Polyga Carbon X Flexible Field of View 3D Scanners Instruction Manual

Contents

Polyga Carbon X Flexible Field of View 3D Scanners

Product Information: Carbon X 3D Scanner
The Carbon X 3D scanner system is a powerful scanning solution that allows users to capture high-quality 3D scans of objects. It comes with a range of accessories and features to ensure accurate and efficient scanning.

Package Contents

- Carbon X Scanner
- ScanBox
- Active USB Cable (A to B Cable) x2
- USB 3.0 Cable (A to Micro-B Cable) x2
- Camera Trigger Cable
- Mounting Rail x2
- Cameras x5
- M6 Allen Key Head Screws x4
- M6 Washers x2
- Allen Keys (M2.5 + M6)
- Tripod with Tripod Head
- DC Power Supply
- DC Power Supply Cord
- Power Extension Cable
- FlexScan 3D License Dongle
- Calibration Board: 5mm, 10mm, 15mm, 20+25mm
- Calibration Board Holder: Small, Large

Product Usage Instructions

Step 1: Assemble Scanner Box

1. Mount the Camera Rail onto the Scanner Body using the provided M6 screws, washers, and Allen Key found in the Hardware Kit.
2. Line up the threads and mount the Scanner Body assembly onto the Tripod Head and Tripod.
3. Slide the Cameras onto the Camera Rail and secure them by turning the Camera mounting brackets clockwise until snug, ensuring that the cameras are in symmetrical positions on the rail.

Step 2: Connect Power Cables

1. Connect the Camera Cables from the camera to the back of the ScanBox.
2. Connect the Camera Trigger Cables to the back of the Scanner Box, ensuring that the notches on the connectors are lined up.
3. Connect the DC Power supply to the back of the Scanner Box.
4. Press the power button. The LED will turn and stay blue once the scanner is booted up correctly.

Step 3: Download FlexScan3D

1. Plug in the USB license dongle that comes with the scanner system into your PC.
2. Log into your Polyga account page and download the latest version of FlexScan3D Software.
3. Connect the Active USB Cable from your PC to the back of the Scanner Box.
4. Note: Carbon X will not work with FlexScan3D Version 3.5.5.4 or older.

Step 4: Create New Project

1. Open FlexScan3D Software.
2. Go to the Scanners tab and click on "New".

3. Select the "Compact/Carbon" type from the dropdown menu.
4. Go to the Project tab and create a new project, giving it a name that you can remember.
5. Note: Leave Z-index Configuration (Depth of field) at default.

Step 5: Place Scanner
For the first time using the scanner:

- Place the object at the default calibration medium standoff distance of 700mm measured from the front of the rail.
- Ensure that the Cameras are in a symmetrical distance on the rail from each other.
- Change the projection pattern to focus on the Scanner window.
- If the red crosshairs are aligned with the projection center, it can be verified that the object is in perfect focus. If not, adjust the distance between the object and the scanner until they align.

Note: For different object sizes, camera positioning, and focus adjustments may be required, and a recalibration is needed whenever any adjustment is made.

Getting started with the Carbon X
Assemble and prepare the system. Take out parts from the travel case and double-check the contents with the packing list, making sure everything is present. This quick-start guide provides you with the resources to get started on the Carbon X 3D scanner system.

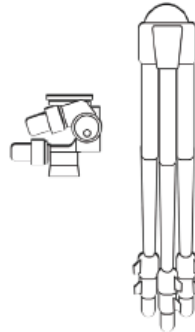**WHAT'S INCLUDED**

x 1
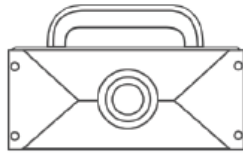
Carbon X Scanner
ScanBox

x 1

Mounting Rail with
Scanner Cameras

x 1

DC Power Supply
with Extension Cable

x 1

Tripod with Tripod Head

x 2

USB 3.0 Cable
(A to Micro B)

x 2

Camera Trigger Cable
(4 Prong Notched)

x 1

Active USB 3.0 Cable
(A to B Cable)

x 1

USB License Dongle

x 1

Hardware Set
(M2.5, M6)

CARBON X CONTENTS: INSIDE TRAVEL CASE

SCAN TO DOWNLOAD FLEXSCAN3D

FLEXSCAN3D

https://www.polyga.com/my-aooount/downloads/

DOWNLOAD

3D Scanner

- Carbon X Scanner ScanBox
- Active USB Cable (A to B Cable)
- x2 USB 3.0 (A to Micro-B Cable)
- x2 Camera Trigger Cable

