

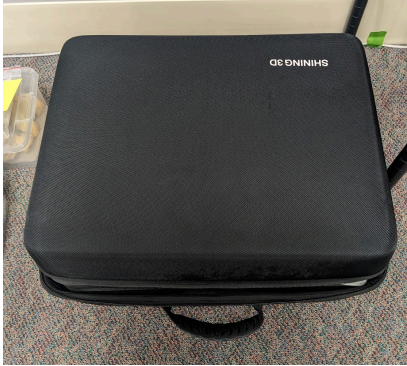
TRANSCAN PROTOCOL

- Fill out the AISOS/LATIS equipment reservation calendar for Megan Thee Laptop and Transcan
- Transcan already calibrated? Jump to scanning!

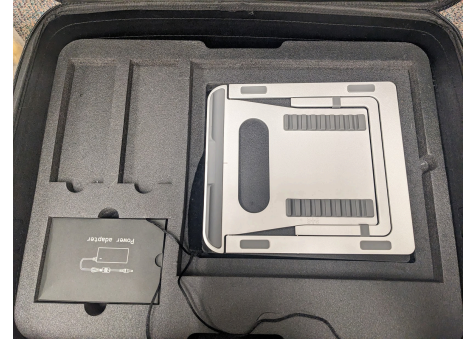
[HERES THE TRANSCAN C PROTOCOL FROM THE MANUFACTURER](#)

Scanning Equipment

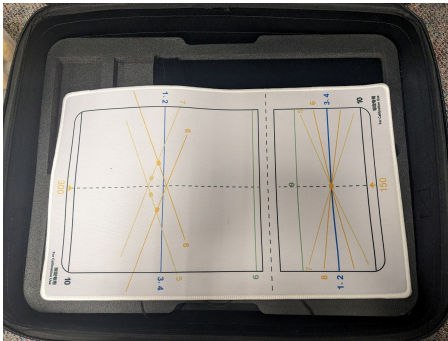
1. Transcan-C Case



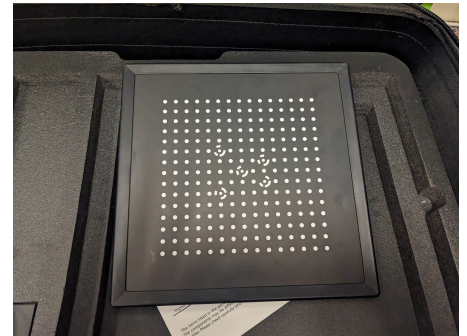
3. Calibration stand



2. Calibration mat



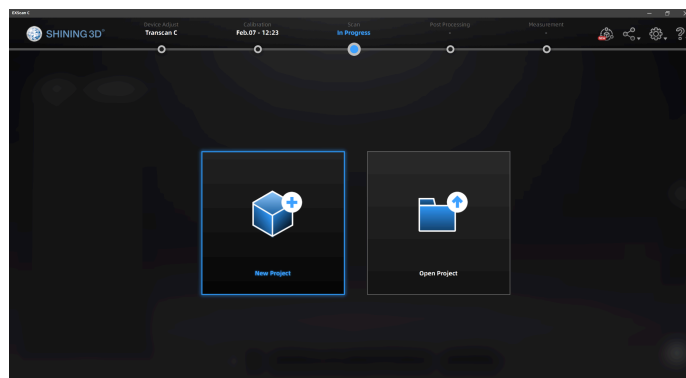
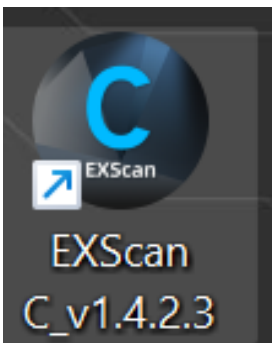
4. Calibration board 150 (found in black velvet bag)



