

# **Revo Scan 5**

## **User Manual**



**REVOPOINT**

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# Getting Started

## Introduction

Welcome to Revo Scan, an advanced 3D scanning and post-processing application that's your gateway to creating 3D models with Revopoint 3D scanners.

This manual will explain how to use the Revo Scan software and a Revopoint 3D scanner to create great-looking 3D models quickly and easily on a PC. To get the most out of the documentation, review the **Glossary and Abbreviations section** to familiarize yourself with the 3D scanning terminology used throughout this manual. Also, check **Keyboard Shortcuts** to streamline the scanning experience.

The following list outlines the chapters in this manual:

**PC Requirements:** Covers the system requirements and recommended screen resolution.

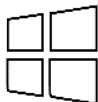
**Basic Scanning Workflow:** Explains the basic scanning method and offers tips on obtaining the best scanning results.

**Workspace and More:** Describes the context-sensitive user interfaces and functions for complete 3D model scanning and editing, including alignment of multiple scans into a complete model.

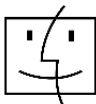
In addition to this manual, you can find practical tips and other information in Revo Scan's separate **Learning** document. If you encounter an issue using Revopoint 3D scanners or applications, please message our **customer service team** or submit feedback.

## PC Requirements

Generally speaking, an office laptop is powerful enough to support scanning because most of the data processing during scanning is handled in the scanner itself. However, more powerful CPUs will perform faster post-processing, and with more RAM, more frames can be captured during the scan.



Windows: Win10/11 (64-bit)  
Memory:  $\geq$  8GB  
Processor: Intel Core i5 or better



Mac with Intel  $\times$  86 chip: Mac OS 10.15 and later models  
Mac with Apple M1 chip: Mac OS 11.0 and later models  
Memory:  $\geq$  8GB

The minimum required screen resolution is 1344 $\times$ 768. For an optimal scanning experience, it's recommended to use 1920 $\times$ 1080 or higher. Review the PC's Screen Settings to verify that the screen resolution meets the minimum requirements.

## Read Before Scanning

1. Before starting Revo Scan, connect the scanner to a PC. A **USB 3.0** or **USB C** port is required for power. While Wi-Fi operation is supported, its configuration should be reviewed first; this requires a direct connection to the PC.
2. The following pages use the **Windows** version of Revo Scan for reference. There are some slight differences for **macOS** devices, but all the essential processes are the same.

## Preparing Objects for Scanning

With all structured-light 3D scanners, some object characteristics can be difficult to scan due to their surface properties. However, these limitations can be addressed by correctly preparing the object before scanning.

For example, a transparent or dark object can be coated with a scanning spray or dusted with talcum powder.

## Hard-to-scan Surfaces

Surface Features	Possible Solutions
Black or very dark objects	Apply scanning spray or fine powder
Shiny or reflective objects	
Metal or electroplated surfaces	
Transparent objects	
Smooth object with few features	Stick markers on or around the object

## Scanning Tips

Revopoint 3D scanners capture objects at many frames per second to ensure that adjacent frame areas overlap, supporting the automatic alignment of captured frames in either Feature or Marker alignment modes.

In Revo Scan, this happens in real-time on the PC's display, with green and blue areas displaying the captured data (unless Color mode is active). Green represents the portion of the object currently seen by the scanner, and blue represents the previously scanned portions of the object.

### **For best scanning results, follow these tips:**

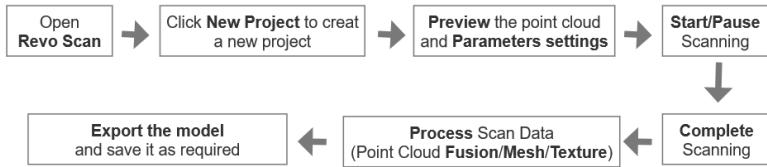
- While scanning, look at the object on the screen rather than the actual object.
- To ensure Revo Scan accurately registers frames from the scanner, do the following:

- 1) Don't move the scanner too fast.
  - 2) Keep stable during handheld scans.
  - 3) Keep the object as close to the scanner's center field of view as possible.
  - 4) Ensure the scanner's field of view is sufficiently filled with surfaces for optimal tracking.
- If using several separate scans to capture the entire object, remember to capture an overlapping area (about 10%) in each one to ensure successful merging.
  - If capturing an object in one scan, scan all the way around the object and then a little more (360+ degrees).
  - Be careful when capturing objects that may deform during scanning (e.g., a bag, blanket, arm, or head). If the scene's geometry changes, the scanner may fail to find the correct position of scan data in new frames relative to previously captured frames.
  - If unwanted objects are captured, they can be removed later while editing.
  - More frames do not mean more detail. Ensure all areas are captured, but avoid scanning them twice to avoid surface noise.

## Basic Scanning Workflow

This summary will cover the basic 3D scanning process with Revopoint 3D scanners. [Skip to the \*\*Workspace and More\*\* section for more detailed and comprehensive information.](#)

The figure below shows a typical 3D scanning and processing workflow in the Revo Scan 3D environment. After connecting a Revopoint 3D scanner to the PC via USB or Wi-Fi, follow these steps to finish the scan.



## Open Revo Scan

Double-click the Revo Scan icon to bring up the Home page. If the Revopoint 3D scanner has been correctly connected, its rear Status light will be green, and the Revo Scan page will show “Scanner Connected” after the POST sequence is complete (approx. 30 seconds).

## New Project

Click **New Project** to access the model’s Scanning, Editing, and Merging options interface. If a scanner is connected, the scanner model & connection method is displayed. If not, then the only option is to open a previous project.

## Preview & Parameters Settings

If a scanner is connected, click the **New Scan** button to turn on the scanner’s cameras and display the scanning interface. Here, the scan configuration can be selected, the scan distance between the scanner and the target object changed, and the scanner’s camera exposure can be adjusted. Refer to the **Scan Settings Preview** section for more details.

## Start/Pause Scanning

The Start/Pause button on the Scan tab is for starting or pausing the scan. While paused, the **Redo** and **Undo** functions can sequentially remove several frames of scan data to remove errors from the model.

## Complete Scanning

After finishing the scan, click the “Complete” button to progress to the next section.

