

# How to convert your point cloud data into .Las / .Laz?



**Pointly** will work with the data format LAS or LAZ.  
The preferred upload format is LAZ because of its compression.

**Excuse:** A LAS (LiDAR Aerial Survey) is an open and binary file format which stores LiDAR point cloud data and a point classification system. It is specified by the American Society for Photogrammetry and Remote Sensing (ASPRS) and its latest Version is LAS 1.4. The purpose of LAS is to function as a standard format between LiDAR tools, including hardware and software. It is seen by the majority as an industry standard for LiDAR data.



Convert your point cloud data within a few clicks with the help of open source solutions like:

- **CloudCompare**
- **LASzip or**
- **PDAL**

**But how do I convert benchmark point cloud data sets?**



Convert any kind of file format using **Python** and the accompanying LAS packages **laspy** and **Open3D**

**Example of approach** with Semantic3D, a benchmark point cloud data set (**convert in 4 steps**)

1. Read-in the text files using e.g. pandas

```
raw = pd.read_csv(PATH_TO_DATA_FILE, sep=' ', header=None).values
labels = pd.read_csv(PATH_TO_LABEL_FILE, sep=' ', header=None).values[:,0]
```

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- 2. Extract the coordinate, the color and intensity information (in this case xyz is stored in the first 3 columns, rgb in columns 5 to 7 and intensity in the 4th column)

```
xyz = np.ascontiguousarray(raw[:, 0:3], dtype='float32')  
rgb = np.ascontiguousarray(raw[:, 4:7], dtype='uint8') * 256  
i = np.ascontiguousarray(raw[:, 3], dtype='float32') * 256
```

- 3. Create an empty LAS file with the desired LAS-version and format. Define the necessary header attributes offset and scale to fit the data.

```
hdr = laspy.header.Header(file_version=1.4, point_format=7)  
mins = np.floor(np.min(xyz, axis=1))  
hdr.offset = mins  
hdr.scale = [0.01,0.01,0.01]  
outfile = laspy.file.File(PATH_TO_OUTPUT_LAS, mode="w", header=hdr)
```

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- 4. Write the desired dimensions to the LAS-file – DONE!

```
outfile.x = xyz[:,0]  
outfile.y = xyz[:,1]  
outfile.z = xyz[:,2]  
outfile.Red = rgb[:,0]  
outfile.Green = rgb[:,1]  
outfile.Blue = rgb[:,2]  
outfile.Intensity = i  
outfile.classification = labels  
outfile.close()
```



How to compress LAS into LAZ?  
PDAL is one tool for an easy compression. Here (<https://pdal.io/workshop/exercises/translation/compression.html>) you'll find a detailed description on how it works.