5. Scanner

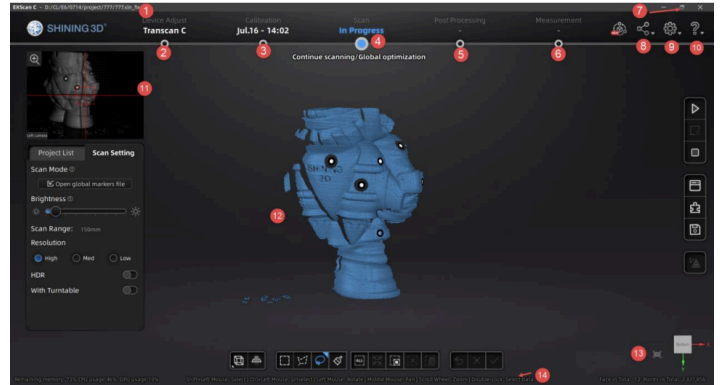
6. Turntable

Step 1: Software Setup, EXScan C



1. **Right click** on the EXScan software to **run as administrator**. The administrator password is aisosadmin if asked.

- a. Click Yes to the window that pops up
2. **Power on the Transcan C** once the software loads
 - a. There is a silver circular power button in the back that you push in.
3. Once the transcan C is powered on, Click the blue circle with arrows next to SHINING 3D at the top left to connect the scanner to the software.
 - a. If you're having trouble connecting the scanner to the software, [see troubleshooting](#)
4. At the top of the screen, click the node under "Device Adjust" (#2 in the photo)



Step 2: Device Adjust and Setting up the Calibration materials

- Follow the steps outlined by the EXScan C software:

Step 2.1: Choosing the correct calibration setting

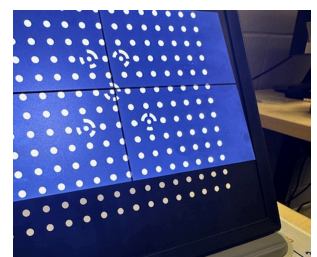
1. Choose 150 mm
2. Look at the position of the cameras on the tripod, make sure they are in line with the 150mm mark.
 - a. To change, remove the camera covers by pulling them off gently. They are connected magnetically.
 - b. Loosen the silver screw all the way, slide the camera to the 150 line then retighten the screw for both cameras.



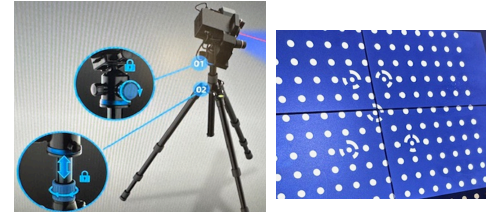
3. Click the arrow to advance to the next step

Step 2.2: Tripod adjustments and Calibration material setup

1. Adjust the tripod arm height (2 on the image) to the bottom edge of the tape marked **C**.
2. Setting up the calibration mat and board:
 - a. Place the calibration mat on the table in front of the tripod with the front left corner of the 150 calibration side matching up with the **angle of the tape on the table**.
 - b. Adjust the calibration stand so that the kickstand is positioned securely in the **4th opening from the back**.
 - c. Slide the calibration around on the mat until you reach the 1,2—3,4 line and match up the **(VERY faint) gray line** in the middle of the base of the stand with the orange box marking the middle of the 1,2—3,4 line.

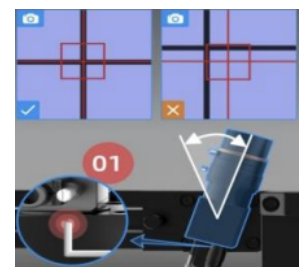
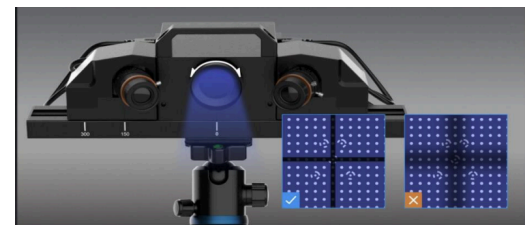


- d. Place the 150 calibration board on the stand (it's the smaller of the two boards). The two dots that are closer together go up and the two further apart go down (see image right).
 - i. To double check up versus down, turn the plate around to the backside. The QR code should be in the upper right corner.
 - ii. The plate should be placed directly up against the back of the stand and not leaning on the gray silicon pieces.
 1. [See this video for how to position the plate on the stand](#). Look closely at where the bottom edge of the plate sits on the stand.
1. Change the projector angle by loosening the screw (1 on the image) while holding the ball-in-socket joint.
 - a. Align the projector such that the black + is in the center of the middle dot
2. **Click the arrow to advance to the next step**



