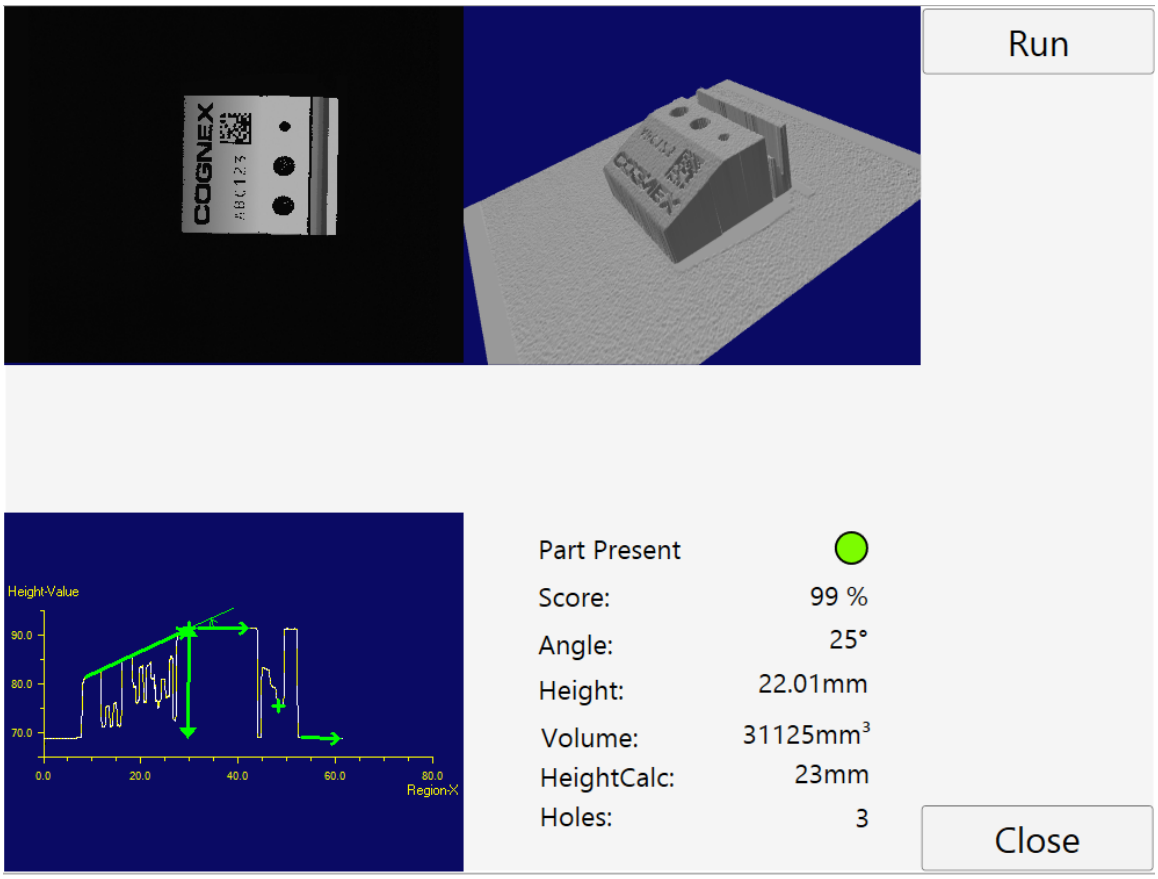
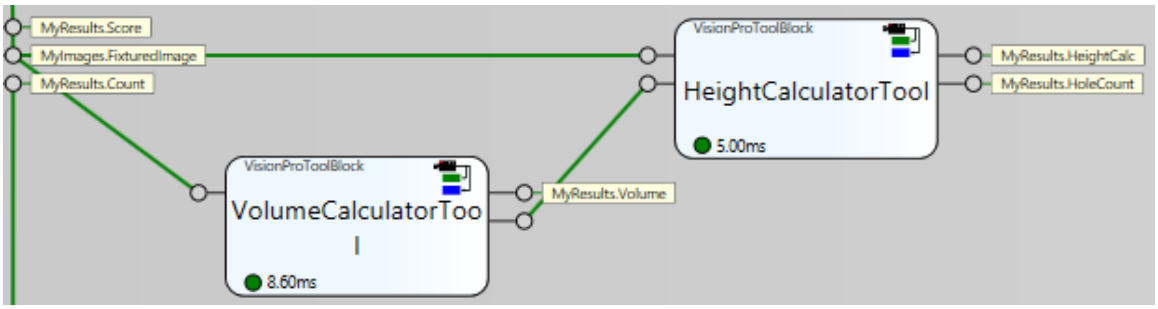
Cognex Designer Standard – Section 7
Height Tool Lab
Approximate Duration: 30 minutes

EXPECTED OUTCOMES:

- Use Fixtured image with the Height Tool
- Learn about the Height and Plane Estimator Tool
- Add formatted results to the HMI

EXPECTED VISUAL RESULT:



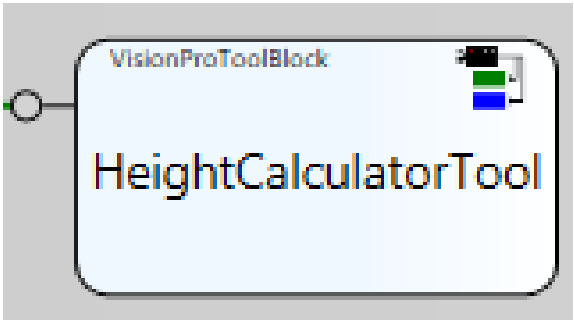


OUTLINE OF LAB:

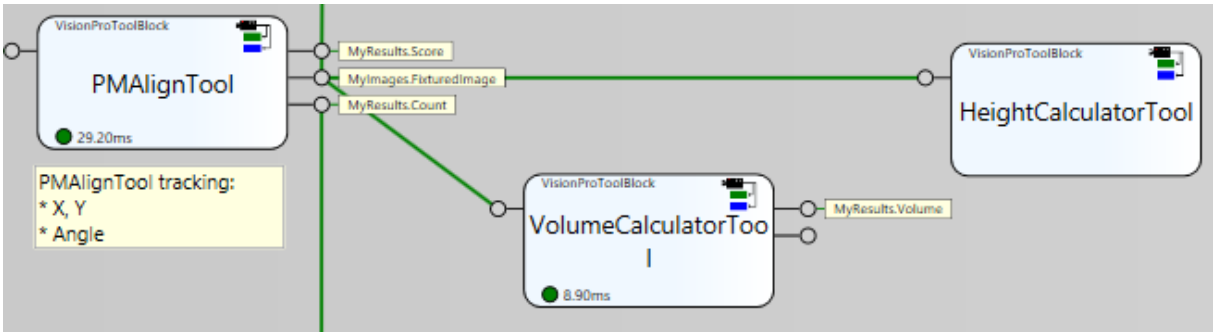
1. **Create a new Tool block for the Height Tool**
2. **Implement a Height Tool to measure from part top to table**
3. **Reuse PlaneEstimator from previous lab**
4. **Implement a Blob tool using the PixelCountsDiag image**
5. **Add Height Tool data to the HMI**
6.

