MS57 Training guide: Structure light scanning with Artec Space Spider using Artec Studio 15 (RMCA)

1. Start the scanner

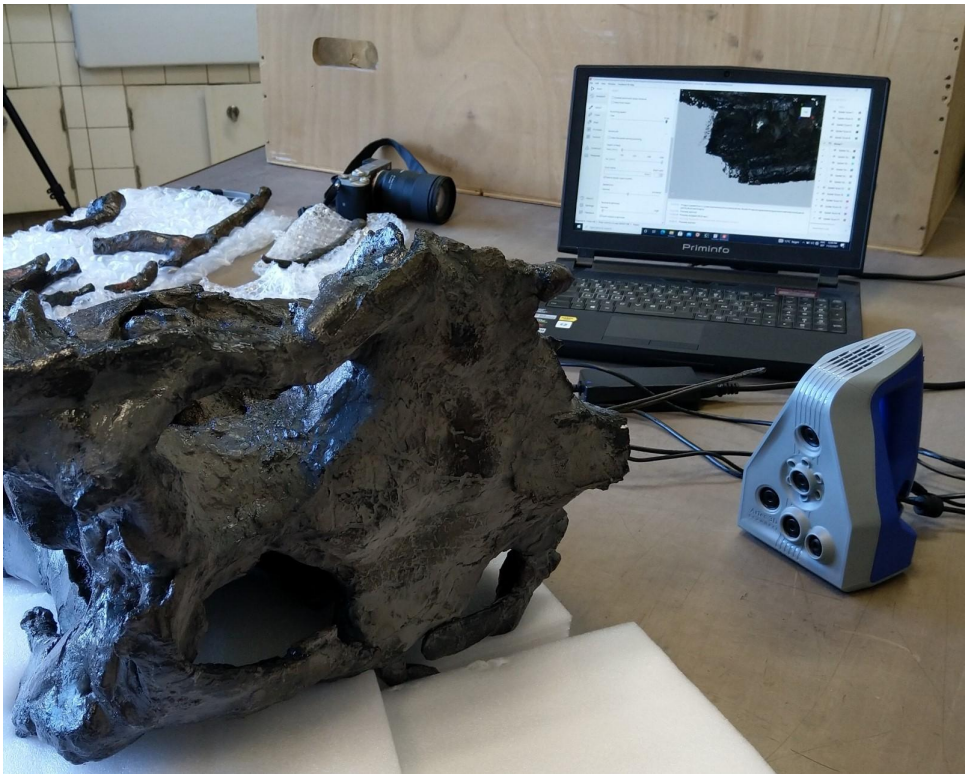
1) The Artec Space Spider is plugged with one usb cable from the computer to a micro-usb on the scanner.
   Additionally, a power cable is plugged into the scanner.
2) Start Artec Studio 15

2. Calibration

Artec recommends the re-calibration of the scanner after transportation, at least once a year, if extra accuracy is required or when using a new computer.

Detail of the procedure is available here:
https://artecgroup.zendesk.com/hc/en-us/articles/201831651-Re-calibration-of-Artec-Spider-Space-Spider

3. Scanning



Artec Space Spider

- Prepare the object you want to scan by placing it, if possible, on a manual turntable or on the Artec turntable[1].

- Plug the scanner in the computer.

- Start **Artec Studio** and select scan.

- To start pre-visualising you scan data **press the button of the scanner upwards**, the scanner will start projecting a light pattern on the object and you can see what data the scanner sees. On your screen you can see a histogram indicating the distance and the amount of data in the view of the scanner. Working distance of Artec Space Spider is between 20 and 30cm from the surface you are scanning, therefore depending on the complexity of the shape of your object you will have to move forward and backward to capture the different planes of the object.

- **To start scanning press again upwards the button at the back of the scanner**. If your object is on a turntable, you can slowly rotate the turntable once you've captured all the data in your view. If you are not using a turntable, start turning around the object with the scanner. Once you have scanned your object completely, **press the button of the scanner down to**

[1] The Artec turntable can load a maximum of 3kg and requires your computer to have bluetooth.

end the scanning.

