COGNEX

FUNCTIONAL SPECIFICATION AND DESIGN SPECIFICATION (FSDS) FOR COGNEX® IN-SIGHT® TRACK AND TRACE 2.0

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7.2.6   Location Tools

Location Tool is an optional tool that can help to locate the ID codes and OCR lines in the image and check that the label itself is positioned correctly. By default, all controls in the location tools are disabled. The following options are available in the Location Tool screen:

- Pattern Fixture
- Model (X/Y button) training region
- Search Region (X/Y button)
- Minimum Score
- Label Position
- Vertical Offset and Horizontal Offset
- Angle
- Label Edges
- Vertical Edge and Horizontal Edge (X/Y buttons)
- Fixture
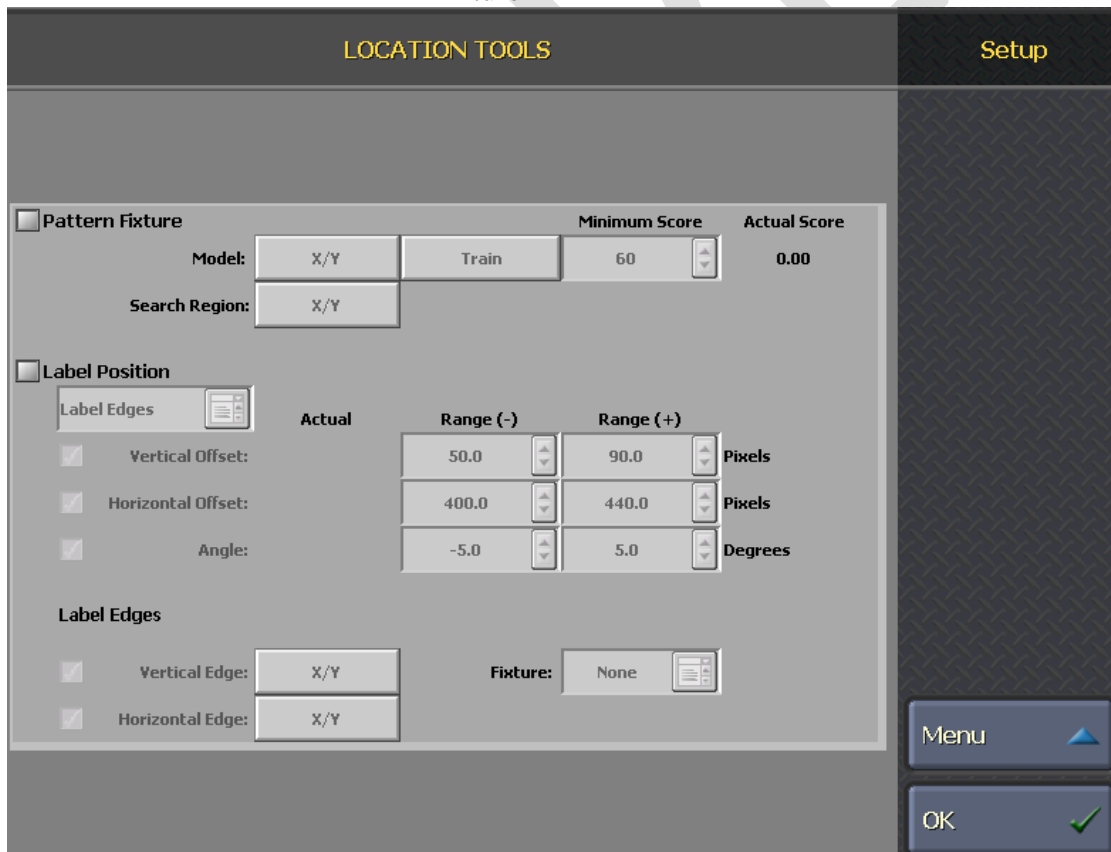
Figure 1: Location Tools Screen

7.2.6.1 Pattern Fixture

The Pattern Fixture tool allows user to train a model of a feature that is present on every label. The position of this pattern can then be used as a fixture from which to locate the tools used to read the ID codes and text printed on the label. Check the Pattern Fixture checkbox to enable the pattern finding tool and train a model that can be used as a fixture.

7.2.6.1.1 Model

Click the X/Y button for the Model to select the area of the image containing the feature that will be trained as a model, then click the Train button to teach the model.

