

# Stonex X120GO

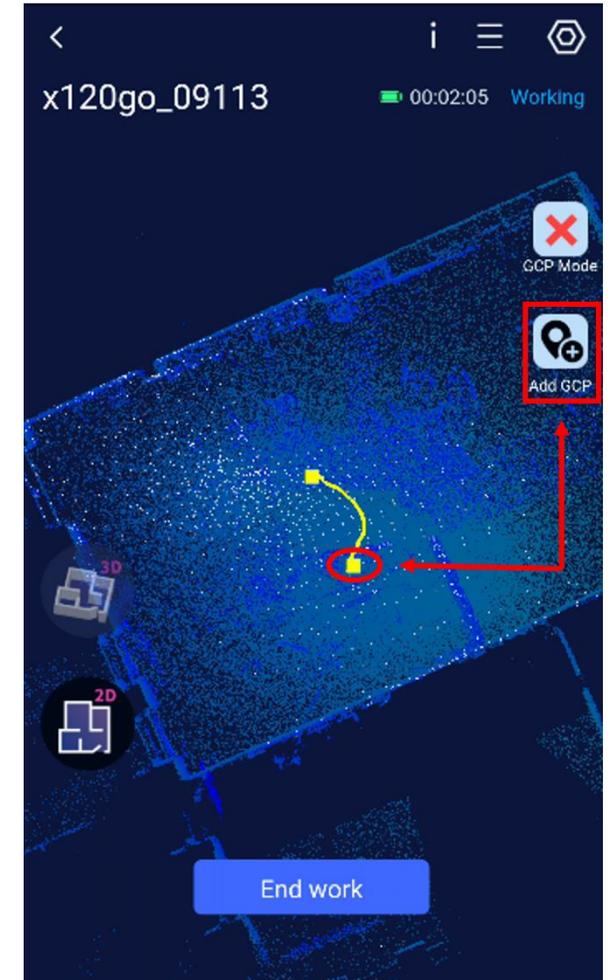
## *How to orientate a point cloud with GCPs*

Tutorial v.1

# GCPs acquisition

To acquire GCPs with 120GO there are two possible ways:

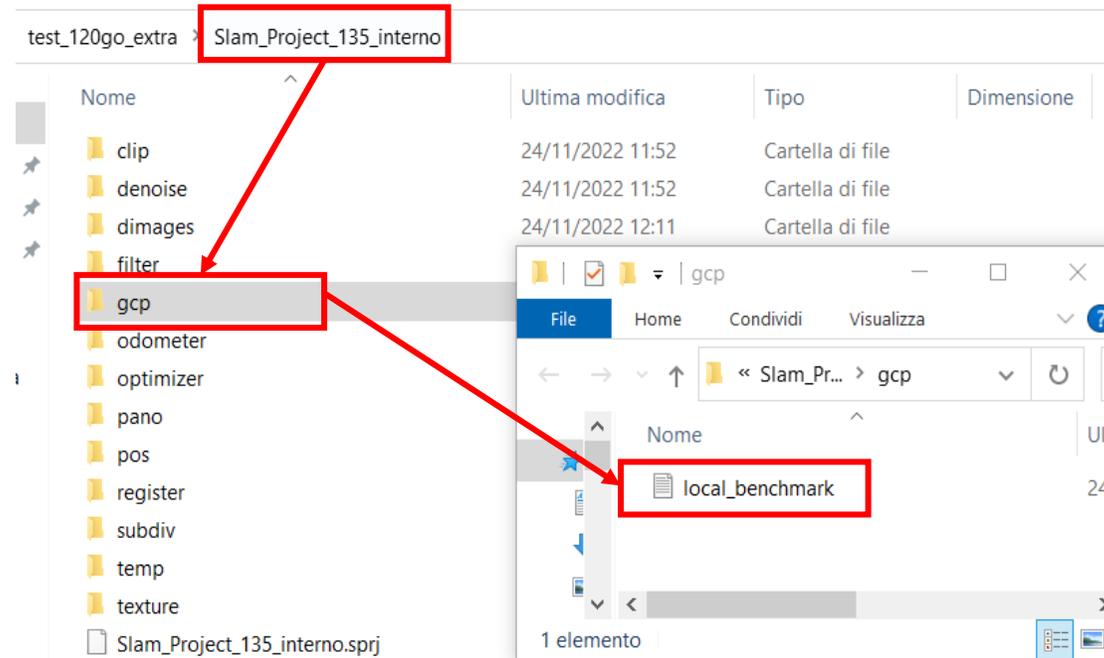
1. Stand still about 10 seconds on a point.
2. In the GOapp, click on the *GCP Mode* icon. While scanning, as you pass above a GCP, stop on it and click the icon *Add GCP*. The software will acquire the position and a message of successful acquisition will be displayed. A yellow square will identify the GCP.



