



Polyga Carbon Structured Light Scanner

HDI Carbon 3D Scanner

detailed instructions with pictures are in the cabinet with the scanning spray

About the Instrument

The Polyga Carbon Structured Light Scanner features two 3.0 megapixel cameras, allowing for an adjustable field of view to capture detailed photographs of an object to turn into a three-dimensional rendering that features texture, color, and more!

Equipment Components

- Carbon Fiber Mount with Projector
- 2 USB 3.0 Cameras and 2 lenses
- Tripod (three legs, one head)
- Calibration Boards (15mm, 25mm, 10 mm, 1mm (?))
- Calibration stand
- Cables:
 - Power cable
 - FlaxScan3D dongle
 - USB 3.0 cables
- Rotating table
- Allen key for camera calibration
- Software: FlexScan3D

Working with the Polyga Carbon Structured Light Scanner

Set Up

1. Assemble the Tripod and mount the scanner onto the Tripod
2. Attach Cameras to mounts and mounts to the scanner
3. Connect the HDMI and power cables to the projector
4. Connect the USB 3.0 cables to the cameras
5. Connect all cables to computer
6. Turn on the projector and the rotating table.
7. Align the projector so that it is at the proper height and distance from your scanning area.
8. Remove lens caps from cameras

Calibration

1. Position the scanner at an appropriate distance from a flat surface
2. Ensure that you are in a dark area with minimal light
3. Open FlexScan3D
4. Go to the Scanners tab, and hit “New”

- a. On the right side panel, change the pattern to “White”
 - b. Adjust the brightness accordingly
5. Place the desired calibration board on the calibration stand and onto the rotating table
 - a. Make sure to use the best size board for the objects you plan on scanning
 - b. Note that once you have calibrated the board, you will not move the projector or cameras; if you do, you will have to recalibrate
6. Connect each camera on the left-hand pop up tab
7. Adjust the angles of the cameras until the projected focus pattern is centered
 - a. Make sure to keep the camera calibration allen key in the hole on the side of the tripod: don't lose this!
8. Start by adjusting the focus and exposure on the individual cameras:
 - a. Hover over the camera field with your mouse to look closely at the calibration table
 - b. Using the larger dial on the camera, adjust it until the squares are in focus
 - c. Next, adjust the smaller dial until there is no red visible on the camera's screen
 - i. You may need to adjust the brightness of the camera itself slightly if the exposure is too high. You can do this under the “Advanced” tab on the right pop up with the sliding tool.
 - d. Repeat with the other camera
9. On the left hand tab, toggle “enable continuous capture” on and change the interval settings to between 5-10 seconds. This will allow you to simply rotate the stand between captures without having to keep clicking a button.
10. Hit “Start” and move the board slightly for each camera capture so that the cameras get various angles of calibration
 - a. After about 15-20 photos, hit “Stop” and the continuous capture will end
11. Hit “Calibrate”
 - a. If your calibration is over 65% successful, you are ready to begin scanning!
12. Toggle to the project tab at the top, and calibrate your rotary:
 - a. Toggle on rotary on the left-hand pop-up tab
 - b. Choose Calibrate (or whatever the button says)
 - c. The rotary table will automatically calibrate with the calibration board

Scanning

1. Remove the calibration board from the rotating table and place your object in the center of the table.
 - a. If your object is glass or has a shiny surface, spray it with the AESUB spray to coat it in a matte color prior to scanning
2. Choose the number of scans you want to take: I recommend at minimum 8, but likely more for larger or more textured objects
3. Hit “Scan” and watch the light scanner do its thing!



Adjustments

1. Once the scans are complete, now you need to adjust as necessary.
2. First, select all scans and click “Fine Align” at the top menu
 - a. The program will then try to align the images as best as it can
3. If you are dissatisfied, you can individually align each scan:
 - a. Lock the first scan by right clicking and clicking “lock”
 - b. Keep the second scan unlocked
 - c. Deselect all other scans
 - d. You can now manipulate the second scan to match with the first using the 3D movement tool
 - e. Once you are satisfied with the positioning, with both scans selected, click “Combine” on the top menu
4. Repeat the prior steps with each scan until you have merged them all into one
5. To remove exterior scanned stuff that is not relevant to your object, select the lasso tool from the small menu under the main menu (it is to the left of a circle tool)
 - a. Holding down CTRL, you can now lasso around anything you would like to delete and hit “delete” on the keyboard to remove it
 - b. For the inverse, after selecting, right click and hit “invert selection”
6. Once you are satisfied with your scan, save and export!