7.2.6.1.2 Search Region

Click the X/Y button for the Search Region to select the area of the image in which to search for a pattern that matches the trained model. During operation, the pattern must be present within the search region to be found. If Pattern is selected as the Fixture for the ID codes or OCR lines and the model cannot be found, the inspection will fail.

7.2.6.1.3 Minimum Score

This indicates the minimum acceptable score for the pattern in the image. If the Actual Score is lower than the specified Minimum, the inspection will fail (default = 60).

7.2.6.2 Label Position

The Label Position tool allows user to inspect whether a label has been correctly applied to a package. The Label Position tool can determine the location of the label by locating label edges, locating an ID code or locating a pattern, User then defines the range of tolerances for the label position or skew. If the label is located outside of the specified area and/or at greater than the specified angle, the inspection will fail even if the label can be located.

- Label Edges (default): The label position will be determined relative to the edges of the image. Configure the label edges using the Vertical and Horizontal Edges controls.
- ID Code 1: The label position will be determined relative to the position of ID code 1 in the image.
- Pattern: The label position will be determined relative to the position of the pattern in the image.

7.2.6.2.1 Vertical Offset and Horizontal Offset

Vertical Offset and Horizontal Offset allows user to adjust the Range (-) and Range (+) values, which defines minimum and maximum allowable distance (in pixels) from the reference point.

7.2.6.2.2 Angle

When the vertical or horizontal edge of the selected Label Position is found, the angle of the label (in degrees, below Actual) will be displayed. Specify the angle tolerance by adjusting the Range (-) and Range (+) values, which defines minimum and maximum allowable rotation (in degrees) of the label in the image. If the checkbox is enabled and an angle is outside of the specified tolerance, the inspection will fail. (Angle: -180 to 180, Range (-) default = -5.0, Range (+) default = 5.0).

7.2.6.3 Label Edges

The Label Edges controls checkbox is enabled only when Label Edges is the selected Label Position tool. It controls vertical and horizontal edge and fixture.

7.2.6.3.1 Vertical Edge and Horizontal Edge

Vertical Edge and Horizontal Edge button allows the X/Y buttons to position and size the regions in which to search for the vertical and horizontal edges of the label. If one or both edge checkboxes are enabled and an edge cannot be found, the inspection will fail. If the Vertical Edge checkbox is disabled, the Horizontal Offset control is grayed out. If the Horizontal Edge checkbox is disabled, the Vertical Offset control is grayed out. If both the Vertical Edge and Horizontal Edge checkboxes are disabled, the Label Position inspection will always pass.

7.2.6.3.2 Fixture

The Fixture tool allows user to inspect the label position relative to a nearby, visible feature on the package, regardless of where the package is in the image. If the fixture cannot be located, the inspection will fail.

- None (default): No Fixture will be used. The label position will be located by its Vertical and/or Horizontal Edge locations in the image.
- Pattern: The label position will be located by its Vertical and/or Horizontal Edge locations relative to the trained Pattern in the image.
- ID Code 1: The label position will be located by its Vertical and/or Horizontal Edge locations relative to the position of the ID code in the image.

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INSTALLATION AND OPERATIONAL QUALIFICATION PROTOCOL (IOQ) FOR COGNEX® IN-SIGHT® TRACK AND TRACE 2.0

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6.3	**VERIFICATION OF THE LOCATION TOOL**

TEST TITLE OR DESCRIPTION:	Verification of the Location Tools

TEST OBJECTIVE:

This test is to verify the Location Tools configuration setting of the In-Sight Track and Trace job file.

ACCEPTANCE CRITERIA:

All user interface screen objects on In-Sight Track & Trace v2.0 must be in accordance with the Functional Specifications.

User is allowed to configure the Location Tools settings of the In-Sight Track and Trace job file.

TEST METHOD:

Verify that the system functions as specified in the Functional Specification

TEST RESULTS:

Comments:	
Date of Test:	
Signature of Tester:	
Date of Review:	
Signature of Reviewer:	

