TUTORIAL 5

# LASER SCANNER DATA IMPORT

In this tutorial, you will become familiar with the process of importing a laser scanner dataset to reconstruct and generate a 3D model in **ShapeMetriX's ModelEditor** tool.

The ModelEditor is a convenient tool for:

- Generating 3D models from existing **.e57* laser scanner or **.obj* datasets
- Converting models from previous ShapeMetriX versions in the **.jm3* file format to the new ShapeMetriX v5.0 compatible **.jm3x* file format
- Editing existing 3D models by trimming and confining it to the area of interest

## TOPICS COVERED IN THIS TUTORIAL

- Laser Scanner Data Import
- 3D Model Reconstruction and Saving

## FINISHED PRODUCT

The finished product of this tutorial can be found in the downloaded **Tutorial 5 – Model Files > Finished Product** folder.

# 1.0 IMPORTING A LASER SCANNER DATASET

If you have not already done so, run the **ShapeMetriX (SMX)** program by double-clicking the **ShapeMetriX** icon on the desktop or in your installation folder, or by selecting **Programs > ShapeMetriX** in the Windows Start menu.

When the program starts:

1. Select  **ModelEditor** to run the ModelEditor tool.

Whenever the ModelEditor tool runs, a default blank work page opens as shown in the image below.

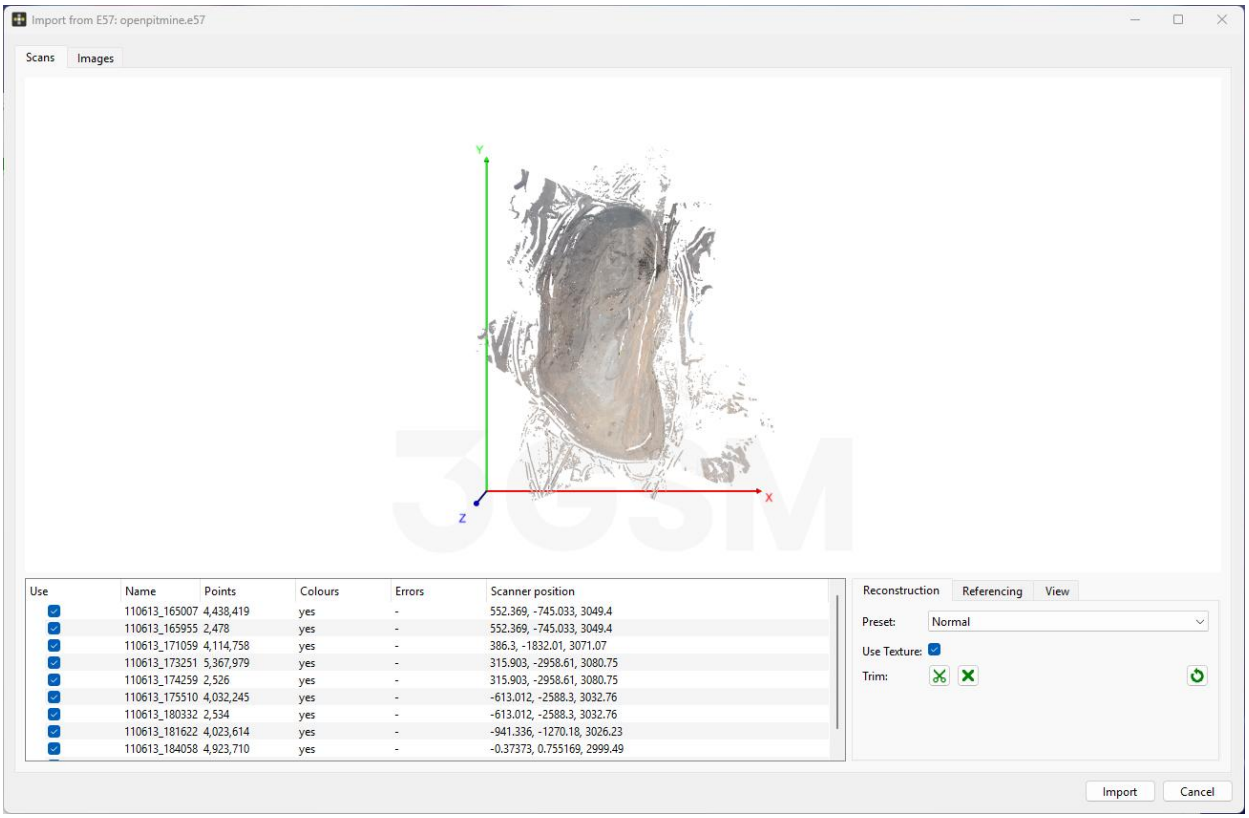
*Blank ModelEditor work page*

This tutorial will use an example Open Pit Mine dataset to demonstrate the laser scanner import feature. The *openpitmine.e57* file (*© Copyright 2011, Riegl LMS GmbH*) can be found in the downloaded **Tutorial 5 – Model Files > Input Files** folder.

