Lucana Bead Help

About Lucana Bead

Lucana-Bead is an affordable device that can measure bead width, height, cross-sectional area, and distance to the edge of the glass. Lucana-Bead can perform measurements automatically without calibration, setup or programming.
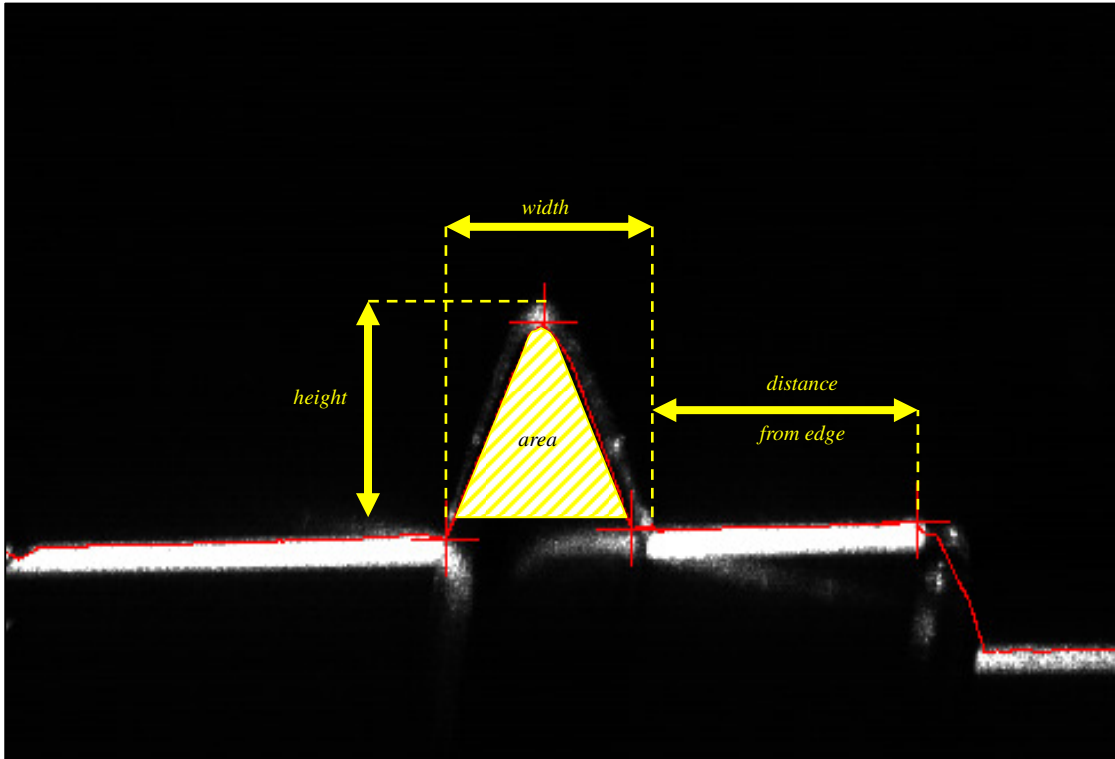
Camera Connection

Lucana hardware can be connected to a computer through a USB 2.0 port. The application will fail if Lucana is opened without a camera connected. This will cause an error message to be displayed. If the camera is disconnected while Lacuna is running, the program will pause and you will be notified. Operation will resume when communication is re-established.

Region of Interest

The Region of Interest (ROI) can be moved over the desired area of the image, resulting in more accurate measurements. To select a region, first select STOP, Lucana must ***not*** be in the live image capture mode. Move the ROI by pressing anywhere within the blue box and dragging it to the desired area. To resize the ROI, press the small box in the lower, right corner, and adjust to include the bead and class edge. Once you are in live image capture mode, the ROI will turn red indicating that you cannot alter the ROI until you stop the capture. For the most accurate measurements, align the laser with the horizontal green reference line displayed on the screen.