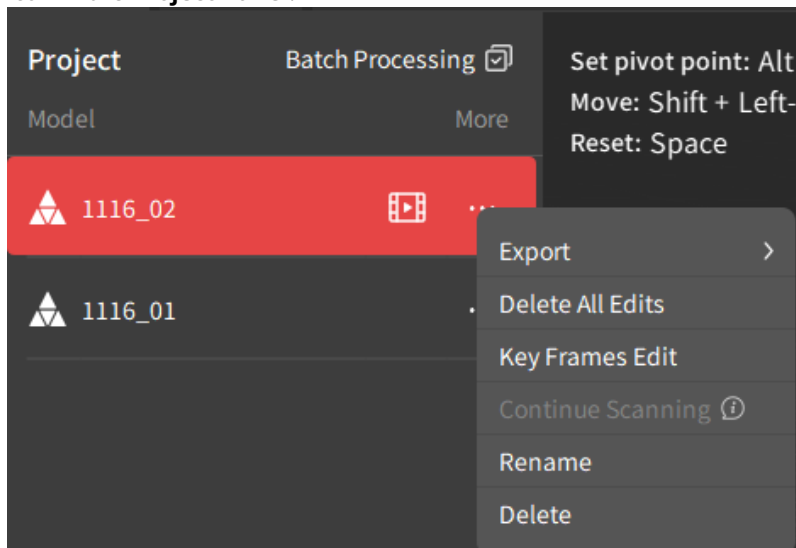
## Process Scan Data (Fusion/Mesh/Texture)

Post-process the scan data to generate the point cloud, mesh, and

texture mapping models. Texture Mapping is valid when you enable the **Color Scanning** setting in Scan Settings.

### Export & Save

After processing the model, click the **Export** button to save and export the model. Alternatively, export the scan by clicking the **More** icon in the **Project Panel**.



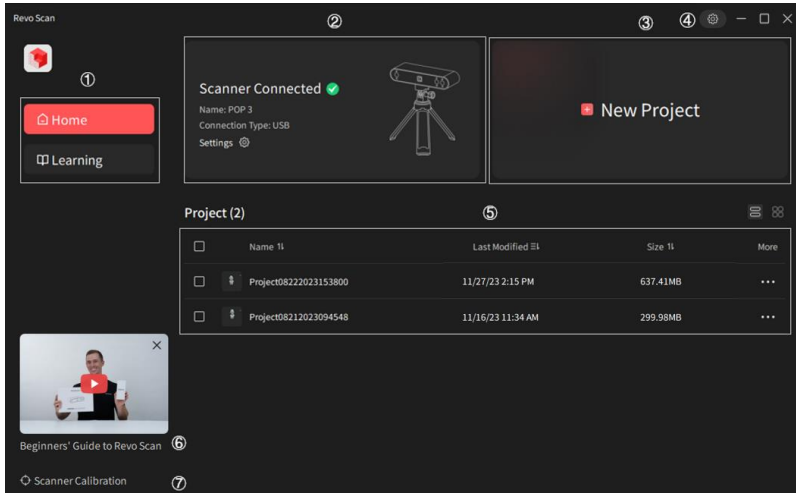
Point Clouds can be exported in the PLY and OBJ file formats only. After the Mesh operation is performed, the object can be exported in the PLY, OBJ, and STL file formats. If the Color option is selected, a Texture Map can be applied to the Mesh and exported in the PLY or OBJ file formats (only the OBJ format supports an image for an actual texture). The need for each post-processing step (Fuse, Mesh, or Texture) depends on the end goal. They do not all have to be performed all at once.



# Workspace and More

## Revo Scan User Interface

### Home Screen



#### ① Navigation Pane

Navigate to the **Home** and **Learning** pages here.

On the **Home** screen, start a new project or open existing projects & model files.


On the **Learning** page, find instructions and tutorials demonstrating how to use the Revo Scan application and Revopoint 3D scanners.

#### ② Scanner Connection Status Pane


In the **Scanner Connection Status** pane (at the top of the Navigation Pane):

- If a Revopoint 3D scanner isn't connected or it didn't successfully connect, it will show "Scanner Disconnected" and the connection





methods. If a scanner is correctly connected, it will show “Scanner Connected,” its name, and its Connection Type.

- b) Click the **Settings**  icon to see Wi-Fi configuration options for SSID and Passwords, perform IMU calibration, and check the scanner’s serial number and firmware version.

### ③ **New Project Pane**

Click the  icon to start a new project.

### ④ **Settings and Application Control**

- a) Click the settings icon  in the upper right corner to check and change the default file location, select a language, and enable or disable GPU-accelerated rendering.
- b) Click the  icon to minimize the application.
- c) Click the  icon to zoom in/out the application.
- d) Click the  icon to close the application.


### ⑤ **Project**

Displays projects that can be opened in the default folder allows changing the folder, renaming or deleting the project (click the “...” icon to see the options in the **More** column).

- a) Each project can include one or more 3D models.

For project information:

This page shows the project name, the model thumbnail of the last modified scan, the last modified time, and the project’s size.

- b) Click the **More** icon  to see the details of the last modified scan, go to the saved project’s file location, and rename or delete projects.

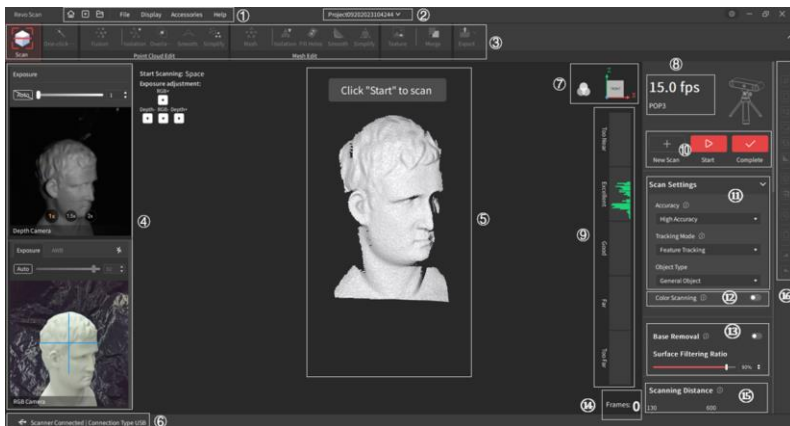
c) Check the tick box  to select one or more projects for deletion.

