induced Breakdown Spectroscopy (LIBS) is a laser spark analytical technique used to determine the elemental composition of various solids, liquids and gases. A high-power laser pulse is focused on to a sample to create a plasma or laser spark. The atoms and ions in the plasma emit light energy that is collected by a lens or fiber optic cable and analyzed by a time-gated spectrometer. The atomic spectral lines can be used to determine elemental composition (and concentrations in some systems). One of the benefits is that little or no sample preparation is required, making the technique field-portable. Additionally, the system needs only trace amounts of a sample to make measurements, so it's a practical tool for scanning applications. For more information about the Ocean Optics LIBS systems, visit our website at <http://www.oceanoptics.com>.



Parts Included

The Ocean Optics LIBS Imaging Module ships with the following items:

- LIBS Imaging Module with black and white camera (LIBS-IM) or LIBS Imaging Module with color camera (LIBS-IM-C)
- *LIBS and PixeLINK Software CD*
- 12 VDC power supply
- FireWire cable
- Also if purchased – FireWire PCI (LIBS-IM-PCI) or PCMCIA Card (LIBS-IM-PCIA)

Other Required Equipment

- Ocean Optics LIBS Sample Chamber (LIBS-SC)
- Laser – Users can supply their own laser for excitation or can purchase one through Ocean Optics. We recommend the ULTRA CFR Nd:YAG laser from Big Sky Laser Technologies (www.bigskylaser.com/compactseries.html).
- Personal Computer – See the PixeLINK documentation on the *LIBS and PixeLINK Software CD* for a list of PC hardware and software requirements
- Spectrometer system

System Requirements

- Microprocessor:
 - Minimum – 450 MHz Pentium® III or equivalent
 - Recommended – 1.5GHz Pentium® 4 or equivalent
- 128 MB system RAM
- 25 MB hard drive free space
- Video card with 24 or 32 bit True Color graphics
- 8 MB of video memory
- FireWire port or adapter card (available from Ocean Optics)

Installing the Software

► **Procedure**

To install OOILIBS and PixeLINK software,

1. Close all other applications running on the PC.
2. Start the software installation process.

Installing from CD:

- a. Insert the *LIBS and Pixelink Software* CD containing the OOIBase32. The CD interface automatically launches.
- b. Double-click on **A6XX SERIES CameraKit R3.2.exe** to install the appropriate drivers and software.
- c. Go to the FlashUpdate menu and double-click on the setup.exe file.

Installing from Web:

- a. Go to <http://www.oceanoptics.com/technical/softwaredownloads.asp>.
- b. Right-click on **PixelINK Software** and select **Save Target As...** to download the executable to your machine.
- c. Double-click on the downloaded file. The installation process begins.

Installing the Hardware

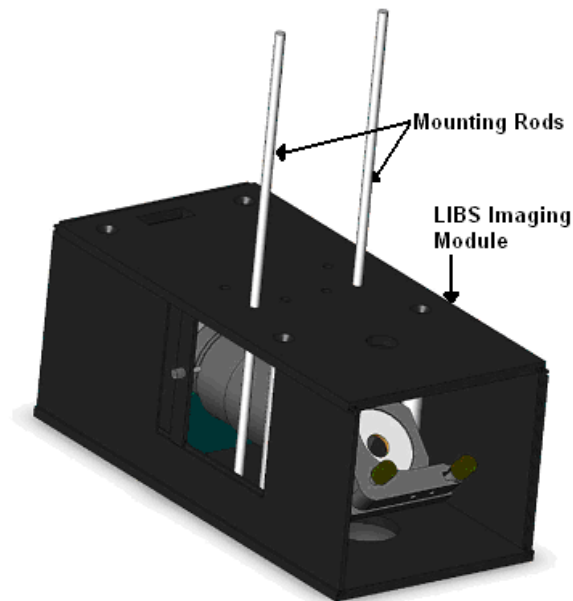
The LIBS Imaging Module sits on top of the LIBS-SC. The laser mounts to the top of the LIBS Imaging Module.

