PRESSCO TECHNOLOGY INC.

Empty Bottle Inspection (BNS) Series V

Empty Bottle Inspection (BNS) Series V | 5.7

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Module 1 Pressco Introduction

Welcome!

Congratulations on your purchase of an Intellispec system! The Intellispec is a high-speed machine vision system designed specifically for product and online process monitoring. It is a powerful tool that provides inspection much more reliably than the human eye or sampling methods. The latest PC technology, powerful inspection algorithms, online adjustment capability, and inspection data storage allow the Intellispec to automatically inspect parts with extreme accuracy on high-speed lines.

The Intellispec will help you provide the highest quality of products shipped to your customers.

Inspection Terminology

Analysis - Analyzes the pixel shade information within a region and compares it to reference values. The inspection passes or fails based on these comparisons. There are also several analyses that make measurements. You may have many analyses for each inspection region.

Dimension - The dimension inspection type connects the results of two other inspections to do the analysis. For example, a distance inspection can connect two registrations to measure the distance between centers of two features.

Enhancements - Enhancements are used to alter images for better defect detection, or for making certain features stand out.

Inspection Module - The housing, camera, cables, and associated electronics that are installed on or over the production line to acquire an image of your product. Sometimes referred to as a tunnel. The inspection module can have a different sensor than a camera to make measurements of your product (example: Intellimass sensor).

Lane - A lane usually refers to one production line, and can contain multiple sensors.

Orientation - An orientation compensates for part rotation by finding a grayscale pattern. An analysis which must rotate with the part must follow an orientation.

Part Program - The list of regions, analyses, registrations, etc. programmed specifically for your part to detect defects or make measurements.

Part Tracking - refers to the monitoring of parts from the part detect sensor to reject station. This ensures that the correct parts are rejected at the correct time, and that good parts remain in the part stream.

Region - The Region indicates where on the part the analyses will take place. You may have as many inspections as you like in one region.

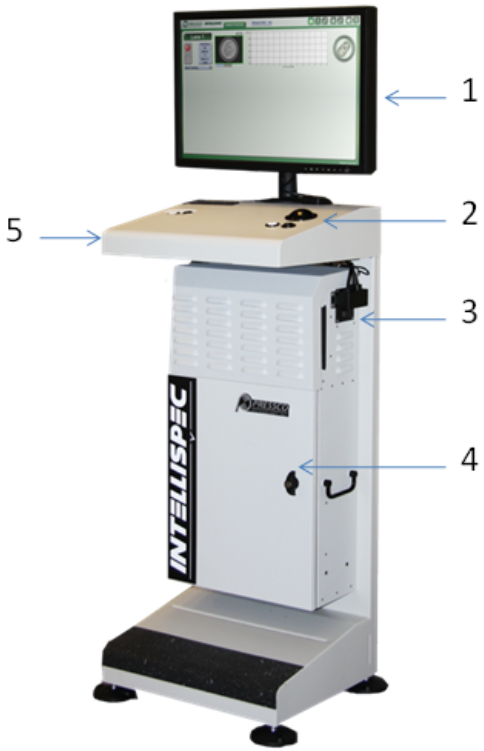
Registration - A registration compensates for part movement by finding the reference point on the part. All analyses follow a registration.

Reject - A part that failed one or more inspections from any sensor. The part can be physically rejected, or simply counted in the statistics.

Retro-Spec - The graphical interface that allows you to make quick changes to a part program. It also allows you to experiment with different parameter settings to see how changes affect the most recent inspection population, without rejecting parts.

Sensor - A camera, Intellimass, or other sensor that acquires images, measurements, or other data from your product.

Intellispec Cabinet and User Interface



1) 24" Diagonal color LCD with optional touch screen. An on-screen keyboard (OSK) is displayed when needed.

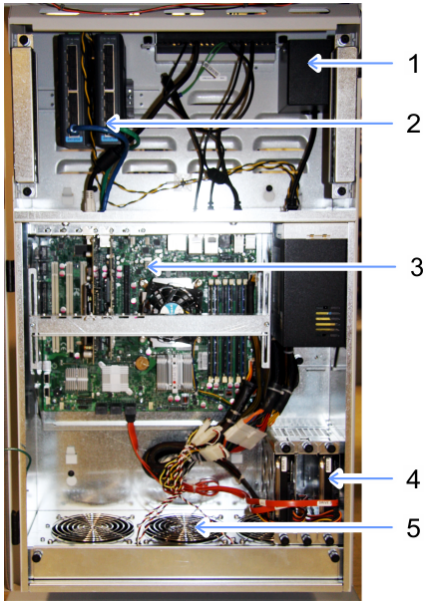
2) Use the left button to select and activate objects on the screen. Use the right button to call up a context-sensitive menu related to the area or object clicked.A second set of each button type is located on the left side of the podium for two-handed operation.

3) Vision processor on/off switch.

4) Inside the cabinet: Ethernet switches, Vision processor, Mechanical keyboard (MKB)

5) USB convenience port is mounted on the side of the user interface.

Computer Internal Components



1 - Main power switch

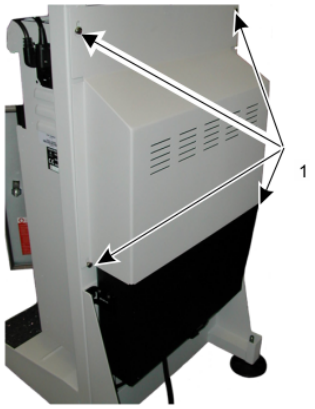
2 - Ethernet switches (up to four switches)

3 - CPU/ Motherboard

4 - Two hard drives

5 - Cooling fans

UPS Information



To access the UPS:

Loosen 4 thumb screws [item 1] and lift up to remove UPS cover located on the back of the User Interface Cabinet.

UPS LED description

LINE - Green LED lights continuously to indicate the utility-supplied AC line voltage at the wall outlet is OK.

BYPASS - Yellow LED lights continuously when the UPS system is in economy mode. The LED flashes when the UPS system is bypass mode, indicating that the UPS system's DC/AC inverter is deactivated.

FAULT - Red LED flashes when the UPS detects an internal fault.

ON LINE - Green LED lights continuously to indicate the UPS system is operating normally in on-line mode.

LOAD - Green LED lights when the UPS system is receiving AC power. It also indicates that the % level LEDs (25%, 50%, 75%, 100%) are displaying the UPS load level.

OVERLOAD - Red LED lights continuously to indicate that the UPS system's capacity has been exceeded. The UPS alarm beeps continuously.

% Level - These dual-function LEDs indicate the % level for either the load level (if the "LOAD" LED is lit) or the battery charge level (if the "BATT" LED is lit).

BATT - Green LED lights when the UPS system is operating from battery power.

ON BATT - Green LED lights continuously to indicate that AC line voltage is absent. The UPS system also beeps every 2 seconds, unless you press the ON/TEST button to silence it.

BATT LOW - Yellow LED lights when the UPS system's battery charge level is low. The UPS alarm beeps until the batteries are either depleted or adequately recharged.

REPLACE BATT - Red LED lights continuously and the UPS alarm beeps every 2 seconds if the UPS system fails the automatic self-test.

4-Light Tree

The lights on the optional light tree will turn on, off, or blink depending on status of certain hardware. Each lane has its own light tree.

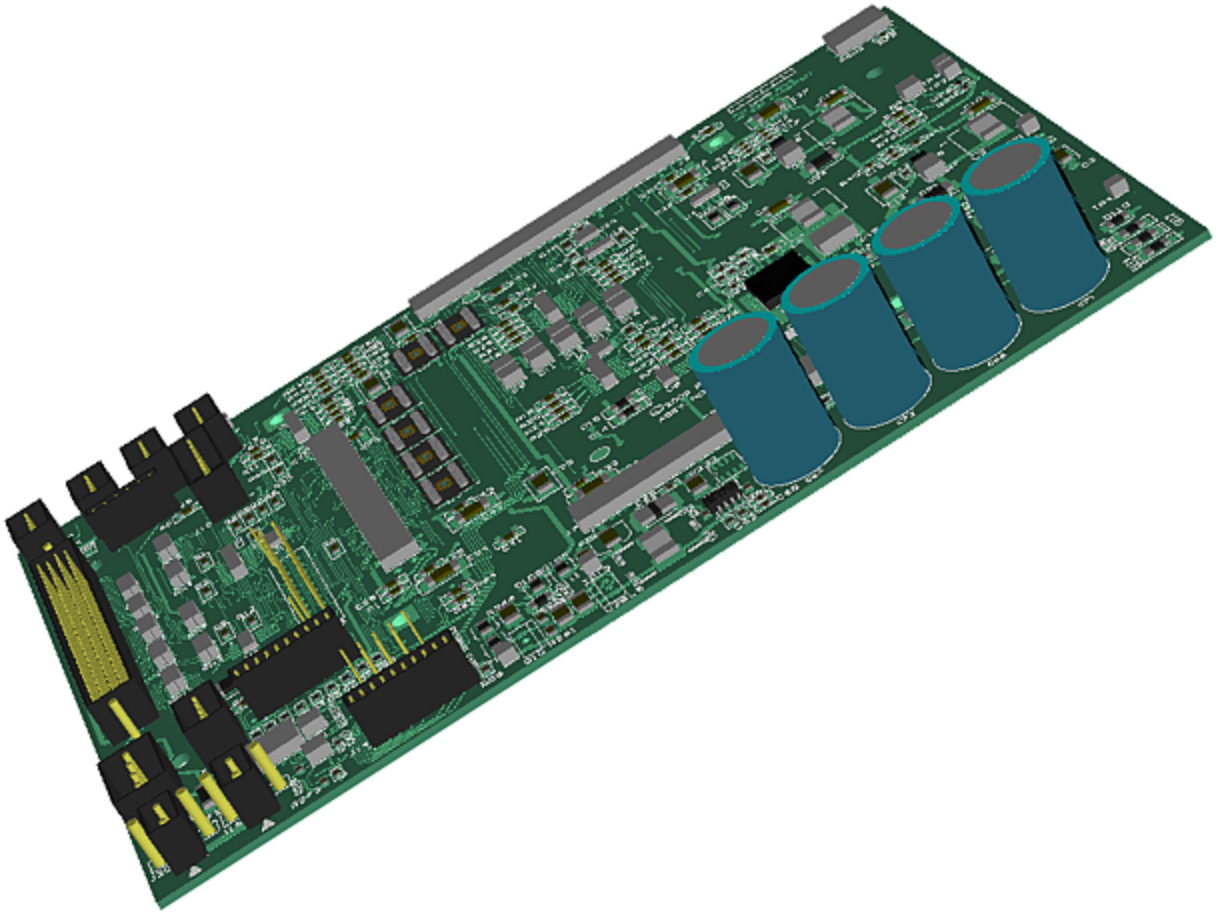
Note: the light tree on your system may look different than the picture shown

4-Light Tree	Light color	Condition	What it means
	Red	On - steady	Alarm condition
	Red	On - blinking	Part tracker board lost communication with the host PC or has an error and needs to initiate an alarm
	Red	Off	No alarm (OK)
	Amber	On	Warning alarm condition
	Amber	Off	No warning (OK)
	Amber	0.5 second flash	System automatically resets Asynchronous Correlation FIFO (not used in all systems)
	Green	On	Lane is online
	Green	Off	Lane is offline
	Blue	On	Part tracker board has power (OK)
	Blue	Off	Part tracker board has no power

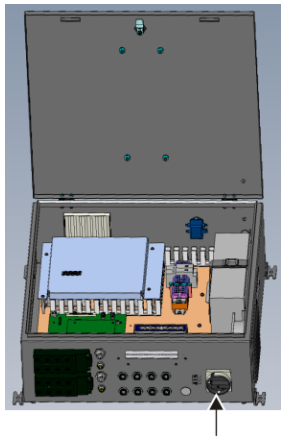
Part Tracker Board

The part tracker board monitors parts throughout the inspection process. There are two types of part tracker boards for Pressco Series 5 systems: 2-channel and 8-channel.

A 2-channel board is shown below.

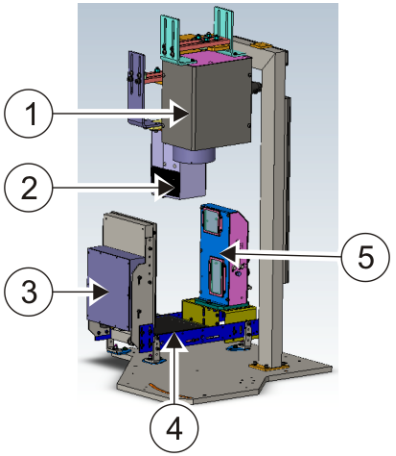


Typical Modules, Cluster Box, and Light Tree



Cluster Box

On/ Off switch indicated by arrow



1- Seal camera

2 - Base camera

3 - Neck Light Array

4 - Base Light Array

5 - Neck Camera

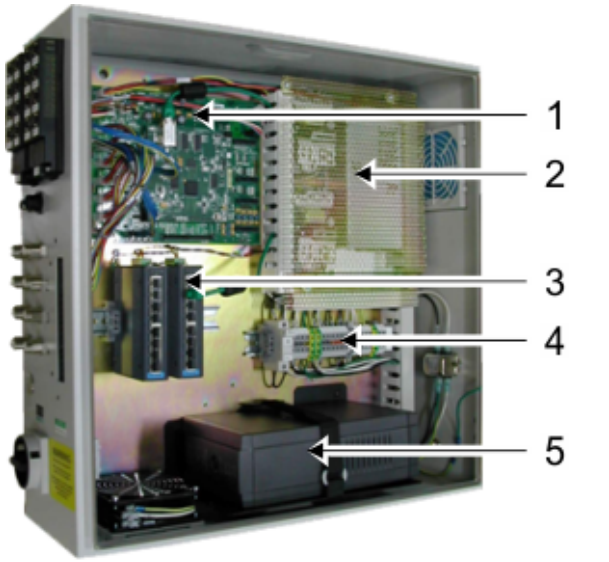
Light Tree (optional)

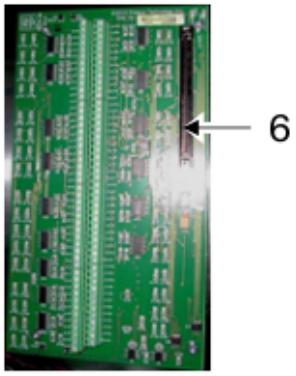
- Red (Alarm)
- Amber (Warning)
- Green (Online)
- Blue (Power)

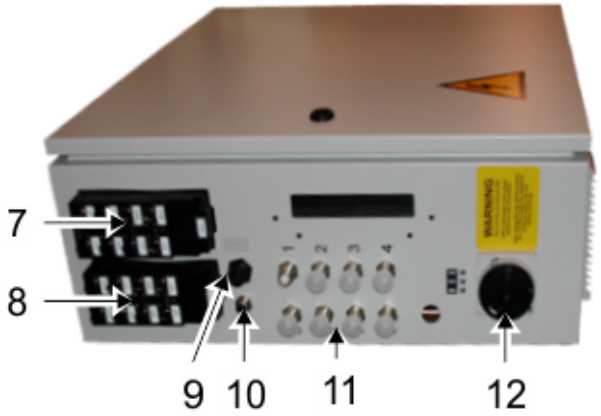
Clusterbox Information

Series 5 Standard Eight Sensor Cluster Box

1 - Part tracker board
2 - DC distribution
3 - Ethernet switches
4 - AC distribution
5 - UPS battery backup
6 - Optional Extended I/O board
7 - Rejecter(s) connections
8 - Correlation sensors connections
9 - Alarm light tree connection
10 - Encoder connection
11 - Gray camera power and trigger control cables
12 - Control box power switch







Inspection Modules

Blowmolder Overview - locations of cameras

1 - Exit Starwheel

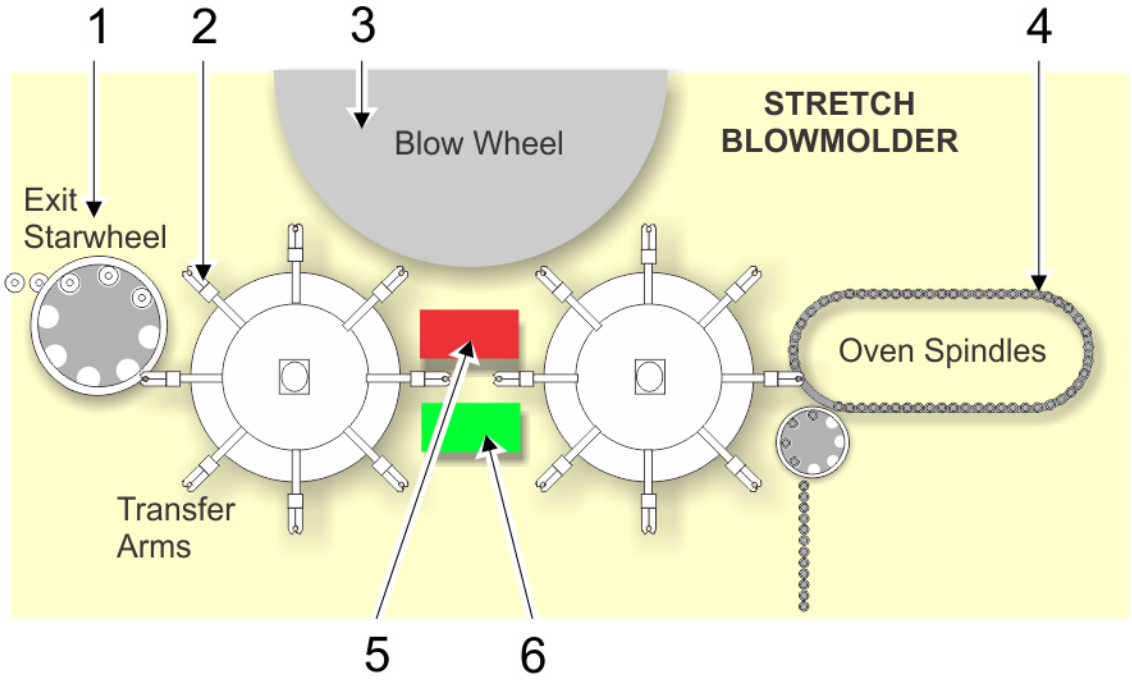
2 - Transfer Arms

3 - Blow Wheel

4 - Oven Spindles

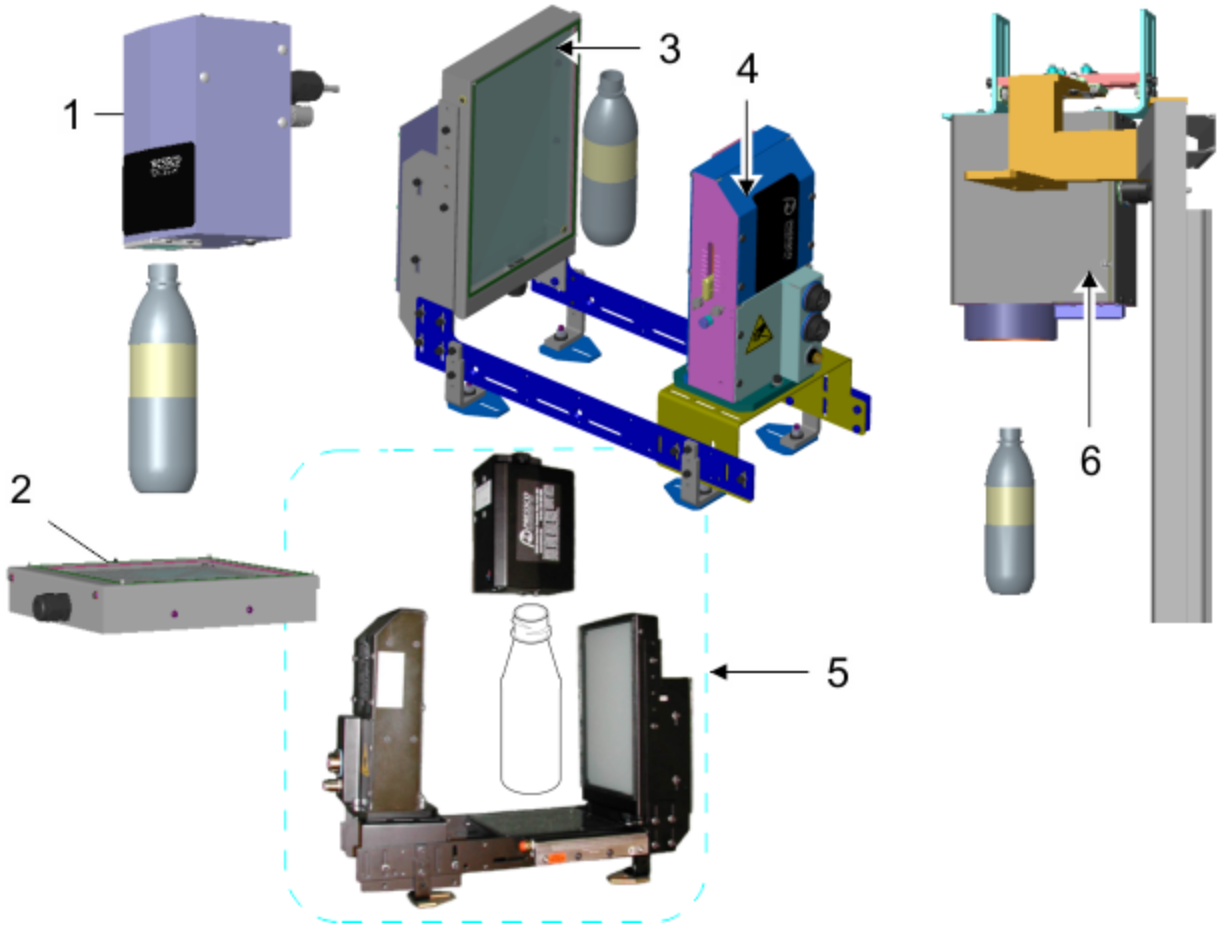
5 - Seal Surface Inspection Module

6 - Base and Neck Inspection Modules



Series 5 BNS Camera Modules

1 - Base camera
2 - Base light array
3 - Neck light array
4 - Neck camera
5 - Base and Neck cameras mounted together
6 - Seal camera - Light arrays (2) are inside



Series 5 BNS Modules Installed in Blow Molder

(installed using Pressco's mounting hardware; designed to allow ease of installation, service, and maximum adjustability)

1 - Cavities [MP1]

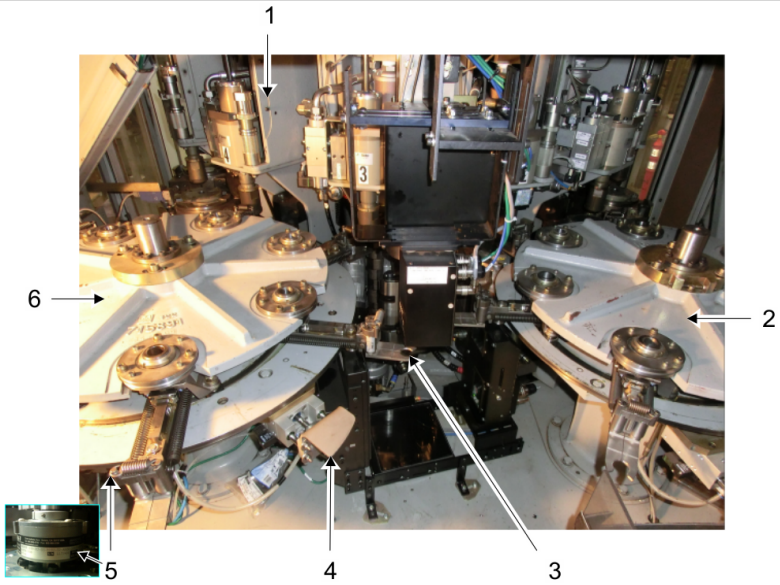
2 - Preform infeed wheel [MP3]

3 - Gripper finger(s)

4 - Rejector assembly

5 - PDX/ Encoder installed at the bottom of the transfer wheel on Sidel blowmolders

6 - Outfeed transfer wheel [MP4]

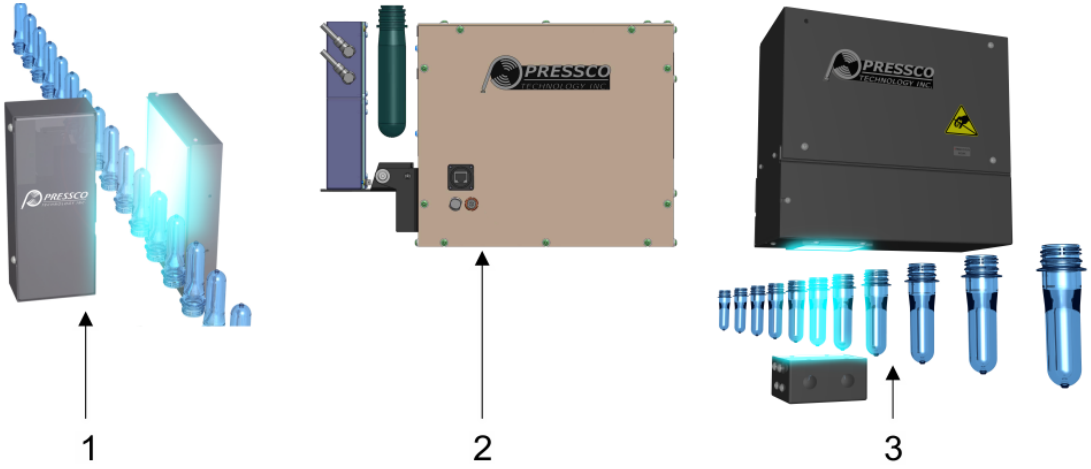


Series 5 Preform Camera Modules - PWC, PW360, PSE

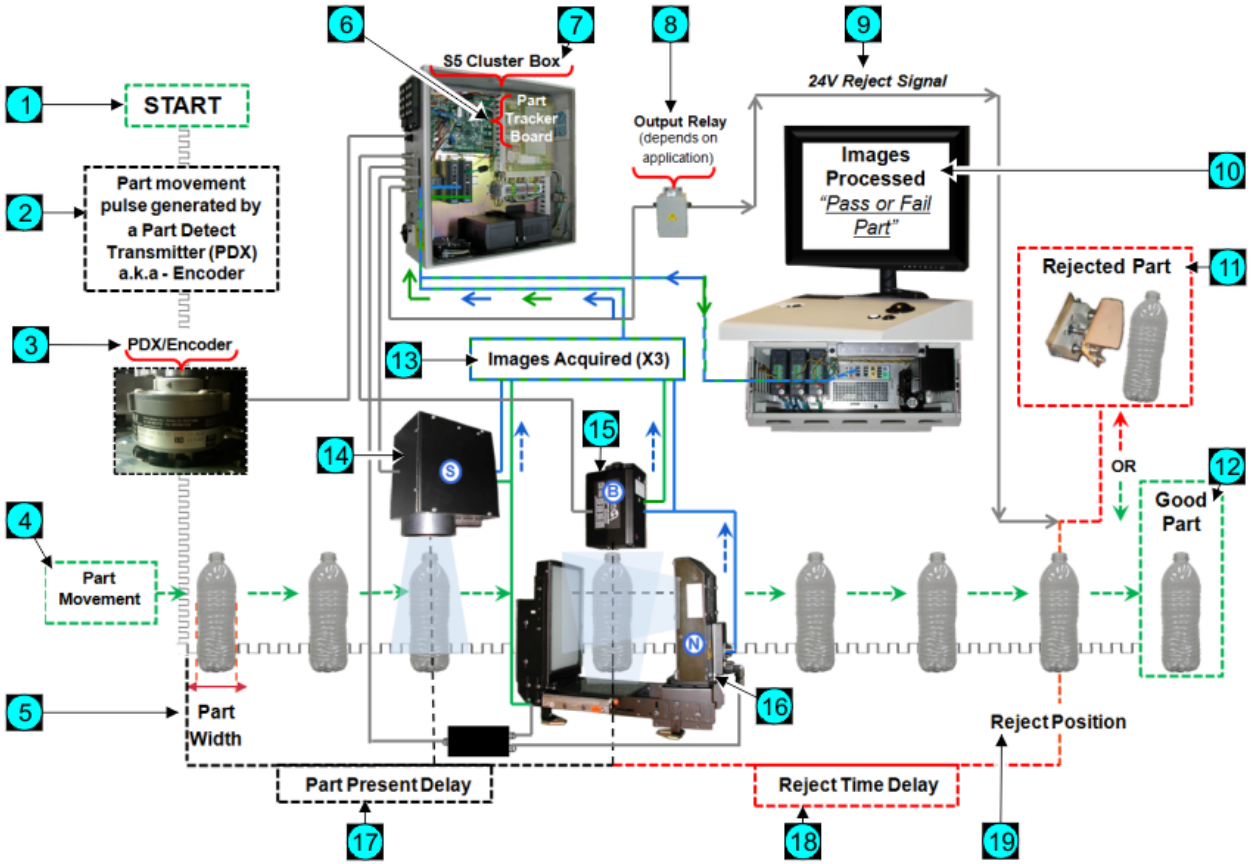
1 - PWC (preform sidewall color) module and light array

2 - PW360 (preform sidewall 360) module and light array

3 - PSE (preform seal endcap) module and light array



Sequence of Events (PET)



1 - Start

2 - Part movement pulse generated by a Part Detect Transmitter (PDX) - or encoder

3 - PDX/ Encoder

4 - Part movement

5 - Part Width

6 - Part Tracker board

7 - Cluster Box

8 - Output Relay - depends on application

9 - 24V reject signal

10 - Images processed - pass or fail part

11 - Rejected part

12 - Good part

13 - Images acquired (three images)

14 - Seal surface inspection module

15 - Base inspection module

16 - Neck inspection module

17 - Part present delay

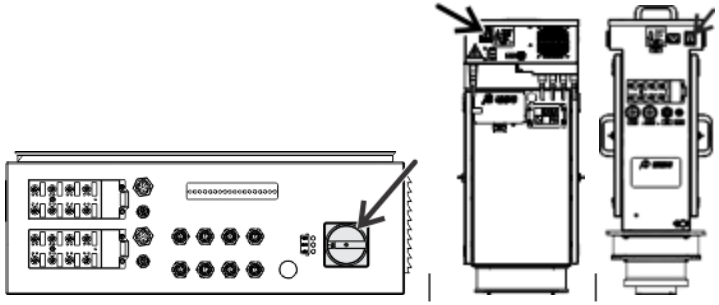
18 - Reject time delay

19 - Reject position

How to start up the Intellispec system

Note: you may need Operator user permission to put the Intellispec system online.

1. Turn the power switches for all Cluster Boxes (if applicable) and Modules to the ON position, in any order. All cluster boxes and modules must be powered on before proceeding.



2. Turn on the UPS (uninterruptible power supply):

   Remove the cover from the back of the Intellispec pedestal by turning the thumb screws [item 1].

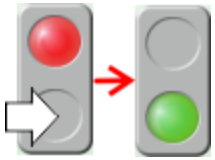
   Press and hold the ON TEST button (of the UPS) until you hear a beep. Release the button as soon as you hear the beep.

3. Replace the cover on the back of the Intellispec pedestal.
4. Wait for the Intellispec software to start. This takes about 3 to 5 minutes.

   Note: Steps 5-7 only need to be completed if your system does not automatically go online after startup.

5. Log in to the Intellispec software.

6. Put the system online.



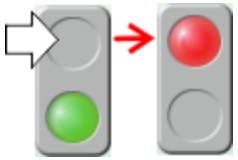
7. Log out of the system.