Hardware

- Mounting Rail
- x2 Cameras
- x5 M6 Allen Key Head Screws
- x4 M6 Washers
- x2 Allen Keys (M2.5 + M6)
- Tripod with Tripod Head

Power Supply

- x1 DC Power Supply Cord
- x1 Power Extension Cable

Other Accessories

- FlexScan 3D License Dongle
- x4 Calibration Board: 5mm, 10mm, 15mm, 20+25mm x2 Calibration Board Holder: Small, Large

SCAN TO DOWNLOAD FLEXSCAN3D

https://www.polyga.com/my-account/downloads/

STEP 1: ASSEMBLE THE SCANNER BOX
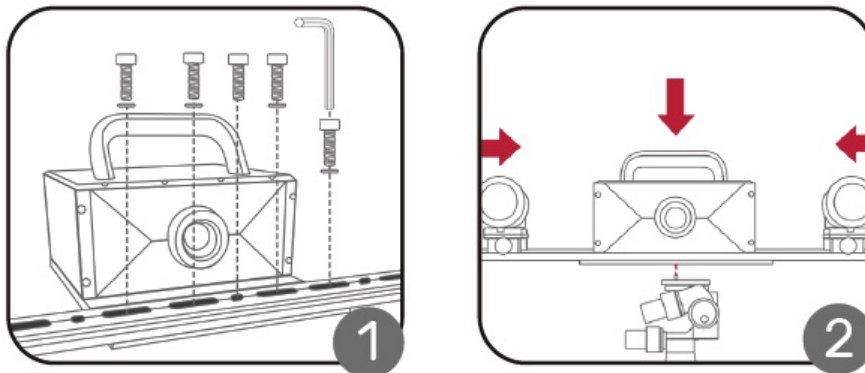
- Mount Camera Rail onto Scanner Body using x5 M6 screws, and x4 washers, with Allen Key found in Hardware Kit. Line up threads and mount Scanner Body assembly onto Tripod Head and Tripod.
- Slide x2 Cameras onto Camera Rail and secure them by turning the Camera mounting brackets clockwise until snug making sure cameras are in symmetrical positions on the rail.

STEP 2: CONNECT POWER CABLES
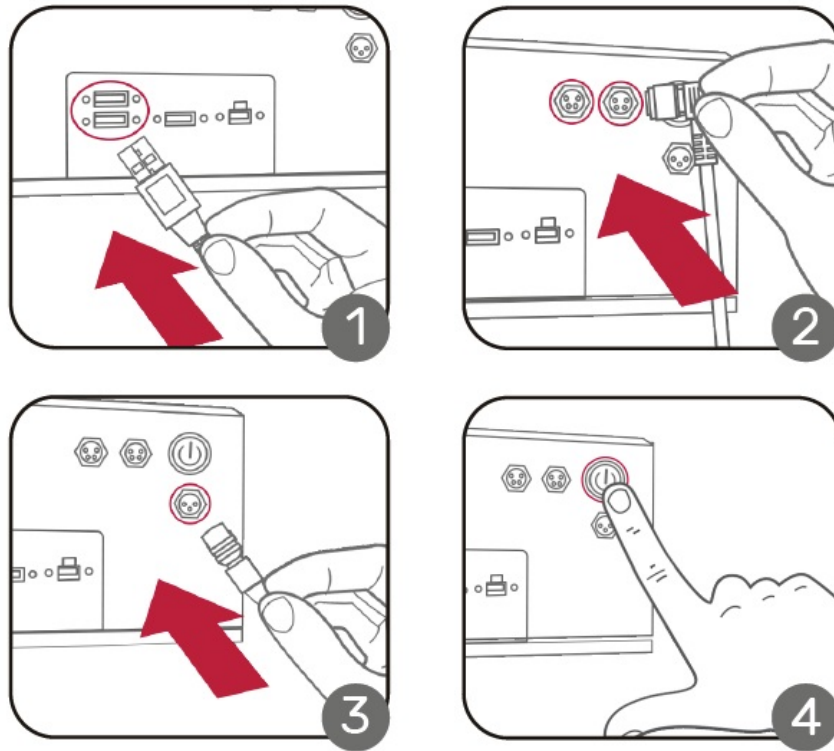
- Connect x2 Camera Cables from the Cameras to the back of the Scanbox.
- Connect Camera Trigger Cables to the back of the Scanner Box. Note: Make sure to line up notches on the connector.
- Connect the DC Power supply to the back of the Scanner Box.
- Press the power button. The LED will turn and stay blue once the scanner is booted up correctly.

