How to use Pick-it Flex

This article describes how to get started with the Pick-it Flex engine. The Pick-it Flex engine easily finds geometric shapes (cylinders, boxes, planes, circles ...) and can handle a variety of sizes with one configuration.

Working with Pick-it Flex is all about clustering (grouping) of points. The Pick-it camera captures the scene and converts it into points with depth information (point cloud). For Pick-it Flex we need to split this point cloud into several clusters (step 3 (#step-3)), each cluster is then used to match a geometrical shape on it (step 4 (#step-4)).

The typical workflow when using the Flex engine is as following:

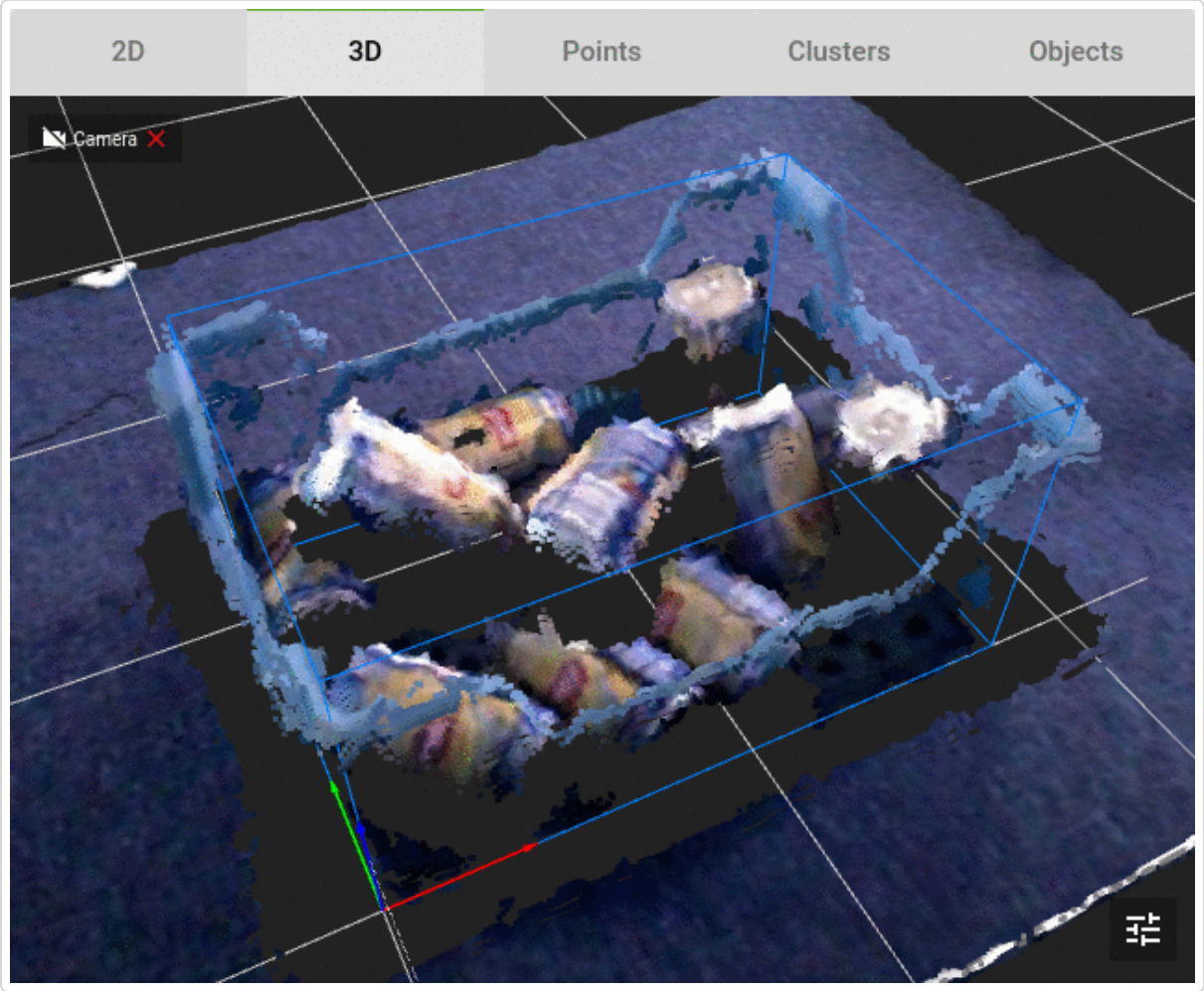
1. Choose the vision engine (#step-1)
2. Optimize the 3D image (#step-2)
3. Group points into clusters (#step-3)
4. Reject clusters (#step-4)
5. Fit objects (#step-5)
6. Invalidate objects (#step-6)

1. Choose vision engine

On the **Detection** page select **Pick-it Flex** under the Detection algorithm option.