How to shut down the Intellispec system

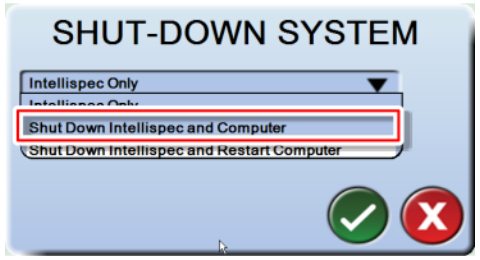
NOTE: You must have Mechanic-level user permission or higher

1. Log in.

2. Take the system offline. (Repeat for all lanes if necessary)

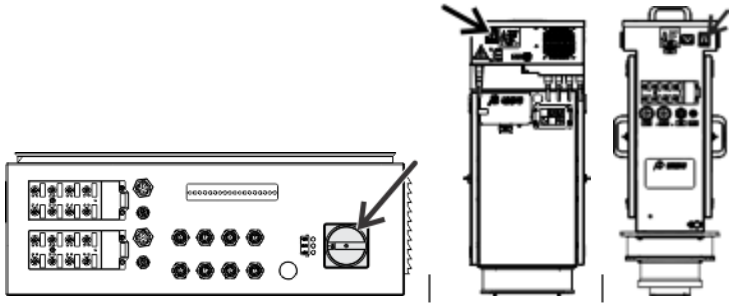


3.  Exit the software: Home | Tools | Shut Down Intellispec and Computer.



4. After the computer shuts down, turn off the UPS (uninterruptible power supply):
5. Remove the cover from the back of the Intellispec pedestal by turning the thumb screws [item 1].

6. Press and hold the OFF button (of the UPS) for 4 seconds. You will hear a beep. Release the button as soon as you hear the beep.
7. Turn off power switches for all Cluster Boxes (if applicable) and Modules, in any order.

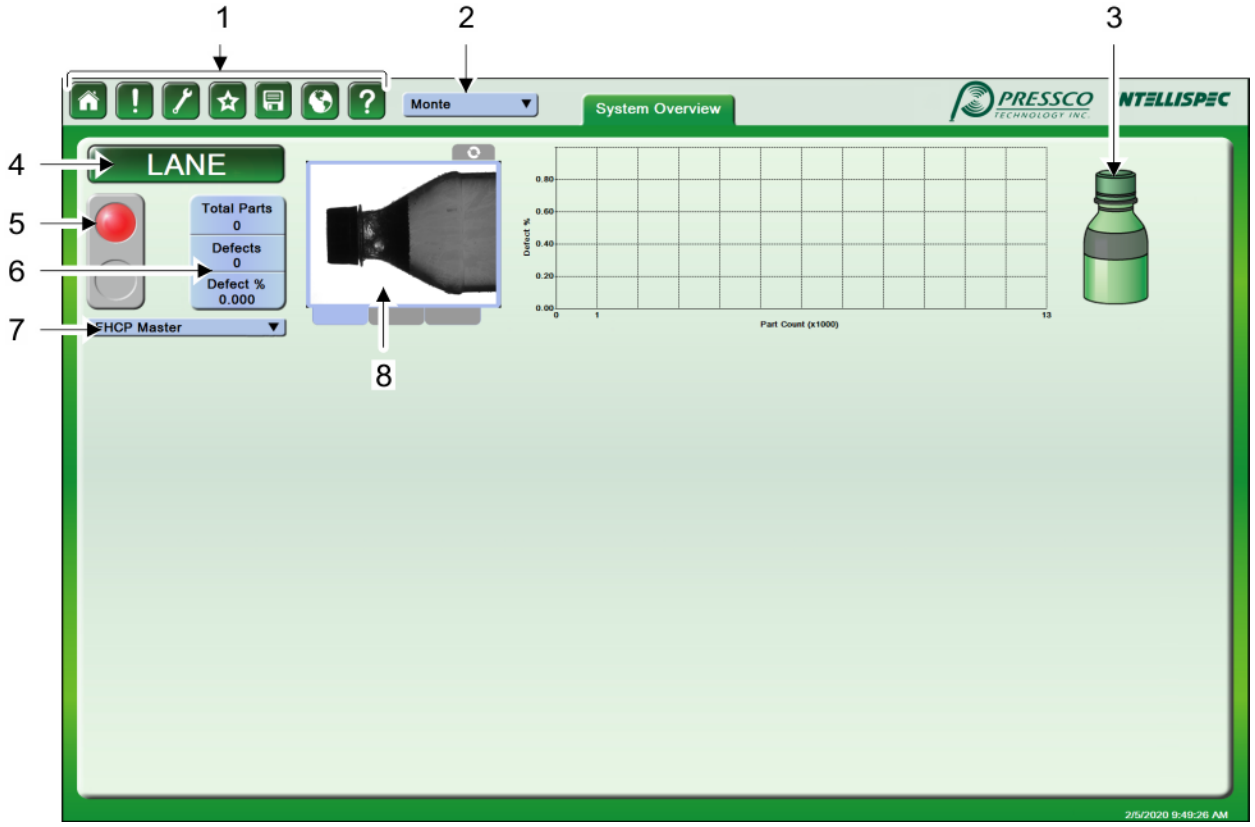


4 Software Screens

This section describes the four main types of screens in the Intellispec software.

System Overview screen

Access the System Overview screen by selecting the Home icon.

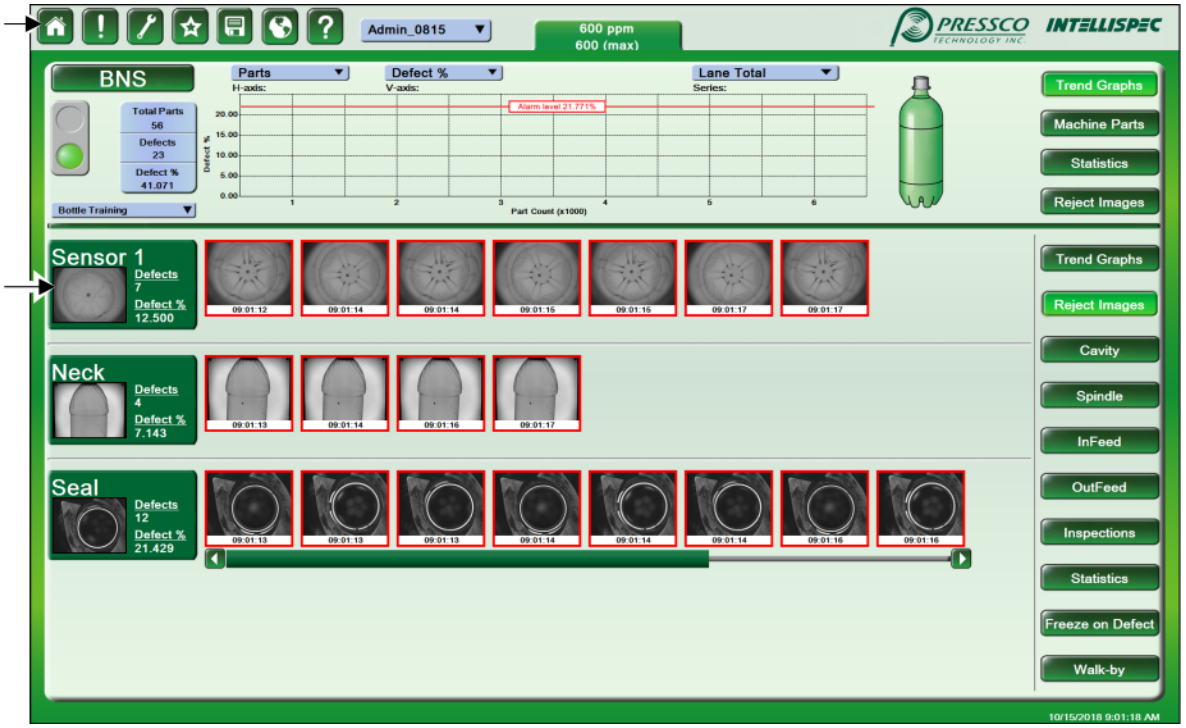


1) "Menu Toolbar" on page 31
2) Log in/ Log out.
3) Walk-by graphic
4) Go to Lane Overview
5) Online/ Offline
6) Lane Statistics
7) Part Program
8) Heartbeat Image

Note: your system may have multiple lanes. This example shows one lane.

Lane Overview Screen

Lane *n* Access a Lane Overview screen by selecting a Lane button. Your system may have multiple lanes.

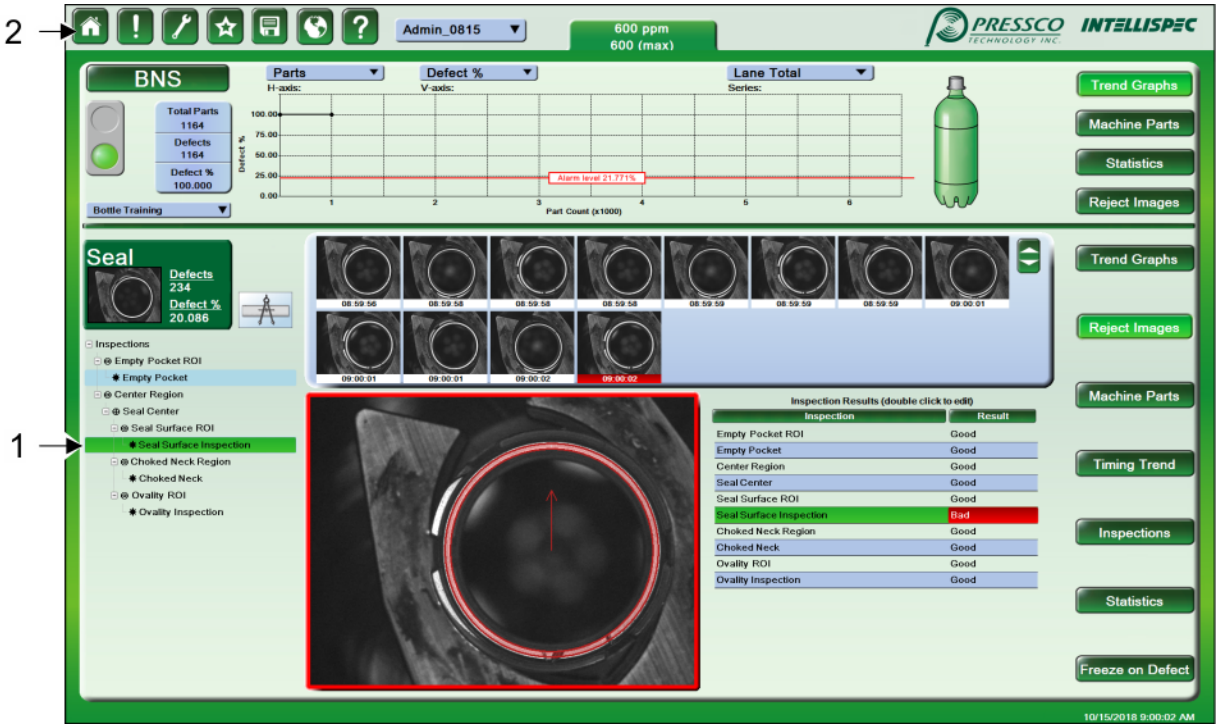


1) Select the sensor button to toggle to detailed Sensor View and back

2) Switch to System Overview

Sensor Overview Screen

Access the Sensor Overview by selecting a sensor button. Your system may have multiple cameras/ sensors.



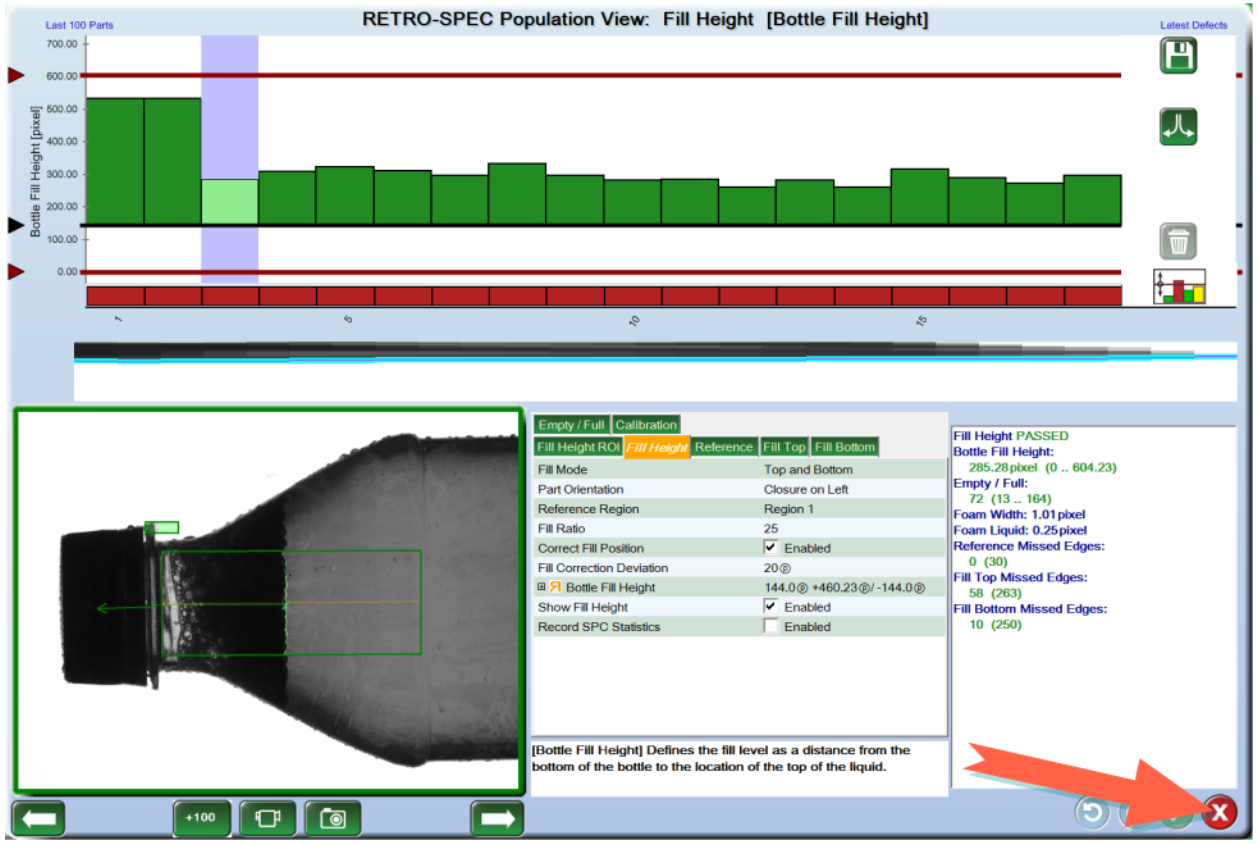
1) Double-click to open Inspection View

2) Switch to System Overview

Inspection Overview Screen

Double-click an inspection name in the inspection tree to access the Inspection Overview screen. This is the screen where you may adjust inspection parameters (if you have user permission).

Two different views are available: "Retro-Spec Population View Graph" and "Retro-Spec Part View Graph." Double-click on the upper graph to switch between them.



Close the Inspection View to switch to System Overview or Sensor Overview

Menu Toolbar

Note: some menu items change, depending whether you are in System Overview mode or Lane/Sensor Overview mode

1) **Home** - Go to the System Overview Screen

2) **Alarms** - Clear, view, and set alarms

3) **Tools menu** - Configure system settings, reports, hardware, part tracking, rejectors, part setup, and more

4) **Star menu** - Take screen shots and manage background tasks, and launch the OPC Client (if installed)

5) **Back Up and Restore Menu** - Create a support package, restore the system from a support package, and launch Windows Explorer

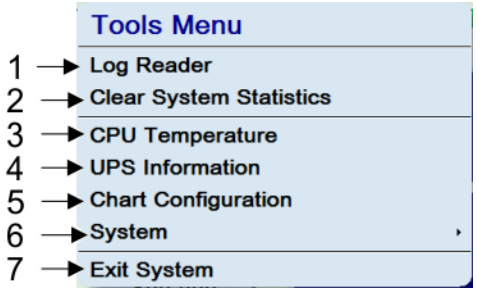
6) **Language** - Select the language to display the Intellispec software, from the available options

7) **Help** - Access the help documents, remote support, and determine software version

Tools menu - System Overview Screen

 To get to this menu: Select the Home button | Tools .

Note: Some menu items are only available to advanced level users.



1) **Log Reader** - Open the Intellispec log (see also "Log Reader" on page 43)

2) **Clear System Statistics** - Clear the entire system statistics (all Lanes)

3) **CPU Temperature** - If a multiple core computer is used, the highest temperature is displayed. If the shutdown CPU temperature is reached, the Intellispec system shuts down.

4) **UPS Information** - Display Uninterruptible Power Supply (UPS) information and settings

5) **Chart Configuration** - Choose the Trend Graph type and the number of points for the chart in the System Overview Screen

(not shown)- **Defect Writing** - [Only if Defect Database option is installed and enabled] Enable or disable defect recording for multiple lanes.

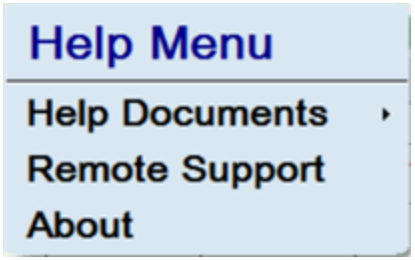
6) **System** - Set system date and time or set up a printer

7) **Exit System** - Shut down Intellispec software

Help

Select the Help icon to:

- use the system manuals
- access Pressco "Help - Remote Support" on page 157
- obtain your current software version



To access the user manuals:

1. Select the Help icon .
2. Select Help Documents, then select a manual from the list. The user manual is displayed.

User Accounts & Login

This section describes how to log in and how to manage user accounts.

Log in and log out

To log in, use either method:

A. 

Select the Log In button. Select your user name, and enter your password.

B. With the optional biometric sensor: Press your finger to the sensor. The system logs you in. If the system fails to recognize your identity after three attempts, then log in through the log in dialog box.

To log out:

A. 

Select the button with your name, then select the Log Out button.

B. With the optional biometric sensor: Press your finger to the sensor. The system logs you out.

Note: When another user logs in, the system automatically logs you out.

Log In menu

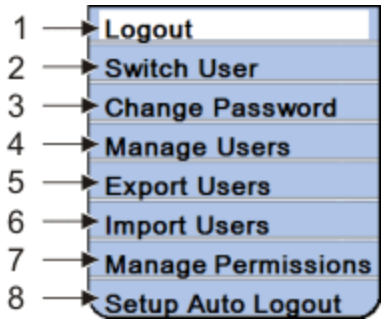
To ensure that only authorized users perform certain changes to the system, users are required to log in.* Some of these menu items are available to advanced users only.

*Some tasks can be configured so that users do not need to log in. This is done through the Manage Permissions menu.

To view the Log In menu:

Select the Log In button and enter your password. The text on the button changes to indicate who is logged in.

Select the Log In button again. The popup menu appears.



1) Logout

2) Switch user

3) **Change Password** - change only your password

4) **Manage Users** - add, remove, or edit users

5) **Export Users** - export user profiles from one Intellispec to another

6) **Import Users** - import user profiles from one Intellispec to another

7) **Manage Permissions** - assign specific areas of the system that a user can access

8) **Set Up Auto Logout** - the system logs you out if there is no activity for the specified time

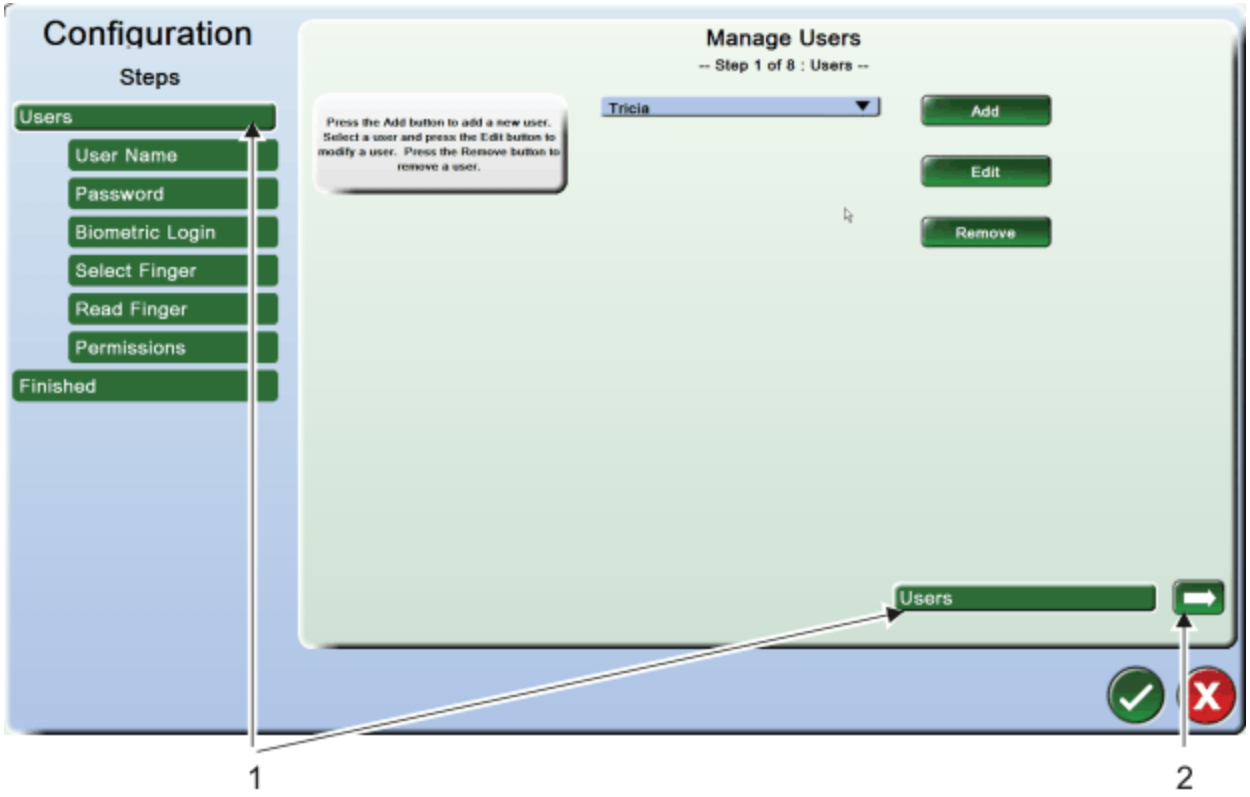
> *Note: There is a Pressco Technician account for use only by Pressco Service Engineers. This gives access to unsupported features (menu items are a different color). If you log into this account and use those features, do so at your own risk.*

Manage Users

Administrator only

Add, Edit, or Remove users. You may create one user account for a group of people (example: Shift 1).

Note: the biometric login features are only used when the optional biometric login device is installed



To manage a user account:

1. Log in as an administrator.
2.  Select the button with your user name | Manage Users.
3. Select Add, Edit, or Remove a user. Follow the information on screen to complete these actions. The current step is highlighted [item 1 in illustration].
4.  Use the forward arrow button [item 2] to move to the next screen(s).

Add a user with the biometric login device

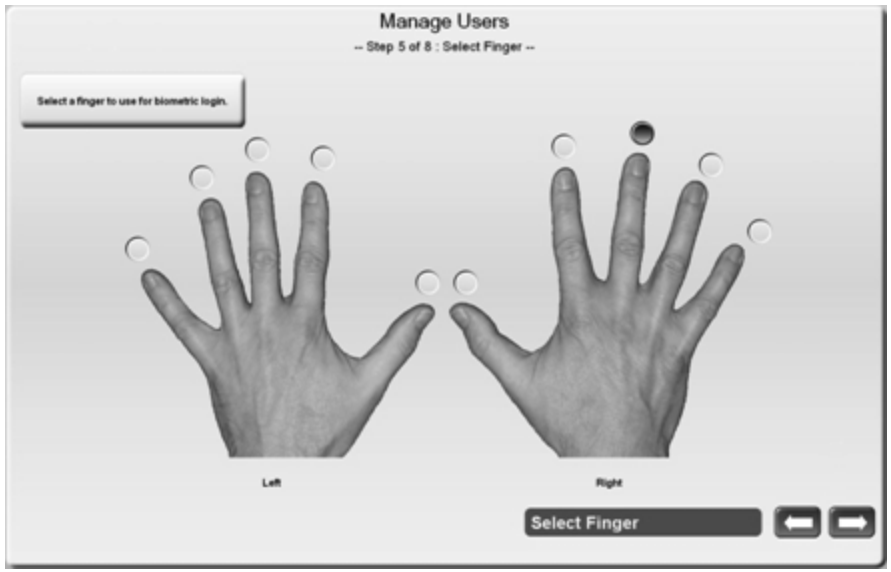
The biometric device uses finger recognition software to log in. You can always log in using your user name and password, even if you have a biometric login device. The maximum number of biometric accounts is 40.

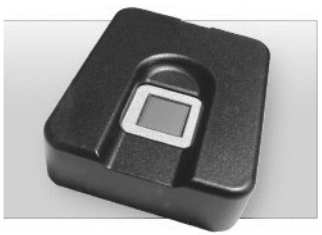
> *Note: You cannot create two accounts for the same finger print. You could create two accounts for one person, but you must use two different fingers*

To add a user with the biometric login device:

1. Log in as Administrator.
2. 

Select the button with your user name | Manage Users | Add.
3. Add the new user name when prompted. Select the forward arrow.
4. Enter a password, then Confirm it. Select the forward arrow.
5. [Biometric login] Select "Biometric".





6. [Select Finger] Choose which finger the biometric sensor will read. This finger must be used every time when logging in.
7. [Read Finger] Select the Start button at the top of the screen. Instruct the user to place his or her finger on the biometric sensor three times (for accuracy) when prompted.
8. [Permissions] Select the desired permissions.
9. [Finished]  Select the OK button to save changes and exit.

Export Users

Export user accounts from one system to another, or back up your user accounts.

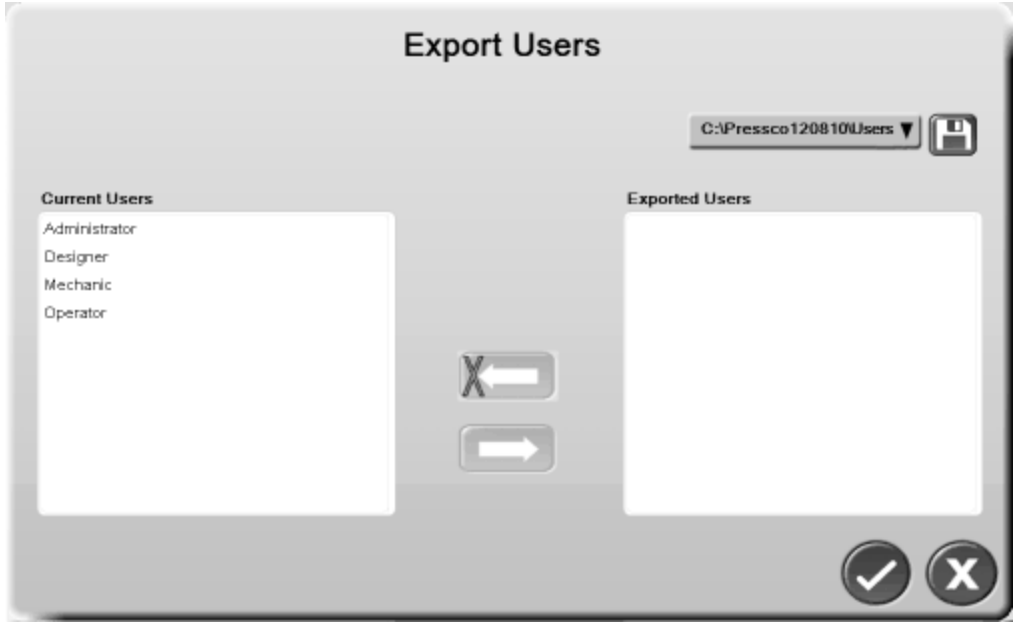
What you need:

- A USB device
- Administrator access

To export a user account:

1. Insert the USB device into an available slot on the Intellispec Series V system.
2. 

Select the button with your user name | Export Users.



3. Select the user account that you want to export.
4.  Select the right arrow to export the user account.
5.  Choose the destination to save the user account from the drop-down menu, or select the Save button to browse to the USB device.
6.  Select the OK button to save changes and exit. The user account is exported.

Import Users

Import user accounts from one system to another, or from a backup USB device.

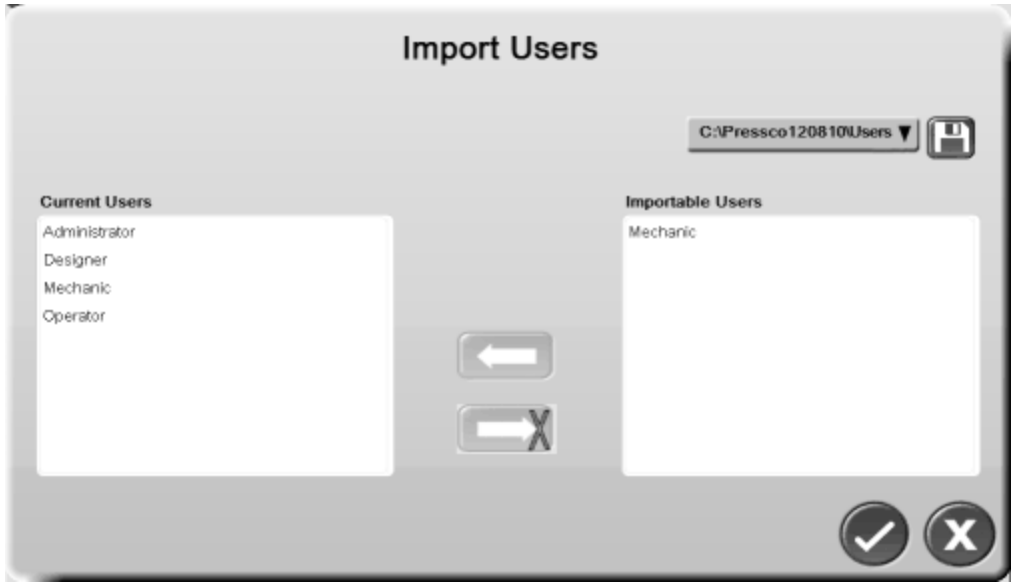
What you need:

- A USB device with user accounts already saved on it, or a folder on the Intellispec hard drive with valid user accounts
- Administrator access

To import a user account:

1. Insert the USB device into an available slot on the Intellispec Series V system.
2. 

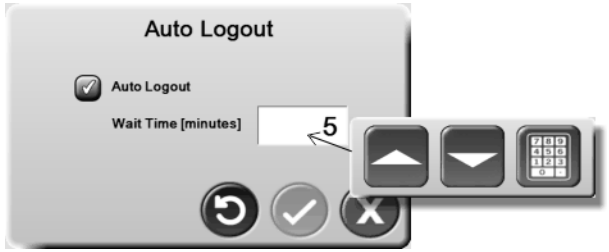
Select the button with your user name | Import Users.



3.  Select the user account that you want to import from the right column. If you do not see any users available, select the Save button to browse to a location where the user account is saved.
4.  Select the left arrow to import the user account.
5.  Select the OK button to save changes and exit.The user account is imported.

Set Up Auto Logout

This feature will automatically log out any user after a number of minutes of inactivity.