6.3.1	VERIFICATION OF THE LOCATION TOOL				
Train .No	**Procedure Details**	**Expected Result**	**As Expected, YES / NO? If No, Explain**	**Incident Number**	**Initials / Date**
6.3.1.1	From the Main Screen Navigate to> Setup>Location Tools and verify that the following labels and controls are available: • Pattern Fixture • Model • Search Region • Minimum Score • Label Position • Vertical Offset and Horizontal Offset • Angle • Range (-) • Range (+) • Vertical Edge and Horizontal Edge • Label Edges • Fixture	The following options are displayed: • Pattern Fixture • Model • Search Region • Minimum Score • Label Position • Vertical Offset and Horizontal Offset • Angle • Range (+) • Range (-) • Vertical Edge and Horizontal Edge • Label Edges • Fixture			
6.3.1.2	Check the Pattern Fixture checkbox and verify that the following tools are enabled: • Model: X/Y • Search Region: X/Y • Train • Minimum Score	The following options are displayed: • Model: X/Y • Search Region: X/Y • Train • Minimum Score			
6.3.1.3	Click the 'Model' X/Y button and select the area of the image. Then click OK. After that Click Train button to train the model.	Model and Train buttons are available to train the selected area of the image.			
6.3.1.4	Select Minimum Score and verify that default is set to 60.	Minimum Score is verified.			
6.3.1.5	Minimum Score can range between 0 and 100.	Minimum Score could be set between 0 and 100.	**Minimum Score** Upper limit: _____ Lower limit: _____		

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6.3.1.6	Minimum Score can only range between 0 and 100.	Minimum Score does not allow user to set values outside the threshold limits of 0 and 100.	**Minimum Score** Outside Upper limit: _____ Outside Lower limit: _____	
6.3.1.7	Check the Label Position checkbox and verify the following tools are available for selection: • Label Edges (Default) • ID Code 1 • Pattern	The following options are displayed: • Label Edges (Default) • ID Code 1 • Pattern		
6.3.1.8	Select Label Edges from Label Position and verify that the following tools are enabled: • Vertical Offset/Horizontal Offset (Checkbox) • Angle (Checkbox) • Range (-) (3 number edit boxes) • Range (+) (3 number edit boxes) • Vertical Edge / Horizontal Edge (Checkbox) • Fixture	The following options are displayed: • Vertical Offset/Horizontal Offset (Checkbox) • Angle (Checkbox) • Range (-) • Range (+) • Vertical Edge / Horizontal Edge (Checkbox) • Fixture		
6.3.1.9	Vertical Offset can range between -2448 and 2048, Horizontal Offset can range between -2048 and 2048 and the angle value can range between -180 and 180.	Vertical Offset allows user to set threshold value from -2448 to 2448 , Horizontal Offset from -2048 to 2048 and Angle ranges from -180 to 180.	**Vertical Offset** Upper limit: _____ Lower limit: _____ **Horizontal Offset** Upper limit: _____ Lower limit: _____ **Angles** Lower angle: _____ Upper angle: _____	

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6.3.1.10	Vertical Offset can only range between -2448 and 2448, Horizontal Offset can only range between -2048 and 2048 and the angle value can range between -180 and 180.	Vertical Offset does not allow user to set values outside of the threshold limits from -2448 to 2448, Horizontal Offset does not allow user to set values outside of the threshold limits from -2048 to 2048 and angle ranges from -180 to 180.	**Vertical Offset** Outside Upper limit: _____ Outside Lower limit: _____ **Horizontal Offset** Outside Upper limit: _____ Outside Lower limit: _____ **Angles** Outside Lower angle: _____ Outside Upper angle: _____		
6.3.1.11	Select ID Code 1 from Label Position tool and verify that the following tools are disabled: • Vertical Offset/Horizontal Offset (Checkbox) • Angle (Checkbox) • Range (-) (3 number edit boxes) • Range (+) (3 number edit boxes) • Vertical Edge/Horizontal Edge (Checkbox) • Fixture	The following options are disabled: • Vertical Offset/Horizontal Offset (Checkbox) • Angle (Checkbox) • Range (-) • Range (+) • Vertical Edge/Horizontal Edge (Checkbox) • Fixture			

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6.3.1.12	Select Pattern from Label Position tool and verify the following tools are enabled: • Vertical Offset/Horizontal Offset (Checkbox) • Angle (Checkbox) • Range (-) (3 number edit boxes) • Range (+) (3 number edit boxes)	The following options are displayed: • Vertical Offset/Horizontal Offset (Checkbox) • Angle (Checkbox) • Range (-) • Range (+)			
6.3.1.13	Select Label Edges from Label Position then select Fixture list control and verify that the following are available for selection: • None (default) • Pattern • ID Code 1	The following options are displayed: • None (default) • Pattern • ID Code 1			