Attaching the LIBS Imaging Module to the LIBS Laser

► **Procedure**

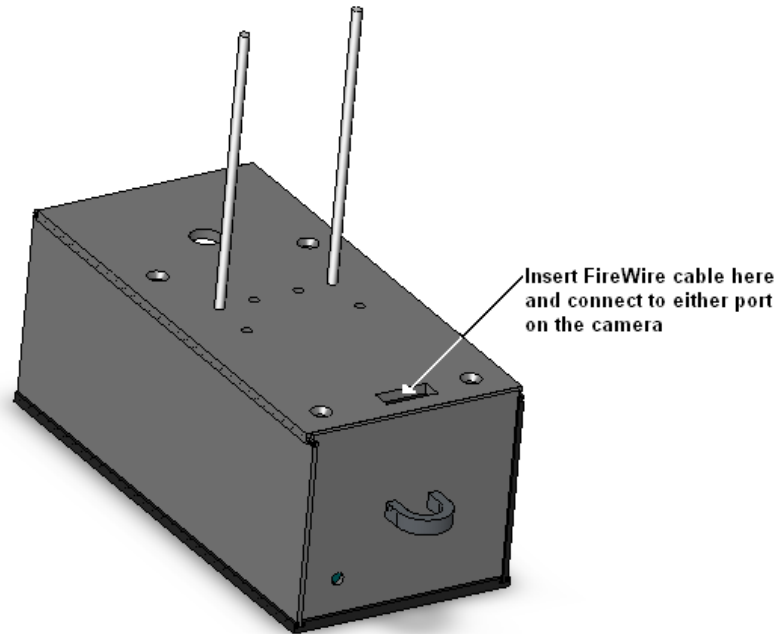
Follow the steps below to attach the LIBS Imaging Module to the bottom of the laser:

1. Insert the mounting rods into the holes in the top of the LIBS Imaging Module. These rods should pass completely through the LIBS Imaging Module and enter the corresponding holes in the LIBS Sample Chamber. This assures the alignment of the camera to the sample.

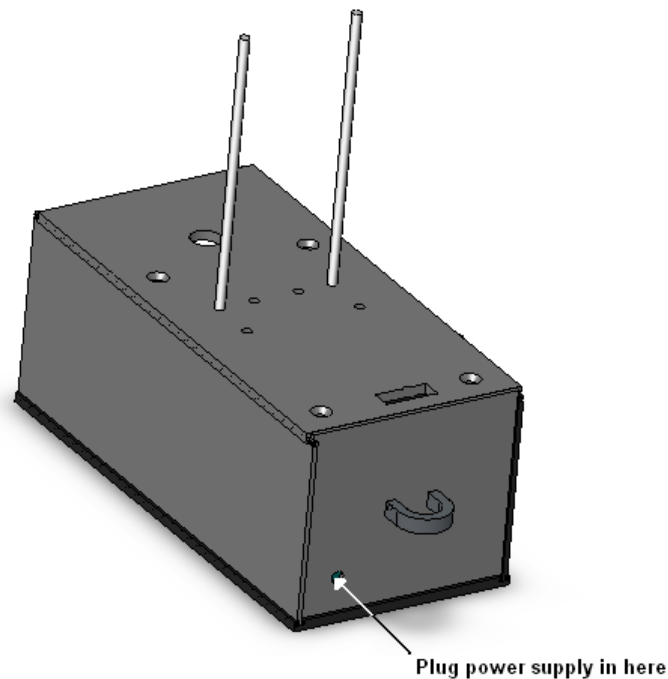


LIBS Imaging Module Installation and Operation Instructions

2. Insert one end of the FireWire cable through the hole in LIBS Imaging Module cover and plug it into either FireWire port on the PixeLINK camera. Plug the other end of the cable into the FireWire port on your PC.

