

Workshop 3:

Final Quality Check with Vision

Follow this step-by-step guide during the session.

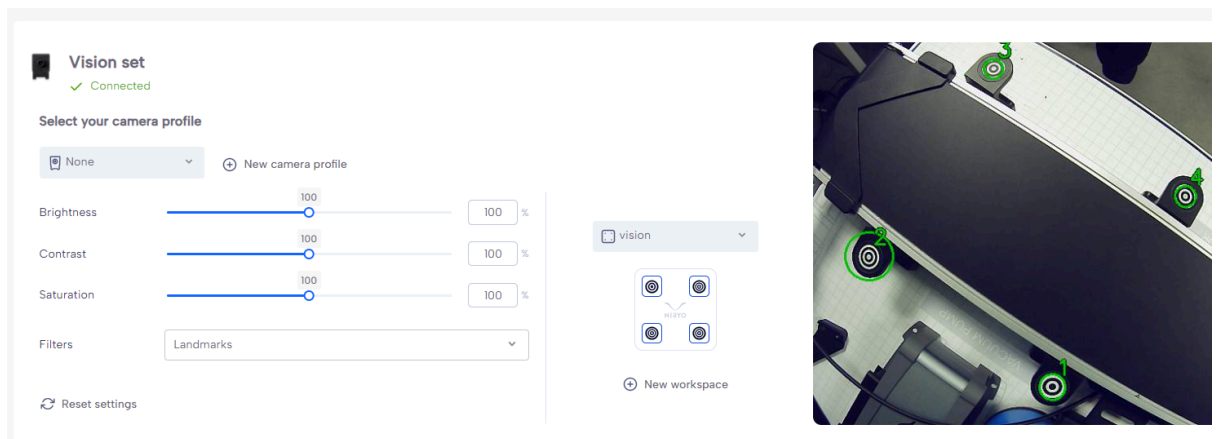
Step 1 – Goal of the Workshop

You will build a quality check system:

- **Red object** → Trash area (Beta zone)
 - **Non-red square** → Storing zone (Alpha zone)
 - **Non-red circle** → Shipping zone (vision plate)
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Step 2 – Adjust Vision Parameters

1. In NiryoStudio, open the **Equipment** tab and select the camera workspace.
2. Place 3 objects of different colors on the workspace.
3. Adjust **Brightness, Contrast, Saturation** for best detection.
4. Test filters to refine object detection.



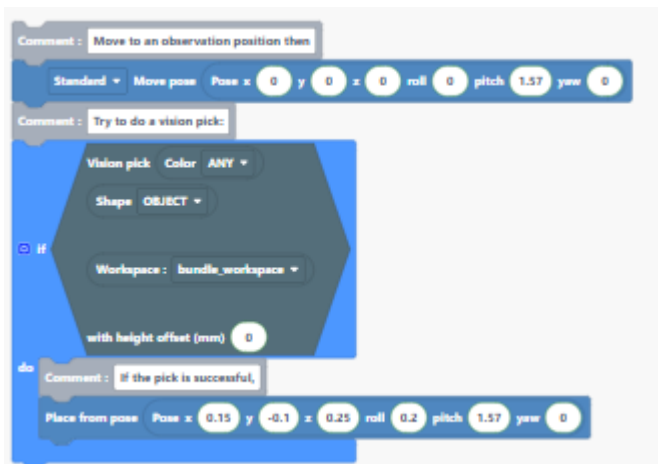
Step 3 – Start a New Blockly Program

1. Create a new Blockly program.
2. Add a **Scan & Update Tool** block at the very top.



Step 4 – Load and Adjust the Vision Pick Template

1. Load the **Vision Pick** template.
2. Move the robot to an **observation pose** above the conveyor workspace (all 4 landmarks must be visible).
3. Save this pose and replace the template's default observation pose.
4. Select the **conveyor workspace** in the Vision Pick block.



Step 5 – Configure Vision Pick Parameters

1. In the Vision Pick block, set:
 - **Color = Red**
 - **Shape = Any**
 - **Height Offset = 10 mm** (for vacuum pump use)

Step 6 – Add Placement to Trash Area

1. Record an **intermediate safe position** between conveyor and trash area.
2. Record a position **above the trash area (Beta zone)**.
3. Add a **Release** action after the place position.
4. Replace the default “place from pose” block in the template with your positions.