# GOpst orientation

If GCPs were acquired standing still, the information about them will be obtained automatically during the processing of point cloud creation.

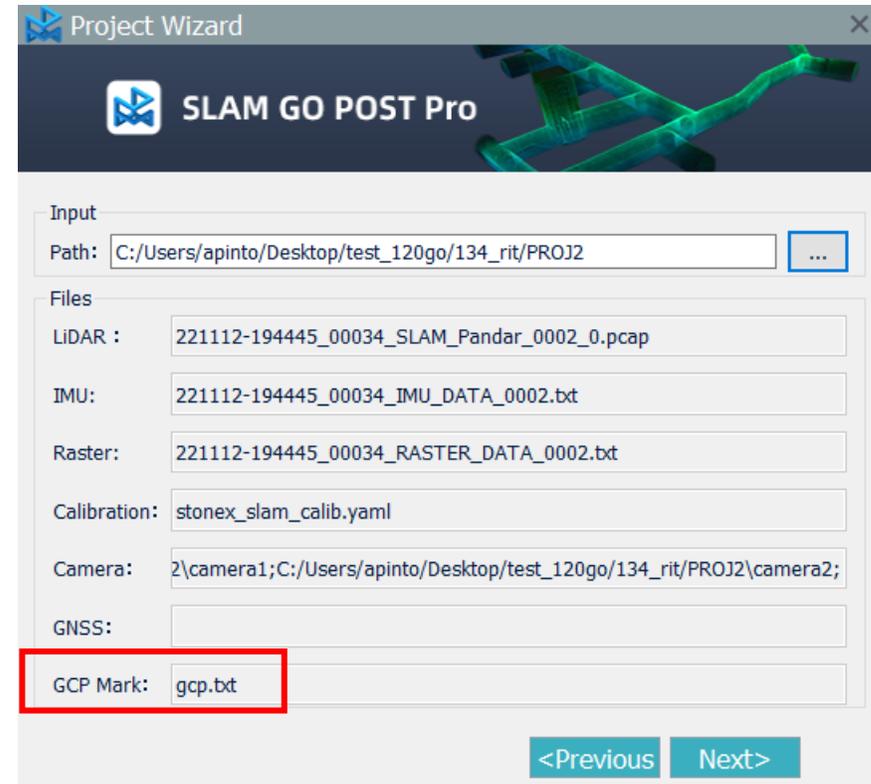
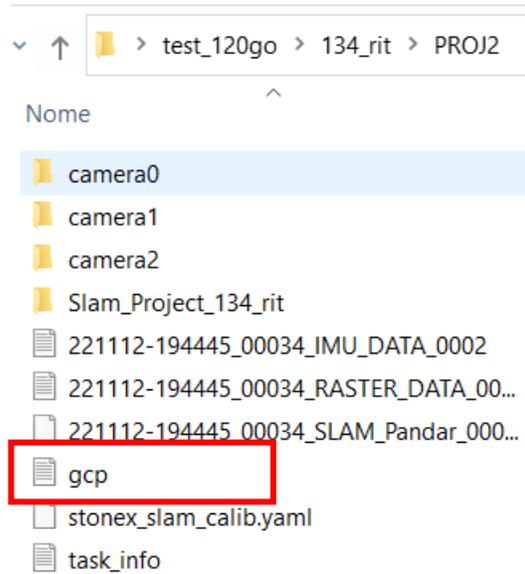
In the project folder, there will be a subfolder called *gcp*. Inside there will be a file called *local\_benchmark.txt*, with the coordinates of GCPs in a local coordinate system.