To import the Laser Scanner data:

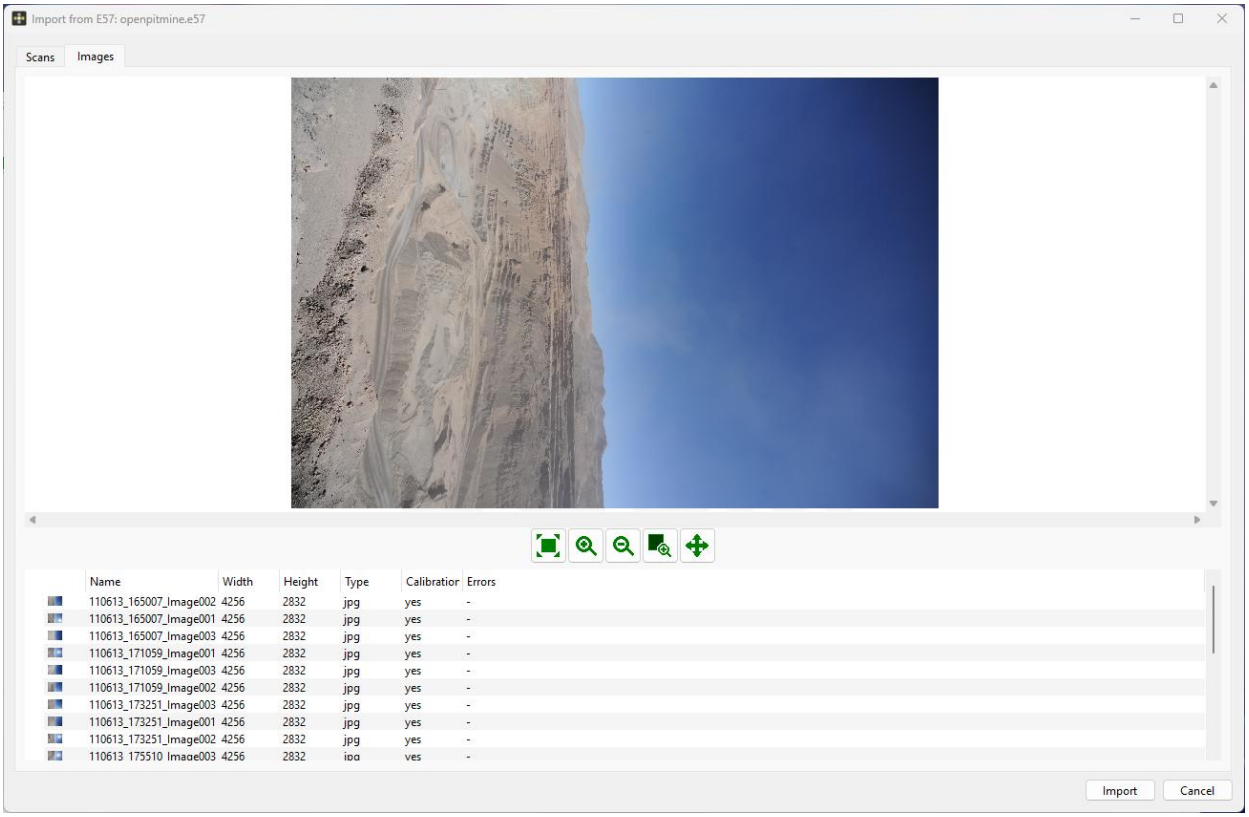
1. Select **File > Import 3D Model > Import from E57.**
2. Select *openpitmine.e57* in the downloaded folder.
3. The **Import from E57** dialog will open and the laser scanner dataset will be imported.

The list of imported scans is presented at the bottom of the **Scans** tab, indicating the name and the number of points for each scan, if any associated colour data is included in the scan, and the scanner's position in space.