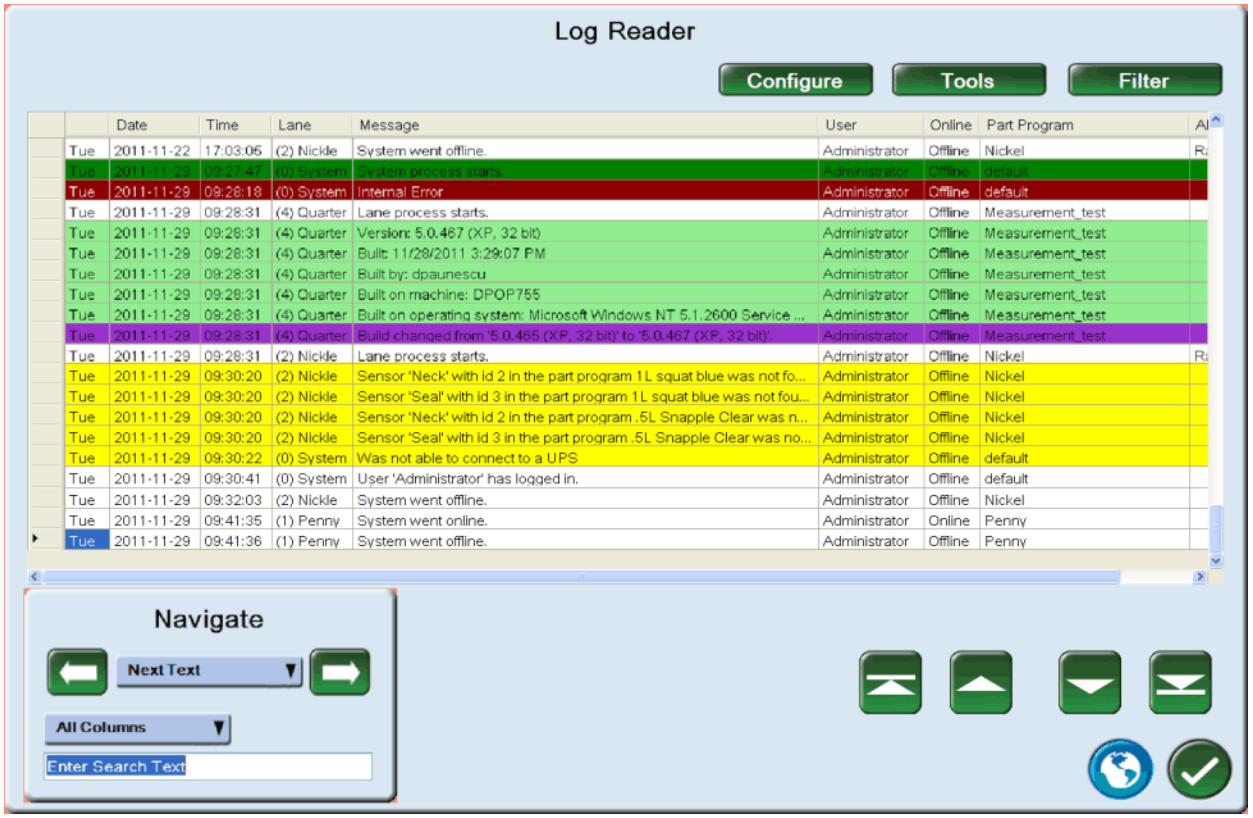


To set up Auto Logout:

1. Log in.
2. 

Select the button with your user name.
3. Select Setup Auto Logout. The setup menu is displayed.
4. Enable Auto Logout. A check mark is displayed in the box when it is enabled.
5. Set the Wait time in minutes (from 1 to 9999 minutes).
6.  Select the OK button to save changes and exit. All users will be logged out automatically after the set number of minutes of inactivity.

Log Reader



To get to this menu: select Home | Tools | Log Reader.

The log reader displays the Intellispec event history including:

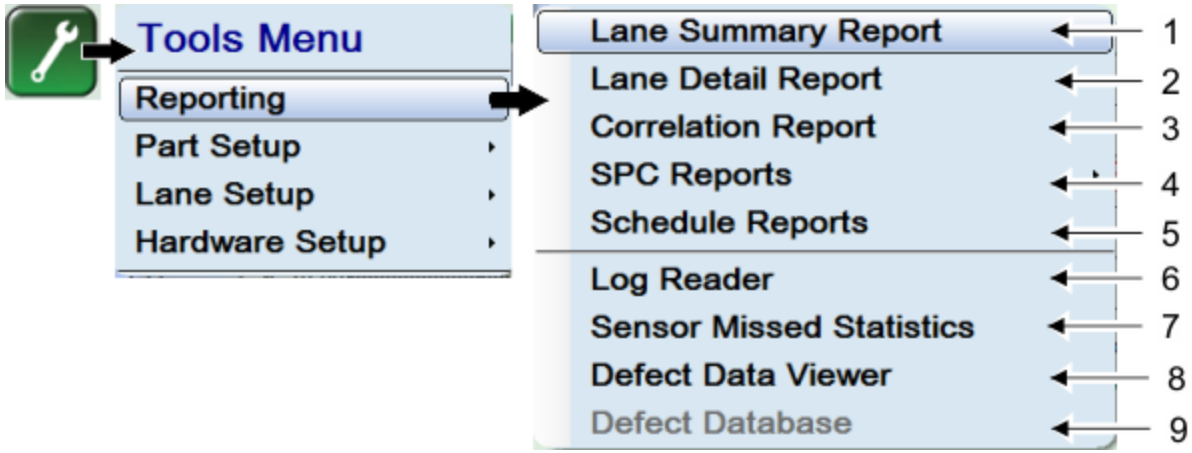
- User log in and log out information
- Notification when the part program was changed. Note: detailed changes to parameters and program changes are found in the Part Program Change Log
- Alarms, when triggered and cleared
- System errors
- System starting information
- Lane online/ offline history
- Lighting changes
- Reports generated
- Text files of the logs are stored at: C:\Pressco\Logs.

Reporting

The Intellispec generates many different reports to provide inspection detail. Many of these reports can be transferred outside of the Intellispec.

Note: Some menu items are only available to advanced level users.

To view reports: Select a Lane button | Tools | Reporting.



1 and 2) "Lane Summary and Lane Detail reports" on the next page

3) "Correlation Report" on page 46

4) SPC Reports (SPC = Statistical Process Control)

5) "Schedule Reports" on page 47

6) Log Reader

7) **Sensor Missed Statistics** - Displays the number of missed parts and missed part tracking for the sensor.

8) **Defect Data Viewer** - [if enabled] view the images in the defect database

9) **Defect Database** - [if enabled] view the inspection data from the defect database

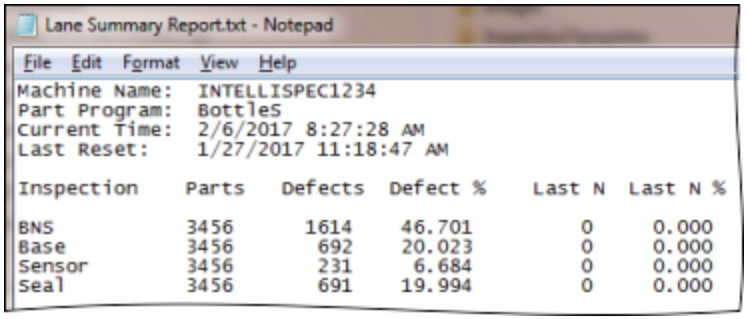
Lane Summary and Lane Detail reports

Lane Summary Report

This report lists the statistics for the lane, including:

- Number of parts inspected
- Number of defects
- Defect percentage

The above numbers are reported per sensor, and as an overall number for the lane. An example from a one lane system is shown below.



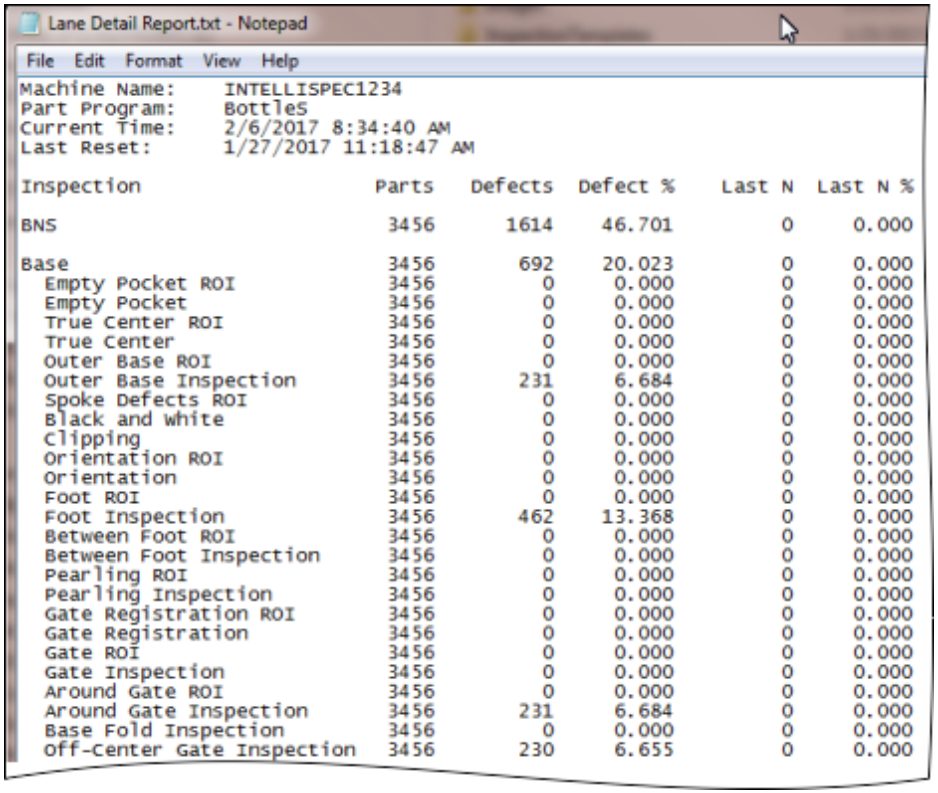
Lane Summary Report.txt - Notepad

File Edit Format View Help

```
Machine Name:  INTELLISPEC1234
Part Program:  BottleS
Current Time:  2/6/2017 8:27:28 AM
Last Reset:    1/27/2017 11:18:47 AM

Inspection    Parts    Defects   Defect %    Last N  Last N %

BNS           3456       1614     46.701         0     0.000
Base          3456        692     20.023         0     0.000
Sensor        3456        231      6.684         0     0.000
Seal          3456        691     19.994         0     0.000
```

Lane Detail Report

This report contains all the information in the Lane Summary Report, plus inspection detail for each sensor.



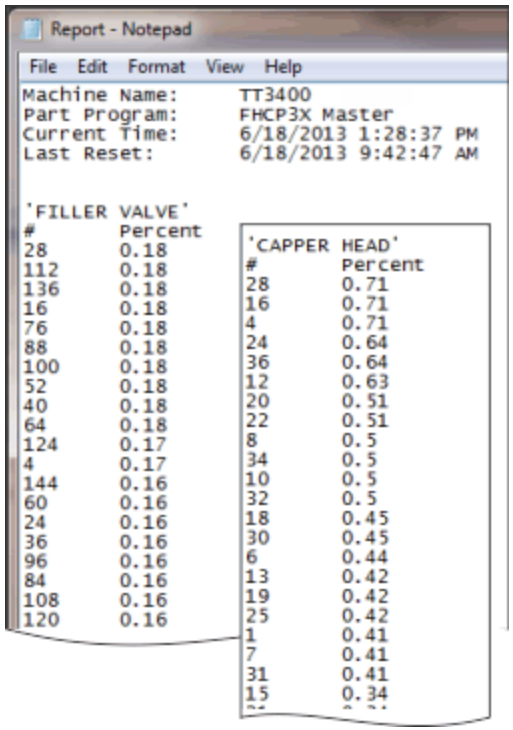
Lane Detail Report.txt - Notepad

File Edit Format View Help

```
Machine Name:     INTELLISPEC1234
Part Program:     BottleS
Current Time:     2/6/2017 8:34:40 AM
Last Reset:       1/27/2017 11:18:47 AM

Inspection                    Parts    Defects   Defect %    Last N  Last N %

BNS                           3456       1614     46.701         0     0.000

Base                          3456        692     20.023         0     0.000
  Empty Pocket ROI            3456          0      0.000         0     0.000
  Empty Pocket                3456          0      0.000         0     0.000
  True Center ROI             3456          0      0.000         0     0.000
  True Center                 3456          0      0.000         0     0.000
  Outer Base ROI              3456          0      0.000         0     0.000
  Outer Base Inspection       3456        231      6.684         0     0.000
  Spoke Defects ROI           3456          0      0.000         0     0.000
  Black and White             3456          0      0.000         0     0.000
  Clipping                    3456          0      0.000         0     0.000
  Orientation ROI             3456          0      0.000         0     0.000
  Orientation                 3456          0      0.000         0     0.000
  Foot ROI                    3456          0      0.000         0     0.000
  Foot Inspection             3456        462     13.368         0     0.000
  Between Foot ROI            3456          0      0.000         0     0.000
  Between Foot Inspection     3456          0      0.000         0     0.000
  Pearling ROI                3456          0      0.000         0     0.000
  Pearling Inspection         3456          0      0.000         0     0.000
  Gate Registration ROI       3456          0      0.000         0     0.000
  Gate Registration           3456          0      0.000         0     0.000
  Gate ROI                    3456          0      0.000         0     0.000
  Gate Inspection             3456          0      0.000         0     0.000
  Around Gate ROI             3456          0      0.000         0     0.000
  Around Gate Inspection      3456        231      6.684         0     0.000
  Base Fold Inspection        3456          0      0.000         0     0.000
  Off-Center Gate Inspection  3456        230      6.655         0     0.000
```

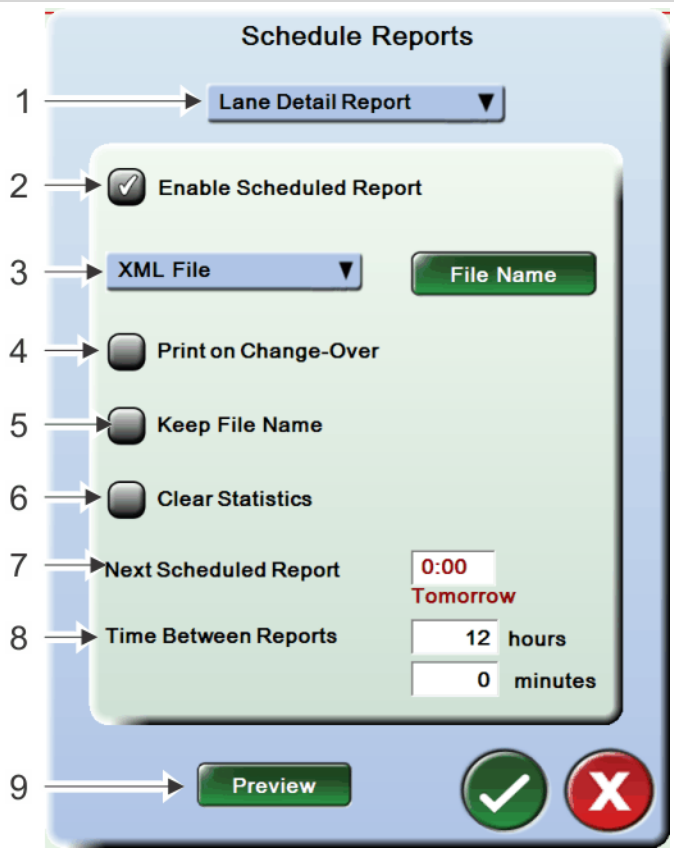
Correlation Report

This report contains the percentage of defects by machine part, sorted from highest to lowest percentage of failure.



Schedule Reports

Set up a schedule where the Intellispec generates reports automatically. This is a Lane-level setting. To schedule reports for more than one lane, you must repeat the process for each lane.



1) Report drop-down menu
2) Enable Scheduled Report
3) Destination drop-down menu
4) Print on Change-Over
5) Keep File Name
6) Clear Statistics
7) Next Scheduled Report
8) Time Between Reports
9) Preview

Schedule Reports Details

1) **Report drop-down menu** - Select a report to schedule. Each report must be set up separately. See also Lane Summary Report, Lane Detail Report, and Correlation Report.

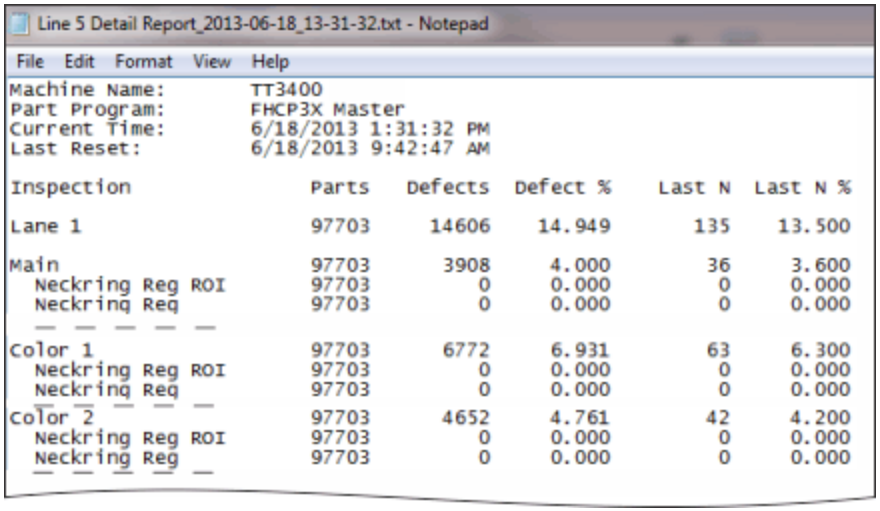
2) **Enable Scheduled Report** - When this box is checked, the settings below are active.

3) **Destination drop-down menu** - Send the report to the default printer or a file. When "Text File" is selected, you can enter a file name by selecting the File Name button. If you do not choose the name or location of the file, then the file is named "Report.txt" and is saved at the hard disk location "c:\Pressco\DataExport." Subsequently saved reports include a time stamp in the file name, unless you enable Keep File Name.

4) **Print on Changeover** - Schedule the system to generate a report if someone changes a part program. This contains defect statistics from the time of the last statistics reset until the time that the part change-over occurred.

Changeover Report Example

This report contains defect information for the most recent parts. It has the time of the last statistics reset, and displays information through the time that the part change-over occurred.



Line 5 Detail Report_2013-06-18_13-31-32.txt - Notepad

File Edit Format View Help

```
Machine Name:        TT3400
Part Program:        FHCP3X Master
Current Time:        6/18/2013 1:31:32 PM
Last Reset:          6/18/2013 9:42:47 AM

Inspection              Parts   Defects  Defect %   Last N  Last N %

Lane 1                  97703     14606    14.949      135    13.500

Main                    97703      3908     4.000       36     3.600
  Neckring Reg ROI      97703         0     0.000        0     0.000
  Neckring Reg          97703         0     0.000        0     0.000
  — — — — —
Color 1                 97703      6772     6.931       63     6.300
  Neckring Reg ROI      97703         0     0.000        0     0.000
  Neckring Reg          97703         0     0.000        0     0.000
  — — — — —
Color 2                 97703      4652     4.761       42     4.200
  Neckring Reg ROI      97703         0     0.000        0     0.000
  Neckring Reg          97703         0     0.000        0     0.000
  — — — — —
```

5) **Keep File Name** - The system overwrites the file each time, rather than creating unique names for files. Select the File Name button, browse to the location where you want to save it, and create a name for your report. Example: a plant where the Intellispec is networked. Say the office computer is programmed to poll the Intellispec at regular intervals to get the latest statistics report. With the same file name, the office computer just needs to request the same file name each time, regardless of the date and time the report was saved.

6) **Clear Statistics** - The Lane statistics are cleared after each report.

7) **Next Scheduled Report** - Using a 24 hour clock, set the time to save or print the next report. No reports will print until the specified time. This time of day is always used in subsequent report days, so that you can schedule your network computer to collect reports after this time. Note that this number is updated by the system continuously - it will always show the next scheduled report time. Example: if the current time is 17:00, and Next Scheduled Report is 15:00, then the next report will not print till the next day at 15:00.

8) **Time Between Reports** - Set the time interval to save or print the following reports. This interval is used after the Next Scheduled Report. The reports on following days are scheduled to always include the Next Scheduled Report time as originally set up.

Example: Time Between Reports

Next Scheduled Report = 15:00 and Time Between Reports = 5 hours. The reports will print the next day at 15:00, then at 20:00. The following day, the scheduled reports occur at 00:00, 05:00, 10:00, 15:00, and 20:00. This repeats each following day.

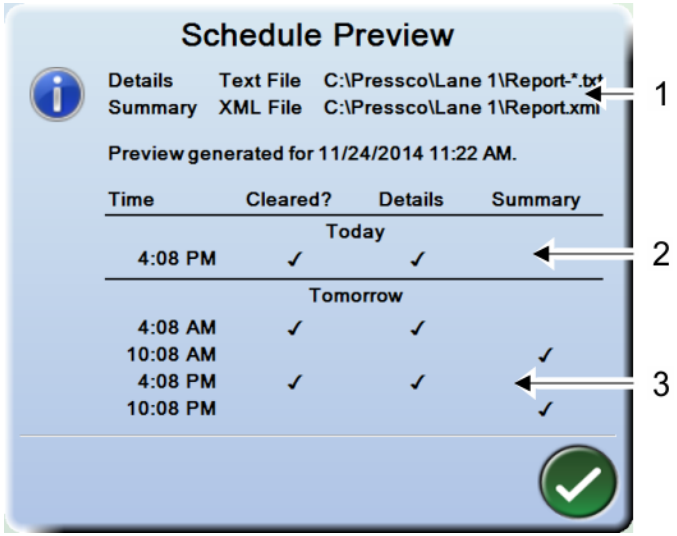
If the system is shut down when a report is scheduled and later started up again, then no report is created for the time when the system is shut down. This is true with the following exceptions:

- If a report was already created today, or the report schedule was edited today
- If the shut down was today
- If either of the above conditions happens, and a report was scheduled during the down time, then a report is created immediately after the system starts up again.

---

9) **Preview** - Select the preview button to see when scheduled reports will print.

Preview Details

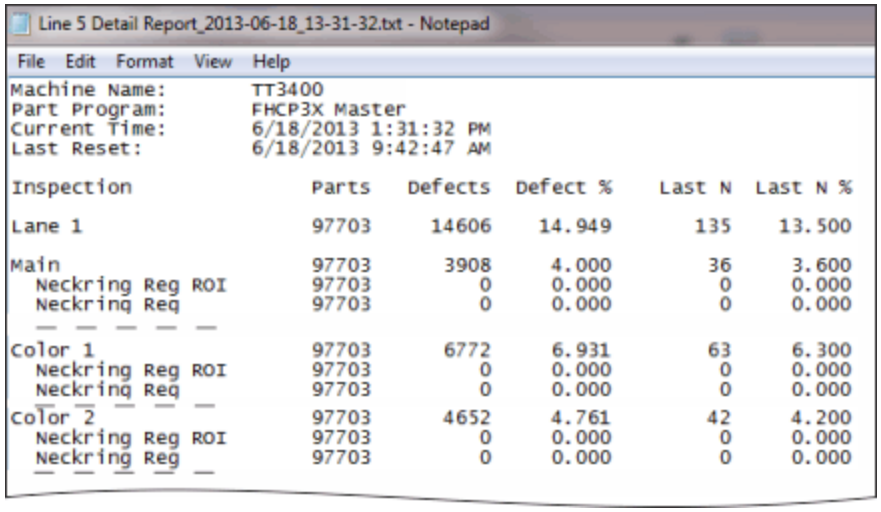


1) Enabled reports | 2) If checked, that report will print today at the time shown | 3) If checked, that report will print tomorrow and each day after at the time shown

Cleared = Clear Statistics is enabled for that report.

Change-over Report Example

This report contains defect information for the most recent parts. It has the time of the last statistics reset, and displays information through the time that the part change-over occurred.



Line 5 Detail Report_2013-06-18_13-31-32.txt - Notepad

File Edit Format View Help

```
Machine Name:        TT3400
Part Program:        FHCP3X Master
Current Time:        6/18/2013 1:31:32 PM
Last Reset:          6/18/2013 9:42:47 AM

Inspection              Parts   Defects  Defect %   Last N  Last N %

Lane 1                  97703     14606    14.949      135    13.500

Main                    97703      3908     4.000       36     3.600
  Neckring Reg ROI      97703         0     0.000        0     0.000
  Neckring Reg          97703         0     0.000        0     0.000
  __ __ __ __ __
Color 1                 97703      6772     6.931       63     6.300
  Neckring Reg ROI      97703         0     0.000        0     0.000
  Neckring Reg          97703         0     0.000        0     0.000
  __ __ __ __ __
Color 2                 97703      4652     4.761       42     4.200
  Neckring Reg ROI      97703         0     0.000        0     0.000
  Neckring Reg          97703         0     0.000        0     0.000
  __ __ __ __ __
```

Alarms

There are five types of alarms: System, Lane, Sensor, Rejector, and Machine Part alarms. Most of these are configurable (except the System Alarms - UPS and over temperature).

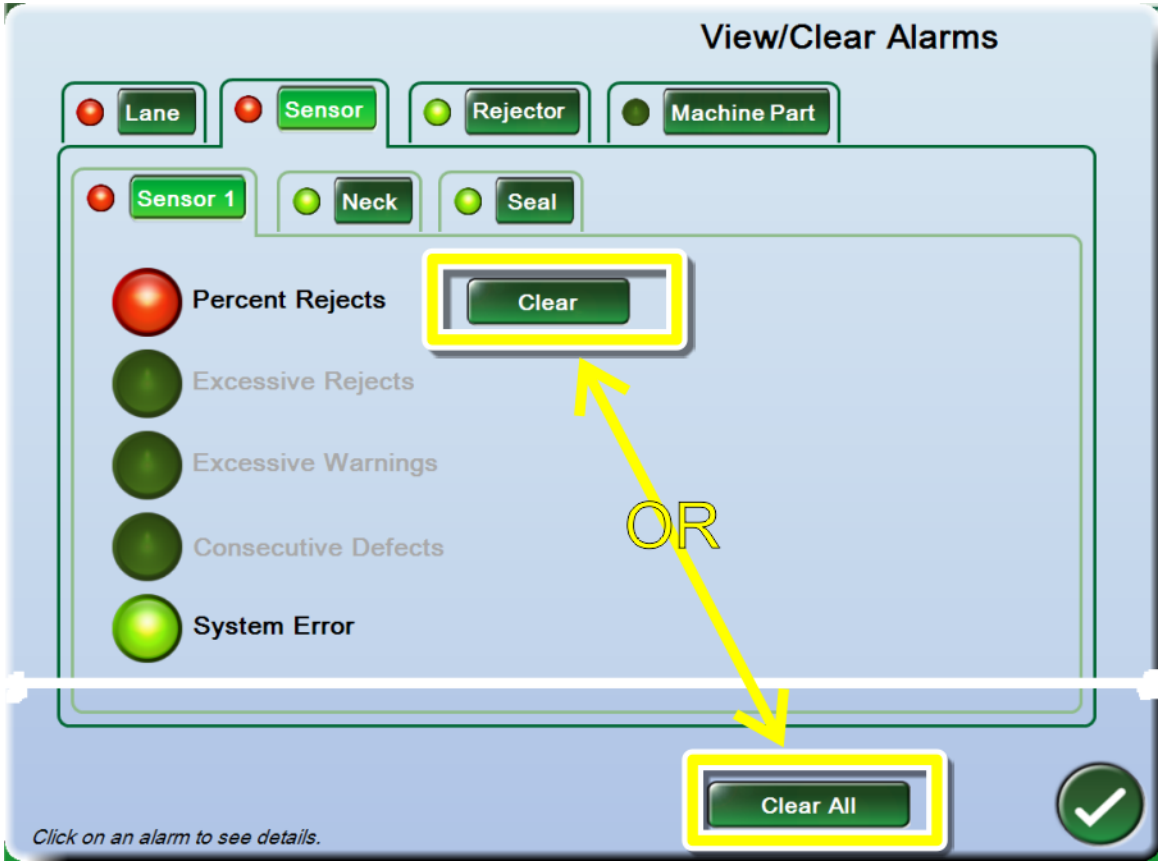
The information in this section is valid in software versions 5.6.010, 5.7.008 and higher.

> *Note: Alarms are recorded in the system log reader, even when the alarms are automatically cleared.*

View and Clear Alarms

To View or Clear Alarms, select an Alarm button. If no alarm is active, click the Alarms icon | View/Clear Alarms.

Select the Clear button to clear a single alarm, or the Clear All button to clear all alarms, including alarms in other tabs.



Select different tabs to see more alarms. The tabs (except Lane) have sub-tabs. If any alarm is raised in a sub-tab (Sensor 1 in our example), then the container tab (Sensor) also shows an alarm.

Select any indicator to see alarm details. You can also do this if an alarm is not active.

The indicators in this screen show whether an alarm is enabled, and whether it is triggered.

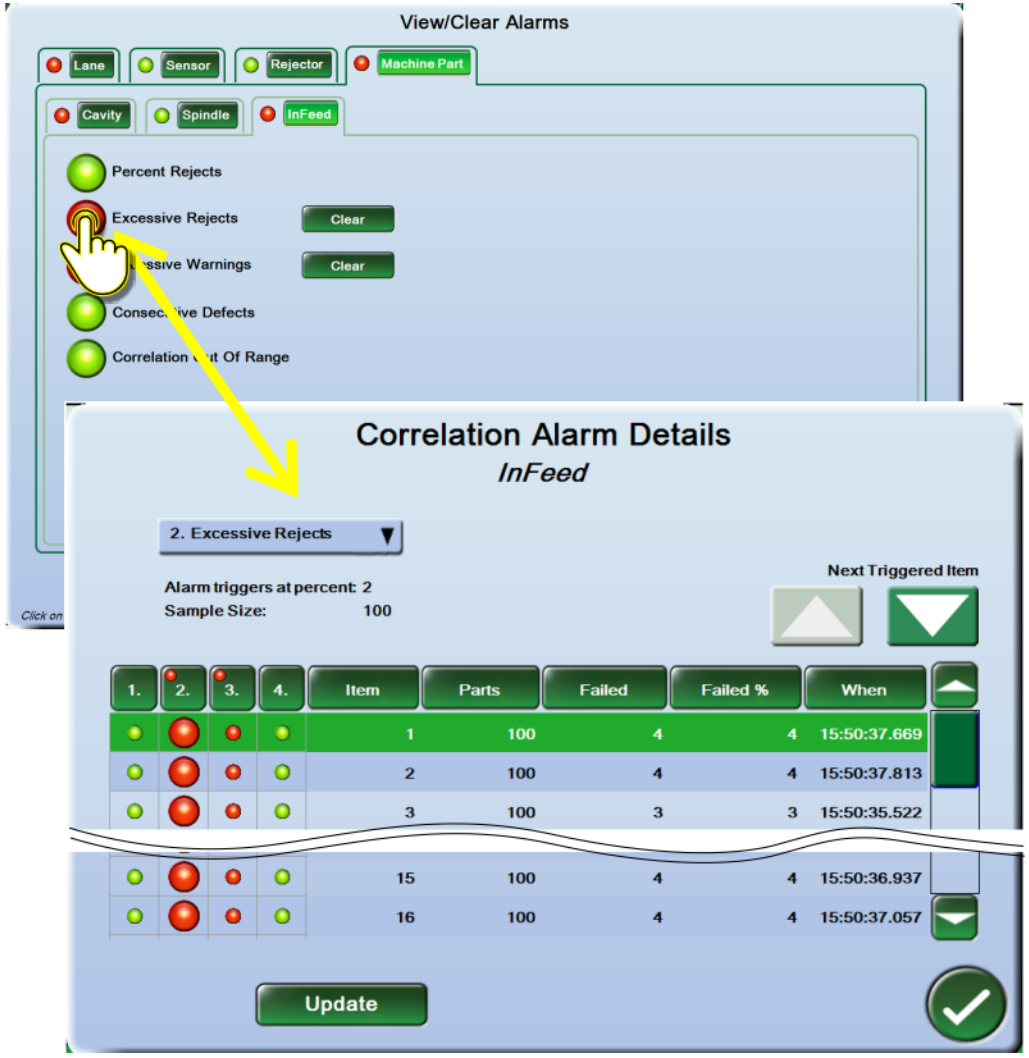
Red On - the alarm is both enabled and triggered

Green On - the alarm is enabled, but has not been triggered

Green Off - the alarm is not enabled nor triggered

View and Clear Machine Part Alarms

From the alarms button | View/ Clear Alarms | Machine Part:



Clicking on any machine part alarm shows a details table breaking the alarm details down per correlation value (aka machine part item).

The table lets you select any of the (enabled) alarms either by using the drop down or by clicking one of the columns 1., 2., 3., etc.

A "Next Triggered Item" navigator helps to quickly find the item in alarm when all machine parts cannot be displayed simultaneously.

The Update button updates current inspection information (how many parts have currently been processed and how many failed; this is automatically done if an alarm is raised while in this view).