NOTE: remember to delete the first GCP, since the scanner will save the position of the initialization as a GCP, unless the initialization isn't itself a control point!

# GOpst orientation

If GCPs were acquired through the app, when you download the data in your PC, in the project folder there will be a .txt file called *gcp*. When you import the data in the GOpst software, check if the *gcp.txt* file is called as an input file. When the point cloud is created, in the subfolder *gcp* there will be a file with coordinates of GCPs called *local\_benchmark.txt*.



## GCPs file creation

If you have acquired GCPs coordinates with GPS or total station, create a .txt file with the following format: **point name, easting, northing, height.**

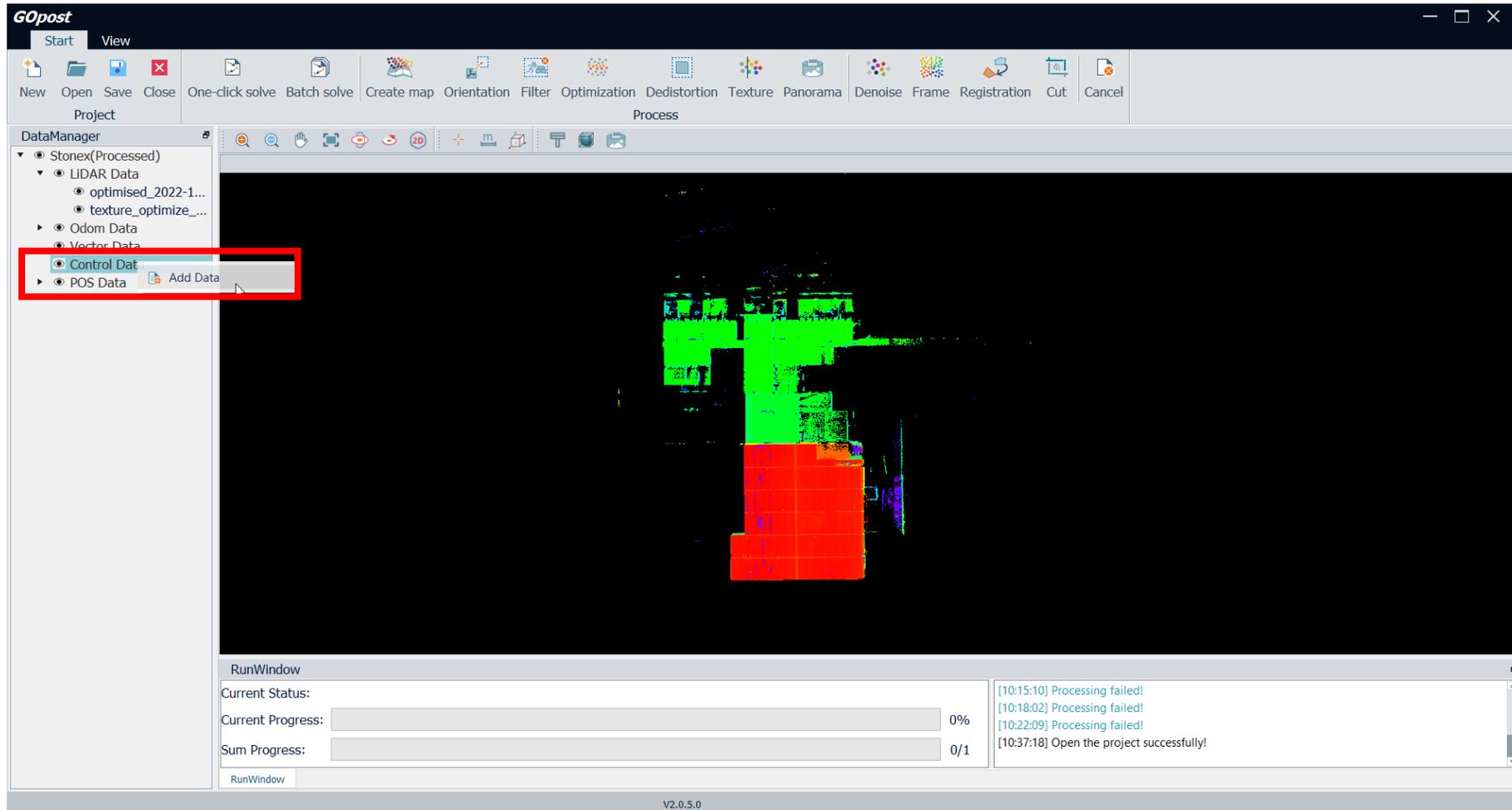
The separator can be either comma or space.