If you don't see this option on your Pick-it system contact us on support@pickit3d.com (mailto:mailto:support@pickit3d.com).

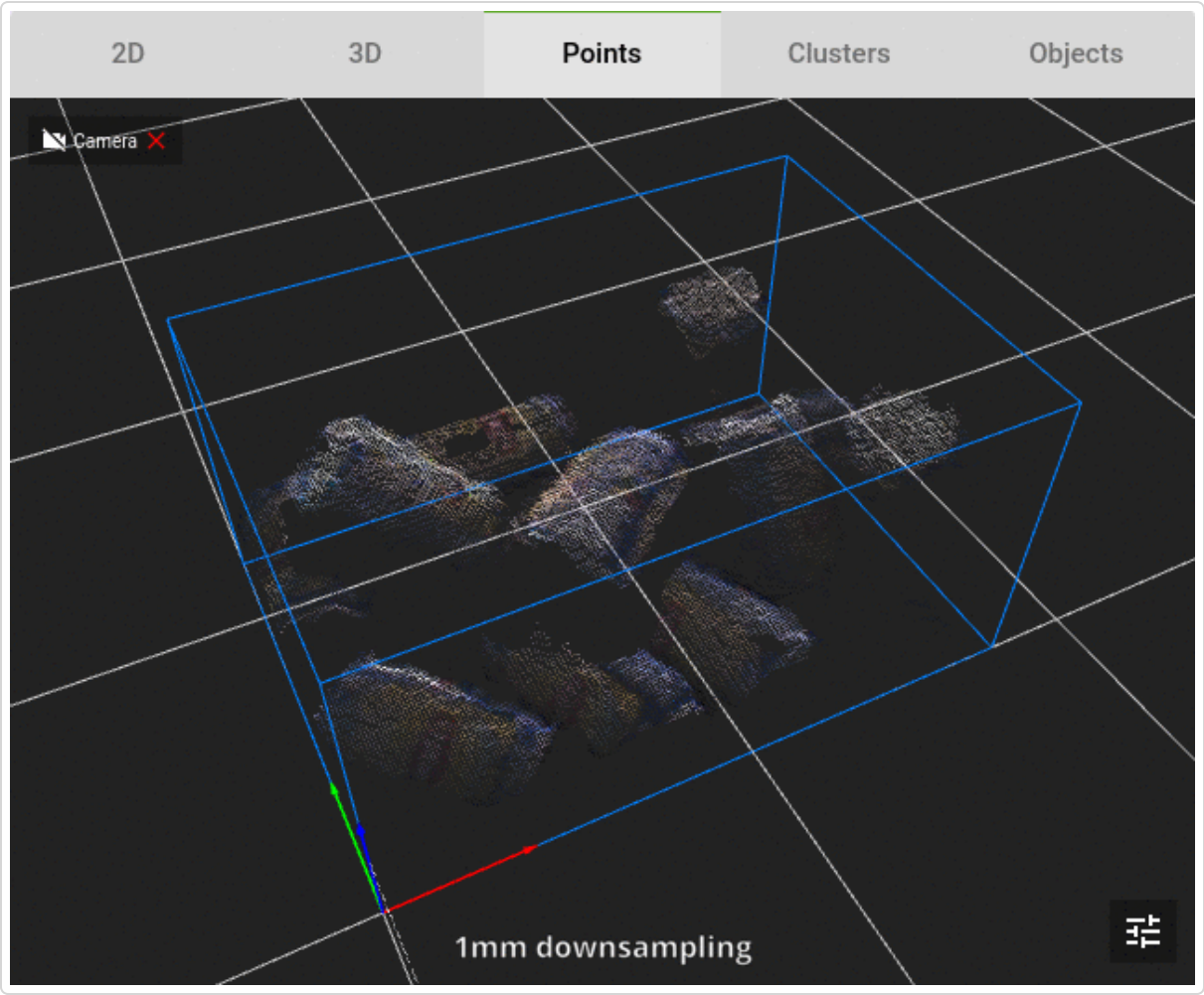
2. Optimize the 3D image