Step 2.3: Adjusting the cameras and projector

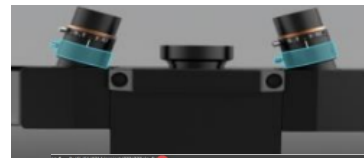
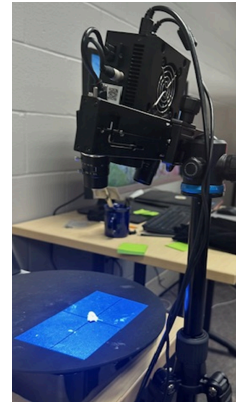
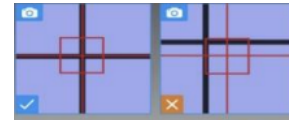
1. Aperture will likely stay the same for your objects (ring on front of camera)
 - a. **Rotate the dial all the way to 16** (the darkest setting). This lets in the least amount of light and will help you maintain good scanning conditions in the bright room.
2. Focus may need to be adjusted depending on your set up (back ring closer to camera base)
 - a. Adjust focus by unscrewing the silver screw on the inside ring and rotating the ring while holding onto the screw. Tighten screw when the object is in focus.
 - i. Left camera (according to positioning on the tripod) should be about halfway between 0.1 and 0.2
 - ii. Right camera (according to positioning on the tripod) should be about 0.3
3. Focus the projector by rotating the ring in the center on the front of the scanner (see image right)
 - a. **Look at the calibration board for focus not the screen.**
4. Set the camera angle to match the angle of the tape, use the hex key magnetically connected to the base of the scanner under the left camera on the tripod to loosen each camera (image right).
 - a. To double check your camera angles, ensure that the red box is in line with the black + in the left camera screen **ON THE COMPUTER** (which is actually the right camera on the tripod)
 - b. The right camera according to the software (but the left camera on the tripod) should be in the bottom right corner of the + (positions depicted in image right)
5. **NOTE:** you may need to readjust your projector angle and focus after changing camera angles.



Step 3- Fine tuning camera focus:

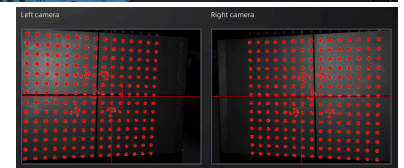
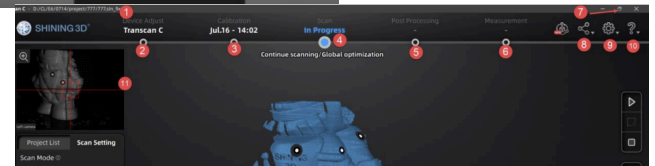
1. Move the calibration pad, stand and plate out of the way.

- Place the turntable at the edge of the table, with the object you want to digitize close to the edge of the turntable.
- Grab the ball-in-socket joint on the tripod and loosen the joint with the large knob in the back. Angle the projector as directly down at the object as you can (image right).
- Raise the tripod arm until the black + is in focus on the mold (image right).
- In the software, Look at the image in the left and right cameras and double check that the red box is either in line with (left camera on screen) or to the bottom right of (right camera on screen) of the black +.
 - If they are not close, you likely need to raise or lower the projector arm.
- Adjust the left and right camera focus by rotating the back ring (image right) closer to the base of the cameras. Remember, left is right and right is left in the software!



Step 4: Calibration

- In the software, click on the second node from the right at the top (3 in the image right), to navigate to **Calibration**.
- [Follow the steps to setup the tripod and calibration materials as you did before](#)
- Adjust the Camera Brightness so that it is one notch below sith lord (sith lord depicted in photo right).
- Double check the angle of the cameras to ensure the left and right camera views in the software match the image (right).
- Follow the calibration steps on the EXScan C software!
 - The Transcan software has a calibration wizard built in, making set-up quite easy. You simply follow the steps on the screen!
- Record the calibration deviation number in the [google sheet](#) with all other pertinent information for that mold**



Step 4- Calibration tips, notes, troubleshooting:

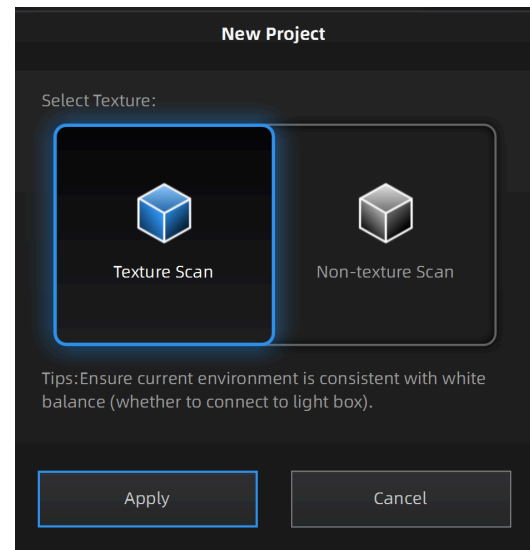
- The key will be learning to identify when the calibration seems off and thus should be recalibrated. This means you may not need to calibrate when you come in. But if you start scanning and think the scan data looks unusually bad, do feel free to recalibrate.
- The calibration board, stand, and mat will be kept in the large black Transcan case and should be returned to the case after calibration is complete.
 - Place the calibration board back in the velvet sleeve.
- It will be important to verify that your camera fine-settings have not changed. If they have, you will need to return them to the appropriate settings (below) and recalibrate.**
- CALIBRATION NOTE:** On step 9, if you're struggling to get it to calibrate, turn up the brightness.
- CALIBRATION NOTE:** During white balance calibration, Make sure the Camera Brightness is all the way up, change the projector angle so that the cameras can see the QR code in the top right corner.

All set up and ready to scan!

Step 5: Scanning

Step 5.1: Starting a new project

1. Click “**New Project**” to start a new scan.
2. Decide whether you need the software to capture the object color and location of such colors then click apply.
 - No color= non-texture scan
 - Most of the time you wont need it for scientific work
 - Yes color= texture scan
 - Yes color means more data to store so these files will be larger!
3. Navigate to: **This PC > OS (C:) > Users > DevonAshley**
4. Create a new folder in DevonAshley folder and name it according to its specimen number and the mold number NAO#-# mold ##
 - example: NAO13-1 mold A2
5. Enter that folder you just made. In the project name line, type the same name as the folder you’re in and date (two numbers for month and date, 4 numbers for year with no spaces or characters) of scan
 - Example: NAO13-1 Mold A2 04012024
 - This will automatically save the transcan C project file into its own folder. This process does NOT automatically save your individual scans!
6. Record scan data in [this google sheet](#)
7. Raise or lower the tripod arm so that the uppermost part of the screw that holds the tripod arm in place is in line with the BOTTOM line of the piece of blue tape marked S



Step 5.2: Loading a previous project

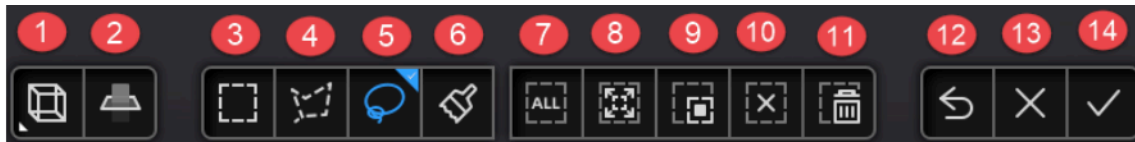
1. Click “**Load Project**” instead of New Scan
2. Navigate to the proper folder, open the .sln_fix file in that folder
 - a. If when you click on that project, no scans are imported, you likely did not save the scans properly or the software had a grumpy day and you have to rescan the mold 😞

Step 5.3: Scan Settings

- **Settings that stay the same:**
 - Resolution: High
 - Align Mode: Features
 - HDR: ON
 - With Turntable: off
- **Settings that may be adjusted on an “as need” basis:**
 - Brightness

Step 5.4: Scanning Protocol

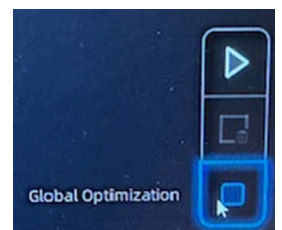
- Put the calibration materials away and reposition the turntable with your object on it close to the tripod
- Change the tripod arm height and projector angle [following the same procedure above](#)
- Once your settings are in place you are ready to scan!
 - scan start button is the top play button (right)
- Clean (remove putty and other extraneous material) ([SEE PAGE 29 IN PROTOCOL](#))
 - SHIFT + Left mouse:** Select unwanted points, the selected points will turn red.
 - Ctrl + Left mouse:** Deselect selected data.
 - Choose whichever tool fits you best, descriptions of each tool in the image below.
 - Once you are satisfied with your scan cleaning, click #14 to apply your changes to the scan.



