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Lab Exercise 1.1 – Getting Connected & Image Acquisition

At the end of this lab exercise, Participants will be able to:

- Confirm the camera has power and is properly connected to IO and the Network
- Launch the Cognex GigE Configuration Tool
- Configure the GigE camera for use in Cognex Designer applications
- Launch the Cognex Designer software and create a new project

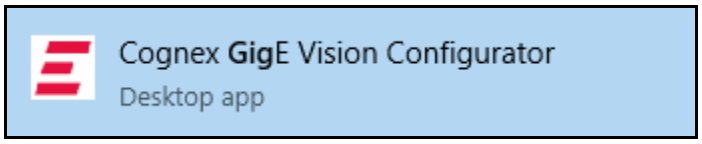
The Participant will utilize the following functions to successfully complete this exercise:

- Cognex GigE Configuration Tool

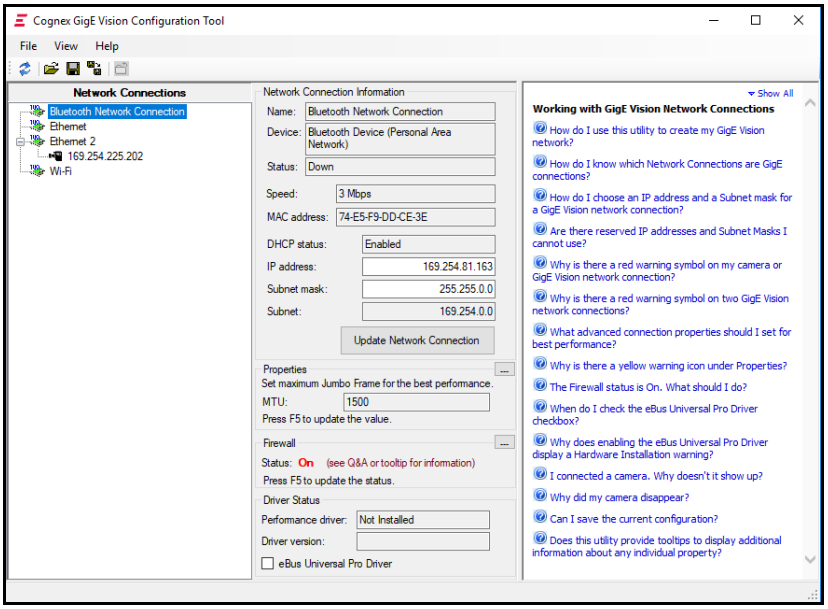
NOTE: *The first section of this lab requires a physical camera. All other exercises can be completed using saved images.*

Follow the steps below to complete the lab exercise:

1. Confirm your camera has the proper connections to the following:
   - ☐ Power
   - ☐ I/O (not connected)
   - ☐ Network
2. Search for the **Cognex GigE Configuration** tool using the Windows Search box. Select the **Cognex GigE Vision Configurator** from the displayed selections.



The **Cognex GigE Vision Configuration Tool** displays.

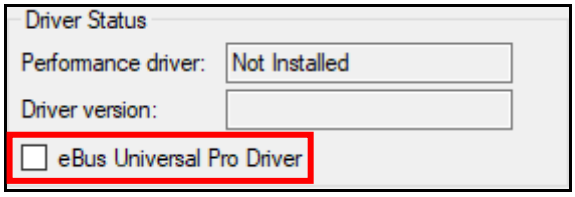


3. Record the following information about your camera and PC configuration:
    a. Camera
        a. Serial Number: _____
        b. IP Address: _____

    b. PC
        a. IP Address: _____

4. Confirm your camera is listed without warnings.

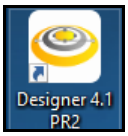
   NOTE: *If your camera is on a different IP Address/Subnet Mask there will be a red question mark showing.*
5. If the network connection is to be used for image acquisitions check the **eBus Universal Pro Driver** checkbox, otherwise uncheck it.



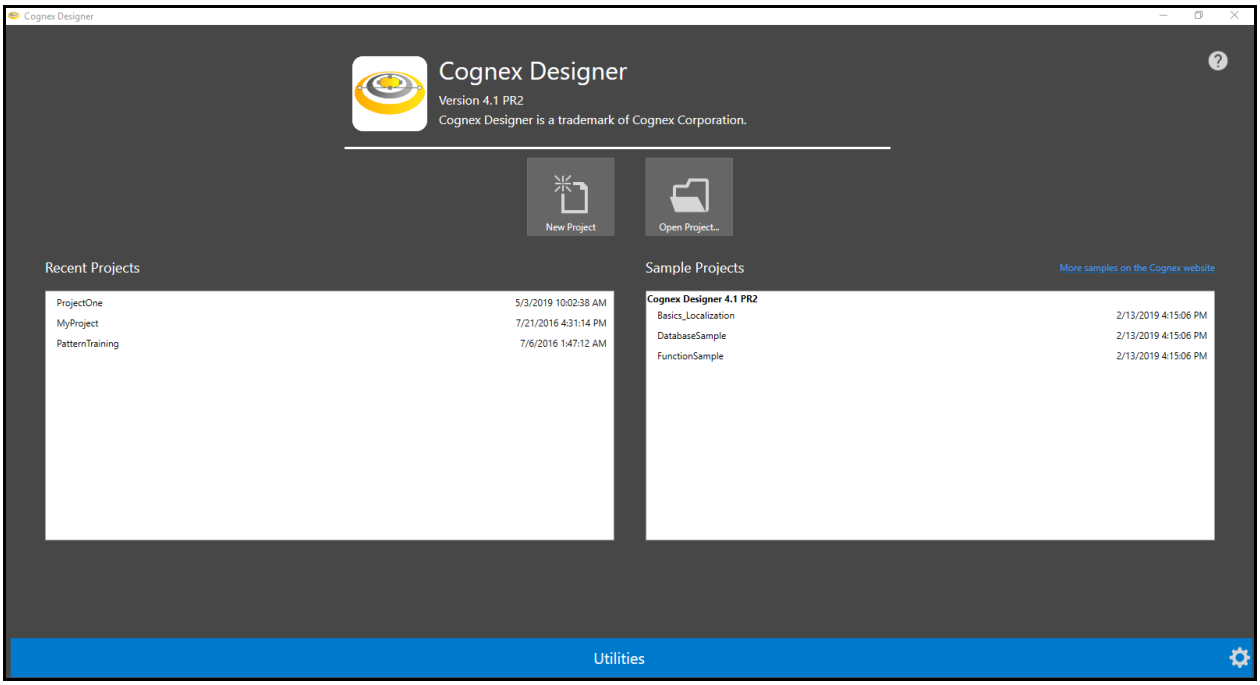
Launch Cognex Designer

Follow the steps below to launch Cognex Designer and acquire an image:

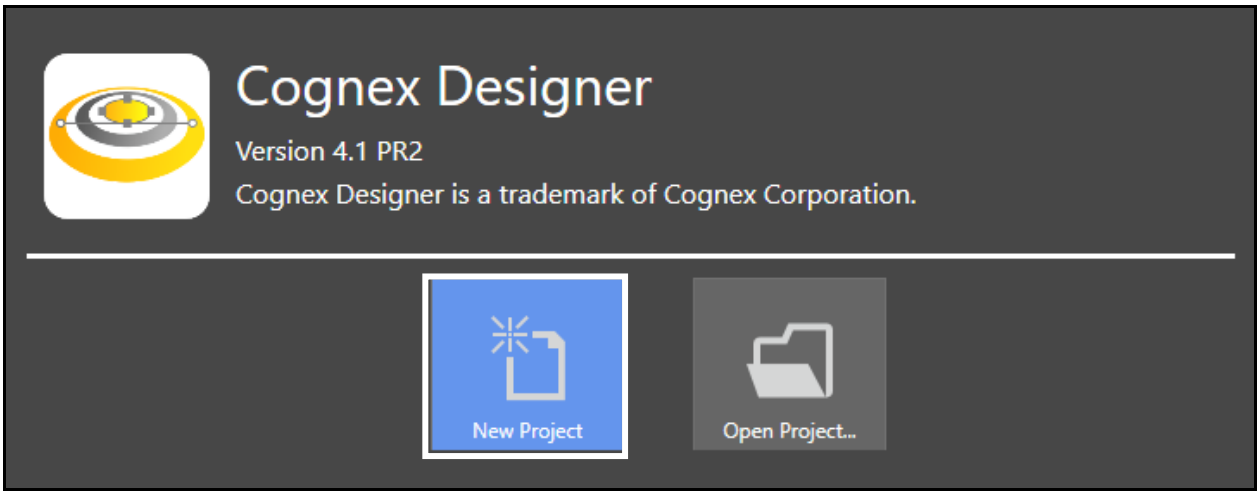
1. Double click the **Designer** icon on your desktop.



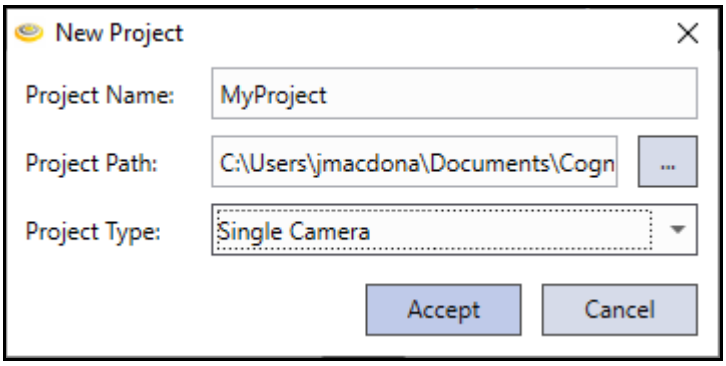
The **Cognex Designer** launch page displays.



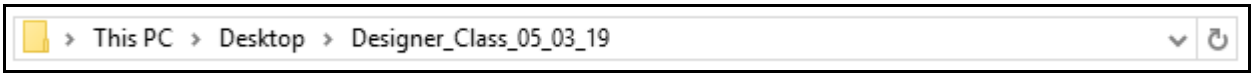
2. Click the **New Project** button.

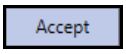


The **New Project** dialog displays.

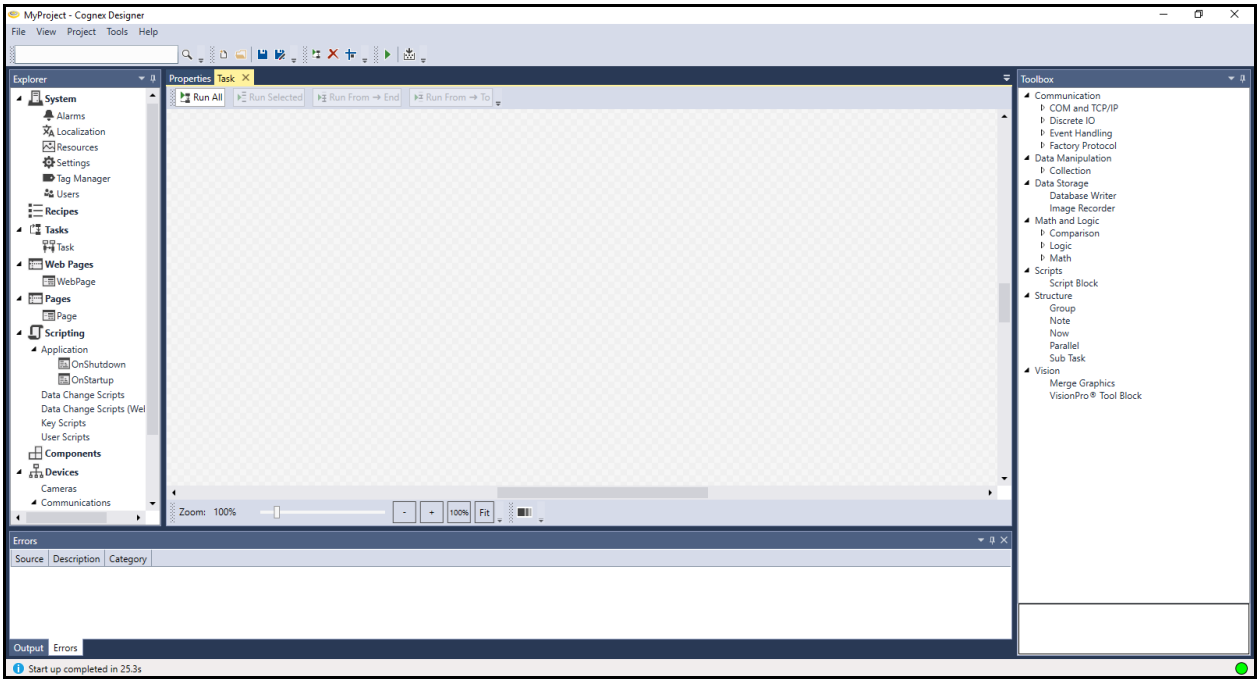


3. Enter *MyProject* in the **Project Name** field, Create a new folder on the desktop named *Designer_Class_XX_XX_XX* (where the X's are the class start date) as the **Project Path**, and select *Single Camera* as the **Project Type**.



4. Click the **Accept**  button.

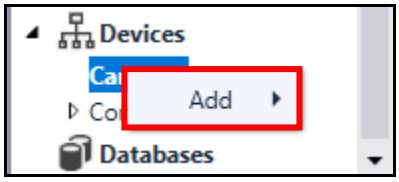
The **Cognex Designer** application launches.



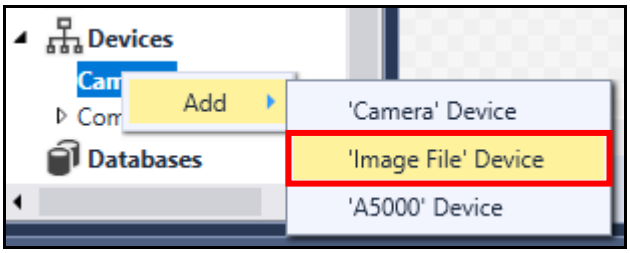
Follow the steps below if you are using an **Image Database** for your images:

NOTE: *If you are using a Cognex Industrial Camera (CIC) to capture your images skip to **step #14**.*

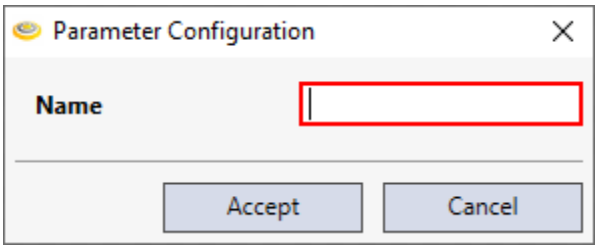
5. Right click the **Cameras** link under **Devices** in the Cognex Designer Explorer window.
   The **Add** Menu displays.



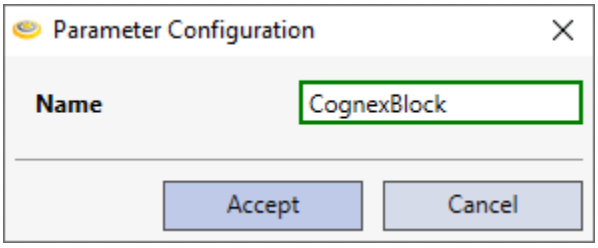
6. Hover your mouse over the word **Add** and select **'Image File' Device** from the fly out.



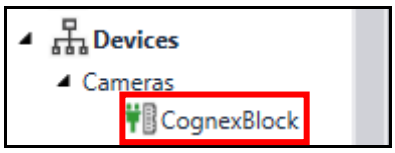
   The **Parameter Configuration** window displays.



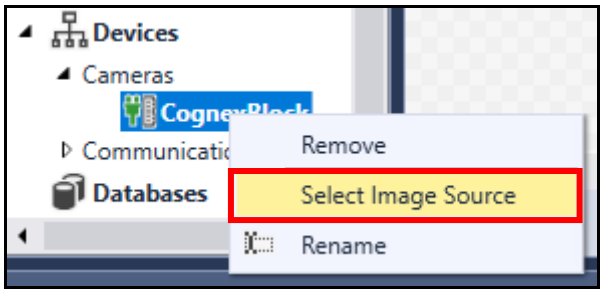
7. Enter *CognexBlock* in the **Name** field and click the **Accept**  button.



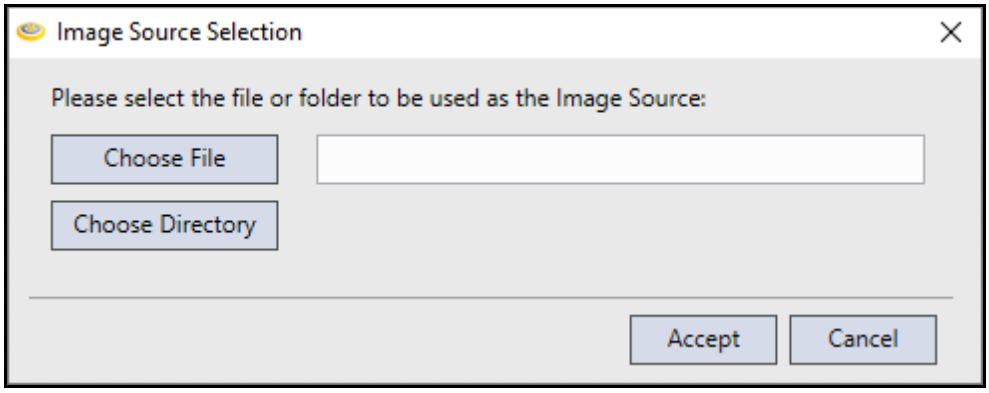
   CognexBlock is added under Cameras.

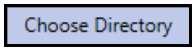


8. Right click on **CognexBlock** and choose **Select Image Source** from the fly-out.



The **Image Source Selection** dialog displays.

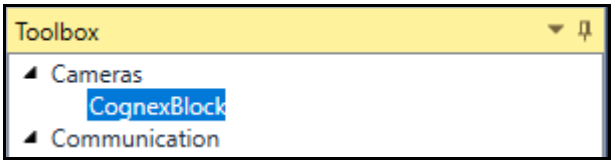


9. Click the **Choose Directory**  button and navigate to the location of your image database.

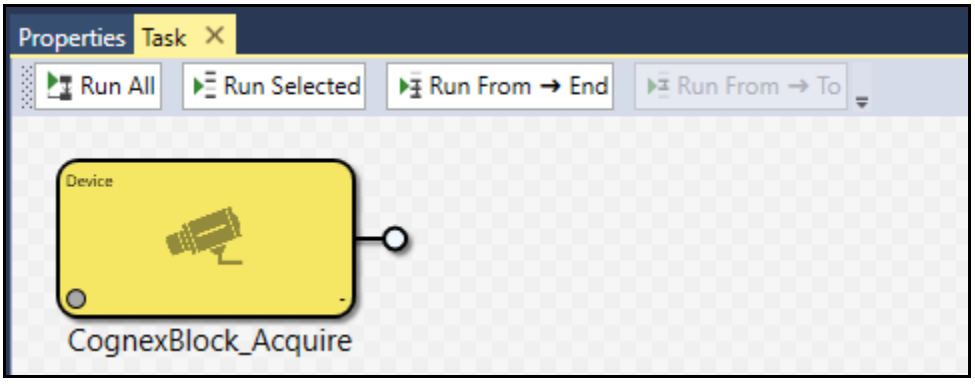
NOTE: *The images can be found in the Student Folder on the desktop*.

10. Click the **Accept**  button.

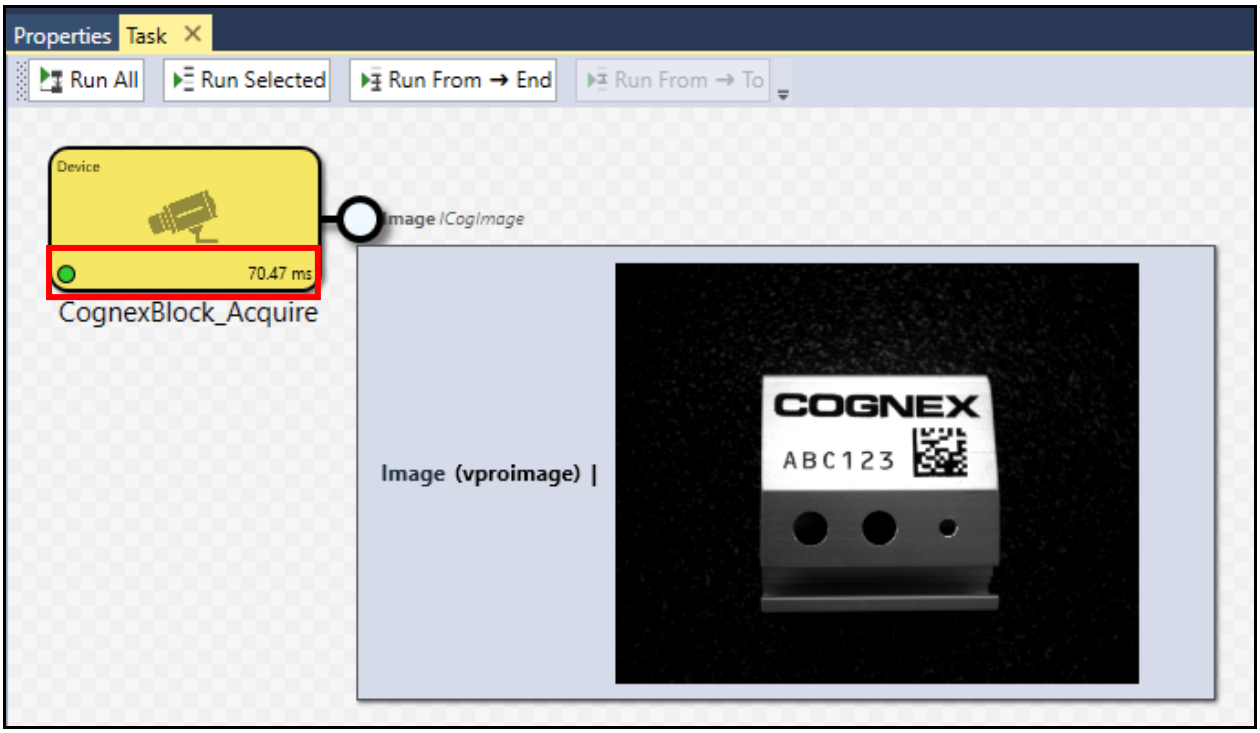
CognexBlock has been added under Cameras in the Cognex Designer toolbox.



11. Drag and drop the **CognexBlock** into the Cognex Designer Task.



12. Click the **Run All**  button to bring the image into the Task.
Notice the green dot in the lower left and the time noted on the lower right of the CognexBlock. If you hover your mouse over the output the image flyout will display.

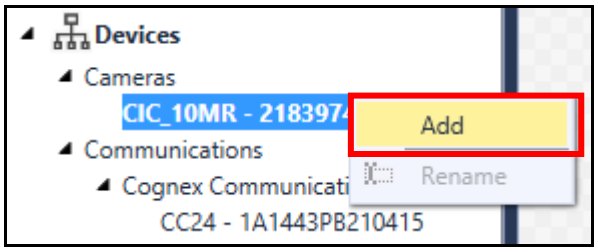


NOTE: *Cognex Designer does not have an auto-save feature so make sure that you are saving your work often.*

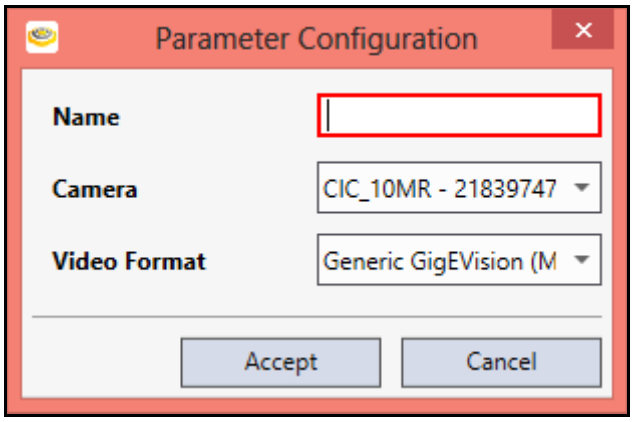
13. Click the **Save**  button in the Designer toolbar to save your job.

Follow the steps below if you are using a **Cognex Industrial Camera (CIC)** to capture your images:

14. Right click the **Camera** listed under the Devices → Cameras section of the Cognex Designer Explorer.
    The **Add** Menu displays.

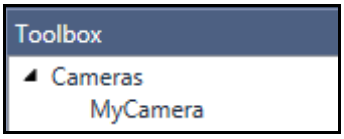


15. Click **Add**.
    The **Parameter Configuration** window displays.

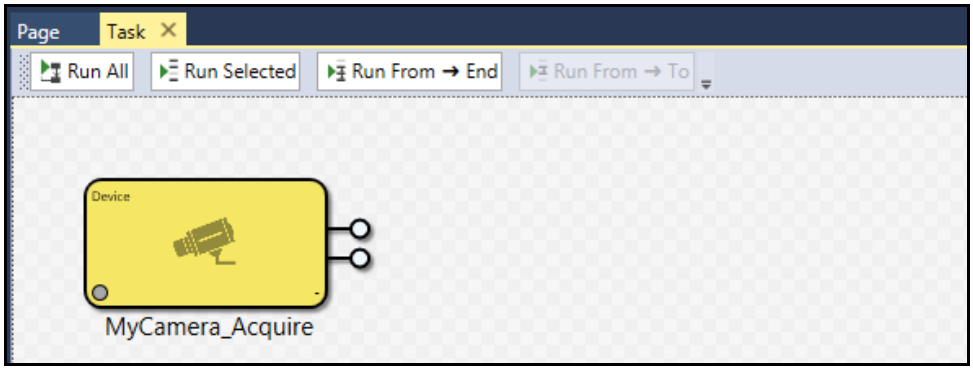


16. Enter *MyCamera* in the Name field and click the **Accept** 

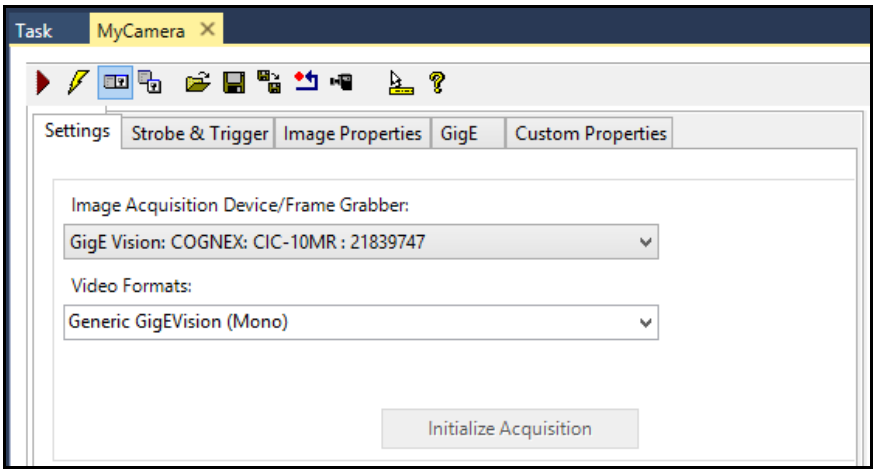
button.
    MyCamera has been added under Cameras in the Cognex Designer toolbox.



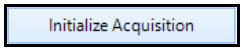
17. Drag and drop **MyCamera** into the Cognex Designer Task.

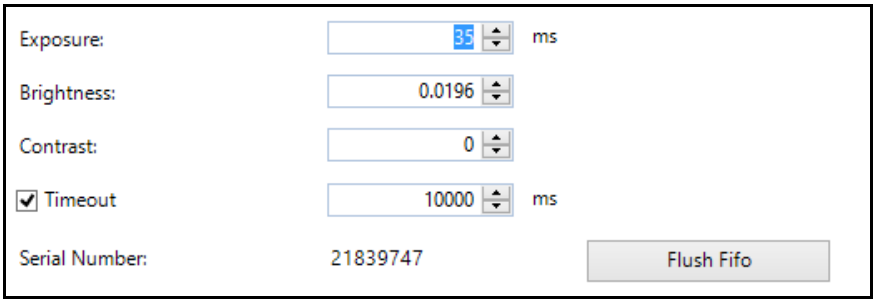


18. Double-click the **MyCamera_Acquire** ToolBlock to access the camera settings.
    The **MyCamera Settings** display.

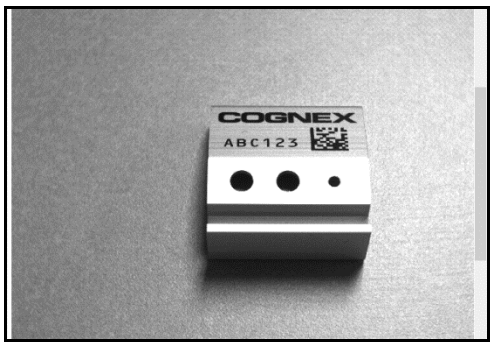


19. Select *Generic GigEVision* → *Mono* as the camera's Video Format.

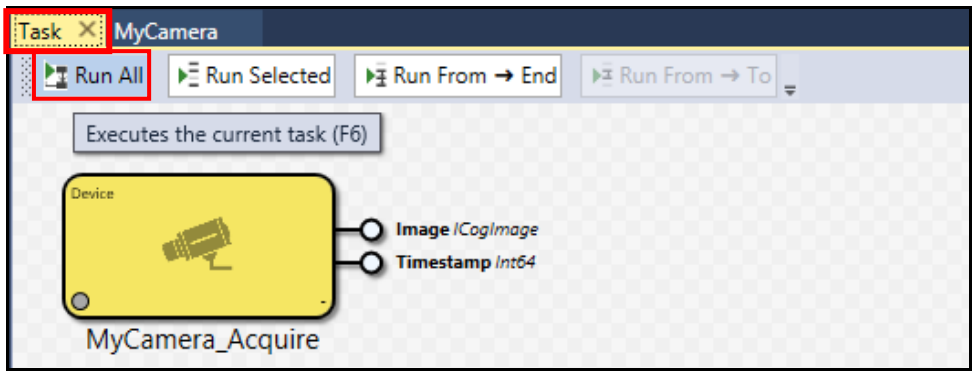
20. Click the **Initialize Acquisition**  button.
    The **camera settings** display.



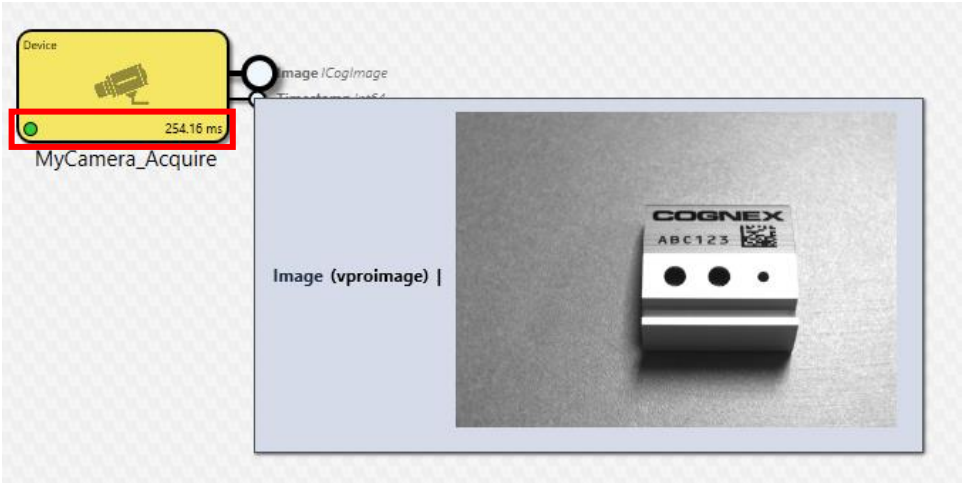
21. Configure the camera settings so that you can acquire an image from the camera at your workstation.
22. Click the **Run**  button.
    The **image** is captured.



23. Return to the **Task** Tab and click the **Run All**  button.



Notice the green dot in the lower left and the time noted on the lower right of the CognexBlock. If you hover your mouse over the output the image flyout will display.



NOTE: *Cognex Designer does not have an auto-save feature so make sure that you are saving your work often.*

24. Click the **Save**  button in the Designer toolbar to save your job.

Lab Exercise 2.1 – Tasks and PatMax® RedLine

At the end of this lab exercise, Participants will be able to:

- Configure a PatMax RedLine tool to find a pattern under various run-time conditions
- Train a pattern and determine if the automatically extracted features are valid for the application
- Determine if the PatMax RedLine score is valid

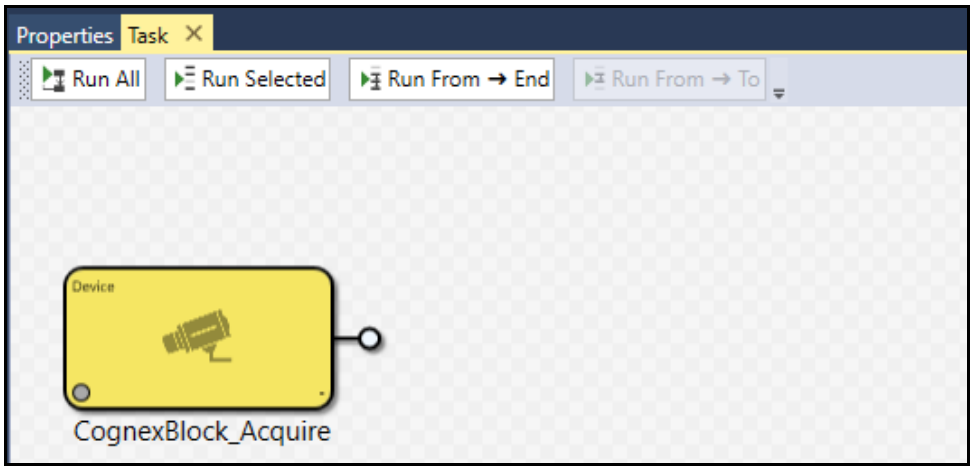
The Participant will utilize the following Cognex Designer functions to successfully complete this exercise:

- Toolbox
  - CogPMRedLine Tool
  - Script Block

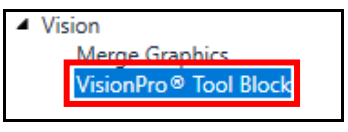
Follow the steps below to complete the lab exercise:

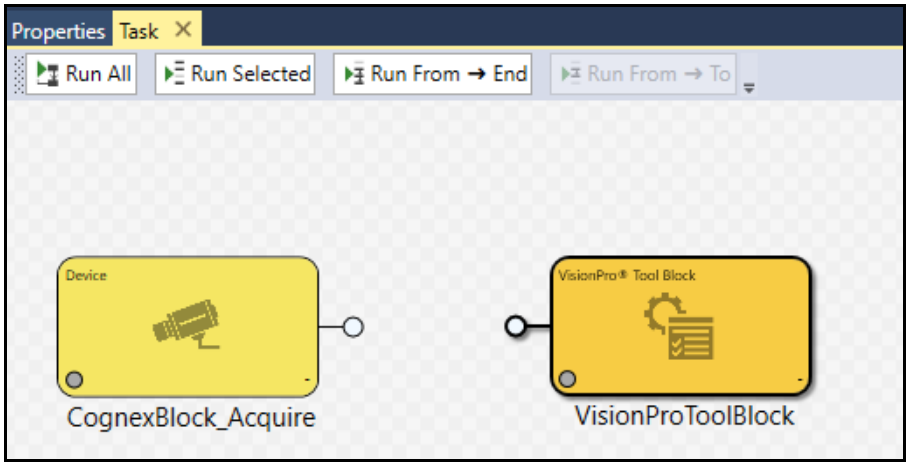
1. Open the **MyProject** Application from the previous lab exercise.

   The Task opens.

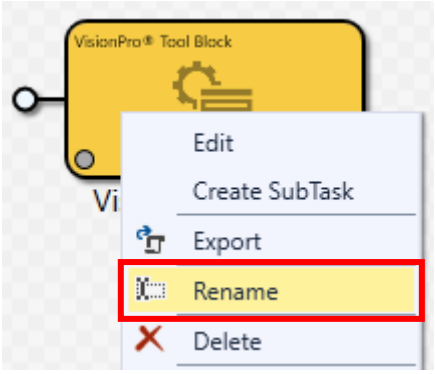


2. Drag a **VisionPro Tool Block** from the Toolbox and drop it to the right of the *Device* block on the Task.

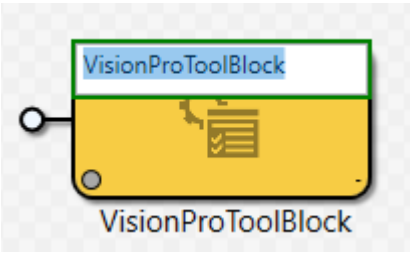




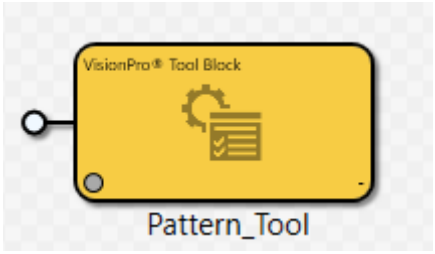
3. Right click on the VisionPro ToolBlock and select **Rename** from the fly-out box.