Steps for the Lab:

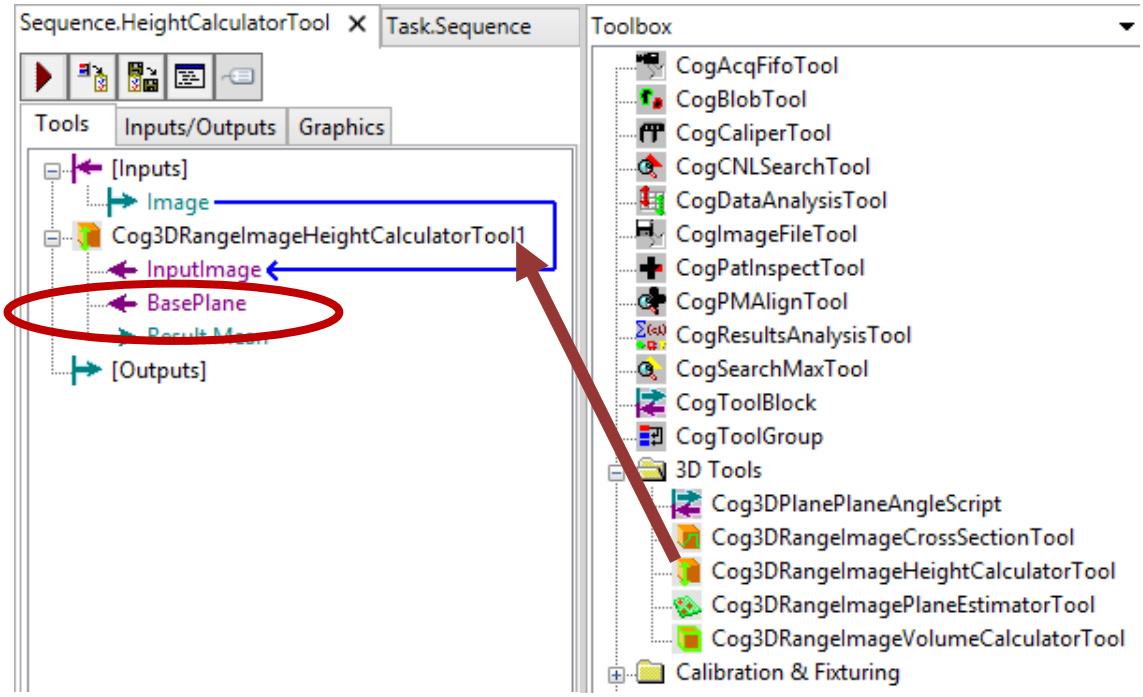
1. **Create a new Tool block for the Height Tool**
    - Add a new Tool block to the Sequence and name it "HeightCalculatorTool".



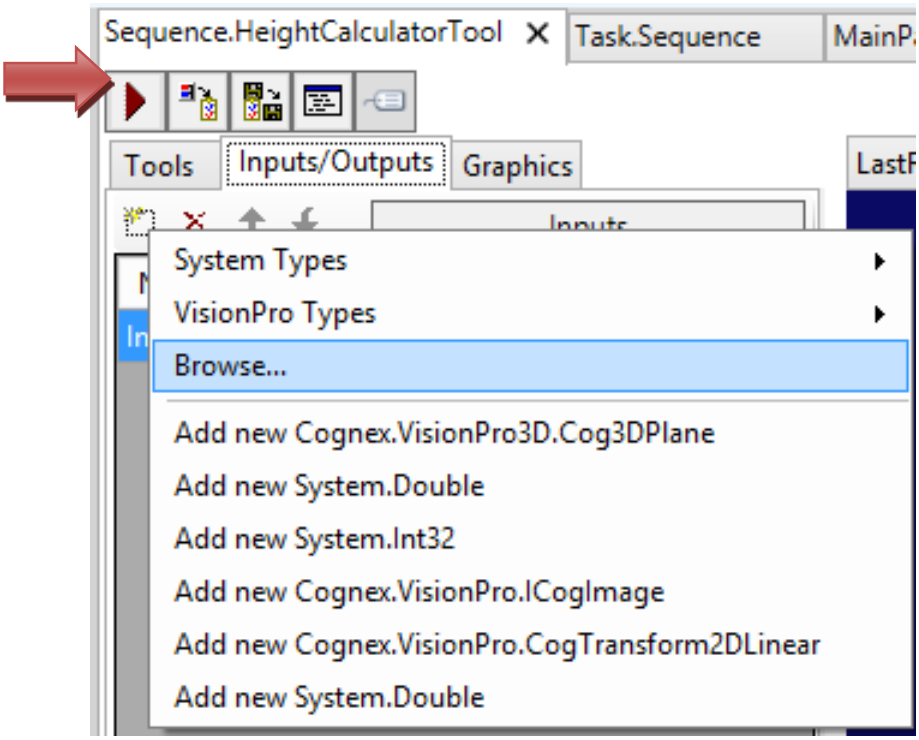
    - Attach the Fixtured image to the InputImage of the HeightCalculatorTool tool block.



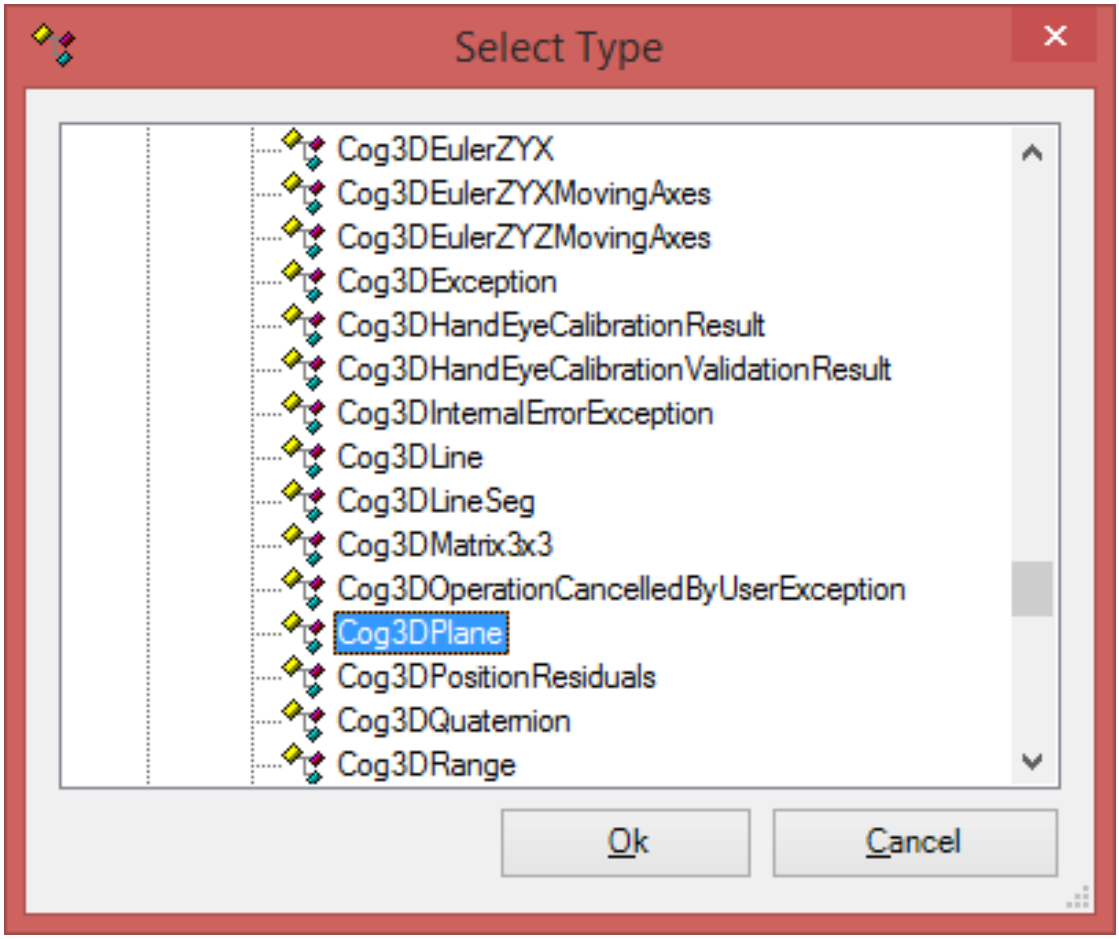
2. **Implement a Height Tool to measure from part top to table**
    - Open the HeightCalculatorTool and add a Cog3DRangeImageHeightCalculatorTool. Note the inputs for both InputImage and BasePlane.