Please be sure to save the points in the order with which you acquired them during the scanning.

```
PtID,East,North,Height
105,-43.9739,27.9214,-0.1931
103,-45.4290,0.6931,0.8562
104,-44.6201,-17.3495,0.7759
102,-19.1088,-0.2728,0.1708
101,4.8659,0.0752,-0.1866
106,-0.2861,28.7795,-0.0462
107,-13.7712,19.4766,-0.1862
```

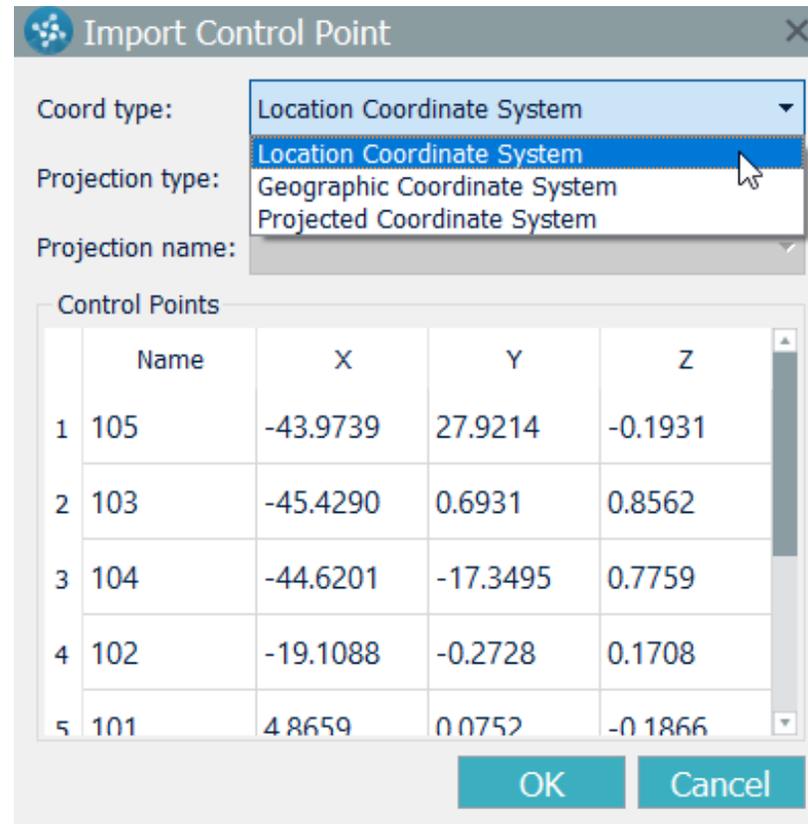
# Gopost orientation

Once the processing of your scanning data is done, right click on *Control Data* and click *add Data*.