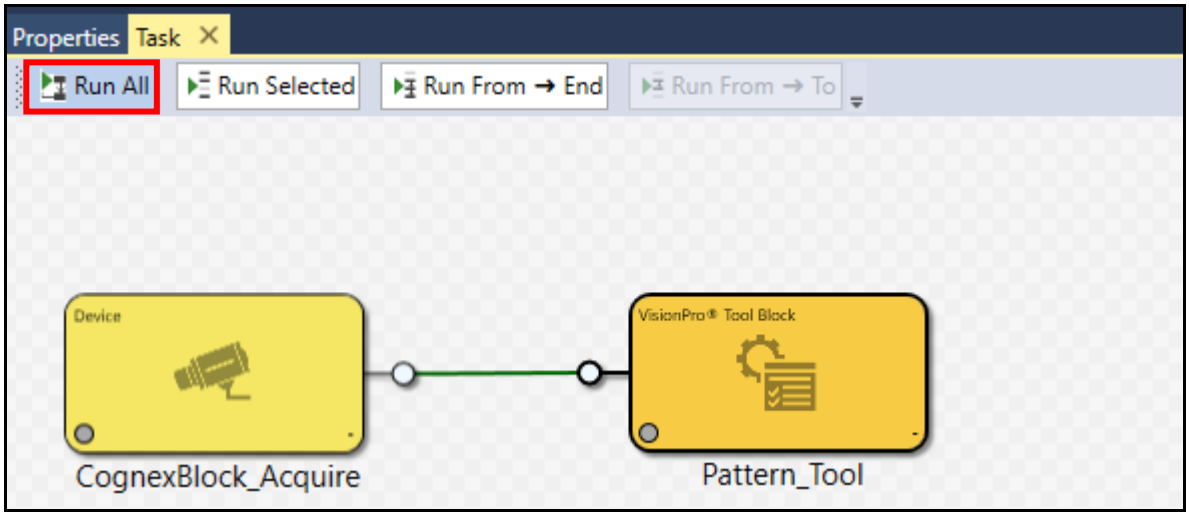
The **Name** field becomes editable.



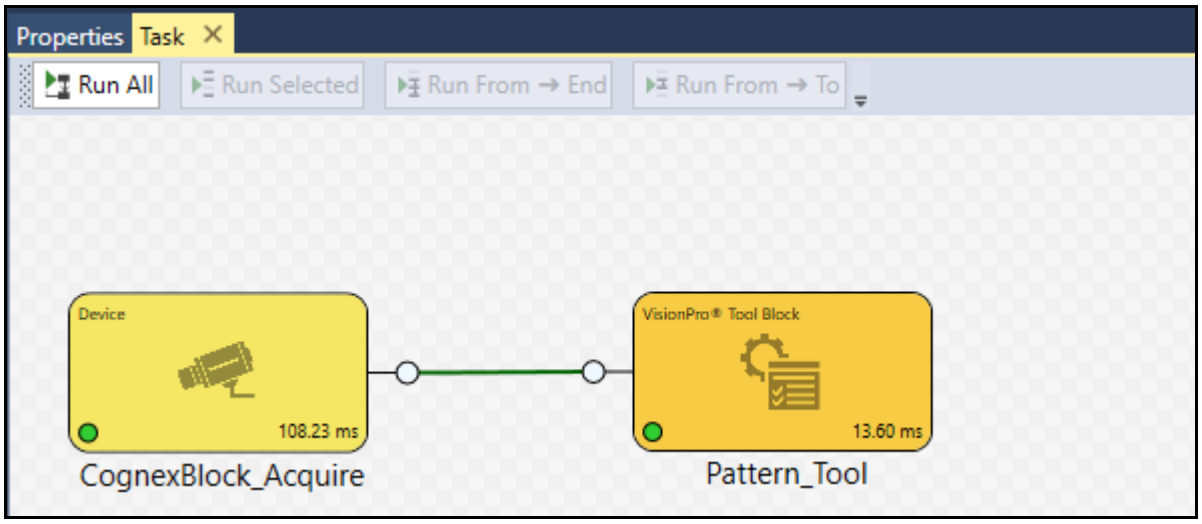
4. Rename the ToolBlock to *Pattern_Tool* and press the **<Enter>** key.
   The ToolBlock name changes.



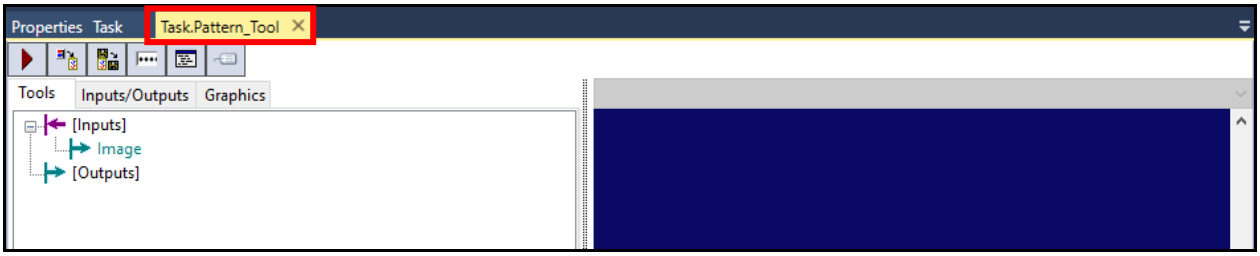
5. Connect the *Output* pin of the Device block to the *Input* pin of the Pattern_Tool block and click the **Run All**  button.



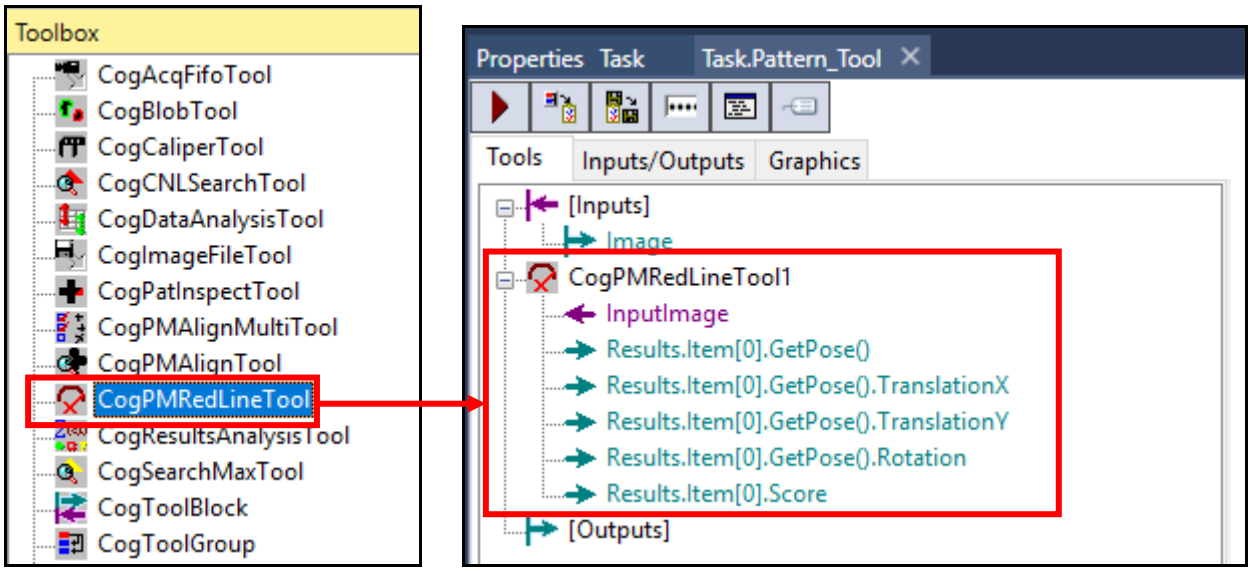
The blocks are linked and an image has been acquired.



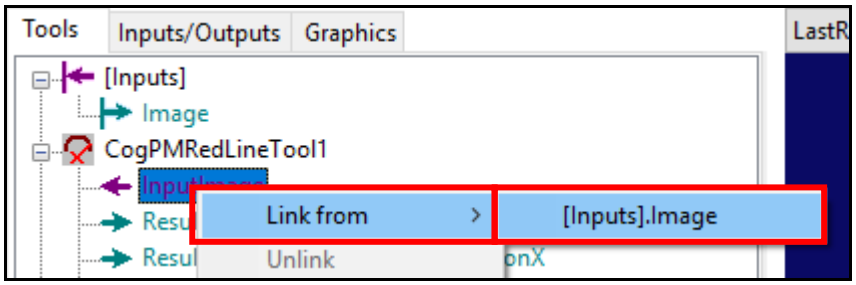
6. Double-click on the Pattern_Tool ToolBlock.
   The *Task.Pattern_Tool* tab opens.



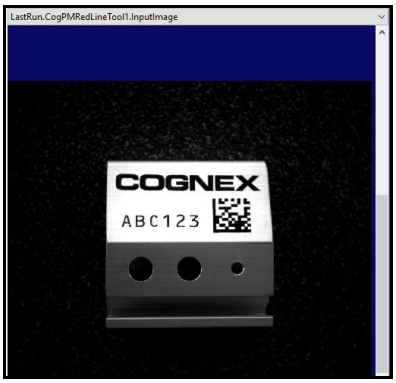
7. Drag a **CogPMRedLineTool** from the toolbox and drop it in the *Task.Pattern_Tool*.



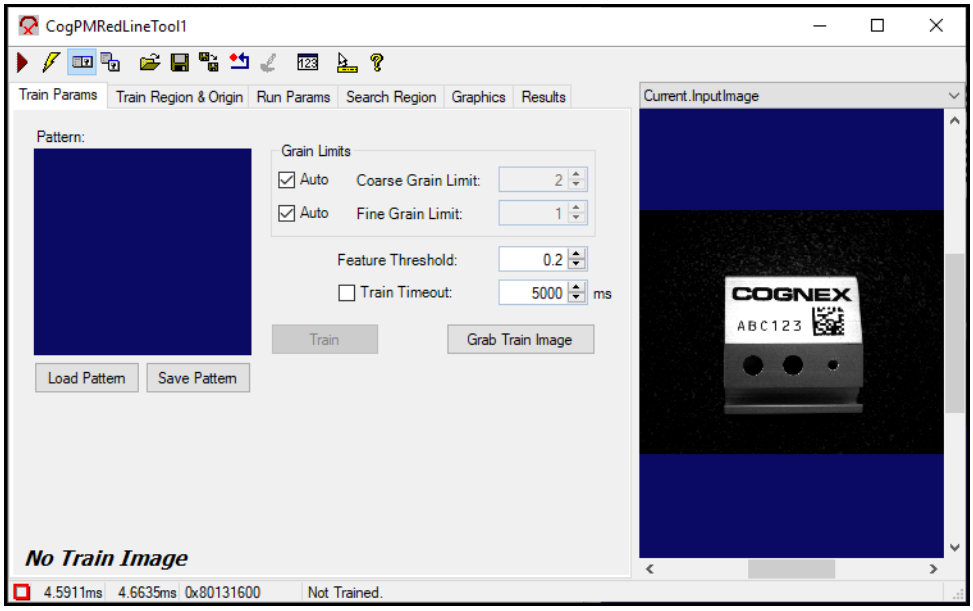
8. Connect the **InputImage** of the CogPMRedLineTool to the **[Inputs] Image**.
   NOTE: *This can also be done by right-clicking on the CogPMRedLineTool InputImage → Link From → [Inputs].Image.*

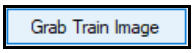


9. Click the **Run Tools** button.
   An **image** is captured.

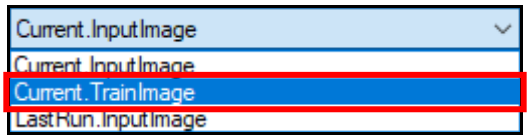


10. Double-click the **CogPMRedLineTool** to open the tool control for the PatMax RedLine tool.
    The **PatMax RedLine** tool controls open.



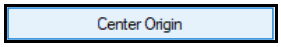
11. Click the **Grab Train Image** 

button on the Train Params tab.
12. Change the Image Buffer to **Current.TrainImage**.



The *Region* and *Origin* appear on the Current.TrainImage.

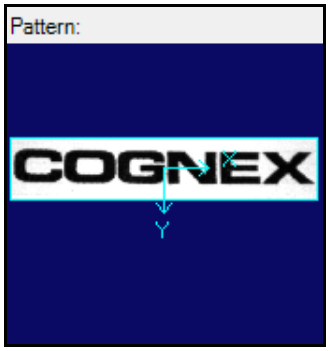
13. Set the **Region** around the word COGNEX.

14. Click the **Train Region & Origin** tab and click the **Center Origin** 

button.

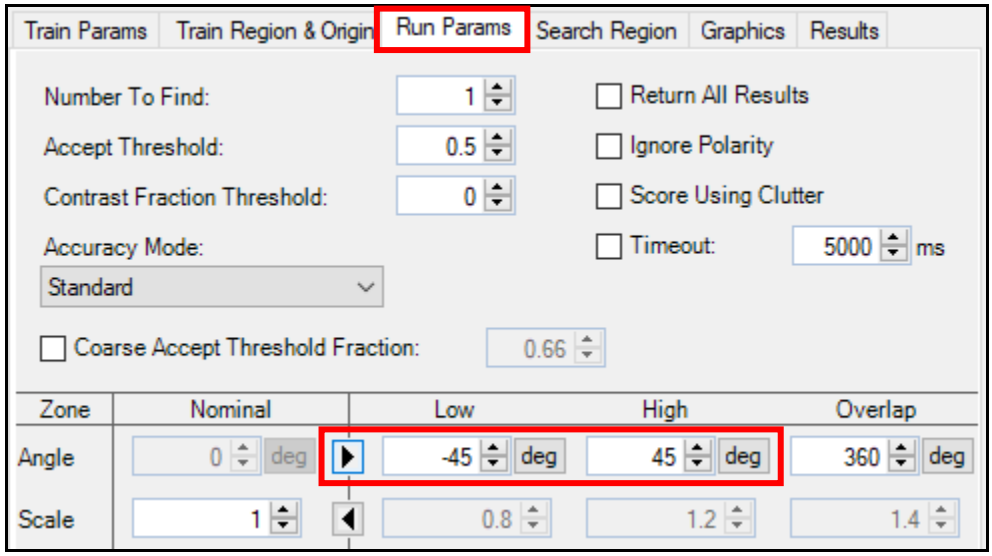
15. Click the **Train** 

button.
16. Return to the **Train Params** tab and notice the image of the model appears in the **Pattern:** window.

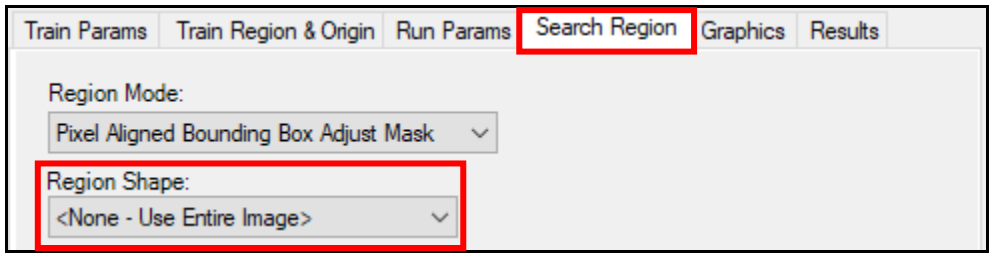


17. Click the **Run Params** tab and add an *Angle* range.

NOTE: *The arrow for the Angle is facing the Low and High fields*.

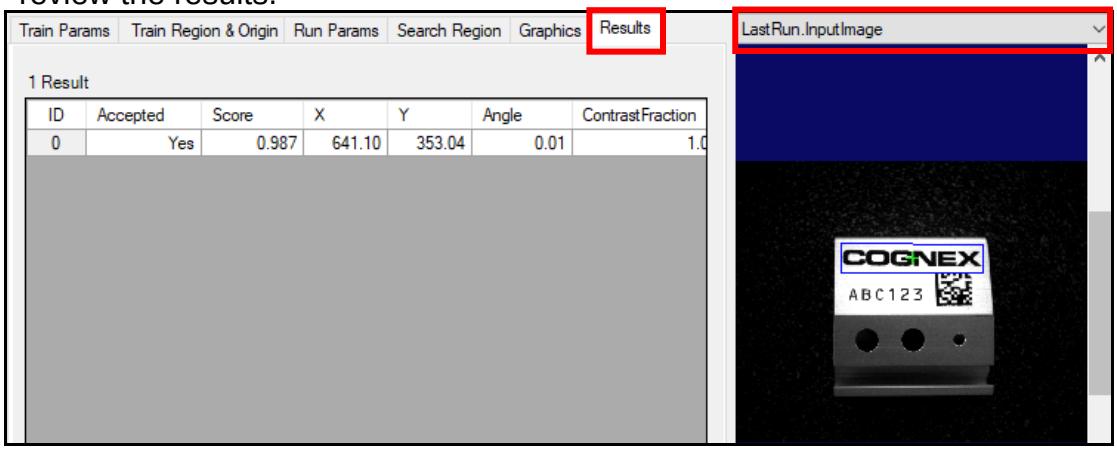


18. Click the **Search Region** tab and select *<None – Use Entire Image>* as the **Region Shape**.



19. Click the **Run**  button to run the tool once.

20. Click the **Results** tab and change the **Image Buffer** to *LastRun.InputImage* to review the results.

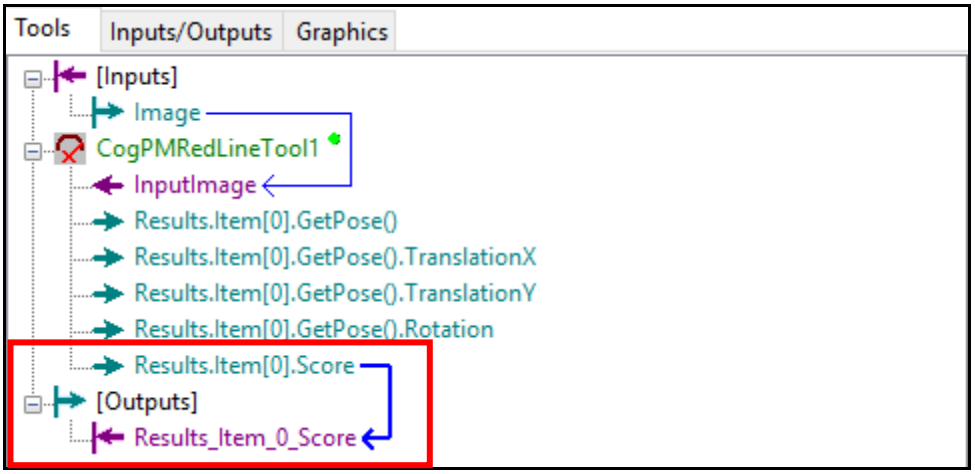


21. Close the tool control by clicking the **X** in the upper-right hand corner.

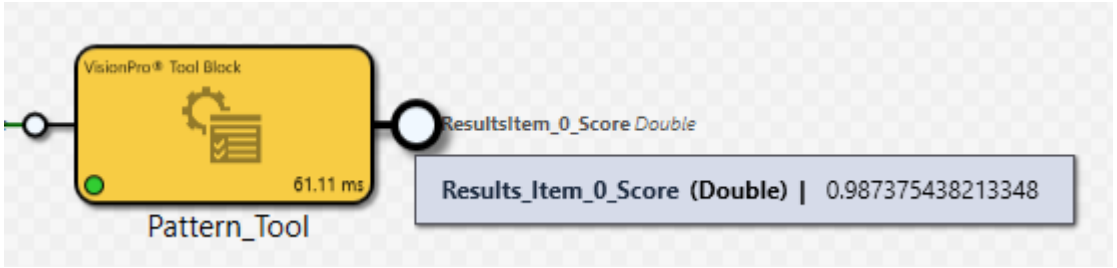
Add an Output for Score and Count

Follow the steps below to add an output to the ToolBlock:

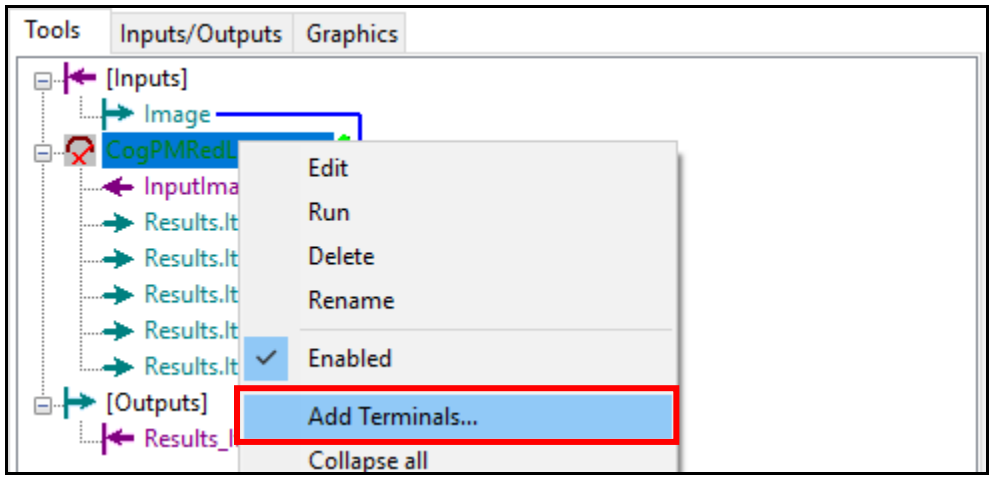
1. Drag the **Results.Item[0].Score** and drop it at **[Outputs]**. This creates a new output terminal from the ToolBlock.



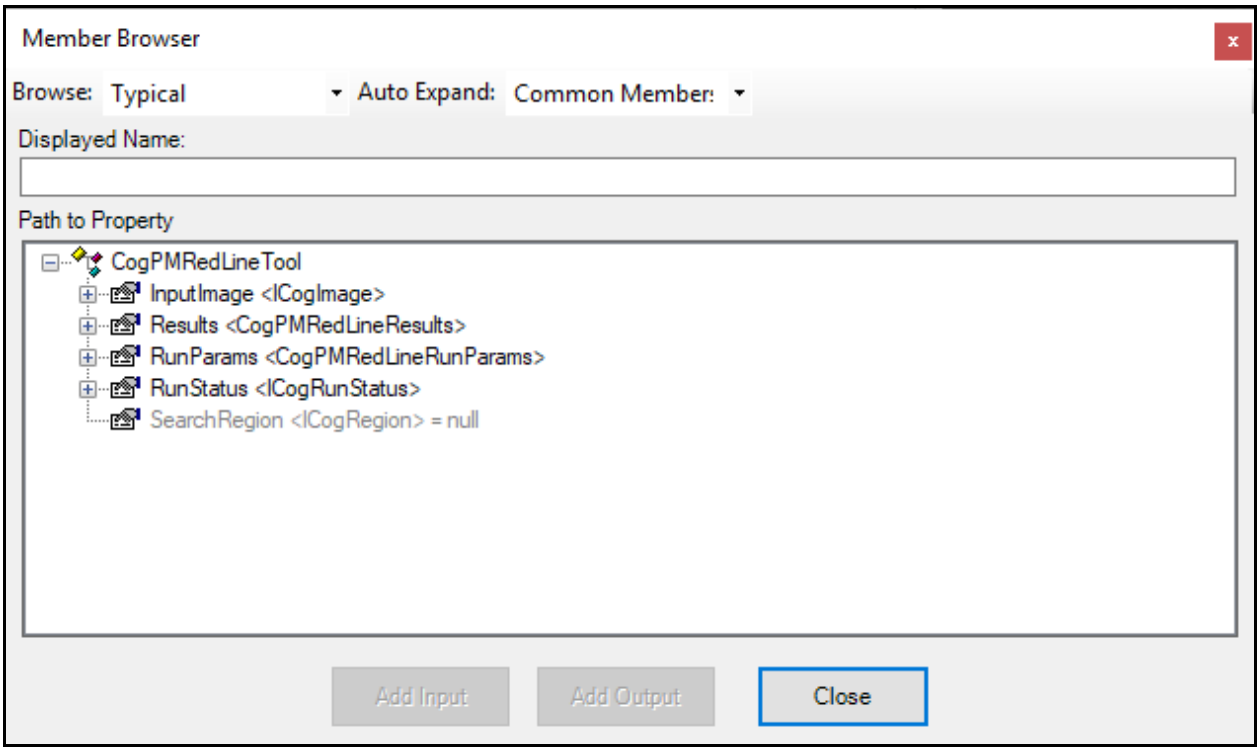
The *Results* Output pin is added to the Pattern_Tool ToolBlock on the Task.

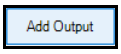


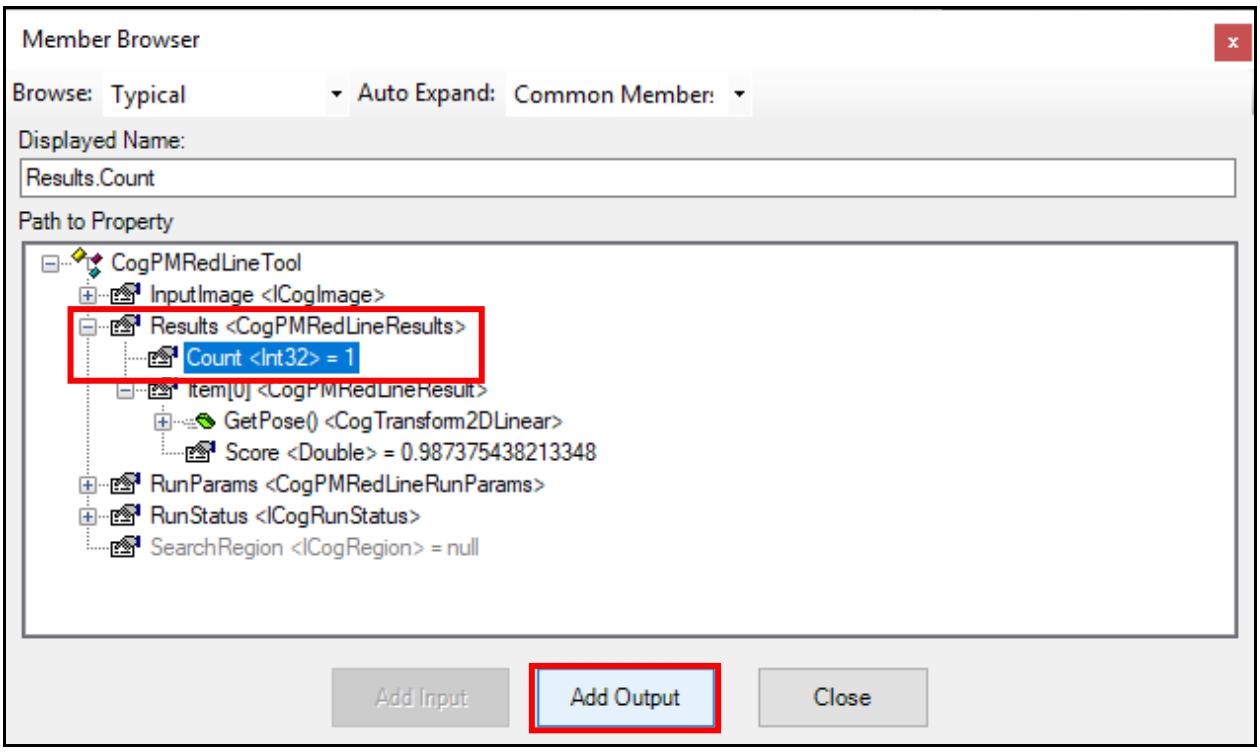
2. Right click on the CogPMRedLineTool and select **Add Terminals**.



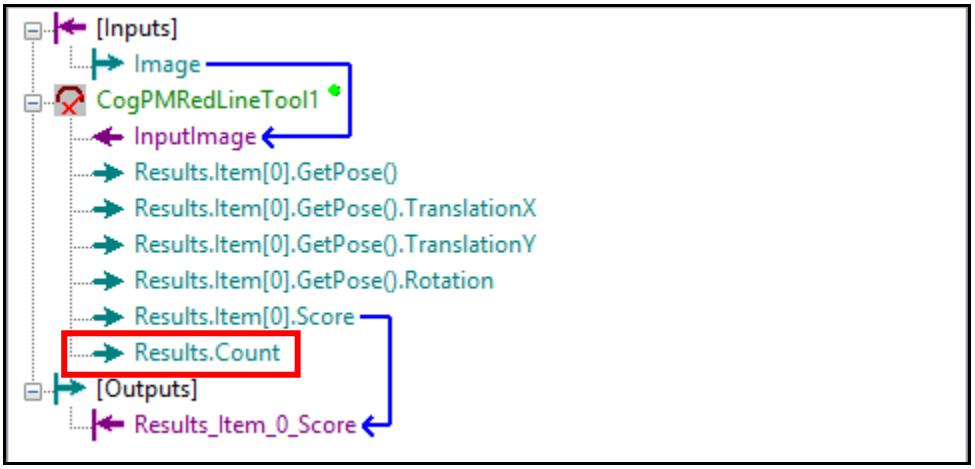
The **Member Browser** displays.



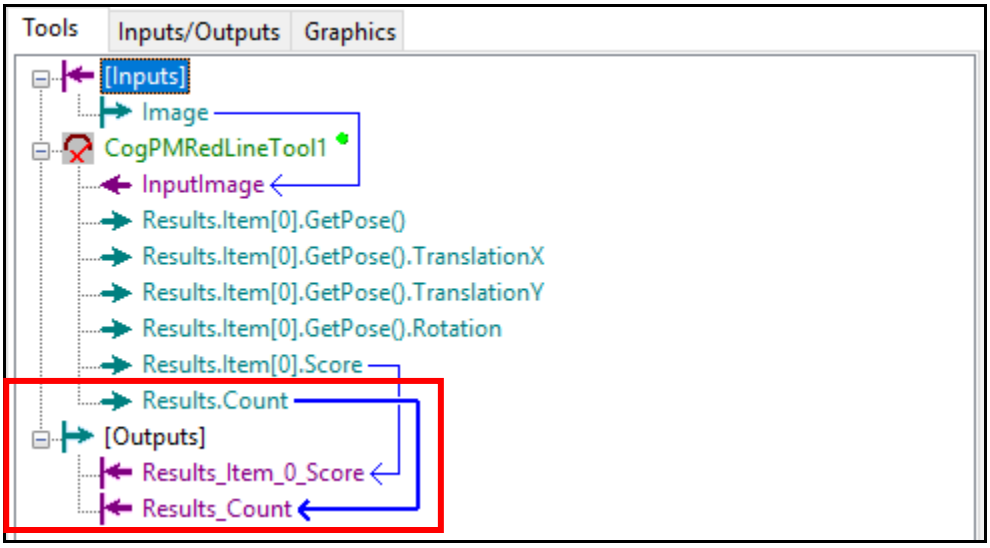
3. Open the *Results* branch, select *Count* and click the **Add Output**  button.



4. Click the **Close**  button.
Results.Count has been added to the CogPMRedLineTool.

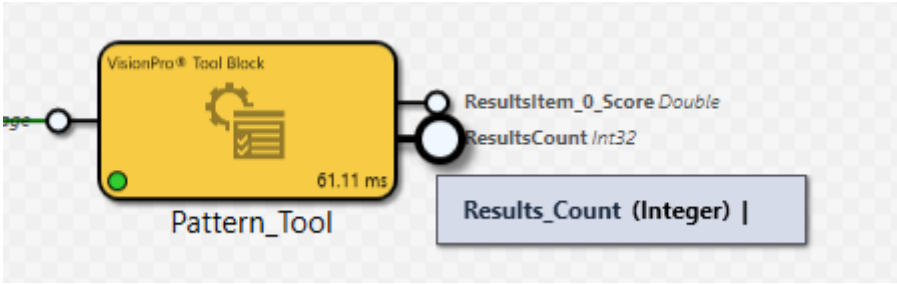


5. Drag the **Results.Count** and drop it at [Outputs]. This creates a new output terminal from the ToolBlock.



The *Count* Output pin is added to the Pattern_Tool ToolBlock on the Task.

Note that the Pattern_Tool ToolBlock now has two output pins.



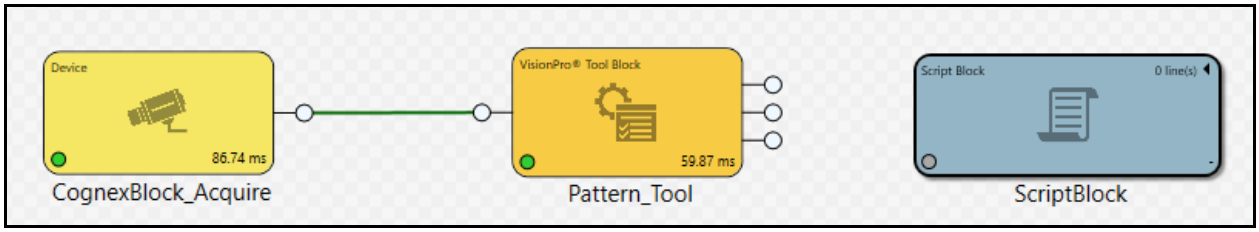
6. Click the **Run All**  button.

7. Record the Output results:
   a. Score: _____
   b. Count: _____

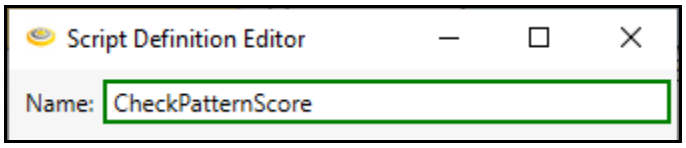
Create a Script Block

1. Add a Script Block to the Task.

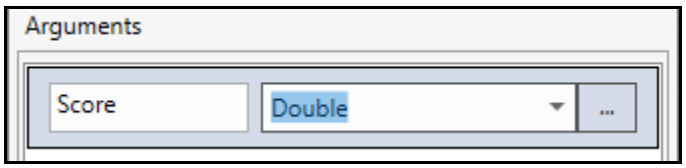
   NOTE: *The Script Block is found in the Toolbox under Scripts.*



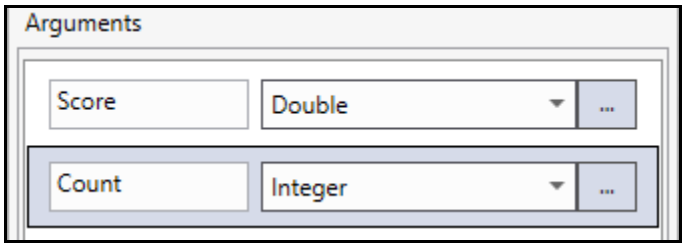
2. Double-click the ScriptBlock to open and rename it to *CheckPatternScore.*



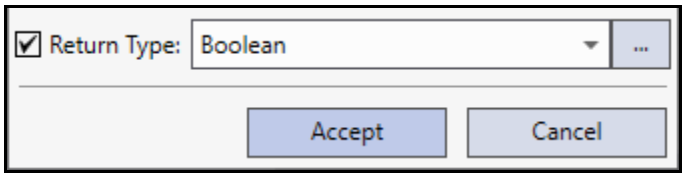
3. Click the green plus sign button to add an argument.
4. Rename the argument *Score* and set it to Double.



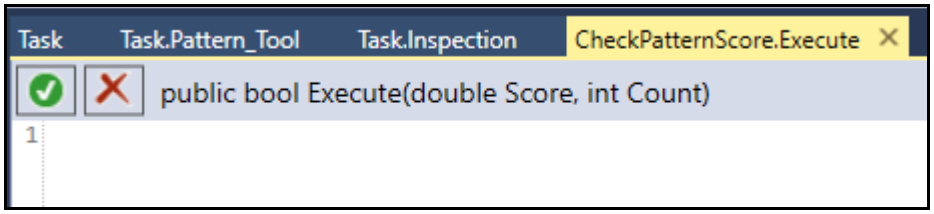
5. Add a second argument named *Count* and set it to Integer.



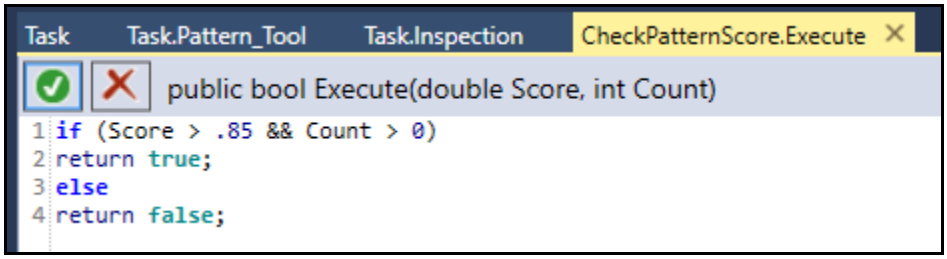
6. Check the Return Type checkbox and set to Boolean.