## STEP 3: DOWNLOAD FLEXSCAN3D
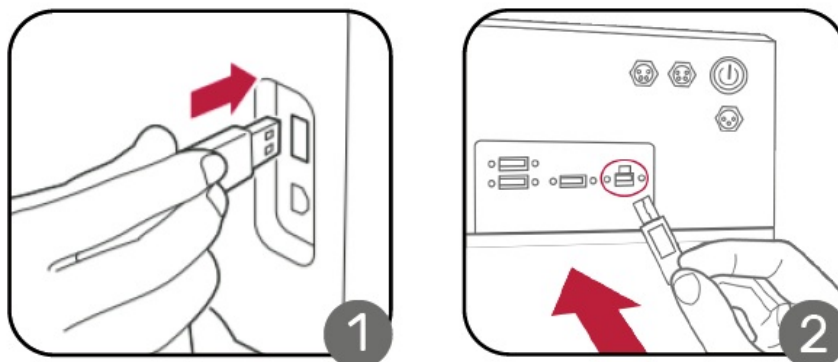
- Plug in the USB license dongle that comes with the scanner system into the PC. (Can be found in the travel case)
- Log into the Polyga account page and download the latest version of FlexScan3D Software.
- Connect the Active USB Cable from the PC to the back of the Scanner Box.
- Carbon X will not work with FlexScan3D Version 3.5.5.4 or older.

STEP 4: CREATE NEW PROJECT
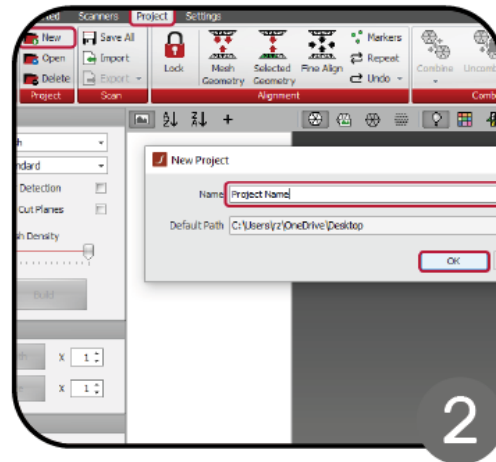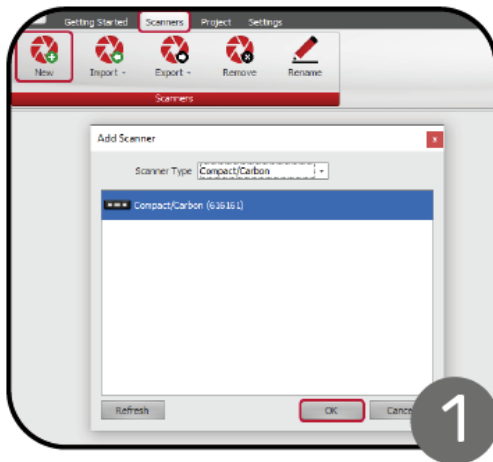
- Open FlexScan3D Software. Go to the Scanners tab. Click New. Select Compact/Carbon type from the dropdown menu.
- Go to the Project tab. Create a new project and name it something you can remember.
- Leave Z-index Configuration (Depth of field) at default.
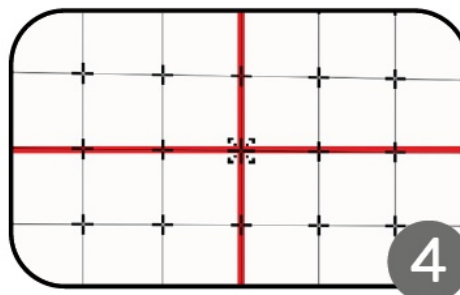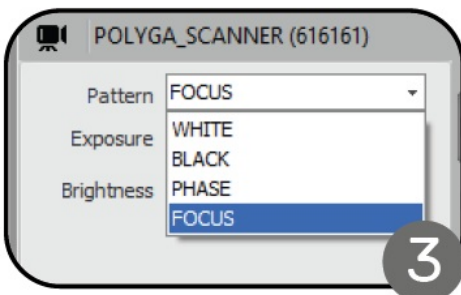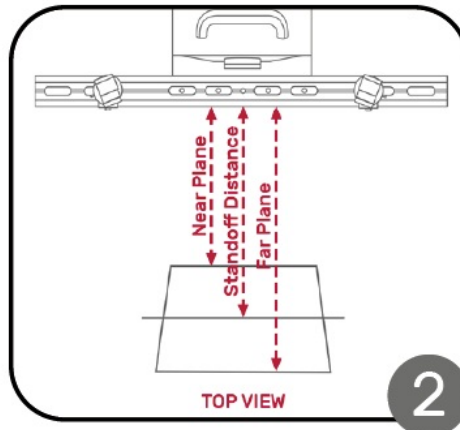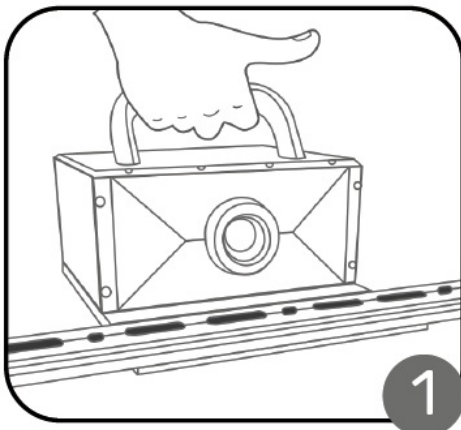
## STEP 5: PLACE SCANNER