*Import from E57 dialog and imported Open Pit Mine dataset (© Copyright 2011, Riegl LMS GmbH) in Scans tab*

Any images associated with the scan data are also imported under **Images** tab. Select the **Images** tab and review the images (texture information) provided with the import.




*Import from E57 dialog and imported Open Pit Mine images (© Copyright 2011, Riegl LMS GmbH) in Images tab*

# 2.0 3D MODEL GENERATION

The **Import from E57** dialog requires **Reconstruction** and **Referencing** inputs to run the reconstruction and generate a 3D model.

The **Reconstruction** tab (in the **Scans** tab) includes the following inputs:

- **Preset:** to define the resolution of detailed object geometry including a detailed point cloud, surface mesh and the texture projected onto the 3D model (if colour data and/or images are available with the scan). There are three presets available:
    - **Fast** dense construction preset generates low resolution topography and low-resolution texture (can be used for volume calculations, etc.).

  - **Normal** dense construction preset is the default preset option and generates medium resolution topography and high-resolution texture (can be used for blast design, single faces and benches for rock mass characterization, etc.).
  - **High** dense construction preset generates high resolution topography and high-resolution texture (can be used for rock mass characterization, etc.).
- **Use Texture:** to enable/disable the texture projected onto 3D model, if colour data and/or images are available with the scan.
- **Trim:** to trim the point cloud in the 3D viewer.

**Note:**

If there is no colour data and/or images available, the **Use Texture** and **Texture Quality** features will be inactive, and the 3D model will be generated without texture information.

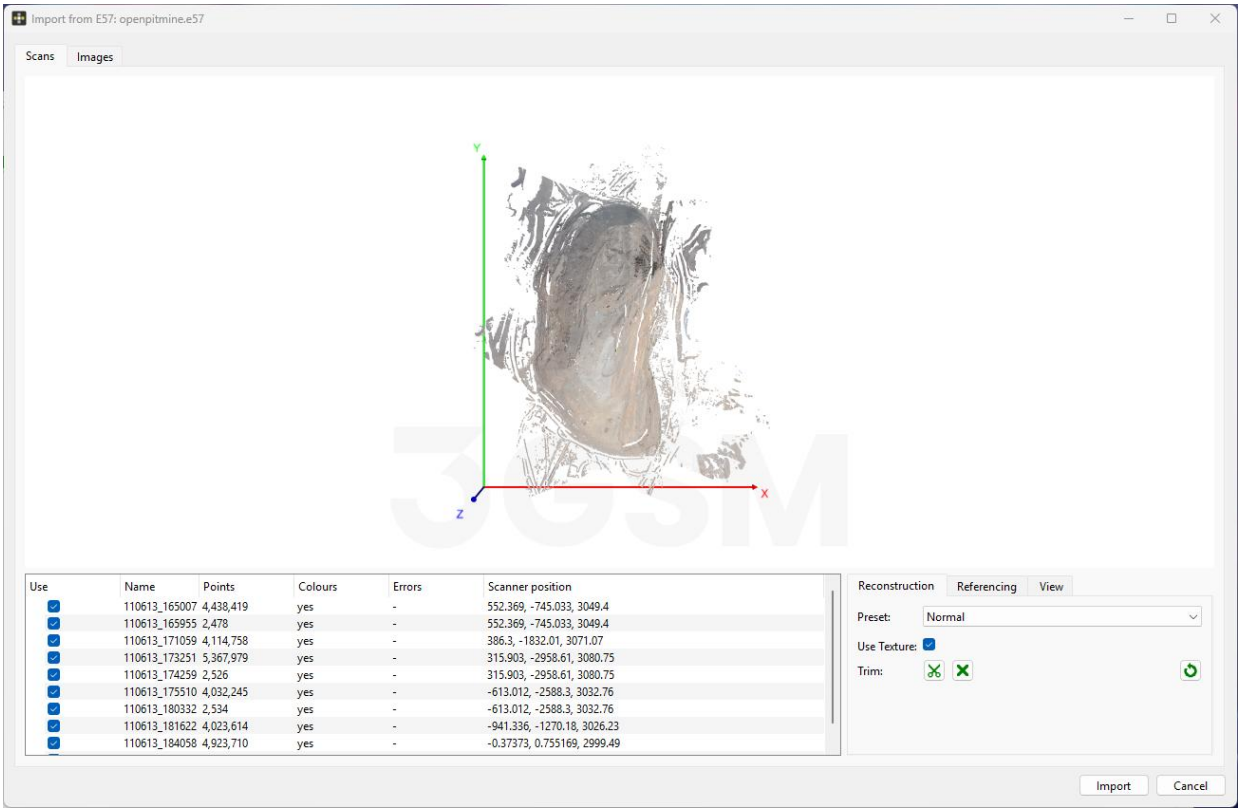
**Tip:** The imported point cloud, extension of the point cloud and the scanner positions can be hidden/shown using the **Point Cloud**, **Bounding Box** and **Scanner Positions** checkboxes in the **Scans > View** tab. The size of the displayed scanners can also be adjusted by using the **Scanner View Size** slider in the View tab.

