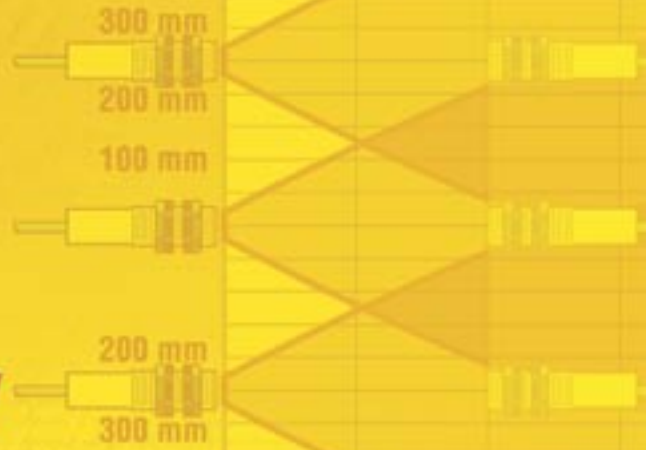# iKnow™
Vision Sensor Software Training

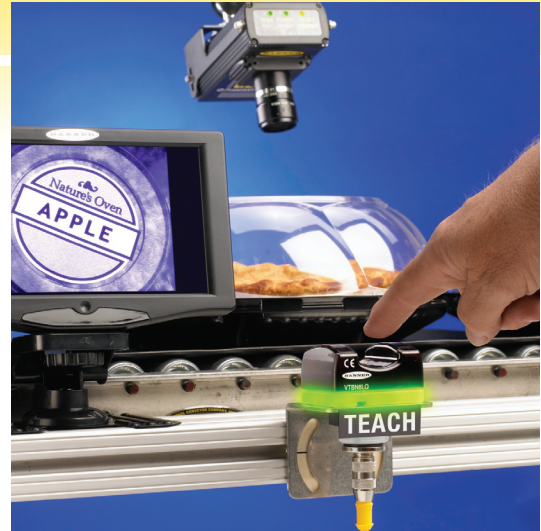**Maximizing P4 GEO Inspection Speed and Performance**

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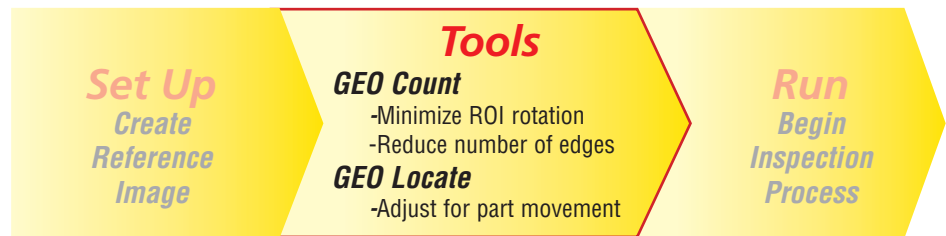## Maximizing P4 GEO Inspection Speed

Purpose:

Users can optimize the inspection speed of the P4 GEO to achieve the required throughput of accurate inspections as defined by their specific application. The following steps explain configurations that increase inspection speeds.

Overview: (Inspection Process using P4 Software)

Before You Start:

- Install Software
- Confirm PC & Sensor are communicating
- Fixture Sensor & Target
- Setup a P4 GEO basic inspection*

Set Up
Create Reference Image

Tools

GEO Count
- Minimize ROI rotation
- Reduce number of edges

GEO Locate
- Adjust for part movement

Run
Begin Inspection Process

APPLICATION EXAMPLE

Example of Geometric Count Tool using the entire Field of View (FOV) to find the part number
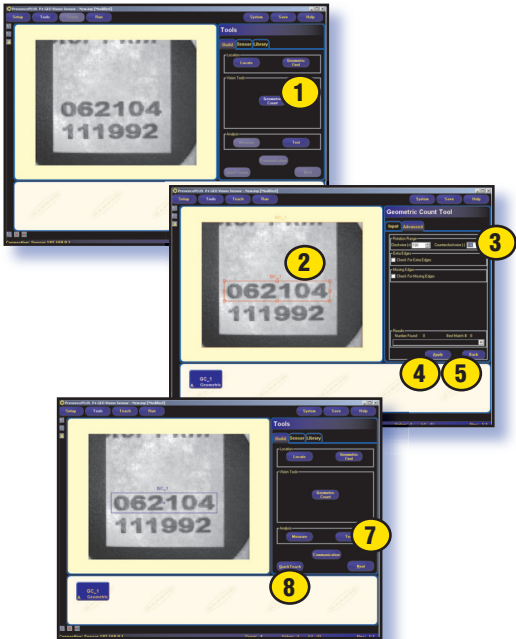

A **Search ROI** defines the search area for the **Geometric Count** pattern.