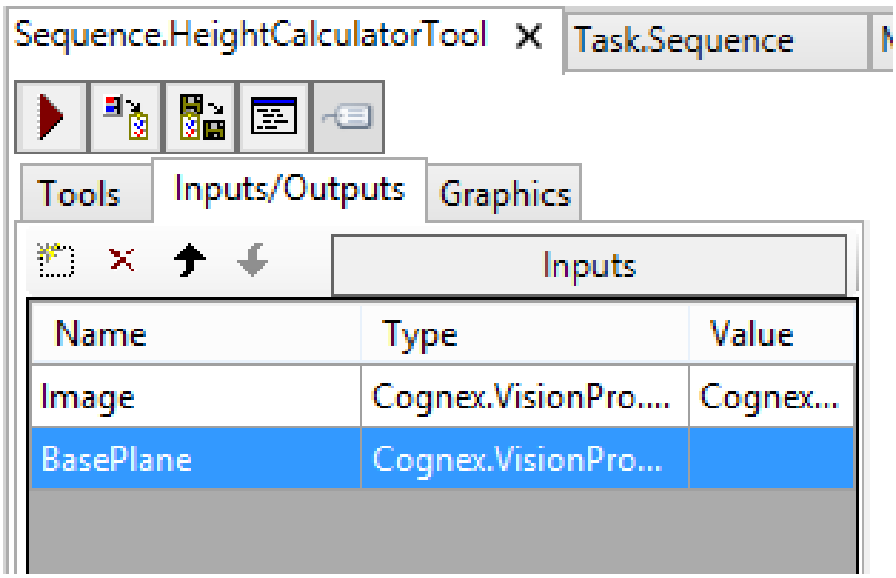
    a. **Add a BasePlane input**
        i. Click the Inputs/Output tab. Click the New button and click Browse.



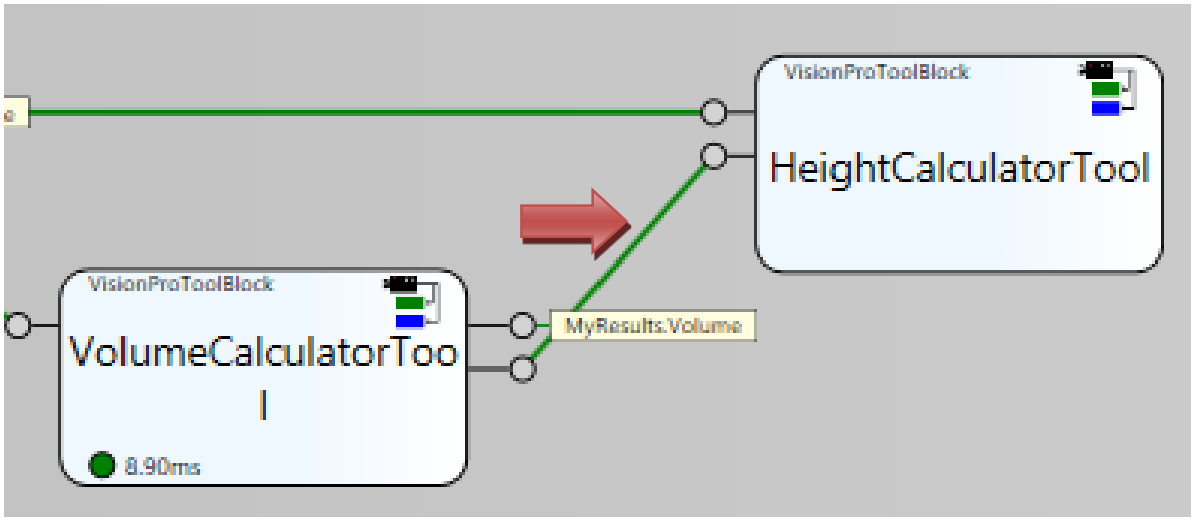
ii. Navigate to and select VisionPro→Cognex.VisionPro3D.Core.dll→Cognex.VisionPro3D →Cog3DPlane.



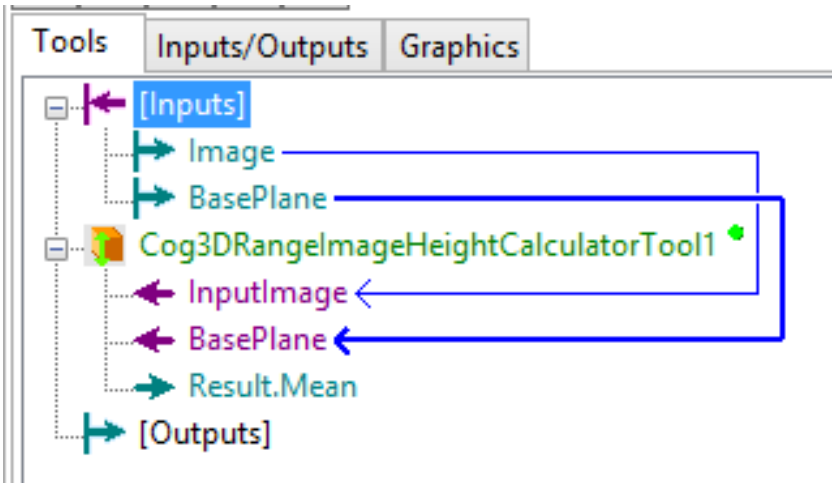
iii. Rename the inout to BasePlane.



iv. Back in the sequence, connect the VolumeCalculator's BasePLane outpu to the HeighCalculatorTOll's BasePlabe input.