7. Click the **Accept** button.
   The **CheckPatternScore.Execute** tab opens.

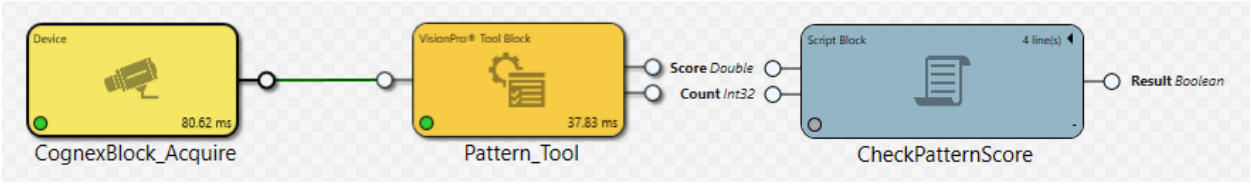


8. Enter the following script in the script window.

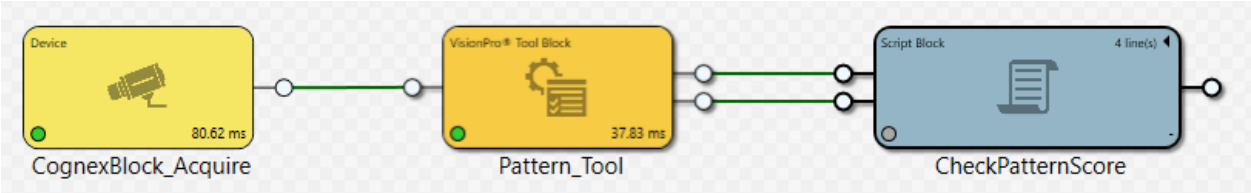


9. Click the **green check** button to compile the current script.
   The script is a success.

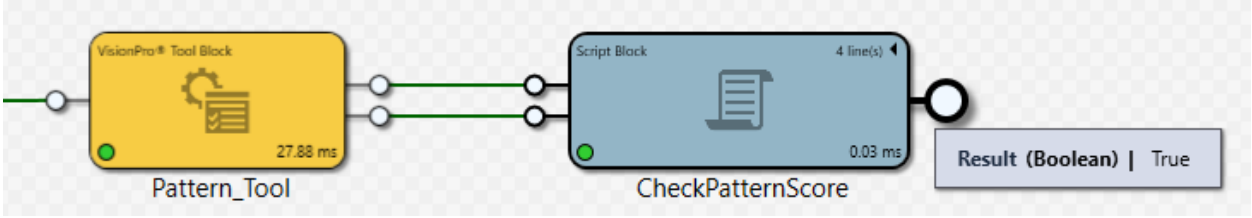
10. Click the X in the upper right hand corner of the script tab to close.
    You are returned to the Task.



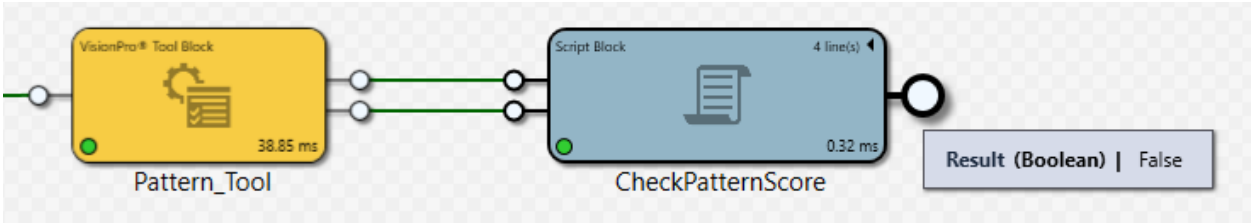
11. Connect the Output pins of the Pattern_Tool block to the corresponding Input pins of the CheckPatternScore script block.



12. Click the **Run All** button to run execute the task.



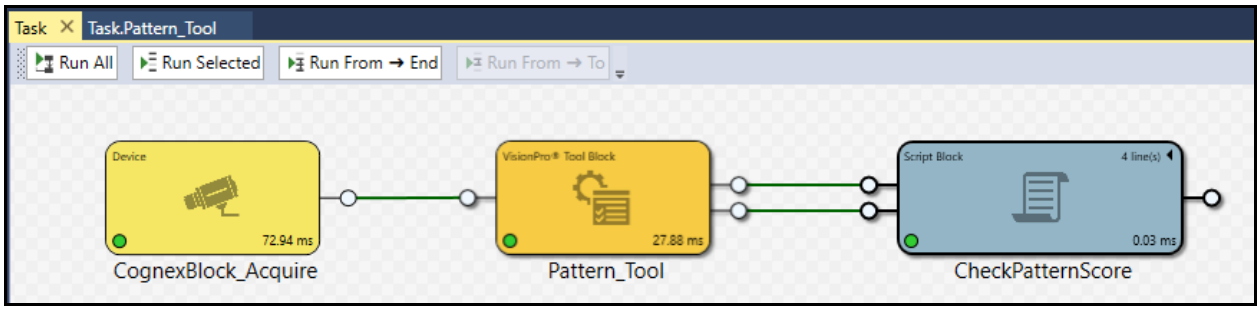
13. Run the task with the bad part and review the results.



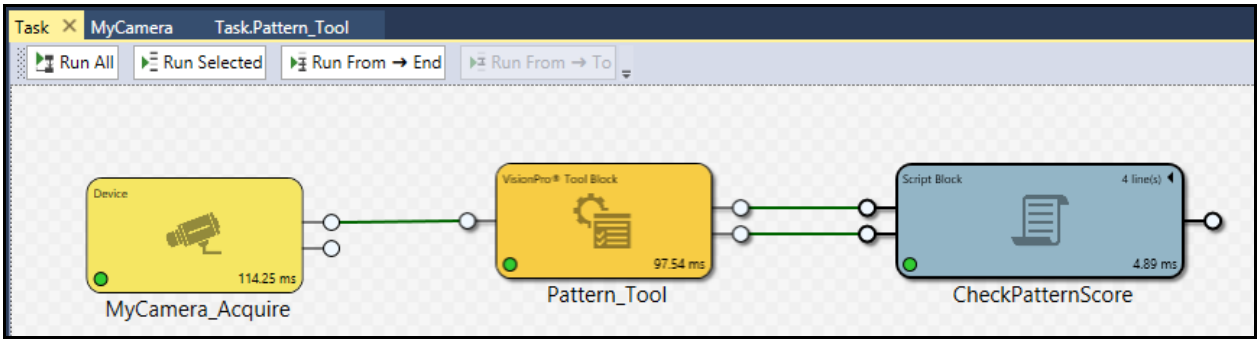
14. Click the **Save** button in the Designer toolbar to save your job.

Expected Results:

Images:



CIC Camera:



Lab Exercise 3.1 – Histogram and Fixturing Tools

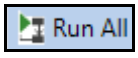
At the end of this lab exercise, Participants will be able to:

- Configure a Fixture tool
- Configure a Histogram tool to analyze the image for the presence/absence of a part
- Determine if the gouge is found

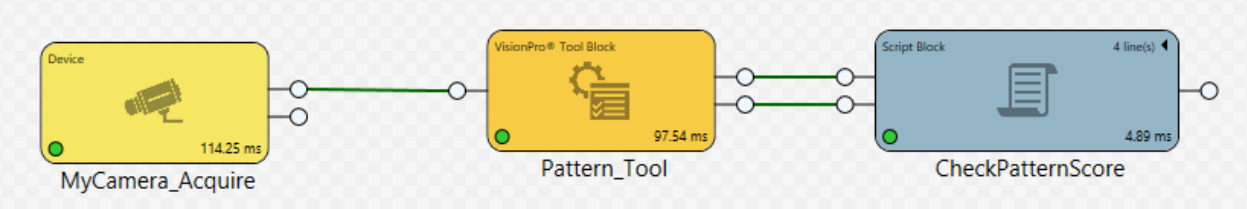
The Participant will utilize the following Cognex Designer functions to successfully complete this exercise:

- Toolbox
  - CogFixture Tool
  - CogHistogram Tool
  - Script Block

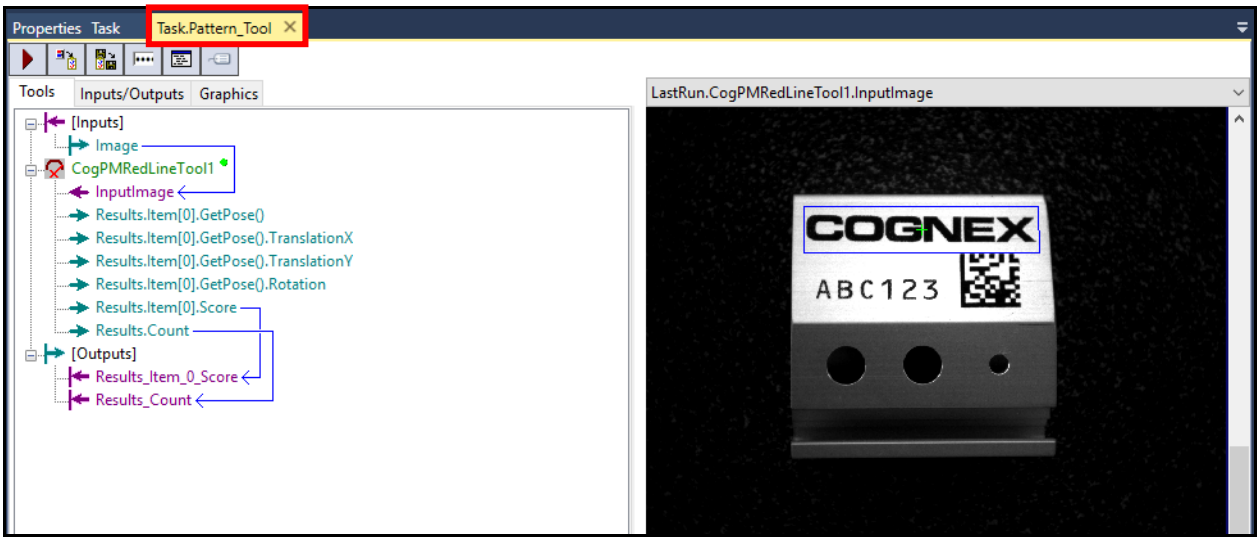
Follow the steps below to complete the lab exercise:

1. Open the **MyProject** Application from the previous lab exercise.
2. Click the **Run All** 

button to bring the image into the tool.
   NOTE: *If the job was open from the previous lab, this step is not required.*

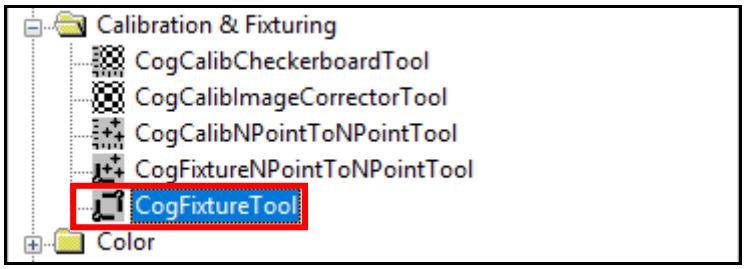


3. Double click the **Pattern_Tool** ToolBlock to access the tool settings.
   The **Task.Pattern_Tool** opens.



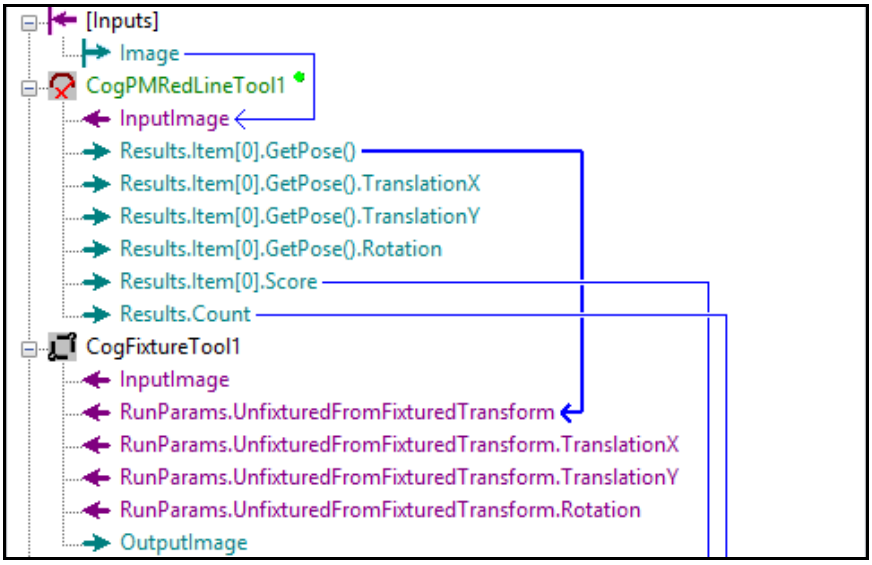
4. Add a **CogFixtureTool** under the CogPMRedLineTool.

NOTE: *The CogFixture tool is found in the Calibration & Fixturing folder.*

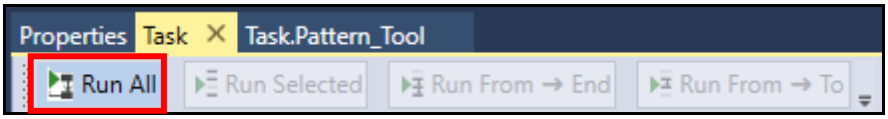


The **CogFixtureTool** is added.

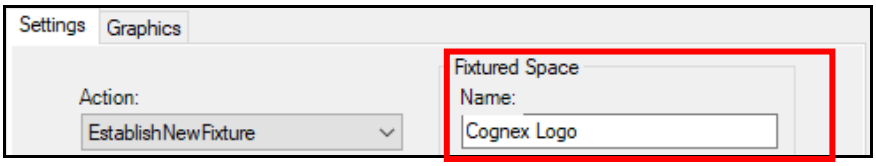
5. Connect the **[Inputs].Image** to the InputImage of the CogFixture tool.
   NOTE: *To do this you can either drag and drop the connection, or right click on the InputImage → Link from → [Inputs].Image.*
6. Connect the **Pose** result of the PMRedLine tool to the **Transform** result of the Fixture tool.
   The image is now connected to the CogFixture tool.



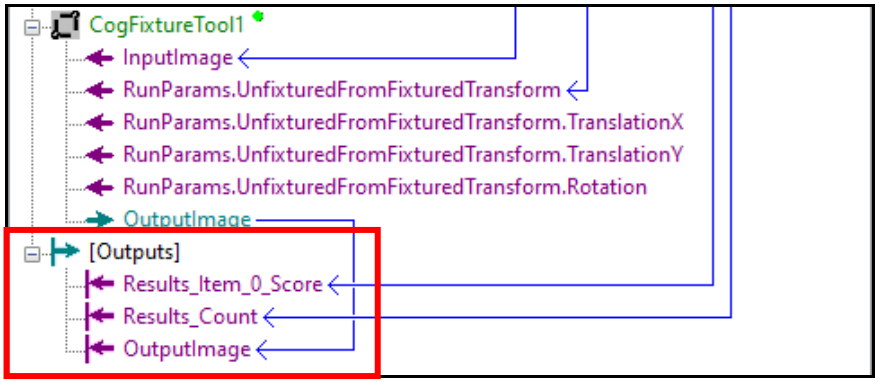
7. Return to the **Task** tab and click the **Run All**  button to bring the image into the tool.



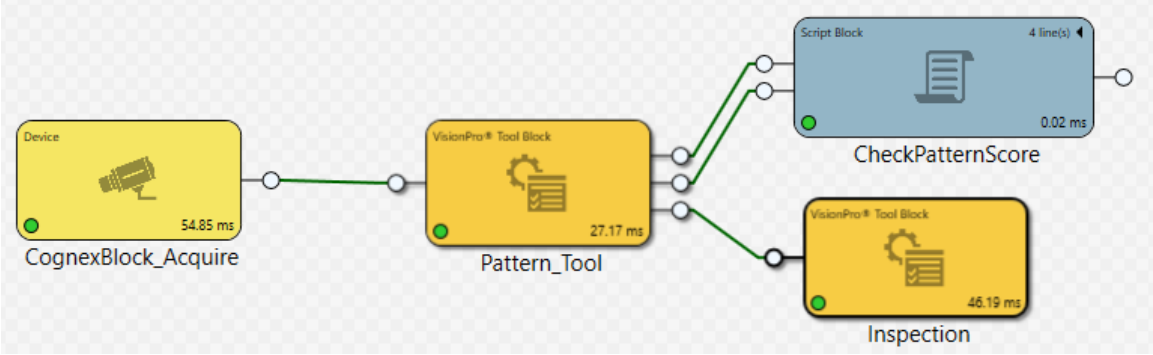
8. Return to the **Task.Pattern_Tool** tab and double-click the CogFixture tool to access the tool settings.
9. On the Settings tab change the **Name** of the Fixtured Space to *Cognex Logo*.



10. Click the **Run** button.
11. Close the Fixture tool.
12. Drag the **OutputImage** from the Fixture Tool to the **[Outputs]** section of the ToolBlock.

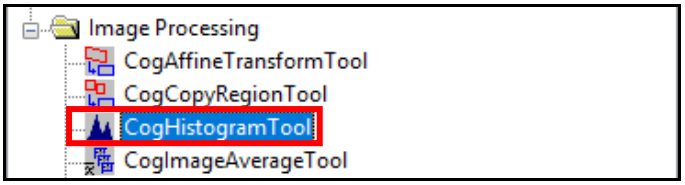


13. Add a new VisionPro Tool Block to the right of the Pattern_Tool block.
14. Rename the Toolblock to *Inspection* and connect the Output image from the Pattern_Tool block to the Input pin of this tool block.
15. Click the **Run All** Run All button to bring the image into the new tool block.



16. Open the Inspection tool block and add a **CogHistogram** tool.

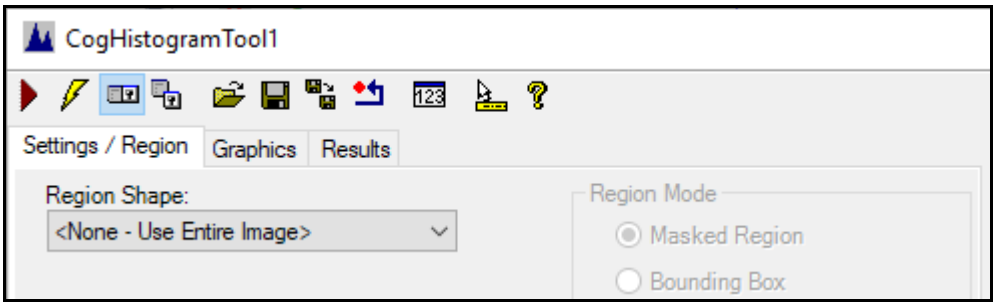
NOTE: *The CogHistogram tool is in the Image Processing folder*.



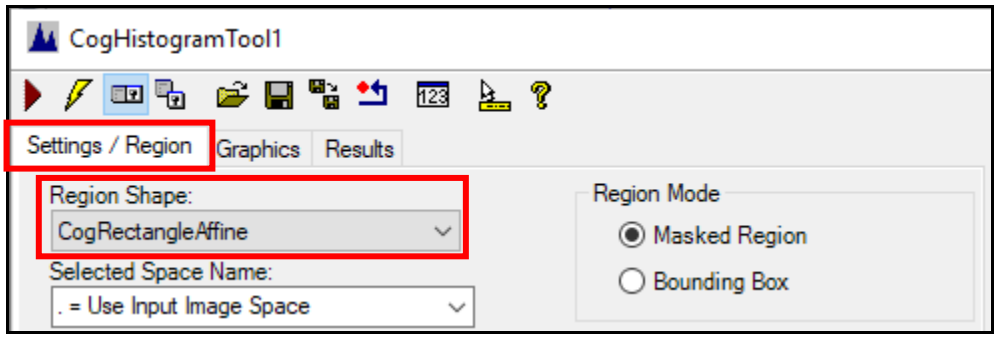
The **CogHistogram** tool is added.

17. Connect the InputImage of the CogHistogram tool to the [Inputs] Image.
NOTE: *To do this you can either drag and drop the connection, or right click on the CogHistogramTool InputImage → Link from → [Inputs].Image.*
18. Click the **Run** button to bring the image into the tool.

19. Double-click the **CogHistogram** tool to access the tool settings.



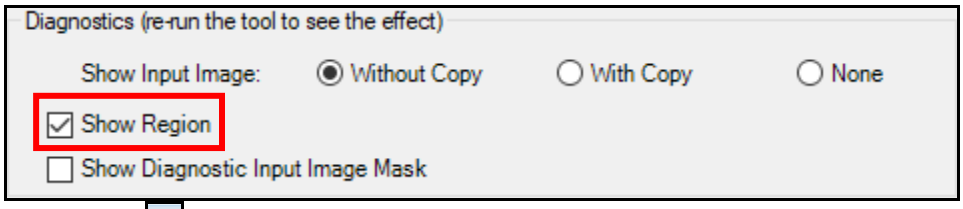
20. On the **Settings / Region** tab select **CogRectangleAffine** as the Region Shape.



21. Position the Region between the Cognex logo and the number/letter string.

NOTE: *There is a gouge in this position on the bad part that we want to find.*

22. Click the **Graphics** tab and check the **Show Region** checkbox.

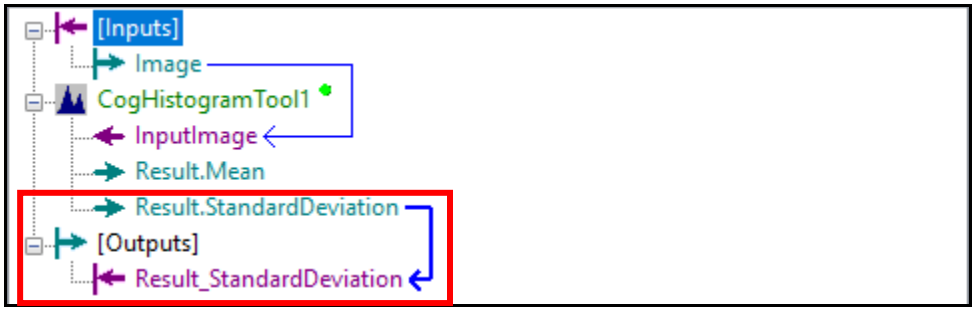


23. Click the **Run** button.
24. Close the Histogram tool.
25. Change the Image Buffer to **LastRun.CogHistogramTool1.InputImage**.

26. Run the Task with both the good part and the bad part. Confirm the Histogram tool's region moves with the part.
27. Click the **Results** tab and review the following values:

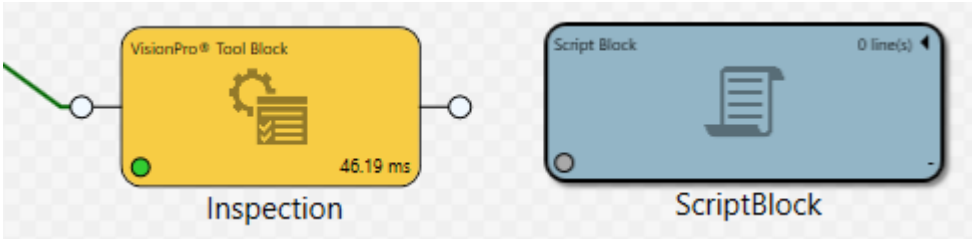
	Good Part	Bad Part
Standard Deviation		
Minimum		
Maximum		

28. Drag the **Results.StandardDeviation** from the Fixture Tool to the **[Outputs]** section of the ToolBlock.

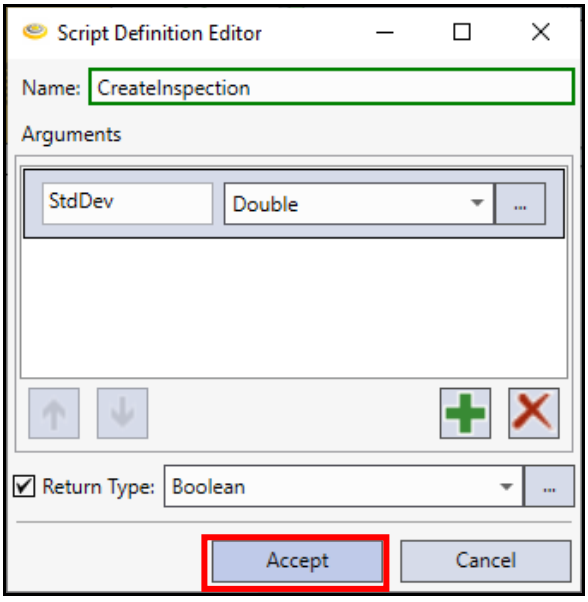


Create a Script Block

1. Add a Script Block to the Task.

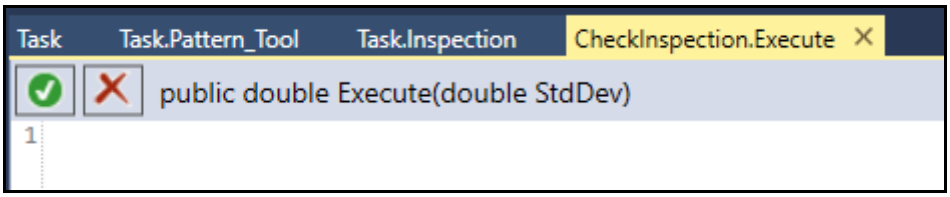


2. Double-click the Script Block to open and rename it to *CheckInspection.*
3. Add an argument named *StdDev* and set it to **Double**.
4. Check the Return Type checkbox and set it to **Boolean**.

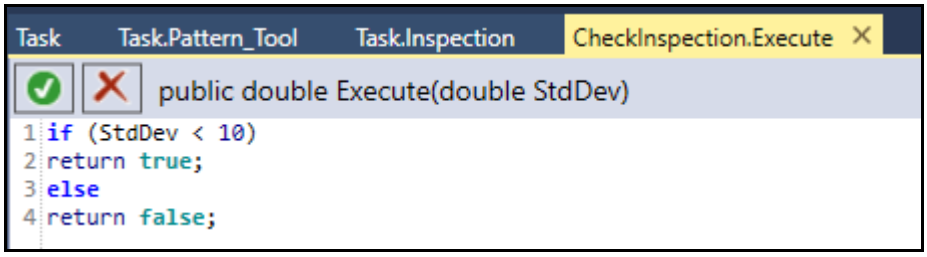


5. Click the **Accept** button.

The **CheckInspection.Execute** tab opens.

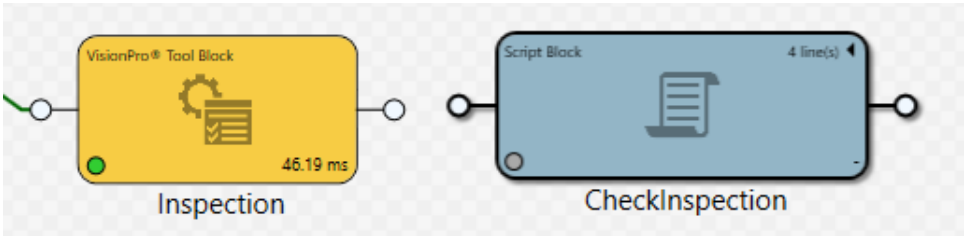


6. Enter the following script in the script window.

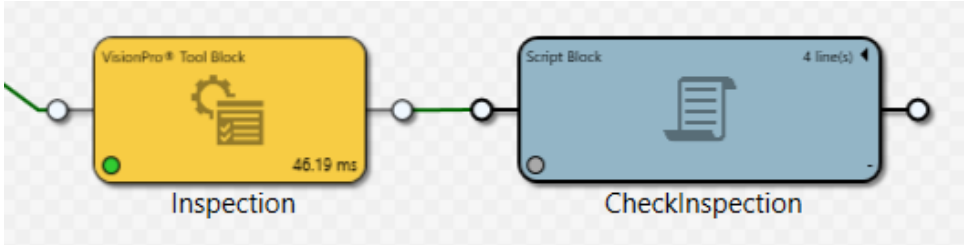


7. Click the **green check** button to compile the current script.
   The script is a success.

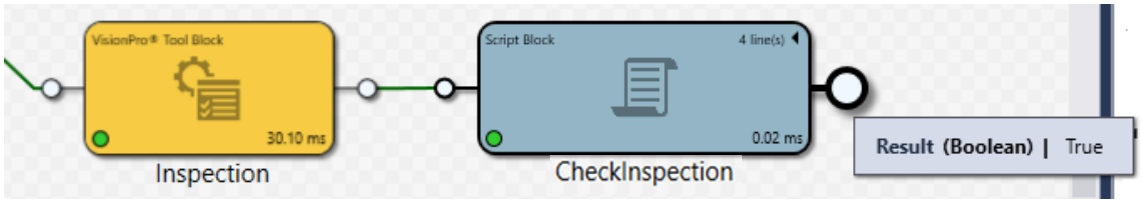
8. Click the **X** in the upper right hand corner of the script tab to close.
   You are returned to the Task.



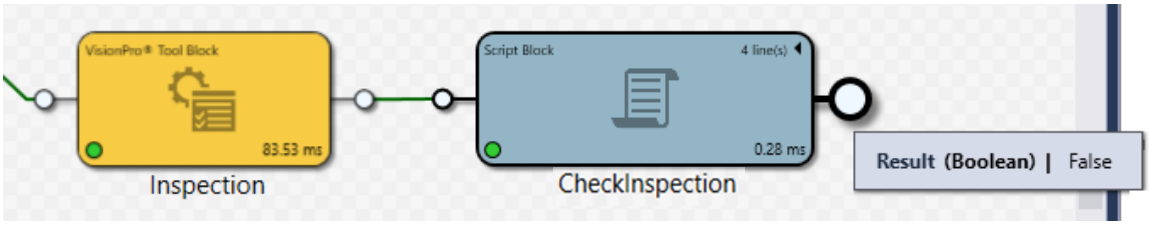
9. Connect the Output pin of the Inspection block to the Input pin of the CheckInspection Script Block.



10. Click the **Run All** button to run execute the task.



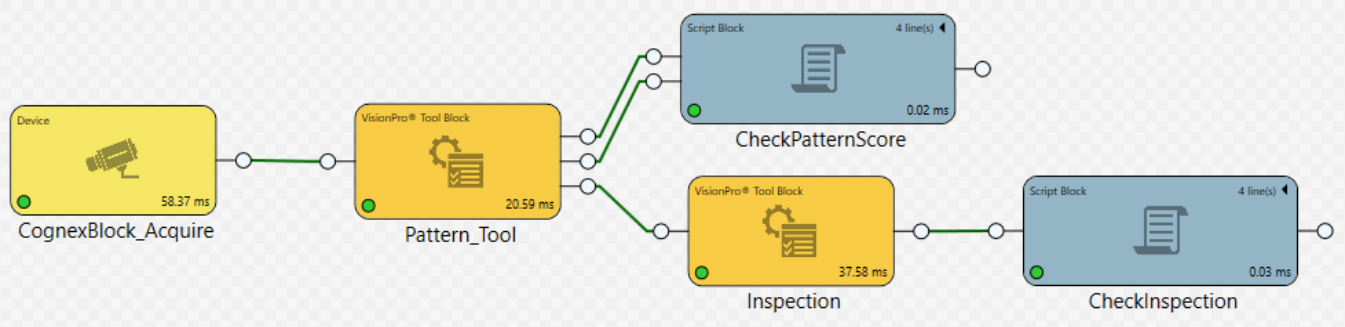
11. Run the Task with the bad part and review the results.



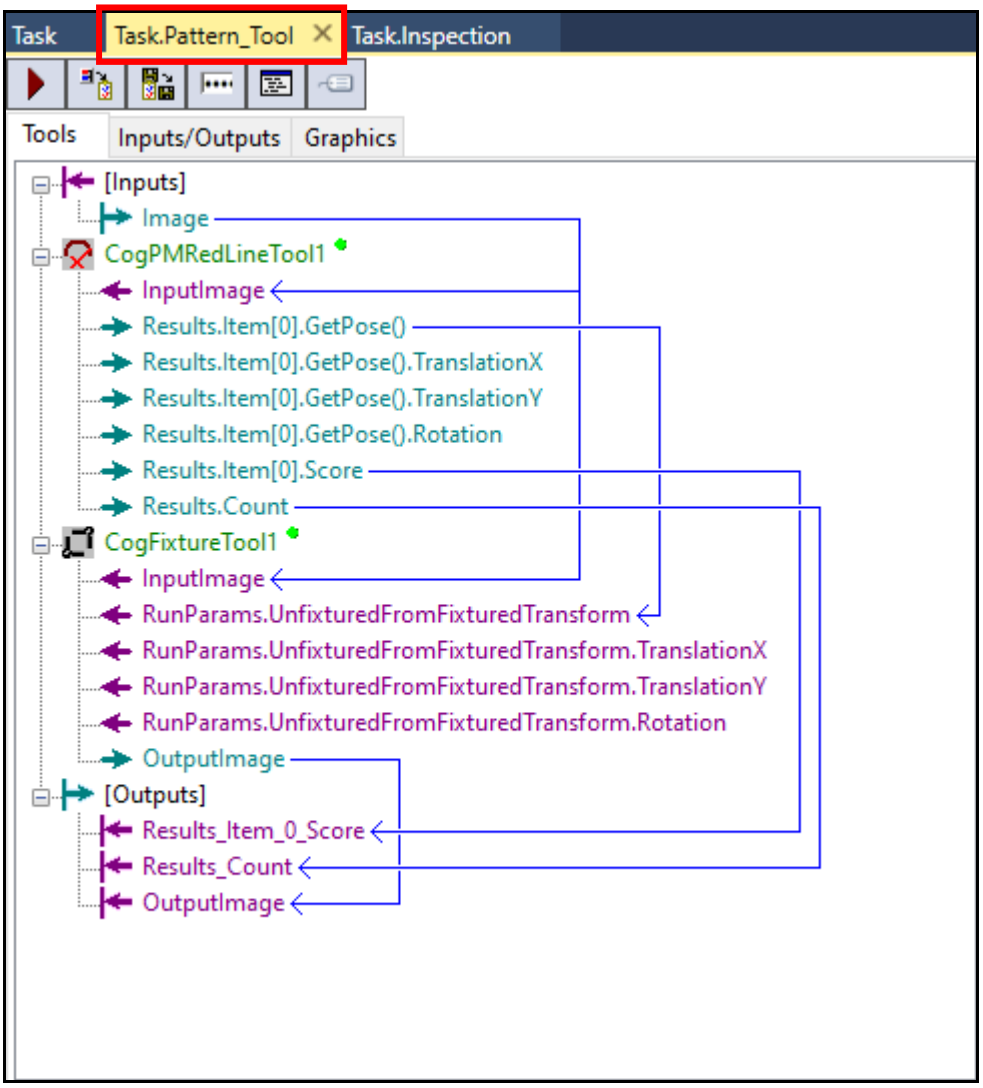
12. Click the **Save** button in the Designer toolbar to save your job.

Expected Results:

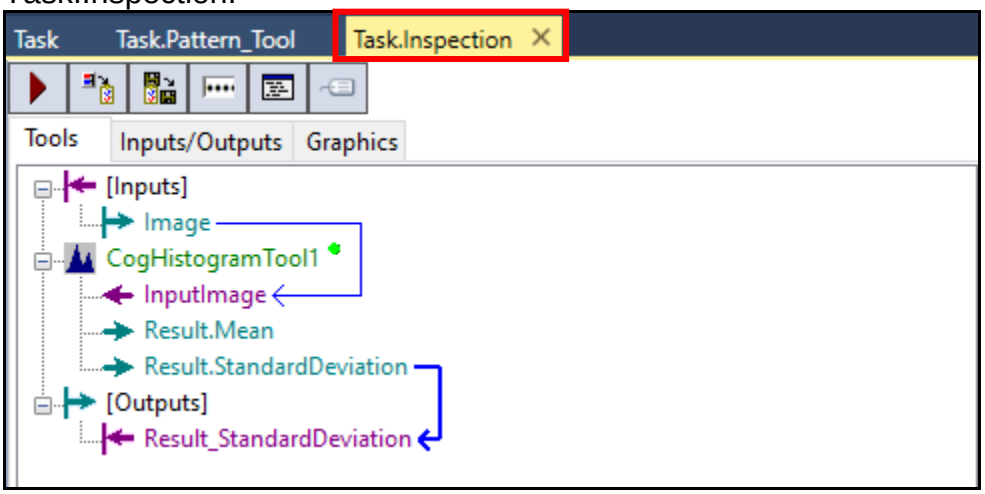
Task:



Task.Pattern_Tool:



Task.Inspection:



Lab Exercise 4.1 – Blob Tool

At the end of this lab exercise, Participants will be able to:

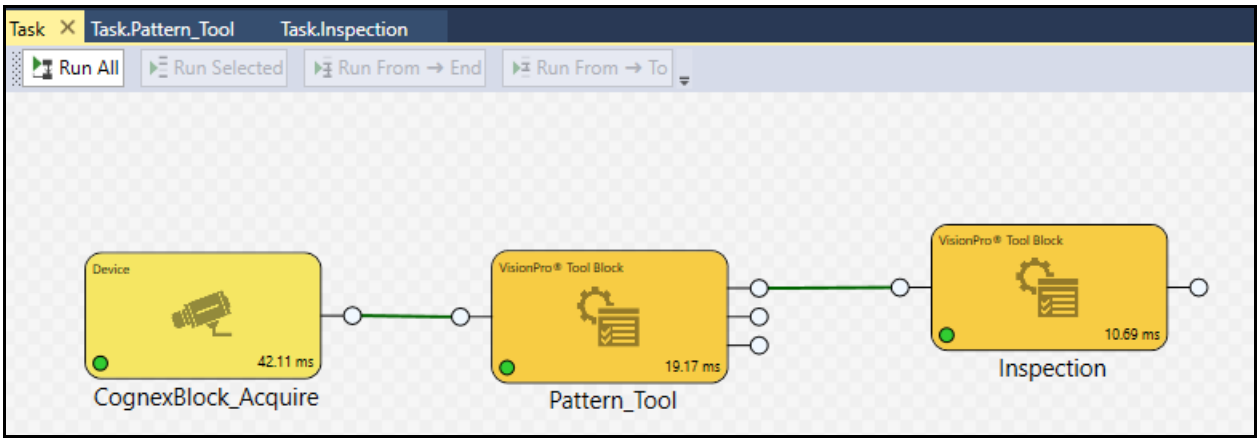
- Configure a Blob tool that will find blobs in a designated grey level range
- Filter blobs based on a given criteria

The Participant will utilize the following Cognex Designer functions to successfully complete this exercise:

- Toolbox
  - CogBlob Tool

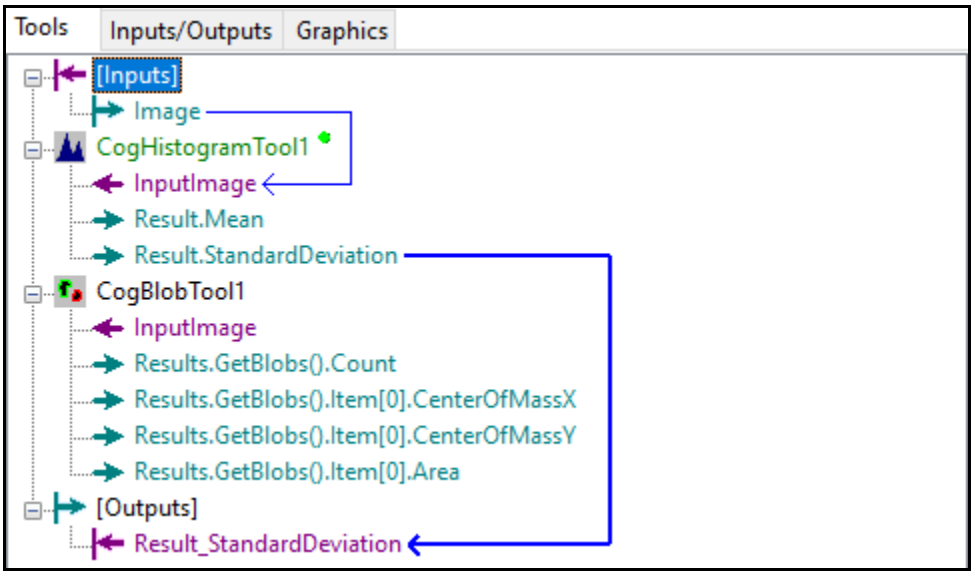
Follow the steps below to complete the lab exercise:

1. Open the **MyProject** Application from the previous lab exercise.

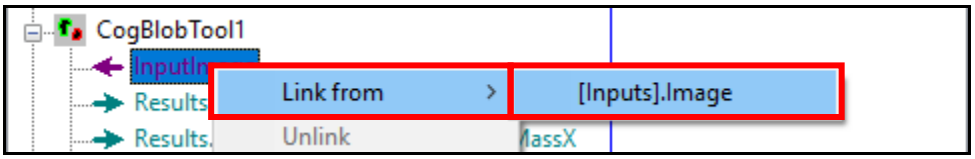


2. Double click the **Inspection** ToolBlock to access the tool settings or click the Task.Inspection tab if it is open (as shown above).
3. Add a **CogBlobTool** under the CogHistogramTool.

