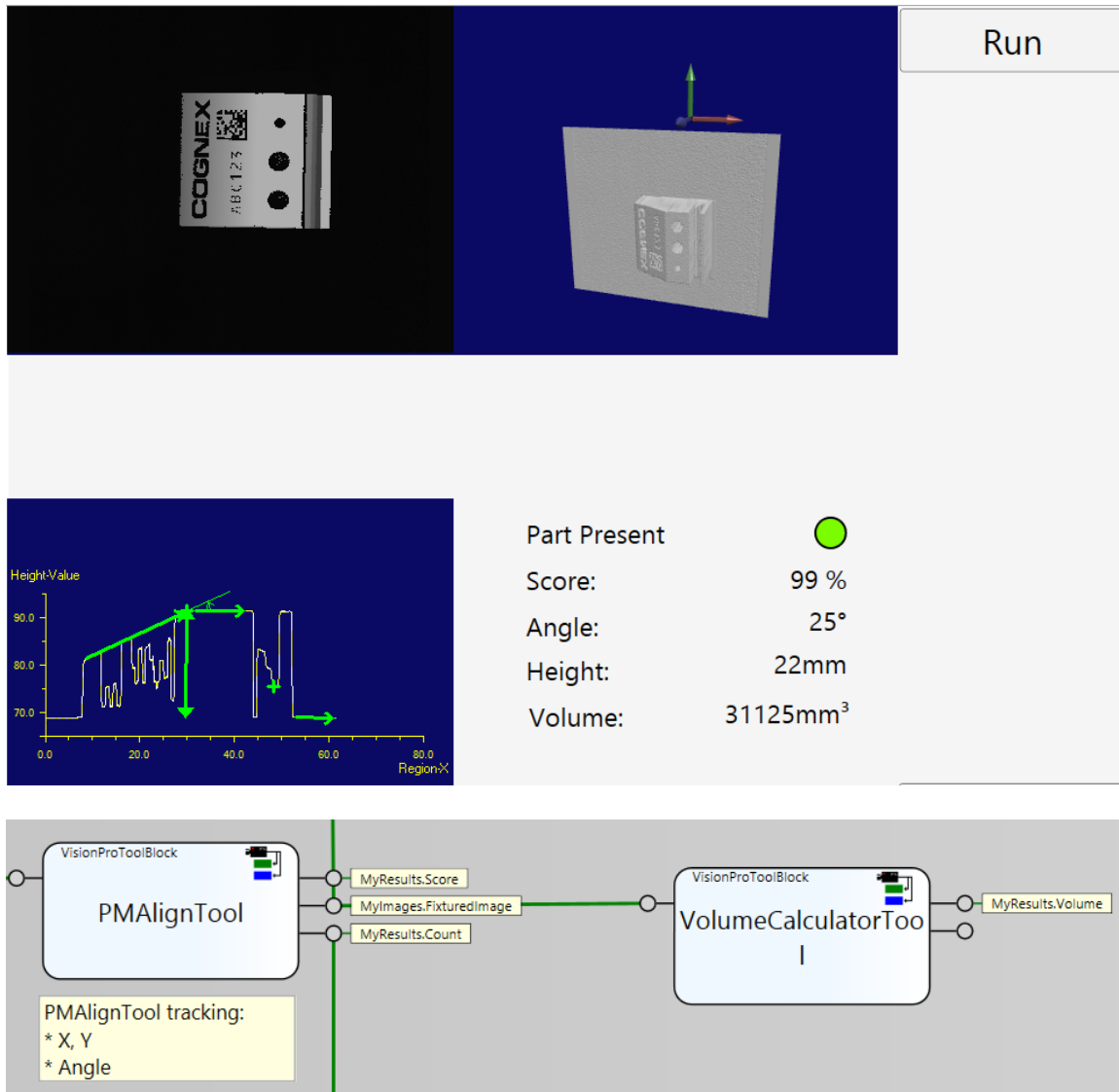**Cognex Designer Standard – Section 6**
Volume Tool Lab
Approximate Duration: 30 minutes