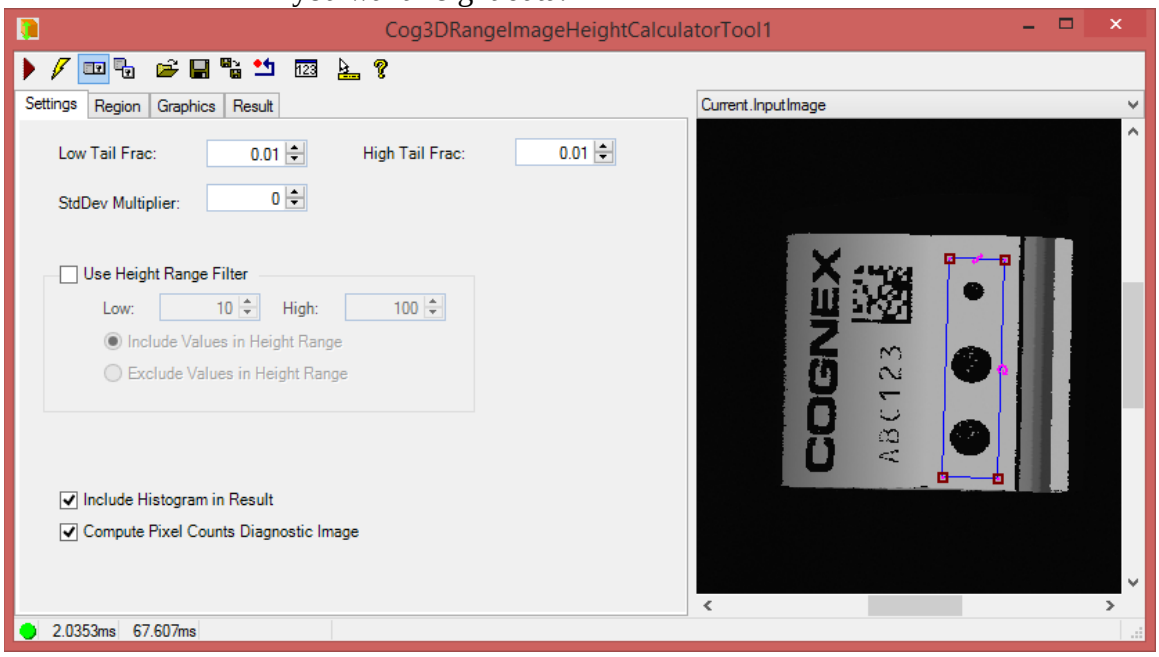


v. Attach the BasePlane incoming BasePlane input to the BasePlane input terminal of the Cog3DRangeImageHeightCalculatorTool1 tool. Once connected, run the sequence once.

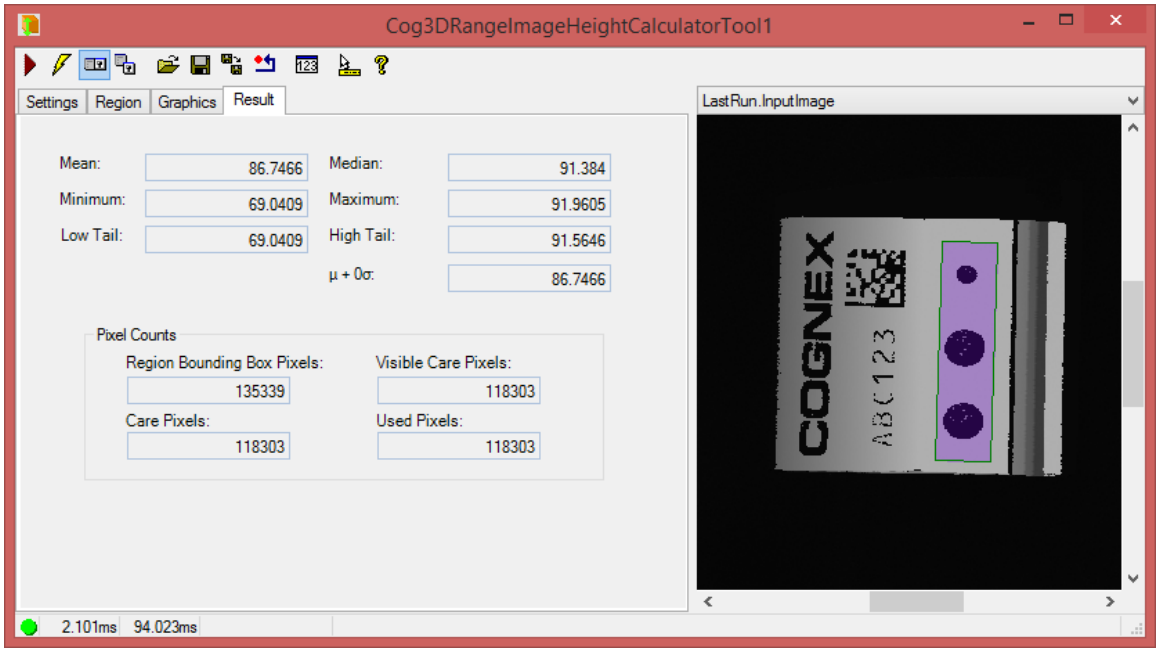


b. Configure Height Tool

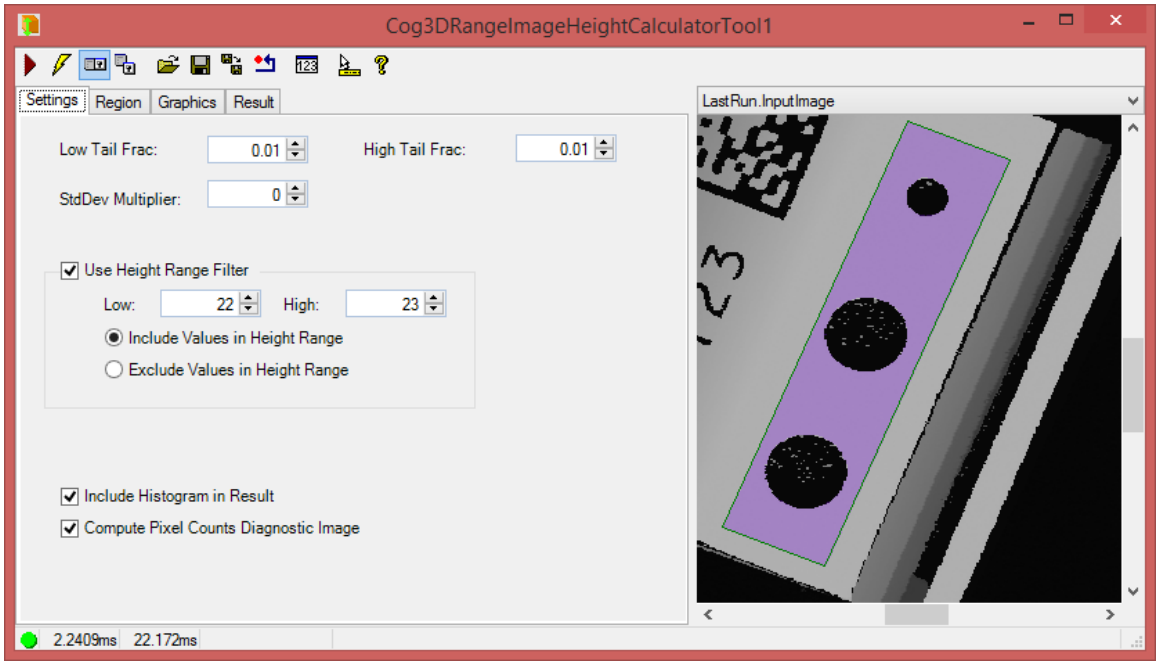
i. Double-click on the Height Tool to open it. In the Current.InputImage, place your region around the area in which you want height data.