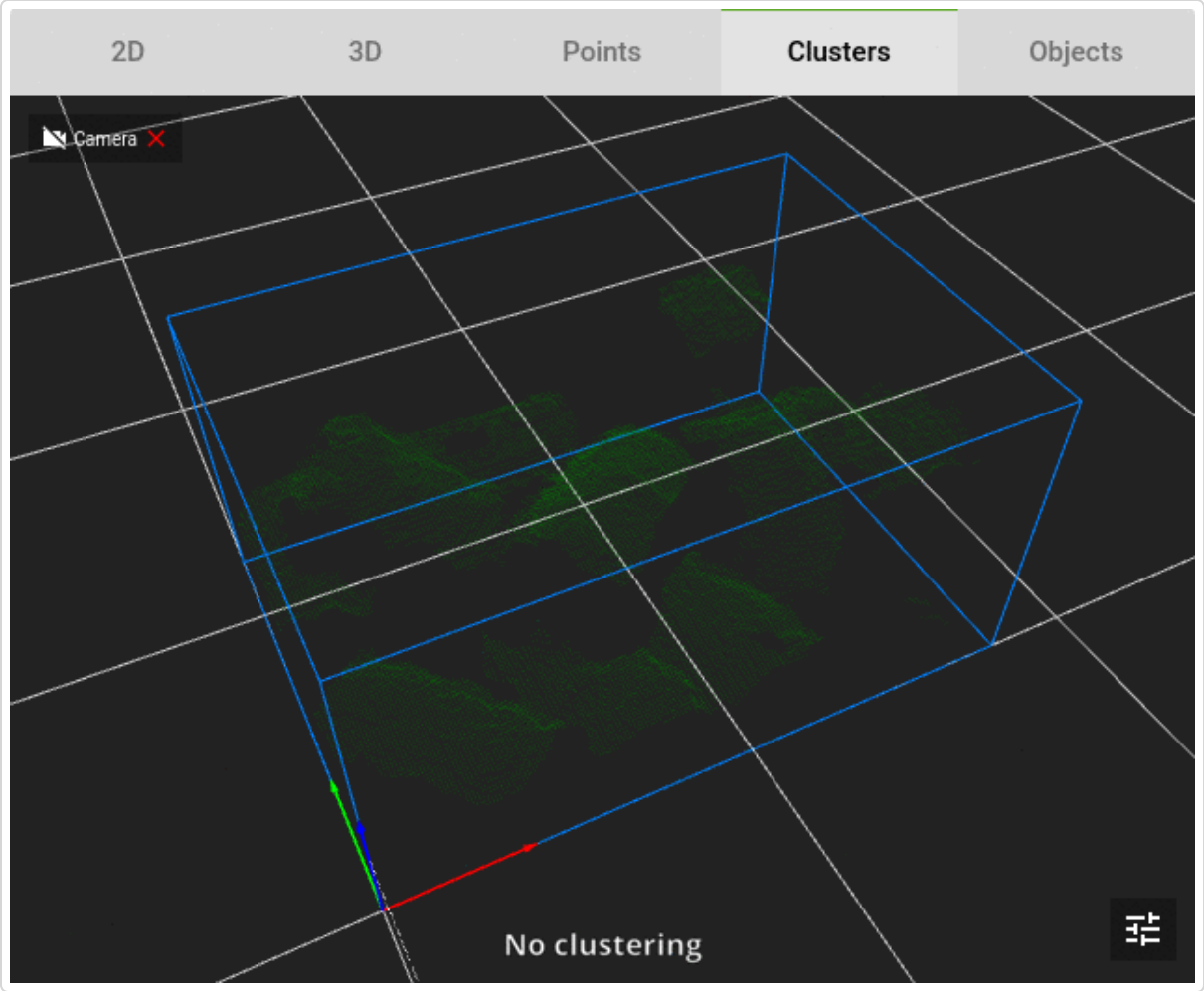
Select the **Points** view, press the **Check** button and make sure your objects are visible inside the blue ROI box. You can now configure how many points used for object detection.