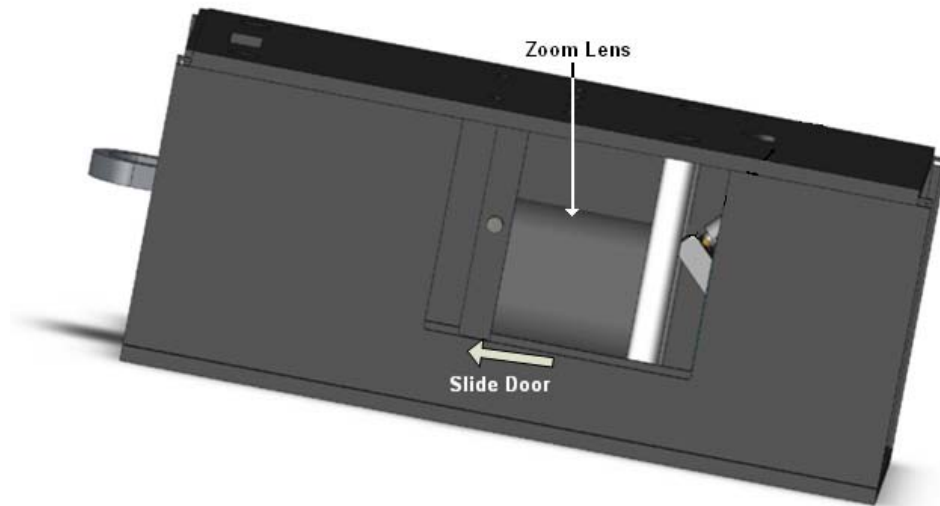


3. Plug in the 12 VDC power supply as shown below. There is no need to open the door of the LIBS Imaging Module.

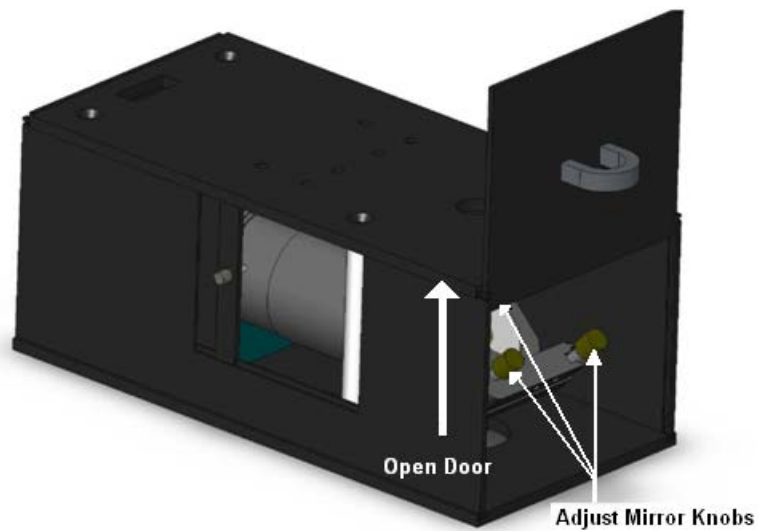


4. Insert the laser mounts onto the mounting rods on top of the LIBS Imaging Module and slide it into position.

5. Open the sliding door on the side of the imaging module to adjust the zoom lens. Completely extending the zoom lens offers the finest resolution.



6. Open the front door of the imaging module to adjust the mirror using its three knobs.



Operating the LIBS Imaging Module

► Procedure

1. Focus the image on the screen.
2. Fire the laser at the sample.
3. Adjust the mirror's three knobs after firing laser at target to ensure that the laser spot is in the center of the image.
4. Close the front door of the LIBS Imaging Module.
5. Fire the laser.
6. Start your experiments.

Specifications

Specifications	Criteria
Physical Dimensions	305 mm x 146 mm x 127 mm
Weight	3.68 kg
Power Consumption	250 mA at 12 VDC (supplied by PC FireWire card)
Sample Image Resolution:	
Black and white camera	40 microns
Color camera	60 microns
Operating Temperature	+5° to +60°C
Camera Specifications:	
Resolution	1280 x 1024 active pixels
Pixel Size	6.0 um x 6.0 um, square
Frame Rate	Up to 12.7 fps at 180 x 1024 resolution