- ① Multi-view ② Cutting plane ③ Rectangle selection ④ Polygon selection ⑤ Lasso selection
 ⑥ Brush ⑦ Select all ⑧ Connected field ⑨ Inverse selection ⑩ All unselected
 ⑪ Delete selected ⑫ Undo deletion ⑬ Cancel editing ⑭ Apply editing

	Brushes After selecting a brush, you can change the brush size with the mouse wheel while holding down the CTRL key on the keyboard.
	Connected field After selecting the data, clicking the button to select all the data connected to that piece of data.
	Delete selected data Click the button or press Delete key to delete selected data.
	Undo You can only undo the most recent deleted data.
	Click the button or press Space key to save data and exit editing. The edited data is saved in the project file.
	Cancel editions on the data.

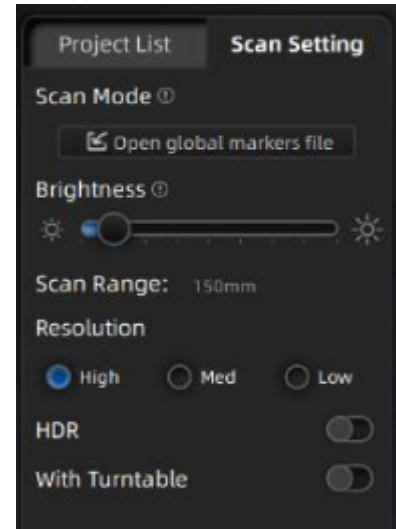
- Repeat steps 3 and 4 after repositioning your object to capture additional data.
 - [I'm not sure I have good scan data, how can I tell?](#)
- Once you have 2 scans, after cleaning, click the box for **Global Optimization**
 - This will fine tune your alignment between scans and create a group from your individual scans from which all new scans will use as data to align to.
- If I notice my scans aren't aligning properly, what should I do? [See aligning](#)



Step 6: Aligning your scans

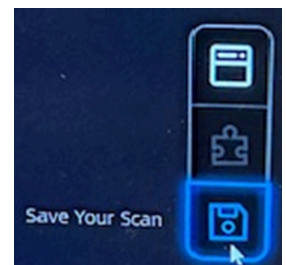
- Click the puzzle piece button to align your scans.

2. Select the bubble next to “Features” at the top
3. Select a scan or a group of scan as the “Fixed Window”
 - a. This will be the stationary scan or group of scans that all others will align to
4. Select a scan or group of scans as the “Floated Window”
5. Click apply
6. Zoom in on the combined scans in the bottom window to make sure the alignment looks accurate
7. Click Next to combine scans into a single group
8. Click exit to navigate back to the scanning screen
9. Help! I have a group of scans that aren’t aligned, what do I do?!
 - a. Click on the tab “**Project List**” under the Scanning node next to the “**Scan Setting**” tab.
 - b. Click the + next to **Project**
 - c. Click the + next to the **Group** you wish to realign
 - d. Click on each individual scan (thus highlighting that specific scan) which will cause it to turn blue while the unselected scans are white.
 - e. Once you locate the scan(s) that are misaligned, highlight it (click on it or hold CTRL + click on multiple scans), right click, and **Split Group**
 - i. This will remove scans from that group so they can be realigned
10. [I still can't get those scans to align! help!](#)



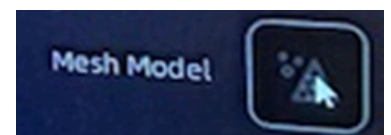
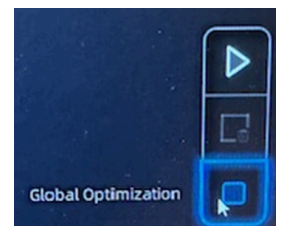
Step 7: Saving your individual scans