⑥ **Beginners' Guide:** Access to Revo Scan tutorial video.

⑦ **Scanner Calibration**




Access to the built-in calibration software for Revopoint 3D scanners. It's used to recalibrate the scanner to ensure that a high-quality and accurate 3D model can be obtained during scanning.

## Project Interface Overview



### 1. Menu Bar Overview

Contains both tools and actions for a project.

- **Home icon** : Returns to the Home Page.
- **New Project icon** : Starts a new scan with the settings reset.
- **Open a project icon** : Supports opening a project file in your computer, including .revo, .csprj, .ply, .obj, and .stl formats.
- **File:** Manage files and settings. Refer to **File Menu** in the **Menu**

**Bar** section for more details.

- **Display:** Contains options to control how the scanned data is displayed on the screen. Refer to **Display Menu** in the **Menu Bar** section for more details.
- **Accessories:** Displays all accessories that can be controlled via Revo Scan. This dropdown menu lets you connect to an accessory and set its parameters. Accessory control is also available underneath **Scan Settings** when the **Scan** tab is active, and the **New Scan** button is not ghosted.
- **Help:** Provides access to various resources and tools to learn about and effectively use the Revo Scan software. Refer to the **Help Menu** in the **Menu Bar** section for more details.

## 2. Title Bar

Find this at the top center of the window. The title bar shows the project title. Change the project name by clicking on it.

## 3. Tab Bar

Contains all the processes for scanning, editing, aligning, and exporting a model.

- **Scan Tab:** Configure the scanner for data capture.
- **Edit Tab:** Among other things, fuse raw data to create a Point Cloud, convert a Point Cloud to a Mesh, and apply a Texture Map to the mesh. Each step of post-processing can be selected to optimize the 3D model. See **Edit Settings** for more details.
- **Merge Tab:** Multiple scans can be aligned and merged into a new model. This process can be automatic (up to 9 models may be merged in one operation) or manual (2 models at a time).
- **Export Tab:** Export point clouds, mesh, or texture model as required.

## 4. RGB & Depth Data Displays

**RGB window** displays the live feeds from the RGB camera.

**Depth window** displays the live feeds from the Depth cameras.


### 5. 3D Display Window


Displays the scanned surface of the object during preview or the scan data that is being captured or has already been captured.

### 6. Status Bar

Displays the scanner connection status, connection method, and model editing process.

### 7. Color Display & 3D Coordinates

**Color Display**  Hides or displays the original color of the target. This button is only active when the color scanning mode is enabled.

**3D Coordinates**  Click the Coordinates button, and the model will be centered on the chosen face. Alternatively, adjust the viewing angle by clicking and dragging it.

### 8. Scanner Info

When the Scan tab is selected, the scanner's data capture rate is displayed in frames per second, along with the scanner name.

### 9. Distance Display

Displays the range of distances between the scanner and the surfaces being scanned. If the distance is "Excellent," the color bars will be green, meaning it's the optimal distance for scanning. If the distance is too near, the color bars will be orange. If the distance is too far, the color bars will be red.

During scanning, green is the current data being captured, and blue represents the captured data (except when Color mode is active).

### 10. Operating Menu



Buttons for New Scan (& cancel), Start (& Pause) Scanning, and Complete the scan.

### 11. Scan Settings

Displays configuration options that can be selected depending on the object being scanned. Refer to **Scan Preview Settings** for more details.

## 12. Color Scanning

Disables the Color  to capture the shape information of the target objects. Enables the Color  to capture both color and shape information.

## 13. Base Removal

Enables the automatic removal of unwanted, flat background surfaces during the scan. Refer to **Scan Preview Settings** for more details.

## 14. Frames Captured

Displays total frames captured in the active scanning task.

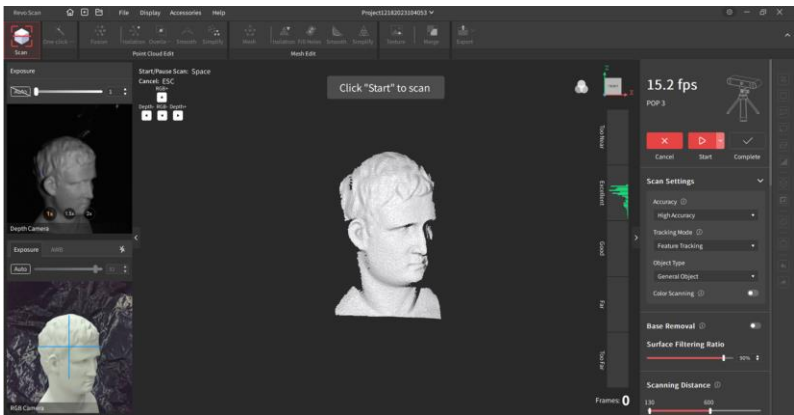
## 15. Scanning Distance

Adjusts the depth cameras' working distance so that any unwanted background or foreground objects aren't included in the scanned data.

## 16. Tool Bar

Contains the main tools to edit the 3D model. Refer to the **Edit Settings** section for more details.

# Scan Settings Preview

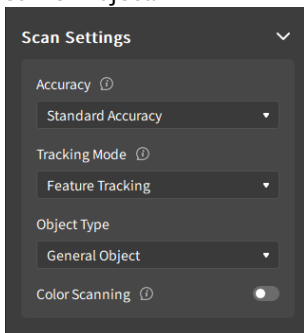


Click the **New Scan** button on the Home page to enter the Scan

Preview page. The settings on this page greatly influence scanning results, so please consider them carefully before scanning.

## 1) Scan Settings

Select the settings for a scan by clicking on the different options. These selections will be remembered for subsequent scans in the same Project.



- **Accuracy**

In Standard Accuracy mode, the model processing speed is faster and is suitable for general scanning applications.

In High Accuracy mode, the post-processing time will be longer, but the results are more suitable for applications needing more detail.