EXPECTED OUTCOMES:

- Use Fixtured image with the Volume Tool
- Extract accurate voume values using VolumeCalculator and PlaneEstimator tools
- Add formatted results to the HMI

EXPECTED VISUAL RESULT:

OUTLINE OF LAB:

1. **Create a new ToolBlock for the Volume Tool**
2. **Implement a Volume Tool to measure the volume of an object**
3. **Implement a PlaneEstimator tool to get the most accurate volume results**
4. **Add Volume Tool data to the HMI**

Steps for the Lab:

1. **Create a new ToolBlock for the Volume Tool**
   - Add a new ToolBlock to the Sequence and name it "VolumeCalculatorTool".
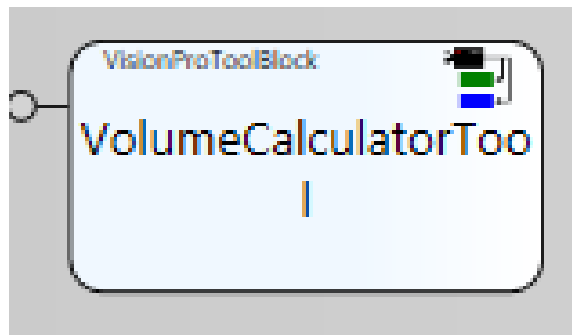
   - Attach the PMAlignTool's image to the input of the VolumeCalculatorTool Tool Block.
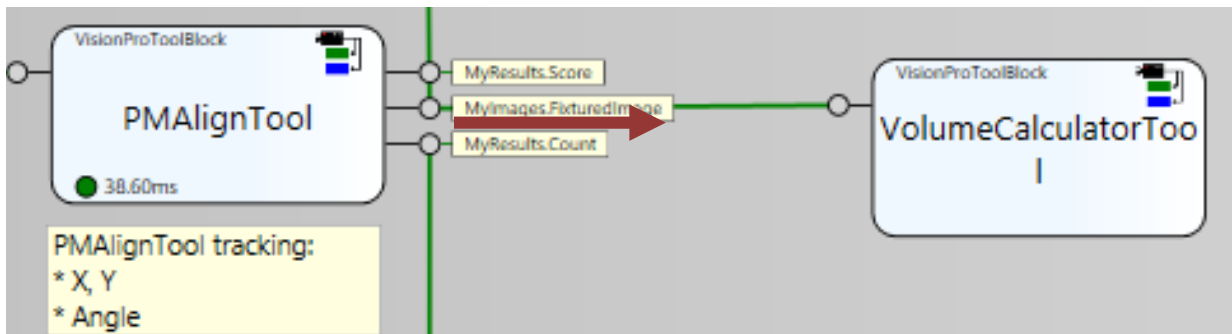
1. **Implement a Volume Tool to measure the volume of the part**
    - Open the VolumeCalculatorTool block and add a Cog3DRangeImageVolumeCalculatorTool. Note the inputs for both InputImage and BasePlane. Connect the Image to the InputImage terminal.
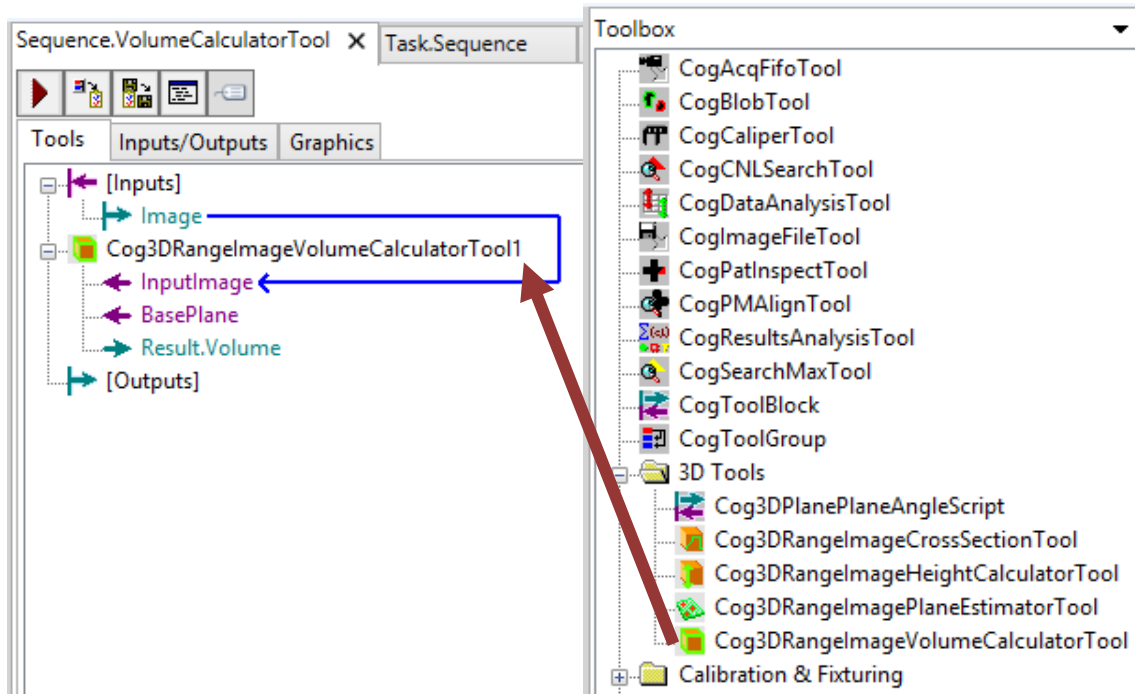