System Alarms - Description and Configuration

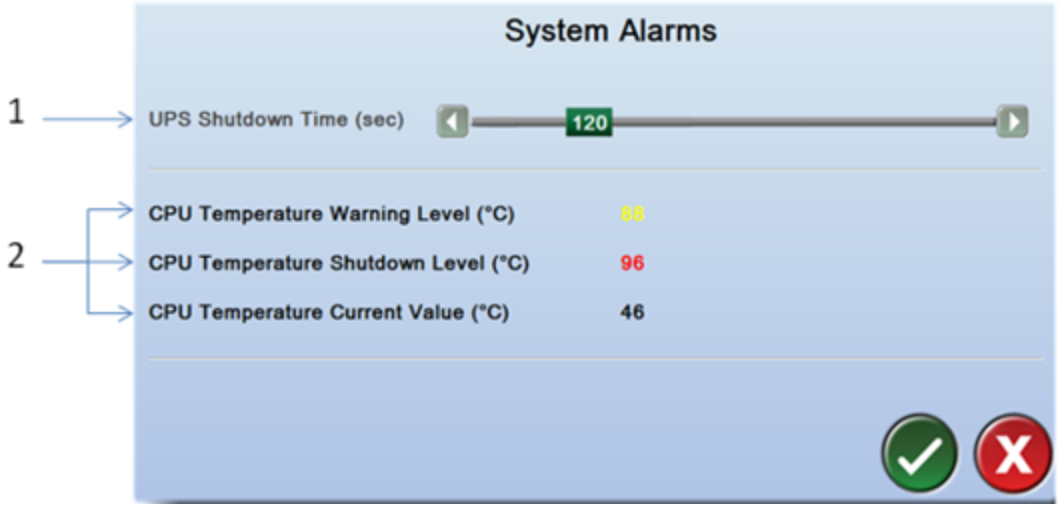
The system alarms are the UPS (uninterruptible power supply) and CPU temperature alarms. You can configure the UPS shut down time.

These are only shown in the System Overview and will not show up as flashing lane buttons, or on any light tree, and will not sound a horn.

Alarm	Description	Action
UPS	Battery is dead. Or: Plant power is lost and the UPS shutdown time is exceeded. The Intellispec shuts down.	Replace battery Automatically resets If plant power is restored before the Intellispec shuts down, then the alarm is automatically cleared. Otherwise, restart the system.
Over temperature	CPU temperature exceeds highest recommended operating temperature. The Intellispec system shuts down. You must wait till the processor cools before resuming operation.	

System Alarm Setup

 To get to this menu: select Home | Alarms.



1) **UPS Shutdown Time** - The number of seconds that the UPS will maintain power to the system if AC power has been lost. The Intellispec system shuts down after this time period. This allows for a normal Windows shutdown.

2) **CPU Temperature** - If a multiple core computer is used, the highest temperature is displayed. If the shutdown CPU temperature is reached, the Intellispec system shuts down.

Lane Alarms - Brief Description

The Lane Alarms affect the hardware associated with one lane. A lane usually refers to one production line, and can contain multiple sensors.

Alarm	Description	Action	Light Tree[2]
Percent Defects[1]	Percentage of defects exceeds the set limit.	Check the production line to see what might be creating too many bad parts Reset alarm on screen	Red
Offline[1]	Lane goes offline	Automatically resets	Green = system is online Red = system is offline
Chute Full[1]	Reject chute is full	Clear chute Reset alarm on screen	Red
Power Status[1]	Lane AC Power is lost	Automatically resets Troubleshoot: Check that the inspection module power switch is on. Check +24V supply.	Red = AC power is lost Blue = power is OK
Good Parts[1]	Used as a part counter. When specified number of parts is reached, then alarm is triggered.	Replace the box with counted parts with an empty box, then clear alarm. Reset alarm on screen	Red
System Error[1]	Part tracker or other internal system errors	Depends on specific alarm (see details for System Error Alarm) Reset alarm on screen	Red Red Flashing for Part Tracker Lost Communication

[1] If you want to connect an external monitoring device such as a PLC, an optional Extended I/O board is required for each lane.

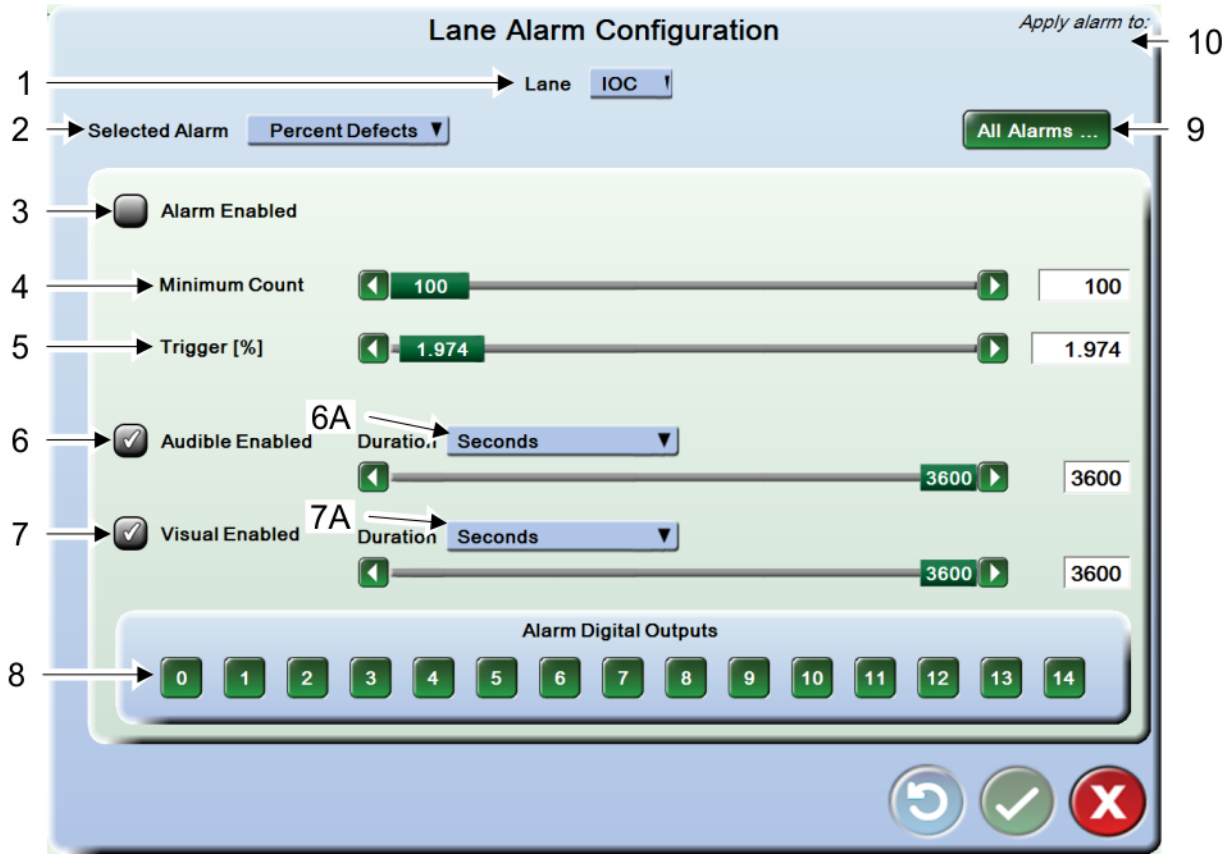
[2] The light tree displays this color for the Duration if Visual Enabled.

Lane Alarm Configuration

Set up alarms for a lane.

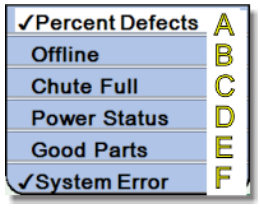
Note: Some menu items are only available to advanced level users.

To get to this menu: From Lane Overview mode, select Alarms | Lane Alarm Configuration. Select an alarm from the drop-down menu to configure that alarm. Enabled = checked.



1) **Lane** - Select the lane to configure

2) Selected alarm:



A) **Percent Defect** - The percentage of defective parts in a Lane exceeds the Trigger %. It remains triggered until you clear the alarm.

B) **Offline alarm** - This alarm is triggered when the system goes offline.

C) **Chute Full alarm** - This alarm is mainly used in systems that have inspection modules installed within a blow molder, and use the blow molder's internal reject chute. (it may not apply to your system) It is triggered when the blow molder's internal reject chute is full. NOTE: This alarm is disabled when the Intellispec is offline.
If this alarm is triggered, the blow molder's internal rejector will be disabled, thus not allowing any more defective parts to be rejected. The rejector will remain disabled until you clear the chute and then clear the alarm from the alarms tab. If you clear the alarm without clearing the chute, the alarm will be triggered again.

D) **Power Status** - This alarm is triggered when Lane AC power is lost. It remains triggered until AC power is restored. If AC power remains off for an extended period of time, the system will shut down.

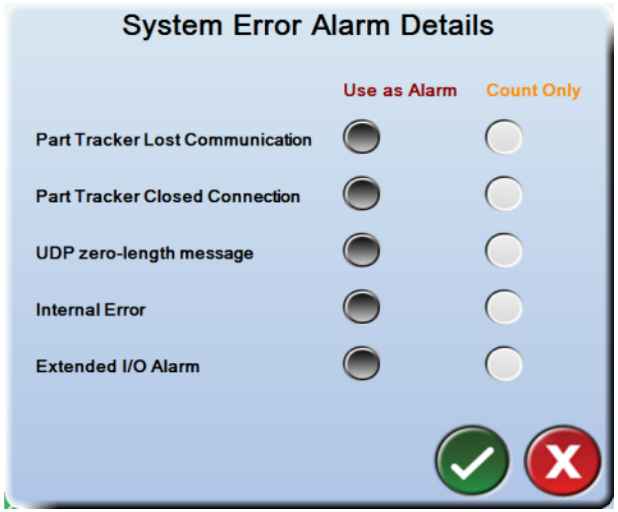
E) **Good Parts alarm** - This alarm is triggered when a number of good inspected parts [Trigger (thousands)] has been reached. It will remain triggered until you clear the alarm. Note that clearing this alarm also clears the Good Parts count.

Good Parts alarm example

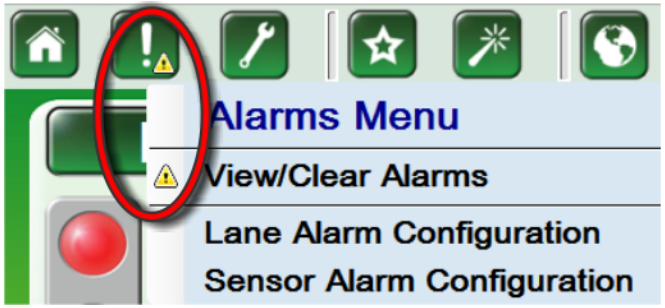
> The Good Parts alarm can be used as a part counter. For example, say you are inspecting preforms, and have a box at the end of the conveyor (after inspection) that holds 5000 preforms. This alarm counts the number of good inspected parts, and notifies you when 5000 good parts have reached that box. The Alarm Output through the optional Extended I/O can be used to stop the conveyor from moving parts into the inspection system. You can then install a new box at the end of the conveyor, reset this alarm, and start counting the next 5000 parts. See also information about the optional Extended I/O board.

F) **System Error Alarm** - The System Error Alarm cannot be disabled. However, there is a Details button that shows whether it is being used as an alarm. System alarms may be added or subtracted (by Pressco) from the software without notice. These errors are recorded in the Log Reader.

System Error alarm details



- Part Tracker Lost Communication – a transient problem with sending result packets to the part tracker. Often this is related to a Missed Packets threshold that is too low (Missed Packets Exception under Lane – Tools – Hardware Setup). Otherwise, network connections may need to be checked. The light tree will flash red.
- Part Tracker Closed Connection – The communication to the part tracker was closed. This always requires resetting the part tracker and restarting the system. The system will also show a message box instructing to do this, and going on-line will not be permitted. In this condition, since no communication between Intellispec and Part Tracker exists, the light tree may not show an alarm or sound the horn.
- Internal Error - an internal error was logged. This usually requires Pressco technical assistance.
- Use as Alarm - This is the normal setting.
- Count Only - The selected alarm(s) will count triggers only.
    - In the View/Clear Alarms screen, the indicator will be yellow if the alarm is triggered (instead of red).
    - The Count Only alarms will NOT light the light tree, sound the horn, nor cause the flashing ALARM button over the Lane button.
    - A small warning indicator displays over the Alarms button and View/Clear Alarms menu item when one or more count-only alarms have been triggered - in Lane Overview mode only. The warning indicator is not displayed when a regular alarm is already active.

- 

> *We do not recommend using Count Only for any of the System alarms, unless the system has a problem where a specific alarm is frequently triggered and thus overshadows other alarms.*

---

3) **Alarm Enabled** - Enables the alarm.

4) **Minimum Count** - The minimum number of parts that must be inspected before the alarm can be triggered. This prevents the alarm from being triggered too soon, when only a small number of parts may make the statistics trigger the alarm.

5) **Trigger [%]** - The percentage of parts inspected that must fail, to trigger the Percent Defects alarm. This number is selectable between zero and 100. The default value is five percent.

(not shown) **Trigger [parts]** - [Good Parts alarm] The number of parts (in thousands) that must pass inspection to trigger the alarm.

6) **Audible Enabled** - The horn will sound when the alarm is triggered.

6A) **Audible Duration** - The number of seconds the horn will sound. After this time it will remain on off until the alarm is cleared.

7) **Visual Enabled** - The appropriate light tree segment will light when the alarm is triggered.

7A) **Visual Duration** - The number of seconds the light tree will remain on when the alarm is triggered. After this time it will remain on off until the alarm is cleared.

8) **Alarm Digital Outputs** - Select an output (Inspection Alarm 0-14) to be toggled on the optional Extended I/O kit when the alarm is triggered.

Alarm Digital Outputs details

- There are 15 available Inspection Alarm outputs that correspond to the extended I/O signals. Select one of the output numbers to assign the current alarm to an output.
- These outputs go active when the alarm is triggered, and go inactive when the alarm is cleared, provided no other alarm is still active that uses the same output.

- The outputs can be monitored by your plant equipment, such as a PLC, to notify you when certain alarms are triggered.
- See the Intellispec Hardware Guide for information about Extended I/O.

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9) **All Alarms** - Select the All Alarms button from an alarm configuration window (Lane, Sensor, Rejector, or Machine Part). See also All Alarms

10) **Apply Alarm to** - Click on additional lanes (if applicable to your system) to simultaneously configure all lanes currently checked in the side list. Any changes to the currently visible settings are reflected in all checked lanes. When you uncheck a lane, the settings remain applied but the unchecked lane will not follow the visible changes anymore. Each alarm has a separate list of simultaneous lanes.

Apply Alarm to - details

"✔ " means the settings are applied to those selections

" * " (asterisk) means the setting for the source differs from the current configuration

"≠ " means the settings for the source and alarm differ from the currently visible settings

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Sensor Alarms - Brief Description

Sensor alarms are configured for each sensor (camera or other sensor).

Alarm	Description	Action	Light Tree[2]
Percent Rejects[1]	**Percent Rejects** - This alarm is triggered when the Trigger [%] is exceeded. It will remain triggered until you clear the alarm.	Check the production line to see what might be creating too many bad parts Reset alarm on screen	Red
Excessive Rejects[1]	**Excessive Rejects** - This alarm is triggered when Trigger [%] of the last Sample Size parts have been found defective. It will remain triggered until you clear the alarm.	Check the production line to see what might be creating too many bad parts Reset alarm on screen	Red
Excessive Warnings[1]	**Excessive Warnings** - This alarm is triggered when Trigger [%] of the last Sample Size parts have been found with a warning status. It will remain triggered until you clear the alarm. Warnings are enabled in the Retro-Spec Options when you are editing an inspection. They can also be enabled in Lane Setup | Select Features.	Check the production line to see what might be creating too many bad parts Reset alarm on screen	Amber
Consecutive Defects[1]	**Consecutive Defects** - This alarm is triggered when Consecutive Triggers has been exceeded [the sensor had too many consecutive defects]. It will remain triggered until you clear the alarm.	Check the production line to see what might be creating too many bad parts Reset alarm on screen	Red
Mass Lighting	Mass Lighting - This alarm is triggered when the lighting threshold falls below a minimum level.	Clean the mass sensors and emitters Reset alarm on screen	none
System Error[1]	Missed part, missed acquisition, missed result, or other internal error	Reset alarm on screen	Red

[1] If you want to connect an external monitoring device such as a PLC, an optional Extended I/O board is required for each lane.

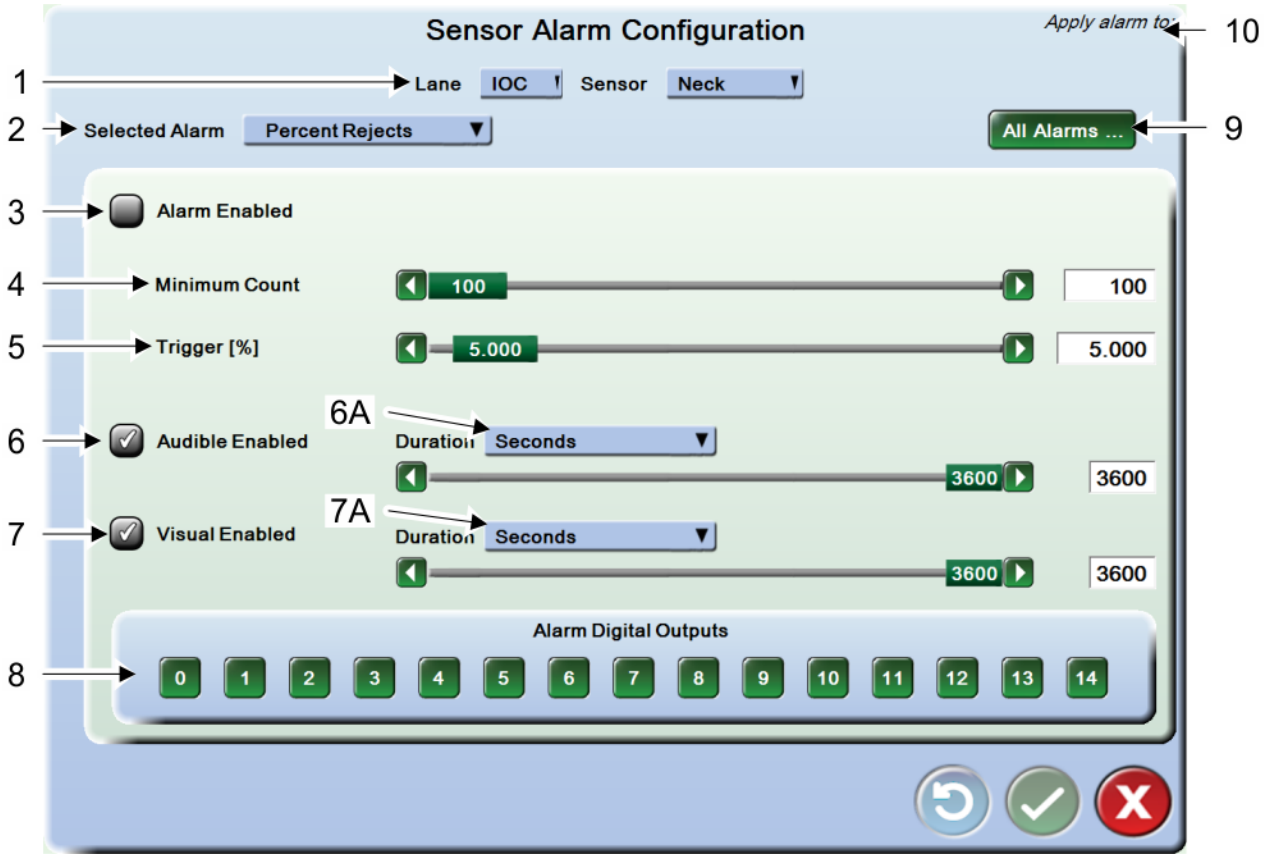
[2] The light tree displays this color for the Duration if Visual Enabled.

Sensor Alarm Configuration

Set up alarms for a Sensor.

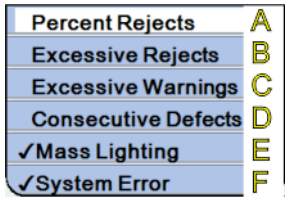
Some menu items are only available to advanced level users.

To get to this menu: From Lane or Sensor Overview mode, select Alarms | Sensor Alarm Configuration. Choose a sensor to configure. You must configure each sensor separately. Select an alarm from the drop-down menu to configure that alarm. Enabled = checked.



1) Select a lane and sensor to configure.

2) Select an alarm to configure:



A) **Percent Rejects** - This alarm is triggered when the Trigger [%] is exceeded. It will remain triggered until you clear the alarm.

B) **Excessive Rejects** - This alarm is triggered when Trigger [%] of the last Sample Size parts have been found defective. It will remain triggered until you clear the alarm.

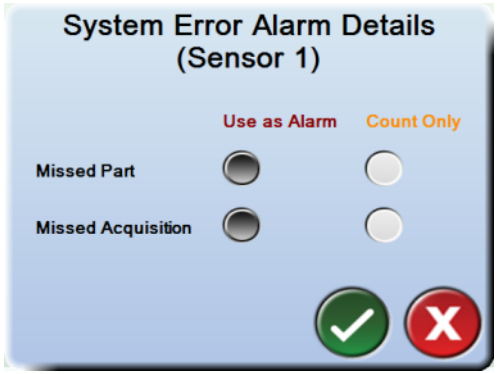
C) **Excessive Warnings** - This alarm is triggered when Trigger [%] of the last Sample Size parts have been found with a warning status. It will remain triggered until you clear the alarm. Warnings are enabled in the Retro-Spec Options when you are editing an inspection. They can also be enabled in Lane Setup | Select Features.

D) **Consecutive Defects** - This alarm is triggered when Consecutive Triggers has been exceeded [the sensor had too many consecutive defects]. It will remain triggered until you clear the alarm.

E) (only on systems with Mass sensors) **Mass Lighting** - This alarm is triggered when, for the given sensor, the backlight measured for the part is below the Alarm Level given in the Mass Lighting dialog.

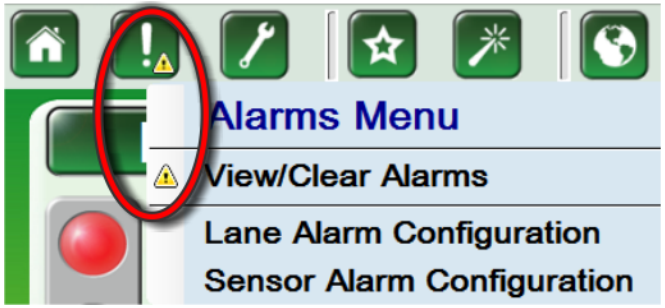
F) **System Error Alarm** - The System Error Alarm cannot be disabled. However, there is a Details button that shows whether it is being used as an alarm. System alarms may be added or subtracted (by Pressco) from the software without notice.

System Error alarm details



These errors are recorded in the Log Reader.

- Missed Part - the inspection was still being processed when the part made it to the reject station
- Missed Acquisition - the system was unable to acquire an image in time. There may be a problem with the camera or with the connection of the camera to the computer.
- Use as Alarm - This is the normal setting.
- Count Only - The selected alarm(s) will count triggers only.
    - The selected alarm(s) will be used as a warning. In the View/Clear Alarms screen, the indicator will be yellow if the alarm is triggered (instead of red).
    - The Count Only alarms will NOT light the light tree, sound the horn, nor cause the flashing ALARM button over the Lane button.
    - A small warning indicator displays over the Alarms button and View/Clear Alarms menu item when one or more count-only alarms have been triggered - in Lane Overview mode only. The warning indicator is not displayed when a regular alarm is already active.



> *We do not recommend using Count Only for any of the System alarms, unless the system has a problem where a specific alarm is frequently triggered and thus overshadows other alarms.*

---

3) **Alarm Enabled** - Enables the alarm.

4) **Minimum Count** - The minimum number of parts that must be inspected before the alarm can be triggered. This prevents the alarm from being triggered too soon, when only a small number of parts may make the statistics trigger the alarm.

(not shown) **Sample Size** - [Excessive Rejects and Excessive Warnings alarms] The number of parts that must be inspected, to determine the excessive warning percentage. This number is selectable between one and 100,000. The default value is 100. This is a sliding window: for example, assume Sample Size = 1,000 and Percent Trigger = 3. If three percent of the last 1000 parts have had a warning status, the alarm is triggered.

5) **Trigger [%]** - The percentage of parts inspected that must fail, to trigger the Percent Defects alarm. This number is selectable between zero and 100. The default value is five percent.

(not shown) **Consecutive Triggers** - [Consecutive Defects alarm] The number of defects in a row that must occur to trigger the alarm. This number is selectable between two and 100. The default value is 25.

6) **Audible Enabled** - The horn will sound when the alarm is triggered.

6A) **Audible Duration** - The number of seconds the horn will sound. After this time it will remain on off until the alarm is cleared.

7) **Visual Enabled** - The appropriate light tree segment will light when the alarm is triggered.

7A) **Visual Duration** - The number of seconds the light tree will remain on when the alarm is triggered. After this time it will remain on off until the alarm is cleared.

8) Alarm Digital Outputs

Alarm Digital Outputs details

- There are 15 available Inspection Alarm outputs that correspond to the extended I/O signals. Select one of the output numbers to assign the current alarm to an output.
- These outputs go active when the alarm is triggered, and go inactive when the alarm is cleared, provided no other alarm is still active that uses the same output.
- The outputs can be monitored by your plant equipment, such as a PLC, to notify you when certain alarms are triggered.
- See the Intellispec Hardware Guide for information about Extended I/O.

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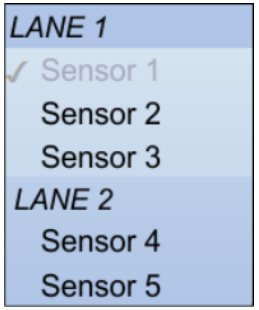
9) **All Alarms** - Select the All Alarms button from an alarm configuration window (Lane, Sensor, Rejector, or Machine Part). See also All Alarms

10) **Apply Alarm to** - Click on additional sensors to simultaneously configure all sensors currently checked in the side list. Any changes to the currently visible settings are reflected in all checked sensors. When you uncheck a sensor, the settings remain applied but the unchecked sensor will not follow the visible changes anymore. Each alarm has a separate list of simultaneous sensors.

Apply Alarm to - details



- "✔ " means the settings are applied to those selections
- " * " (asterisk) means the setting for the source differs from the current configuration
- "≠ " means the settings for the source and alarm differ from the currently visible settings

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Rejector Alarms - Brief Description

Rejector Alarms are triggered when a part did not get rejected as expected.

Alarm	Description	Action	Light Tree[2]
Jam at Reject Confirm[1]	The reject confirm path has been blocked too long. Works with Reject Confirm Calibration (Optional)	Remove jammed parts at the rejecter, then clear alarm. Reset alarm on screen	Red
Missed Reject[1]	System missed rejecting a part. Works with Reject Confirm Calibration (Optional)	Reset alarm on screen	Red
Missed Result[1]	The part reached the rejector before the part was fully inspected and the result was sent to the part tracker. That is, the inspections took too long to run.	If this occurs often, look at the inspection settings. It may be possible to use other settings to reduce inspection time. Reset alarm on screen	Red

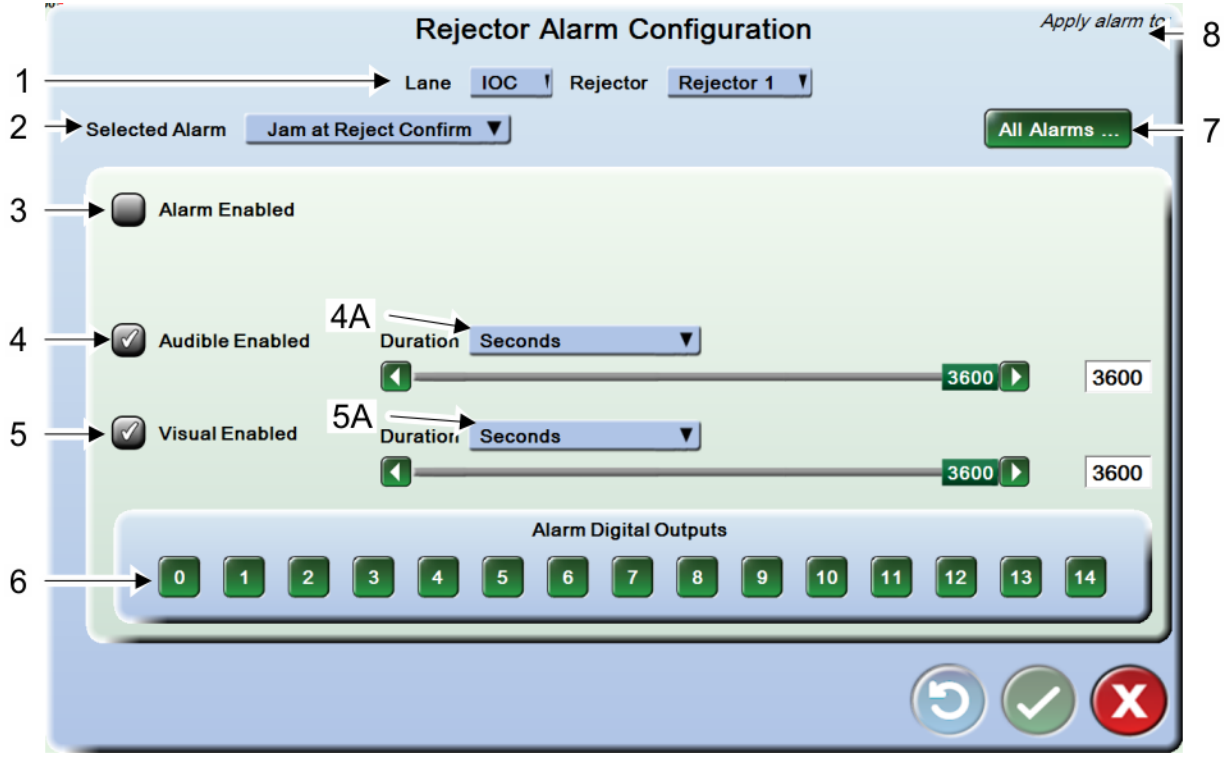
[1] If you want to connect an external monitoring device such as a PLC, an optional Extended I/O board is required for each lane.

[2] The light tree displays this color for the Duration if Visual Enabled.

Rejector Alarms Configuration

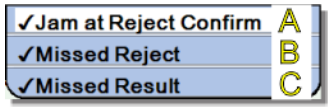
Set up alarms for rejecting. To get to this menu: From Lane Overview mode, select Alarms | Rejector Alarm Configuration. Select an alarm from the drop-down menu to configure that alarm. Enabled = checked.

Note: Some menu items are only available to advanced level users.



1) Select a lane and rejector to apply the current alarm to

2) Selected alarm:



A) **Jam at Reject Confirm** - This alarm is used with Reject Confirm Calibration (Optional). The alarm is triggered when the reject path has been blocked too long.

B) **Missed Reject** - This alarm works in conjunction with Reject Confirm Calibration (Optional). It is triggered when a missed reject occurs. There will be two Missed Reject alarms available if two rejectors are enabled and two Reject Confirm rejectors are enabled.

C) **Missed Result** - This signal is triggered if a part reaches the rejector without the part tracker having received the reject/not-reject command, determined by the inspection results. That is, the inspections took too long to run.

3) **Alarm Enabled** - Enables the alarm.

4) **Audible Enabled** - The horn will sound when the alarm is triggered.

4A) **Audible Duration** - The number of seconds the horn will sound. After this time it will remain on off until the alarm is cleared.

5) **Visual Enabled** - The appropriate light tree segment will light when the alarm is triggered.

5A) **Visual Duration** - The number of seconds the light tree will remain on when the alarm is triggered. After this time it will remain on off until the alarm is cleared.

6) **Alarm Digital Outputs** - Select an output (Inspection Alarm 0-14) to be toggled on the optional Extended I/O kit when the alarm is triggered.