For the first time using the scanner, place the object at the default calibration medium standoff distance of 700mm measured from the front of the rail. Cameras should always be at a symmetrical distance on rail from each other. Change the projection pattern to focus from the Scanner window. If the red crosshairs are aligned with the projection center, it can be verified that the object is in perfect focus. If not, move the object and scanner closer or farther apart to align them. For different object sizes, the camera positioning and focus need to be adjusted, and a recalibration is required whenever any adjustment is made. Carbon X is calibrated from the factory but Calibration is needed whenever cameras are moved. See Step 7 for the calibration steps.

STEP 6: TAKE SCANS
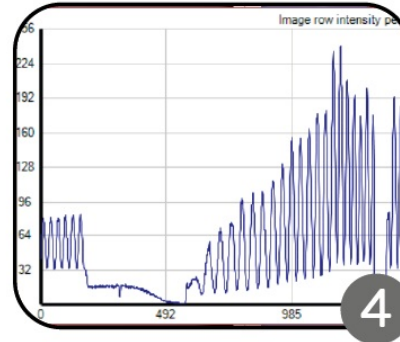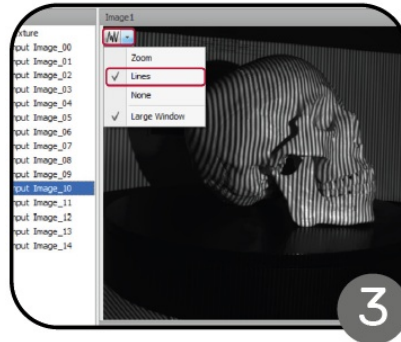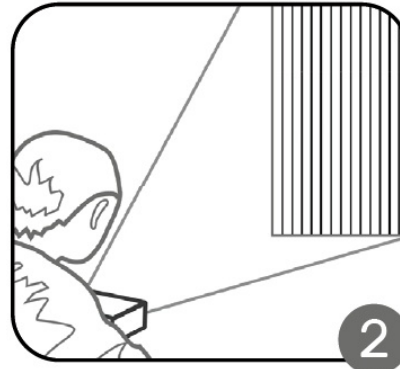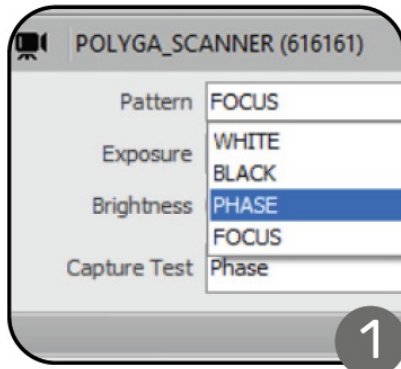
- Change projection pattern to phase. Make sure the object is not overexposed or underexposed in the live view.
- Take a test scan. Right-click on the scanned thumbnail -> View Images.
- Change the view mode from Zoom to Lines to access the intensity map. If the light intensity is saturating on some of the images, increase or decrease the exposure time/brightness accordingly.
- Repeat step 7 if a different object with different color or texture is being scanned, or the ambient lighting condition changed.