Note: The object of interest should be placed ***perpendicular*** to the laser.
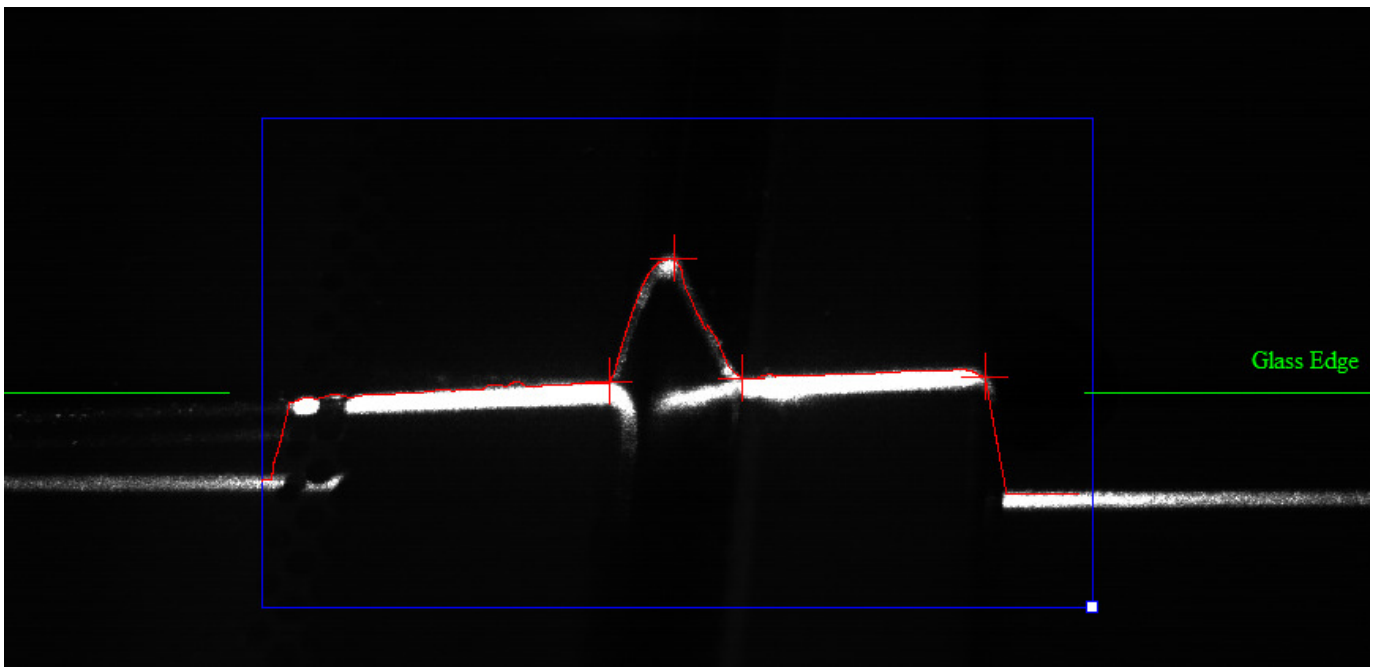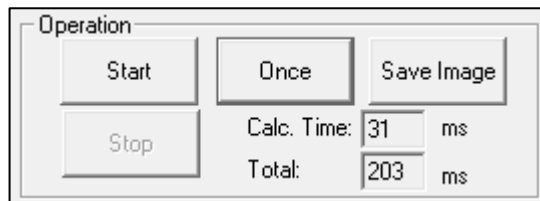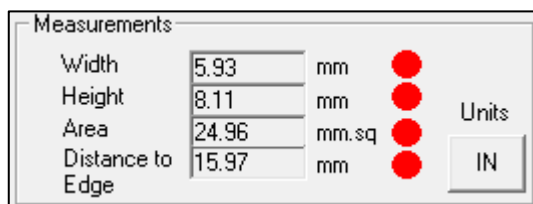
Camera Operation

There are two options to view the objects. The camera can be operated in a live feed mode by choosing the START button once the ROI is over the bead. While in live mode, a continuous image feed is displayed. The ROI box will turn red and red cross-hairs should appear indicating points of measure as shown under ROI section in this help document. Measurements of bead width, height, cross-sectional area, and distance from the edge are calculated and displayed in units of inches / millimeters.

A second option is to capture a single image using the ONCE button. Measurements are then calculated and displayed.

SAVE IMAGE saves the currently displayed image to a specified location.

```
┌─ Operation ──────────────────────────────┐
│                                           │
│   Start      Once      Save Image         │
│                                           │
│   Stop      Calc. Time: 31     ms         │
│             Total:      203    ms         │
│                                           │
└───────────────────────────────────────────┘
```

The measurements can be displayed in inches or millimeters and can be adjusted by selecting the button next to the measurement display. Once tolerances are set, an indicator displays whether the measurement are within specified tolerances (red: not within specified tolerances or green: within specified tolerances). If the ROI is not placed properly to cover a sufficient amount of the image, measurements cannot be made, cross-hairs will not appear and an error value of -1 will be displayed.

```
┌─ Measurements ───────────────────────────┐
│  Width          5.93      mm      ●       │
│  Height         8.11      mm      ●       │
│  Area           24.96     mm.sq   ●  Units│
│  Distance to    15.97     mm      ●   IN  │
│  Edge                                     │
└───────────────────────────────────────────┘
```