In High-speed (18fps) mode, the model processing speed remains the same as the Standard Accuracy mode, but the frame rate reaches 18fps and is suitable for large object and people scanning applications.

- **Tracking Mode**

Use **Feature Tracking** for objects with detailed, distinct surface features with no repeating patterns. **Marker Tracking** requires marker stickers to be placed on or around the object. Use it for objects that have large, flat areas with no distinct surfaces. At least 5 markers must be in view for each frame during scanning.

- **Object Type**

**General Object** mode is best suited to scan objects with unique shapes, such as sculptures and anything with easily identifiable features at close to medium distances.

**Dark Object** mode is for scanning objects with darker surfaces, such as black or dark gray clothes, black boxes, etc. However, not all dark objects can be successfully scanned. One example would be black leather shoes because leather absorbs light (or they have been made so shiny that they reflect too much light).

**Face** mode is for scanning people's faces.

**Body** mode is for scanning people or larger objects from a greater distance than is used for the other modes. The exposure and gain are set accordingly (no Automatic exposure adjustment).

**Large Object** mode allows the fastest scanning rate.

- **Color Scanning**

Texture Mapping is applied to the scanned 3D model using color data captured from the RGB camera. If turned off, the scanned model will have no color information; only the shape data is captured.

NOTE: Revo Scan can only export color objects in the PLY & OBJ formats.

## **2) Base Removal**

Enable "Base Removal" to delete any unwanted flat surfaces detected (e.g., a table or floor). If scanning an object with large areas of flat surfaces, turn this function off to avoid deleting any of the object's details, and adjust the surface filtering ratio to a proper range.

## **3) Scanning Distance**

This adjusts the depth cameras' working distance so that any unwanted background or foreground objects are ignored.

## **4) Depth Camera and RGB Camera**

Before 3D scanning, one last crucial setting is Exposure.




The Depth Camera's Exposure setting greatly influences 3D data



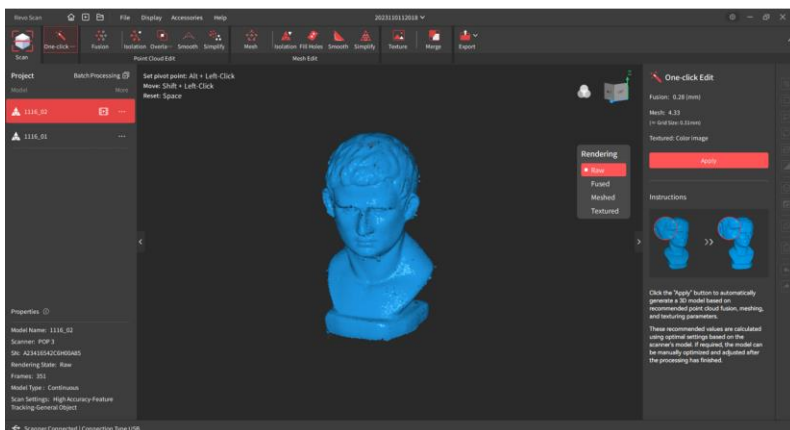
capture. To ensure an accurate scan, adjust the exposure until there are as few blue and red patches on the object as possible in the Depth window.

Note that Blue on the object means underexposed, and Red means overexposed.

The RGB camera's exposure and white balance settings will affect texture mapping. To accurately capture an object's color during a scan, please ensure that the object is evenly lit with soft light and adjust the brightness as required.

The default mode is automatic exposure. Control exposure by clicking the  icon and  icon near the upper right of the Depth and RGB Camera panes or drag the slider bar to adjust exposure value when the auto exposure is disabled. Control the white balance by clicking the  icon or dragging the slider bar to adjust the white balance value till the color appears as natural as possible.

## Edit Settings



After scanning, process the scan as required. Revo Scan provides a **One-click Edit** function for new users and allows experienced users to perform Fusion, Mesh, and Texture step by step.

## One-click Edit

Applying the One-click Edit feature, point cloud fusion, mesh construction, and texture mapping (if color scanning is selected) will be performed sequentially with the recommended parameters.

### Fusion

The initial scan data is a collection of individual data sets or frames. To work with them, they must be fused into a Point Cloud. Point Clouds can be exported in the PLY & OBJ formats only.

### Mesh

While Point Clouds are the preferred format for editing, an object cannot be 3D printed until it is meshed into an object and exported.

### Texture

While each facet in a Mesh object can have color, a Texture can provide a more realistic depiction by mapping an image over the object. Revo Scan supports exporting color objects in PLY & OBJ, but Texture is only supported in the OBJ format.

## Manual Edit

### Point Cloud

#### 1. Point Cloud Fusion

There are two fusion methods: **Standard** and **Advanced**. Advanced refers to fitting fusion, which takes longer fusion time and outputs a point cloud with higher topological quality. It is suitable for irregular surfaces or models with higher detail requirements. Standard point cloud fusion refers to voxel fusion, which has a shorter fusion time and is suitable for point clouds with large file sizes or scenes requiring faster processing. Unlike **One-click Edit** mode, the Point Distance can be specified before fusion. Revo Scan will suggest the optimum Point Distance for each scan to optimize accuracy and resulting file size, but different values can be set depending on your needs. The Merge operation will fail if the Point Distance between two scanned objects is too great.

A 5:1 point distance ratio has been observed to work when

automatically combining scans made with the RANGE and MINI scanners (set to 0.1 and 0.02, respectively). An 85:1 ratio (such as 1.7mm for the RANGE and 0.02 for the MINI) will fail.

## **2. Point Cloud Edit**

The final quality of a 3D object can be improved with careful preparation.

### **Isolation**

Identifies and highlights isolated Point Cloud data not connected to the object's main body (for example, a portion of the arm when scanning a person's head). Setting higher values for the Radius, Angle, and Isolation Rate will highlight more Point Cloud data for deletion.

### **Overlap Detection**

Detects and deletes overlapping and unnecessary data points in the Point Cloud. The distance can be specified.

NOTE: Repeating this operation with the same distance can result in more highlighted points; this will almost always be a smaller number, and the process can, if desired, be repeated until it is zero.

### **Smooth**

Smooths irregularities in flat or curved surfaces and can be repeated (or undone) as many times as needed.