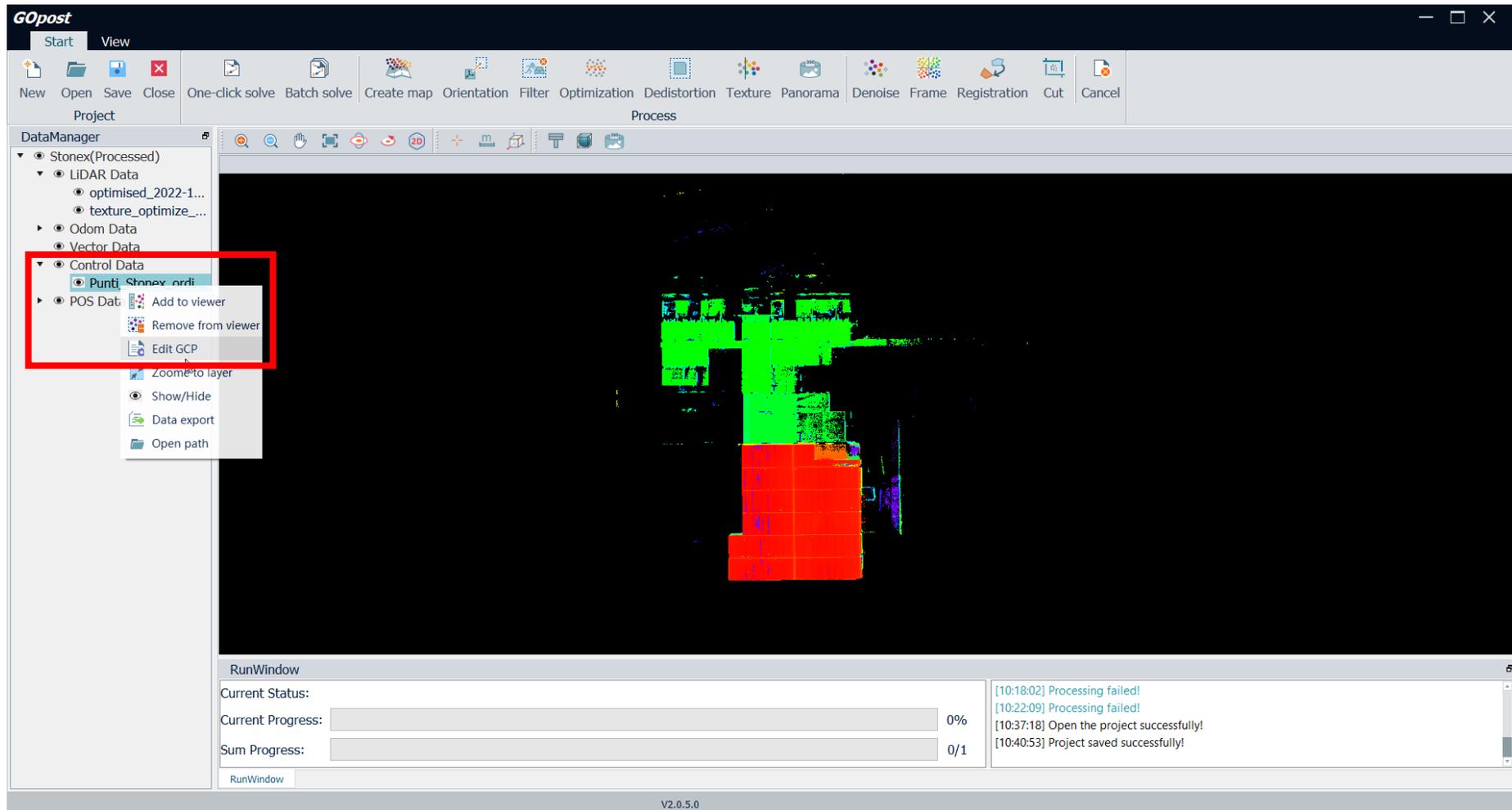
# Gopost orientation

Select the file you just created with your GCPs. Then the import control point window will open. Here you can set the coordinate type, the projection type and name. You will see also a preview of the point you are importing. Click OK when done.



# Gopost orientation

In *Control Data*, right click on the file of the GCPs and click on *Edit GCP*.



# Gopost orientation

In GCP Edit window you can see the preview on the left of the Reference control point, while on the right (called Matching control point) you can see the GCPs saved in the *local\_benchmark.txt*.