Exposure Control & Calculation Parameters

The exposure can be controlled by adjusting the slider to a desired time or manually entering a value in milliseconds. Changing the exposure until a clear image of the laser is observed will allow for better performance and more accurate readings. "Edge Strength", found under "Parameters", can be adjusted in conjunction with exposure control. It is important that the laser is not saturated. It is therefore typical for a lighter object to have lower exposure time and edge strength. An ideal image of the laser would result in the edges being a dull gray color as shown in previous images.
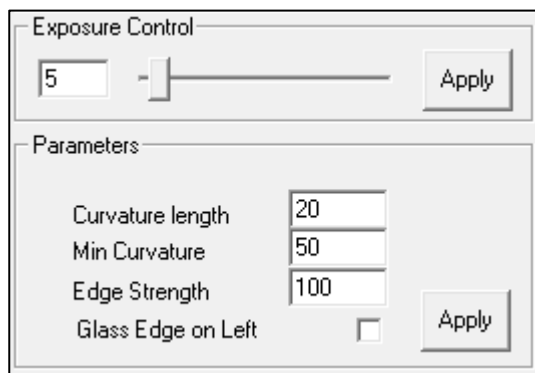
Initial values for "Curvature Length" and "Min Curvature", located under "Parameters", must be entered for Lucana Bead to make accurate measurements. Curvature Length values must be between 10 and 60 while Min Curvature must be between 10 and 100.
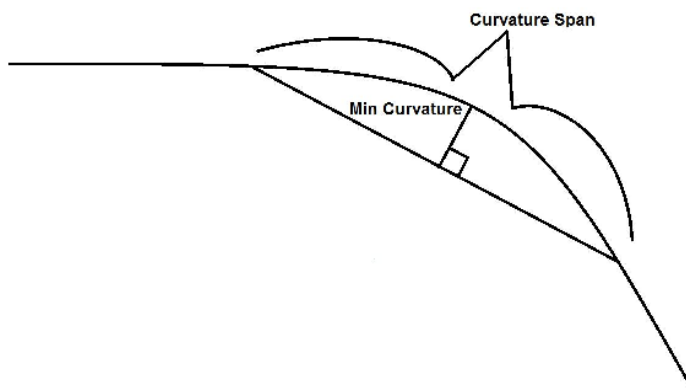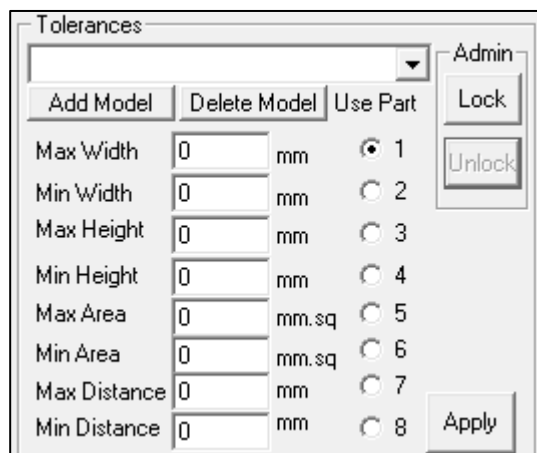
Tolerances

A range of acceptable values for bead width, height, cross-sectional area, and distance to the edge can be set by indicating the minimum and maximum values displayed in millimeters or inches. The drop-down menu enables you to choose the model you wish to work with. Once the desired model is selected, the tolerances can be set only when Lucana interface is **_unlocked_**. Depending on the radio button selected under "Use Part," different tolerances will be applied for different sections of the model (up to 8 sections are allowed). Once tolerances have been entered for a specified part number, you **_must_** press APPLY for new variables to be considered before entering in new tolerances for the next part. If a single image is being captured and tolerances are changed after the image has been taken, the ONCE button must be pushed again after the tolerances have been applied for them to take effect.

To add a new model, type in the model name in the drop down menu and select ADD MODEL.

To delete an existing model, select the model from the drop down menu and press DELETE MODEL.


Data Logging

To log the data to a text file, select from the drop down menu the part ID that you are examining. If the part is not there, you can add it by entering the part ID into the list and pushing ADD. After you have selected the part from the drop down menu, check the "Enable Logging" checkbox to record the data. Push STOP and uncheck the "Enable Logging" box when data logging is completed. The logs will be located in a folder in C:\beadlogs. The logs are organized by part ID and by date.

DELETE ENTRY deletes the last line of data that was logged for the part list selected.

The overlap, where two ends of the bead meet, must be visually inspected and given a pass or fail grade. If the overlap is of good quality, the user must manually press the PASS button, otherwise press FAIL next to "Log Overlap." This will add the text *"pass"* or *"fail"* to the log.