Alarm Digital Outputs details

- There are 15 available Inspection Alarm outputs that correspond to the extended I/O signals. Select one of the output numbers to assign the current alarm to an output.
- These outputs go active when the alarm is triggered, and go inactive when the alarm is cleared, provided no other alarm is still active that uses the same output.
- The outputs can be monitored by your plant equipment, such as a PLC, to notify you when certain alarms are triggered.
- See the Intellispec Hardware Guide for information about Extended I/O.

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7) "All Alarms" on page 77

8) Apply Alarm to: details

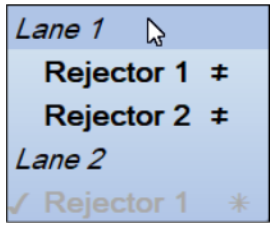
Click on additional rejectors (if applicable to your system) to simultaneously configure all rejectors currently checked in the side list. Any changes to the currently visible settings are reflected in all checked items. When you uncheck a rejector, the settings remain applied but the unchecked rejector will not follow the visible changes anymore. Each alarm has a separate list of simultaneous rejectors.

"✔ " means the settings are applied to those selections

" * " (asterisk) means the setting for the source differs from the current configuration

"≠ " means the settings for the source and alarm differ from the currently visible settings

The options available are based on your system configuration, and may be different than shown here.


Lane 1
Rejector 1
Rejector 2
Lane 2
Rejector 1

Machine Part Alarms - Brief Description

Machine Part alarms are the correlation-based alarms. They are visible only if your system has correlation sensors installed.

Note: for Machine Part Alarms, except Correlation Out of Range, statistics apply to each correlation value separately. That is, if one of 100 machine parts fails at 100 percent, the detected percentage is 100 percent while overall it would be 1 percent.

Alarm	Description	Action	Light Tree[2]
Percent Rejects[1]	**Percent Rejects** - This alarm is triggered when the Trigger [%] is exceeded. It will remain triggered until you clear the alarm.	Check the production line to see what might be creating too many bad parts Reset alarm on screen	Red
Excessive Rejects[1]	**Excessive Rejects** - This alarm is triggered when Trigger [%] of the last Sample Size parts have been found defective. It will remain triggered until you clear the alarm.	Check the production line to see what might be creating too many bad parts Reset alarm on screen	Red
Excessive Warnings[1]	**Excessive Warnings** - This alarm is triggered when Trigger [%] of the last Sample Size parts have been found with a warning status. It will remain triggered until you clear the alarm. Warnings are enabled in the Retro-Spec Options when you are editing an inspection. They can also be enabled in Lane Setup | Select Features.	Check the production line to see what might be creating too many bad parts Reset alarm on screen	Amber
Consecutive Defects[1]	**Consecutive Defects** - This alarm is triggered when Consecutive Triggers has been exceeded [the sensor had too many consecutive defects]. It will remain triggered until you clear the alarm.	Check the production line to see what might be creating too many bad parts Reset alarm on screen	Red
Correlation Out of Range	Correlation Out of Range - This alarm is triggered if the part tracker counts a machine part that was not configured.	Reset alarm on screen	Red

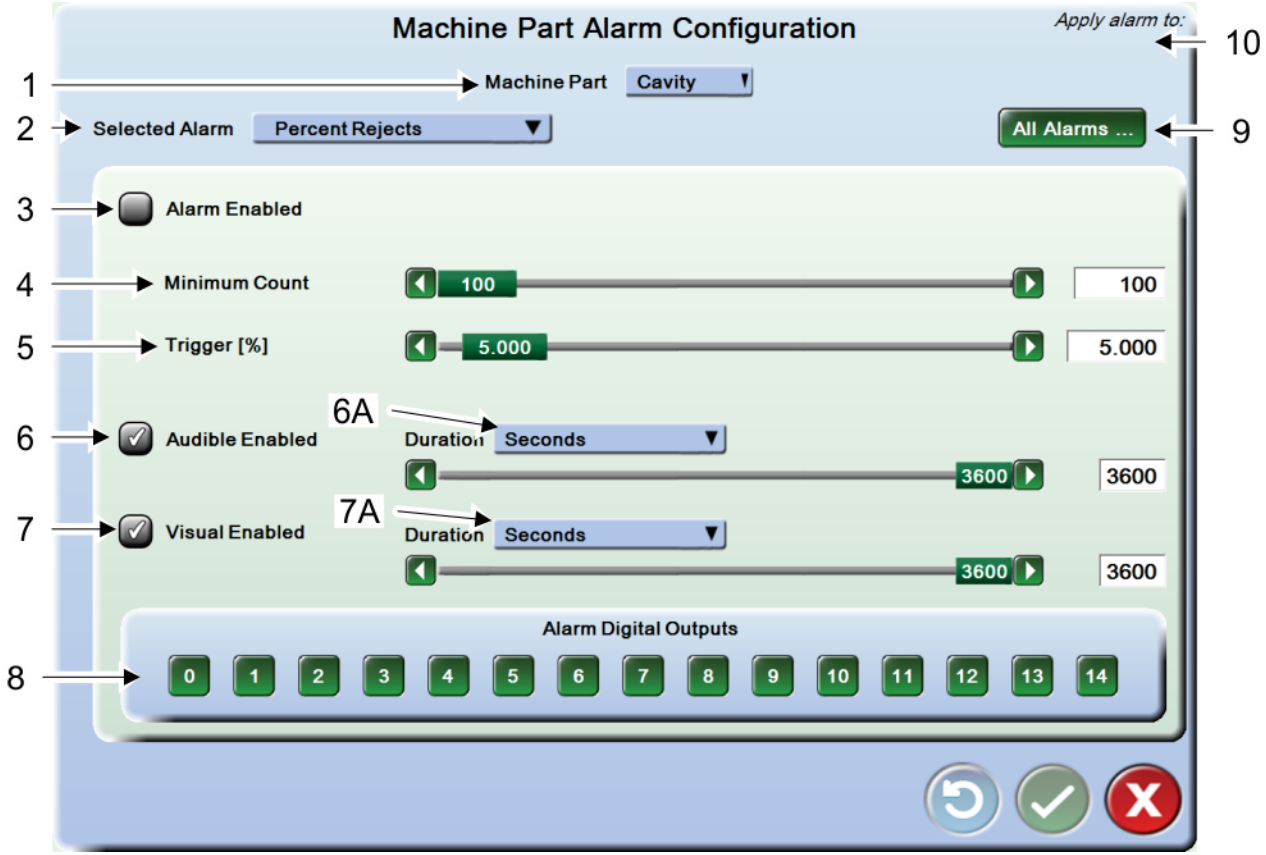
[1] If you want to connect an external monitoring device such as a PLC, an optional Extended I/O board is required for each lane.

[2] The light tree displays this color for the Duration if Visual Enabled.

Machine Part Alarms Configuration

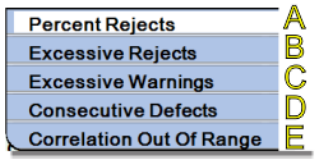
Set up alarms for machine parts. To get to this menu: From Lane Overview mode, select Alarms | Machine Part Alarm Configuration. Select an alarm from the drop-down menu to configure that alarm. Enabled = checked.

Note: Some menu items are only available to advanced level users.



1) **Machine Part** - Select the machine part to apply an alarm to

2) Selected Alarm:



A) **Percent Rejects** - This alarm is triggered when the Trigger [%] is exceeded. It will remain triggered until you clear the alarm.

B) **Excessive Rejects** - This alarm is triggered when Trigger [%] of the last Sample Size parts have been found defective for a correlation value. It will remain triggered until you clear the alarm.

C) **Excessive Warnings** - This alarm is triggered when Trigger [%] of the last Sample Size parts for a correlation value have been found with a warning status. It will remain triggered until you clear the alarm. Warnings are enabled in the Retro-Spec Options when you are editing an inspection. They can also be enabled in Lane Setup | Select Features.

D) **Consecutive Defects** - This alarm is triggered when Consecutive Triggers has been exceeded [the correlation value had too many consecutive defects]. It will remain triggered until you clear the alarm.

E) **Correlation Out of Range** - This alarm is triggered if the part tracker counts a machine part that was not configured. For example, if you configure 24 cavities, normally the part tracker counts 22, 23, 24, 1, 2, etc. If the part tracker sees 24, 25, 1, 2 then 25 is out of range. In Machine Part Correlation, you set a number of machine part items (Number) for each machine part. The part tracker continuously increases a counter for each machine part until it sees an index pulse, which resets the counter. When the counter runs longer than the “Number” configured, the correlation is out of range – the part tracker reports a machine part that does not exist (assuming the original configuration matches the physical number of machine parts).

3) **Alarm Enabled** - Enables the alarm.

4) **Minimum Count** - The minimum number of parts that must be inspected before the alarm can be triggered. This prevents the alarm from being triggered too soon, when only a small number of parts may make the statistics trigger the alarm.

5) **Trigger [%]** - For a correlation value, the percentage of parts inspected that must fail, to trigger the Percent Defects alarm. This number is selectable between zero and 100. The default value is five percent.

6) **Audible Enabled** - The horn will sound when the alarm is triggered.

6A) **Audible Duration** - The number of seconds the horn will sound. After this time it will remain on off until the alarm is cleared.

7) **Visual Enabled** - The appropriate light tree segment will light when the alarm is triggered.

7A) **Visual Duration** - The number of seconds the light tree will remain on when the alarm is triggered. After this time it will remain on off until the alarm is cleared.

8) **Alarm Digital Outputs** - Select an output (Inspection Alarm 0-14) to be toggled on the optional Extended I/O kit when the alarm is triggered.

Alarm Digital Outputs details

- There are 15 available Inspection Alarm outputs that correspond to the extended I/O signals. Select one of the output numbers to assign the current alarm to an output.
- These outputs go active when the alarm is triggered, and go inactive when the alarm is cleared, provided no other alarm is still active that uses the same output.
- The outputs can be monitored by your plant equipment, such as a PLC, to notify you when certain alarms are triggered.
- See the Intellispec Hardware Guide for information about Extended I/O.

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9) "All Alarms" on the next page

10) **Apply Alarm to** - Click on additional machine parts (if applicable to your system) to simultaneously configure all machine parts currently checked in the side list. Any changes to the currently visible settings are reflected in all checked items. When you uncheck a machine part, the settings remain applied but the unchecked machine part will not follow the visible changes anymore. Each alarm has a separate list of simultaneous machine parts.

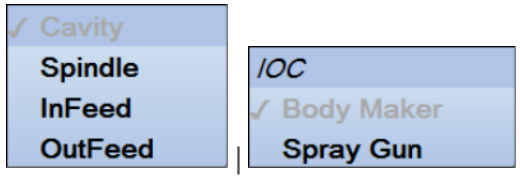
10) Apply Alarm to - details

"✔ " means the settings are applied to those selections

" * " (asterisk) means the setting for the source differs from the current configuration

"≠ " means the settings for the source and alarm differ from the currently visible settings

The options available are based on your system configuration, and may be different than shown here.



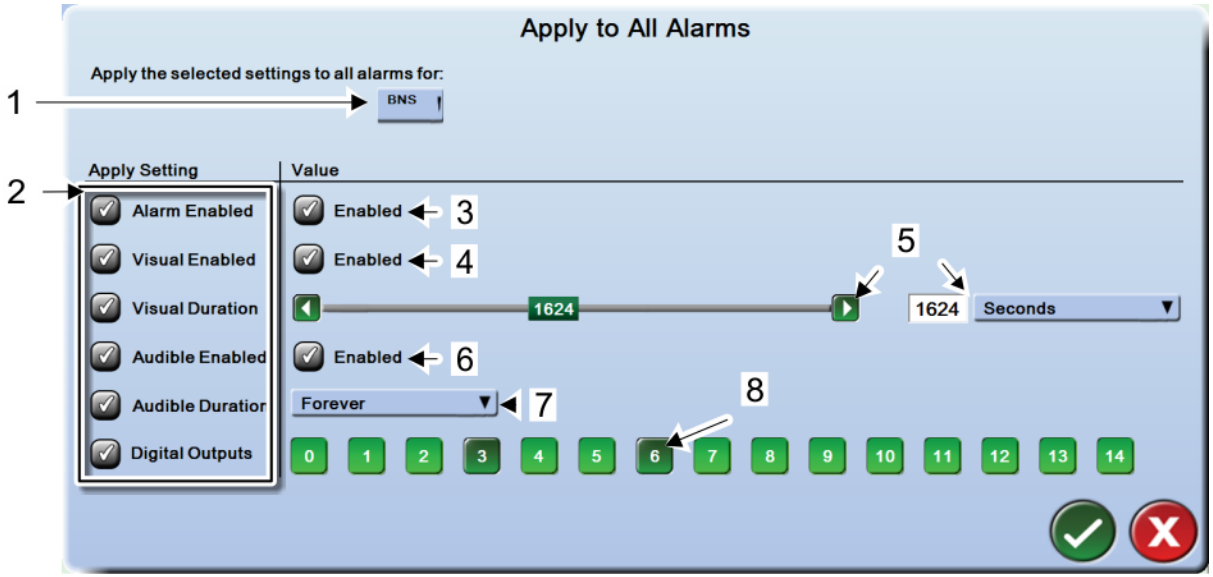
All Alarms

All Alarms button from an alarm configuration window

Settings made here allow applying the same settings to all alarms on one or all lanes and one or all sources (depending on where from invoked: one or all Sensors, one or all Rejectors, one or all Machine Parts). For example, you may always want to use the same Visual Duration regardless of which alarm. This allows doing this in a single step without having to go through all alarms to apply the same setting. (You still have to do it separate for each source type: Lane, Sensor, Rejector, Machine Part.)

Example 1

In the example below, everything is enabled. When we apply the changes, all of the lane alarms will be enabled, and all the values shown in the right column will be applied.



1) Select the item(s) for which the alarms settings will be applied (Lane, Sensor, Rejector, or Machine Part). More than one drop-down menu may be shown, depending on your configuration.

✔= enabled

2) **Apply Setting** - select which settings you want to apply to all alarms for the alarm sources selected in 1). If a box in Apply Setting is unchecked, the setting is NOT applied to any alarm and remains unchanged on OK.

Value column - contains the value of the setting to apply.

3) **Alarm Enabled** - Value “Enabled” checked (unchecked) = enables (disables) all alarms for the selected alarm sources.

4) **Visual Enabled** - Value “Enabled” checked (unchecked) = The appropriate light tree segment will light (not light) for any alarm for the selected alarm sources when triggered.

5) **Visual Duration** - Value = The number of seconds the light tree will remain on when the alarm is triggered. After this time it will remain on off until the alarm is cleared.

6) **Audible Enabled** - Value “Enabled” checked (unchecked) = The horn will sound (not sound) for any alarm for the selected alarm sources when triggered.

7) **Audible Duration** - Value = The number of seconds the horn will sound. After this time it will remain on off until the alarm is cleared.

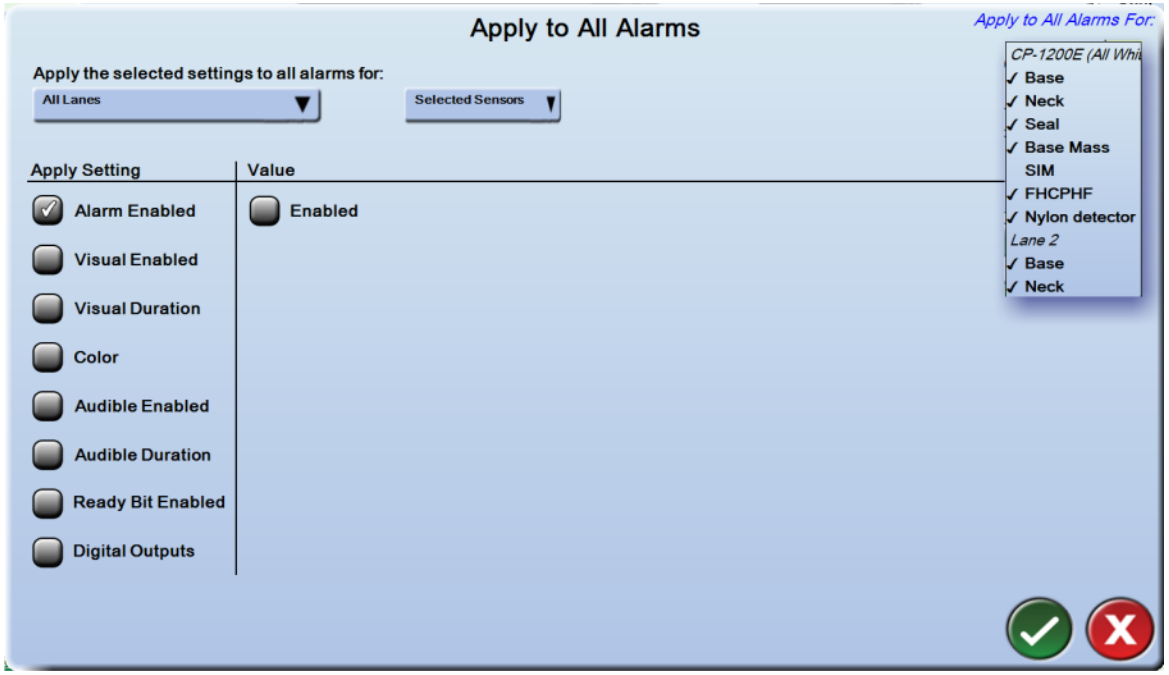
8) Alarm Digital Outputs

Alarm Digital Outputs details

- There are 15 available Inspection Alarm outputs that correspond to the extended I/O signals. Select one of the output numbers to assign the current alarm to an output.
- These outputs go active when the alarm is triggered, and go inactive when the alarm is cleared, provided no other alarm is still active that uses the same output.
- The outputs can be monitored by your plant equipment, such as a PLC, to notify you when certain alarms are triggered.
- See the Intellispec Hardware Guide for information about Extended I/O.

Example 2

If we only check Alarm Enabled in the Apply Setting column, then only the state of the Enabled checkbox in the Value column would be applied. In this example, after clicking the OK button, all alarms would be disabled for all lanes (except for the SIM sensor) but no other alarm settings would change.


Apply to All Alarms
Apply to All Alarms For:
Apply the selected settings to all alarms for:
All Lanes
Selected Sensors
Apply Setting
Value
Alarm Enabled
Enabled
Visual Enabled
Visual Duration
Color
Audible Enabled
Audible Duration
Ready Bit Enabled
Digital Outputs
CP-1200E (All Whi
Base
Neck
Seal
Base Mass
SIM
FHCPHF
Nylon detector
Lane 2
Base
Neck

Exclamation Sign or Warning Displayed on Alarms Button

If you see a small exclamation sign over the Alarms button, this means that a count-only alarm was triggered. See:

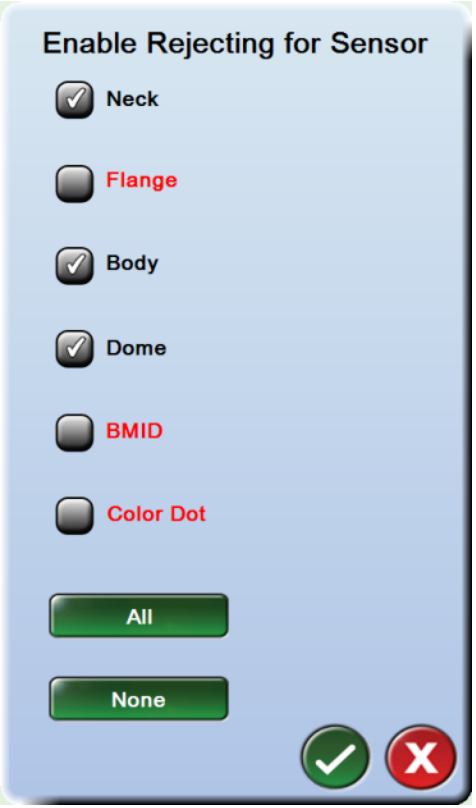
- Missed Reject / Missed Result in "Rejector Alarms Configuration" on page 69 (Details button next to Alarm Enabled, which cannot be modified for these alarms).

Rejecting

Reject Enable/ Disable for Multiple Sensors within a Lane

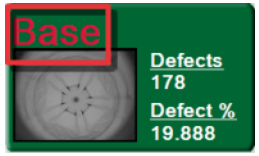
To enable or disable the rejector for one or more sensors within a lane:

1. From Lane Overview or Sensor Overview mode, select Tools | Lane Setup | Rejecting | Rejector Enable/Disable.
2. Check or un-check the box next to the sensor(s) to enable or disable the rejector.

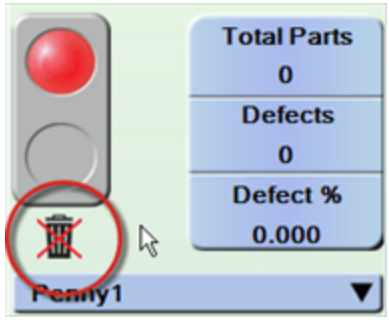


Select the OK button to save changes and exit. The new setting is applied.

If a rejector is disabled, the sensor name is displayed in red instead of white.



If the rejector for all sensors within the lane is disabled, you will see the trash can icon near the statistics for that lane.



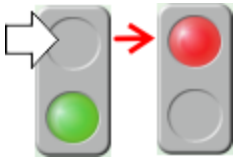
> *Note: the trash can symbol is only displayed if ALL sensors within the lane are disabled.*

If you put the system online when the lane rejectors are disabled, you will see a message stating "Lane Rejector Disabled - Do you want to go online?" You may select Yes and continue online.

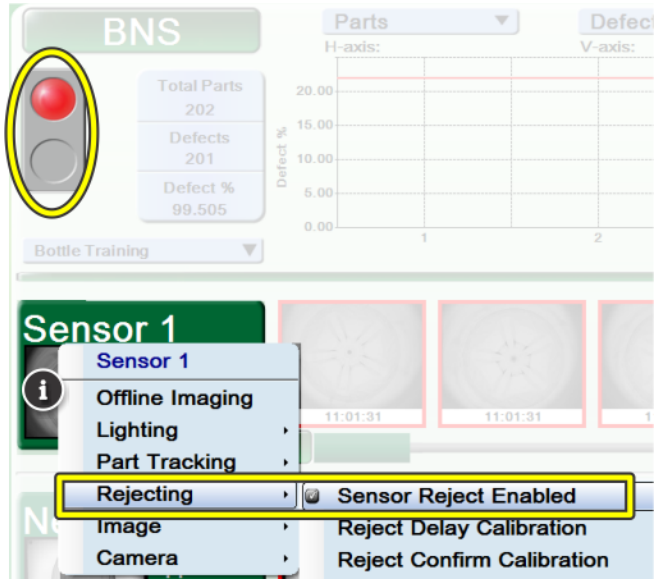
Reject Enable/ Disable for Sensor Only

If the system is rejecting excessive parts, you can quickly disable the rejecter for that sensor.

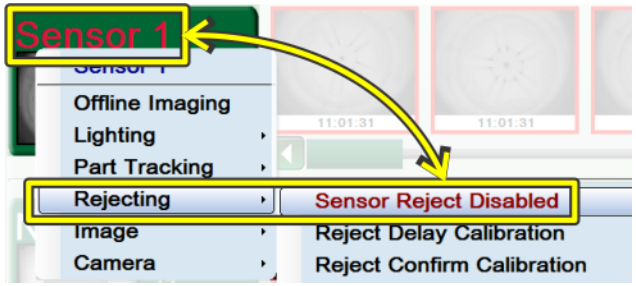
To enable or disable the rejector for one sensor only:


Take the lane offline.

From Sensor Overview mode | right-click over the sensor button | Rejecting | uncheck Sensor Reject Enabled.



This toggles to Sensor Reject Disabled. Red text = disabled.



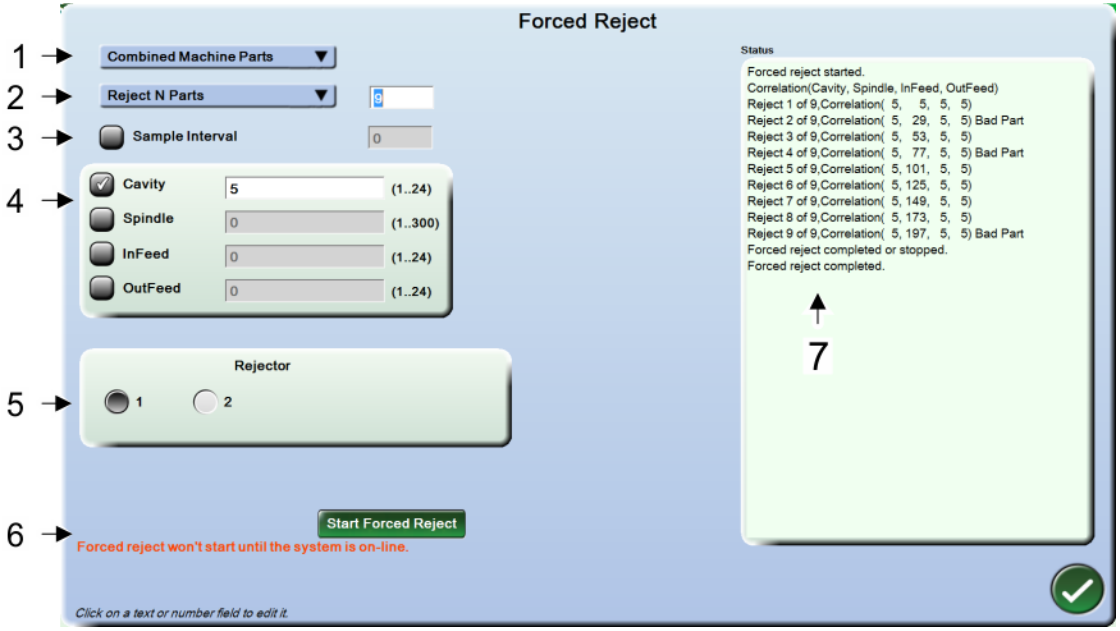
If you put the system online when the Sensor rejector is disabled, you will see a message stating "Sensor Rejector Disabled - Do you want to go online?" You may select Yes and continue online.

Forced Rejects Utility

To get to this screen: From Lane or Sensor Overview mode, select Tools | Lane Setup | Start Forced Reject.

Note: the lane must be Online to force rejects

Exiting the Forced Rejects utility will not stop the forced reject process. Use the Stop Forced Rejects button.



1) Any Part/ Single Machine Part/ Combined Machine Parts/ By Sampling Inspection (drop-down menu)

2) Reject one part, 'N' parts, or continuously reject from a specific machine part.

3) Sample Interval - Only reject parts every n number of intervals.

4) Select Machine Part

5) Rejector - Specify which rejector to force rejection of the part.

6) Start Forced Reject/ Stop Forced Reject

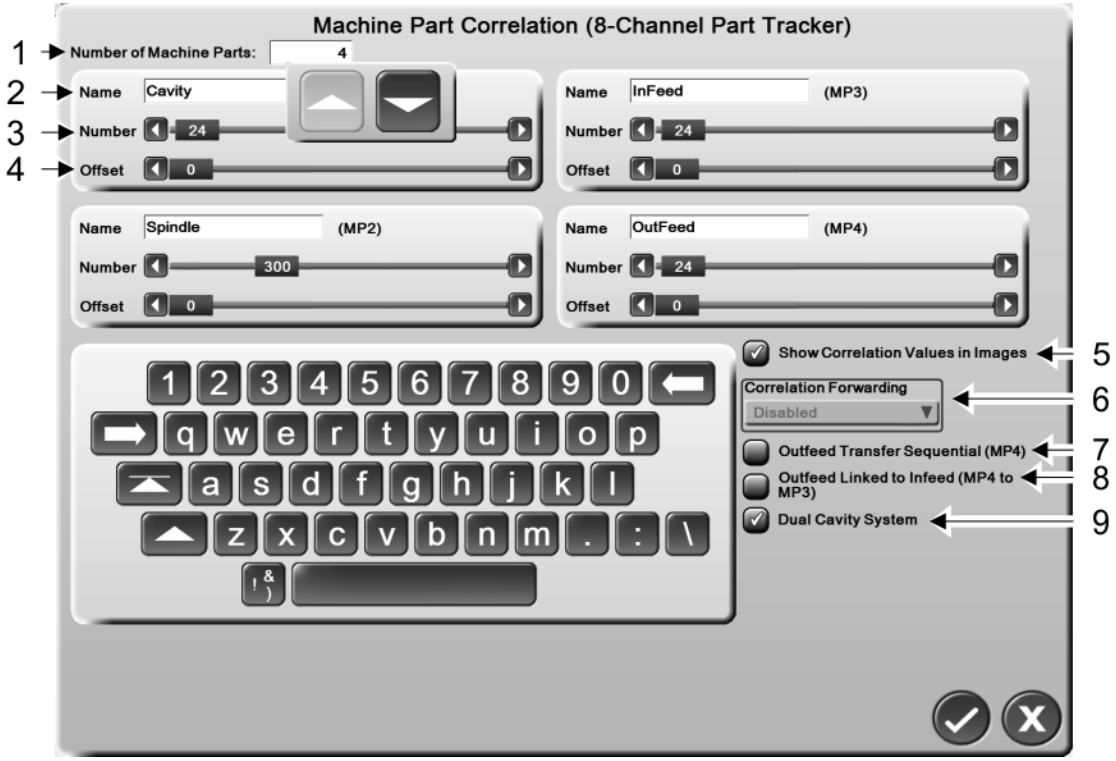
7) Status box - Displays information about the rejection process.

Machine Part Correlation

Configure up to four parts for correlation.

Note: this screen is usually set up by the Pressco installer

To get to this screen: From Lane or Sensor Overview mode, select Tools | Lane Setup | Machine Part Correlation.



1) **Number of Machine Parts** - Select the number of correlation sensors in your system (1-4). Note: If you only see two Machine Parts, you probably have a two channel Part Tracker board. This is the default configuration. If your system has an eight channel part tracker board, you must run the Discovery software and configure the lane for an eight channel part tracker board. Use the Edit Existing Lane function. This will provide the capacity for four Machine Parts to be configured.

2) **Name (correlation)** - Name each machine part to something recognizable to you (examples: Cavity, Spindle, or Liner Gun #1). This name is displayed on the Intellispec screens and throughout correlation reports.

Important: Do not name a machine part the same name as a sensor (example: BMID or Color Dot). This will cause errors if your system uses OPC. Instead, name the machine part descriptively, such as "Body-Maker" or "Spray Gun."

3) **Number** - Set the number of components in each machine part (example, number of pockets in a starwheel).

4) **Offset** - Change what the inspection system considers part #1 (or pocket #1) and the actual part. For example, if you reject a part from cavity #1, and the system rejects the part from cavity #2, then set the offset at 1. This ensures the inspection system tracks components properly.

5) **Show Correlation Values in Images** - Displays the correlation value in the images. These values are saved as part of the image file (if you save images).

6) **Correlation Forwarding** - This feature takes correlation information from one lane of inspection (slave lane) and forwards it to another lane (master lane). This is used when one lane has software correlation (inspections) set up, and the other lane does not. See also topic in Intellispec software guide.

7) **Outfeed Transfer Sequential** - (Only when four sensors are used, and only in blow molder installations) Specify whether the infeed and outfeed transfer arms are numbered Independently or Sequentially.

Example of Outfeed Transfer Sequential

> For example, your machine has 10 infeed transfer arms and 10 outfeed transfer arms. If they are numbered Independently, the infeed transfer arms are numbered 1 - 10, and the outfeed transfer arms are also numbered 1 - 10. If they are numbered Sequentially, the infeed transfer arms are numbered 1 - 10, and the outfeed transfer arms are numbered 11 - 20.

8) **Outfeed Linked to Infeed (MP4 to MP3)** - (Only in blow molder installations) Enable this to derive the outfeed correlation count (MP4) from the infeed correlation count (MP3). This is typical of most blow molders

Example of Linked to Infeed

For example, in an SBO20 machine, the infeed count will be from 1 - 10. The outfeed count will be from 11 - 20. Infeed count 1 will correspond to outfeed 11, and so forth.

Note: When this feature is enabled, the number of components is forced to be equal (number of components in MP3 = number of components in MP4).