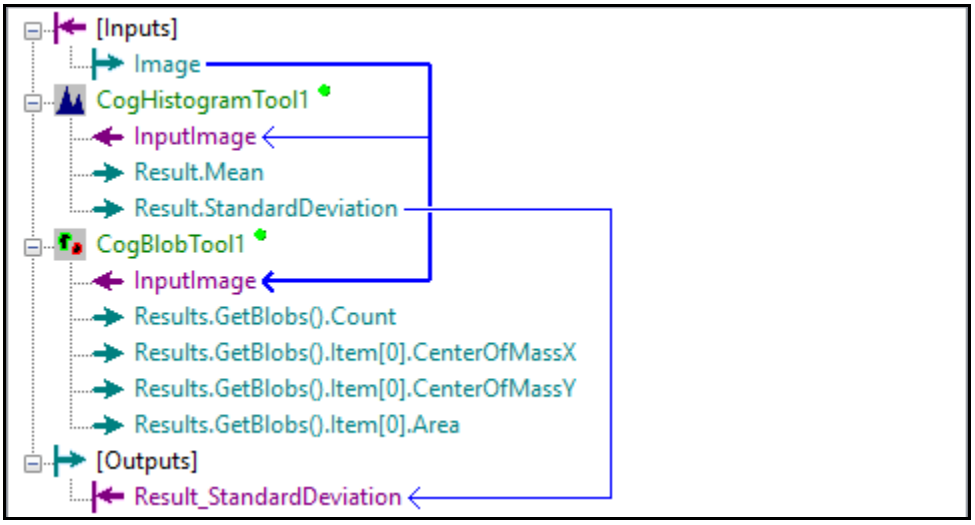
   The **CogBlob** tool is added.



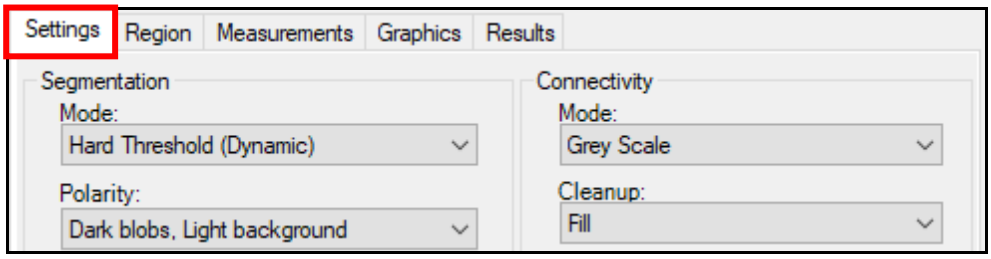
4. Connect the InputImage of the CogBlobTool to the [Inputs].Image.



5. Click the **Run Tools** button to bring the image into the tool.

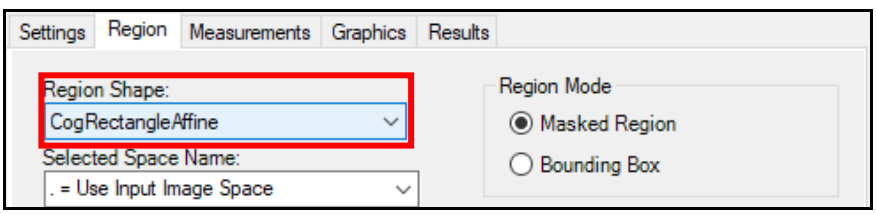


6. Double-click the **Blob** tool to access the tool.
7. You are looking for the 3 blobs (holes) on the part. On the *Settings* tab allow the default settings to remain.



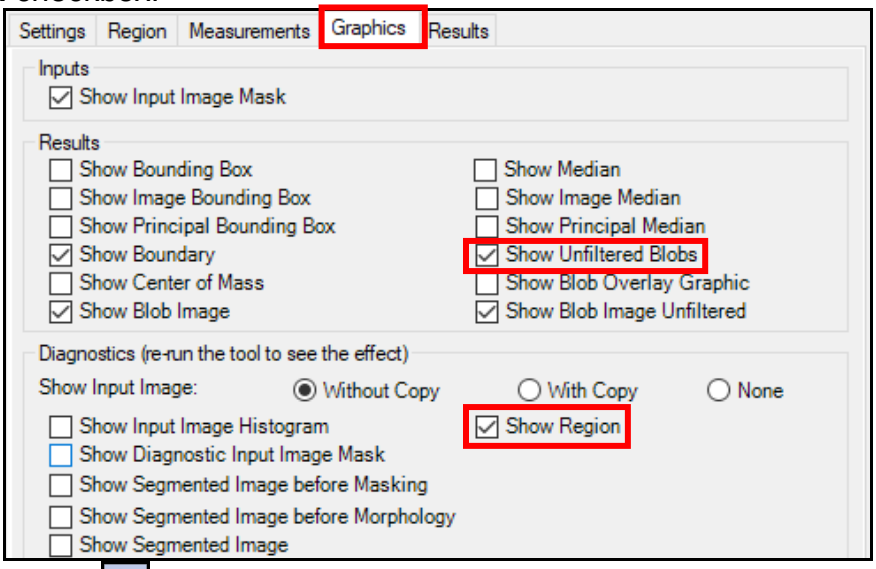
NOTE: *The Mode is Hard Dynamic Thresholding – a process that automatically computes an appropriate threshold on the input image histogram, and since we are searching for 3 dark holes on a slightly lighter background, we select Dark blobs, Light background for Polarity.*

8. On the *Region* tab, select **CogRectangleAffine** as the Region Shape. Move the region to encompass the 3 blobs.

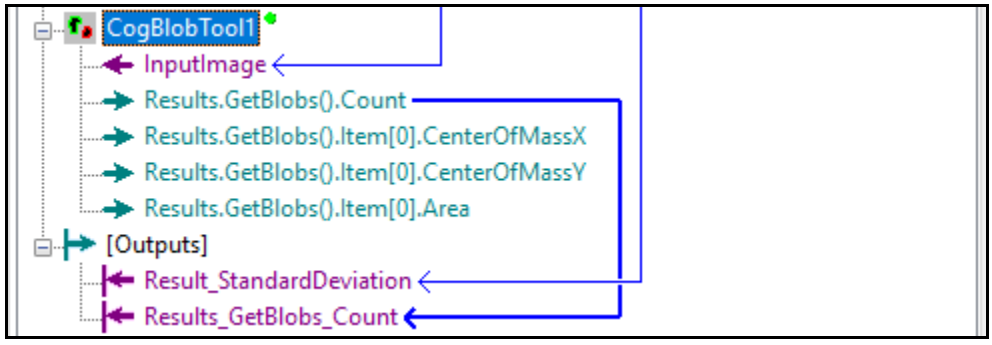


9. On the *Measurement* tab allow the default settings to remain.

10. On the *Graphics* tab, check the **Show Unfiltered Blobs** checkbox and the **Show Region** checkbox.



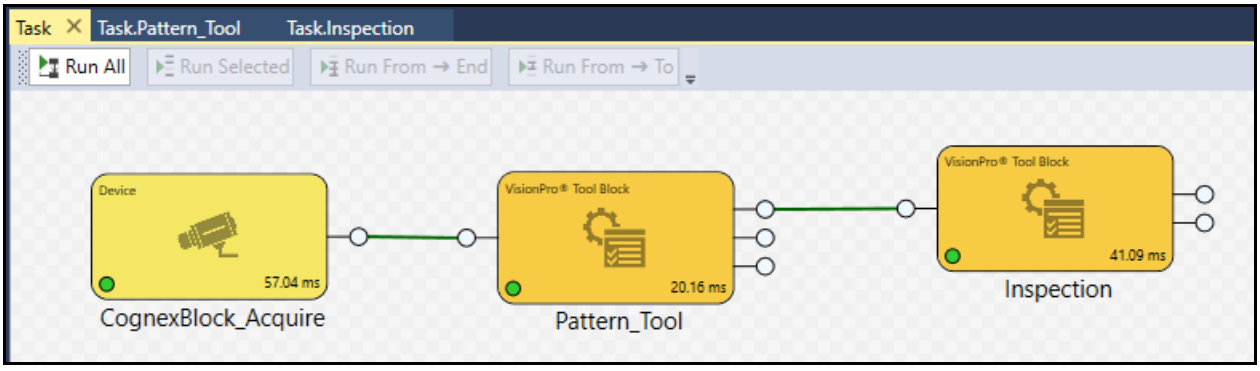
11. Click the **Run** button to bring the image into the tool.
12. On the *Results* tab review the results.
    a. How many results display?
13. Change to the bad part and click the **Run** button.
    a. How many results display now?
14. Run the Task with both the good part and the bad part. Confirm the Blob tool's region moves with the part.
15. Drag the **Results.GetBlobs().Count** and drop it at **[Outputs]**. This creates a new output terminal from the ToolBlock.



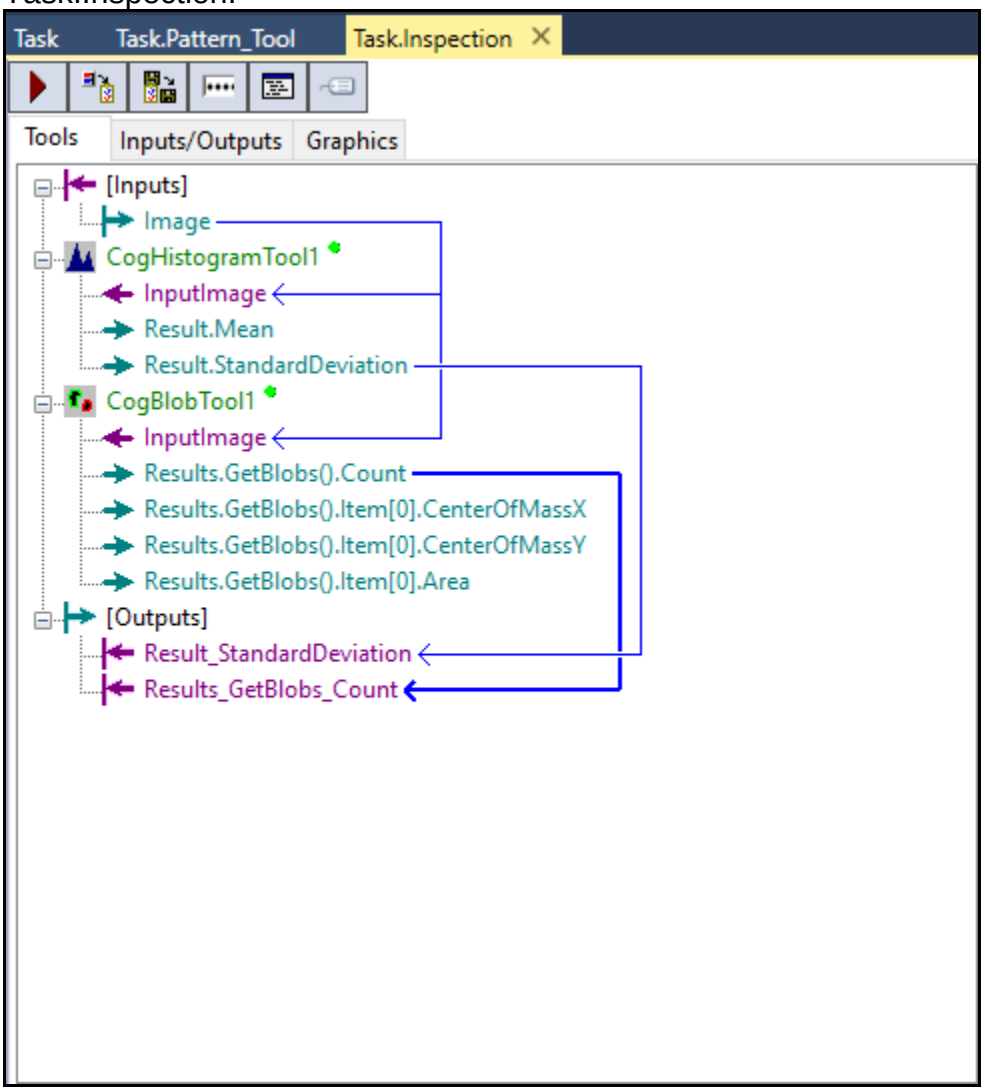
16. Click the **Save** button in the Designer toolbar to save your job.

Expected Results:

Task:



Task.Inspection:



Lab Exercise 5.1 – Caliper and Geometry Tools

At the end of this lab exercise, Participants will be able to:

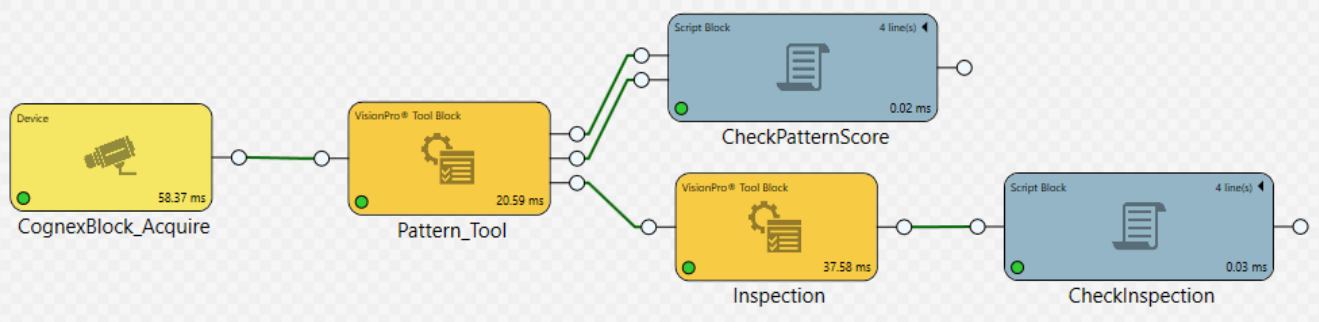
- Configure a Caliper tool to detect edges under various run-time conditions
- Configure Geometry tools

The Participant will utilize the following Cognex Designer functions to successfully complete this exercise:

- Toolbox
  - CogCaliper Tool
  - CogFindLine Tool
  - CogAngleLineLine Tool

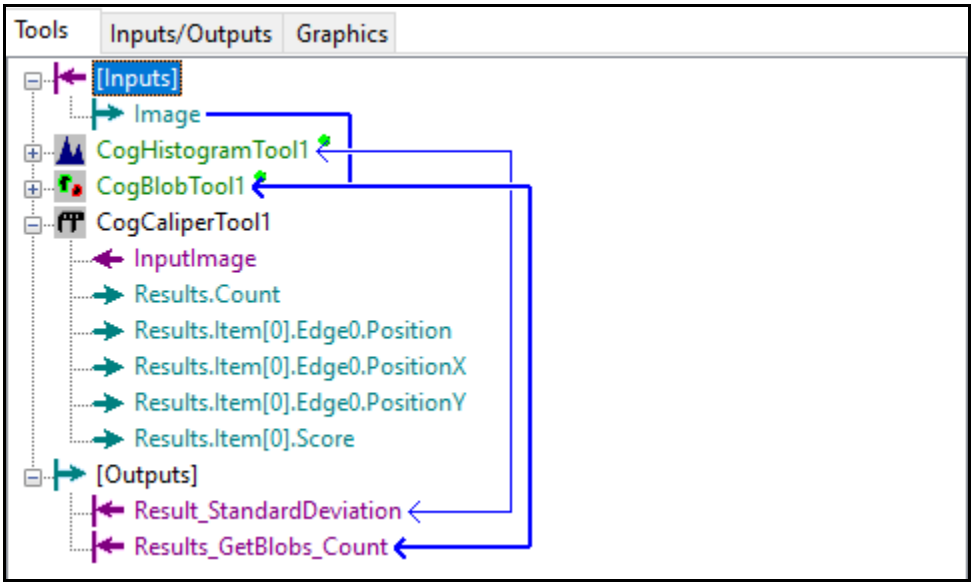
Follow the steps below to complete the lab exercise:

1. Open the **MyProject** Application from the previous lab exercise.



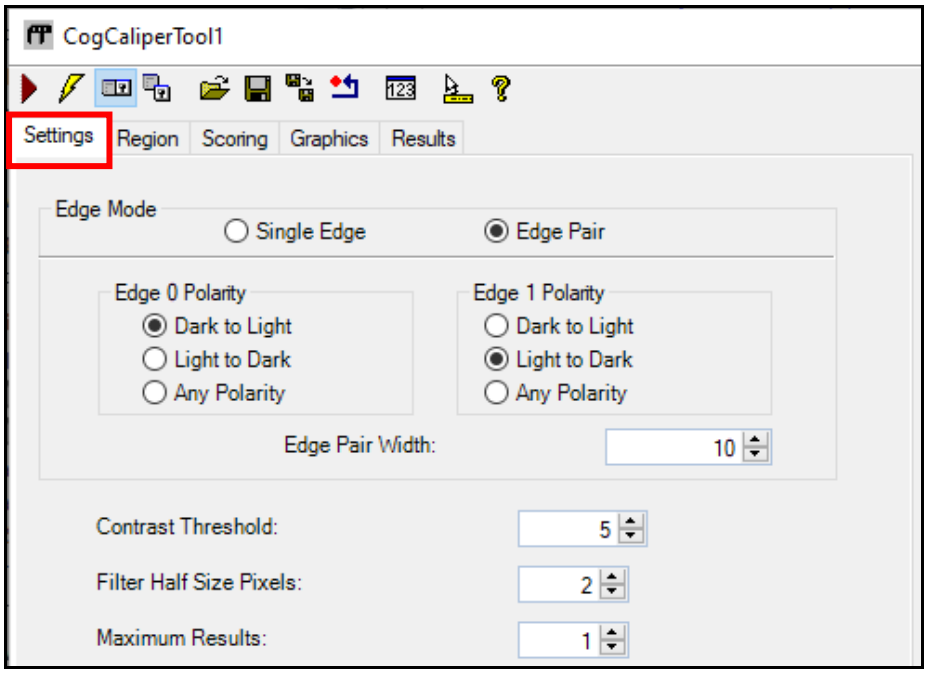
2. Double click the **Inspection** ToolBlock to access the tool settings or click the Task.Inspection tab if it is open (as shown above).
3. Add a **CogCaliperTool** under the CogBlobTool.

   The **CogCaliper** tool is added.



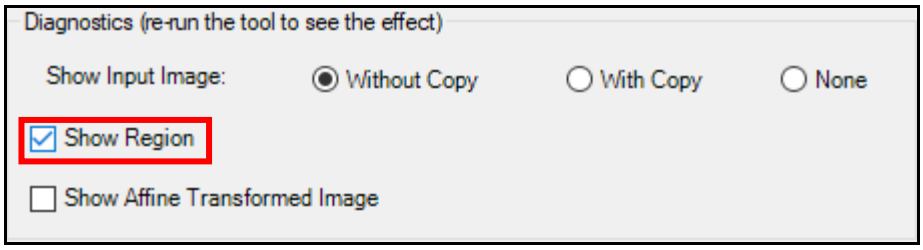
4. Connect the InputImage of the CogCaliperTool to the [Inputs].Image.

5. Click the **Run Tools** button to bring the image into the tool.
6. Double click the **Caliper** tool to access the tool.
7. On the *Settings* tab, select the following:
   - Edge Mode = *Edge Pair*
   - Edge 0 Polarity = *Dark to Light*
   - Edge 1 Polarity = *Light to Dark*
   - Maximum Results = *1*

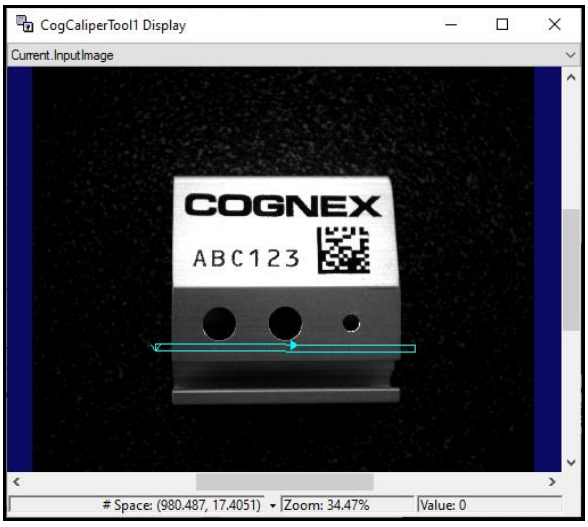


8. On the *Region* tab select **CogRectangleAffine** as the Region Shape. Position the Region as shown below.
   NOTE: *Do not position the region exactly to the edges, you want the region to overlap the part. This will ensure that the edges are found.*

9. On the *Scoring* tab, do not make any changes.
10. On the *Graphics* tab, check the **Show Region** checkbox.



11. Click the **Run** button.
12. Click the *Results* tab to see the edges found.
    - How many edges were found?
    - Are the edges found the edges you expected?
    - How do you find the correct edges?
13. Click the **Floating Display** button.
    The **CogCaliperTool1Display** opens.



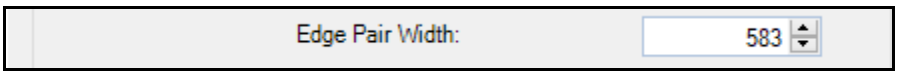
14. Hover your mouse over the left and right edges and record the X values:

    Left Edge _____

    Right Edge _____

    Difference _____

    NOTE: *In this example, the left X value is 356 and the right X value is 939 – the difference is 583.*
15. Close the **Floating Display**.
16. Return to the *Settings* tab and enter the difference in the **Edge Pair Width** field.



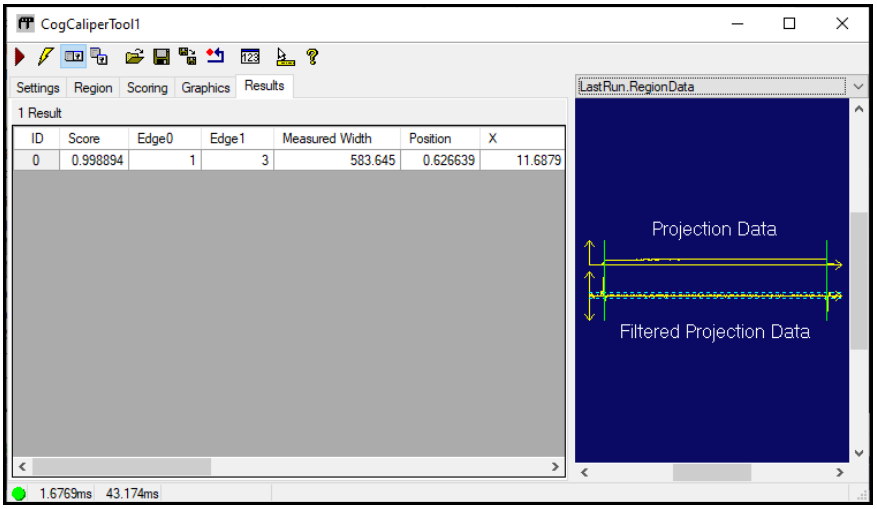
17. Click the **Run** button.

18. Click the *Results* tab and review the following to confirm the correct edges were found:

    Score _____

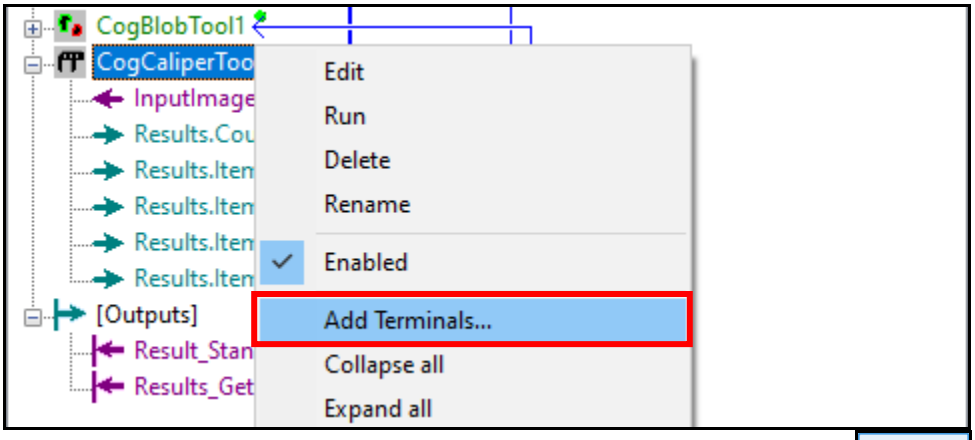
    Measured Width _____

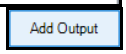
19. Change the Image Buffer to **LastRun.RegionData** and review the edges found.



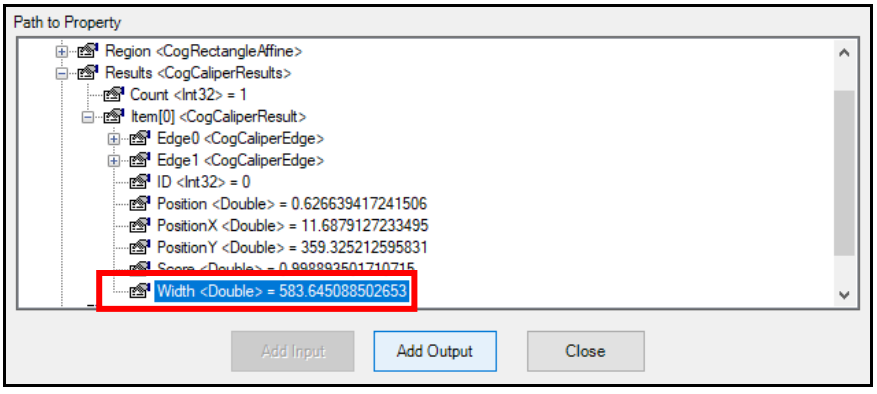
20. Close the Caliper tool.

21. Right-click on the Caliper tool and select **Add Terminals** from the fly out.

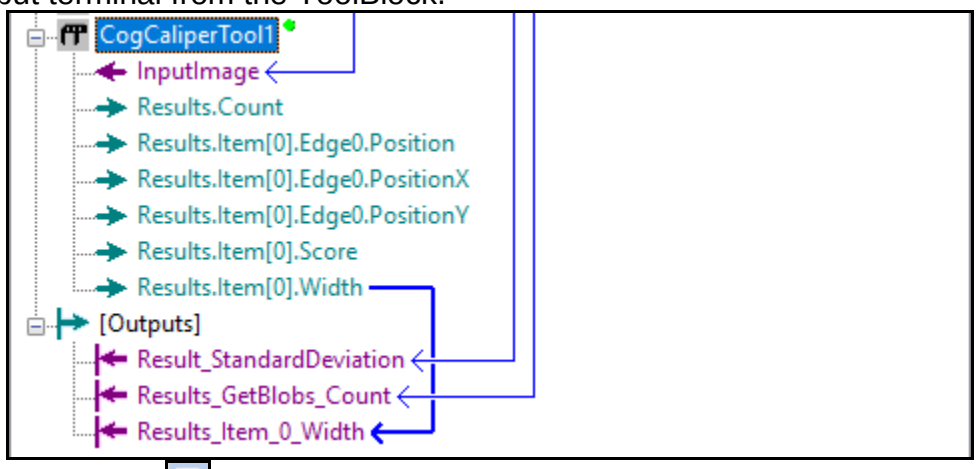


22. Open the *Results* path and select **Width**, click the **Add Output** 

button and **Close** the Member Browser.



23. Drag the **Results.Item[0].Width** and drop it at **[Outputs]**. This creates a new output terminal from the ToolBlock.



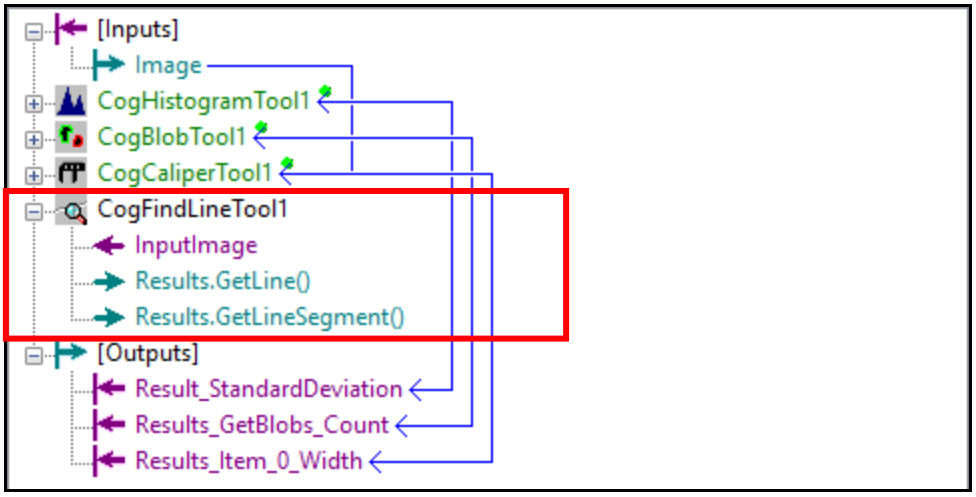
24. Click the **Save** button in the Designer toolbar to save your job.

Geometry Tools

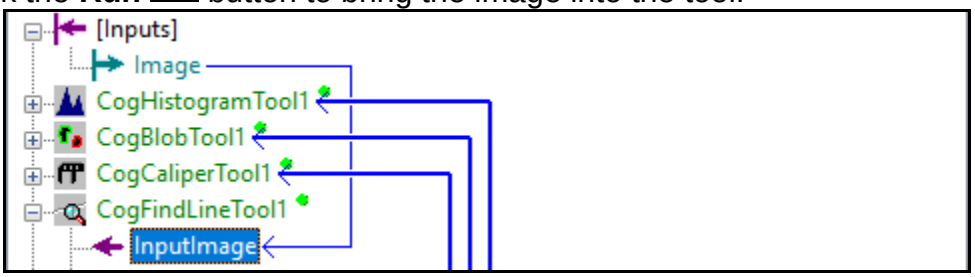
Continue with the MyProject job.

1. Open the Inspection Toolblock and add a **CogFindLineTool** under the CogCaliperTool.

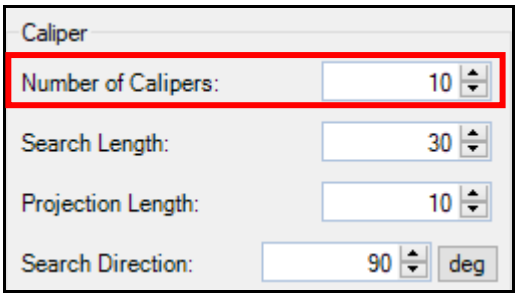
   NOTE: *The CogFindLineTool is in the Geometry – Finding & Fitting folder.*



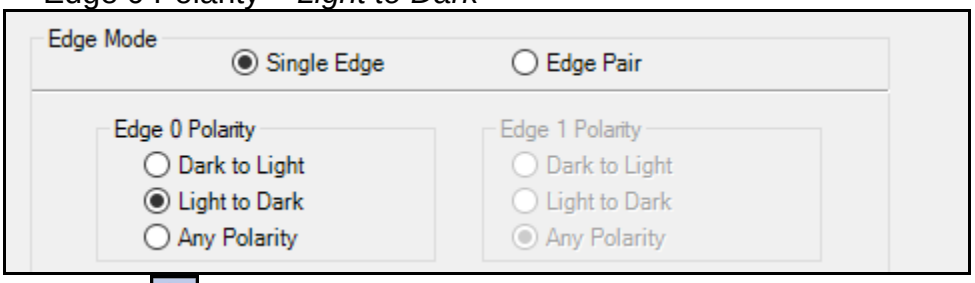
2. Connect the **InputImage** of the CogFindLineTool to the **[Inputs].Image**.
3. Click the **Run** button to bring the image into the tool.



4. Double-click the Find Line tool to access the tool settings.
5. On the *Settings* tab, position the Find Line tool on the left edge of the block.
6. Increase the **Number of Calipers** to *10*, leave all other settings as the defaults.

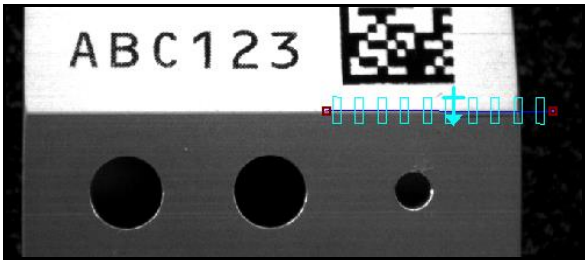


7. On the *Caliper Settings* tab:
   - Edge Mode = *Single Edge*
   - Edge 0 Polarity = *Light to Dark*



8. Click the **Run** button.
9. Review the results on the *Point Results* tab.

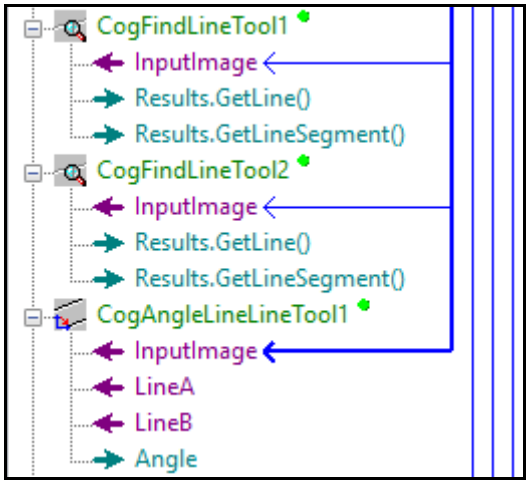
   NOTE: *The number of results matches the number of calipers selected in the Settings tab. Since we increased the number of calipers to 10 there are 10 results, if you left the default of 6 there are 6 results.*
10. Add a second **CogFindLineTool** to the job and position it as shown below.



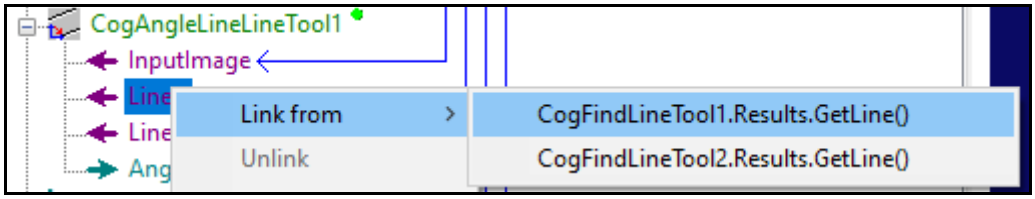
Link Image From: _____
Number of Calipers: _____
Edge Mode: _____
Edge 0 Polarity: _____
Edge 1 Polarity: _____

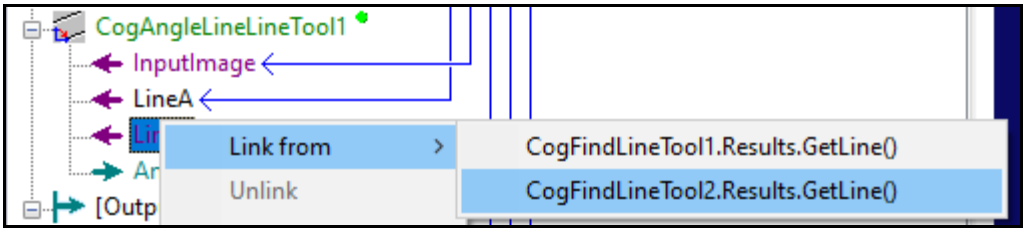
11. Click the **Run** button.
12. Run the job with both the good and the bad part. Confirm the Cog Line tools move with the part.
13. Add a **CogAngleLineLineTool** under the second Find Line tool in the job.