    a. **Create a BasePlane from where to measure the volume sing a Cog3DRangeImagePlaneEstimatorTool.**
        i. Add a Cog3DRangeImagePlaneEstimatorTool ABOVE the Cog3DRangeImageVolumeCalcultorTool1 tool and connect the InputImage and Result.Plane termianls as shown below.
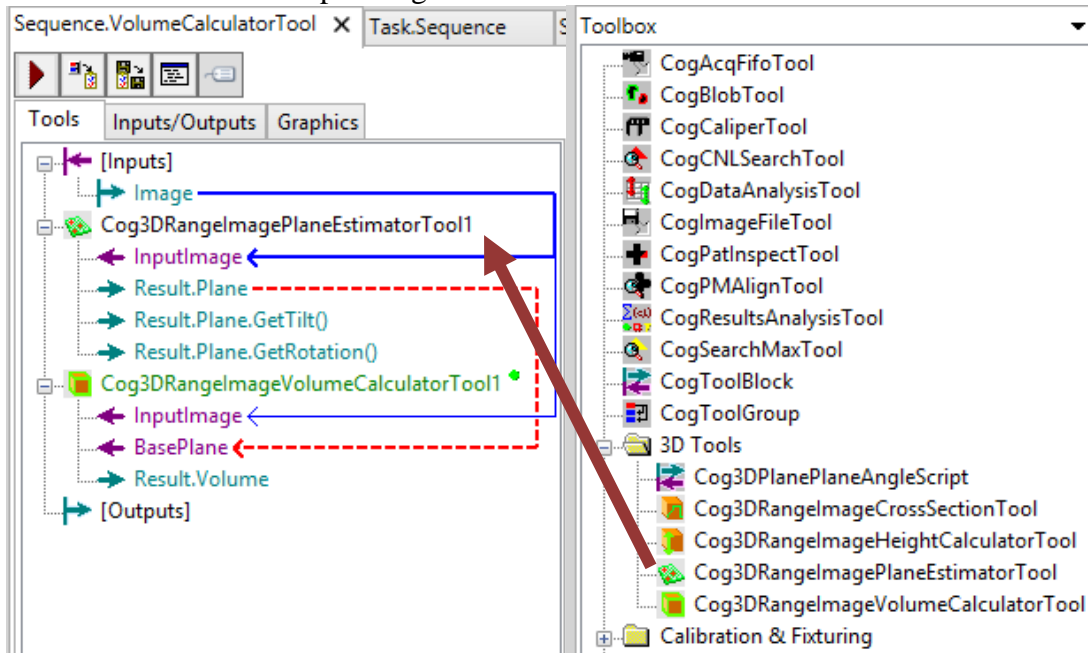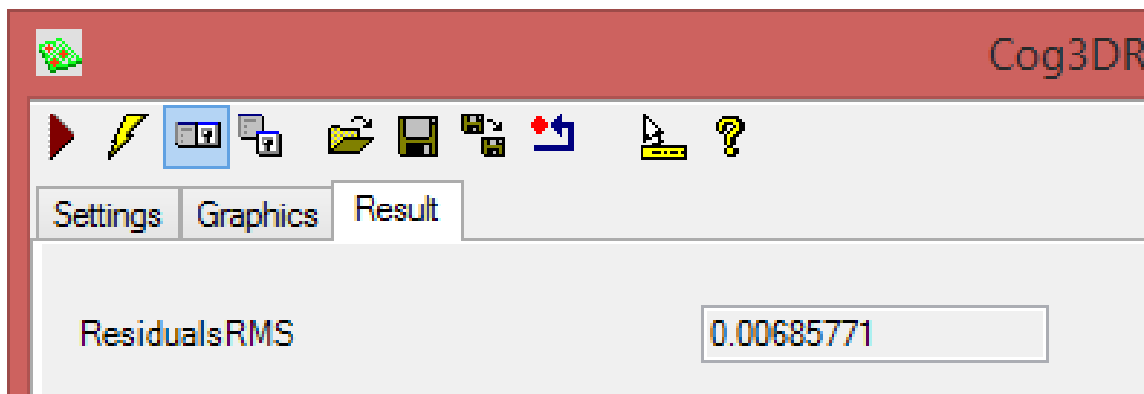