STEP 7A: CALIBRATION POSITION
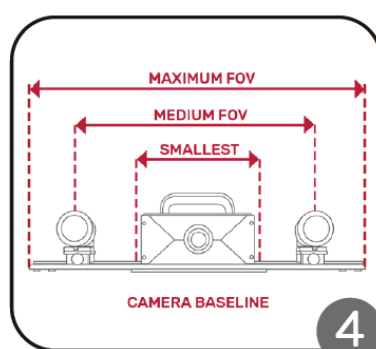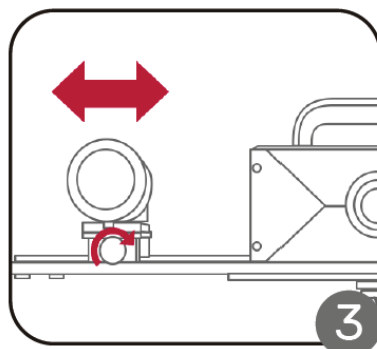
| Field of View	Camera Baseline	Object Size (cm)
Minimum – 220 mm ø	12 cm	5 to 15
Medium – 555 mm ø	25 cm	15 to 40
Maximum – 975 mm ø	43 cm	80+

- Add the scanner as Advanced type from the Scanners tab.
- Select Projector from the dropdown in the Projector window.
- Change the distance between the two cameras or Camera Baseline based on the size of the object to be scanned. Cameras should always be at a symmetrical distance on rail from each other.
- See the reference table below for suitable FOV and object size.

7B STEP 7B: ADJUST APERTURE/FOCUS
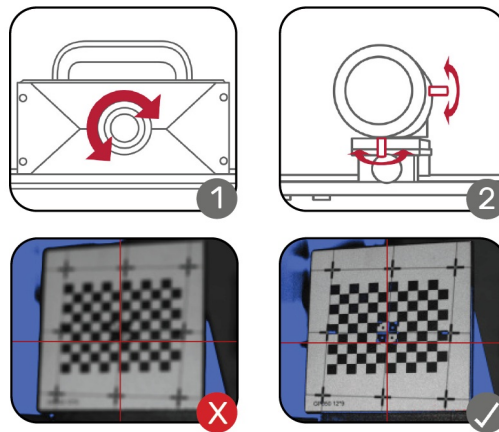
- Using a white surface and focus pattern, adjust the projector by turning the projector lens until the focus pattern is sharp.
- Choose a reference object and any projection pattern. Any object can be used including a calibration board as seen in the example.
- Adjust the aperture (front knob) and focus (back knob) by turning knobs counter-clockwise to loosen. Adjust the camera lens. The aperture knob will turn with the barrel.
- Both cameras should have the same brightness. Adjust the foci until the sharpest images are seen.
- Turn knobs clockwise to secure adjustments once complete so settings do not move.
- Repeat step 7 if a different object with different color or texture is being scanned, or the ambient lighting condition changed.