### **Simplify**

Reduces the number of facets and complexity in the Point Cloud to reduce file size and noise to improve the object's shape and structure. Simplifying models can also increase post-processing efficiency, reduce calculation & rendering time, and make the model easier to edit.

## **3. Mesh**

Generates a 3D mesh or surface representation from the Point Cloud. With higher Mesh Quality settings, more details are shown in the resulting model at the expense of longer processing times and larger file sizes.

If **Hole Filling (Auto)** is selected, all holes under the **Ratio** will be filled with a curved surface. If more flexibility in filling holes is required, then perform **File Holes** in the **Mesh** section.

## **Mesh**

### **Isolation**

Automatically remove isolated mesh data that is not connected or only loosely connected to the object's main body (for example, a portion of the arm when scanning a person's head). Setting higher values for the Isolation Rate will select more of the scan.

### **File Holes**

Detects all holes, regardless of ratio, but allows individual holes to be selected with a Plane or Curve fill mode and removed.

### **Smooth**

Smooths flat or curved surfaces and can be applied or undone as many times as needed.

### **Simplify**

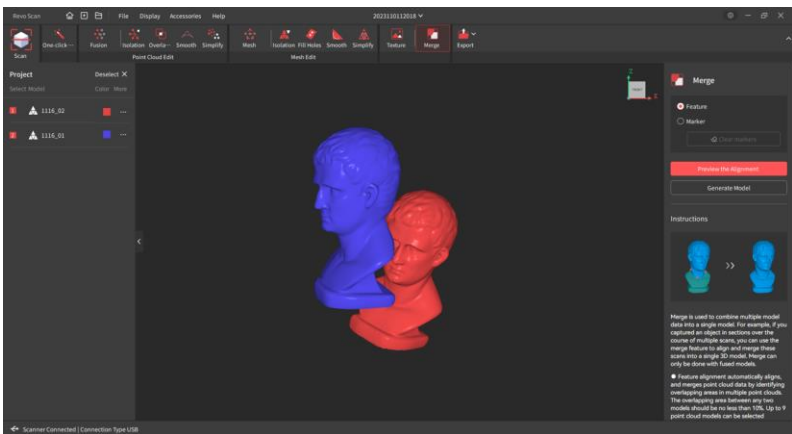
Reduces the complexity in the Mesh to reduce file size and noise. Simplifying models can also increase post-processing efficiency, reduce calculation & rendering time, and make the model easier to edit.

### **Texture**

The only difference from the **Texture** function in **Auto** is the **Apply** button.

## **Merge Settings**

Multiple scans in a project can be aligned into a new object in the Merge tab. Please note that the scans can only be merged after performing point cloud fusion.



There are two methods of alignment: **Feature** and **Marker**.

**Feature** alignment automatically matches unique features on separate scanned sections of an object and uses them to merge into a new model. Select the models to be merged, and they will be displayed in different colors. Click the Align button to preview the model before merging, and then click the Generate Model button. A maximum of 9 scans can be selected at one time for merging. The scans of adjacent areas on an object must have an overlap of at least 10%, or feature alignment won't find enough features to merge the models.

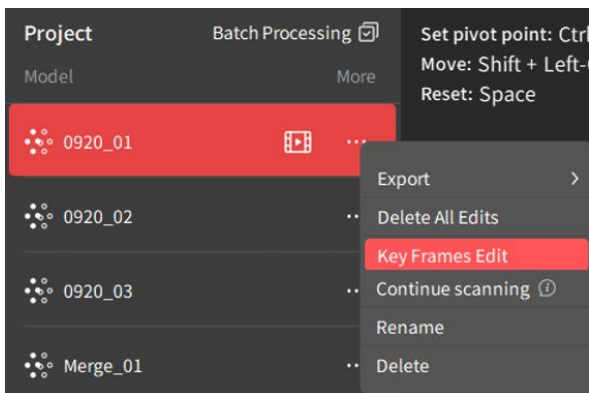
NOTE: A Merge between a small object and a much larger object may be rejected if the smaller object is less than 10% of the size of the larger object. Workaround options include merging multiple smaller objects to create a larger object that can be merged, resuming scanning the smaller object to increase its size, or selecting several scans to merge.


**Marker** alignment requires a minimum of 3 reference points to be manually placed in corresponding locations on each model for them to be successfully merged. Only 2 models can be combined at a time. Zoom in on the features of each model so the marker points can be precisely placed.

Note:

1. When using Marker mode to merge models, the magnifying glass function is available to mark aligned points on the model.
2. If the target scans are scanned with [Color] enabled, Texture Mapping is available after the models are merged.

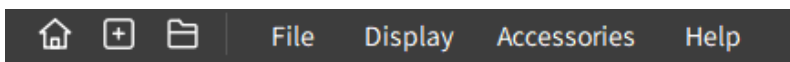
## Key Frames Edit



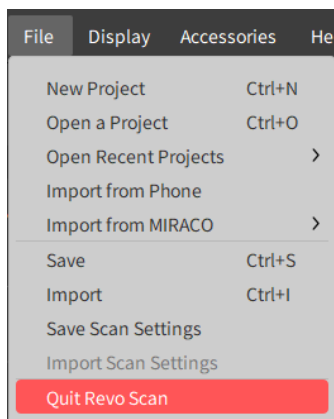
Click the  icon on the project panel or the more icon on the project panel to find the Key Frames Edit mode.

In Key Frames Edit, the scan is replayed frame-by-frame to help you locate any faulty frames quickly. Revo Scan's editing tools can be used to improve the raw data. Alternatively, you can choose to delete the unwanted frames.