ii. Open the PlaneEstimator tool and configure:
1. **Fit Method: Points**
2. **Z Lookup Method: Neighborhood Median**
3. Set the available points:
   a. Around the object
   b. On area that represents the table top
   c. To avoid areas formerly known as missing pixels
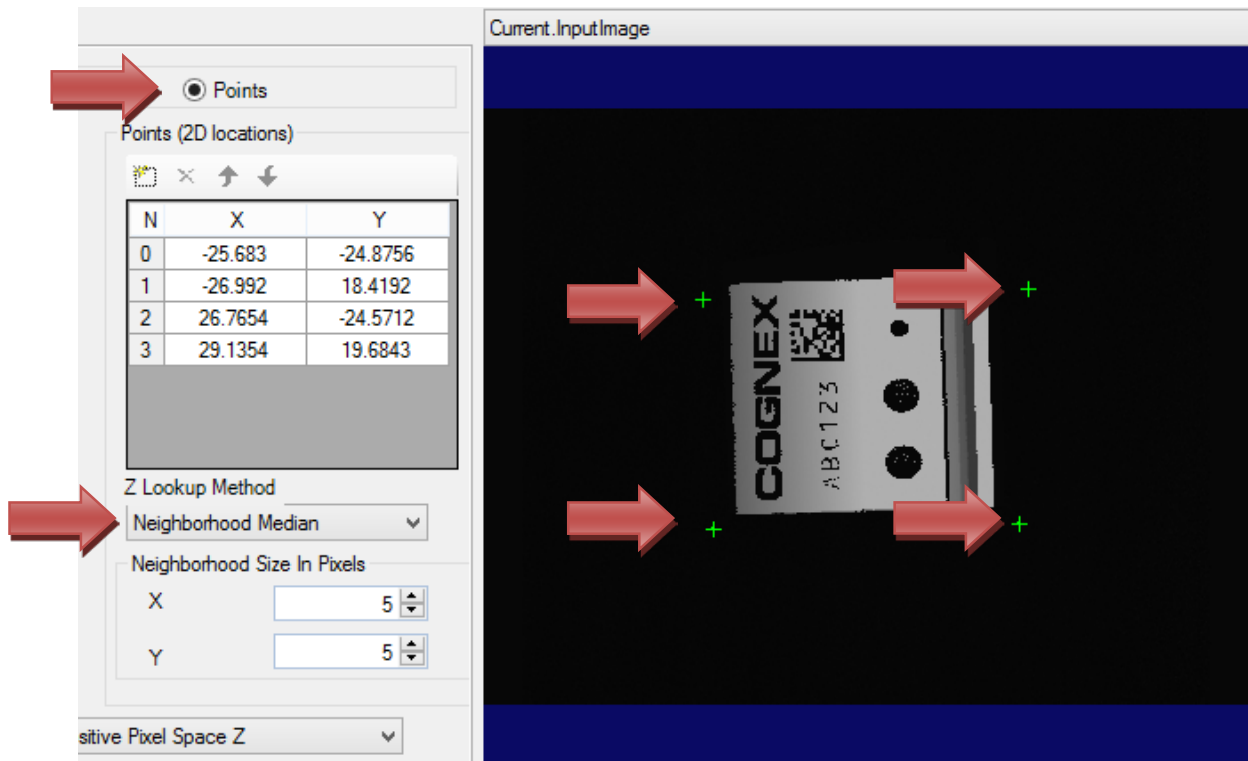
iii. Run the tool and confirm your ResidulasRMS is < 0.01 in the Result tab.