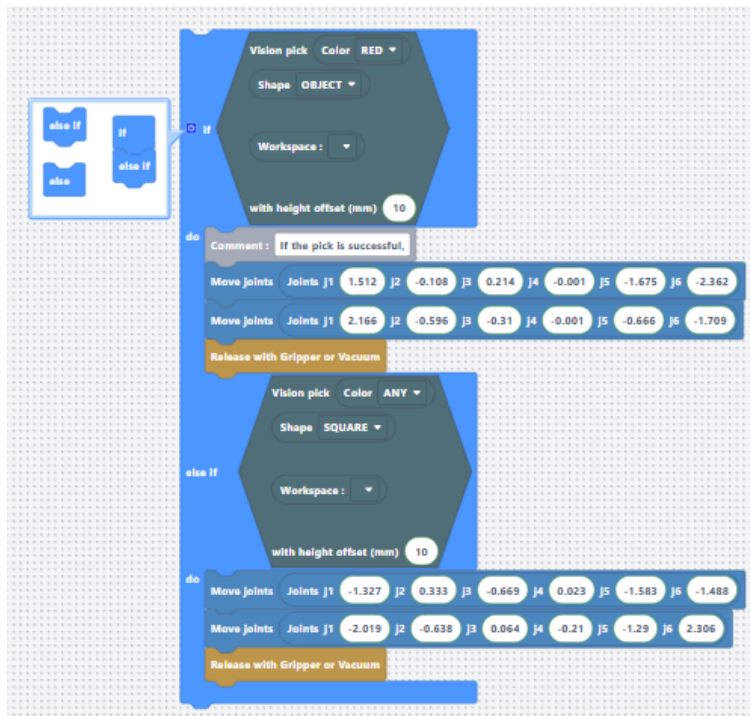
Step 7 – Test with Two Objects

1. Place **1 red object** and **1 green object** on the workspace.
2. Run the program.
 - Red → should go to trash area
 - Non-red → ignored (for now)

Step 8 – Add Condition for Squares

1. On the **If block**, open the gear icon → add **Else If**.
2. Copy the Vision Pick block, set:
 - **Color = Any**
 - **Shape = Square**
3. Record intermediate + place positions above the **Alpha zone** (storing zone).

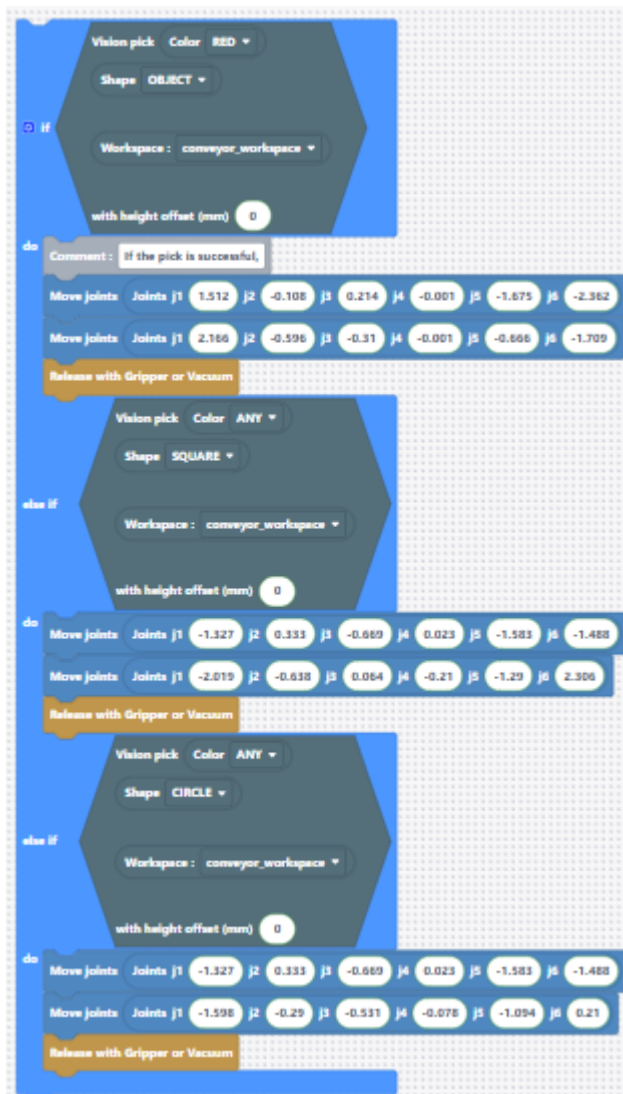
4. Add a **Release** action there.



Step 9 – Add Condition for Circles

1. Add another **Else If**.
2. Copy the Vision Pick block, set:
 - **Color = Any**
 - **Shape = Circle**
3. Record intermediate + place positions above the **vision plate** (shipping zone).