Note: There is no index sensor for MP4 in the hardware configuration.

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9) Dual Cavity System - no function at this time.

Support Package

Create a Support Package

A support package is a set of files gathered by the Intellispec system to help find system problems. You will send this package to Pressco service specialists so that they can troubleshoot your system. This file can also back up your system configuration (not the entire system database).

> *Note: On rare occasions, the Intellispec software cannot be started, so you will not be able to access the support package tool from the user interface. It is possible to create the support package without Intellispec running by starting the following executable from Windows: C:\Pressco\bin\SupportPackaging.exe.*

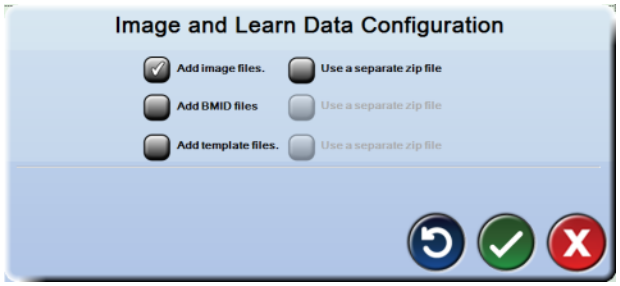
What you need:

- USB flash drive (128MB or larger). Connect this to the USB port
- If you have a ".pcf" file from a Pressco Support representative (to acquire additional system information), then copy that file to the USB drive prior to connecting it to the Intellispec system
- If you want to save images to send with the support file, then save images prior to creating the support file. Be sure to save them in the default image folders: C:\Pressco\Lane n\Images\Sensor n. See Saving Images.

To create the support package:

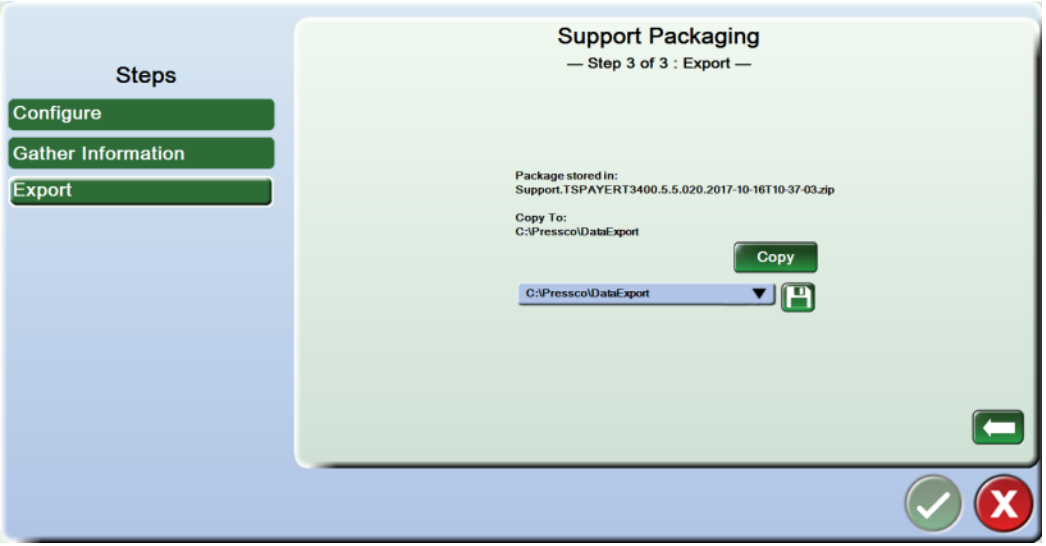
1. Select the Backup and Restore Menu | Create Support Package. The support package wizard is displayed.
2. (optional) At Step 1: Configure: add the ".pcf" file or images.

3. (optional) Check the Load custom configuration box. A .pcf file is a custom Pressco configuration file that gathers information beyond the standard Support Package. If a Pressco Support representative sent you a .pcf file, then connect the USB device that contains the .pcf file. Select the disk icon and browse to the location (USB drive) where the .pcf file is stored. The system locates the .pcf file.
4. (optional) Check the Add images and learned data to package box. A dialog (shown below) allows you to choose the type of images to include.



- **Add image files** - select images in the default image folder (example: C:\Pressco\Lane 1\Images\Sensor 1). All sensors and lanes for which you have images are included.
- **Use a separate zip file** - a zip file with "IMAGES" in the name is created along with the Support Package zip file. All sensors and lanes for which you have images are included. If you do not check this box, then the images are included in the main Support Package zip file.
- **Add BMID files** - if you have an inspection using BMID correlation, the images from the BMID folder are included (example: C:\Pressco\Lane 1\BMID).
- **Add template files** - if you have a Template Registration or Template Orientation inspection, the images from the InspectionTemplates folder are included (example: C:\Pressco\Lane 1\InspectionTemplates).

5.  Follow the instructions on screen. Use the forward arrows to move to the next screens.
6. When the steps are completed, verify that the Step 3: Export screen is displayed.



7. Select the USB Flash Drive in the "Copy to:" location.
8. Select the Copy button. The support package files are copied to the USB flash drive, then a "Copy Succeeded" message is displayed.

9. Select the OK button to continue.
10. Select the OK button at the bottom of the Support Packaging screen to exit.
11. Remove the USB flash drive.
12. Copy the files that were saved, including images, from the USB drive to your computer.
13. Send an e-mail to techsupport@pressco.com and attach the support package files. Pressco service/ tech support will respond within one business day, if possible.

Restore From Support Package

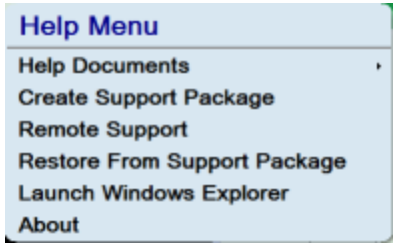
You can restore (import) a support package to a working Intellispec system. This allows you to use the same configuration on multiple systems without having to duplicate your efforts, or use a known good configuration created on another system or by Pressco Technical Support.

What you need:

- A USB flash drive with a known good support package on it
- Mechanical keyboard to enter a problem description (if backing up your current configuration)

To restore the support package:

1.  Select Home | Help | Restore from Support Package.



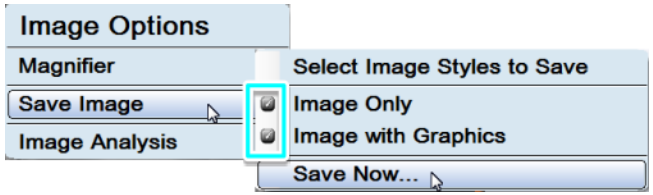
2. The system will suggest that you back up your current system. We recommend that you select the Create a Support File button to back up the system.
3. Follow the instructions on screen, and select the location of the USB drive that contains the support package you want to restore, when prompted.
4. Select the support package from the USB drive that you want to restore.
5.  Use the forward arrows to move to the next screens.
6. When the system says "Series V Application detected," select the Stop Application button to shut down the Intellispec software. This is necessary to restore the support package.
7. At step 4 on screen, select the Unpack Zip File button to restore the support package and wait for the system to unpack the files.
8.  When the system says "Unpacking Complete," select the forward arrow to move to the next screen.
9. Select the Restart Discovery button to restart the Intellispec application.

Save Images

There are several ways to save an image within the Intellispec system.

Save any image:

In most parts of the system, right-click over any image. Follow the instructions on screen. This is useful to save images to include with a Support Package.



Checked = enabled. Then click Save Now...

Image Only - bitmap (.bmp) image with no graphics. Note: only bitmap images can be loaded back into the Intellispec.

Image with Graphics - portable network graphic (.png) image with inspection graphics

The image is saved to the default location shown, unless you specify a different location. A default file name is provided for you. Select the key-board icon to rename the image.

Find information about other methods of saving images through the links below:

"Save Images Through the Sensor Menu" on page 98

"Auto-Save Images" on page 99

"Save Images through the Retro-Spec interface" on page 101

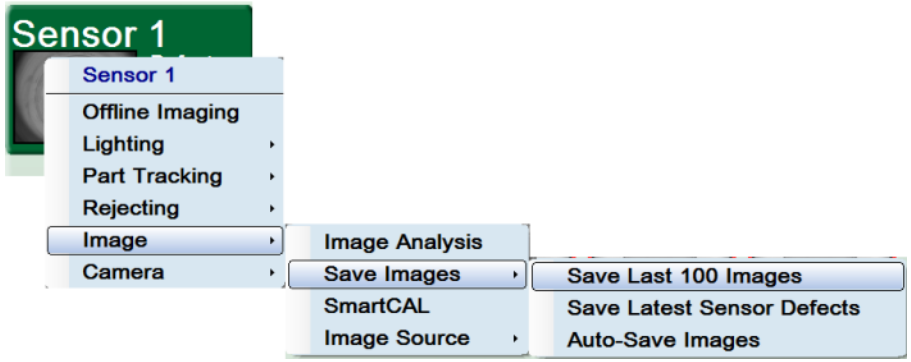
"Save Individual Images While Editing an Inspection" on page 104

"Save Reject Images" on page 105

"Save a Region of Interest (Unwrapped) Image" on page 106

Save Images Through the Sensor Menu

Save a set of images from one sensor (up to 100 images). You can save images whether the lane is online or offline. Right-click to see the menus.



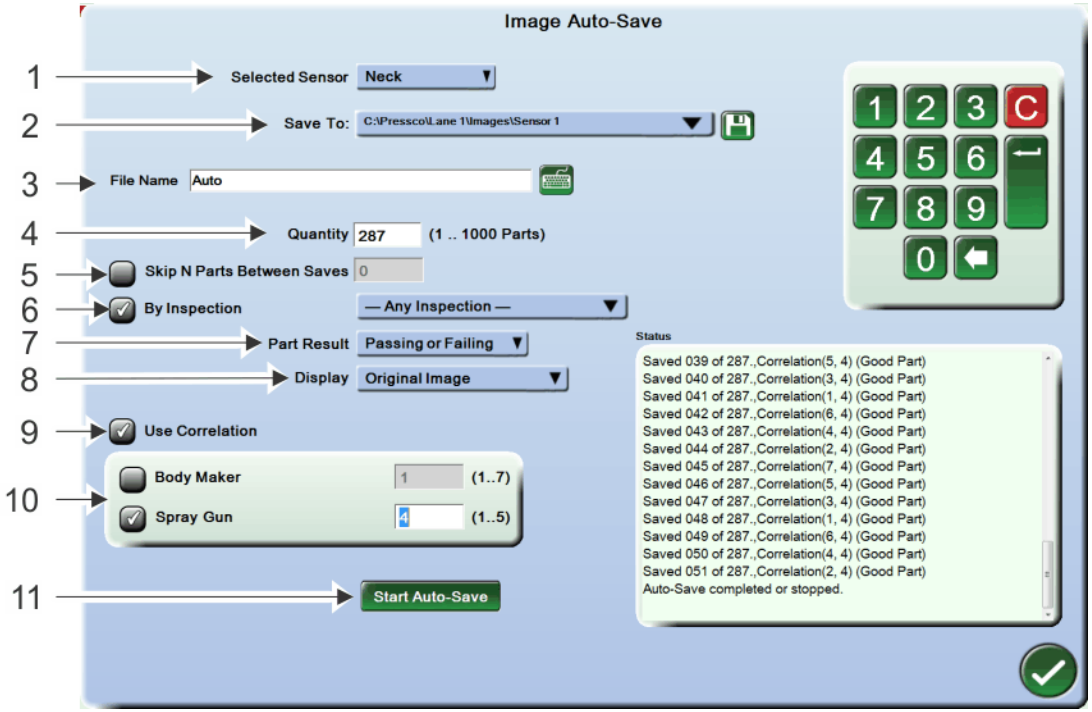
Save Last 100 Images - Save the last 100 images captured by the current sensor.

Save Latest Sensor Defects - Save the latest defect images shown in the Reject Images thumbnails, up to 100 images.

See also "Auto-Save Images" on the next page

Auto-Save Images

Save up to 1000 images from one sensor when the lane is online. To get to this menu: Right-click a sensor button | Image | Save Images | Auto-Save Images.



1) **Selected Sensor** - Select one or all sensors.

2) **Save To** - Select the location. To change the location, select the disk icon and browse to the desired location.

3) **File Name** - Create a file name, descriptive of the part you are inspecting. The system automatically adds numbers and letters to the name. Example: "Auto0001_S1_P.bmp." [0001] = image 1. [S1] = Sensor 1. [P] = part passed. [F] = part failed.

4) **Quantity** - Quantity of images to auto-save, up to 1000.

5) **Skip N Parts Between Saves** - Check the box if you do not want to save consecutive images. Enter the number [N] of parts to skip between saved images.

6) **By Inspection** - Only available when you have one sensor selected [in item 1]. Save images related to an inspection. Use the drop-down menu to select the inspection from the current part program.

7) **Part Result** - Save images that pass or fail inspection, or both. When images are saved, the file name contains [P] for passing or [F] for failing.

8) **Display** - Save the original image from the camera, or the image after centering, or the image after centering and orientation.

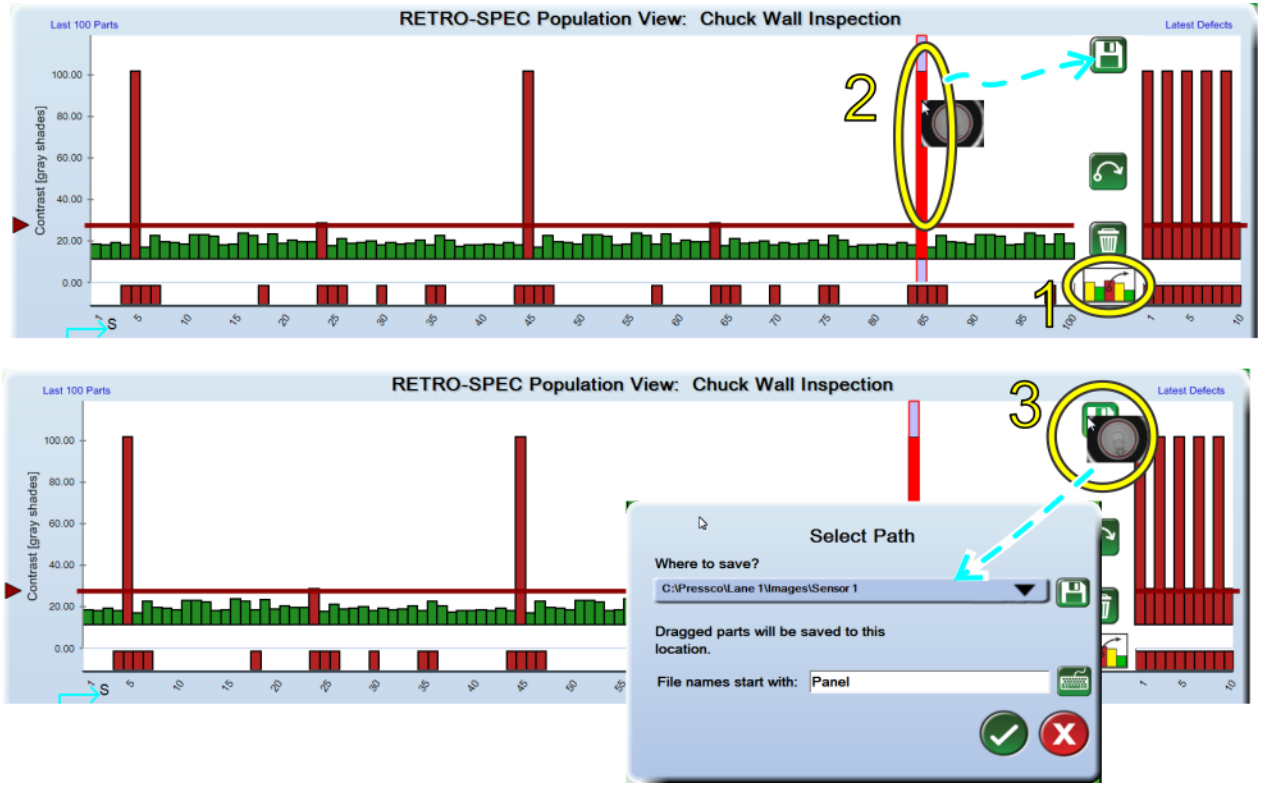
9) **Use Correlation** - [available if correlation is installed] Save images correlated to specific machine parts.

10) **Machine parts** - [available if correlation is installed] Select the machine part(s) to save images from. Also enter a machine part number in the box provided.

11) **Start Auto-Save** - Select Start Auto-Save to start saving images. Select Stop Auto-Save to stop the process. The lane must be online to collect images.

Save Images through the Retro-Spec interface

[1] Unlock, [2] drag image to disk [3]. Choose where to save the image.



Later, you can load the saved images for setting up a part program or testing.

Recommendations for Image File Management

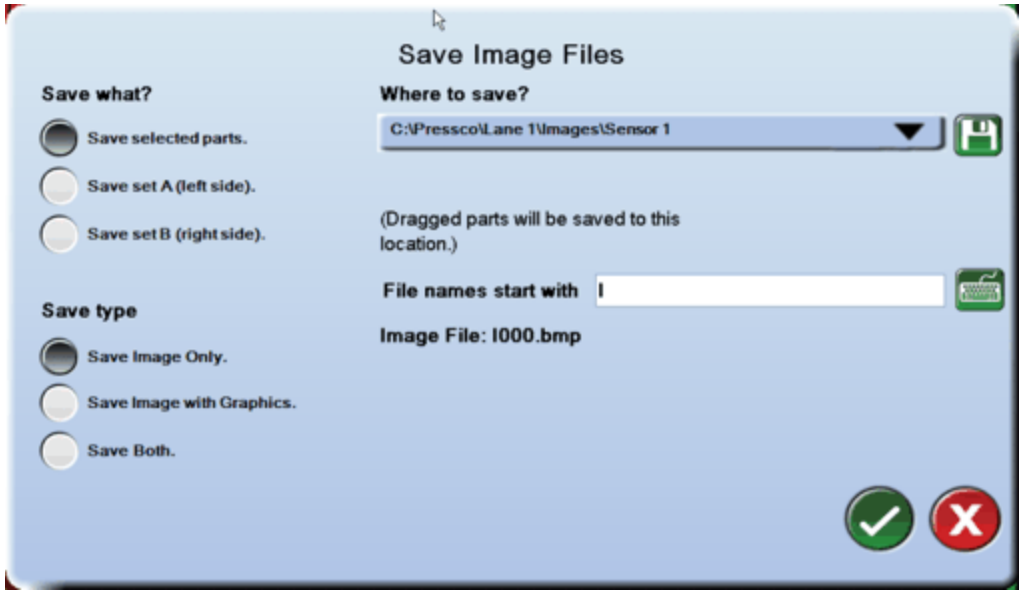
When you save the images for data sets to a folder, each image is given a unique name. Those original images are overwritten if you save images again. We recommend that you create new folders when you save images. Our recommendations are:

- Make new folders and give them meaningful names
- Add the word Defects (or Good) to the folder name to indicate that you are storing defects (or good images) for that inspection

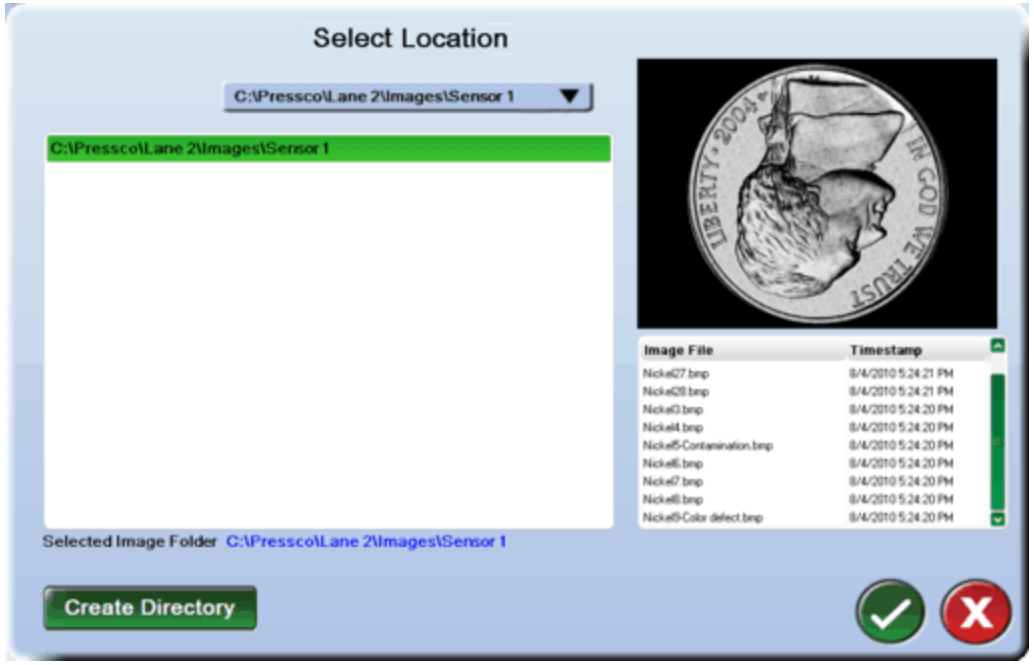
When you are saving images, you can create new folders (directories).

To create a new folder while saving images:

1. Select the disk icon on the Retro-Spec graph.



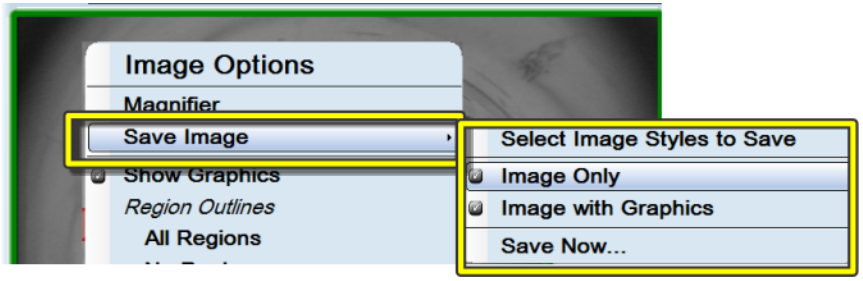
2. Select the disk icon to browse folders. The Select Location menu is displayed.



3. Select the button at the top of the menu to browse to the location for the sensor (example, "C:\Pressco\Lane 1\Images\Sensor 1\"). Note that you can also save images to a USB device.
4. Select the Create Directory button to create a new folder. Rename the folder something meaningful (example, sidewall). If you are saving images of defects, use Defects in the folder name.
5. Select the OK button to complete browsing and return to the Save Image Files menu.
6. Select the OK button to save the images. Depending where the images are being stored, it may take up to a minute to complete, especially if a USB device is used.

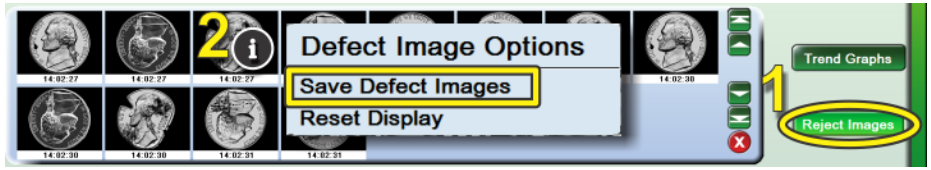
Save Individual Images While Editing an Inspection

Right-click over the image | Save Image | choose the desired option. The image can be saved whether the lane is online or offline.



Save Reject Images

Save up to 100 (*.bmp) images from defective parts. The lane can be online or offline.

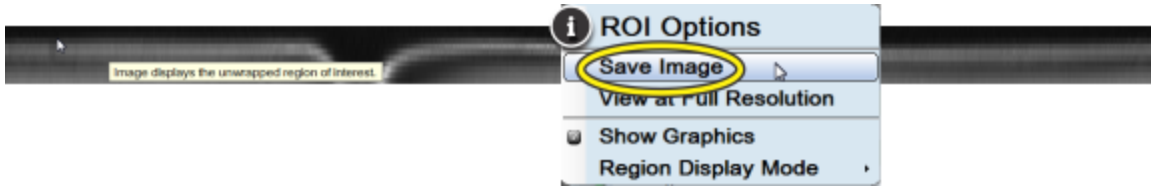


Reset Display - Resets the reject image display to show all failed parts, instead of images from only one part or one inspection.

Save a Region of Interest (Unwrapped) Image

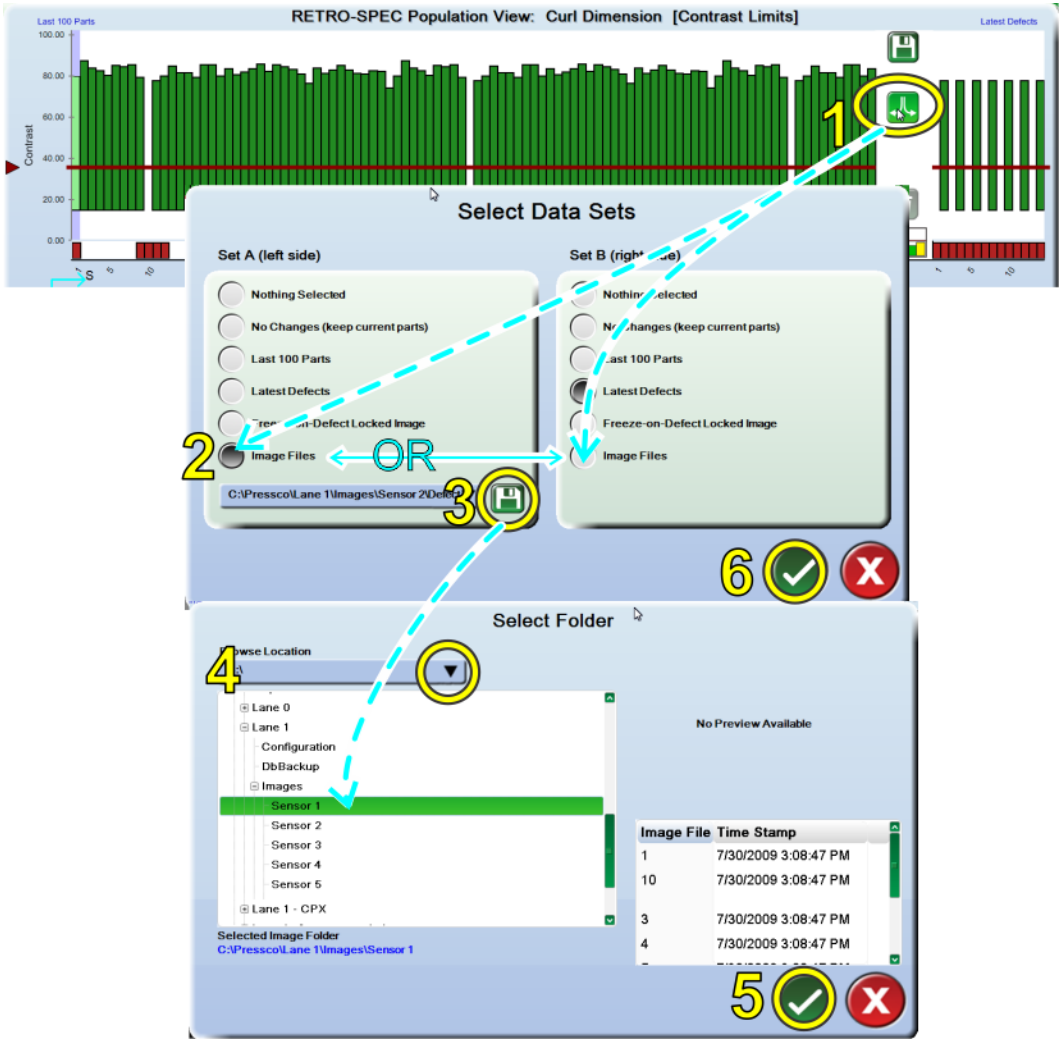
Save the unwrapped region display while you are editing an inspection. The image can be saved whether the lane is online or offline. The image is saved as a .png file.

> *Note: if you want to save graphics with the image, you must Show Graphics.*



Loading Saved Images

You can load saved images through the Retro-Spec interface. These images can be used to test part programs, or to set up a part program without the production line running. See also how to choose an Image Source through the Sensor menu.



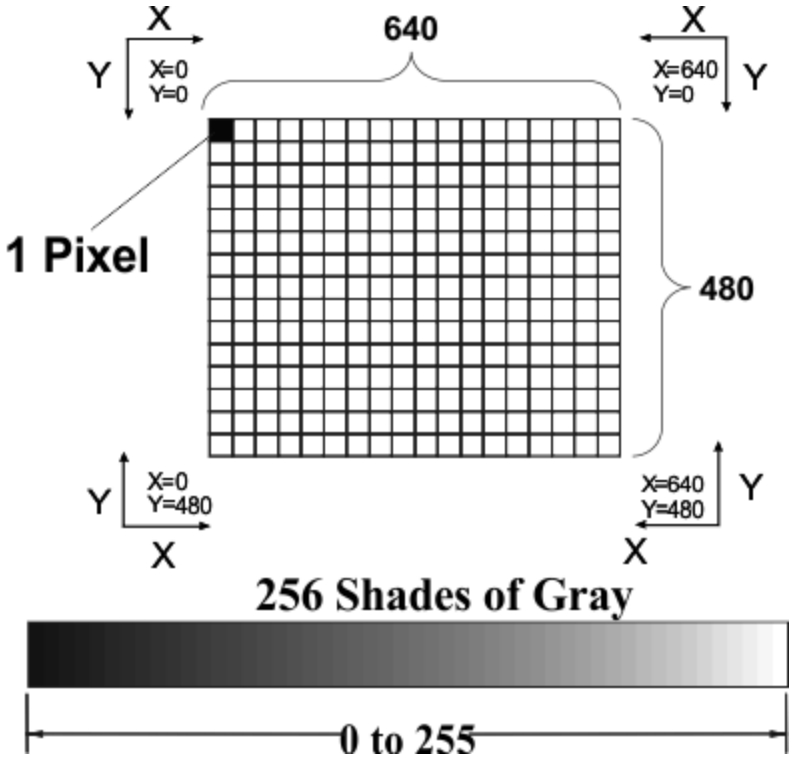
Introduction to Pressco Inspections

What is a pixel? - Pixel (picture element) is the smallest part of a digital image

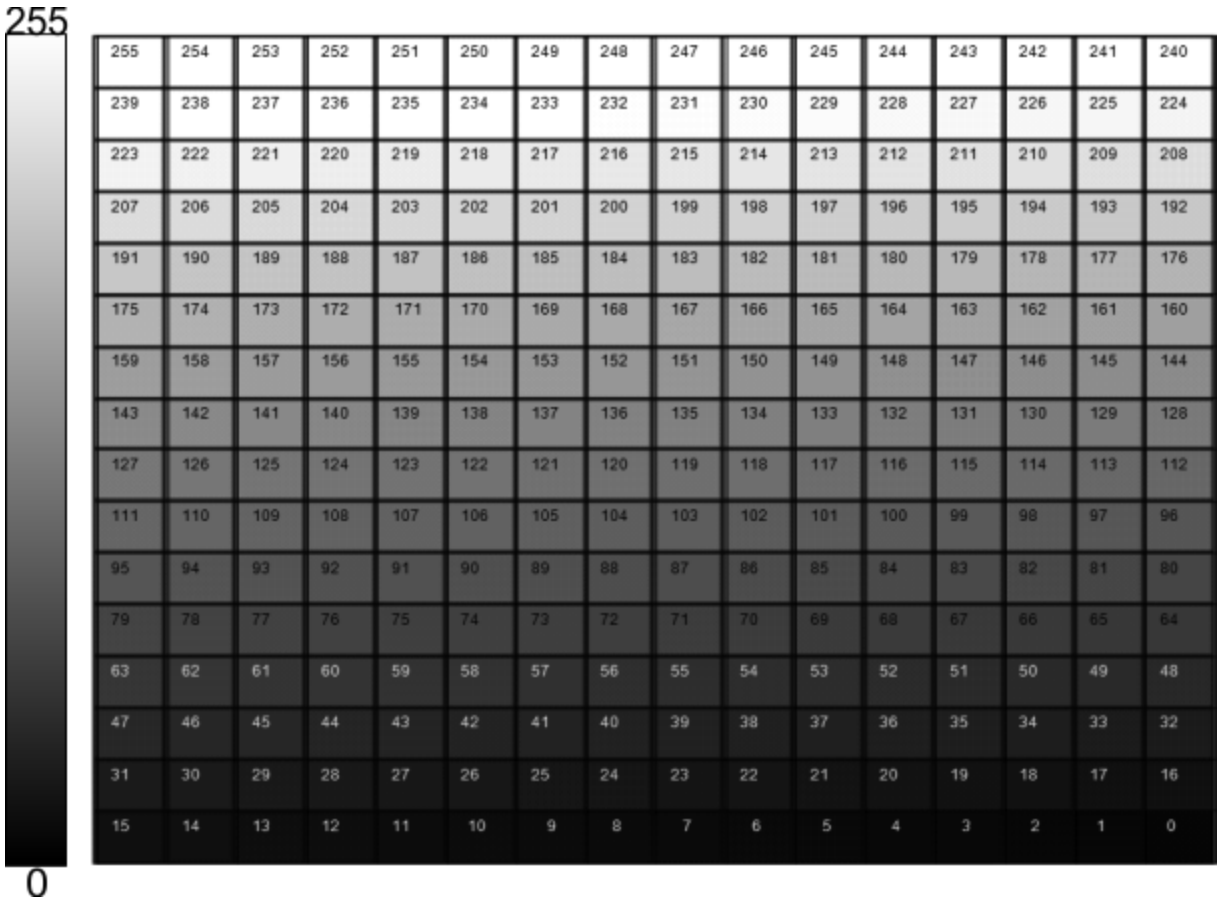
X/Y Location - All pixels have an X/Y location in an image.