iv. Open the VolumeCalculator tool and set the region of interest around the object and include some portion of the table top. Using the PlaneEstimator tool should avoid bad volume measurements even if we include the table top in the region.
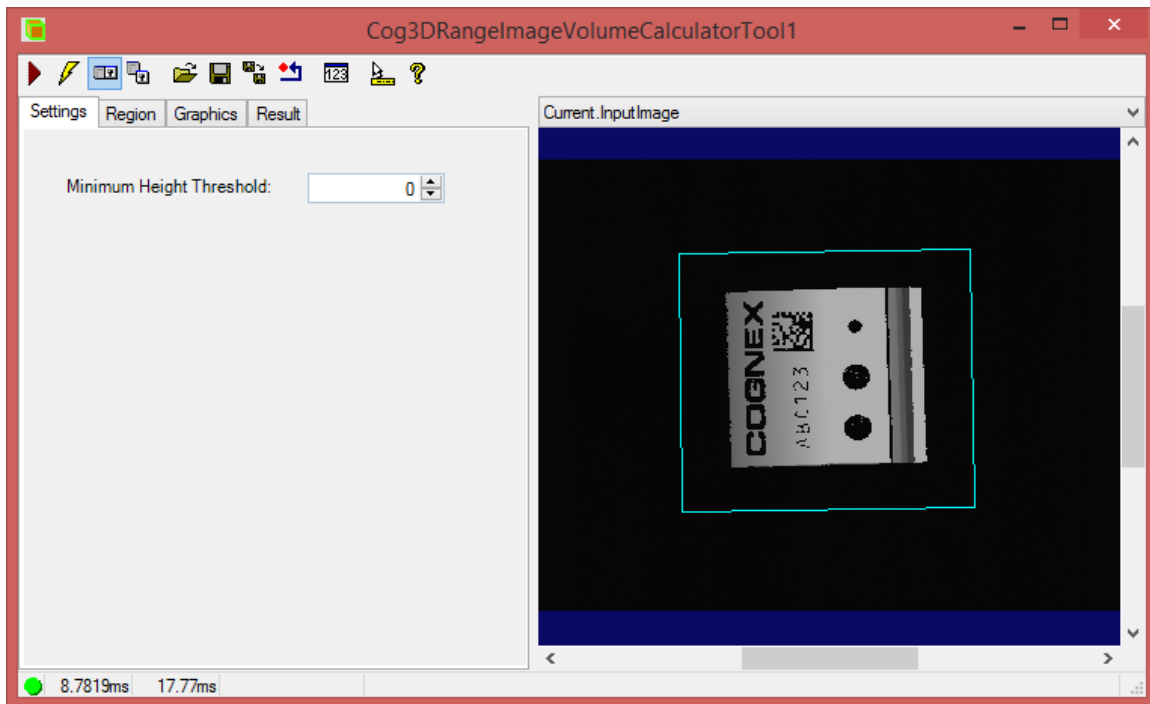

