

WFZ

Zero Point Position

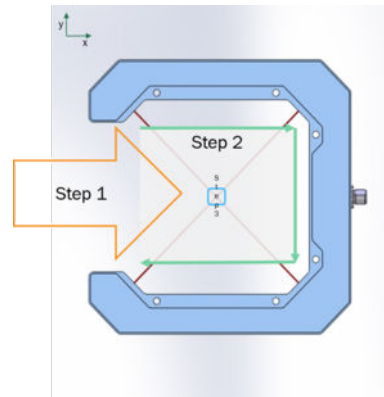
Find the TCP in 3 steps

SICK
Sensor Intelligence.



1 Find TCP in 3 steps

This documents gives some detailed information how to use the sensor.
It describes the three steps to find the TCP:



Step 1 (Rough TCP):

- Go into direction to center point

Step 2 (Find exact TCP in a flat surface)

- Moving around with a wide square orientation
- Calculate the center point from the switching points

Step 3 (3rd axis)

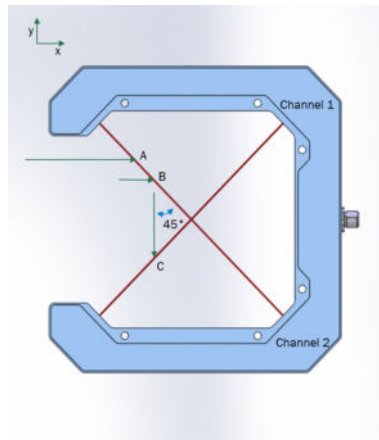
- Find the height of the TCP (3rd axis)



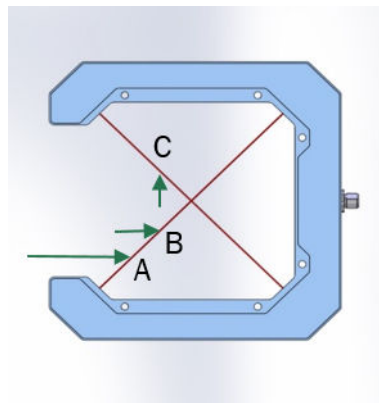
NOTE

Step 1 can be skipped if you know the fork orientation

2 Step 1 (Rough TCP)



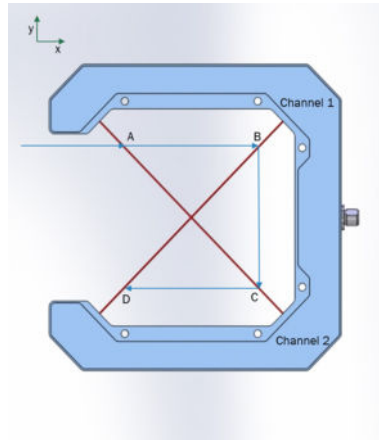
- Move until cross the Channel 2 (Q2) ore Channel 1 (Q1) → A
- Make a parallel movement until crossing Channel 2 ore Channel 1 again → B¹⁾
The first crossing channel define the flowchart



- Move in 45° of the founded Channel 2 direction until cross Channel 1
- Now you can calculate center point

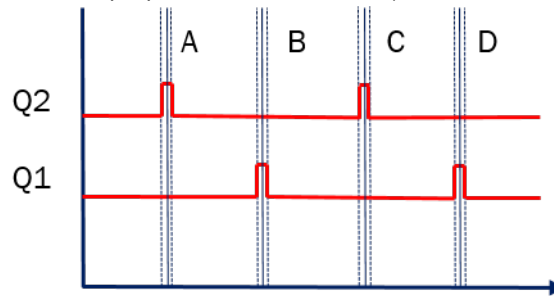
1) If you cross Q2 first then move down /
If you cross Q1 first than move up

3 Step 2 (find exact TCP in a flat surface)



Based on the information of Step1 we move the target in a wide rectangle, using the maximum size of the WFZ.

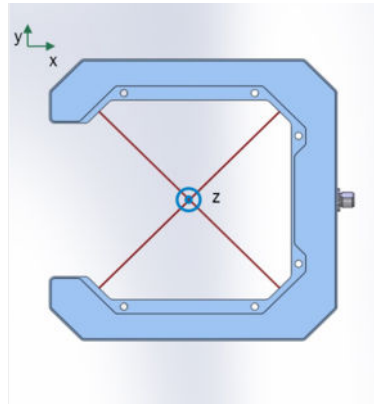
- While moving you collect the positions from every beam crossing
- Make sure that you collect the rising and falling position
- Use the middle of rising and falling position for the axis position
- Move in 3 perpendicular directions (cross direction known from step 1)



- Calculate the precise position x and y of the TCP using the four triangles.
 - A,B,C → TCP₁
 - B,C,D → TCP₂
 - C,D,A → TCP₃
 - D,A,B → TCP₄
 - TCP_{final} = MEAN (TCP₁,TCP₂ ,TCP₃,TCP₄)

Do this in a second sequence with delta Z for surface orientation.

4 Step 3 (3rd axis)



- Move into the calculated TCP (x, y)
- Move in z direction until both light switches (Q1, Q2) are change logic
- Store z position of the TCP → (x,y,z) is defined