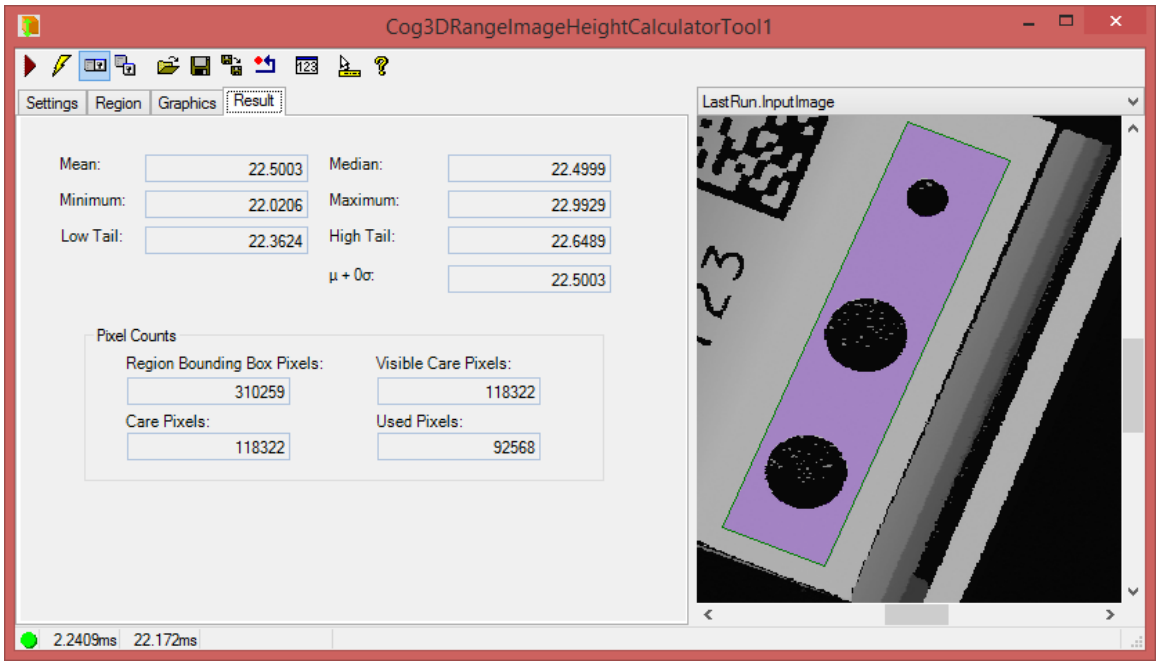
ii. Run the tool once. Note the results on the "Result" tab. With a mean value around 86.7mm, it is not an accurate measurement of our object.



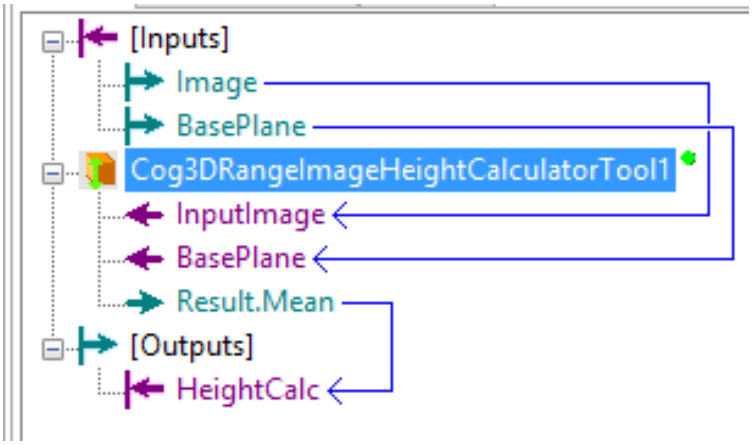
iii. Change the Filer Height Range options as follows:
   1. Check Height Range Filter
   2. Low: 22
   3. High: 23



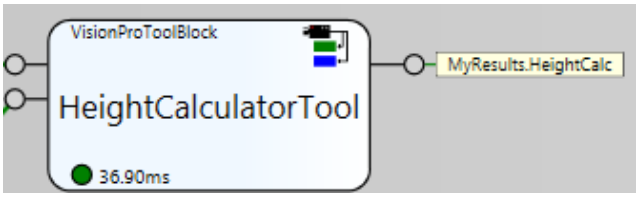
iv. Run the tool with the new settings and review the result.



v. Attach the Result.Mean to the [Outputs] of the Tool block.

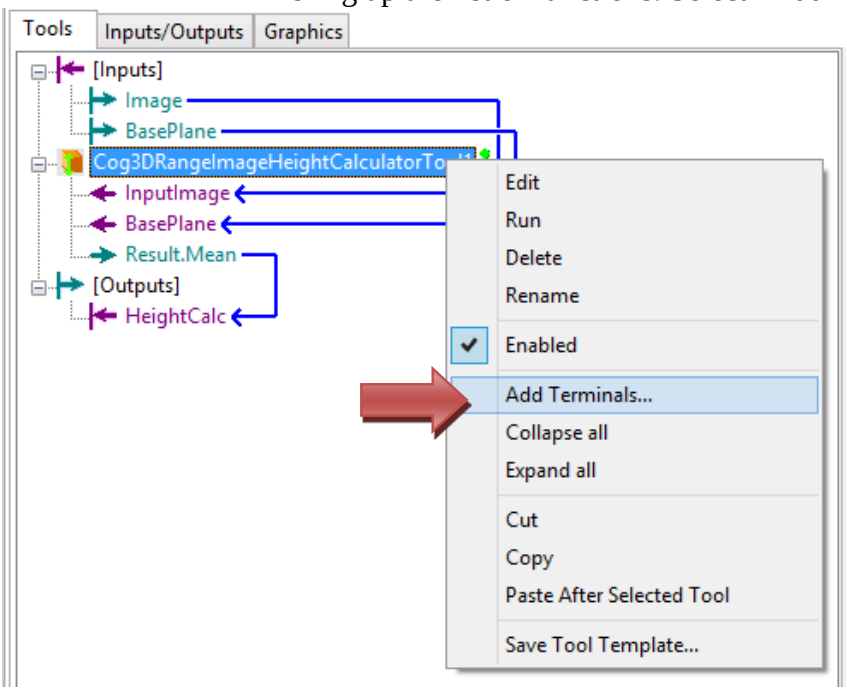


vi. Create a new tag named “MyResult.HeightCalc “ on the output pin of the HeightCalculatorTool block.