The screenshot shows the 'GCP Edit' window with the following settings:

- Coordinate:  Local Coordinate,  Projected Coordinate
- Datum&Projection: Datum **WGS84 UTM**, Coordinate **UTM zone 1N**
- Name:  Order:  X:  Y:  Z:  x:  y:  z:

The window is divided into two preview areas:

- Reference control point:** Shows a cluster of yellow circular markers with numbers 101 through 106.
- Matching control point:** Shows a cluster of yellow cross markers with numbers 1 through 6.

Below the preview areas is a table of control points:

	Name	Order	Check	X	Y	Z	x	y	z
1	105	1	<input type="checkbox"/>	-43.9739	27.9214	-0.1931	23.046	3.11	-0.323
2	103	2	<input type="checkbox"/>	-45.429	0.6931	0.8562	-4.154	3.65	0.695
3	104	3	<input type="checkbox"/>	-44.6201	-17.3495	0.7759	-22.126	2.329	0.587
4	102	4	<input type="checkbox"/>	-19.1088	-0.2728	0.1708	-4.369	-22.574	-0.033
5	101	5	<input type="checkbox"/>	-4.8650	0.0752	-0.1866	-3.135	-46.534	-0.315

Buttons: **OK** and **CANCEL**

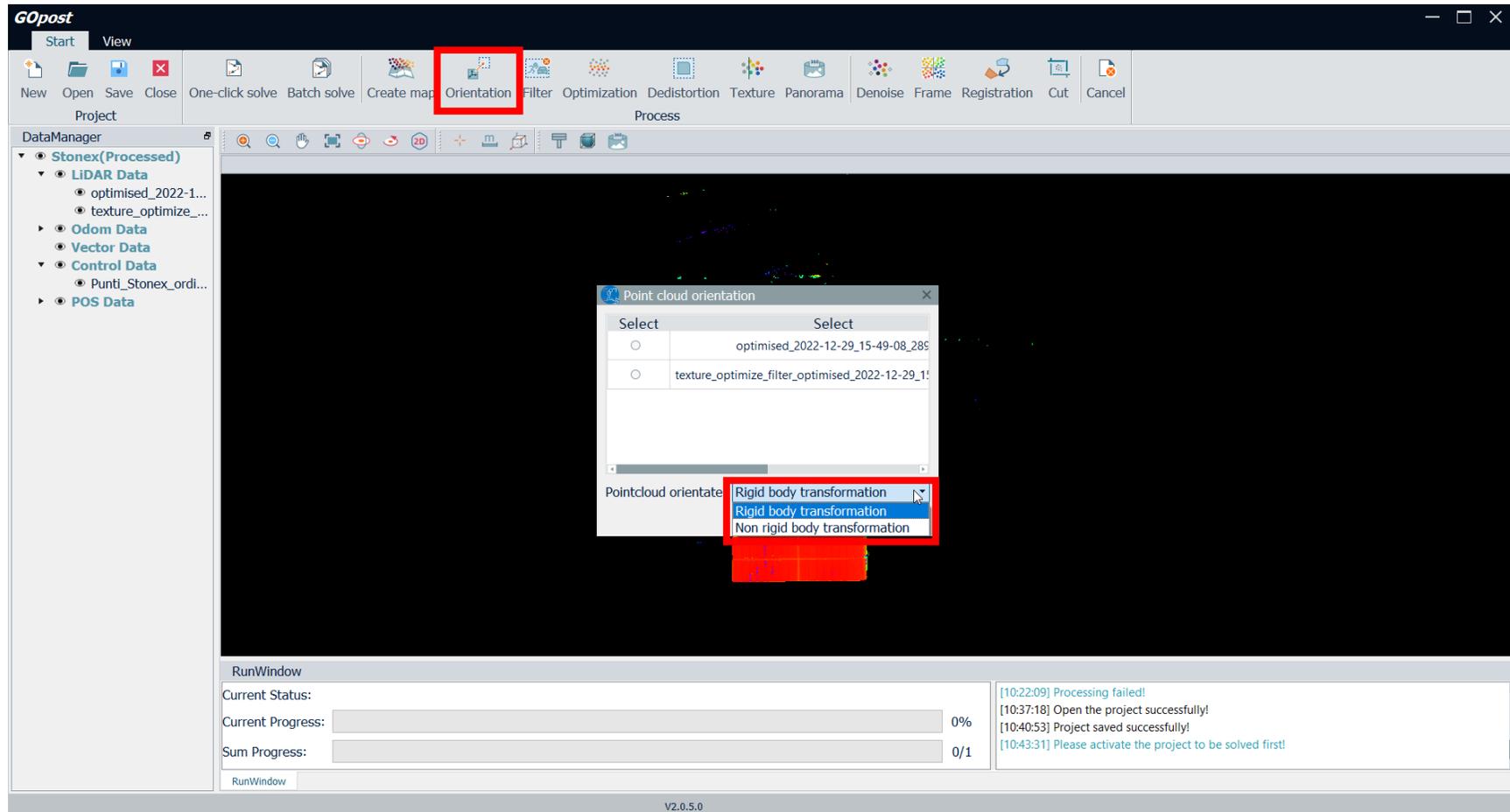
# Gopost orientation

Here you can check if the order of the GCPs is coherent, or you need to add or remove some control points. To do so you have to manually modify one of the two GCP file. In this case the point 8 was not present in the Reference system, so it must be deleted from the file. Once all is done, click *OK*.

Name	Order	Check	X	Y	Z	x	y	z
102	4	<input type="checkbox"/>	-19.1088	-0.2728	0.1708	-4.309	-22.374	-0.033
101	5	<input type="checkbox"/>	4.8659	0.0752	-0.1866	-3.135	-46.534	-0.315
106	6	<input type="checkbox"/>	-0.2861	28.7795	-0.0462	25.32	-40.453	-0.319
107	7	<input type="checkbox"/>	-13.7712	19.4766	-0.1862	15.608	-27.301	-0.438