The **Referencing** tab includes the following inputs:

- **Referencing:** to choose the referencing mode.
- **Coordinate system:** to select the coordinate system if a specific coordinate system is to be used.

## 2.1 Reconstruction

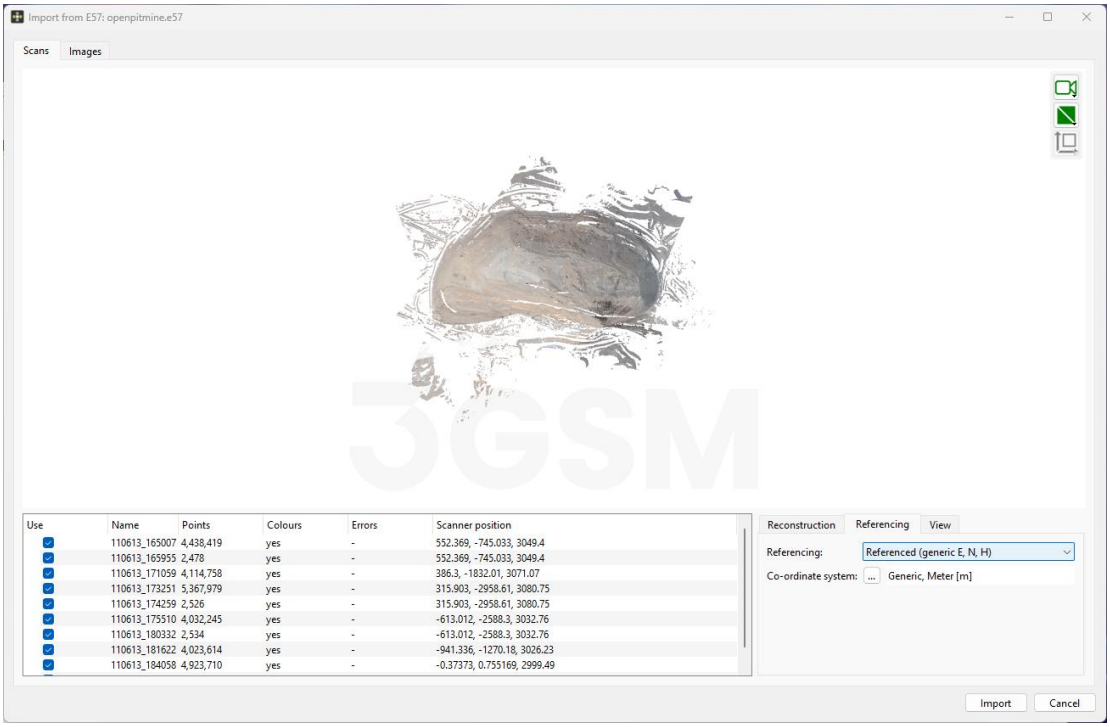
1. Set the following inputs in **Reconstruction** tab:
   a. **Preset = Normal**
   b. **Use Texture = ON**