    NOTE: *The CogAngleLineLineTool is in the Geometry – Measurement folder.*
14. Connect the **InputImage** of the CogAngleLineLineTool to the **[Inputs].Image**.
15. Click the **Run** button to bring the image into the tool.



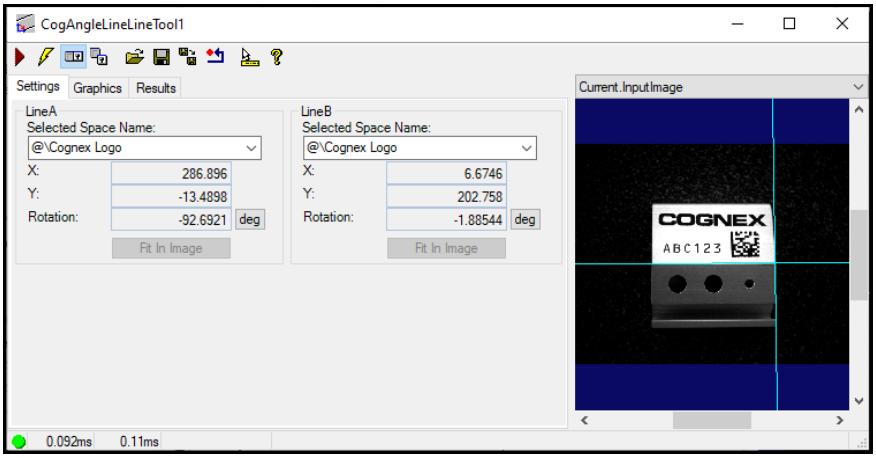
16. Connect **Line A** to the CogFindLineTool1.Results.GetLine0 and connect **Line B** to the CogFindLineTool2.Results.GetLine0.



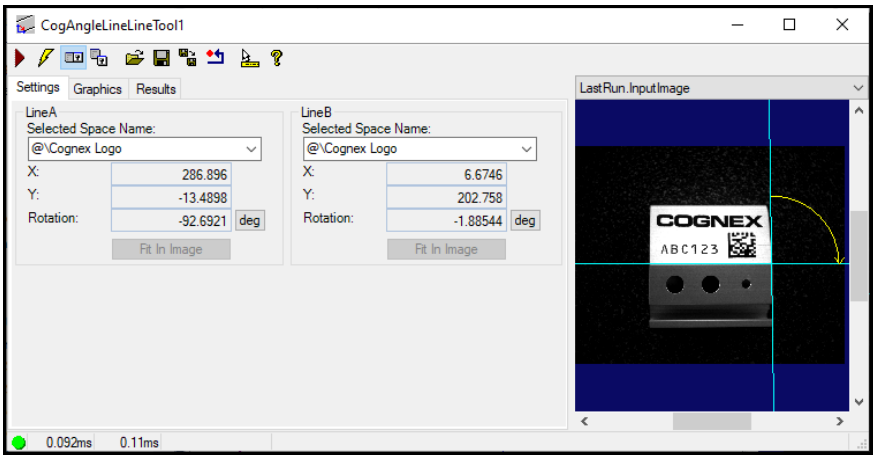


17. Click the **Run** button.

18. Double-click the **Find Angle** tool to access the tool settings.



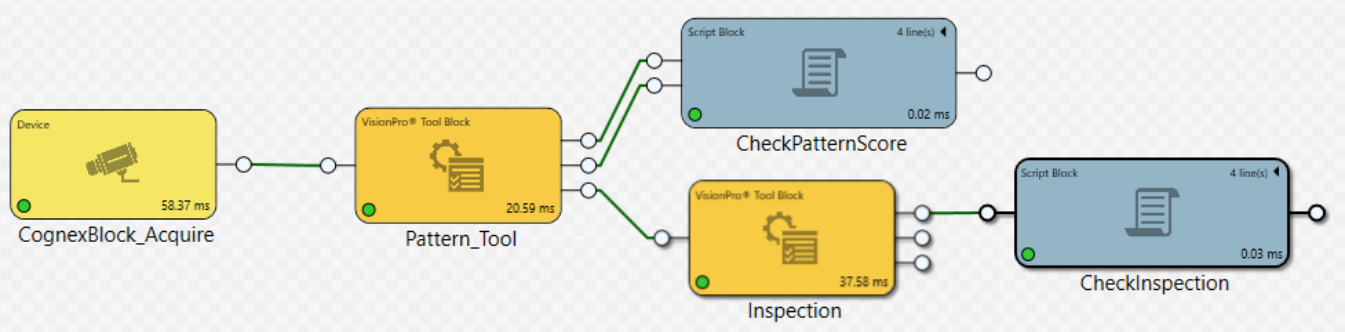
19. Click the *Results* tab and make note of the Angle result.
20. Change the Image Buffer to **LastRun.InputImage** and review the results.



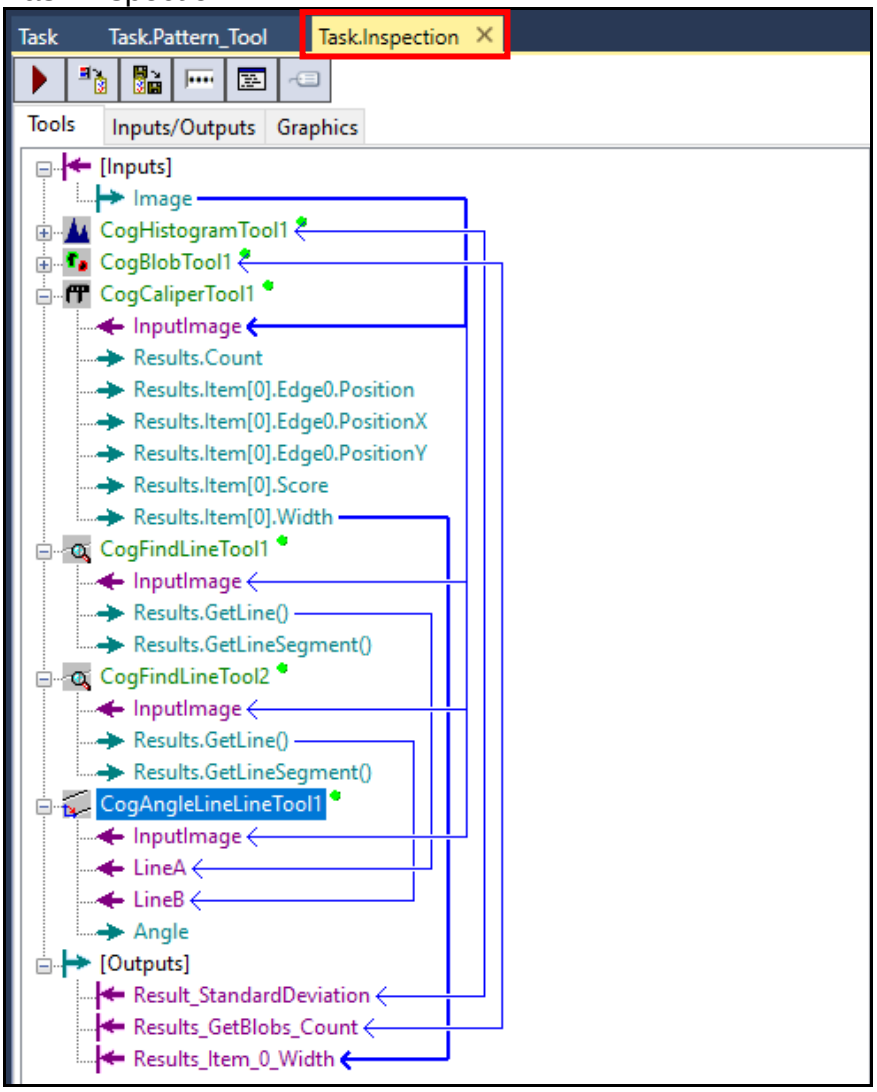
21. Run the job with both the good part and the bad part. Confirm the tools move with the part.
22. Click the **Save** button in the Designer toolbar to save your job.

Expected Results:

Task:



Task.Inspection:



Lab Exercise 6.1 – Calibration

At the end of this lab exercise, Participants will be able to:

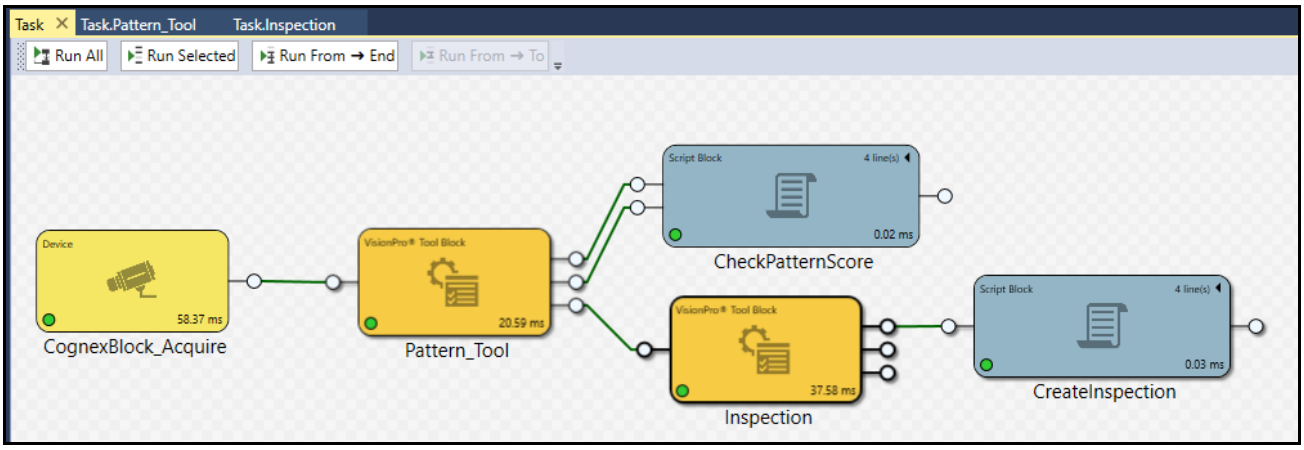
- Add a non-linear calibration to the task
- Convert the width measurement from pixels to a real-world measurement
- Add the Blob and Caliper results to the CheckInspection ScriptBlock

The Participant will utilize the following Cognex Designer functions to successfully complete this exercise:

- CogCalibCheckerboardTool
- ScriptBlock

Follow the steps below to complete the lab exercise:

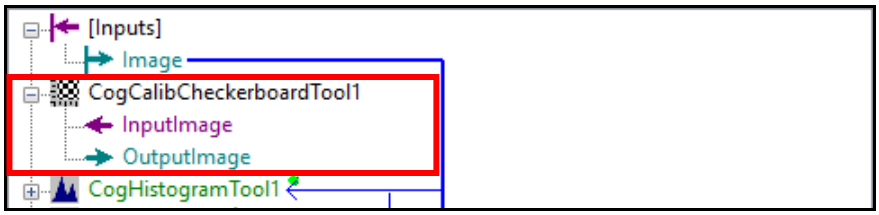
1. Open the **MyProject** Application from the previous lab exercise.



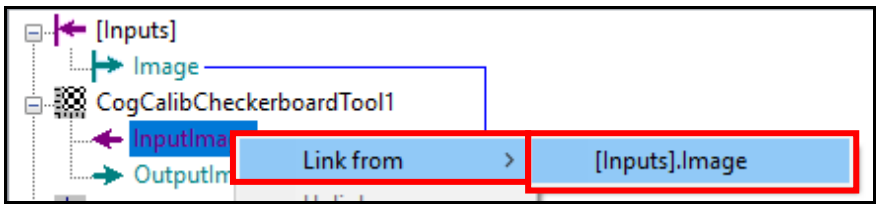
2. Double-click the Inspection ToolBlock and add a **CogCalibCheckerboardTool** above the Histogram tool.

   NOTE: *The CogCalibCheckerboardTool is found in the Calibration & Fixturing folder.*

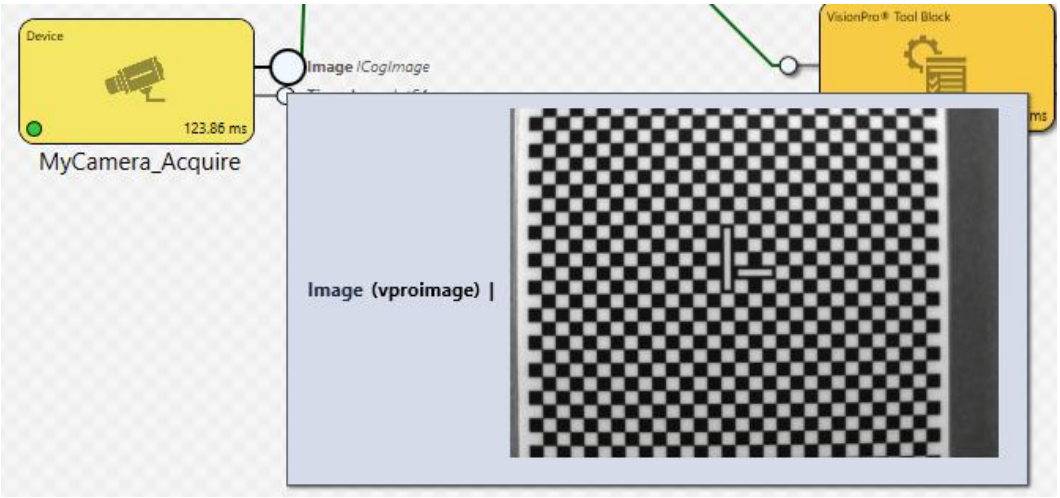
   The **CogCalibCheckerboard** tool is added.

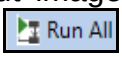


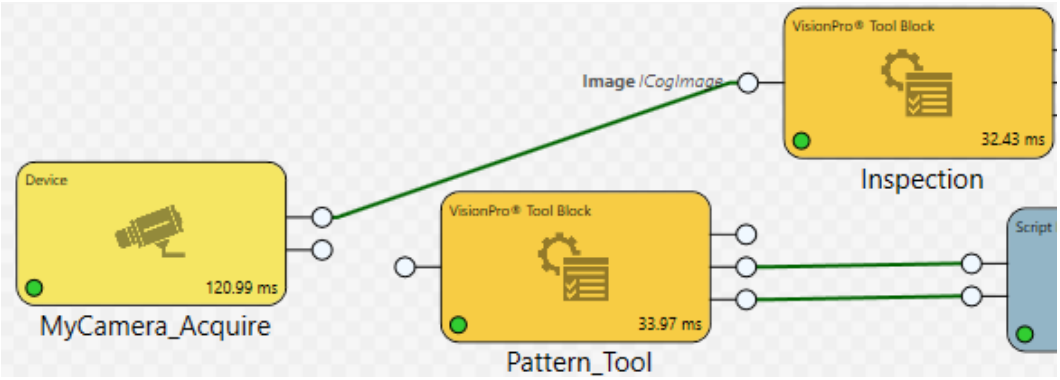
3. Connect the InputImage of the CogCalibCheckerboardTool to the [Inputs].Image.



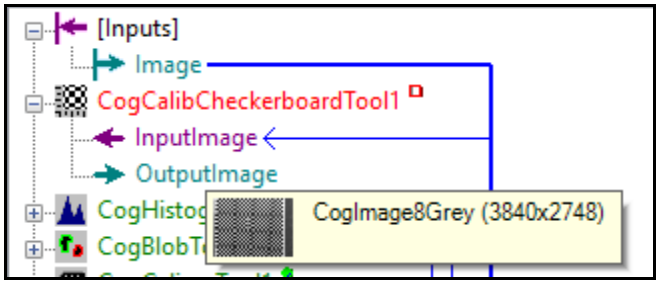
4. Return to the Task and acquire an image of the Checkerboard calibration plate.



5. Hover your mouse over the Pattern_Tool output image – notice that it is now broken.
6. Redirect the input image of the Inspection ToolBlock directly to the camera and click the **Run All**  button.

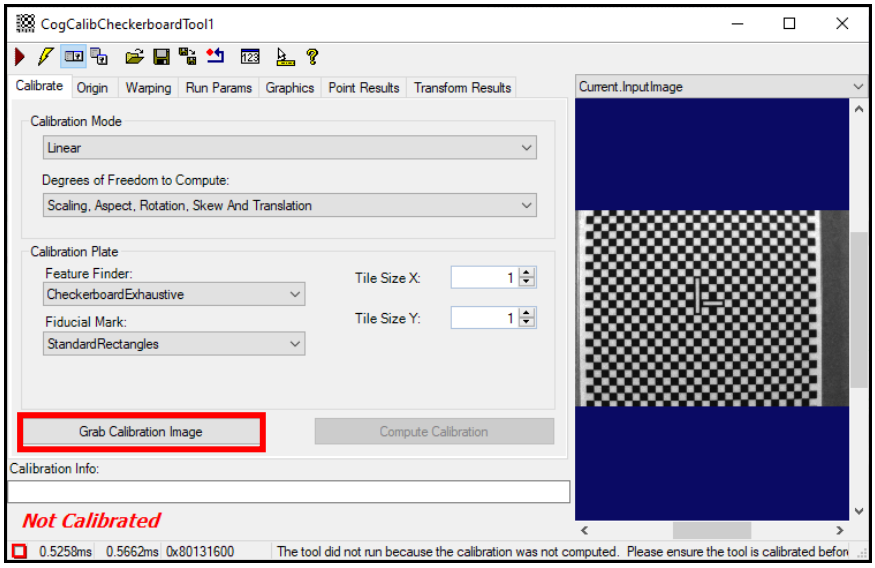


7. Open the Inspection ToolBlock and click the **Run**  button to bring the checkerboard image into the InputImage.

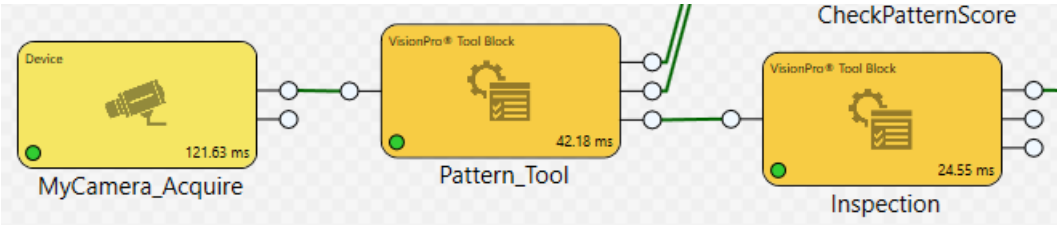


Set-up Calibration

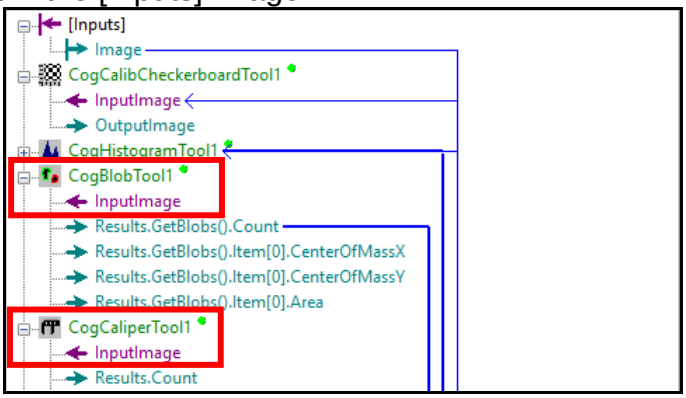
8. Open the Calibration tool and click the **Grab Calibration Image** button.



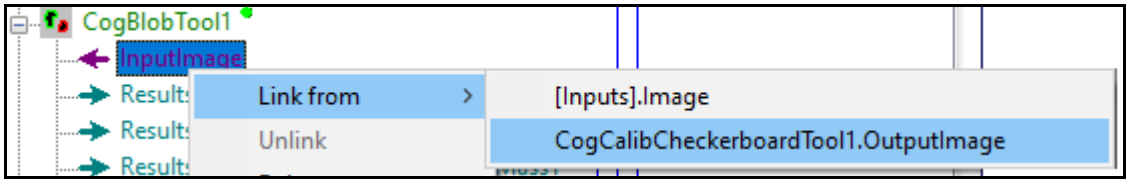
9. Set the Tile Size X and Tile Size Y to 3.175 (or the size shared by the Instructor) and click the **Compute Calibration** button.
10. Click the **Run** button and review the Transform Result to make sure the RMS Error is relatively low.
11. Close the Calibration tool.
12. Return to the Task and disconnect the input image from the camera and reconnect it to the Fixture output image from the Pattern_Tool block.



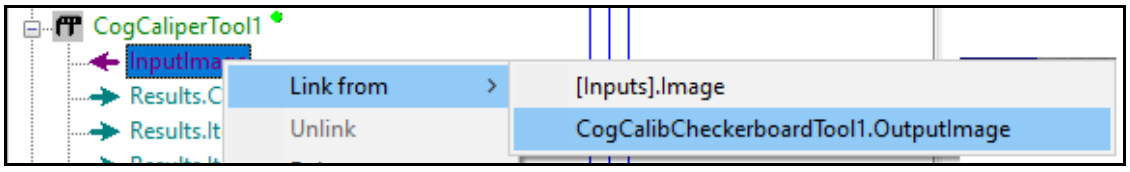
13. Open the Inspection ToolBlock and unlink the Blob tool's and the Caliper tool's InputImage from the [Inputs].Image.



14. Link the InputImage of the Blob Tool to the OutputImage from the Calibration ToolBlock.



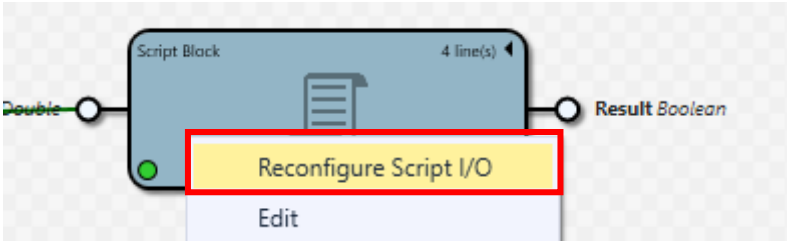
15. Repeat for the Caliper tool.



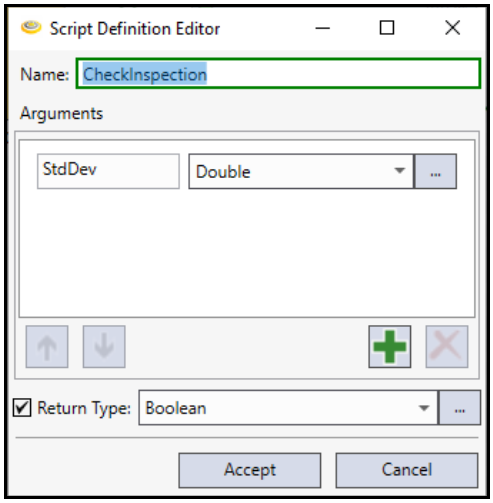
16. Run the ToolBlock once with the Good Part and look at the results from both tools. Tweak your settings to make them work with real world units.

Add Blob and Caliper Results to the CheckInspection ScriptBlock

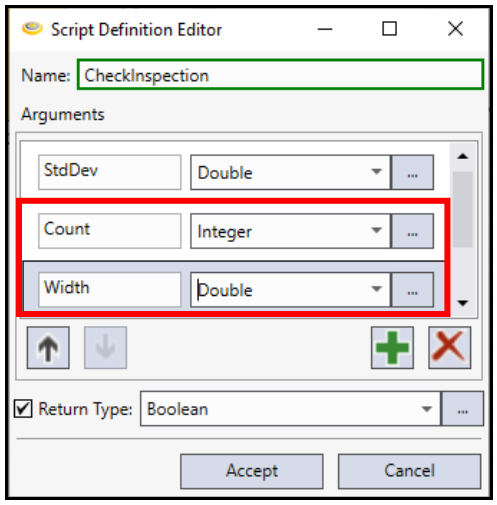
1. Right-click the CheckInspection ScriptBlock and select **Reconfigure Script I/O**.



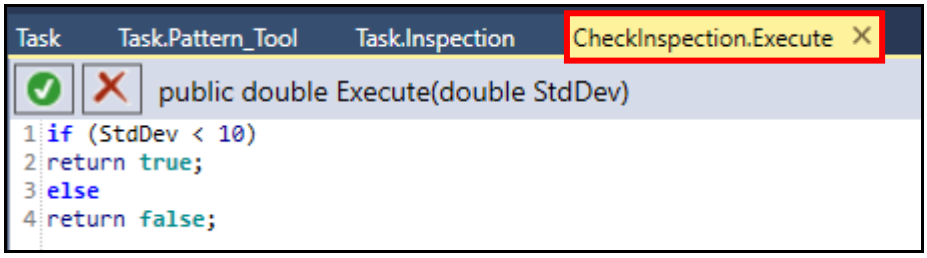
The **Script Definition Editor** displays.



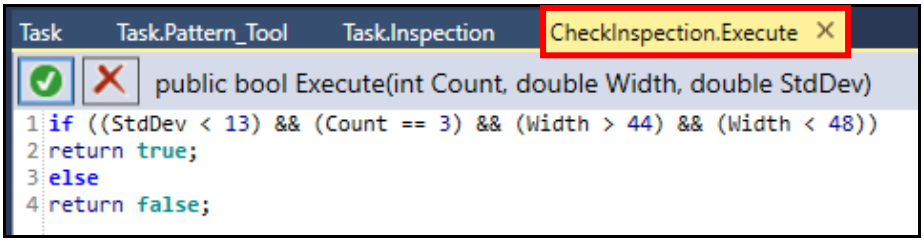
2. Add two arguments to the Editor:
    1. *Count* and set it to **Integer**
    2. *Width* and set it to **Double**



3. Click the **Accept** button.
   The **CheckInspection.Execute** tab opens.



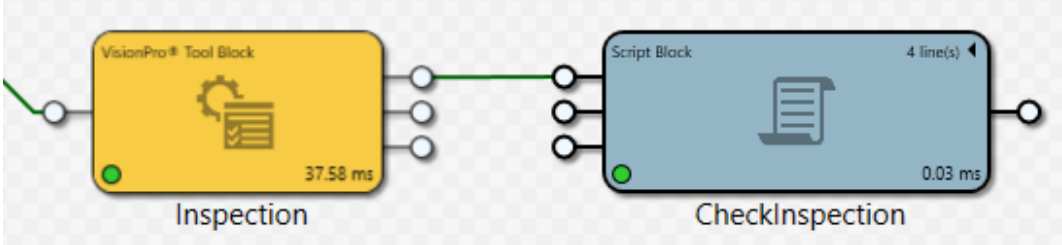
4. Update the code on the **CheckInspection.Execute** tab.



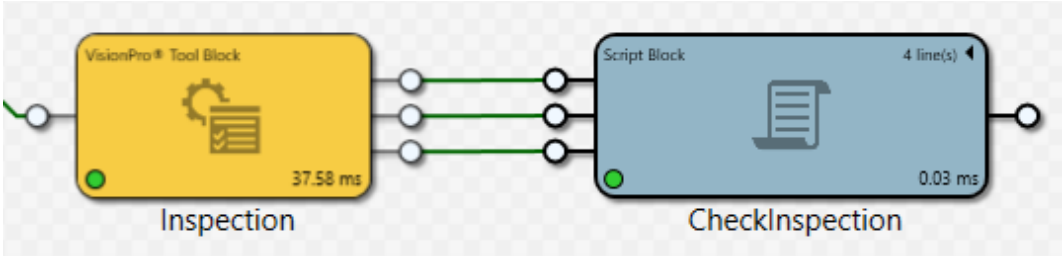
5. Click the **green check**  button to compile the current script.
   The script is a success.

6. Click the **X** in the upper right hand corner of the script tab to close.

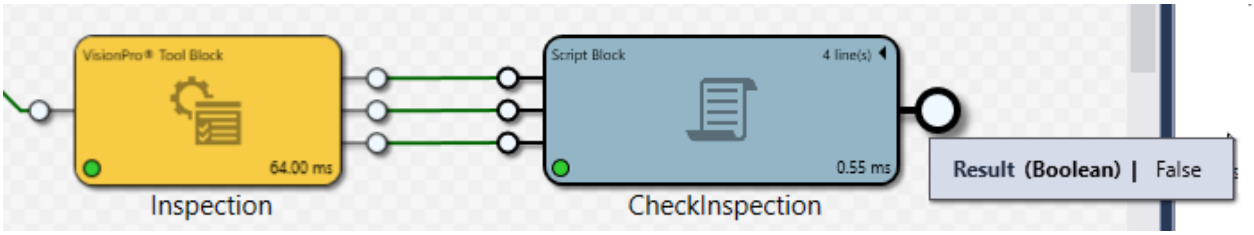
You are returned to the Task.

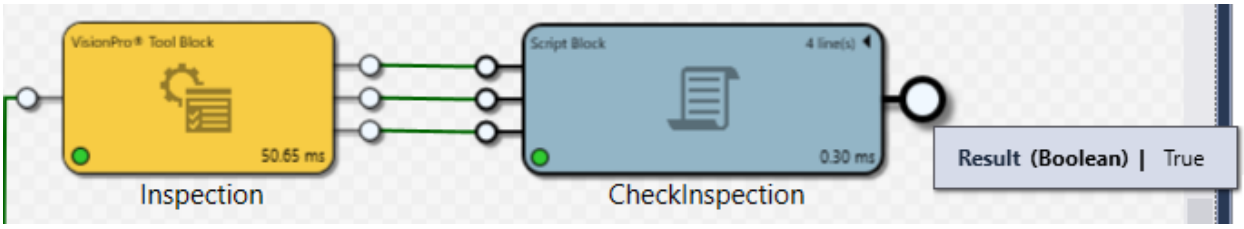


7. Connect the Output pins on the Inspection block to the corresponding Input Pins on the CheckInspection ScriptBlock



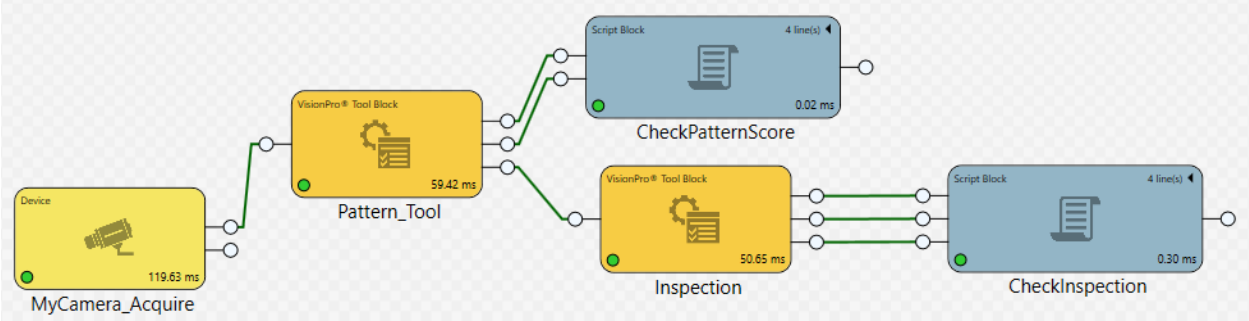
8. Click the **Run All**  button to run execute the task with both the good and the bad parts.



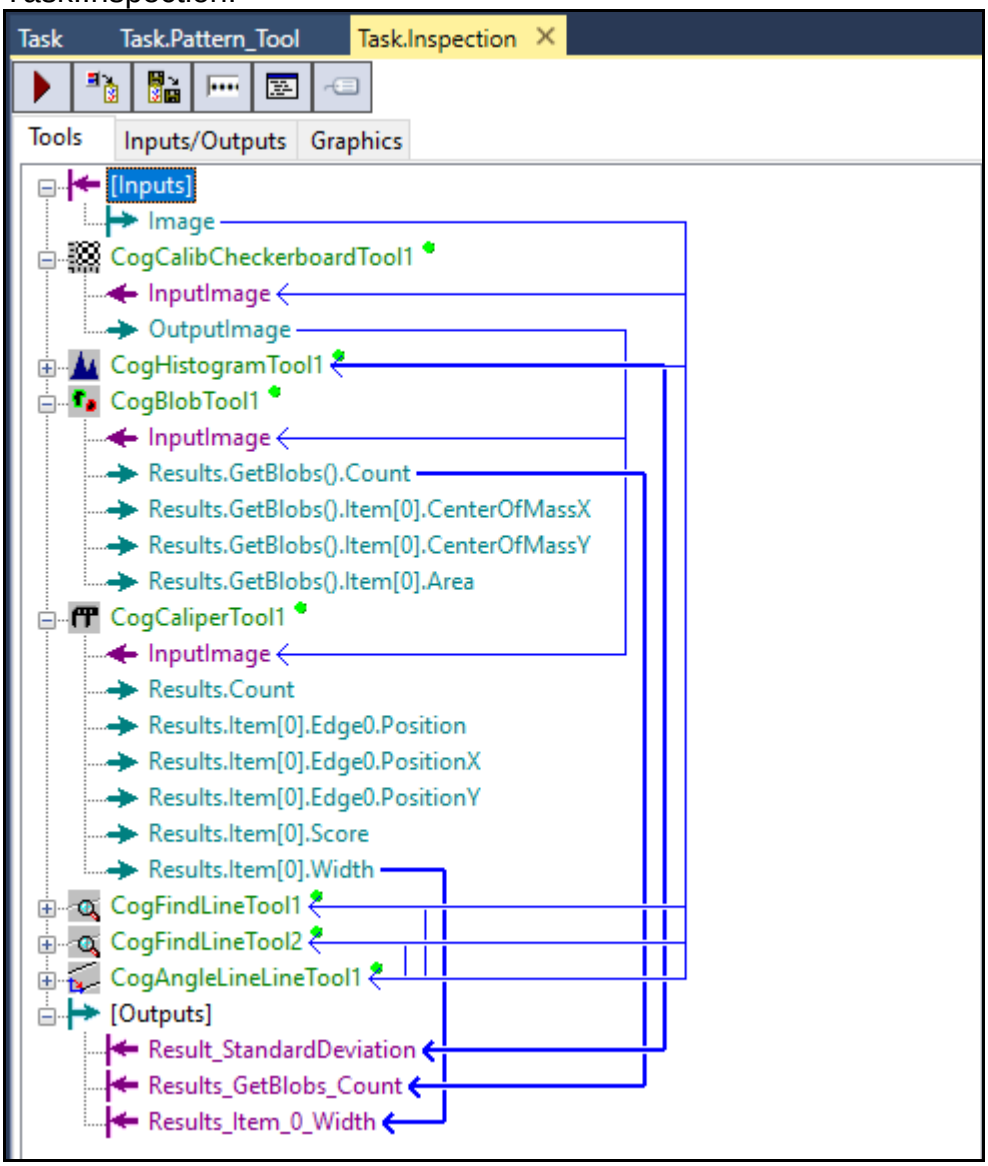


9. Click the **Save**  button in the Designer toolbar to save your job.

Expected Results:



Task.Inspection:



Lab Exercise 7.1 – Identification Tools

At the end of this lab exercise, Participants will be able to:

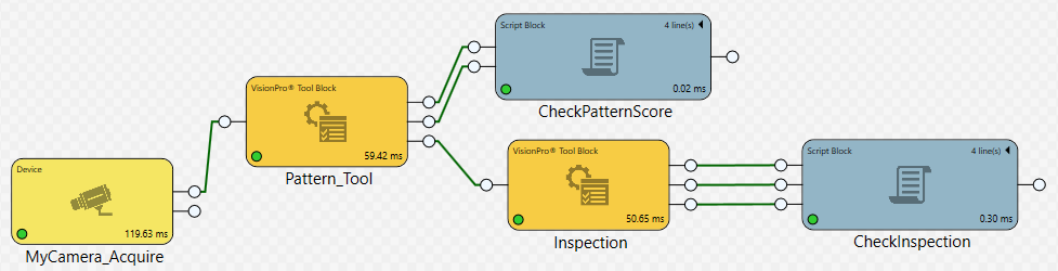
- Configure an OCRMax tool to read text
- Configure an ID tool to read a Data Matrix code

The Participant will utilize the following Cognex Designer functions to successfully complete this exercise:

- Toolbox
  - CogOCRMaxTool

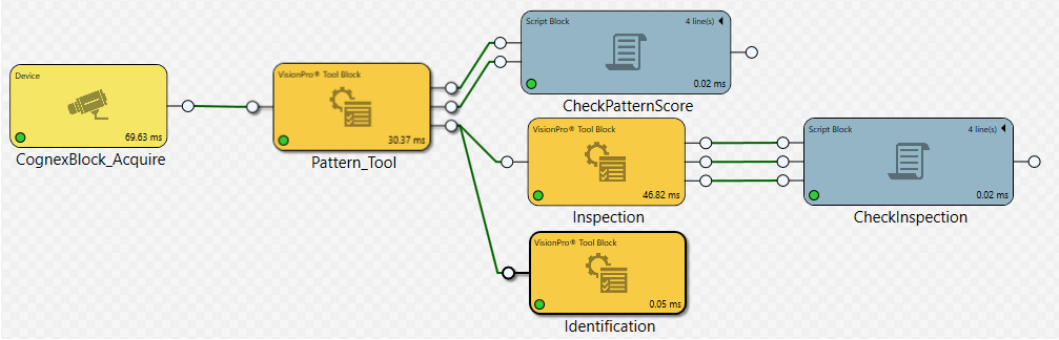
Follow the steps below to complete the lab exercise:

1. Open the **MyProject** Application from the previous lab exercise.



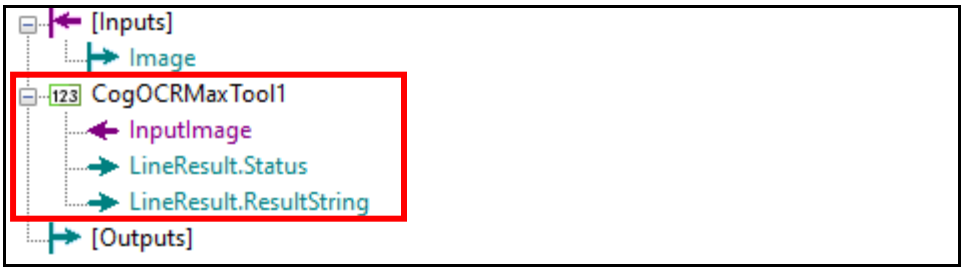
2. Add a new VisionPro Tool Block below the Inspection Block.
3. Rename the Toolblock *Identification* and connect the Output Image from the Pattern_Tool block to the Input pin of this tool block.
4. Click the **Run All** 

button to bring the image into the new tool block.