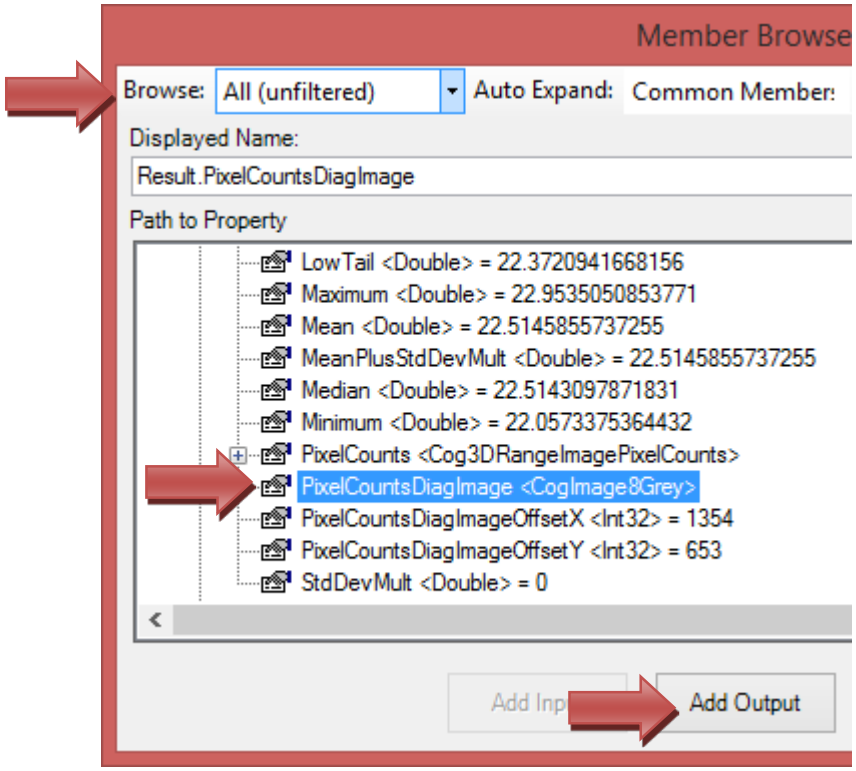


a. Feed result diagnostic mask into a Blob tool for further analysis

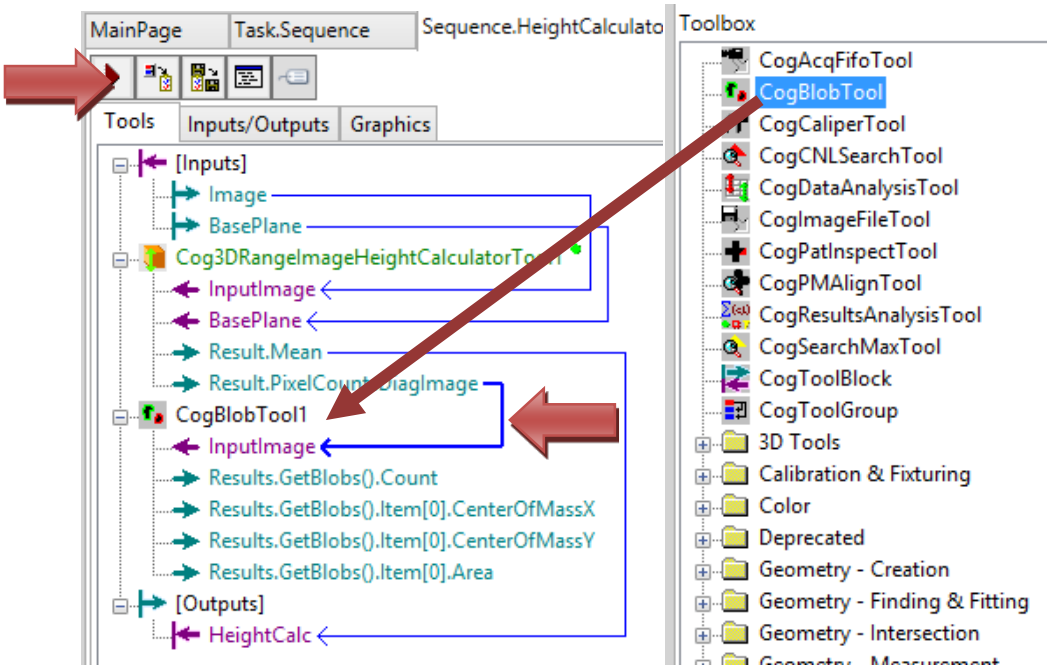
i. Add the diagnostic mask terminal by going to the Cog3DRangeImageHeightCalculatorTool1 and right-clicking to bring up the list of functions. Select “Add Terminals”



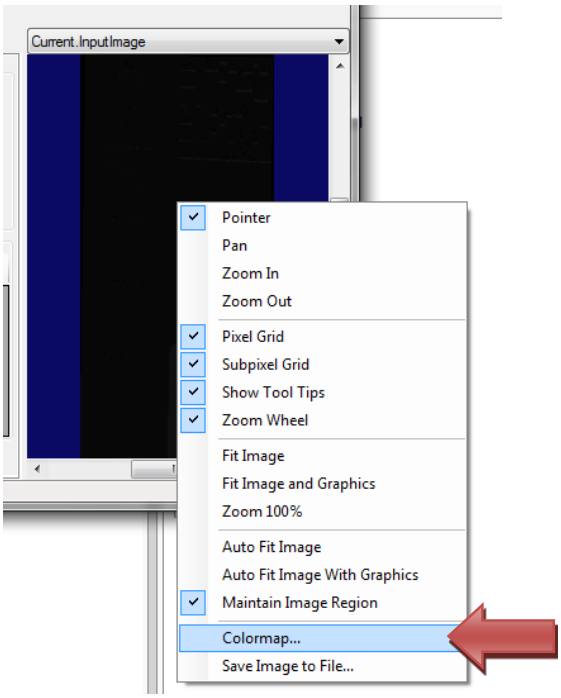
ii. Select “All (unfiltered)” from the **Browse** list and then go down to the Result section and choose “PixelCountsDiagImage” and press “Add Output”



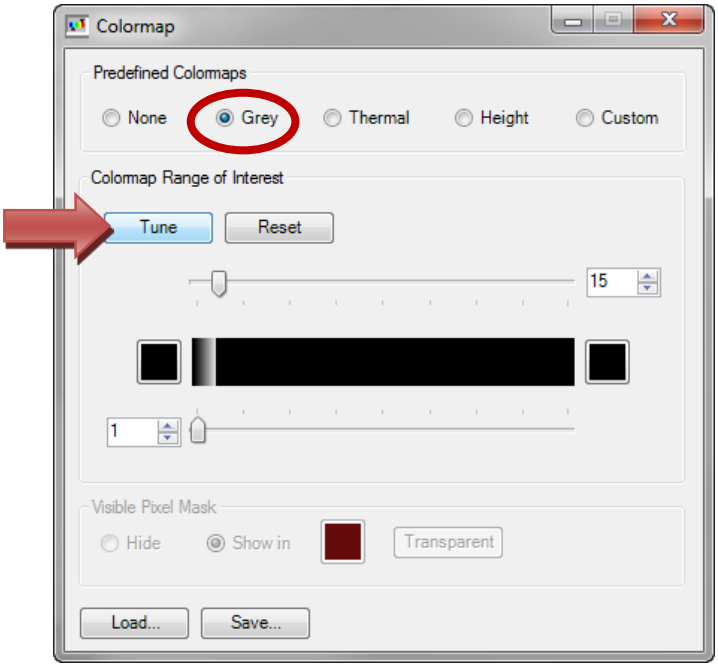
iii. This will create an output terminal under the 3DRangeImageHeightCalculatorTool1. Add a Blob Tool and feed the newly added diag image into a Blob tool’s InputImage. Run the Tool block once.