- Number of Images for Fusion (//support.pickit3d.com/article/30-explaining-the-flex-detection-parameters#fusion)
- Scene downsampling resolution (//support.pickit3d.com/article/30-explaining-the-flex-detection-parameters#downsampling)

(//support.pickit3d.com/article/30-explaining-the-flex-detection-parameters#downsampling)



3. Group points into clusters

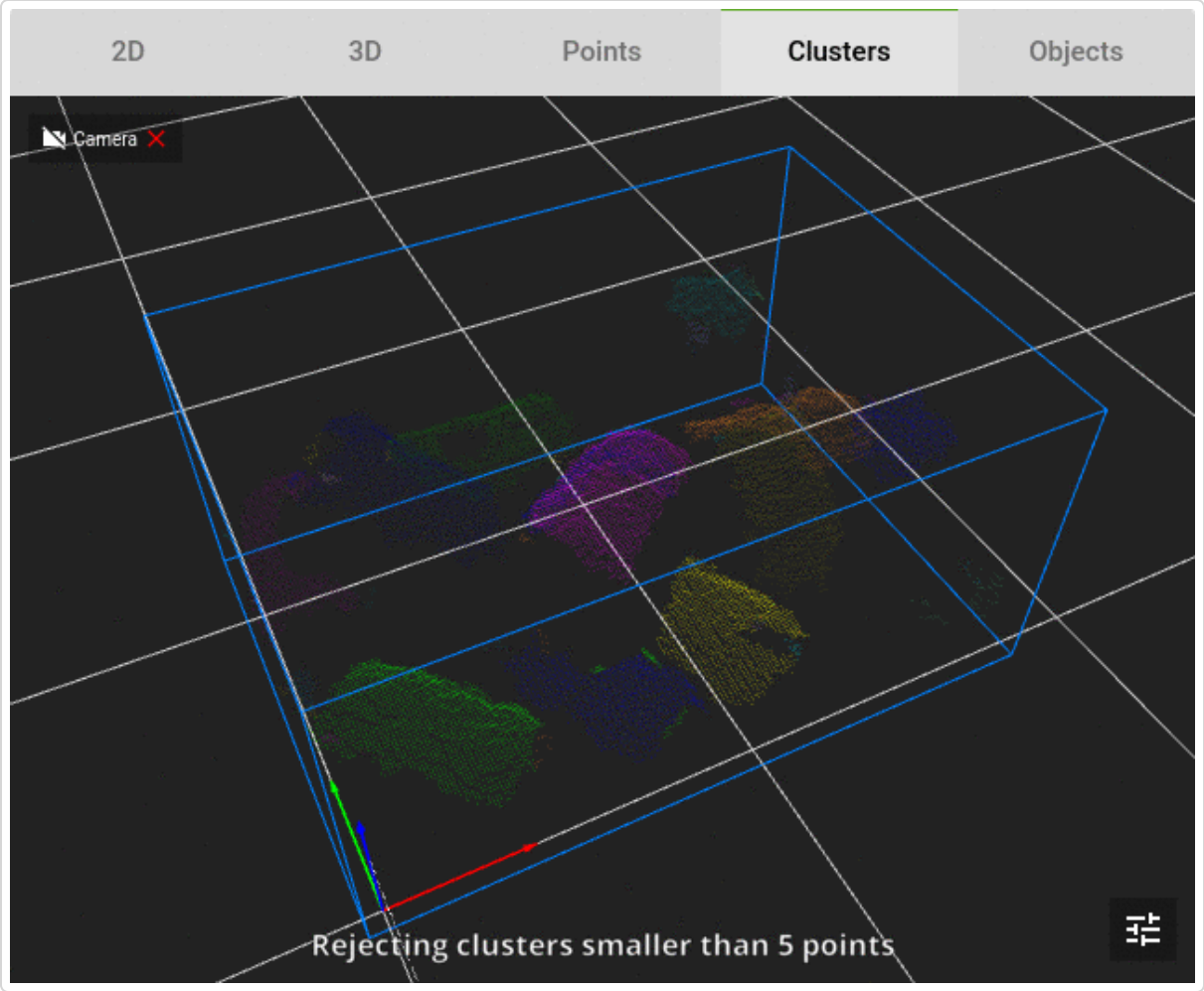


Select the **Clusters** view. Clustering points is a way of grouping points belonging to individual objects.

- No clustering (//support.pickit3d.com/article/30-explaining-the-flex-detection-parameters#no-clustering) is combining all cloud points into a single cluster. This is mostly used with single objects, or to check if there is something to found within the blue ROI box.
- Distance-based clustering (//support.pickit3d.com/article/30-explaining-the-flex-detection-parameters#distance-based-clustering) is ideal for clustering non-touching objects of simple geometrical shapes.
- Normal-based clustering (//support.pickit3d.com/article/30-explaining-the-flex-detection-parameters#normal-based-clustering) is ideal for clustering touching objects of simple geometrical shapes.

Good clustering typically leads to one (or sometimes more) cluster(s) per physical object under the camera.