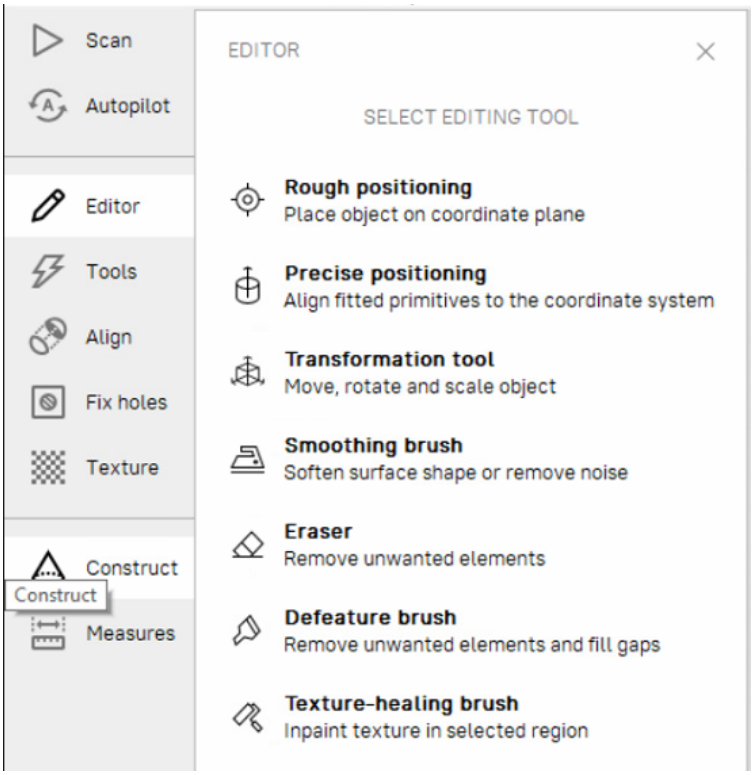
- Turn your object and scan again.

- Once you have scanned your whole object from different views you can start processing your data.

Artec tutorial video: https://youtu.be/wT2SRzSDEBo

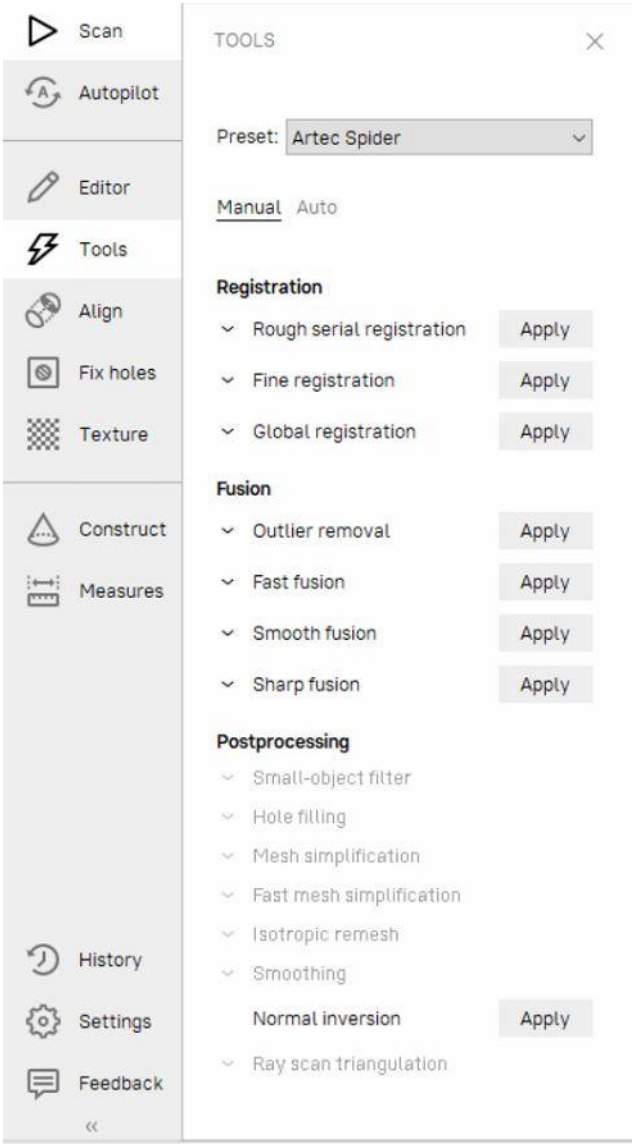
4. Processing with Artec Studio 15

- First, you need to clean your data. Go to **"Editor", select "Eraser".** Several tools are available. Generally, we will select the "lasso" tool. With ctrl pressed, select the unwanted areas of your scan like the background.



- Once you have removed all unwanted data, select your scans and go to **"Align"**. In order to align the different scans together you can do both auto-alignment and manual alignment. For "**auto-alignment"**, select one or several scans and press "auto-alignment", this is a time-consuming operation. If the scans do not align properly, you can perform a manual alignment by moving one scan, with "shift" pressed, to align it to the reference scan (with the blue dot). And then press "Align". If it still does not correctly align, you can perform an auto-alignment again.