v. Increase the Minimum Heigh Threshold to 0.2 to avoid the last bits of table top being used for the volume calculation.
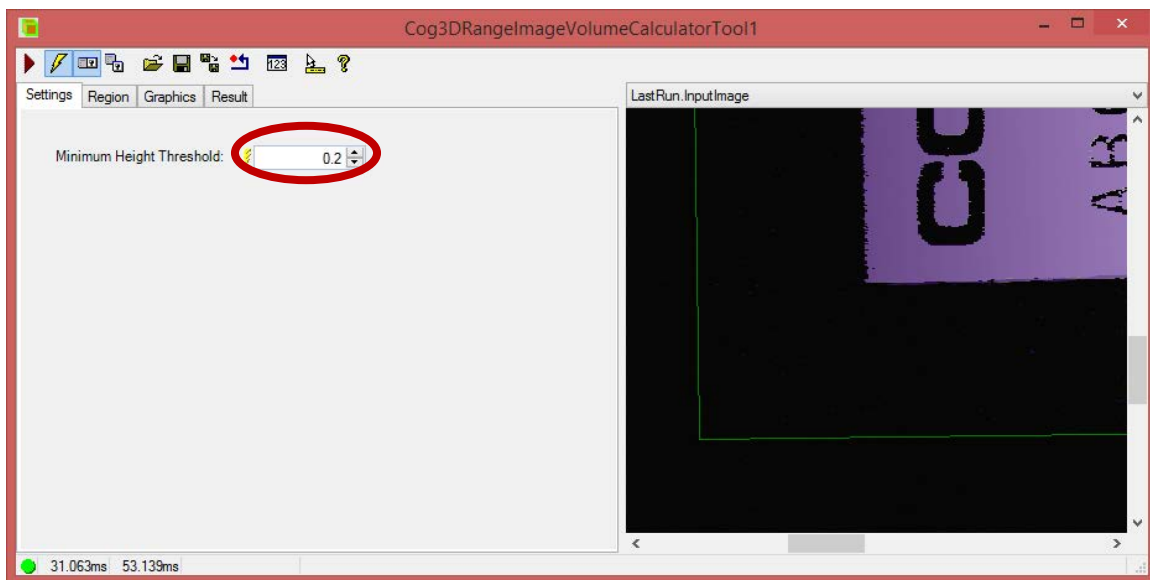