4. Reject clusters

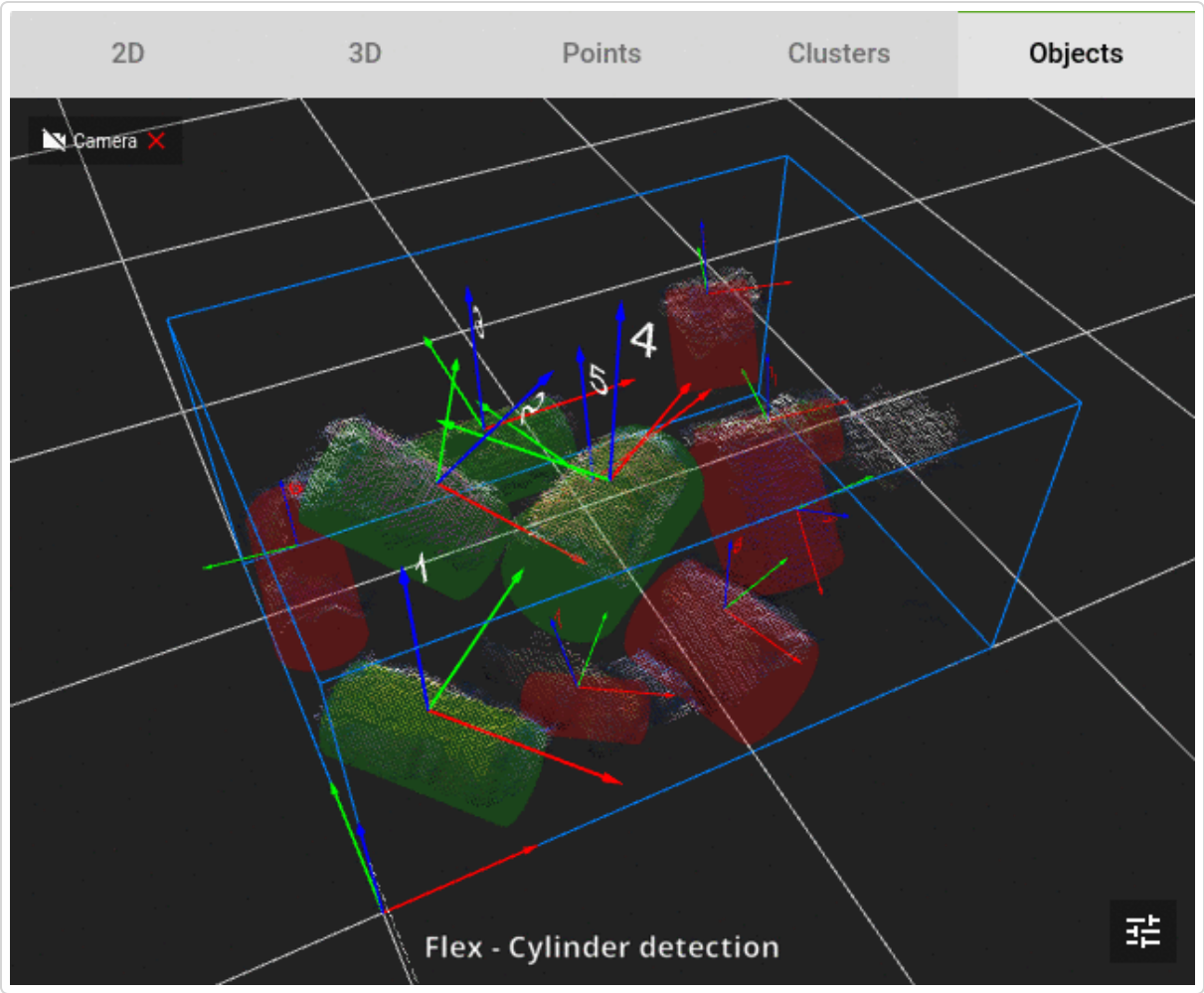


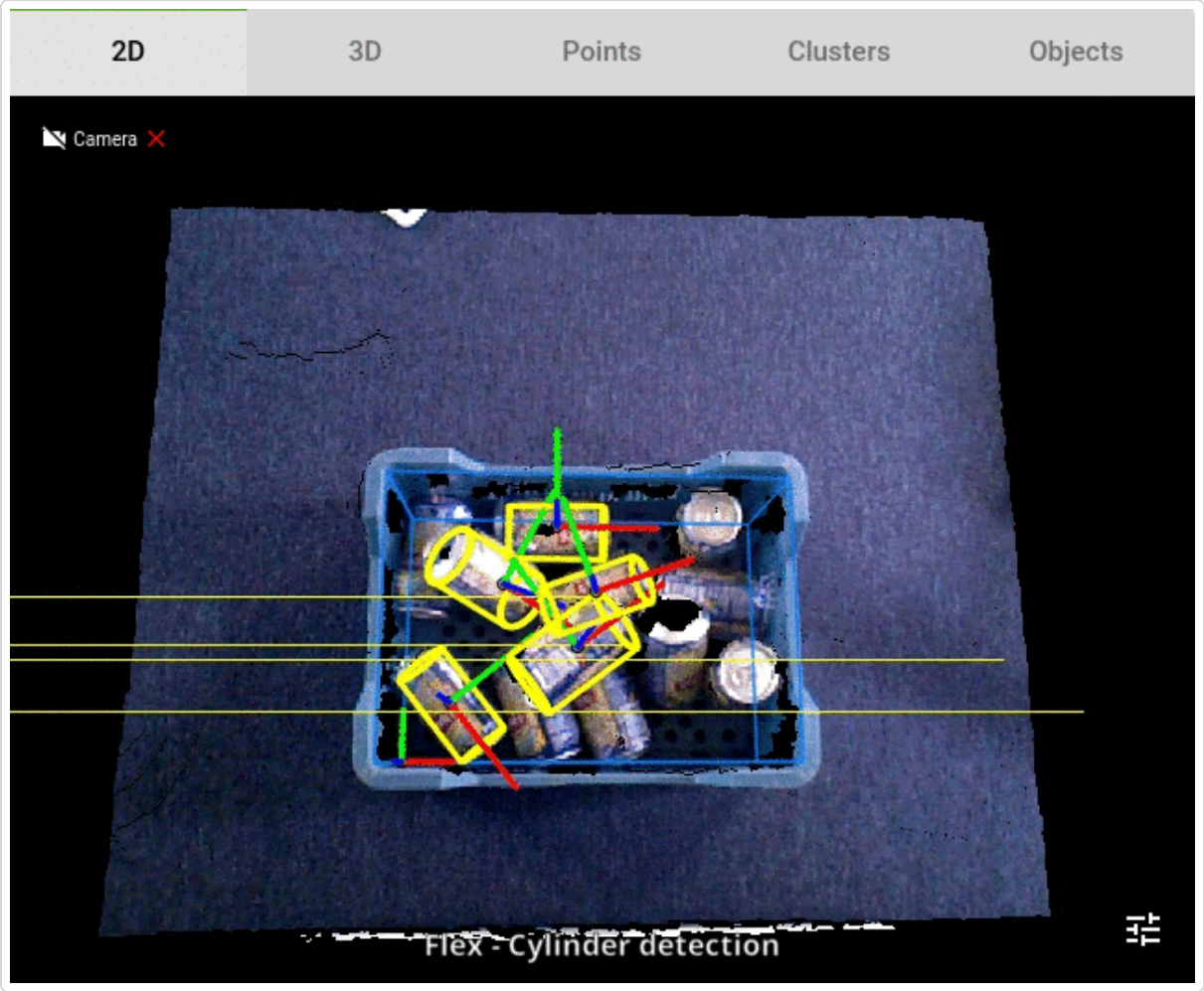
Exclude clusters regarding on their size and dimensions. Good practices for rejecting clusters are:

- Remove very small clusters that will never allow a good match.
- In case you have large objects; increase the minimum number of points in a cluster.

> **Note:** If you have **Cluster size in № of pts** set you have to review your values after modifying the **downsampling** parameter.

5. Fit objects


2D
3D
Points
Clusters
Objects
Camera
1
2
3
4
5
Flex - Cylinder detection



Define the kind of model you want to find in your cluster. Below we have a list of typical applications for each object model:

- **Square** and **rectangle**: cardboard packaging, plastic bags, industrial objects
- **Circle** and **ellipse**: industrial rings, pipe ends, top of soda cans
- **Cylinder**: coke cans, tubes, bottles
- **Sphere**: oranges, footballs
- **Blob** is perfect for detecting objects that can be very well clustered but don't have a geometrical shape. Examples for these are vegetables and fruit (bananas, peppers ...) and special shaped boxes typically on a conveyor belt.

6. Invalidate objects

The Pick-it detection grid (//support.pickit3d.com/article/57-the-pick-it-detection-grid) is a very helpful tool for improving the reliability of your detections.

Still need help? Contact Us (/contact)

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