4. Add a **Release** action there.



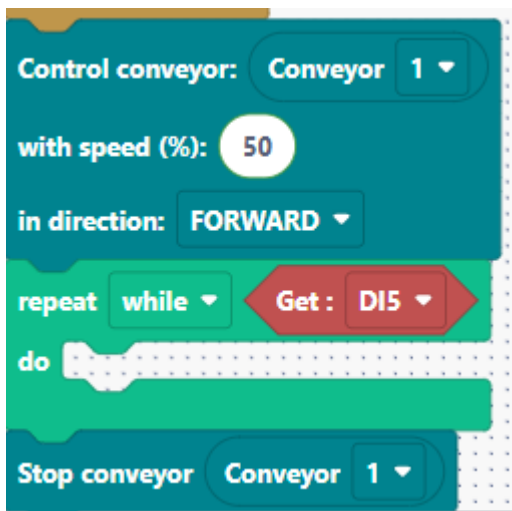
Step 10 – Test with Three Objects

1. Place on the conveyor:
 - 1 red object
 - 1 blue circle
 - 1 blue square
2. Run the program 3 times.

- Red → Beta zone
 - Square → Alpha zone
 - Circle → Vision plate
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Step 11 – Add Conveyor Logic

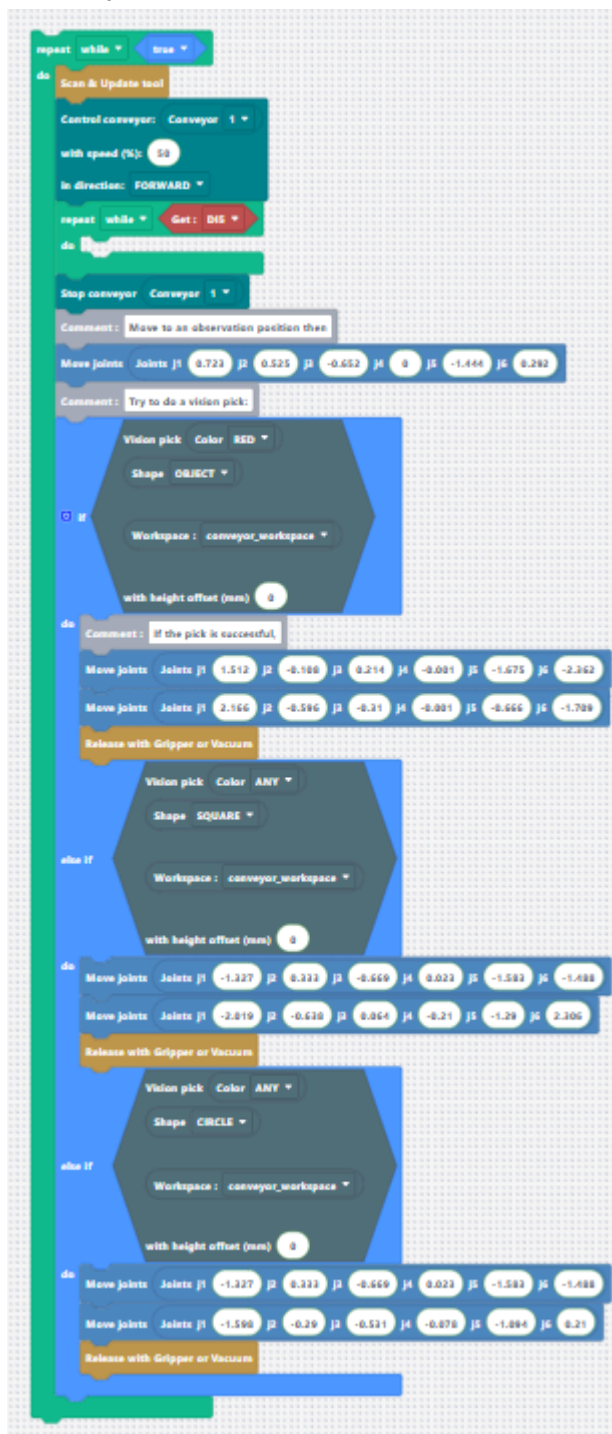
1. Add a **While** loop:
 - Condition: **While DI5 is HIGH** → keep conveyor on at ~50% speed.
2. After loop: add **Stop Conveyor**.
3. Place the **Vision Pick logic** right after the conveyor stop.



Step 12 – Loop the Process

1. Wrap the conveyor + vision pick logic inside a **While True** loop.

- The robot now runs the full inspection continuously until you stop the program manually.



Troubleshooting

- Robot crashes into object** → Check if the correct TCP (Tool Center Point) is activated.

- **Vision errors** (wrong object or no detection) → Adjust filters, brightness, or contrast.
- **Objects too close** → Add spacing on the conveyor.
- **Multiple objects passing sensor** → Add a short delay or switch to vision-based detection.