8	8	<input checked="" type="checkbox"/>				-0.06	-3.908	-0.203

# Gopost orientation

Now you can click on *Orientation*. In the window that will open select the cloud you want to orientate, and choose between a Rigid body or a Non rigid body transformation. Once done, click OK.



# Gopost orientation

When the process is done, you can find, inside your project folder, in the *gcp* subfolder, the orientated point cloud (.las format), the IMU position file oriented and a report with the accuracy of the process.

Nome	Ultima modifica	Tipo	Dimensione
clip	29/12/2022 15:16	Cartella di file	
denoise	29/12/2022 15:16	Cartella di file	
dimages	29/12/2022 16:17	Cartella di file	
filter	29/12/2022 15:53	Cartella di file	
<b>gcp</b>	30/12/2022 10:44	Cartella di file	
modemeter	29/12/2022 15:51	Cartella di file	
optimizer	29/12/2022 16:13	Cartella di file	
File:...	29/12/2022 16:40	Cartella di file	
pos	29/12/2022 15:51	Cartella di file	
register	29/12/2022 15:16	Cartella di file	
subdiv	29/12/2022 15:16	Cartella di file	
temp	29/12/2022 15:51	Cartella di file	
texture	29/12/2022 16:49	Cartella di file	
Stonex	30/12/2022 10:40	File SPRJ	277 KB

Nome	Ultima modifica	Tipo	Dimensione
gcp_texture_optimize_filter_optimised_2...	30/12/2022 10:44	File FMI	1.760.903 ...
gcp_texture_optimize_filter_optimised_2...	30/12/2022 10:44	File LAS	1.760.452 ...
IMUPOS.bin	30/12/2022 10:44	File BIN	51.455 KB
<b>IMUPOS</b>	30/12/2022 10:44	Documento di testo	34.401 KB
local_benchmark	29/12/2022 15:51	Documento di testo	1 KB
<b>report_gcp_texture_optimize_filter_optim...</b>	30/12/2022 10:44	Microsoft Edge PD...	67 KB