- Once alignment is correct, go to tools, perform the following operations:
    - Rough serial registration and Fine registration will perform a quick registration of your scan data. This will reduce the maximum error within your scanned data.
    - Then press "**Global registration"**. It will perform a precise registration of all your scan data. It is time consuming but is an essential operation.
    - Once you are happy with the registration of your scan, you can perform an **"Outlier removal"**. This will remove most of the noise on your data.
    - Now, perform a **"Sharp fusion"**. In sharp fusion you can select if you want a watertight model or not and the size of holes that should be closed. Other fusion modes are available, but will produce a less accurate data set, thus our choice to use "sharp fusion".

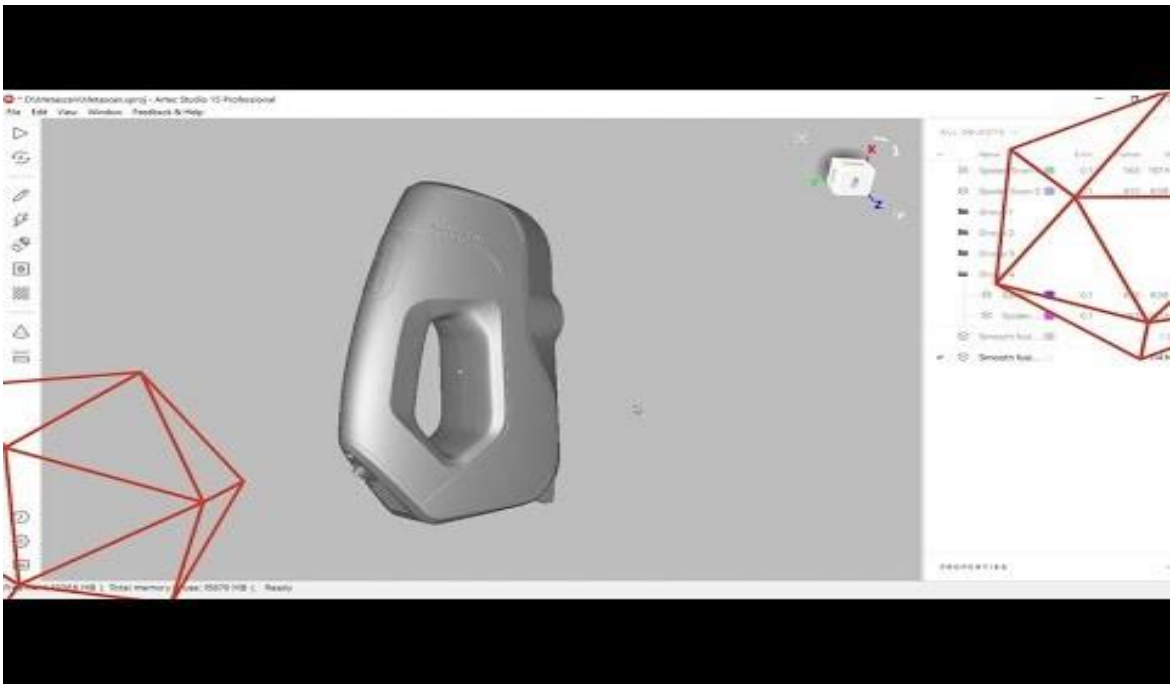


- **Post-processing:**
    - Apply "**Small-object filter**". It will remove part of the mesh not connected to the main model.
    - In "**Mesh simplification**", choose a tolerance of simplification according to the precision of the model you want to obtain. Generally, mesh simplification will be required before texturing.

- **Texturing**
    - In the texturing tab, select the scans you want to use to create your texture. Select “export” and the output texture size you want. You can also use additional options like “remove glare” in case of highly reflective objects or “inpaint missing texture” if you are missing texture data. And press “apply”.
    - Once the texture is calculated, you can modify the exposure, the gamma, the contrast, saturation, etc. Once you have done that, click apply again and you have your final textured model.

- **Export the model as .obj** in order to have the texture and the mesh together.

Artec studio 15 user interface: [Artec Studio 15 – Up close with data processing]



5. Tips

- While scanning, if your scanner loses registration, move back to your previous position or rotate the turntable backward.

- Artec YouTube channels contains many tutorials to help you with your scanning project: https://www.youtube.com/channel/UCcDKxQ3PcdJJOUCyXfT64fQ

6. Credits

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