

Tutorial 3D Scanning

Scan Objects:

1. **Turn on** Scanner (blue button) and turn table
2. Start Software: **OPTOCAT - Requires USB-Dongle** to be connected to the USB hub.
3. Choose: "Automatic"
4. Choose: "**New Project**" → Keep default settings
5. (optional) Deactivate or delete already scanned 3D previews.
6. (first time only) Choose: "**Teach**" to externally calibrate turntable with camera position
 - a. Adjust focus until both pink focus points align on the surface of the object
 - b. Adjust lighting parameters (exposure, gain): yellow is underexposed, pink is overexposed. Aim for gray color on object, but as bright as possible, really small pink spots are okay.
7. Choose: "**Measure**"
 - a. **Uncheck** "use teached positions" checkbox to avoid unnecessary scanning.
 - b. Type scans per rotation **>= 6**
 - c. "Grab presets", choose: "**One setup for all scans**"
 - d. **Uncheck** "Merge", because Geomagic does better merging
 - e. Don't move around the scanner while scanning → Otherwise it might complain about vibrations during the scan.
 - f. Start Optimization for alignment → One view is done.
8. **Physically turn object**: Don't turn object too much, to provide sufficient overlap with the previous scan.
9. Choose "Measure"
 - a. Same as 6 but additionally check: "**Object to table changed.**"
 - b. Check **alignment of scans**: If not well aligned perform manual alignment.
 - c. (optional) Manual alignment: Choose correspondence points in each image using STRG+left_click to select.

Load Actual 3D data into Preview (after scan):

- "File" → "Project" → "Open" → "Single 3D Data" → Yes to override existing.

Export Data:

1. "File" → "Project" → "Save" → "**BRE export**"
2. Data is by default in C:\3DScan\[project_folder]

Finish:

1. Close programs
2. **Shut down the scanner** (long press blue button) and turntable.

Post Processing:

1. Start [Geomagic Wrap](#) → Good for repairing stuff, not good for creating new geometries.
2. Drag and Drop files
3. Choose units: [mm]
4. **Remove artefacts:**
 - a. Selection Mode: “Select Through” + “Select Back Faces”
 - b. Select with lasso tool and delete artifacts from turntable (CTRL-C to undo selection)
5. **Align scans:** Choose “Alignment” → “Global Registration” for finer registration
6. **Merge scans** into a single point cloud: “Points” → “Merge”. Creates a new object named “Merged”.
7. **Create Polygon:** “Points” → “Wrap”
8. **Fill holes:**
 - a. “Display” → uncheck “Vertex color” for better visualization of polygons
 - b. “Polygons” → “Fill Single” → Click on the boundary of small holes. “Polygons” → “Build bridges” for bigger holes.
 - c. Use: “Mesh Doctor” for general improvements