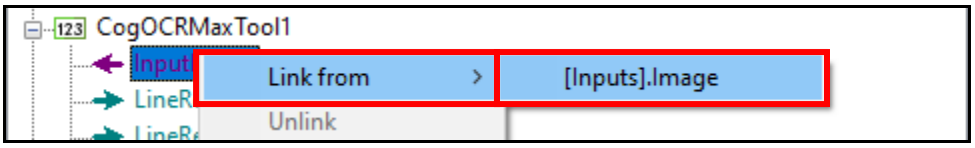


5. Double-click the Identification Tool block to open.
6. Add a **CogOCRMaxTool**.

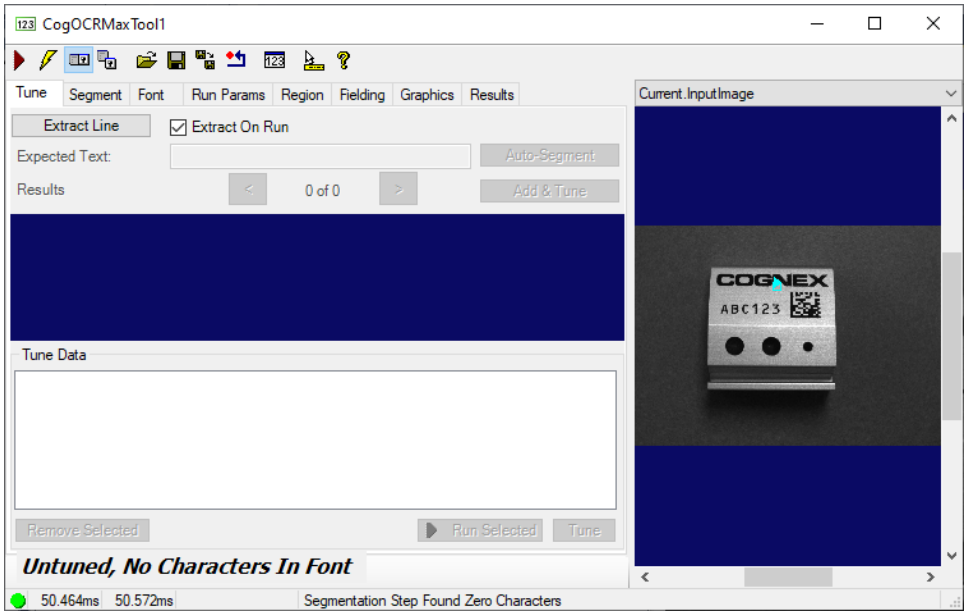
   NOTE: *The CogOCRMax tool is found in the ID & Metrics folder.*



7. Connect the InputImage of the CogOCRMaxTool to the [Inputs].Image.

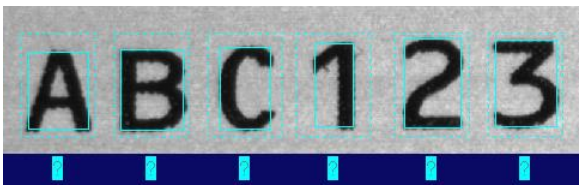


8. Click the **Run** button to bring the image into the tool.
9. Double-click the OCRMax Tool to access the tool settings.

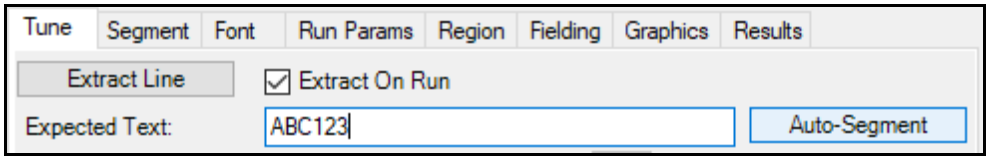


10. Position the Region around the *ABC123* string as shown below.
11. Click the **Run** button.

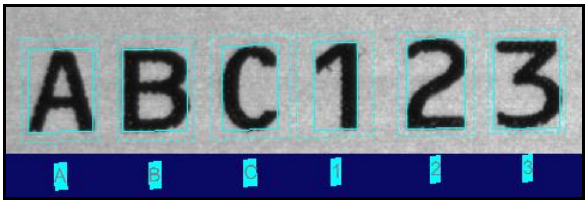
12. Click the **Extract Line** button and confirm that all characters are detected.



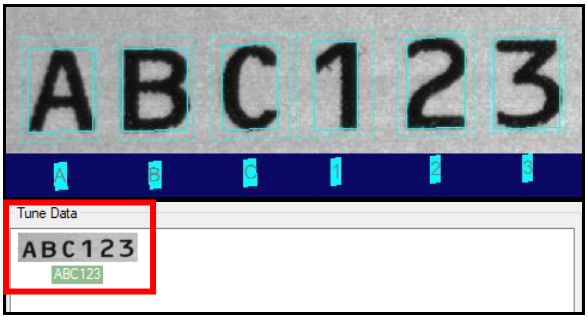
13. Enter the label for each character in the string in the **Expected Text** field and click the **Auto-Segment** Auto-Segment button.



The characters are assigned labels. Confirm that the labels are correct.



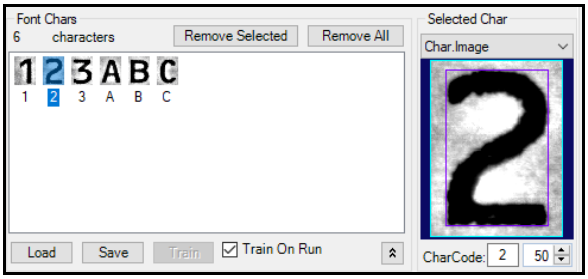
14. Click the **Add & Tune** Add & Tune button.
The characters have been trained and added to the Tune Data field.



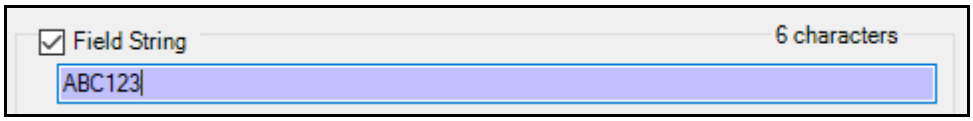
15. Click the **Run** button.
16. Review the **LastRun.InputImage** buffer.

17. Allow the defaults to remain on the *Settings* tab.
18. On the *Font* tab click the **Extract Characters** Extract Characters button.

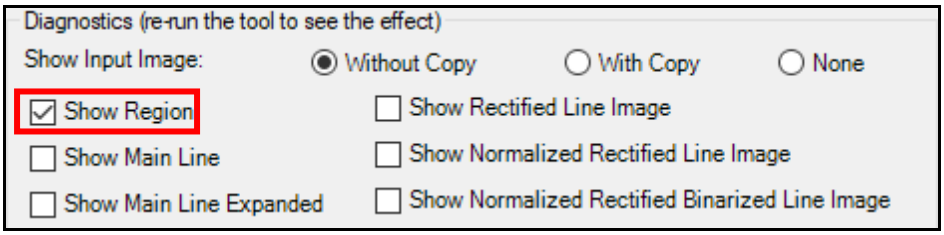
19. Click each character in the Font Chars window and confirm the Char. Image is correct.



20. Allow the defaults to remain on the *Run Params* and *Region* tabs.
21. On the *Fielding* tab, check the **Field String** box, enter *ABC123* in the newly open field, and click the **<Enter>** key.



22. On the *Graphics* tab check the Show Region checkbox.



22. Review the scores on the *Results* tab - notice the Confidence and Confusion Character fields.

ID	Char	Status	Score	Confidence	Confusion Character	Confusion Explanation
0	A	Read	1.000	0.715	1	NotConfused
1	B	Read	1.000	0.430	C	NotConfused
2	C	Read	1.000	0.418	B	NotConfused
3	1	Read	1.000	0.617	B	NotConfused
4	2	Read	1.000	0.469	B	NotConfused
5	3	Read	1.000	0.438	B	NotConfused

NOTE: *Entering the string in the Field String box on the Fielding tab allows the tool to be used as a verification tool instead of just reading the characters.*

23. Run the job with both the good part and the bad part. The good part should pass and the bad part should fail. Confirm the results in the OCRMax tool Results tab.

Good Part:

Status: Read

Result String: 6 characters

ABC123

ID	Char	Status	Score	Confidence	Confusion Character	Confusion Explanation
0	A	Read	1.000	1.000	?	NotConfus
1	B	Read	1.000	1.000	?	NotConfus
2	C	Read	1.000	1.000	?	NotConfus
3	1	Read	1.000	1.000	?	NotConfus
4	2	Read	1.000	1.000	?	NotConfus
5	3	Read	1.000	1.000	?	NotConfus

Bad Part:

Status: Failed

Result String: 6 characters

AB??2?

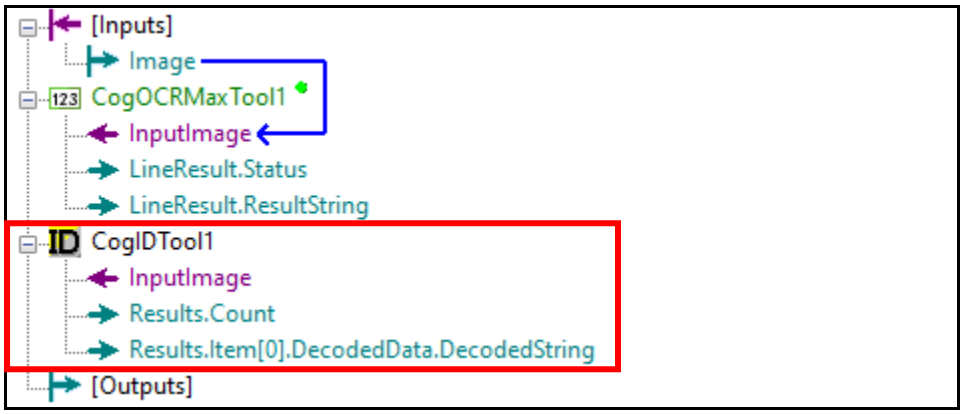
ID	Char	Status	Score	Confidence	Confusion Character	Confusion Explanation
0	A	Read	0.984	0.984	?	NotConfu
1	B	Read	0.977	0.977	?	NotConfu
2	?	Failed	0.000	0.000	?	NotConfu
3	?	Failed	0.000	0.000	?	NotConfu
4	2	Read	0.973	0.973	?	NotConfu
5	?	Failed	0.000	0.000	?	NotConfu

24. Close the OCRMax Tool.
25. Click the **Save** button in the Designer toolbar to save your job.

Add an ID Tool to Read a Data Matrix code

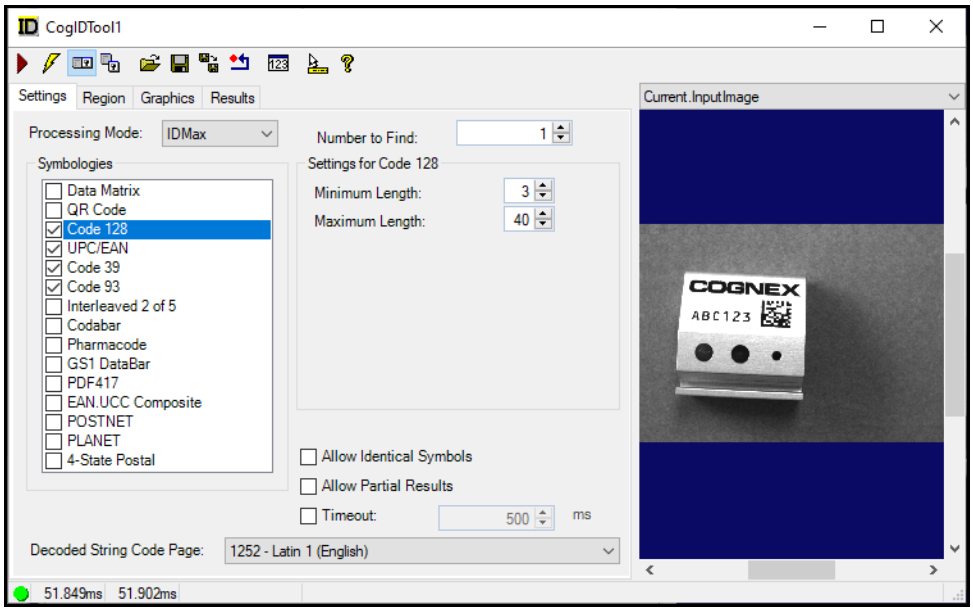
1. Add a **CogIDTool** under the OCRMax tool in the Identification ToolBlock.

   NOTE: *The CogIDTool is found in the ID & Metrics folder.*

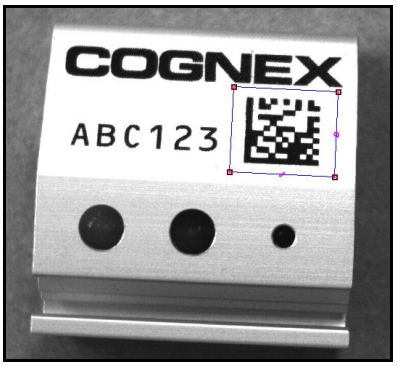


2. Connect the InputImage of the CogIDTool to the [Inputs].Image.

3. Click the **Run** button to bring the image into the tool.
4. Double-click the ID Tool to access the tool settings.

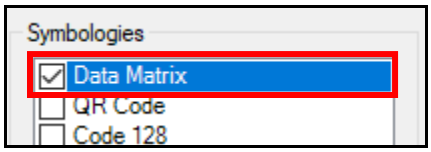


5. On the *Region* tab select **CogRectangleAffine** as the Region Shape. Position the Region as shown below.

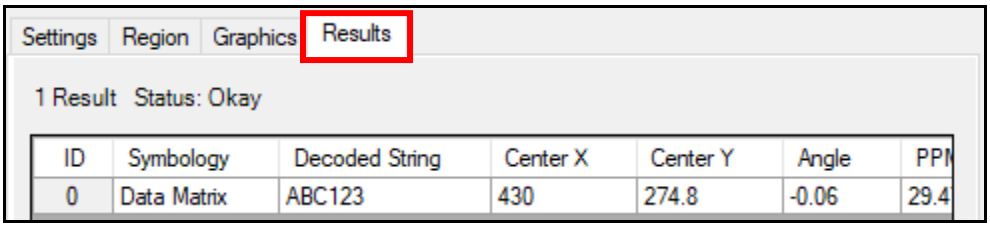


6. On the *Settings* tab select **Data Matrix** under Symbologies.

   NOTE: *This will require two clicks – the other symbologies will be deselected.*



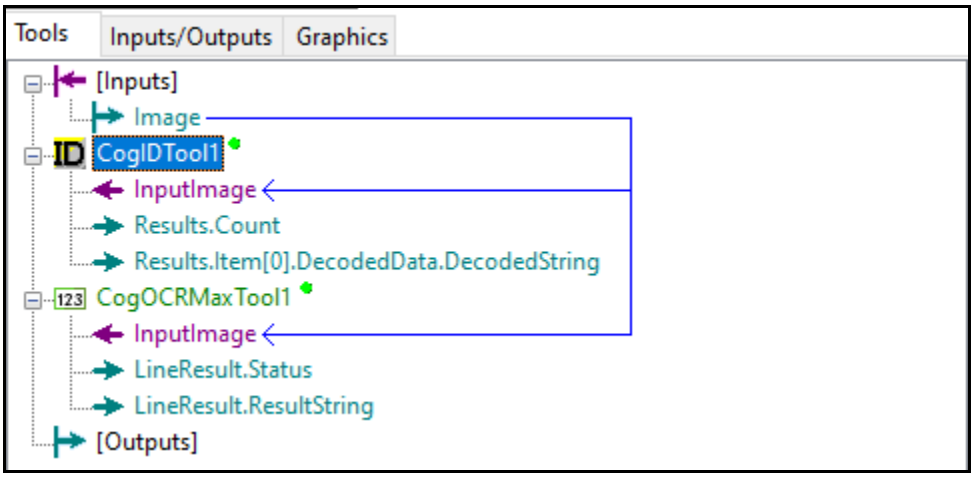
7. Click the **Run** button and review the results.



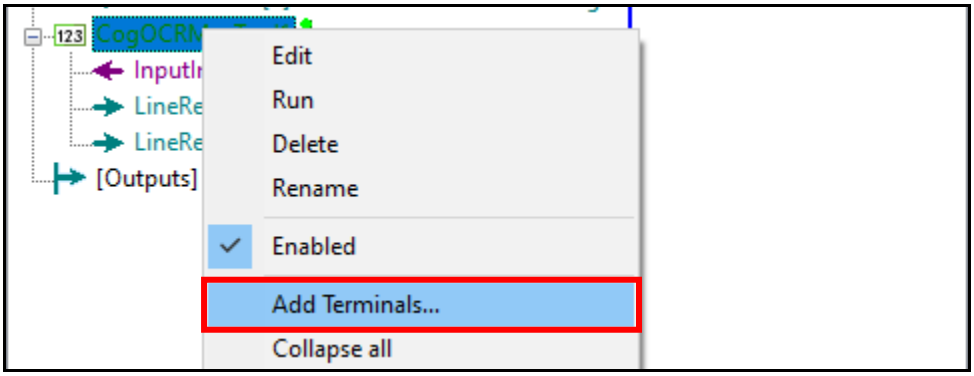
8. Close the ID Tool.

Compare the Results of the OCRMax and Data Matrix Tools

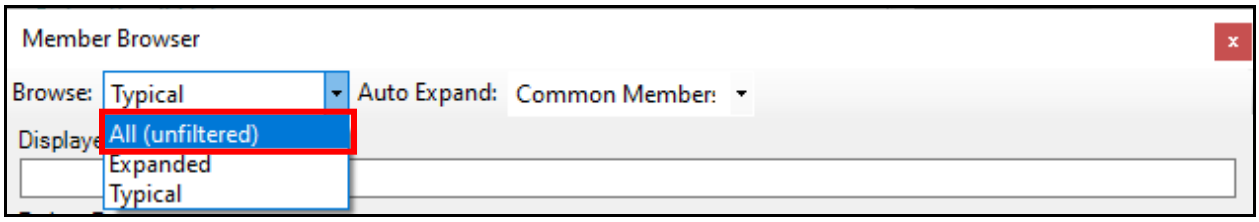
1. Move the CogOCRMax tool below the CogIDTool by dragging the tool down.



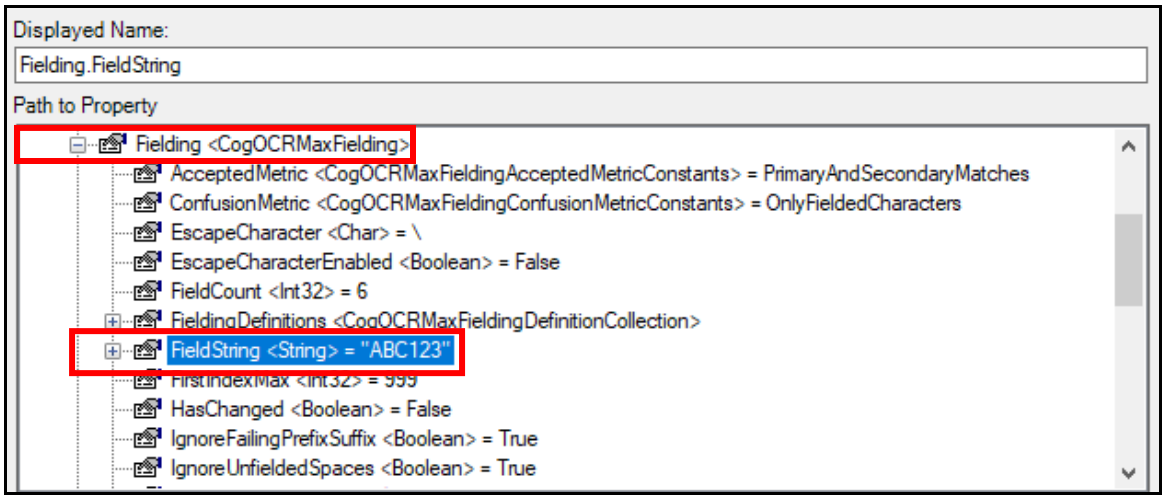
2. Right-click on the OCRMax tool and select **Add Terminals** from the fly-out.

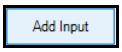


3. Change the **Browse** field to **All (unfiltered).**

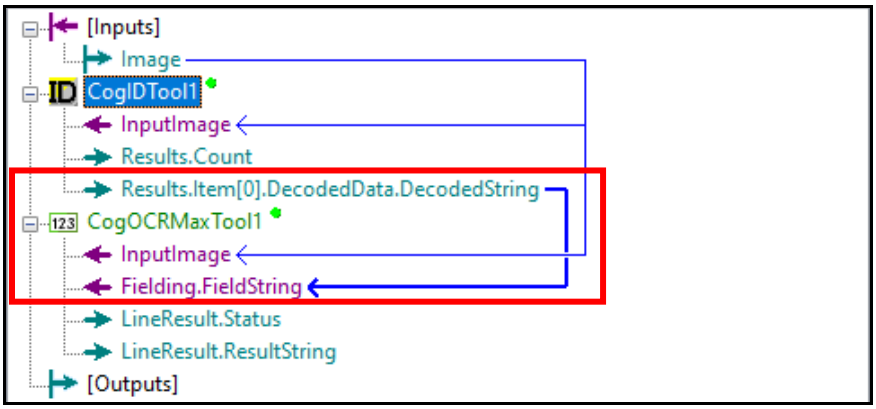


4. Expand the **Fielding** section and select **FieldString <String> = “ABC123”**

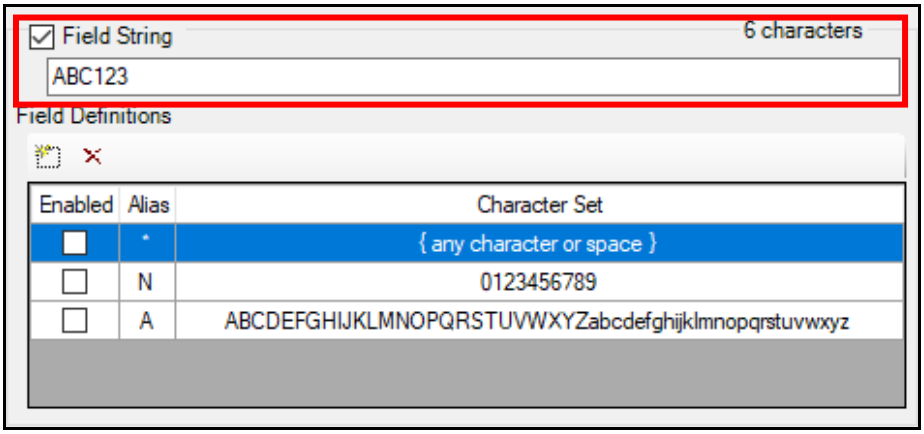


5. Click the **Add Input** 

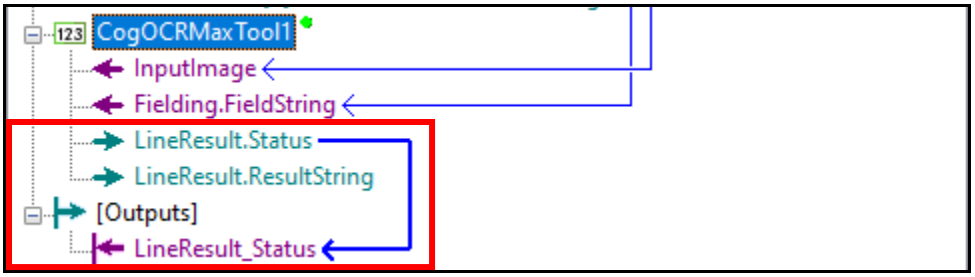
button and close the Member Browser.
A **Fielding.FieldString** Input is added to the OCRMax tool.
6. Connect the **DecodedString** terminal of the ID Tool to the **FieldString** terminal of the OCRMax Tool.



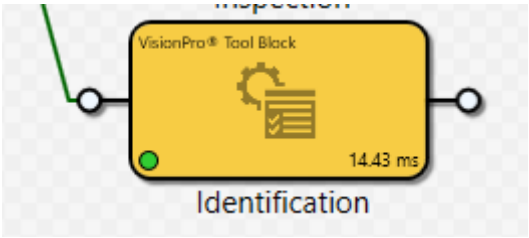
7. Double-click the OCRMaxTool to access the tool settings.
8. On the *Fielding* tab note the string in the **Field String** section and check the **Field String** checkbox. Do not select any of the Field Definitions.



9. Drag the **LineResult.Status** output from the OCRMaxTool to the **[Outputs]** section of the ToolBlock.



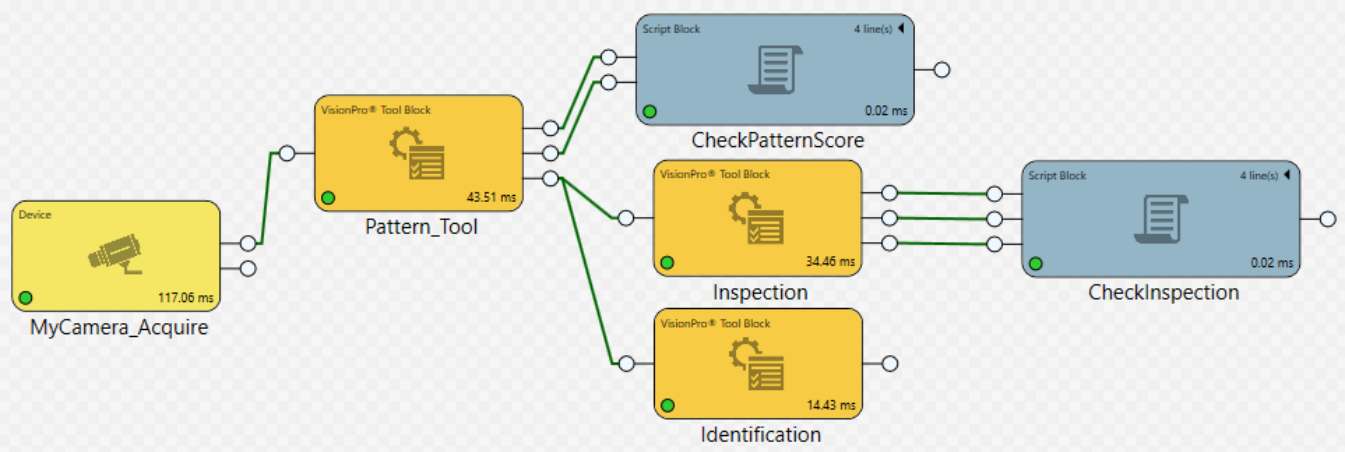
An output pin is added to the Identification ToolBlock.



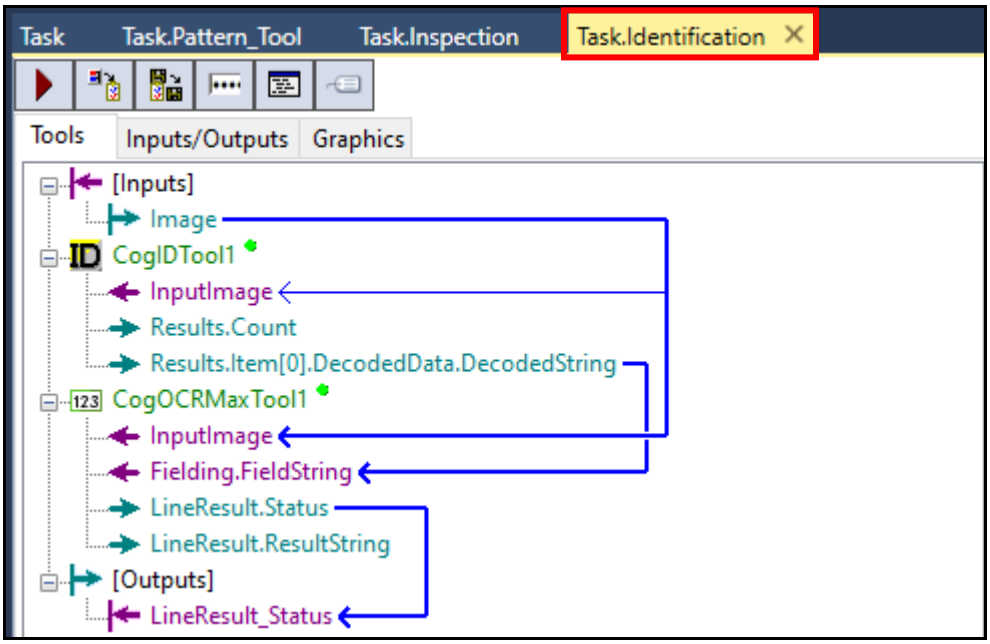
10. Click the **Save** button in the Designer toolbar to save your job.

Expected Results:

Task:



Task.Identification:



Lab Exercise 8.1 – Cognex Designer Components

At the end of this lab exercise, Participants will be able to:

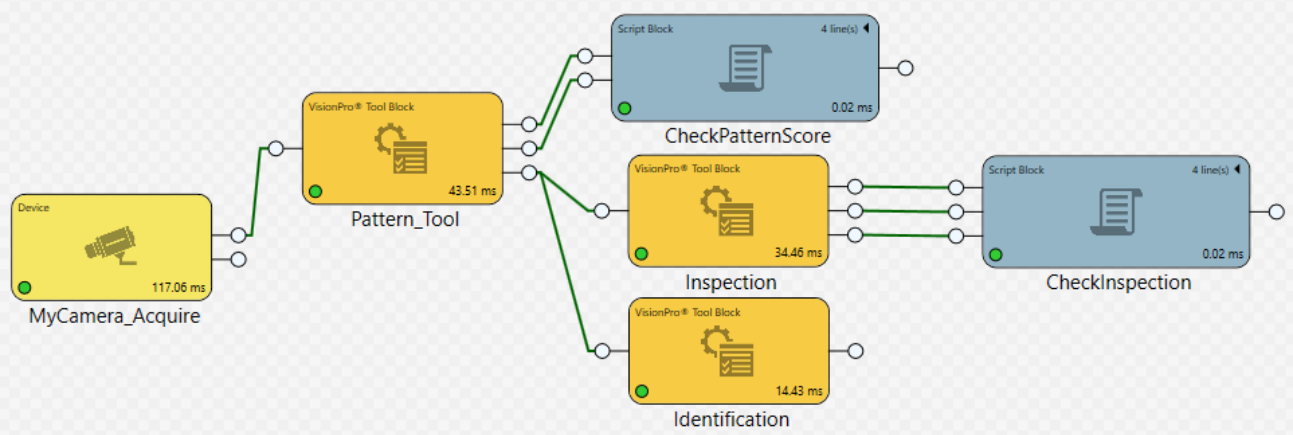
- Create a Shift Register for images
- Add a ScriptBlock to save the image

The Participant will utilize the following Cognex Designer functions to successfully complete this exercise:

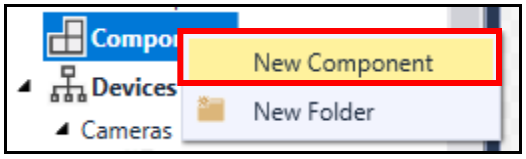
- Project Explorer
  - Components
    - Shift Register
  - ScriptBlock

Follow the steps below to complete the lab exercise:

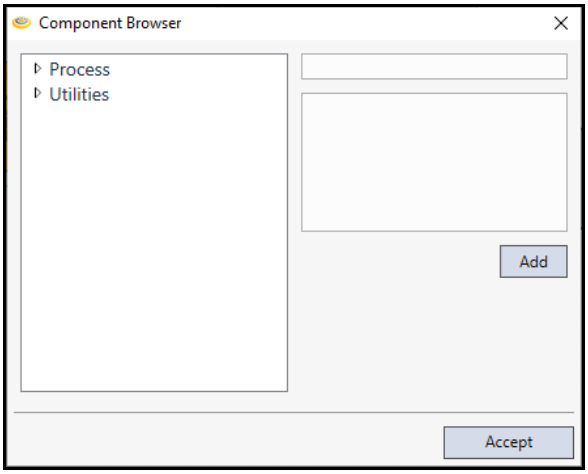
1. Open the **MyProject** Application from the previous lab exercise.



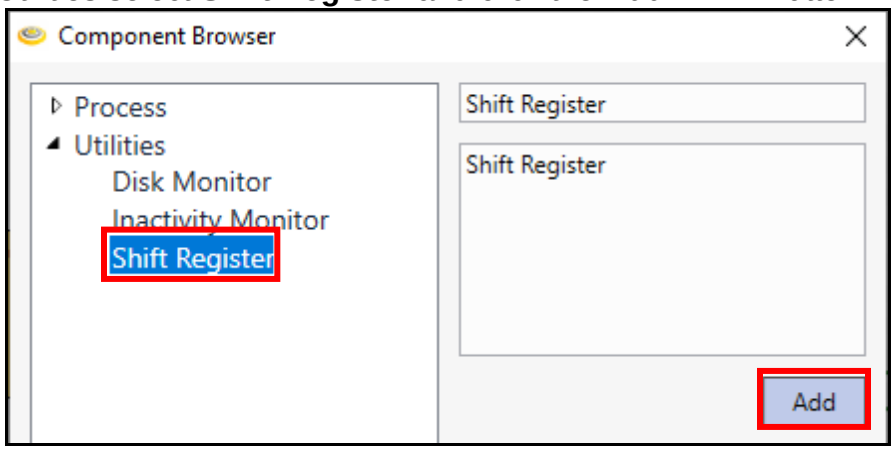
2. Right-click **Components** in the Project Explorer and select **New Component** from the fly-out.



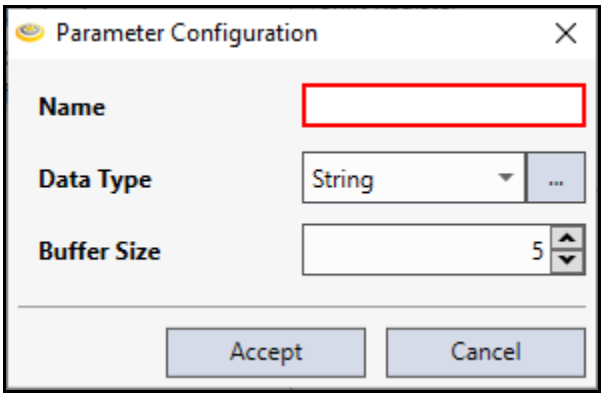
The **Component Browser** displays.



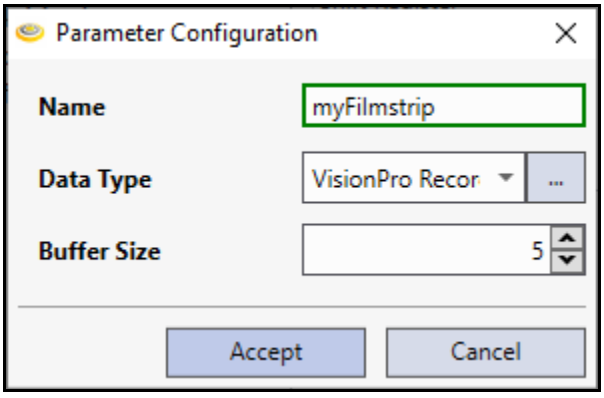
3. Open Utilities select **Shift Register** and click the **Add** Add Button.



The **Parameter Configuration** dialog box displays.

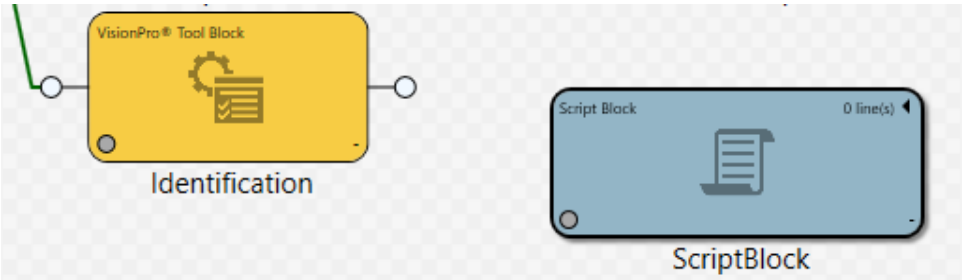


4. Enter *myFilmstrip* in the **Name** field, select VisionPro Record as the **Data Type** and leave the default **Buffer Size** of 5 to remain, click the **Accept** Accept buttons to close the dialog boxes.



myFilmstrip is added under Components in the Project Explorer.