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**TRACEABILITY MATRIX
FOR COGNEX®
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4.2 In-Sight Track & Trace Traceability Matrix

DESCRIPTION	Function Specification Document	Installation Qualification Document	Operational Qualification Document
Location Tools Location Tool is an optional tool that can help to locate the ID codes and OCR lines in the image and check that the label itself is positioned correctly. By default, all controls in the location tools are disabled. The following options are available in the Location Tool screen: • Pattern Fixture • Model • Search Region • Minimum Score • Label Position • Vertical Offset and Horizontal Offset • Angle • Vertical Edge and horizontal Edge • Label Edge	7.2.6	N/A	6.3
Pattern Fixture The Pattern Fixture tool allows user to train a model of a feature that is present on every label. The position of this pattern can then be used as a fixture from which to locate the ID codes and text printed on the label. Check the Pattern Fixture checkbox to train a model that can be used as a fixture.	7.2.6.1	N/A	6.3
Model Click the X/Y button for the Model to select the area of the image containing the feature that will be trained as a model, then click the Train button to teach the model.	7.2.6.1.1	N/A	6.3
Search Region Click the X/Y button for the Search Region to select the area of the image in which to search for a pattern that matches the trained model. During operation, the pattern must be present within the search region to be found. If Pattern is selected as the Fixture for the ID codes or OCR lines and the model cannot be found, the inspection will fail.	7.2.6.1.2	N/A	6.3
Minimum Score This indicates the minimum acceptable score for the pattern in the image. If the Actual Score is lower than the specified Minimum, the inspection will fail (default = 60).	7.2.6.1.3	N/A	6.3
Label Position The Label Position tool allows user to inspect whether a label has been correctly applied to a package. The Label Position tool can determine the location of the label by locating label edges, locating an ID code or locating a pattern, User then defines the range of tolerances for the label position or skew. If the label is located outside of the specified area and/or at greater than the specified angle, the inspection will fail even if the label can be located. • Label Edges (default): The label position will be determined relative to	7.2.6.2	N/A	6.3

DESCRIPTION	Function Specification Document	Installation Qualification Document	Operational Qualification Document
the edges of the image. Configure the label edges using the Vertical and Horizontal Edges controls. • ID Code 1: The label position will be determined relative to the position of ID code 1 in the image. • Pattern: The label position will be determined relative to the position of the pattern in the image.			
Vertical Offset and Horizontal Offset Vertical Offset and Horizontal Offset allows user to adjust the Range (-) and Range (+) values, which defines minimum and maximum allowable distance (in pixels) from the reference point.	7.2.6.2.1	N/A	6.3
Angle When the vertical or horizontal edge of the selected Label Position is found, the angle of the label (in degrees, below Actual) will be displayed. Specify the angle tolerance by adjusting the Range (-) and Range (+) values, which defines minimum and maximum allowable rotation (in degrees) of the label in the image. If the checkbox is enabled and an angle is outside of the specified tolerance, the inspection will fail. (Angle: -180 to 180, Range (-) default = -5.0, Range (+) default = 5.0).	7.2.6.2.2	N/A	6.3
Label Edges The Label Edges control checkboxes allows the user to enable only when Label Edges is the selected Label Position tool. It controls vertical and horizontal edge and fixture.	7.2.6.3	N/A	6.3
Vertical Edge and Horizontal Edge Vertical Edge and Horizontal Edge button allows the X/Y buttons to position and size the regions in which to search for the vertical and horizontal edges of the label. If one or both edge checkboxes are enabled and an edge cannot be found, the inspection will fail. If the Vertical Edge checkbox is disabled, the Horizontal Offset control is grayed out. If the Horizontal Edge checkbox is disabled, the Vertical Offset control is grayed out. If both the Vertical Edge and Horizontal Edge checkboxes are disabled, the Label Position inspection will always pass.	7.2.6.3.1	N/A	6.3
Fixture The Fixture tool allows user to inspect the label position relative to a nearby, visible feature on the package, regardless of where the package is in the image. If the fixture cannot be located, the inspection will fail. • None (default): No Fixture will be used. The label position will be located by its Vertical and/or Horizontal Edge locations in the image. • Pattern: The label position will be located by its Vertical and/or Horizontal Edge locations relative to the trained Pattern in the image. • ID Code 1: The label position will be located by its Vertical and/or Horizontal Edge locations relative to the position of the ID code in the image.	7.2.6.3.2	N/A	6.3