B The **Pattern ROI** identifies the **Geometric Count** pattern that will be used for the inspection. It is located within the **Search ROI.**

C Allowable rotation range selections are located on the **Advanced** tab within the **GEO Count Tool**.

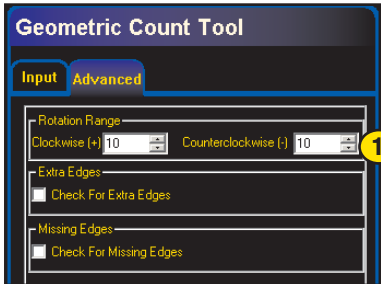*See "Setting Up a P4 GEO Basic Inspection Setup Guide" P/N 120211.*

More information online at **bannerengineering.com/iknow**

TOOLS >> GEO COUNT

Set up the GEO Count Tool to search for a part number before optimizing tool sensitivity

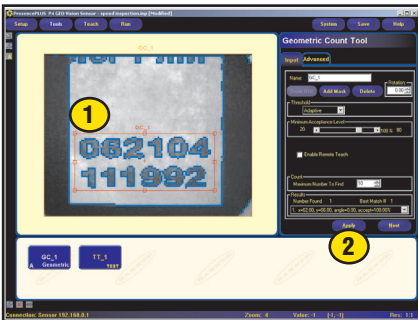| SCREEN	USER ACTION	NOTES
	In the **Tools** Screen: **1** Click **GEO Count** **2** Click **Draw ROI** and draw ROI (pattern) around the top part number. **3** In **Advanced** tab, change **Rotation** to ±180˚ **4** Click **Apply** **5** Click **Back** **6** Click **Next** (not shown) **7** Add **Test Tool*** **8** Click **Quick Teach** **9** **Save** Inspection (not shown) **10** Click **Start** to Run (not shown)	• The Search ROI defaults to the entire FOV when a GEO Count ROI is first added. **Speed: ≈3 seconds or 20 parts/minute†**

TOOLS >> GEO COUNT

Increase inspection speed by minimizing allowable ROI rotation

SCREEN	USER ACTION	NOTES
	To further increase speed, return to **Tools** screen: **1** Reduce **Rotation** to ±10˚ **2** Click **Apply** (not shown) **3** Return to **Run†** (not shown) **4** Click **Start** (not shown)	**Speed: ≈300ms or 200 parts/minute†**

TOOLS >> GEO COUNT

Increase inspection speed by reducing the number of edges in the Search ROI

SCREEN	USER ACTION	NOTES
	To further increase speed, return to **Tools** screen: **1** Draw **Pattern ROI** to increase size around all numerals **2** Click **Apply** **3** Return to **Run†** (not shown) **4** Click **Start** (not shown)	**Speed: ≈60ms or 1000 parts/minute†** †After each setup change, complete a sample run sequence to determine the inspection speed, which will vary based on the actual application.

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TOOLS >> GEO COUNT

Increase inspection speed by decreasing the Search ROI

SCREEN	USER ACTION	NOTES
	To further increase speed, return to **Tools** screen: **1** Reduce **Search ROI** size to include only the **Pattern ROI** **2** Click **Apply** **3** Return to **Run†** (not shown) **4** Click **Start** (not shown)	• The Search ROI defaults to the entire FOV. • Right-click the mouse in the FOV outside the Pattern ROI to make the outer box of the Search ROI appear. **Speed: ≈45ms or 1,333 parts/minute†**

TOOLS >> GEO COUNT

Decrease the GEO Count Tool ROI

SCREEN	USER ACTION	NOTES
	To further increase speed, return to **Tools** screen: **1** Reduce **Pattern ROI** to include only number "4" **2** Reduce **Search ROI** to include only number "4" **3** Click **Apply** **4** Return to **Run†** (not shown) **5** Click **Start** (not shown)	• The Search ROI is always as large or larger than the Pattern ROI. **Speed: ≈6ms or 10,000 parts/minute†**

TOOLS >> GEO LOCATE

Add Locate Tools to adjust for part movement

SCREEN	USER ACTION	NOTES
	To increase flexibility, return to **Tools** screen: **1** Add one **Locate Tool** to find the left edge of the image **2** Add second **Locate Tool** to find the bottom edge of the image **3** Click and drag **Locate Tools** to beginning of inspection sequence **4** Return to **Run†** (not shown) **5** Click **Start** (not shown)	• Adding Locate Tools allows the label to move within the FOV. • Locate Tools will make inspection more tolerant to part movement without compromising throughput. **Speed: ≈6ms or 10,000 parts/minute†**

†After each setup change, complete a sample run sequence to determine the inspection speed, which will vary based on the actual application.