Grayscale - The measured brightness of a pixel from 0 to 255

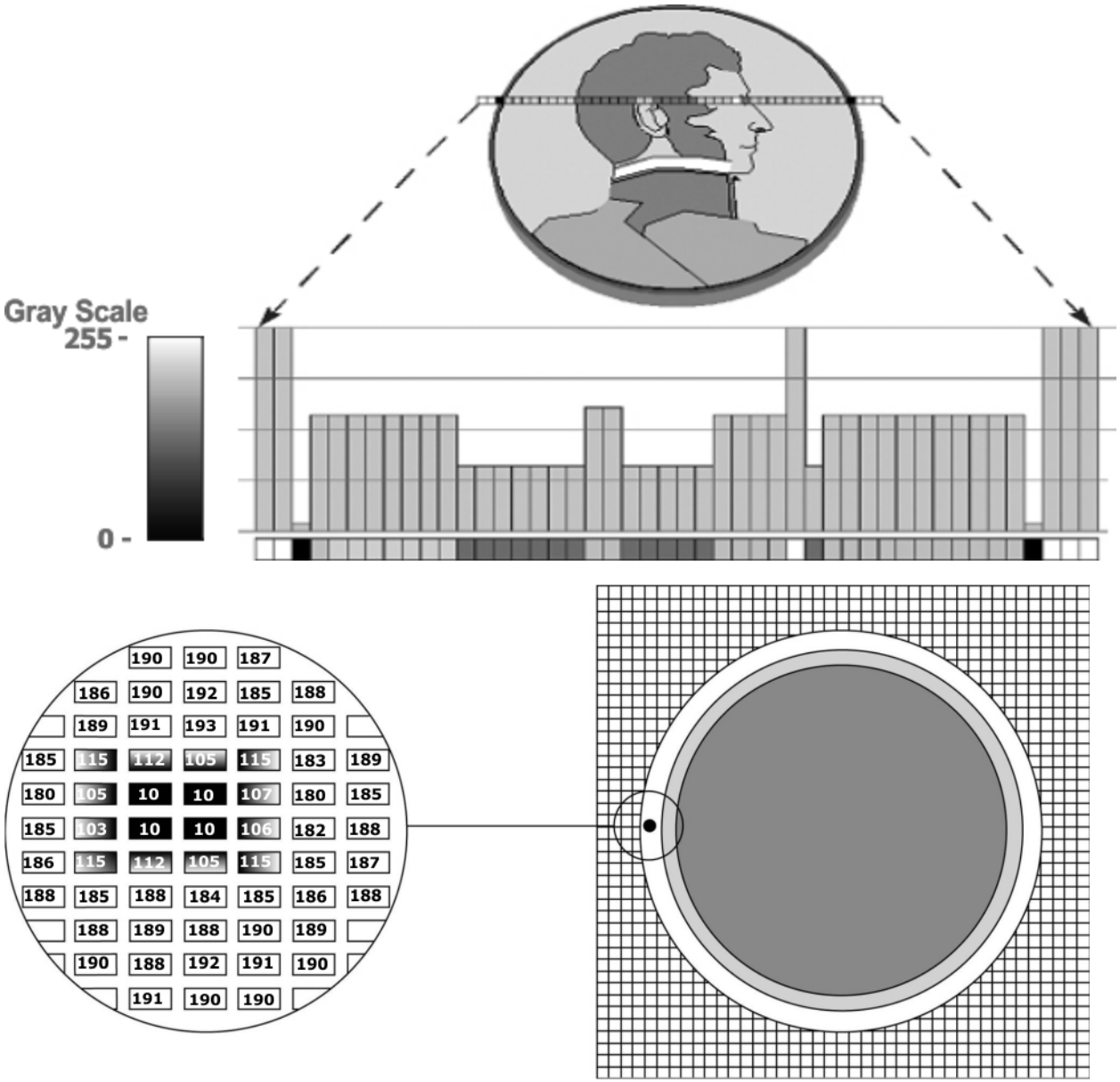
- 0 = black, the absence of light
- 255 = white, saturated with light



Pixel Grayscale Values

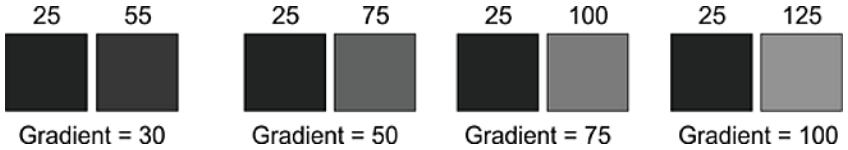


Examples of Grayscale

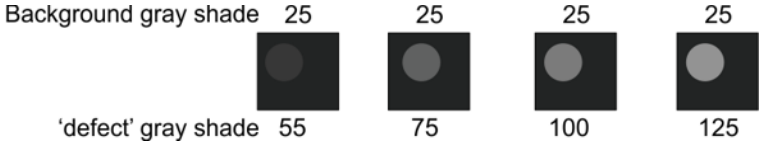


Gradient

The difference in gray shades between pixels being compared.

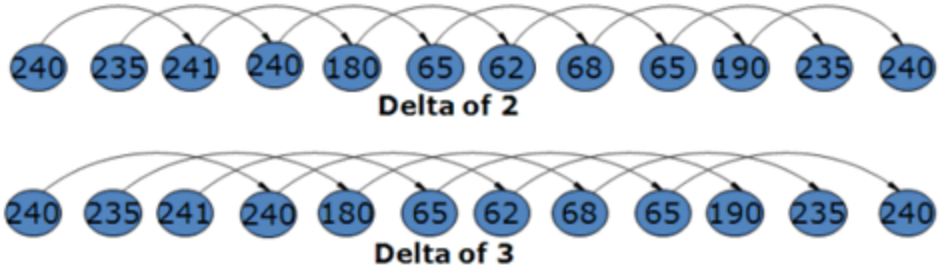


The illustration below shows the same gradient values as above, but displayed as an example 'defect.' In each case, the background is the same - 25 gray shade.



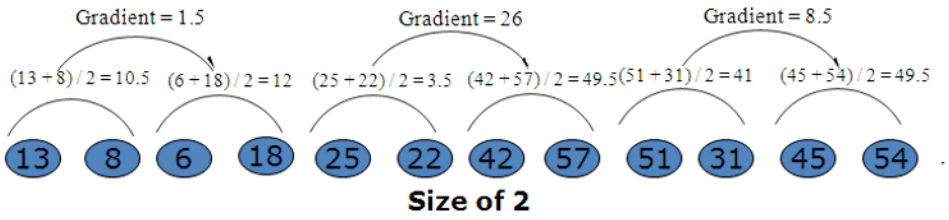
Delta

The distance between pixels being compared. Higher delta = greater sensitivity.

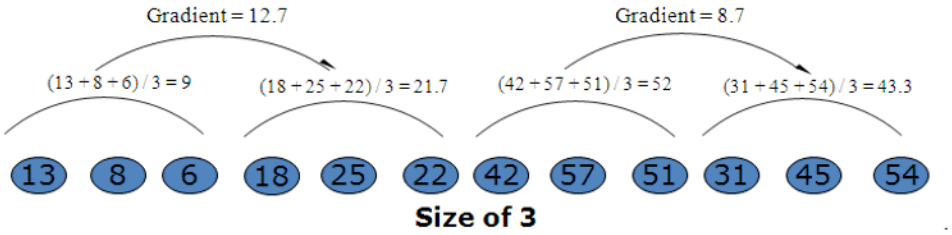


Size

The number of pixels in a group being compared. Greater size = lower sensitivity.



Size of 2

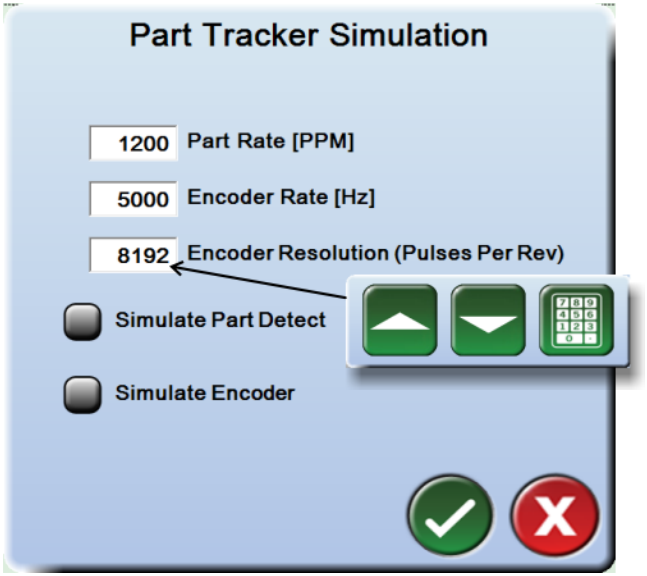


Size of 3

Part Tracker Simulation

Used for troubleshooting. A simulated part rate allows inspection to continue.

To get to this screen: From Lane or Sensor Overview mode, select Tools | Hardware Setup | Part Tracker Simulation.



To enable the simulated part tracker, select the check box and then enter the desired part rate in the window.

Part Rate - Enter a simulated part rate in parts per minute (PPM).

Encoder Rate and Resolution - Enter the simulated encoder properties.

> *Note: the system cannot run in both PDX mode and Part Tracker Simulation mode at the same time. If one mode is already running and you enable the other mode, the system displays a warning that the latest setting will override the previous mode.*

Offline Imaging

Acquire images when the lane is offline. To see this menu, right-click over a sensor button, then select Offline Imaging.

Triggered Mode

Single Image - a picture is taken every time the button is clicked. (it uses the part detector)

Run - pictures are taken continuously as each part triggers the part detect sensor.

Immediate Mode

Single Image - a picture is taken every time the button is clicked. (it does not use the part detector)

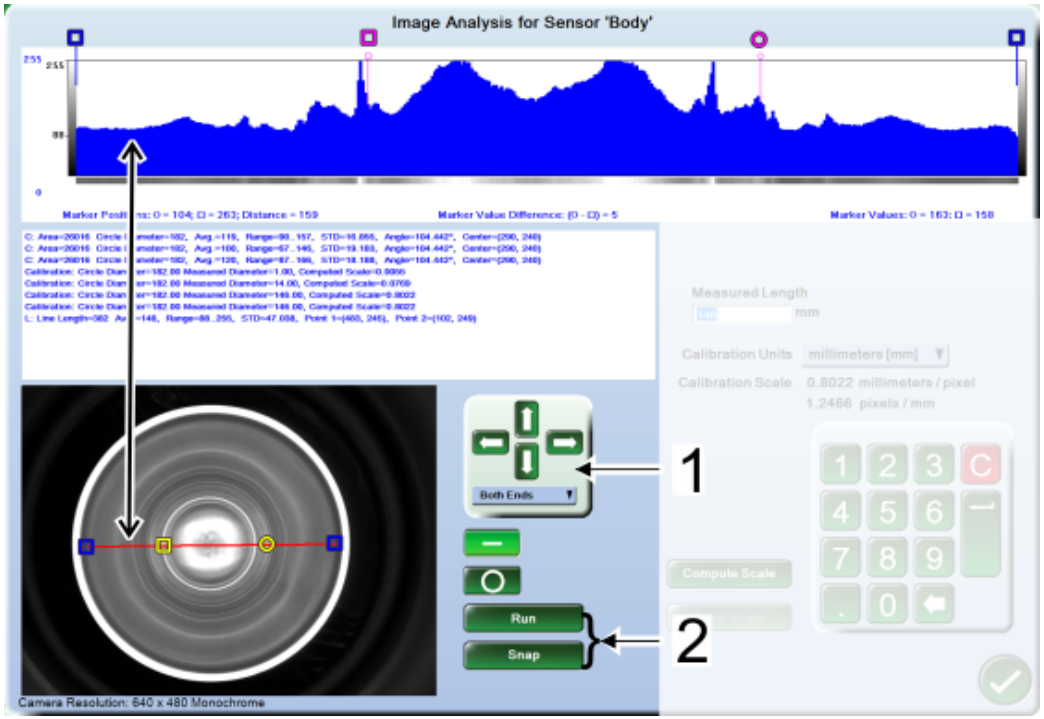
Run - the camera takes continuous pictures, using the "Image Update Interval." You see whatever is under the camera.

Image Analysis

Measure the gray shade value, or distance between, pixels in your image. This is available offline only.

Note: to quickly measure a gray shade in an image, use the Image Magnifier instead (click or right-click an image).

To get to Image Analysis: Make sure the lane is offline. Right-click a sensor button | Image | Image Analysis.



	Measure grayscale variations across a straight line
	Measure grayscale variations in a circular area
1	move
2	get more images
a b	Measure area a - move area b - resize area

Calibrating the Image Pixel Scale

Using Image Analysis

Image Analysis can be used to enter your actual measured values of your part and compute the units of measure per pixel. This is called Pixel Scale. This calibration can be used for any inspection on that sensor.

To compute the pixel scale:

1. Using a known good part, measure the length or diameter of an area on your part.
2. Enter that value into the Measured box.

3. Place a line or circle on the part image in Image Analysis over the same location used to measure your part. Place the markers of the line, or a circle at the edges where you want the system to measure your part.
4. Click the Compute Scale button. The system computes the pixel scale and displays the values.
5. To save the scale to the Sensor file, click the Save Scale button. The pixel scale is saved with the sensor and can be used for any inspection on that sensor.

Using an inspection

Pixel scale can be calibrated for an individual inspection or sensor. When Save Calibration is used in these inspections, you can use the calibrated information in other inspections for that sensor. The inspections that perform pixel scale calibration are:

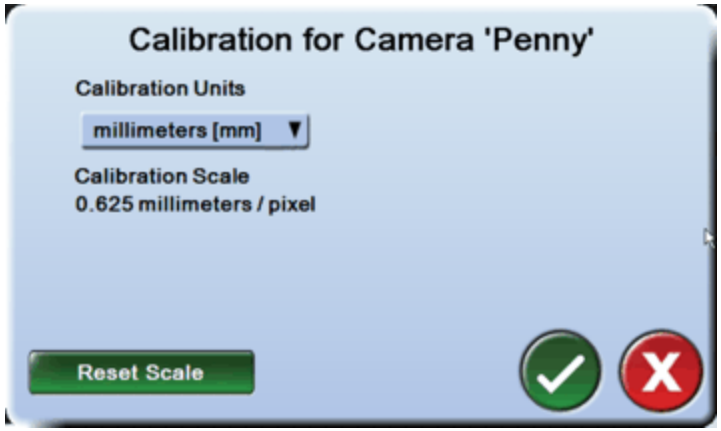
- Measurement
- Fill Height
- Fill Height - Segmented
- Neckring Registration
- Distance

Select Measurement Unit (Review Camera Calibration)

Select a measurement unit. If you switch between inches and millimeters, the pixel scale is automatically converted. Calibration to pixel scale is performed in Image Analysis or some inspections such as Measurement or Fill Height. Calibration is used to compute measurements on a part.

The unit you select in this menu is displayed in the Inspection menus: "p in a circle" for pixels, mm for millimeters, " for inches, or blank for custom units.

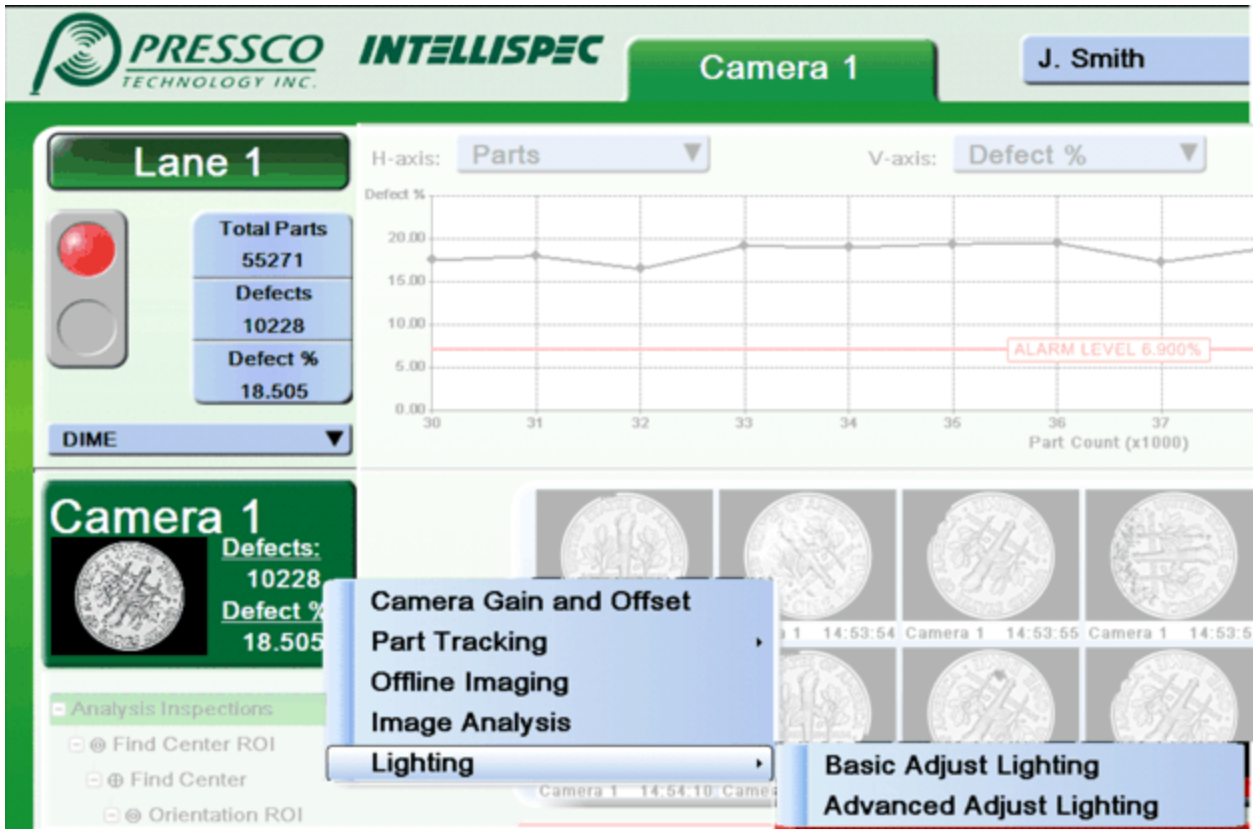
To get to this menu, right-click over a Sensor button | Camera | Review Camera Calibration.



Notes:

- If you switch from mm to inches or the opposite, the scale is converted for you. However, if you switch to custom or pixels between mm and inches, then the scale is not adjusted for you.
- If you switch to pixels, the scale is set to 1.0. The scale will revert back to your calibrated value if you switch from pixels to another unit.
- The Reset Scale button sets the scale to 1.0 for any unit you have selected.

Lighting - access



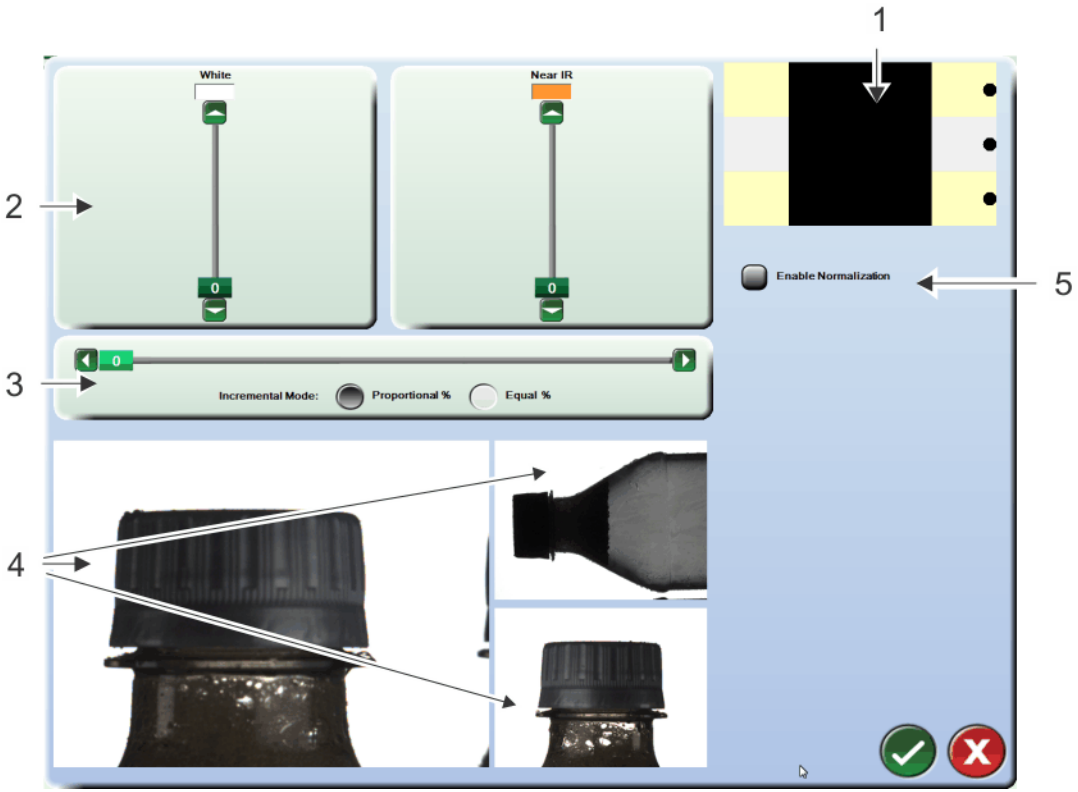
To access the lighting software:

1. From Lane Overview mode, right-click on the desired sensor button.
2. Select Lighting.
3. Select Basic or Advanced lighting. For most adjustments, Basic lighting is adequate. Advanced Adjust lighting is used by Pressco engineers or for making infrequently performed specialized settings.

Basic Adjust Lighting

Basic lighting provides most of the lighting adjustments you will use. Lighting must be adjusted while the lane is offline.

To get to this screen: Right-click over a sensor button | Lighting | Basic Adjust Lighting.



1) Select a zone to adjust it. You can select a single zone or multiple zones. As lighting is changed, the zone and the button next to it change color.

2) Separate slider bars for each color (red, green, blue, and infrared) allow individual adjustment.

3) Proportional % - Moving the slider bar adjusts all colors but maintains the current percentage of each color.Equal % lighting - Each color is adjusted by the same amount.

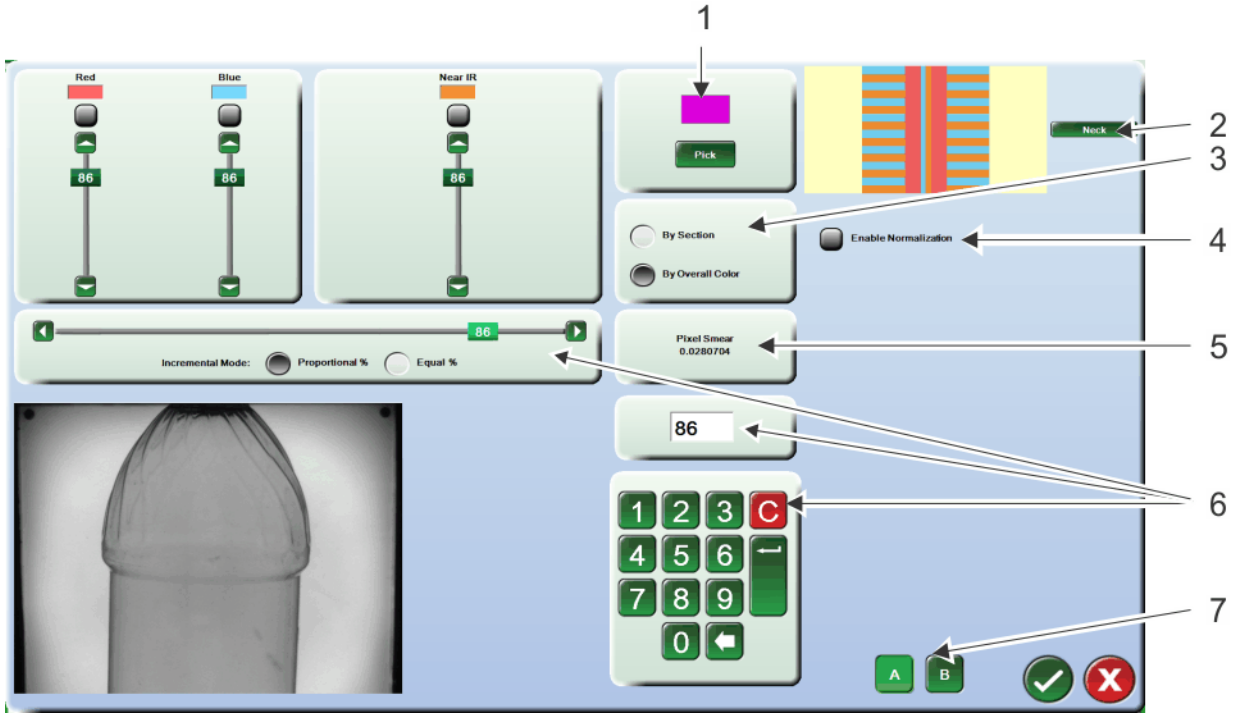
4) Select any image (if applicable to your system) to select the camera to adjust lighting.

5) Enable Normalization - (or Disable Normalization). For most applications leave normalization disabled. If you are modifying an old part program that has normalization enabled, then leave it enabled.

Advanced Adjust Lighting

This screen provides additional lighting setup. This is mostly used by Pressco engineers, or for making infrequently performed specialized settings. Lighting must be adjusted while the lane is offline.

To get to this screen: Right-click over a sensor button | Lighting | Advanced Adjust Lighting.



1) Opens a color palette and allows you to choose preselected colors.

2) If your inspection module has different lighting arrays, click one of the array buttons to adjust lighting by zone.

3) By Section - Change lighting by each section. By Color - Change lighting for multiple sections at once.

4) Enable Normalization - (or Disable Normalization). For most applications leave normalization disabled. If you are modifying an old part program that has normalization enabled, then leave it enabled.

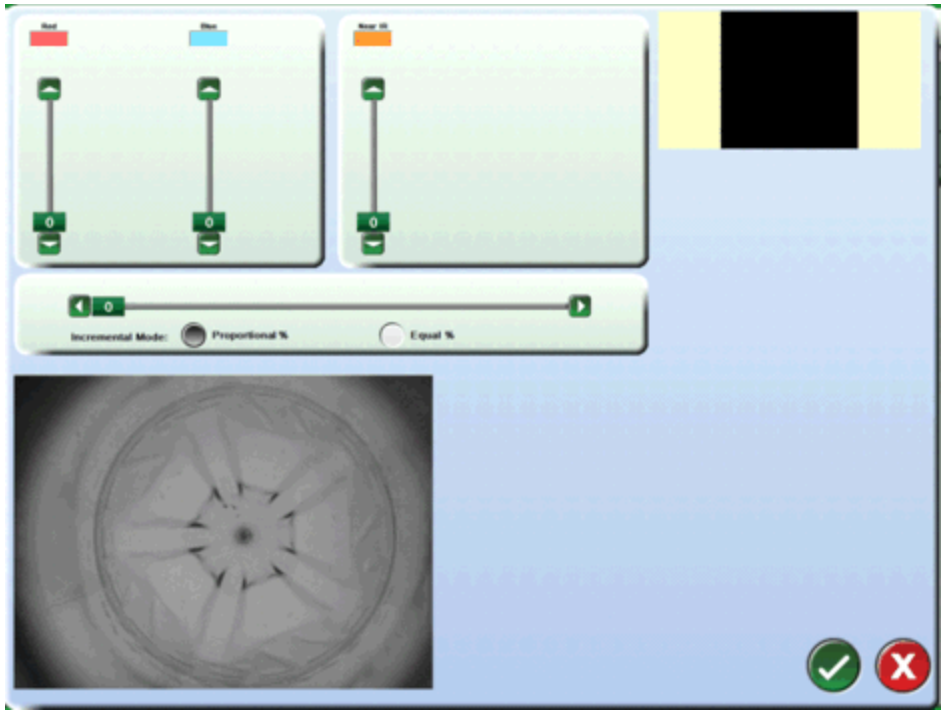
5) Pixel Smear - The Intellispec computes the amount of pixel smear from lighting, image size, and part rate. It should be kept below one.

6) On-screen keypad - enter the percentage of color. This also moves the percentage slider.

7) A/B buttons - Set up two different lighting settings for the same part so you can compare.

Base, Neck, Seal Lighting Adjustments

Base and Neck Lighting



Both Base and Neck cameras use a light array with Red, Blue, and Infrared LEDs.

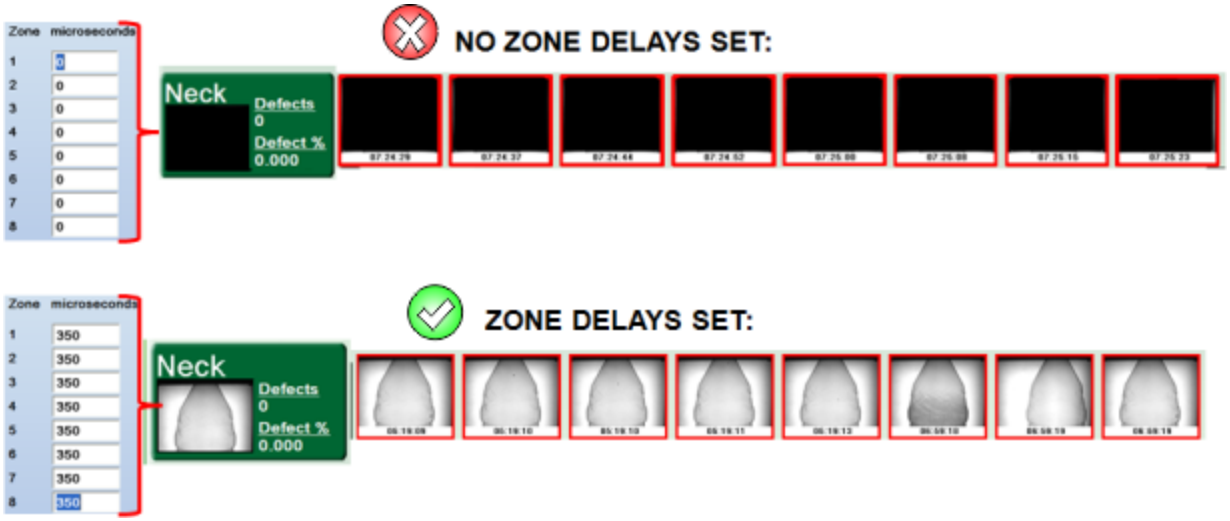
Red - detect off-color bottles

Blue - detect pearling

Infrared - detect defects in darker bottles (uses infrared to see through bottles)

Neck Camera - Advanced Light Adjustment

The Neck Camera light settings MUST have the Zone Delays set at 350 microseconds. Typically, this is set by a Pressco technician, but if this has not been done, the Neck Camera icon and the Neck Camera rejected images will be blank, like this example:



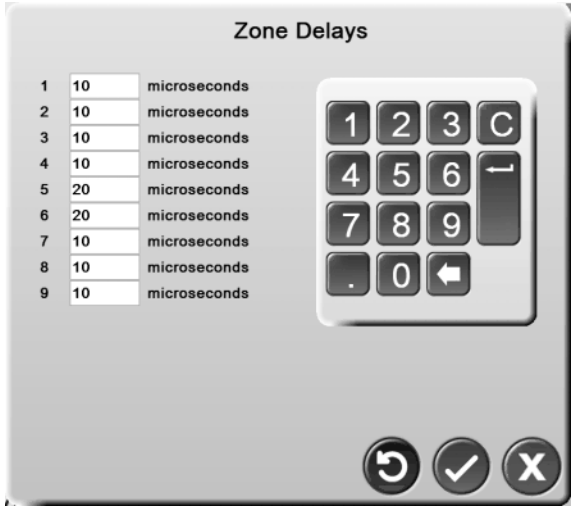
Advanced Lighting Software - Set Delay

This provides a strobe delay for a camera, so that the lighting for all cameras does not all occur at once. For example, in a Base and Neck inspection system, the Base and Neck part present signal occurs at the same time. A lighting delay is required so that the Base is lit separately from the Neck.