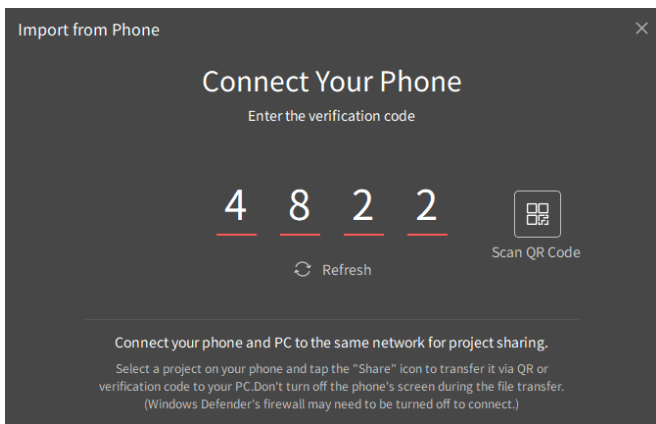
## Menu Bar



### ❖ File Menu




- **New Project**                      **Ctrl+N**  
Clears the current scene and starts a new project.
- **Open a Project**                      **Ctrl+O**  
Open a project file (with .revo, .csprj suffix) or a 3D model (PLY, OBJ, and STL).
- **Open Recent Projects**  
Displays a list of the recently opened Revo Scan projects. Select any of the files in the list to open the file.
- **Import from Phone**



Transfer **Raw** data from a phone to a PC. Ensure the phone and PC are connected to the same Wi-Fi network. Do not minimize the app or turn off the phone's display screen during the file transfer, or the transfer will fail.


## 1. Import from Phone via Verification Code

- Click the **Import from Phone** button in the **File** menu.
- Open Revo Scan V5 or above on the phone and find the Project to transfer.
- Tap the Share  icon.
- Enter the code (displayed on the PC) on the smartphone.
- Start file transfer.

## 2. Import from Phone via QR Code

- Click the **Import from Phone** button in the **File** menu.
- Click the QR Code icon.
- Open Revo Scan V5 or above on the phone and find the project to transfer.



- d) Tap the Share  icon.
- e) Scan the QR code displayed on the PC.
- f) Start file transfer.

- **Import From MIRACO**

Transfer projects from a MIRACO to a PC.

- **Save** **Ctrl+S**

Saves the current Revo Scan Project.

- **Import** **Ctrl+I**

Import any PLY, OBJ, or STL file into the current project. This can result in a Mesh object that does not have a Fuse stage in the Revo scan Project hierarchy.

- **Save Scan Settings**

Save Scan Setting parameters locally.

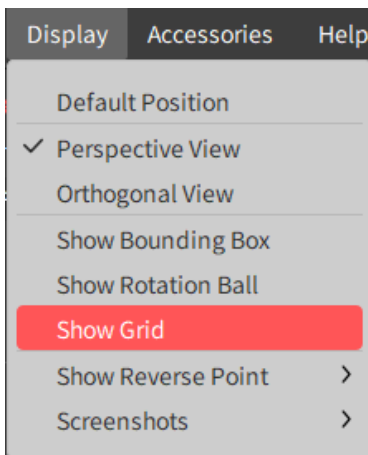
- **Import Scan Settings**

Import an existing scanning parameter file from the local.

- **Quit Revo Scan**

Closes Revo Scan.

- ❖ **Display Menu**



- **Default Position**

Shows the 3D model from a viewpoint determined by the first few frames captured, scaled to fit all the captured data.

- **Perspective View**

In Perspective View, the camera is positioned at a fixed point in space, so the model has a sense of depth and distance. This is the default view. Change it as required.

- **Orthogonal View**

In Orthogonal View, all objects appear at the same scale, and all three dimensions (width, height, and depth) are projected onto a 2D plane to preserve their relative sizes and positions.

- **Show Bounding Box**

Displays or hides the bounding box around the current model.

- **Show Rotation Ball**

Displays or hides the trackball.

- **Show Grid**

Displays or hides a virtual three-dimensional grid in the editing interface. The grid is a structure of horizontal and vertical lines that helps users better position and align objects.

- **Show Reverse Point**

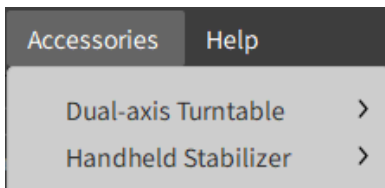
Shows or hides the point opposite the current one in another color (black or transparent).

- **Screenshots**

Screenshots: Full Screen and Mode Only are supported. Users can apply Screenshots to capture images of the entire screen in the software interface, or images of the 3D model to meet different screenshot needs.

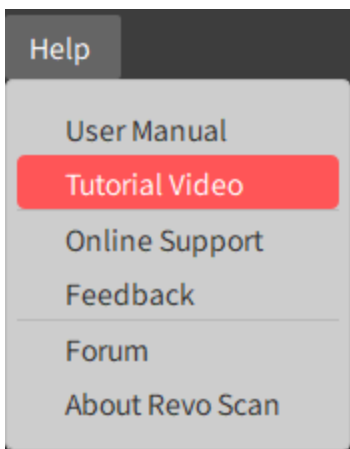
### ❖ **Accessories Menu**

Displays compatible accessories, connection options, settings, and links to user guides.



NOTE: For the Handheld Stabilizer and Dual-axis Turntable, refer to the **Accessories** section for more details.

### ❖ **Help Menu**



- **User Manual**

This is a link to the official Revo Scan User Manual (i.e., this document).

- **Tutorial Video**

Access to the video that tells users how to use Revo Scan 5.

- **Online Support**

This is a link to our customer support team directly. The Revopoint customer service team will respond as soon as possible.

- **Feedback**

Opens an email feedback window to submit a problem report or feedback.

- **Forum**







Opens a link to the Revopoint User Forum website where you can share your scanning experiences, showcases & suggestions and ask for help from our friendly, experienced community.

- **About Revo Scan**


Displays the Revo Scan version and the User Policy, Privacy Policy, and Third-Party Notices links.

# Selection Tools

For **Fused** or **Meshed** objects only. These tools are unavailable for **Raw** or **Textured** data. These tools are available by Hot Keys and icons on the right side of the Revo Scan project window. Each mode except **Clip** allows multiple, successive selections before deletion. **<Esc>** or **V** deselects all. **<Del>** or **<Backspace>** deletes the selected Points or Meshes.

-  **Orbit**  **V**  
Rotate the view freely in any direction. It also de-selects all objects.
-  **Rectangular Selection**  **M**  
Select multiple parts of a model by drawing a rectangular box around them.
-  **Polygon Selection**  **L**  
Select individual polygons (faces) of a mesh object. The Polygon tool creates a straight line between each Anchor Point (mouse click). Click on any edge of the area to be selected and release the mouse pointer to make an Anchor Point.