1. In the “**Project**” tab, right click and choose “**Select All**”
2. Click the “**Save Your Scan**” button
3. Navigate to: **This PC > OS (C:) > Users > DevonAshley > Modification folder** (ex: NAO13 Mold A1)
4. Change the name of the mesh to the specimen number and mold number Mesh. Save the file in the larger folder.
 - a. Ex: NAO13 Mold A1 Mesh
 - b. You should see the project folder with the date and the individual scan folder for that mold



Step 8: Fusing Your Scans

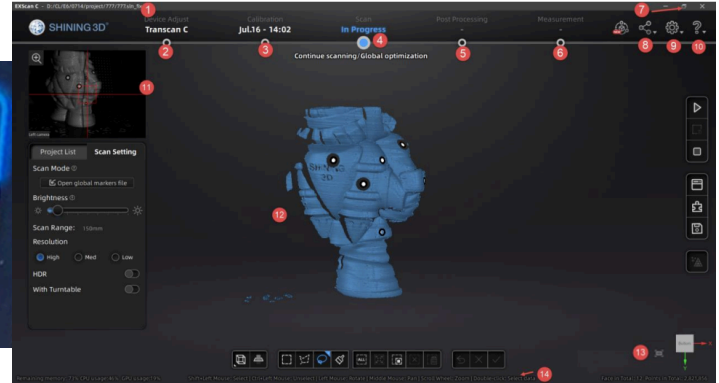
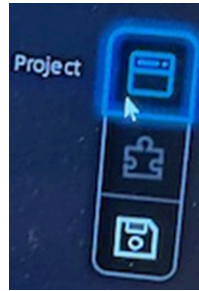
1. If it is clickable, select “**Global Optimization**”
 - a. You will not be able to fuse/mesh your scans without this step
2. Click the “**Mesh Model**” button
 - a. I can’t click Global Optimization OR Mesh Model, HELP!
3. .
4. .
5. Filter should be 0, remove small floating.. Should be 2, Deselect all the boxes
6. We want an “**Unwatertight**” mesh
 - a. A watertight mesh will fill all the holes according to the software’s decisions which we do not want
7. Click accept



8. Click...
9. Save your mesh

Step 9: Starting a new project after finishing a project

1. Navigate back to the “Scanning” node (#4)
2. Click the project button
3. [Follow the steps to start a new project](#)



Step 10: Closing up shop

1. Save the scan you are currently working on, EVEN IF IT'S NOT FINISHED
 - a. [Follow the steps to save your scans](#)
 - b. [You can pick up where you left off next time by following these instructions](#)
2. Replace the mold into its proper bag
3. Backup your files to Google Drive
4. Close the EXScan C software
5. Turn off the scanner
6. Put the camera lenses back on the cameras
7. Shut the computer down
8. Make sure the alignment materials are put away and any putty or other materials are back in their homes
9. Turn off the mouse

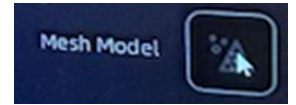
Troubleshooting:

- **Scanner wont connect to the computer**
 - Are you running the software as administrator?
 - Make sure everything is plugged in correctly
 - With the software open and running, turn off and back on the scanner
 - Click the blue circle with arrows next to SHINING 3D at the top left to connect the scanner to the software.
 - Try restarting the program with the scanner on and click the blue circle with arrows next to SHINING 3D at the top left to connect the scanner to the software.
- **I still can't get those scans to align! Help!**
- You likely just need more data. Do a few more scans that capture more of the geometry of the object
- Then follow the steps to remove the problem scans from groups and go through the alignment process with the properly aligned scans or the single scans with the most geometry.
 - Once you have a group of aligned scans you should more easily be able to align the other scans
- If you can't get this to work, no problem! [Save the individual scans](#) so we can mesh them in Geomagic and align + merge in that software instead.



- **I can't click Global Optimization OR Mesh Model, HELP!**

1. Make sure your individual scans have been [saved properly!!!](#)
2. Click the project button
3. [Reload your project you're currently working on](#)
4. Once its loaded, Click “Global Optimization”
5. Click “Mesh Model”
 - a. Then follow the steps to [fuse your scan](#)



- **I'm not sure I have good scan data, how can I tell?**

- **Can't Select**

- Sometimes you all of a sudden can't select things...for some reason. I usually just have to close the program and reopen it