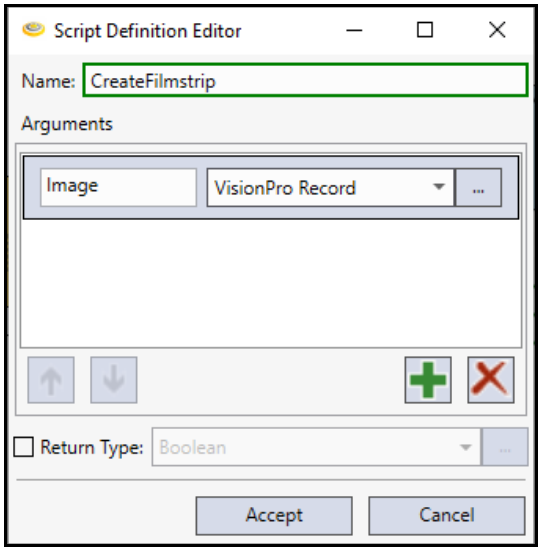
5. Add a **Script Block** to the Task to the right of the Identification block.



6. Double-click the Script Block to open.

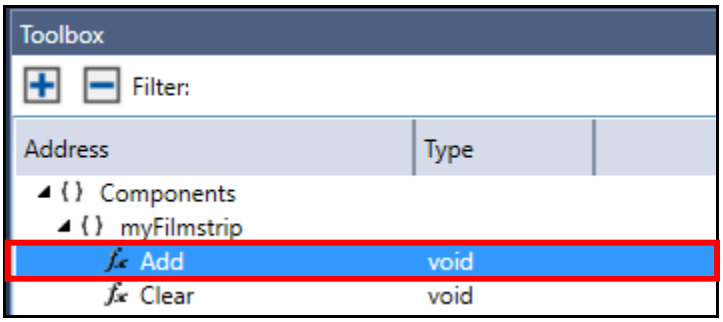
   The **Script Definition Editor** displays.

7. Name the ToolBlock *CreateFilmstrip,* add an argument named *Image,* Type VisionPro Record, leave the Return Type blank and click the Accept button.

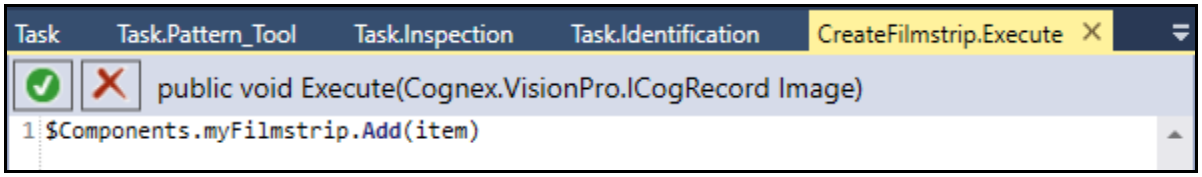


   The **Script Editor** tab opens.

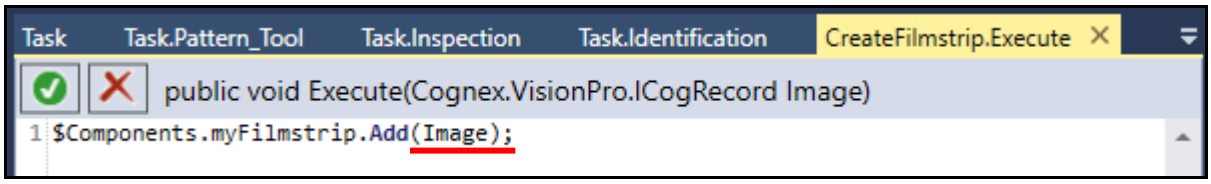
8. Drag the **Add** script from the Toolbox into the Script Editor.



   The Script is entered in the Editor.



9. Update the Script as shown below:

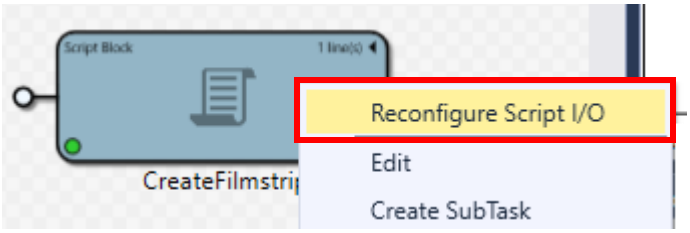


10. Click the **green check** button to compile the current script.
The script is a success.

11. Click the **X** in the upper right hand corner of the script tab to close.
12. Click the **Save** button in the Designer toolbar to save your job.

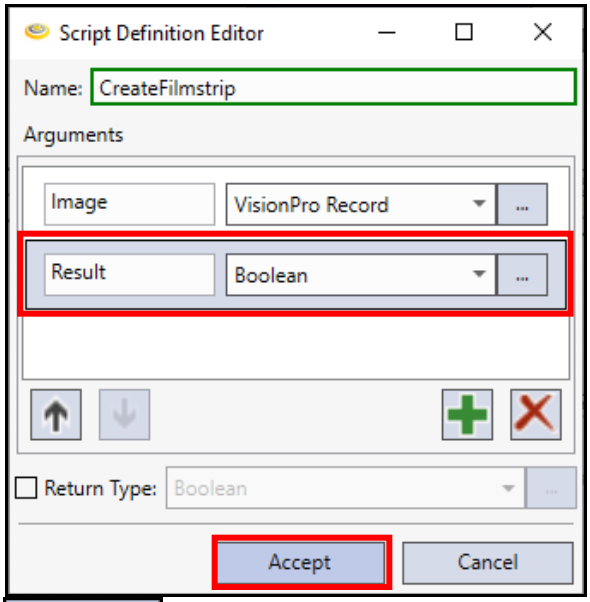
Add an Indication of Pass or Fail

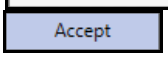
1. Right-click the CreateFilmstrip Script Block and select **Reconfigure Script I/O** from the fly-out.



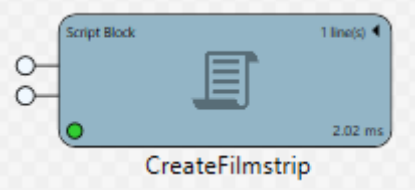
The Script Definition Editor displays.

2. Add a second argument named *Result* and set the Type to **Boolean**.

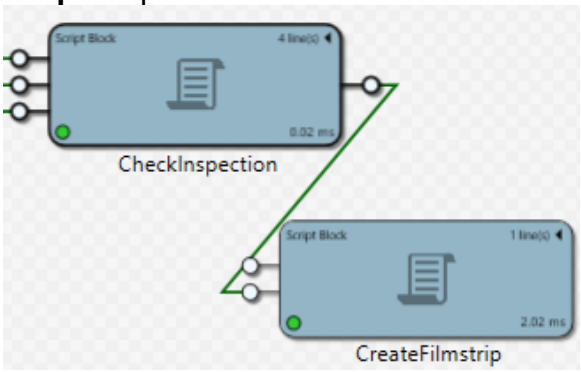


3. Click the **Accept**  button.

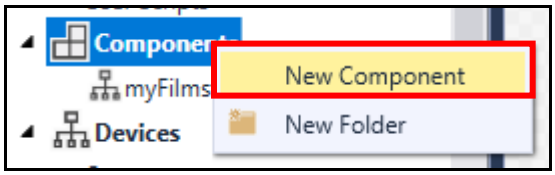
4. The CreateFilmstrip.Execute script tab opens. Leave this open we will be adding to the script later. Return to the Task.
   A new **input pin** has been added to the CreateFilmstrip ScriptBlock.



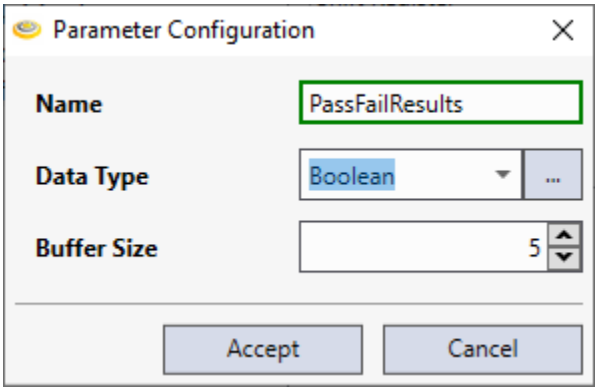
5. Connect the *output* pin of the **CheckInspection** ScriptBlock to the *Result input* pin of the **CreateFilmstrip** ScriptBlock.

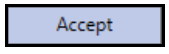


6. A new **input pin** has been added to the CreateFilmstrip ScriptBlock.
7. Right-click **Components** in the Project Explorer and select **New Component** from the fly-out.



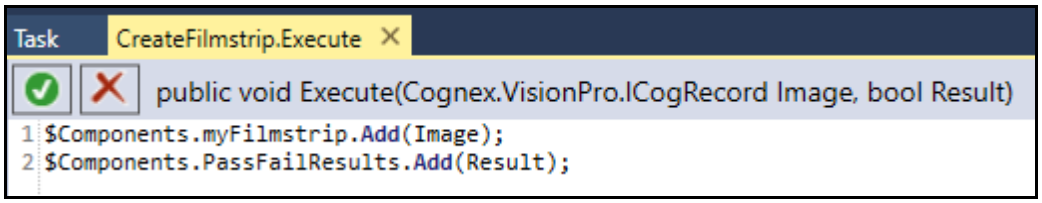
8. Create a new ShiftRegister named *PassFailResults* with the Data Type of Boolean, and a Buffer Size of 5.



9. Click the **Accept** 

button twice.

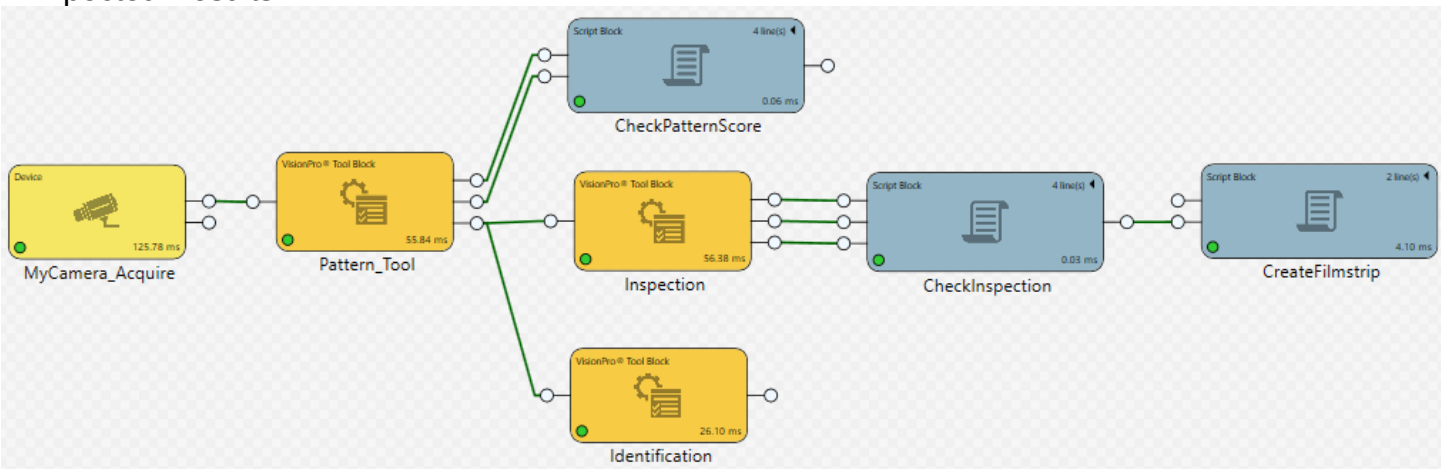
10. Return to the Script tab and enter the following line of script:



11. Click the **green check** button to compile the current script.
The script is a success.

12. Click the **X** in the upper right hand corner of the script tab to close.
13. Click the **Save** button in the Designer toolbar to save your job.

Expected Results:



Lab Exercise 10.1 – Building an HMI

At the end of this lab exercise, Participants will be able to:

- Create a custom Page accessible from other devices, including status indicators, results and controls to view and affect the vision application

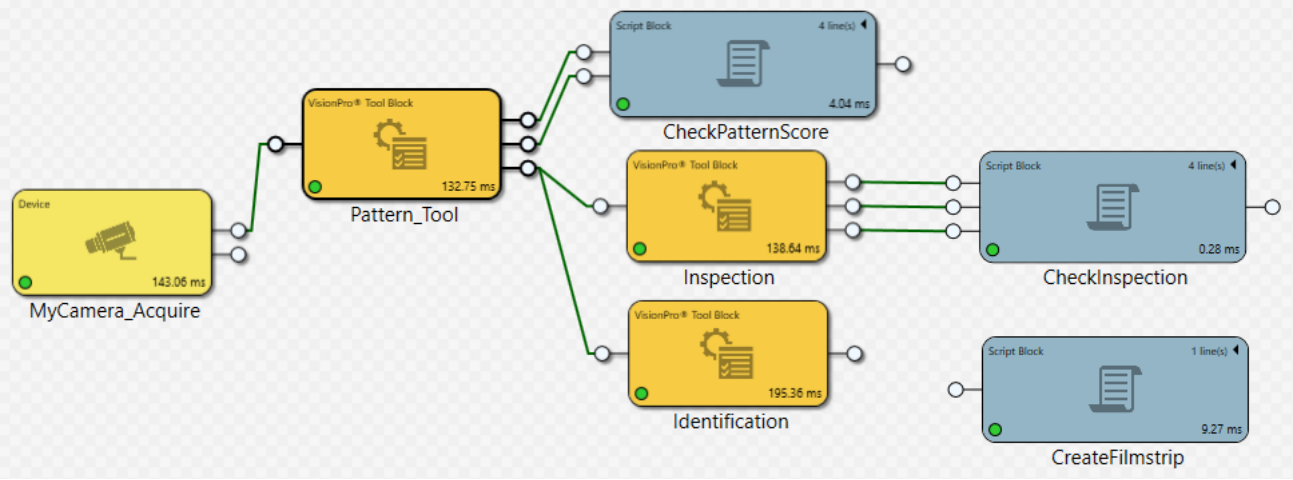
The Participant will utilize the following Cognex Designer functions to successfully complete this exercise:

- Tag Manager
- Pages
- Controls
- Expression Builder
- Associations

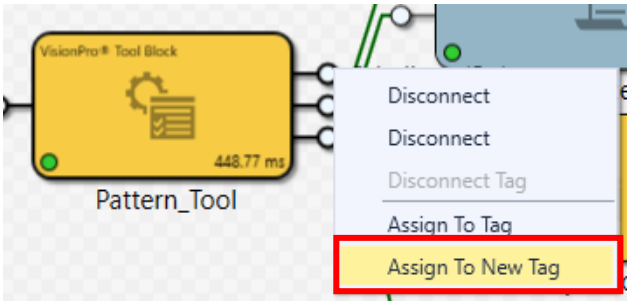
Tag Manager

Follow the steps below to complete the lab exercise:

1. Open the **MyProject** Application from the previous lab exercise.

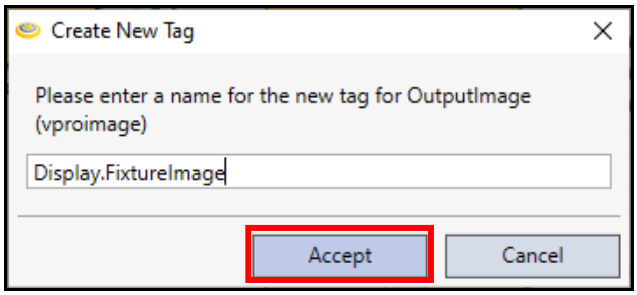


2. On the Task, right-click on the Image output pin of the Pattern_Tool ToolBlock and select **Assign to New Tag** from the fly-out.

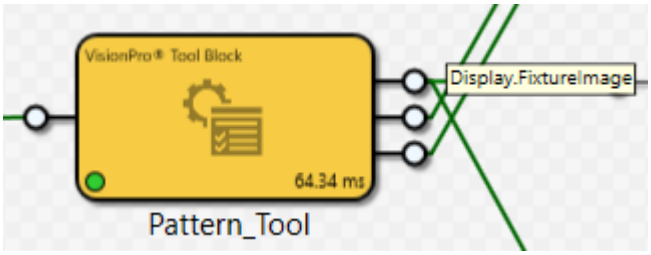


The **Create New Tag** dialog box displays.

3. Name the Tag *Display.FixtureImage* and click the **Accept**  button.



The **Display.FixtureImage** Tag is added to the ToolBlock.



4. Repeat steps 2 & 3 to create the following tags:

Pattern_Tool ToolBlock

Score Output Pin	Result.PMScore

Inspection ToolBlock

Standard Deviation Pin	Result.StdDev
Blob Count Pin	Result.NumHoles
Caliper Width Pin	Result.BlockWidth

Identification ToolBlock

IDTool Pin	Result.IDMatch

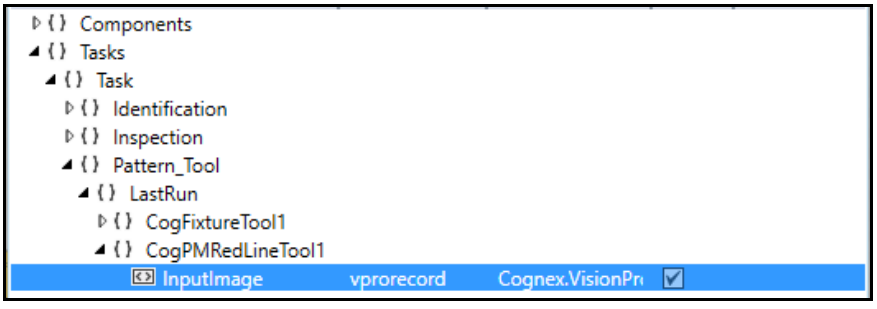
CheckPatternScore ScriptBlock

Result Output Pin	Check.PatternScore

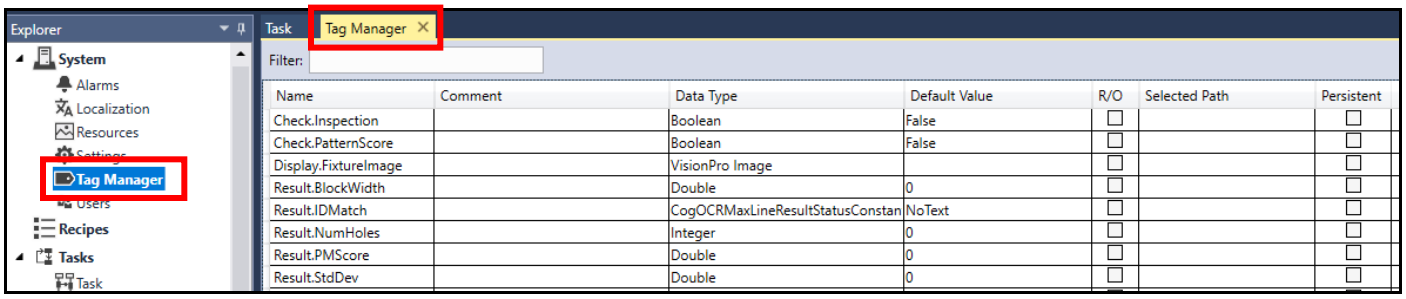
CheckInspection ScriptBlock

Result Output Pin	Check.Inspection

5. Connect the **Image** pin of the CreateFilmstrip ScriptBlock to the **InputImage** of the LastRun result of the PatMaxRedLine Tool.

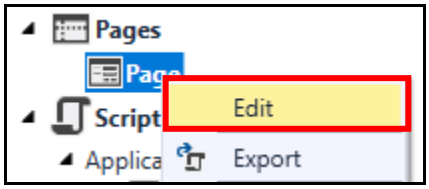


6. Open **Tag Manager** in the Project Explorer and review the Tags.



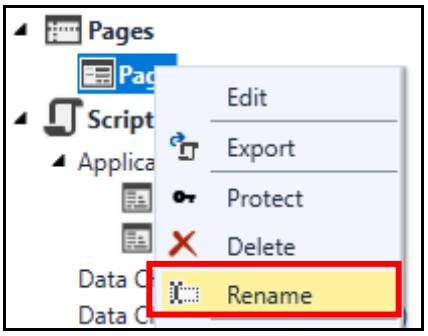
Create the HMI

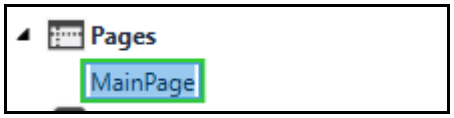
1. Right-click **Page** in the Project Explorer and select **Edit** from the fly-out.



The **Page** tab is added to the project.

2. Right-click **Page** and select **Rename** from the fly-out. Rename the Page *MainPage* and press the **<Enter>** key.

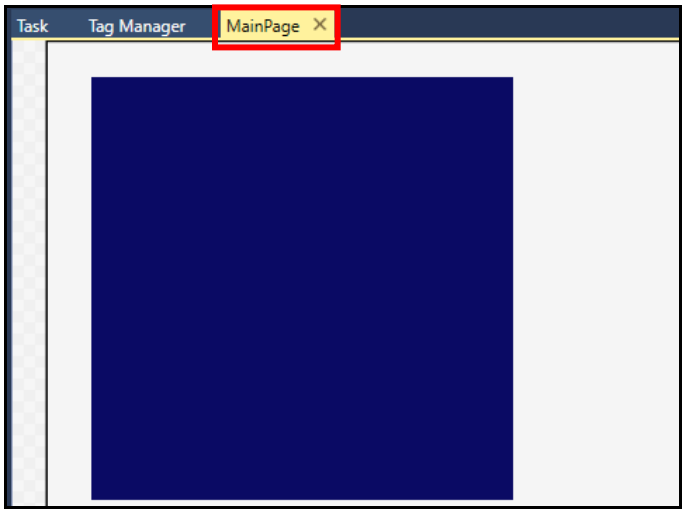




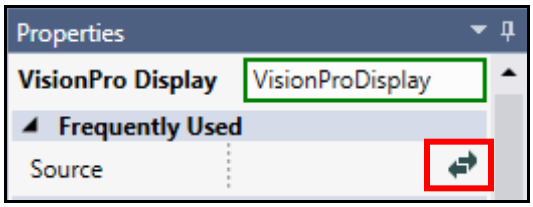
The **Page** tab is renamed to *MainPage*.

3. Go to the *MainPage* tab and add a **VisionPro Display** in the upper left hand corner of the Page.

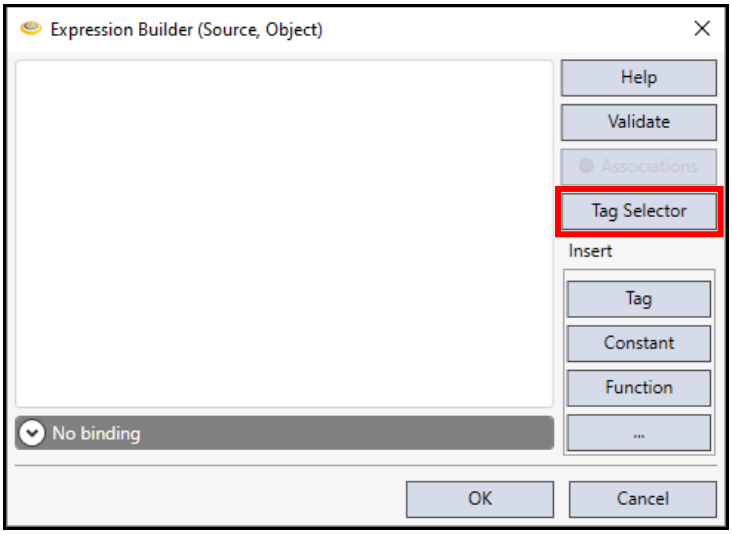
NOTE: *The VisionPro Display is located under Vision in the Toolbox.*

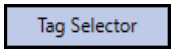


4. Click on the Display to show the **Properties**. The Properties are located on the right-hand side of the Development Environment.

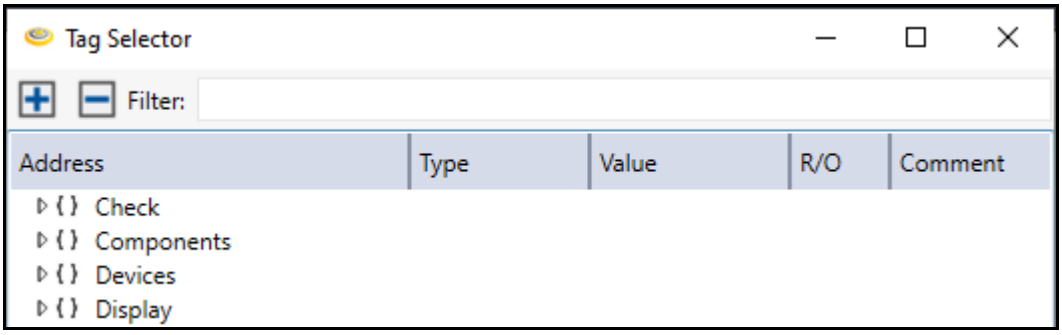


5. Click the **double arrow**  button to set the **Source** of the display.
The **Expression Builder** dialog displays.

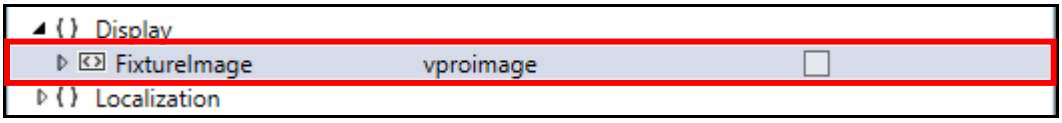


6. Click the **Tag Selector**  button.

The **Tag Selector** dialog displays.

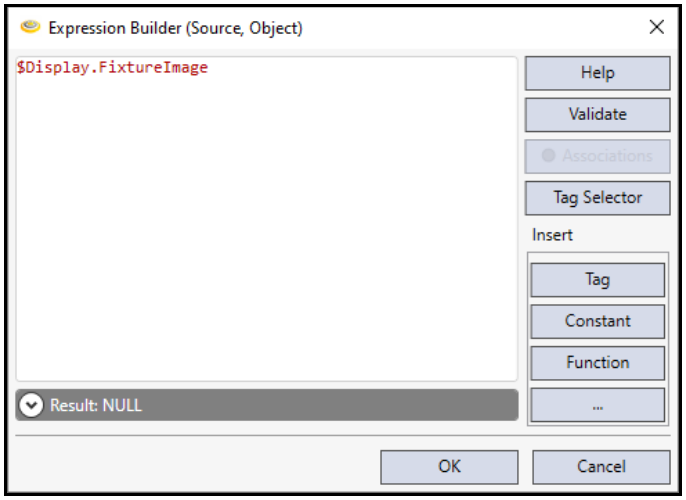


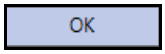
7. Expand the **Display** list and select **FixtureImage**, as shown below.



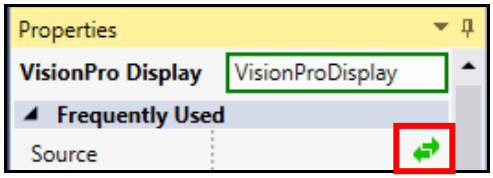
8. Click the **Accept**  button.

The **Expression** has been built.



9. Click the **OK**  button.

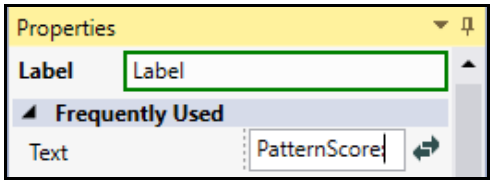
The **Source** icon has changed color from black to green indicating that there is a reference enabled.



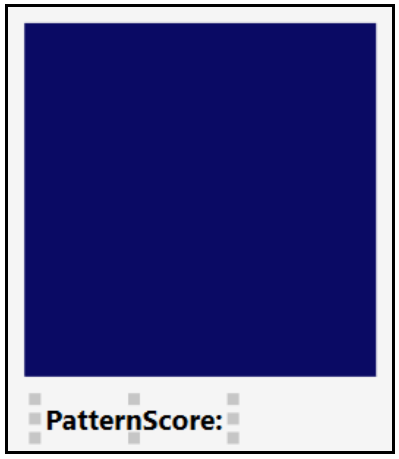
10. Add a **Label** to the Page under the display.

NOTE: *The Label is found in the Toolbox under Controls.*

11. Under the Label Properties change the Text to *PatternScore:*.

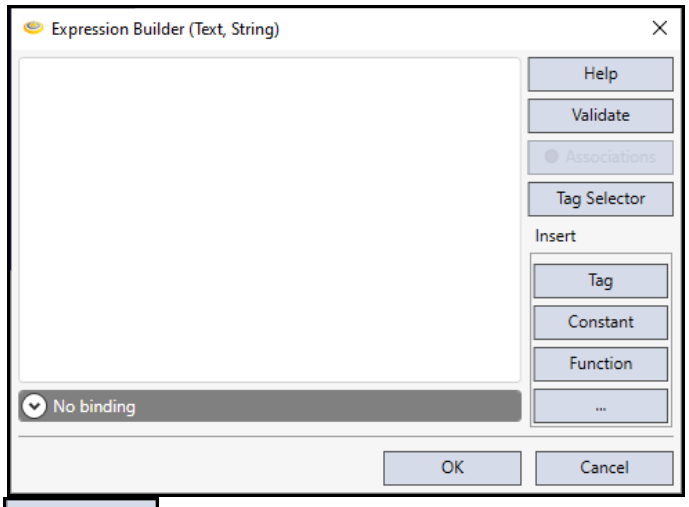


12. In the Label Appearance check the **Bold** checkbox and change the Font Size to **24**.
NOTE: *You may need to increase the size of the text box to see the complete name.*



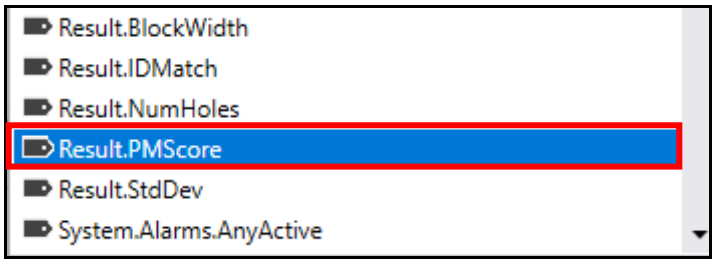
13. Copy the Label and Paste next to the PatternScore label.

14. Under the Properties click the **double arrow**  button to set the **Text** of the label. The **Expression Builder** dialog displays.

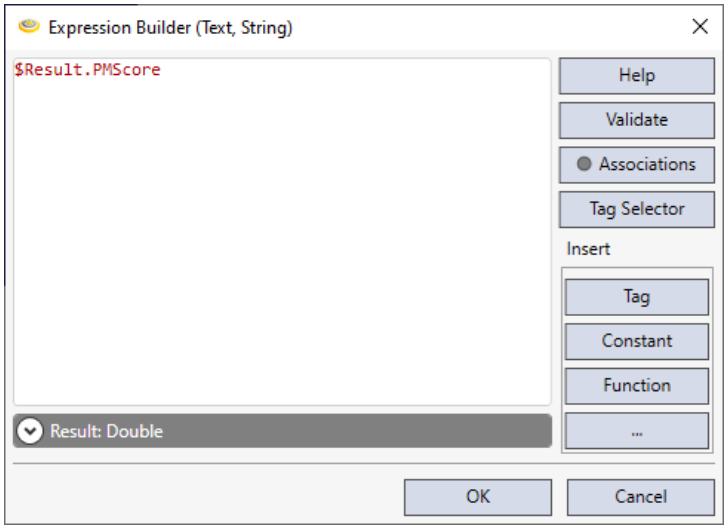


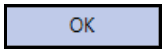
15. Click the **Tag**  button to select a tag.

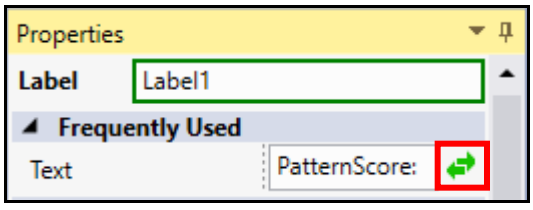
16. Select **Result.PMScore** from the list of available Tags.



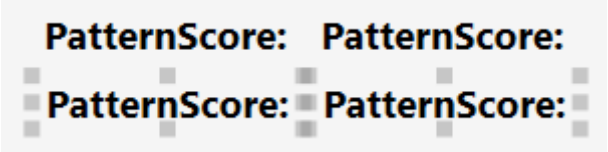
17. Press the **<Enter>** key.
    The **Expression** has been built.



18. Click the **OK**  button.
    The **Text** icon has changed color from black to green indicating that there is a reference enabled.

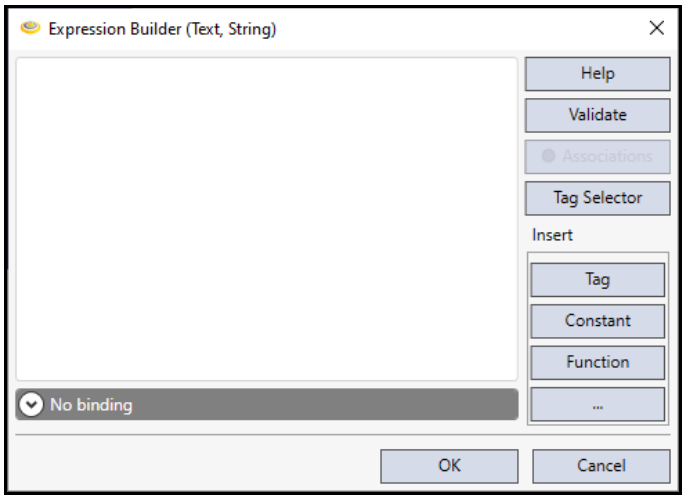


19. Copy and Paste the Labels under the original PatternScore labels.

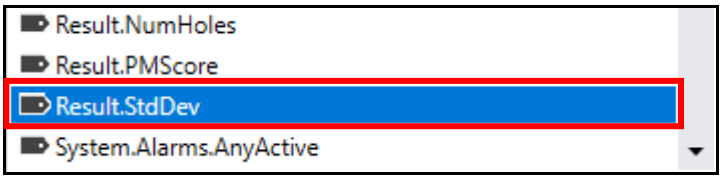


20. Under the Label Properties of the first pasted label change the Text to *Gouge:*.
21. Under the Properties of the second pasted label click the **double arrow**  button to set the **Text** of the label.

The **Expression Builder** dialog displays.

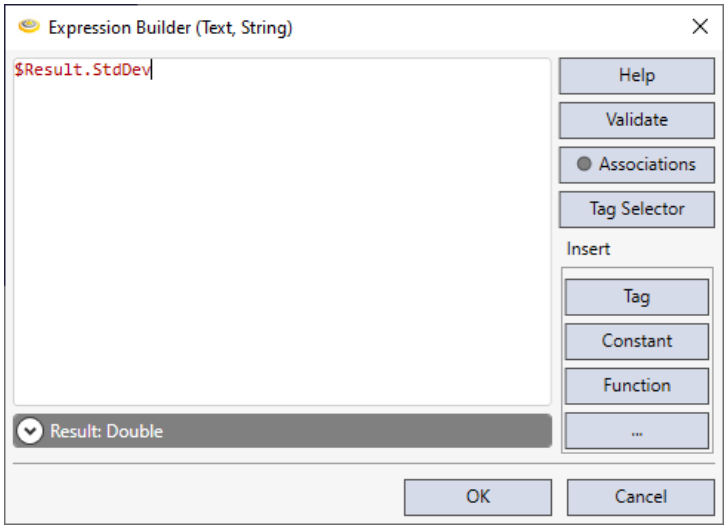


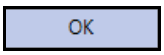
22. Click the **Tag**  button to select a tag.
23. Select **Result.StdDev** from the list of available Tags.



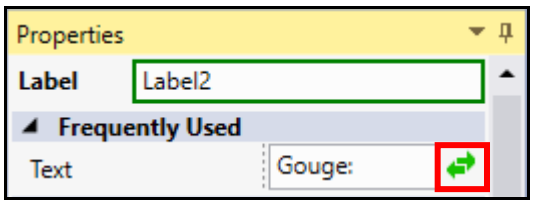
24. Press the **<Enter>** key.

    The **Expression** has been built.



25. Click the **OK**  button.

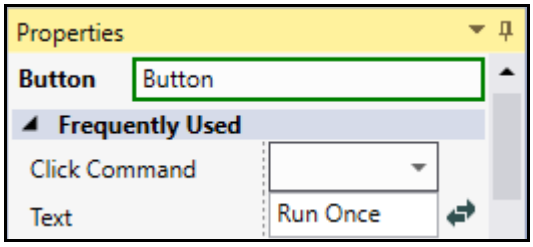
The **Text** icon has changed color from black to green indicating that there is a reference enabled.



26. Add a **Button** to the Page under the display.

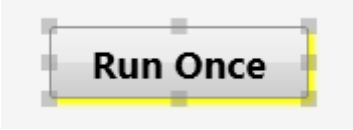
    NOTE: *The Button is found in the Toolbox under Controls.*

27. Under the Button Properties change the Text to *Run Once*.

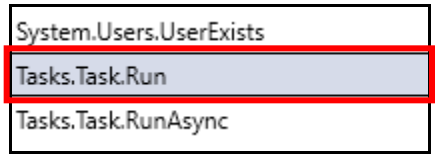


28. In the Button Appearance check the **Bold** checkbox, change the Font Size to **24**, select **DropShadow** as the effect and set the Shadow Color to **Yellow**.