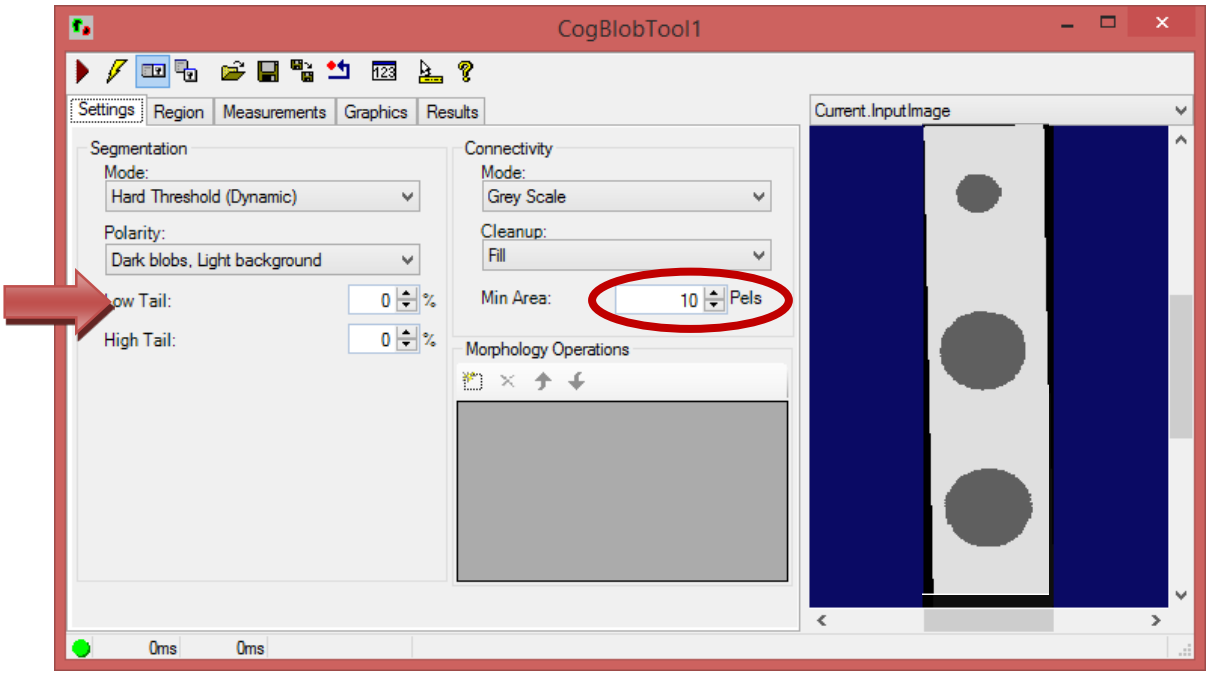
iv. Open the Blob Tool and adjust the image so that better contrast is seen by right-clicking on the image and choosing “Colormap..”



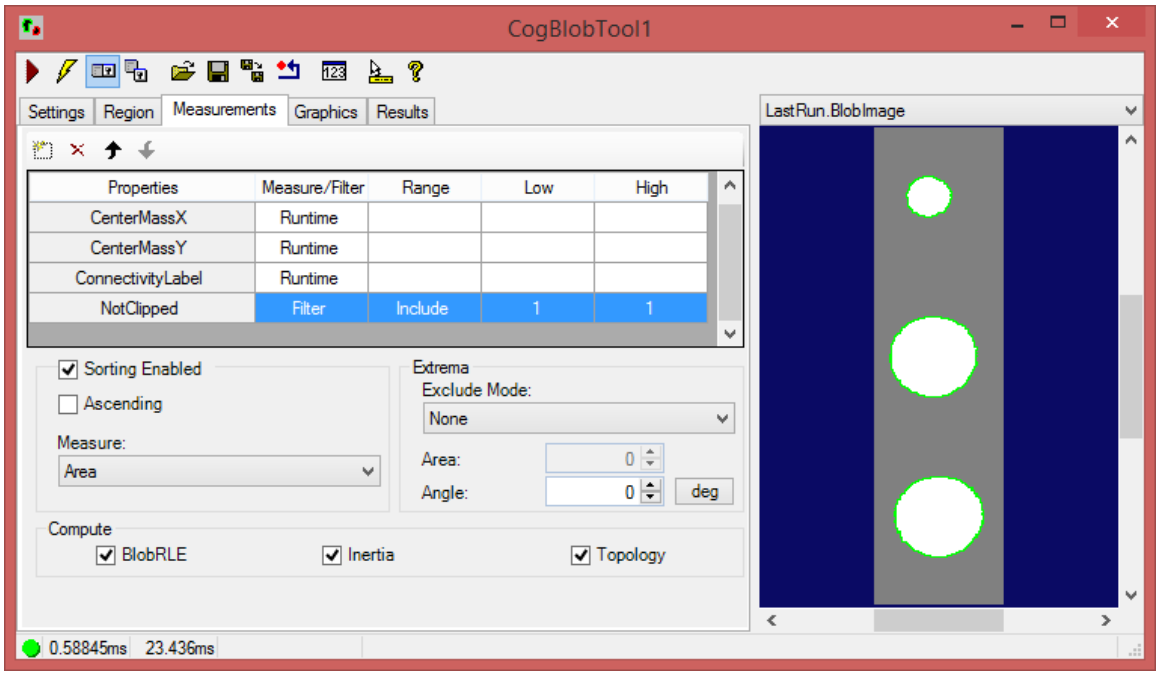
v. Choose “Grey” and then “Tune” to get better contrast in the image. The light areas show that there is some sort of volume area.