*Entered inputs in Reconstruction tab*

## 2.2 Referencing

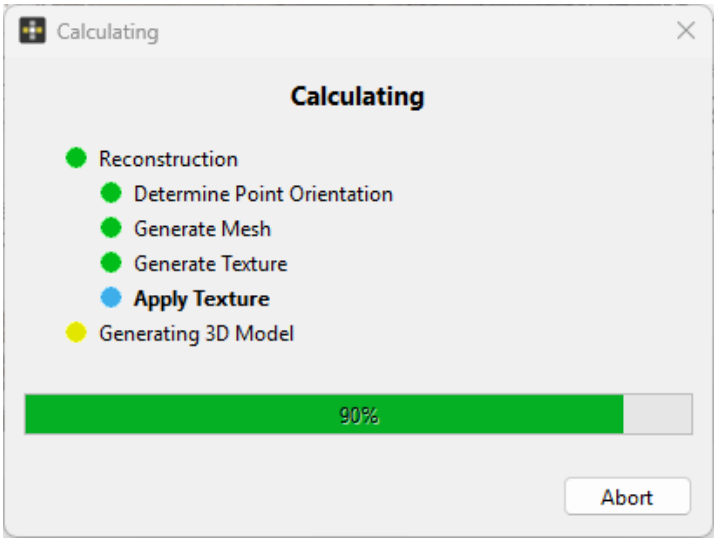
1. Set the following inputs in Referencing tab:
    a. **Referencing = Referenced (generic E, N, H)**
    b. **Co-ordinate system = Generic, Meter [m]**




*Entered inputs in Referencing tab*

2. Click **Import** to confirm the inputs and choose the directory on your computer to save the 3D model *.jm3x* file.

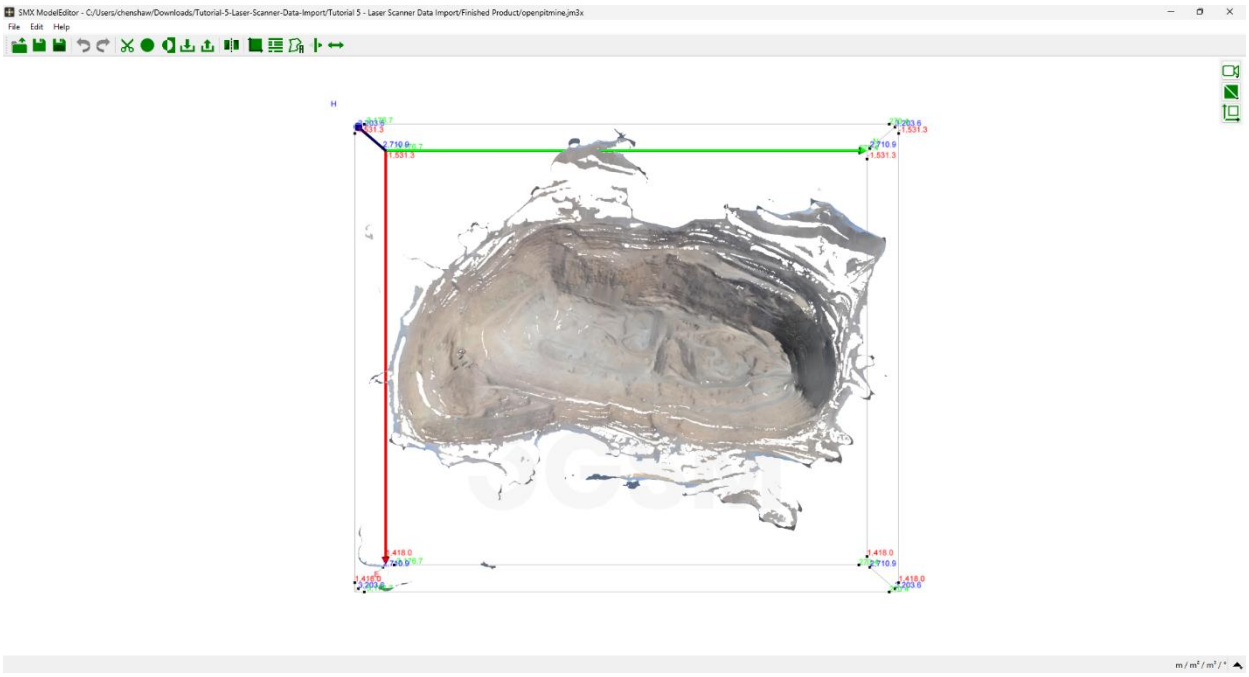
The progress window will appear and reveal the status of the 3D model generation including a live display of progress.



# 3.0 3D MODEL OUTPUT

Once the 3D Model Generation process is completed, a 3D model with texture is generated. An output model file (*.jm3x*) and reconstruction log are automatically saved in the previously selected directory. The resulting 3D model is displayed in the 3D viewer.

Inspect the generated 3D model in 3D Model Viewer and click **Close** to leave ModelEditor.



*Generated 3D model in 3D Model Viewer*

This concludes the tutorial for Laser Scanner Data Import.