With Polygon Selection, users can delete specific polygons or groups of polygons. This tool is useful when working with complex mesh objects where selecting individual vertices or edges can be time-consuming or impossible without selecting other polygons that should be kept. However, the functionality of this command can be confusing, especially with meshed objects. For instance, some polygons between two anchor points may not be selected at maximum zoom.

- Lasso Selection**  **U**  
A freeform selection tool. It is used by holding the left mouse button and drawing a shape around the item. Release the mouse button, and the selection is closed by connecting the current pointer location to the start location with a line.

This tool is useful when working with irregularly shaped objects or when selecting parts of a model that are difficult to reach using other selection tools.

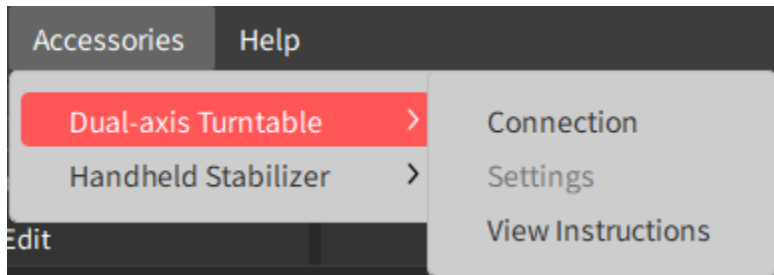
## Select Connection B

Select a connected region in a three-dimensional space composed of adjacent, connected or similar elements, which is used to identify and process specific regions in a model for targeted editing, analysis, or other operations.

## Clip

Removes everything to one side of an arbitrary line. Position the cursor, hold the left mouse button, and drag; the clipping plane will appear as a line. The portion of the model in the direction of the line's arrow will vanish. Press <Enter> to apply the change, <Esc> to cancel.

## Dual-axis Turntable



### 1. Pairing the Dual-axis Turntable

- Click *Accessory* → *Go to Dual-axis Turntable* → *Connection* on the Menu Bar to connect the Dual-Axis Turntable.
- Click Refresh to search for available devices.
- Find the turntable and click “Connection” to pair it.
- Click “Connection” in My Devices to complete pairing.

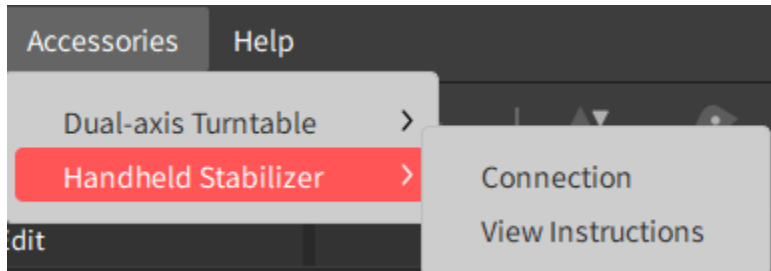
## 2. Adjusting the Dual-axis Turntable

- a) After the Dual-axis Turntable is successfully connected, a popup will appear in Revo Scan's bottom right corner, prompting to set a speed and angle.
- b) Adjust Rotation and Angle as required.

## 3. Click the Start button to rotate the turntable

Alternatively, connect and control the Dual-axis Turntable by finding the accessory at the bottom of the Scan page.

## Handheld Stabilizer



## Pairing the Handheld Stabilizer

- a) Click Accessory → Go to Handheld Stabilizer → Connection on the Menu Bar to connect the Handheld Stabilizer.
- b) Click Refresh to search for available devices.
- c) Find the device and click "Connection" to pair the Handheld Stabilizer.
- d) Click "Connection" in My Devices to complete pairing.

After the Handheld Stabilizer is connected, control the scanner's direction by operating the stabilizer's joystick.

Alternatively, connect the Handheld Stabilizer by finding the accessory at the bottom of the Scan page.

# Scanner Calibration

**Revo Calibration** is a built-in calibration software for Revopoint 3D scanners, helping users recalibrate the scanner to ensure that a high-quality and accurate 3D model can be obtained during scanning.

Please note that a new 3D scanner does not need to be recalibrated, as it was accurately calibrated before leaving the factory. However, after prolonged use, environmental changes, external forces, or collisions, the position and angle of the camera lens may deteriorate. This will result in the optimal parameters no longer being available. If this happens, Revo Calibration will recalibrate it.

## Appendix

### Glossary

**Accuracy** - Refers to the correlation of the 3D model's dimensions to those of the actual object.

**Alignment Modes** - How 3D scanners keep track of an object as they scan. See Feature and Marker for more details.

**AM** - Additive Manufacturing, otherwise known as 3D printing.

**Ambient Light** - The light that comes from the surrounding environment.

**CAD** - Computer Assisted Design software is commonly used for building 3D models for product design.

**Calibration Board** - A board with irregularly placed dots used to check or recalibrate a 3D scanner's accuracy.

**Capture Range** - The area that a 3D scanner can capture in a single



frame.

**Class 1 Light** - Light that is completely eye-safe for people and animals.

**Decimation** - Reducing the number of polygons in a 3D model to optimize its file size, ideally while retaining details.

**DLP** - Digital Light Processing. Like SLA, it polymerizes a liquid resin. It is faster and less expensive but has lower resolution and build volumes.

**Feature** - A tracking alignment mode where 3D scanners use an object's features to keep track as it scans. It's used for objects with many distinct details and surface features.

**FDM** - Fused Deposition Modeling is a 3D printing process that melts thermoplastic filaments to print objects. It is the most common method used by consumers and hobbyists.

**Fuse** - The process of merging multiple raw 3D data sets (aka frames) created during the scan into one complete Point Cloud that's ready for meshing or editing.

**Frames** - 3D surfaces captured during a scanning session, collectively constituting a scan. The scan rate varies with scanner type. See **Fuse**.

**G-code** - Geometric Code is a programming language that tells machines such as 3D printers and CNC machines which operations to perform.

**Marker** - A tracking mode where the 3D scanner tracks marker stickers placed on or around the object to be scanned. It's used for objects that don't have unique surface features for the scanner to track.