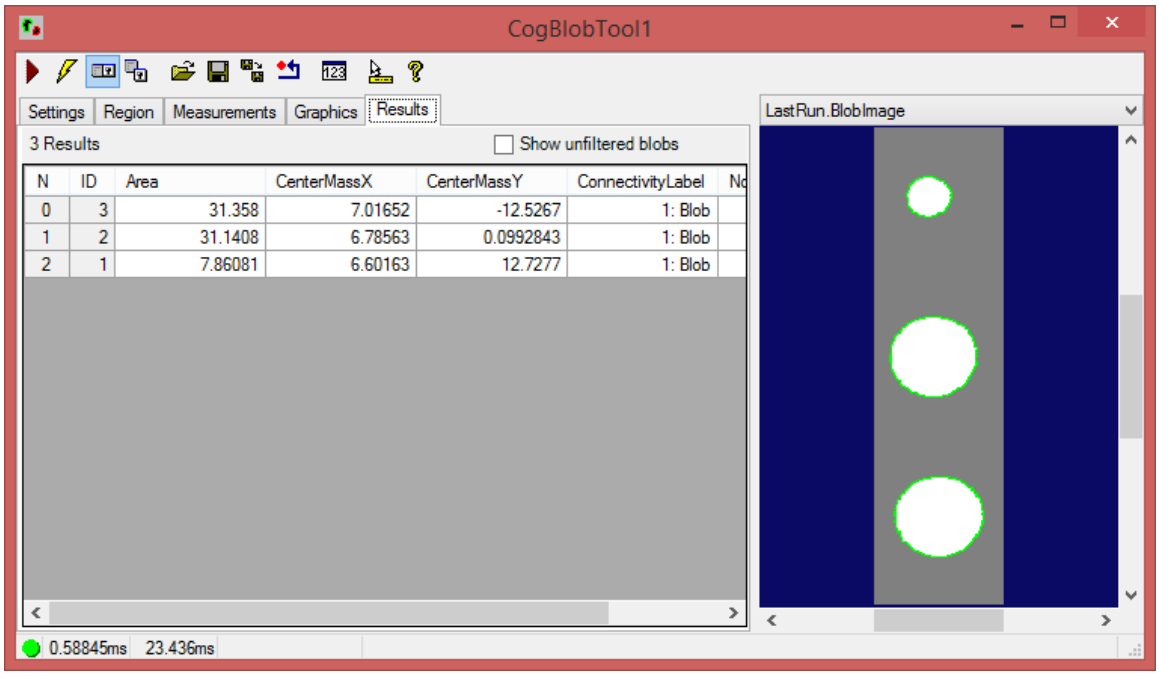
vi. You should be able to use the default blob settings within the Settings tab.



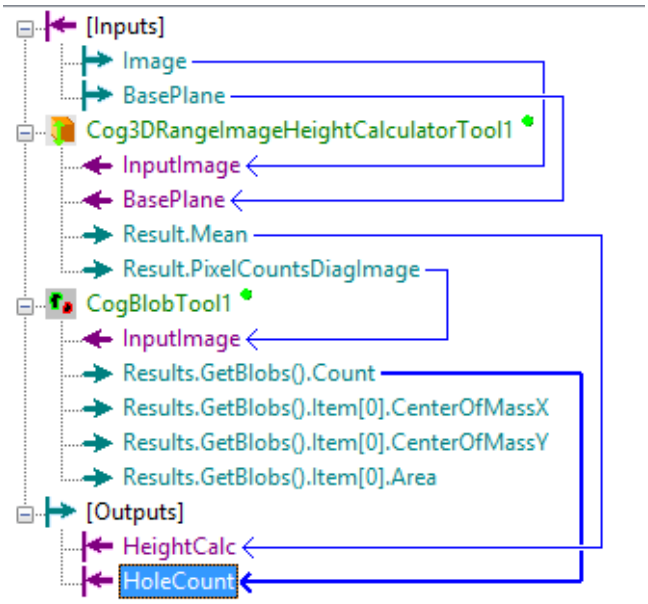
vii. Use the Measurements tab to filter out all blobs that are “clipped”. You will need to add a new measurement called “NotClipped”, and then use it for filtering all the results.

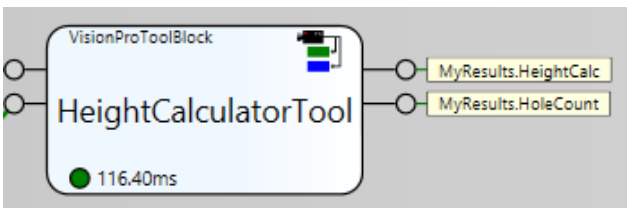


vii. Check the Results tab to make sure that only the holes are begin detected and no boundary blobs are being used.

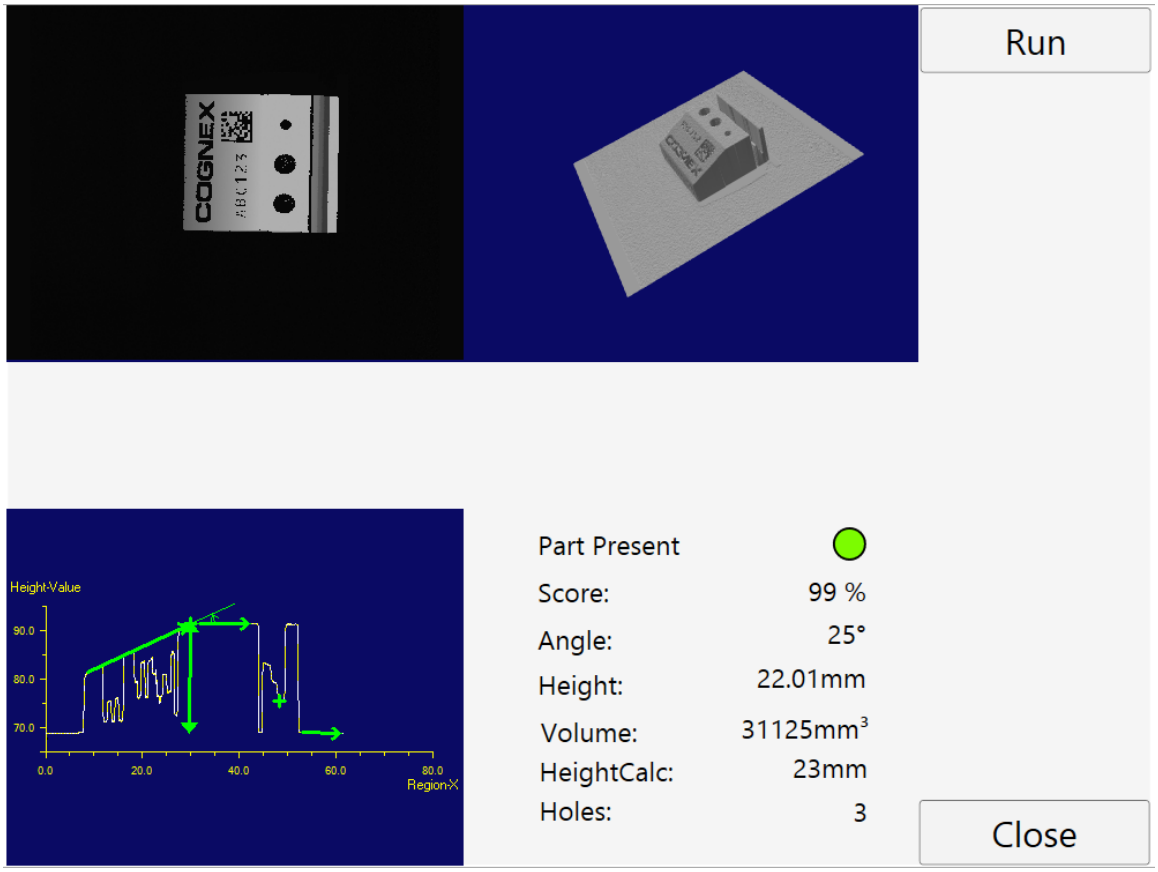


viii. Send out the number of results found by the Blob tool to the [Outputs] collection and add a new tag called "MyResults.HoleCount".





3. **Add height and hole count data to the HMI.**



4. **Save your project.**