vi. Send both the Result.Volume and the Result.Plane to [Outputs] of Tool Block. Rename them plainly to Volume and BasePlane.
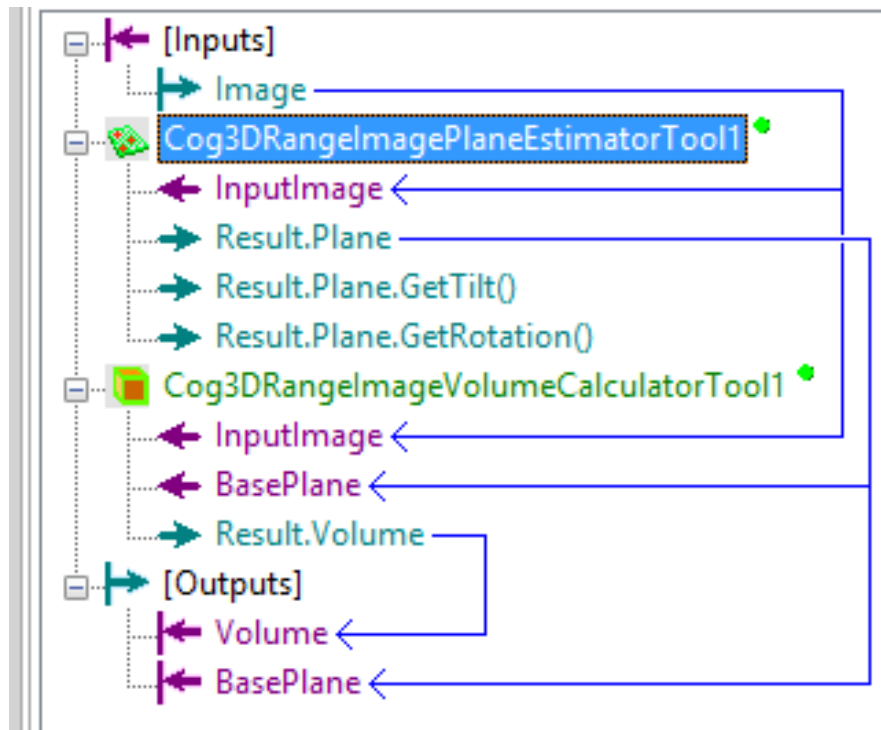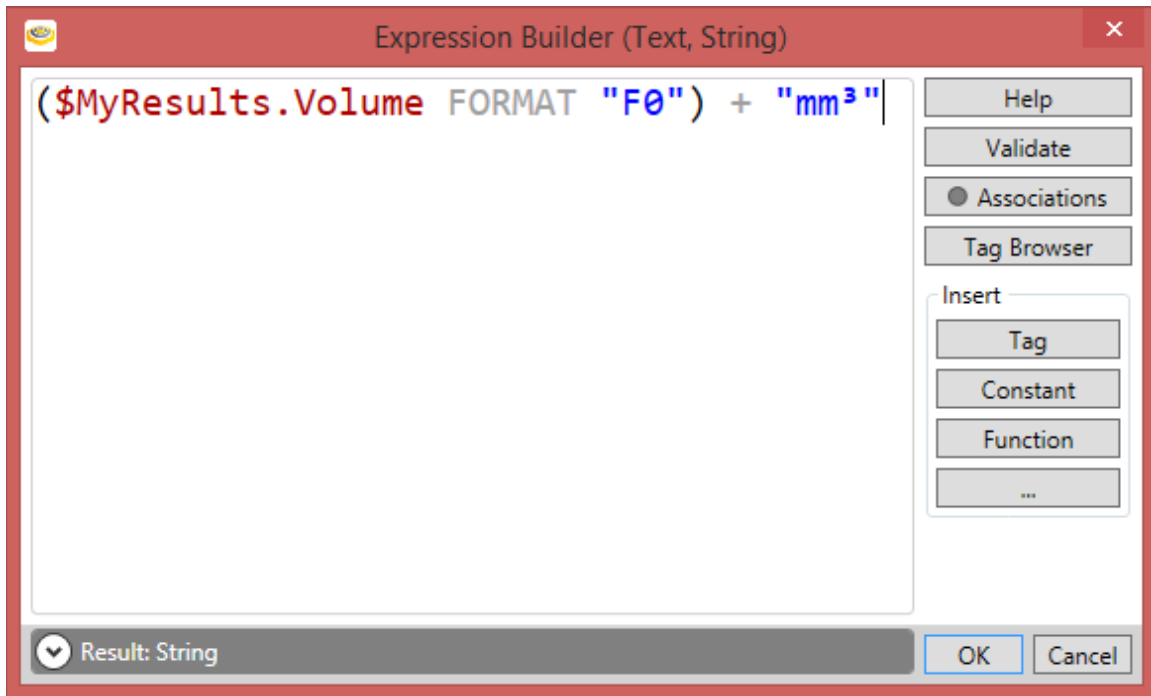