**Marker Points** - Small circular stickers that are placed either on or

around an object's surface in an irregular pattern to help 3D scanners track the object.

**Merge** - The process of combining separate, partial 3D scans of an object to create a complete 3D model.

**Meshing** - The process of converting a Point Cloud into a 3D model.

**Meshes** - The surface geometry of a 3D model comprises a series of Vertices, Edges, and Faces.

**Metrology** - The scientific study of measurements.

**Model** - The 3D object that results from the fusion operation (in Revo Scan) or another modeling process in a different software package.

**OBJ File** - An open-source file format for storing a 3D model's surface geometry, color, and texture data. It's compatible with most 3D modeling software. It may include a photographic image to support more realistic texture maps. It can be a Point Cloud or Meshed model.

**PLY File** - Open-source polygon file format for storing 3D data from 3D scanners. It can be a Point Cloud or Meshed model.

**Point Cloud** - A cloud of tiny points plotted in a 3D space. Each point represents a point of an object's surface captured by a 3D scanner.

**Point Distance** - The distance between the points in a Point Cloud. The smaller the space between the points, the higher the resolution of the Point Cloud.

**Polygons** - Flat geometric shapes with at least three internal angles (i.e., a triangle) that are the building blocks for most 3D models.

**POST** - The Power-On, Self-Test sequence.

**Precision** – The level of accuracy resulting from a scan. It's usually expressed as the maximum possible error between the object and its model.

**Project** – An album including the scanning configuration, Raw data, processed data, and user operation history in memory or hard disk.

**Repeatability** - A 3D scanner's ability, over repeated scans, to provide measurements that are close to one another. It's usually specified as the nominal or maximum possible difference between two measurements of the same item.

**Resolution** – The number of significant figures displayed. While it should be derived from Accuracy and Repeatability, some software packages allow more digits of resolution to be presented than the system supports.

**Scan** - A sequence of frames captured in a single continuous scanner movement around an object or scene.

**Scanning Speed** - Typically listed as frames per second (fps) or points per second, this is how much data a scanner can collect per second as it scans an object.

**Scanning Spray** - An aerosol that's used to lightly coat the surface of dark, shiny, or transparent objects to help 3D scanners see them. It can be purchased or made from common materials.

**SLA** - Stereolithography is a 3D printing process that uses a laser to cure liquid resin to print objects. It is one of the most popular processes for professional applications. It can produce high-resolution results.

**Slicer Software** - Converts 3D models into G-code so 3D printers know how to print the object.

**STL File** - Standard Triangle Language file format to store information about 3D models. It's compatible with most 3D printers' slicing software. It can only be a Meshed model, not a Point Cloud.

**Structured Light** - A high-resolution, patterned light that deforms when hitting an object's surface and allows 3D scanners to capture surface information through its depth cameras.

**Tracking** - Synchronizing frames of scanning data so they are mapped to a location in 3D space consistent with previous frames.

**Texturing** - Applying color data captured during a 3D scan that is aligned with the mesh and applied to the model, usually as a photographic image.

**Vertices** - X, Y, Z coordinates that indicate a single point in a 3D space.

**Watertight** - A mesh without any holes, making it suitable for 3D printing.

**Working Distance** - The minimum and maximum distance a 3D scanner will capture data when scanning an object.

# Abbreviations

S/R (seconds per rotation) specifies the rotation time for a turntable.

RGB (Red, Green, and Blue) refers to a system for representing colors. Red, green, and blue can be combined in various proportions to obtain any color in the visible spectrum. R, G, and B levels can range from 0 to 100 percent intensity. The PLY file format uses 24-bit color (8 bits for each color component), while the OBJ file format supports floating point numbers for more accurate color specifications.

FPS (frames per second) refers to the rate at which successive frames (single pictures that together form a film or video game) appear on a screen. For example, at 30 fps, 30 distinct images would appear in succession within one second. In 3D scanning, each frame is a data set of relatively low-resolution 3D data that is later combined into a Point Cloud with higher resolution.

CPU (Central Processing Unit)

Also referred to as a "processor" or "microprocessor." The CPU is the primary component of a computer that performs most of the processing of data and instructions in a computer system. It is often referred to as the "brains" of a computer.

# Keyboard Shortcuts

Functions	Windows Shortcuts	Mac Shortcuts
Back to Orbit (exit selection mode)	V	V
Rectangle Selection	M	M
Polygon Selection	L	L
Lasso Selection	U	U
Clip	C	C
Select All	Ctrl+ A	Command+ A
Invert Selection	Ctrl+ Shift+ I	Command+ Shift + I
Delete	<Del>/<Backspace>	<Backspace>
Undo	Ctrl+ Z	Command+ Z
Redo	Ctrl+ Y	Command+ Y
New Project	Ctrl+ N	Command+ N
Open Project	Ctrl+ O	Command+ O
Save	Ctrl+ S	Command+ S
Import	Ctrl+ I	Command+ I
Set pivot point	Alt+ L-click	Option+ L-click

Zoom in & out	<p>1) Use the mouse wheel scroll to zoom in or out.</p> <p>2) Use the touchpad to zoom in or out: spread two fingers apart to zoom in, pinch two fingers together to zoom out.</p>	<p>1) Use the mouse wheel scroll to zoom in or out.</p> <p>2) Use the touchpad to zoom in or out: spread two fingers apart to zoom in, pinch two fingers together to zoom out.</p>
Move	Shift+ Left-click/Press and hold and drag the mouse wheel scroll	Shift+ Left-click
Rotate in selection mode	Ctrl+ Left-click	Command+ Left-click
Back to default view	Space	Space
Select Through	Ctrl+ Shift+ T	Command+ Shift+ T
Select Connection	B	B
Reduce selection	Ctrl+ shift+ Selections	Command+ shift+ Selections
Full Screen screenshots	Ctrl+ shift+ A	Command+ shift+ A
Model Only screenshots	Ctrl+ shift+ M	Command+ shift+ M

This content is subject to change.



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If you have any questions about this document,  
Please send a message to [support@revopoint3d.com](mailto:support@revopoint3d.com).

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