Data Logging (continued)

To delete a part, select the existing part from the list and press DELETE PART. Press OK on the confirmation.
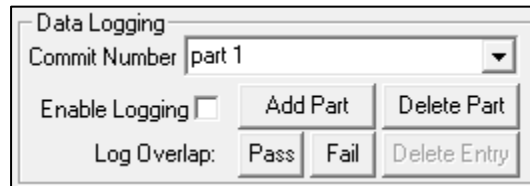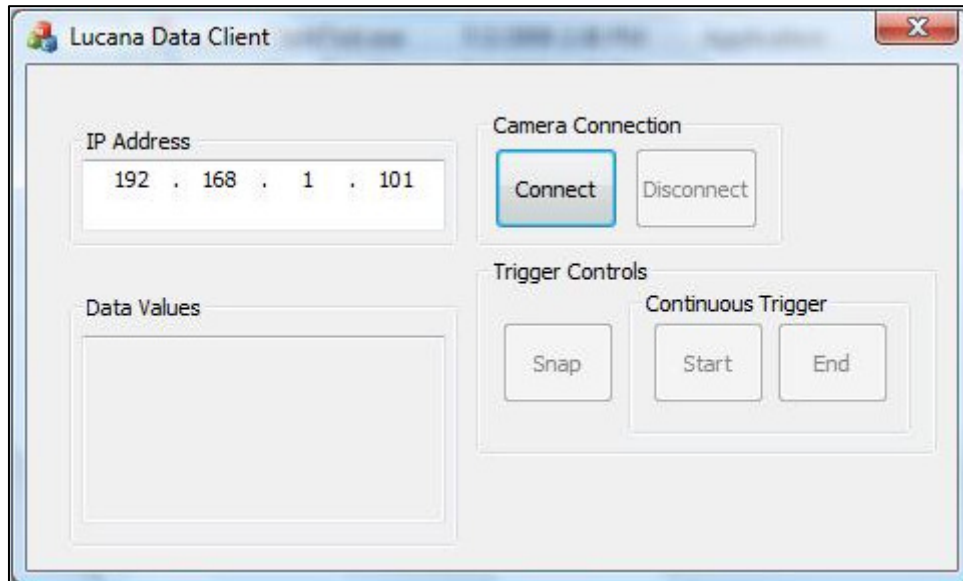

Transfer/Trigger

These options determine in what way the data is transferred between the computer running Lucana and the computer receiving data, as well as if a trigger will be used. Data can be transferred through UDP, TCP/IP, or through I/O console.
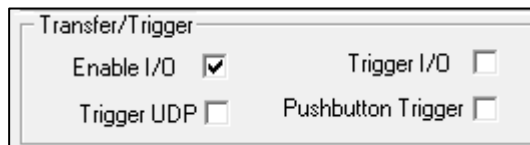
Transfer Client using UDP

To test the transfer of data through a UDP connection, Lucana Data Client is provided. After installing Lucana Data Client on the "communicating" computer (client computer), Lucana Data Client will communicate with the Lucana (host computer). To connect, enter the IP address for the computer which is running Lucana (the server computer). NOTE: To connect properly, make sure that Lucana is running. After you press START on Lucana GUI, press the CONNECT button on Lucana Data Client. This will establish the connection. SNAP will trigger Lucana by sending the string 't'. Once Lucana receives the trigger string, it will measure and send measurement data back to the client. START, in Continuous Trigger box, will cause to continuously trigger and receive data.

Transfer Client using UDP (continued)

Transfer Client using TCP/IP

To transfer data via TCP/IP connection, you must first set up a TCP/IP connection between the server and client computer. NOTE: Use port 9000 for connection. Press the "Trigger TCP/IP" check box before establishing a connection. After connecting, send "t" to the server. The configuration is network specific. Please advise your IT staff if you encounter any problems.

Using an I/O device

To use an I/O device, plug in the device so it is on the network. Change the IP address of the I/O device to 192.168.0.100. After the device is on the network, check the "Enable I/O" check box and press START. NOTE: Be sure to check the "Enable I/O" checkbox before pressing START.

Locking and Unlocking Lucana-Bead

Tolerances, Exposure Control, and Parameters ___cannot___ be changed when Lucana is in the "Locked" mode. The user can only start and stop the operation of Lucana and log data while in this mode.

To unlock Lucana, press the UNLOCK button under "Admin" next to "Tolerances." You will be prompted for an Administrator Password. Type in your password and select LOG ON. Lucana-Bead should now be unlocked and Tolerances, Exposure Control, and Parameters may be adjusted.