vii. Create a new tag named "MyResults.Volume". You do not need to set the BasePlane result to a new tag for future work in this project.
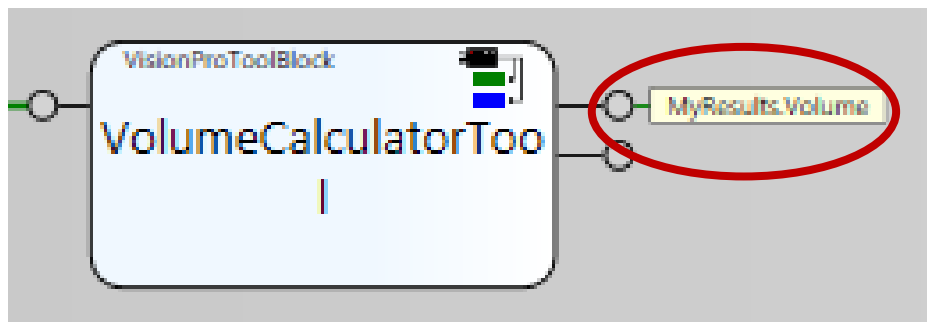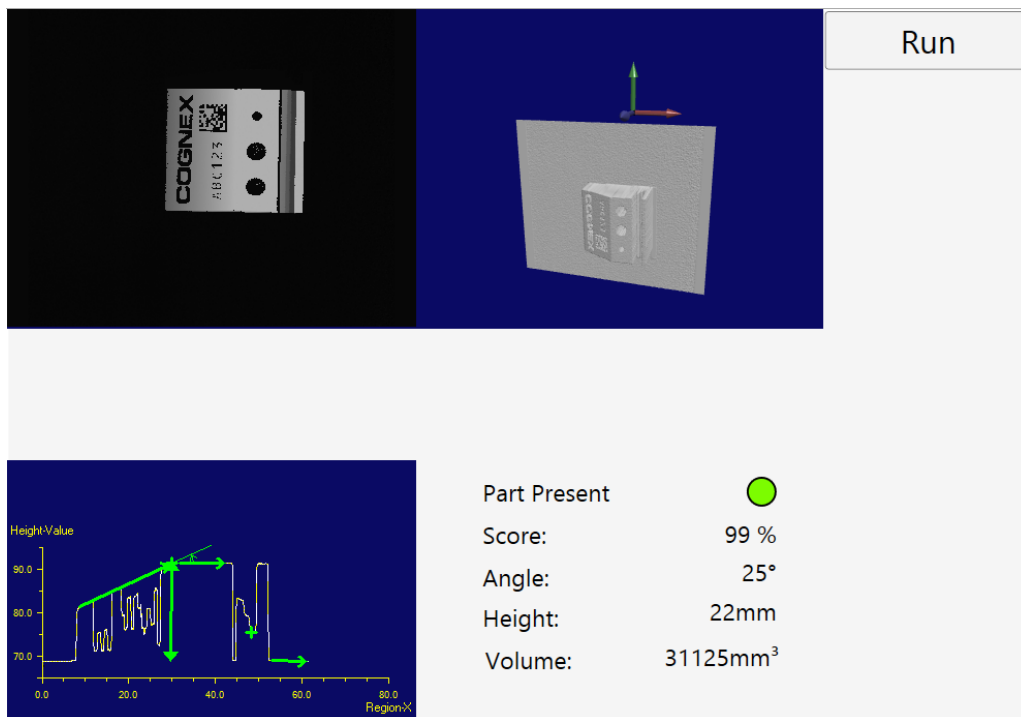

1. Add Volume Tool data to the HMI
   a. Add a label and formatted data (include mm³)

i. For the label next to Volume, choose the MyResults.Volume tag and format it for 2 decimal places and add mm cubed symbol. Hint: Use the Character Map app in Windows or hold the <ALT> key while typing in 0179 <u>on the numerical keypad</u> – it will not work with the numbers on the top of the keyboard.

ii. Try Test Mode and see how things look.

Part Present	🟢
Score:	99 %
Angle:	25°
Height:	22mm
Volume:	31125mm³

b. Save your project