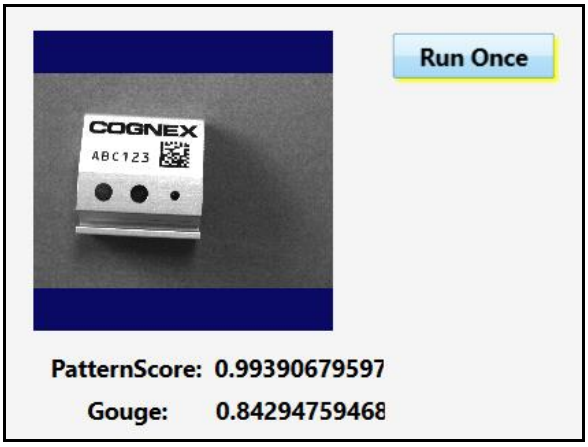
    NOTE: *You may need to increase the size of the text box to see the complete name.*



29. Under the Button Properties set the **Click Command** to **Tasks.Task.Run**.



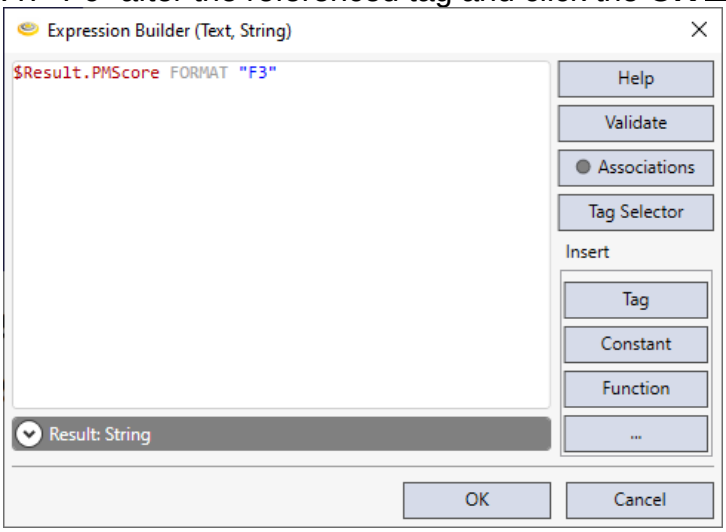
30. Click the **Run** button in the Task bar and click the **Run Mode** tab.
31. Click the **Run Once** Run Once button and review the results.



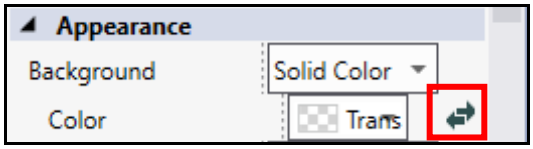
32. Click the **Stop** button in the Task bar.
33. Click the **Save** button in the Designer toolbar to save your job.

Format and Control the Color of the Result Labels Using Associations

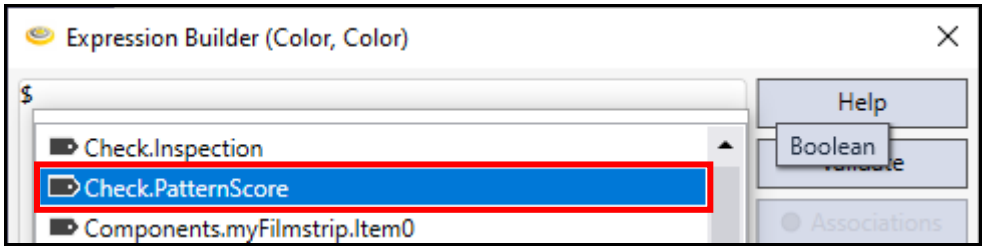
1. Go to the Properties of the Label reporting the **PatternScore** result and click the **double arrow** button to open the Expression Builder.
2. Enter *FORMAT "F3"* after the referenced tag and click the **OK** button.



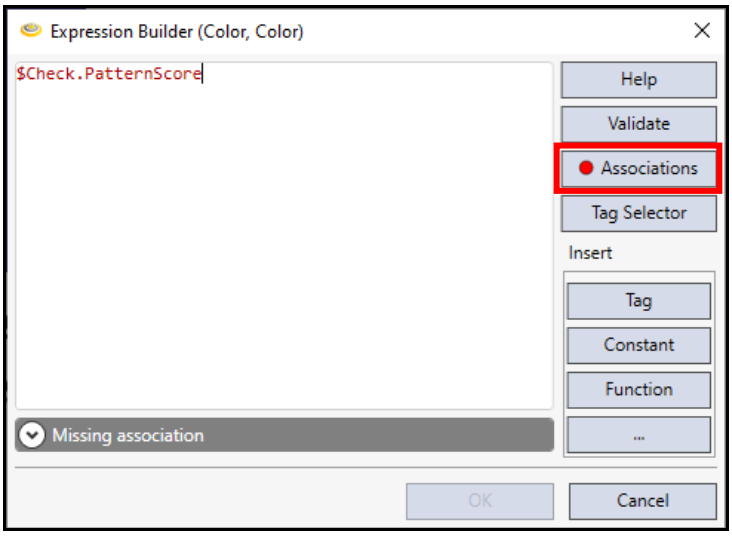
3. Under the Appearance Properties click the **double arrow** button to set the **Background Color** of the label.



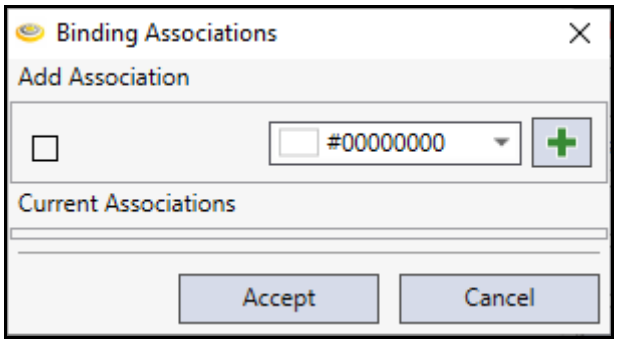
4. Type **$** and select **Check.PatternScore** from the list of available tags and press the **<Enter>** key.



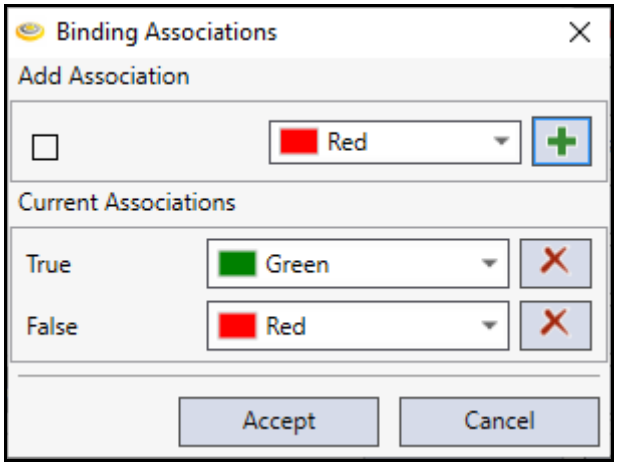
5. Click the **Associations**  button.



The **Binding Associations** dialog displays.

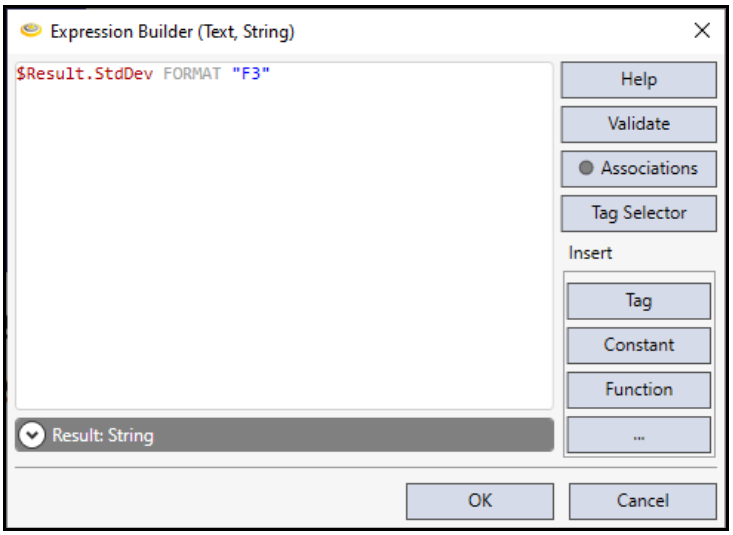


6. Click the **Checkbox** to turn it on, select a color (Green) from the drop down, and click the **Plus Sign**  button to add the association for **True**.
7. Uncheck the Checkbox and select a second color (Red) from the drop down.
8. Click the **Plus Sign**  button again to accept the color entry for **False**.

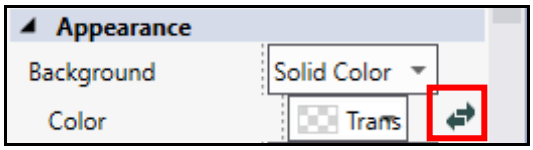


9. Click the **Accept** Accept button.
10. Click the **OK** OK button.

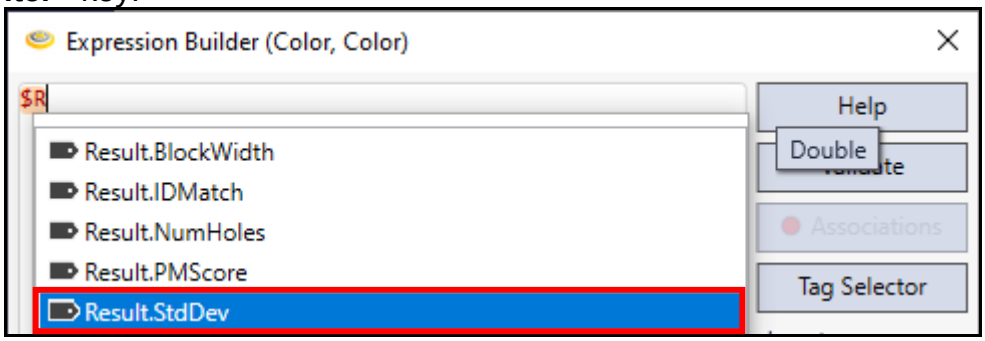
11. Go to the Properties of the Label reporting the **Gouge** result and click the **double arrow** button to open the Expression Builder.
12. Enter *FORMAT "F3"* after the referenced tag and click the **OK** OK button.



13. Under the Appearance Properties click the **double arrow** button to set the **Background Color** of the label.

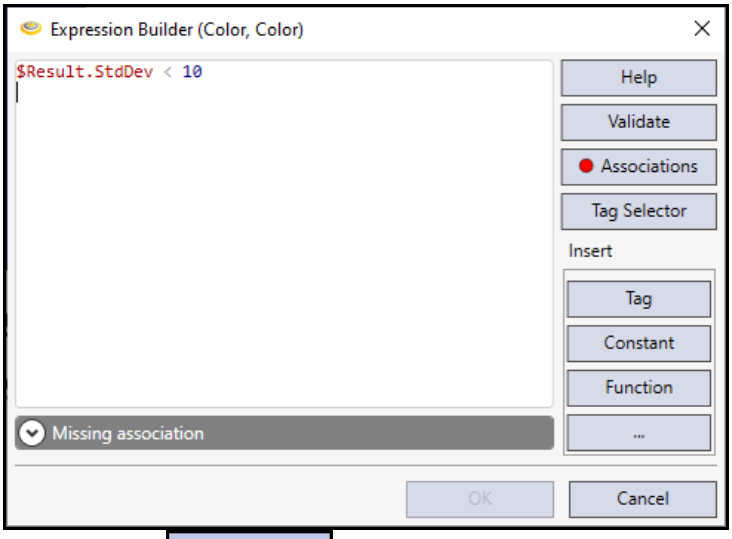


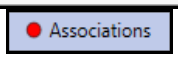
14. Type **$R** and select **Result.StdDev** from the list of available tags and press the **<Enter>** key.

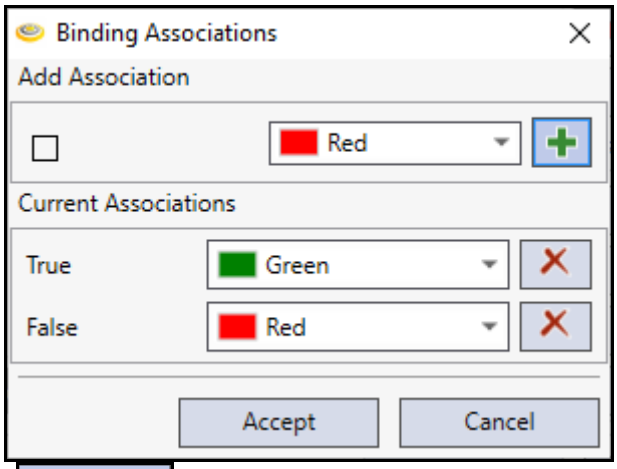


15. Enter the following expression.

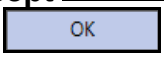
NOTE: *Select the Standard Deviation greater than number based on your results.*

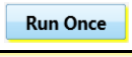


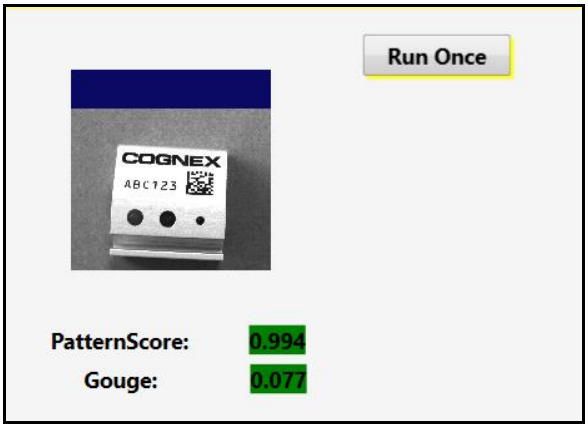
16. Click the **Associations**  button and set the association as above.



17. Click the **Accept**  button.

18. Click the **OK**  button.

19. Click the **Run**  button in the Task bar and click the **Run Mode** tab.
20. Click the **Run Once**  button and review the results.



21. Click the **Stop** button in the Task bar.
22. Repeat steps for the Blob and Caliper Tools.
    Blob:
    Label 1: # of Holes:

    Label 2: No Text
    $Result.NumHoles

    Background Color
    ($Results.NumHoles <> 3)
    Associations: (if bad part in FOV)
        True = Red
        False = Green
    Caliper:
    Label 1: Block Width

    Label 2: No Text
    (($Result.BlockWidth FORMAT “F3”) + “mm”)

    Background Color
    (($Result.BlockWidth FORMAT “F3”) + “mm”)
    Associations: (If good part in FOV)
        True = Green
        False = Red
    ID Tools:
    Label 1: String Result

    Label 2: No Text
    Background Color
    $Result.IDMatch
    Associations
    Note: *You will get a Mismatch warning, click the Yes button to clear.*
    If you copied and pasted your label, delete the current Associations and select new colors for each of the results that can occur.
        Confused = PaleVioletRed
        Failed = Red
        Mismatch = Red
        No Text = Red
        NotRead = PaleVioletRed
        Read = Green
23. Click the **Save** button in the Designer toolbar to save your job.

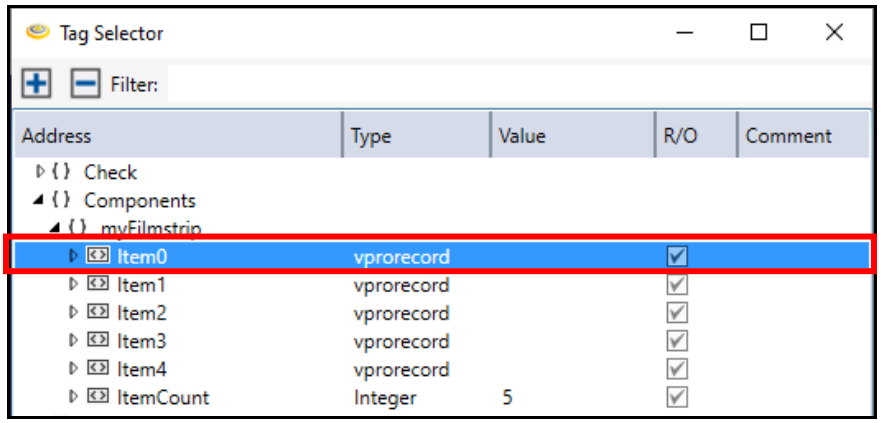
Add a Filmstrip with Color to the HMI Page

1. Add 5 small VisionPro Displays to the bottom of the page.

   NOTE: *You may want to rearrange your page to make everything fit better.*

2. Format the displays using the controls in the Taskbar.

3. Set the Source of the first VisionPro display to reference **Components → myFilmstrip → Item0.**



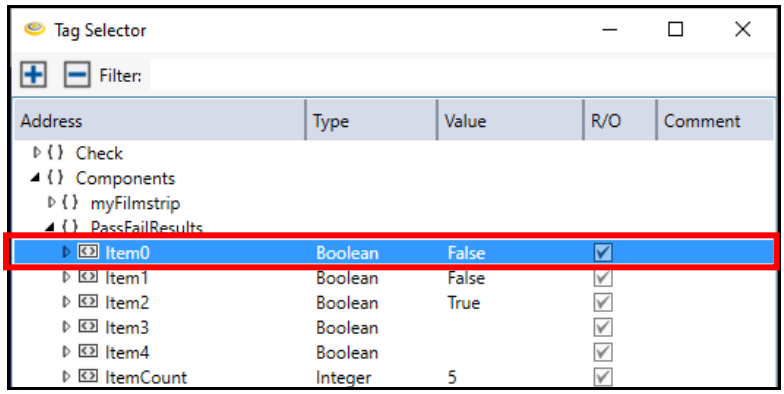
4. Repeat Step 3 for the remaining 4 displays to create the filmstrip:
   Display 2 = Item1
   Display 3 = Item2
   Display 4 = Item3
   Display 5 = Item4
5. Add a Label above Display 1, enter *Recent Results* in the Text field, format **Bold**, Font Size **24**, and Horizontal Alignment **Left**.

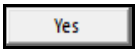
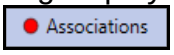
6. Click the **Run** button in the Task bar and click the **Run Mode** tab.
7. Click the **Run Once** Run Once button to acquire a few images of both the good and bad parts and review the results.
8. Click the **Stop** button in the Task bar.

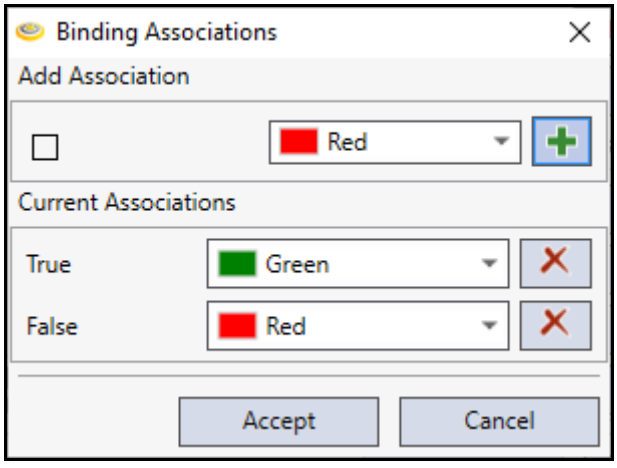
9. Add a **Rectangle** around each of the Filmstrip displays.

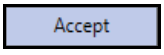
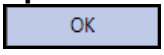
10. Select the first rectangle and click the **double arrow**  button to set the color of the Border Brush.
11. Open the Tag Selector and check the **Show All Types** checkbox.

12. Set the Source of the first rectangle to reference **Components → myFilmstrip → PassFailResults → Item0**.



13. The **Type mismatch** dialog displays. Click the **Yes**  button to continue.
14. Click the **Associations** 

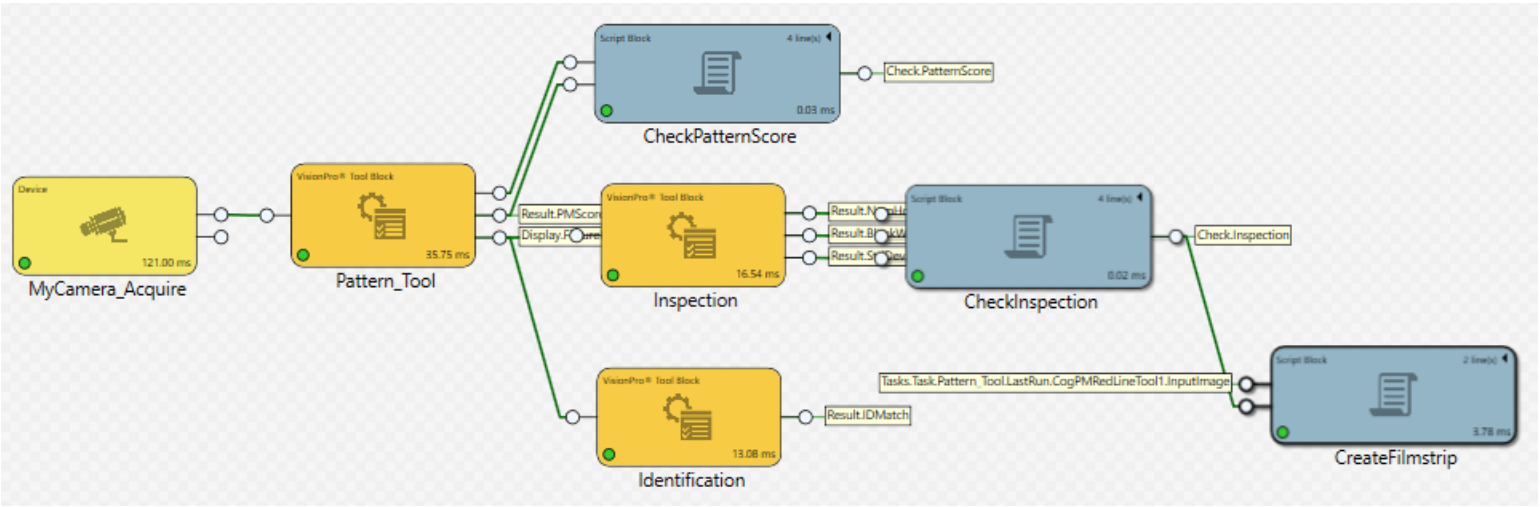


15. Click the **Accept**  button.
16. Click the **OK**  button.

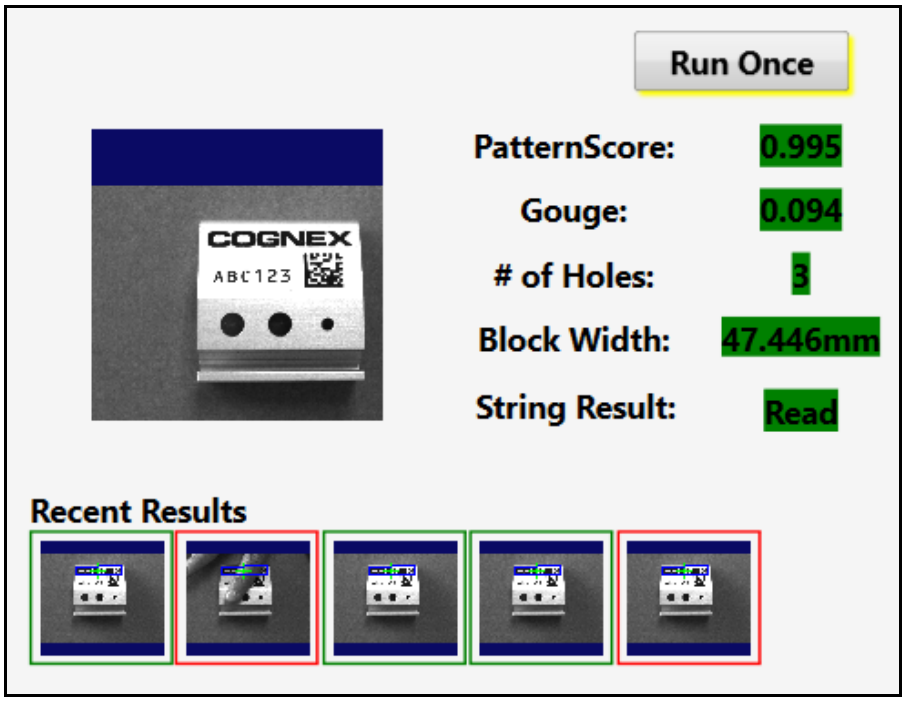
17. Repeat Steps 12 - 16 for the remaining 4 displays to create the filmstrip:
    Rectangle 2 = Item1
    Rectangle 3 = Item2
    Rectangle 4 = Item3
    Rectangle 5 = Item4
18. Click the **Run** button in the Task bar and click the **Run Mode** tab.
19. Click the **Run Once** button to acquire a few images of both the good and bad parts and review the results.
20. Click the **Stop** button in the Task bar.

Expected Results:

Task:



MainPage:



Lab Exercise 11.1 – Deployment

At the end of this lab exercise, Participants will be able to:

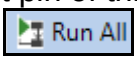
- Employ utilities available to deploy the Cognex Designer application

The Participant will utilize the following Cognex Designer functions to successfully complete this exercise:

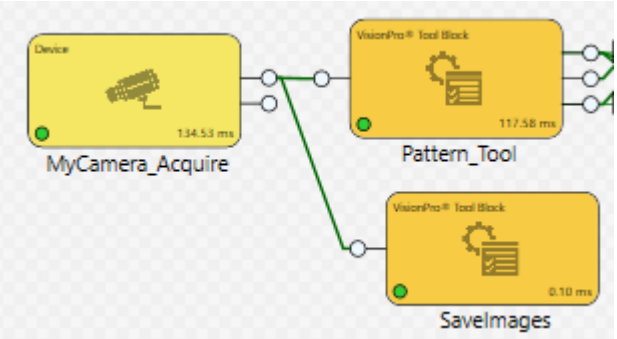
- VisionPro ToolBlock
- CogImageFileTool

Follow the steps below to complete the lab exercise:

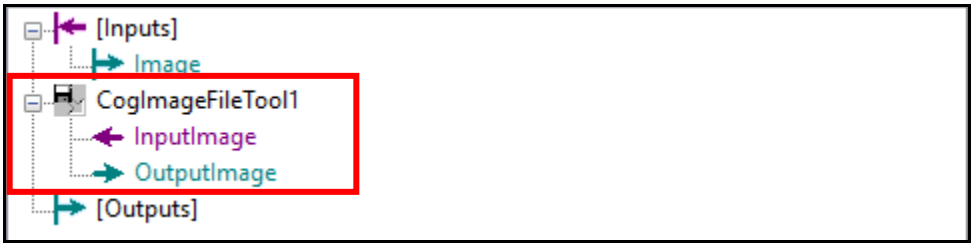
1. Open the **MyProject** Application from the previous lab exercise.

2. Add a new VisionPro Tool Block to the Task.
3. Rename the Toolblock *SaveImages* and connect the output pin from the camera device to the input pin of this tool block.
4. Click the **Run All** 

button to bring the image into the new tool block.

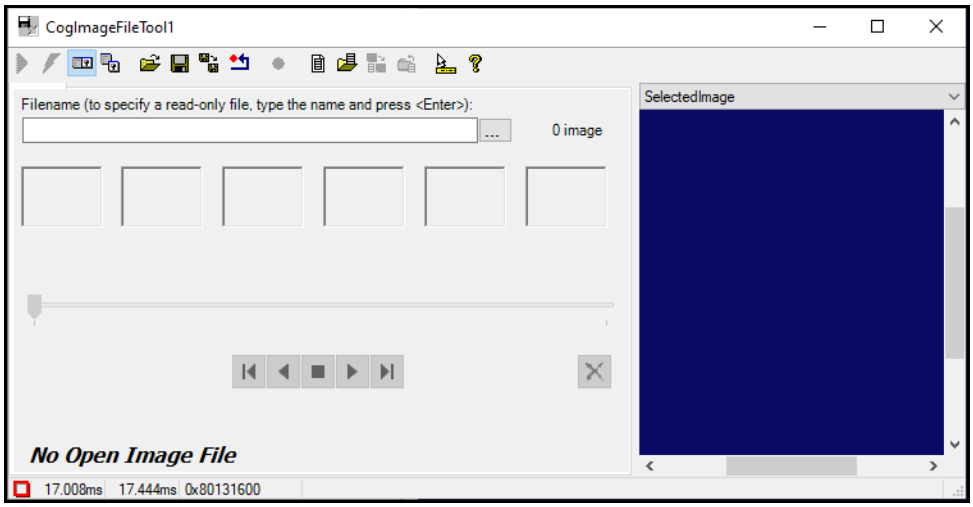


5. Double click the SaveImages tool block to open.
6. Add a **CogImageFileTool**.



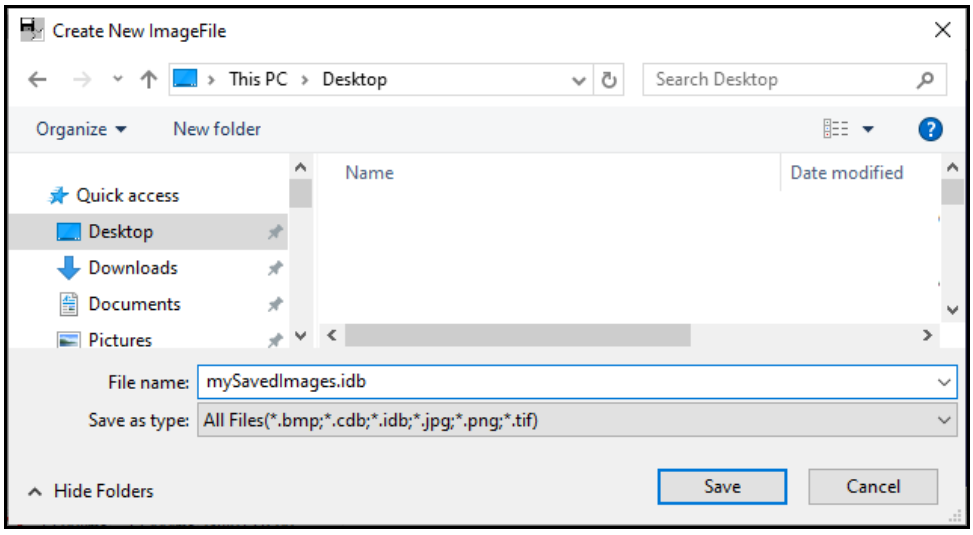
7. Connect the InputImage from the CogImageFileTool to the [Inputs].Image.

8. Double-click the Image File tool to access the tool settings.

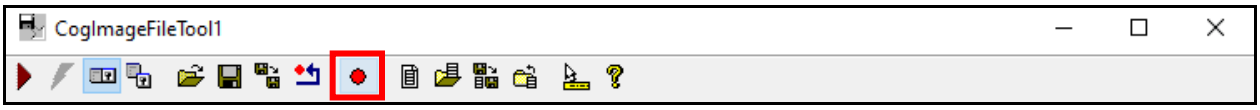


9. Click the **Create New ImageFile** button.
10. Save the file to your Desktop with a name like *mySavedImages.idb* and click the **Save** button.

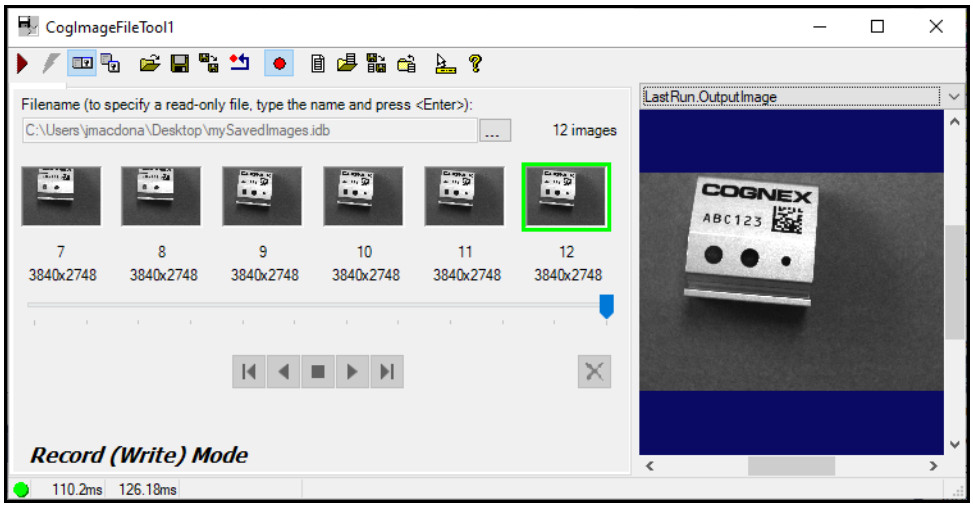
NOTE: *Make sure that you specify .idb, or it will save a bitmap .bmp file.*



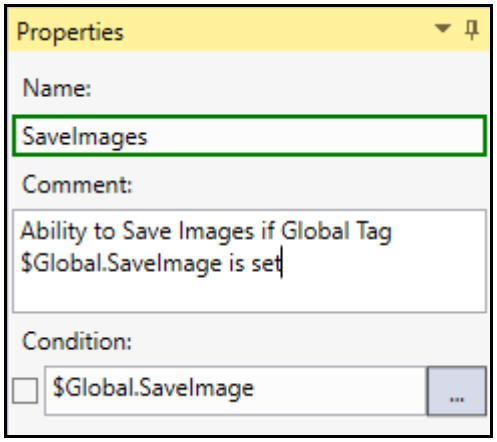
11. Click the **Record** button to put the ImageFile tool into Record mode.

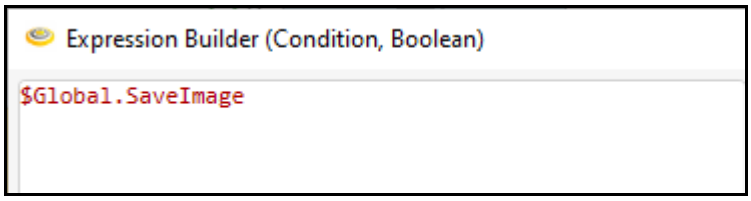


12. Run the Task a few times to bring images into the Database.



13. Go to the Tag Manager and create a new Tag named *Global.SaveImage,* leave the Data Type as Boolean, and False as the Default Value.
14. Return to the Task, click the SaveImages Toolblock to display the Properties, click the ellipsis to open the **Condition** value. The Expression Builder will display.
15. Click the **Tag Selector** button and reference *$Global.SaveImage* and click the **OK** OK button.



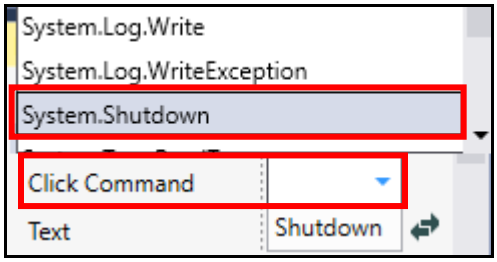


16. Add a **CheckBox** to the Main Page and enter *Save Images* in the Text field.
17. The **State** property should reference the *$Global.SaveImage* tag.
18. Go into **Run Mode** and run the application a few times with the Save Images checkbox both checked and unchecked. Close Run Mode, open the SaveImages Toolblock and open the ImageFileTool to review the images saved.
19. Click the **Save** button in the Designer toolbar to save your job.

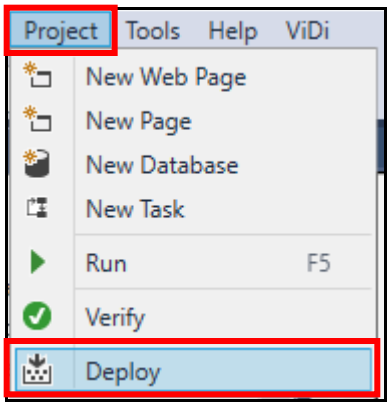
Deploy the Application

1. Add a **Button** to the MainPage next to the Run Once button.
   NOTE: *The Button is found in the Toolbox under Controls.*
2. Under the Button Properties change the Text to *Shutdown*.

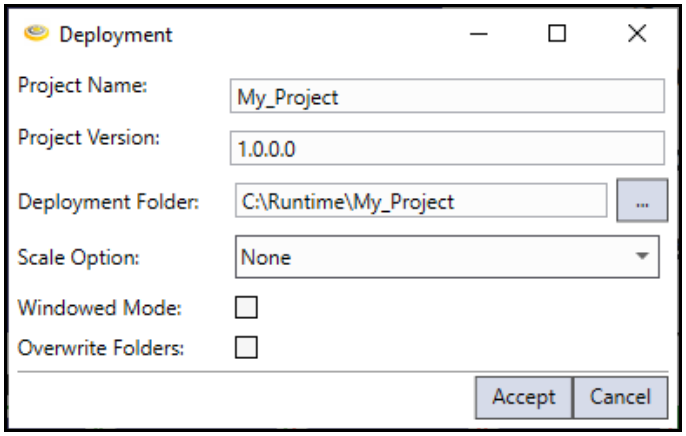
3. Set the **Click Command** to **System.Shutdown**.



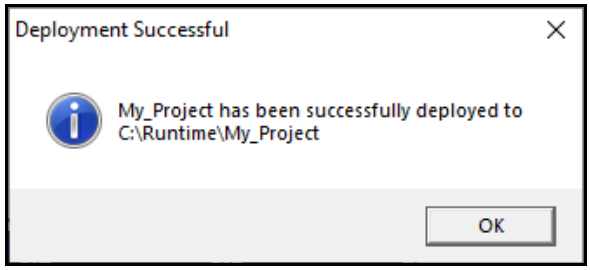
4. Click the **Save** button in the Designer toolbar to save your job.
5. Select **Deploy** from the Project Menu.



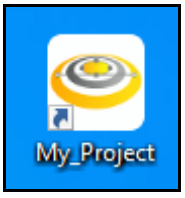
The **Deployment** dialog displays.



6. Enter the Project Name and where you want the project to deploy and click the **Accept** Accept button.
   The **Deployment Successful** dialog displays.



7. Click the **OK** OK button to close the dialog box.
8. Notice that a .exe of your file is now on the desktop.



9. Close Cognex Designer and run the .exe file.