7C STEP 7C: TAKE CALIBRATION IMAGES
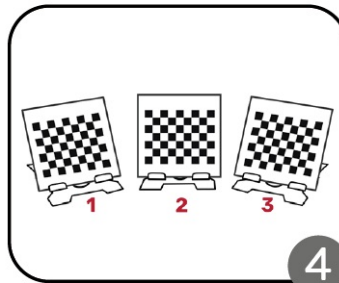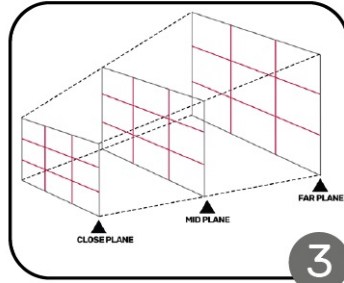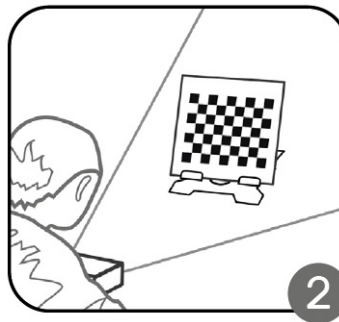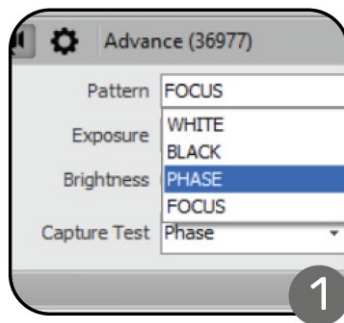
- Choose either white, phase, or focus pattern and depth of field while making sure the camera preview at the front and back planes are not blurry.
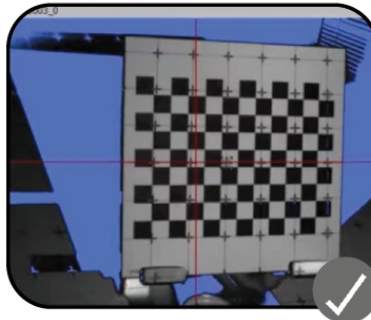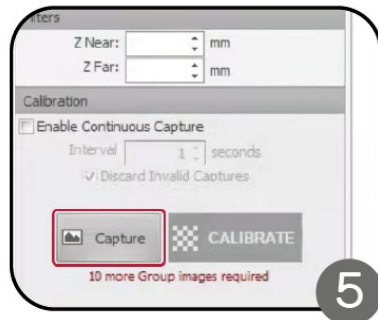

- Choose the calibration board size that is most suitable for your field of view (Approximately ~⅓ – ½ of the camera width).

WATCH OUR STEP BY STEP CALIBRATION VIDEO

WATCH NOW

https://www.youtube.com/watch?v=LHvZgtB_YHM

- Place the chosen calibration board within the field of view. Move the board around to cover 9 positions in the front-mid-far planes for a total of 27 positions.
- Make sure to have some overlap between neighboring positions shown in red (figure 3) for full coverage.
- Press the capture button to take calibration images. Take 3 different angles of each position facing left, right, and forward for a total of 81 images.

STEP 7D: SAVE RESULTS TO SCANNER
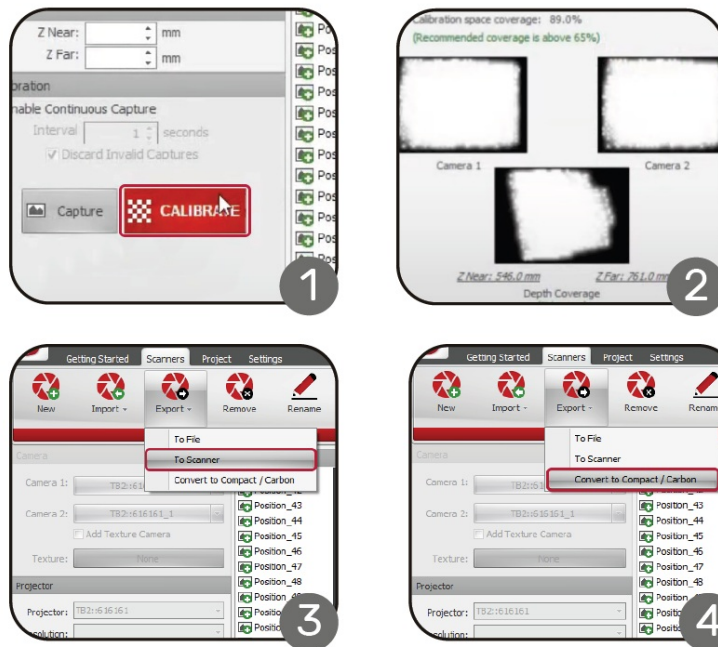
- After capturing all planes, click calibrate to see the results. Ideally, the Calibration space coverage should be over 80%.
- Upload the calibration to the scanner: Export -> To Scanner
- Exit Advance mode: Export -> Convert to Compact / Carbon
- Success! The scanner should be fully calibrated and ready to scan. Return to step 6 to take new scans.

Have an Issue? Contact Customer Support at **Support@polyga.com** Available Monday – Friday | 8 AM – 4 PM (PST) | +1 604 293 1767 Copyright © Polyga Inc. 2023

Documents / Resources

Polyga Carbon X Flexible Field of View 3D Scanners [pdf] Instruction Manual
Carbon X Flexible Field of View 3D Scanners, Carbon X, Flexible Field of View 3D Scanners, View 3D Scanners, 3D Scanners, Scanners

References

- ✳ **My Account - Polyga**

Manuals+,