> *Note: this setting is normally done in the Pressco factory. You should not need to adjust it.*

To get to this screen:

1. Right-click over a Sensor button to see the sensor menu | Lighting | Advanced Adjust Lighting.
2. In the upper right corner of the lighting screen, click one of the array buttons to go to the zone adjustment screen.
3. Click the Set Delays button. The Zone Delays menu is displayed.

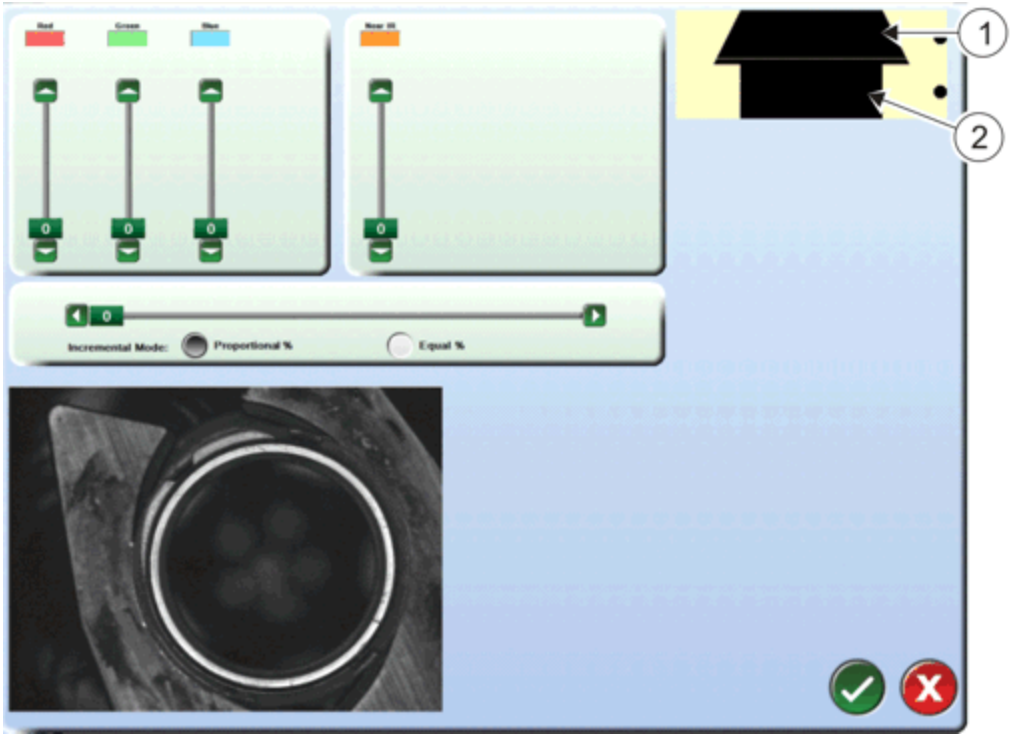


To adjust zone delay:

1. Enter the number of microseconds for each zone with the keyboard. The normal setting for the Neck camera is 350 microseconds on each zone.
2. Click the OK button to save changes and exit the menu.

Note: this delay is separate from the Strobe Delay set in Part Present Delay Calibration.

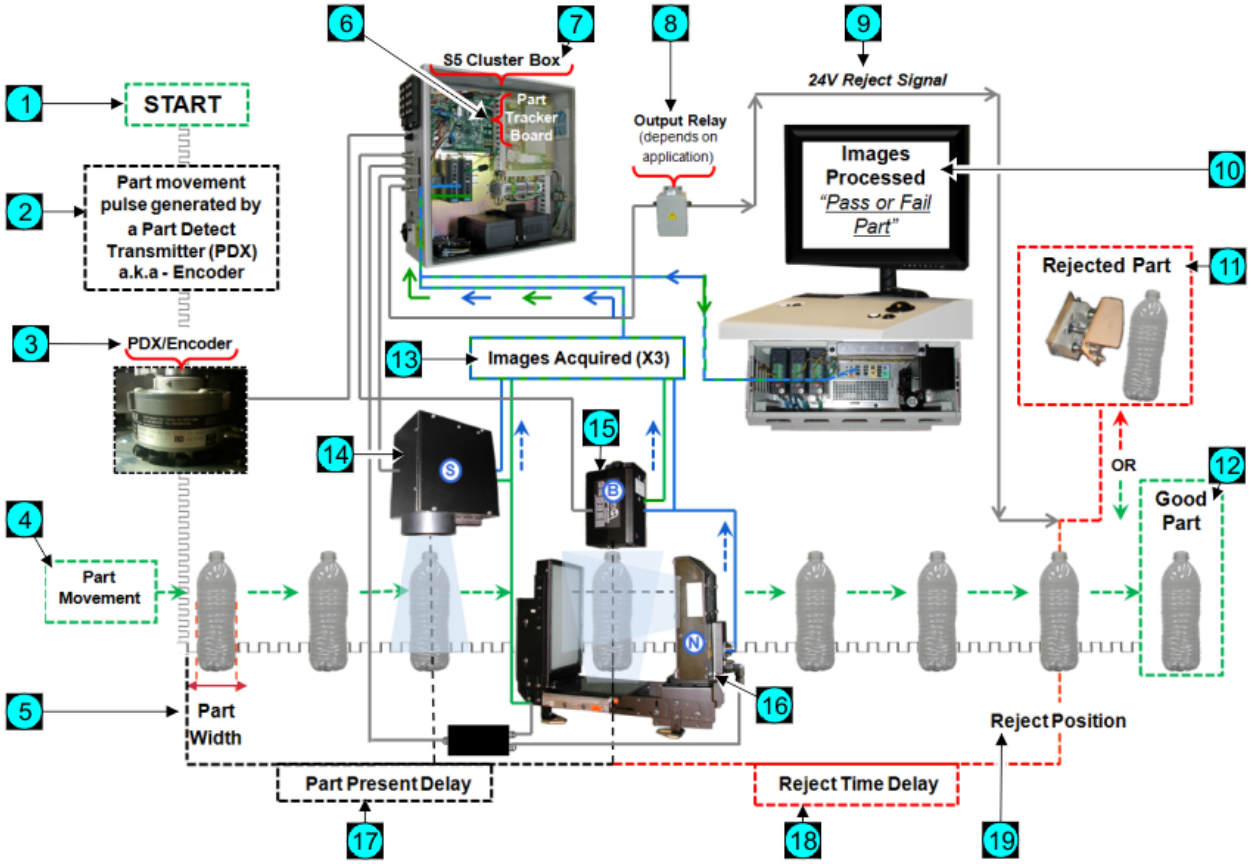
Seal Lighting



The Seal light array uses a wider 'main' light [item 1] and a narrower 'fill' light [item 2].

- You can select either the Main or Fill lights by clicking on the graphic at the top right of the screen
- Both of these lights use red, green, blue, and infrared LEDs.

Sequence of Events (PET)



1 - Start

2 - Part movement pulse generated by a Part Detect Transmitter (PDX) - or encoder

3 - PDX/ Encoder

4 - Part movement

5 - Part Width

6 - Part Tracker board

7 - Cluster Box

8 - Output Relay - depends on application

9 - 24V reject signal

10 - Images processed - pass or fail part

11 - Rejected part

12 - Good part

13 - Images acquired (three images)

14 - Seal surface inspection module

15 - Base inspection module

16 - Neck inspection module

17 - Part present delay

18 - Reject time delay

19 - Reject position

Part Tracking Terminology

Part Width - The number of encoder ticks that the part sensor "sees" the part.

Part Present Delay - The distance (in encoder ticks) from the part detect sensor to the camera centerline. If a PDX is used, this is the number of encoder ticks from the part detect pulse out of the PDX to the camera centerline.

Reject Dwell or Reject Pulse Width - The duration (in milliseconds) of the reject signal. This signal must be long enough to ensure the part is efficiently rejected, and short enough to ensure that only one part is rejected for each reject pulse.

Adaptive Reject - This feature is necessary when you have a significant change in product speed, since the rejector has a constant turn-on time. This logic allows the system to monitor the product speed and compensate the pulse being sent to the rejector.

Reject Confirm - Not commonly used. This is the distance in encoder pulses from the reject mechanism to the reject confirm sensor (if installed).

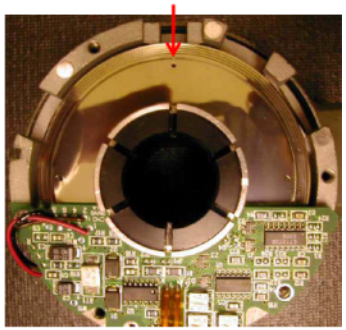
Encoder

Encoder - A device used to indicate mechanical motion with a pulse rate directly proportional to line/ conveyor speed. The system tracks part movement through encoder ticks, from the moment the part is detected until it passes the reject station.

Encoder/ PDX "Timing Wheel"

Encoder sensor counts pulses to know the position of the part

The encoder "Z" indicator is used to zero the count when the wheel has turned a full 360 degrees



Part Tracking Using a PDX

The Part Detect Generator (PDX) is used in some applications where the Intellispec system inspects directly on a machine, rather than on a conveyor. The PDX is a circuit built into the Part Tracker board.

If a PDX is used, part tracking is done by:

- Monitoring the movement of the transfer wheel (or other machine component) with the encoder
- Feeding the signal to the software
- Programming the software with the resolution of the encoder and the number of pockets used
    - This generates a part detect pulse for every pocket
    - This part signal is used to acquire part images and generate reject pulses

An empty pocket inspection must be applied if using a PDX. The PDX tracks pockets, not parts, so the empty pocket inspection determines whether the part is in the pocket.

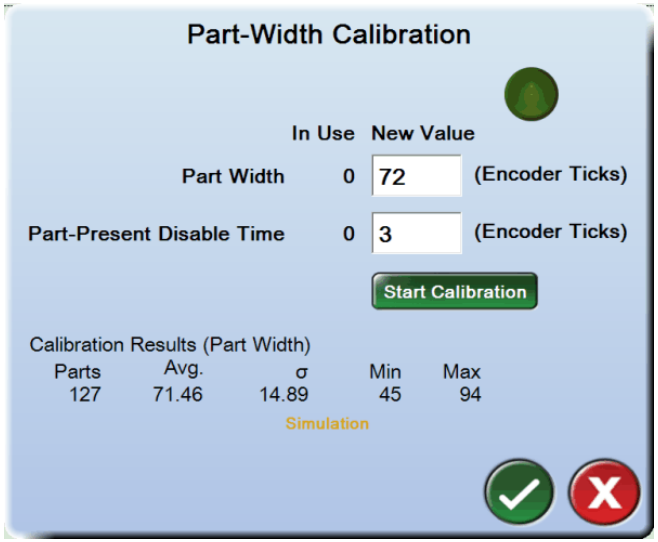
Advantages of using a PDX:

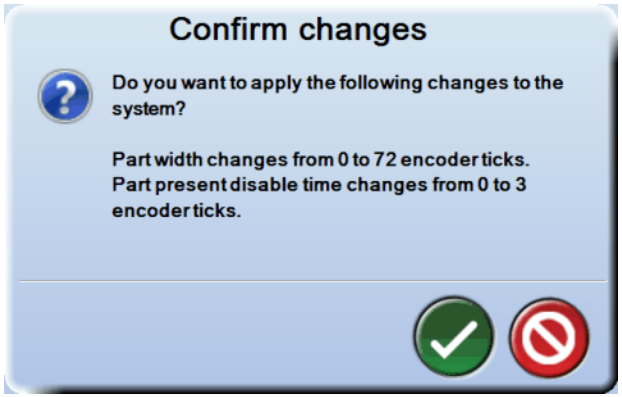
- No part detect sensor is used and therefore no component can be accidentally moved by a machine crash or during maintenance
- Part timing should not be affected when running different parts

Part Width Calibration

Part Width is the number of encoder ticks that the part detect sensor "sees" the part. To perform the calibration you must be running parts past the part detect sensor.

For systems using a PDX, the Part Width Calibration is not used, but values of 0 and 1 should be used respectively for Part Width and Part Present Disable Time.

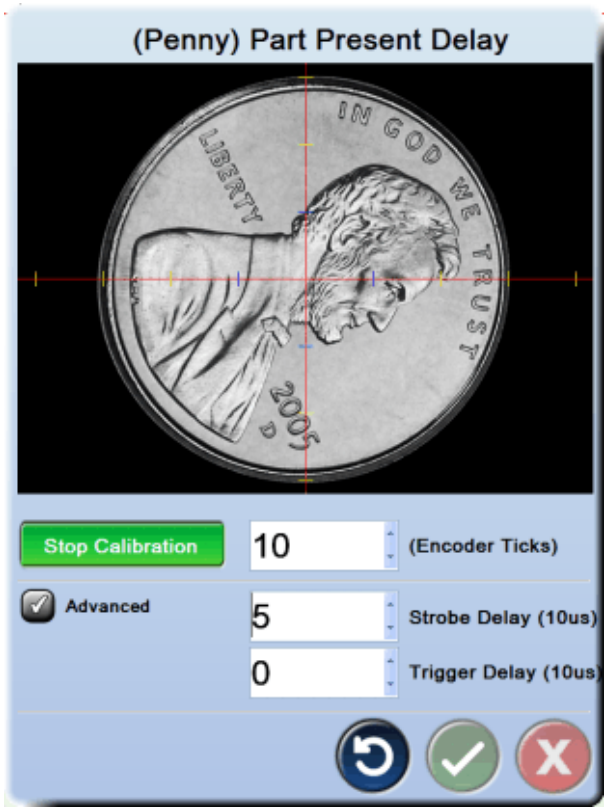




To calibrate the Part Width:

1. From Sensor Overview mode, right-click a sensor button | Part Tracking | Part Width Calibration.
2. With parts running under the camera or sensor, select Start Calibration. As each part goes by its width is displayed in Part Width field.
3. After a sufficient number of parts have gone by (we recommend about 10 parts), select "Stop Calibration" (same button as Start Calibration). This will display the calibration results in the lower part of the screen.
4. Examine the results; look for the minimum and maximum values to be within approximately 10 encoder ticks of each other. If the results are acceptable select OK to save the data. If the results are skewed, recalibrate the part width. To exit without saving the changes, select the exit button.
5. The system will prompt you to confirm your changes. If the results are acceptable select OK to save the data. If the results are skewed, select the cancel button and recalibrate.

Part Present Delay Calibration



To calibrate the Part Present Delay:

1. From Sensor Overview mode, right-click a sensor button | Part Tracking | Part Present Delay Calibration.
2. Select the Start Calibration button.
3. Place a part onto the conveyor or into the part stream. The part will trigger the part detect sensor, then the system will count the number of encoder ticks and take a picture.
4. Manually adjust the part present delay (encoder ticks) value until the image is centered every time a part is run through the system.
5. When completed, select the Stop Calibration button. The Part Present Delay calibration value is saved and stored in a Lane configuration file.
6. Select the OK button to save changes and exit.

Part Present Delay - Advanced settings BNS

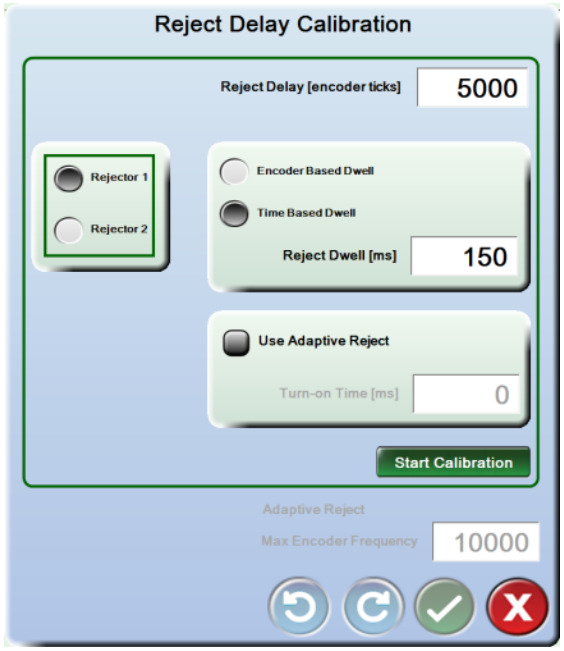
Note: Advanced settings are normally set at the Pressco factory. You should not need to adjust them. Normal settings are listed below.

Camera	Strobe Delay	Trigger Delay	Part Present Delay
Base	5	0	same as Neck
Neck	5	30	same as Base

Also check "Advanced Lighting Software - Set Delay" - set delay to make sure that the Neck lighting delays are set correctly.

Reject Delay and Dwell Calibration

Calibrating Reject Delay and Dwell takes time and patience. In preparation, gather several different preforms if available, and/or use a marker to create 'defects' on preforms. Use as many preforms as it takes to complete proper calibration.



To calibrate the Reject Delay:

1. From Sensor Overview mode, right-click a sensor button | Rejecting | Reject Delay Calibration.
2. Select the Start Calibration button.
3. Place a part on the running conveyor or into the part stream. After the number of encoder ticks shown in the Reject Delay box, the rejector will be activated.
4. Make sure the correct part was rejected.
5. Continue to insert parts into the part stream.
6. Manually adjust the reject delay (encoder ticks) until the correct part is rejected every time.
7. Adjust Reject Dwell so that it is long enough to completely reject the part, and short enough that only one part is rejected for each reject pulse.
8. When completed, select the Stop Calibration button. The Reject values are saved and stored in a Lane configuration file.
9. Select the OK button to save changes and exit.

Reject Delay and Dwell Calibration BNS

Note: Adaptive Reject is not used in BNS
Note: Calibrating Reject Delay and Dwell takes time and patience. In preparation, gather several different preforms if available, and/or use a marker to create 'defects' on preforms. Use as many preforms as it takes to complete proper calibration.

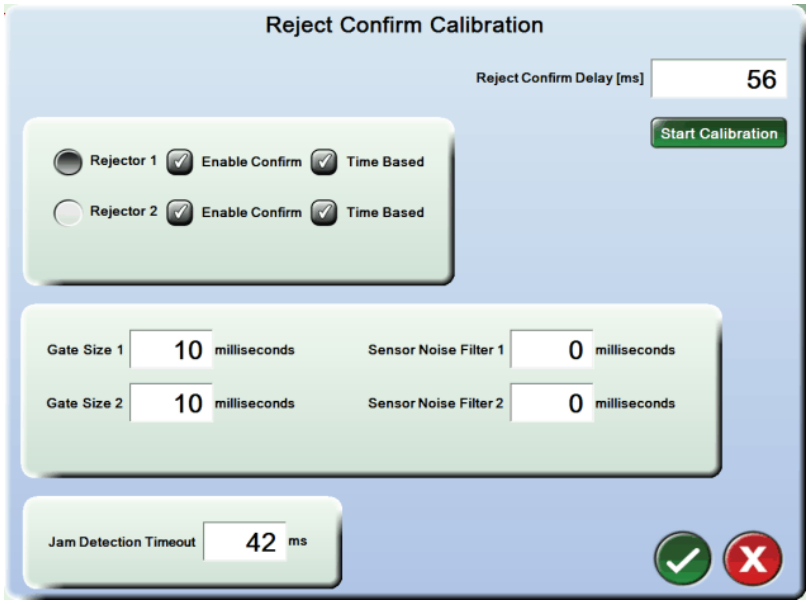
Adaptive Reject Calibration (optional)

Note: Adaptive Reject is not used in BNS

To calibrate Adaptive Reject:

1. Run the conveyor at maximum speed for about 35-40 seconds. This programs the adaptive reject logic for maximum product speed.
2. Go to the I/O Diagnostics screen and record the encoder rate while the line is running at max speed.
3. Go to the Reject Delay Calibration menu: Right-click over a sensor button | Part Tracking | Reject Delay Calibration.
4. Select the check box: Use Adaptive Reject.
5. Set the Max Encoder Frequency to the value you recorded in step 1.
6. Set the reject device Turn On Time (usually about 10 ms for air rejectors and about 15 ms for the pusher rejector).
7. Select the OK button to save changes and exit.

Reject Confirm Calibration (optional)



To calibrate Reject Confirm:

1. From Sensor Overview mode, right-click a sensor button | Rejecting | Reject Confirm Calibration.
2. Check Enable Confirm.
3. If using time-based Reject Confirm, then also check the Time-Based box, and set Gate Size, Sensor Filter and Jam Detection Timeout.
4. Select the Start Calibration button.
5. Run a part through the system. Tip: for best results, run about 10 parts through the system.
6. When completed, select the Stop Calibration button. The system will compute Reject Confirm Delay. [Reject Confirm Delay = (number of pulses from Part Detect to Reject Confirm Sensor) minus Reject Delay]
7. Select the OK button to save changes and exit.

The following parameters are used only with Time-Based Reject Confirm:

Gate Size - The time interval (in milliseconds) that the system looks for the product to pass by the reject confirm sensor. The valid range is 1 to 63 milliseconds.

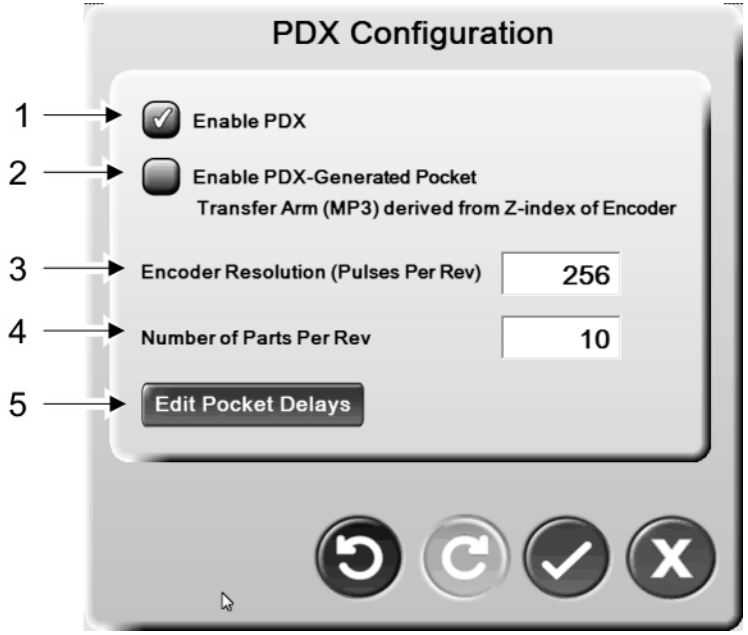
Sensor Noise Filter - The shortest pulse width (in milliseconds) that the reject confirm sensor will pass. This is used to filter out glitches or noise. This is usually set much smaller than part width, but larger than glitches or noise. The valid range is 0 to 4 milliseconds.

Jam Detection Timeout - Specifies how long the sensor is blocked before the Jam at Reject Confirm alarm is triggered. This alarm must be enabled through Lane Alarm Configuration. The valid range is 1 to 32000 milliseconds.

PDX Configuration

The Part Detect Generator (PDX) is used in some applications where the Intellispec system inspects directly on a machine, rather than on a conveyor. The PDX is a circuit built into the Part Tracker board.

Note: the system cannot run in both PDX mode and Part Tracker Simulation mode at the same time. If one mode is already running and you enable the other mode, the system displays a warning that the latest setting will override the previous mode.



To get to this screen: From Lane or Sensor Overview mode, select Tools | Hardware Setup | PDX Configuration.

To configure the PDX:

1. Select the Enable PDX check box.
2. Enter the encoder resolution used on your system (example, 8192 pulses per revolution).
3. If your system is NOT using a pocket disk to generate the index signal, check the Enable PDX-Generated Pocket box.
4. Select the OK button to accept changes and exit.

1) **Enable PDX** - Enables the PDX circuit.

2) **Enable PDX-Generated Pocket** - On Most systems - If your system is not using a pocket disk, and you need the Z-index signal of the encoder, check this box. This eliminates the need for a pocket disk. The index signal is handled on the Part Tracker board. Or, if your system is using a physical pocket disk with an index pin, leave this box un-checked.

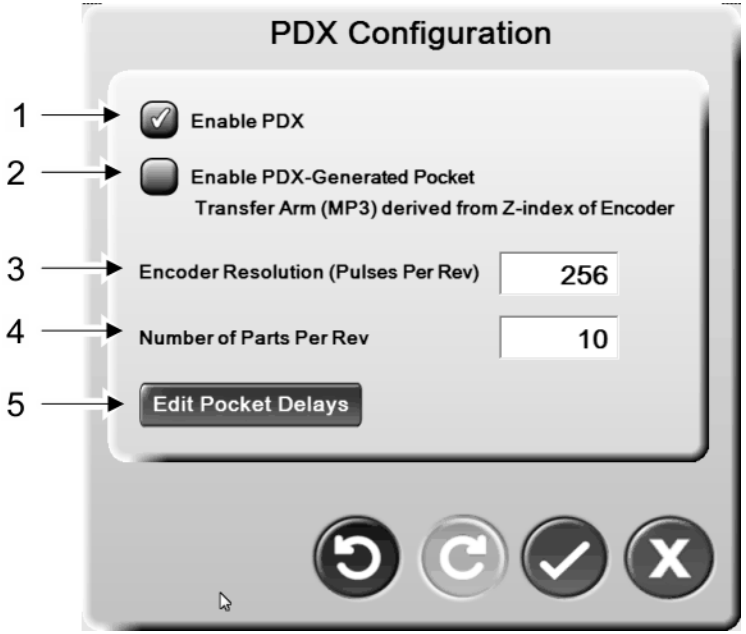
3) **Encoder Resolution (Pulses Per Rev)** - Enter the resolution of the encoder installed on your machine.

4) **Number of Parts Per Revolution** - Enter the number of machine parts or pockets (example, number of Transfer Arms) where the encoder is attached.

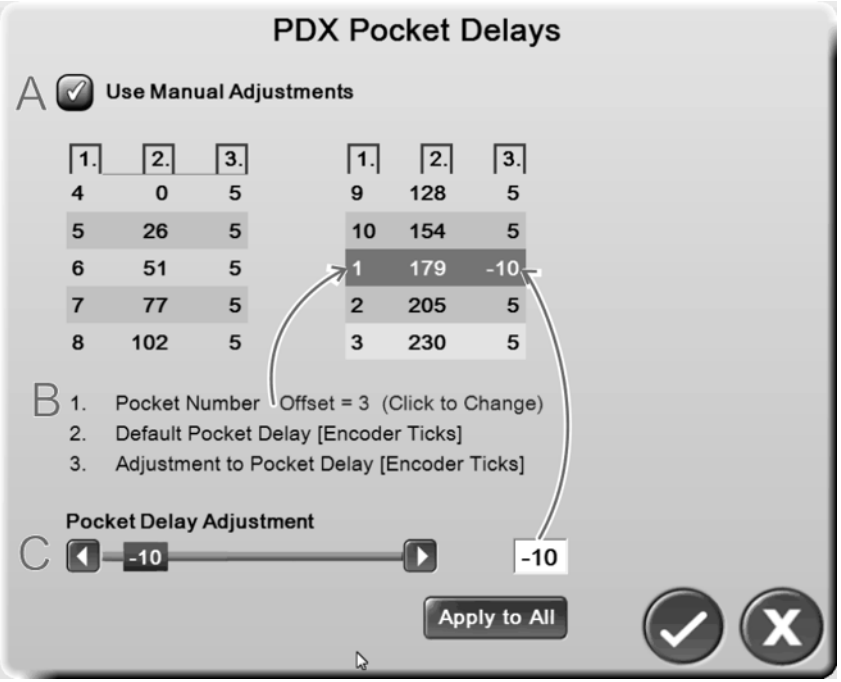
5) Edit Pocket Delays

This feature only needs to be used if machine parts become unevenly spaced. If your system has rigid machine parts and consistent spacing part to part, then no further action is needed.

For this explanation, Encoder Resolution [3] = 256. Number of Parts Per Rev [4] = 10.



When you click the Edit Pocket Delays button, you can manually change the delays, as shown below.



A) checked = enabled

B) Pocket Number [Column 1] - If you have a pocket (physically) marked as pocket #1, but the index pulse is 3 pockets away, you can use 3 as an offset (as shown in the above example). If the index pulse is located at pocket #1, then no offset is necessary.

Default Pocket Delay [Column 2]- This is computed for you. The system divides Encoder Resolution [3] by the Number of Part Per Rev (pockets) [4], and computes the delay between each pocket.

C) Pocket Delay Adjustment [Column 3] - You can change the delay for one pocket, or Apply to All. If just one machine part has shifted, then you may only need to change the delay for one pocket.

You may notice that sometimes you can enter a negative number, and sometimes not, or a value for the last pocket is limited more than others. Pocket delays are sent as a list of values to the part tracker. The system computes valid values for the part tracker rules, which include: non-negative values, subsequent delays are larger than the previous delays, and the last delay must be fewer ticks than the encoder resolution.

Part Width Calibration using PDX

Note: For systems using a PDX, the Part Width Calibration is not used, but values of 0 and 1 should be used respectively for Part Width and Part Present Disable Time.

Maintenance Frequency

Empty Bottle Inspection Maintenance

Maintenance Frequency		
Observe proper rejection	Verify that defective parts are being rejected, by inserting a known defective part through inspection	Daily
Observe Proper inspection	Verify that no stray parts are stuck in or near the inspection module or reject station	Daily
Observe Proper inspection	Verify that no buildup of dirt or contaminants has occurred on inspection module. Clean if necessary.	Daily
Observe Proper inspection	Verify that each camera's image is properly centered, focused, and properly lit. Adjust if necessary.	Daily
Glass surfaces	Clean with soft, clean, oil-free cloth dampened with glass cleaning solution.	Daily - as needed
Plastic surfaces	Clean with soft, clean, oil-free cloth dampened with mild soap and water solution.	Daily - as needed
Vision Processor filter	Rinse in clean water; use mild soap and water solution if oily. "Cleaning the Vision Processor Filter" on the next page	Monthly
Cluster Box filters (if applicable)	Rinse in clean water; use mild soap and water solution if oily. "Cleaning the Cluster Box Filters" on page 151	Monthly
Beam Splitter Seal Surface and PSE modules	Clean with soft, clean, oil-free cloth dampened with lens cleaning solution. "Cleaning the Beam Splitter Seal Surface module" on page 152 "Cleaning the Beam Splitter PSE Module" on page 153	Monthly
Support Package	Create a snapshot of your Intellispec settings	Monthly
Acronis Backup	Create a full System Backup.	Yearly

Cleaning the Vision Processor Filter

The filter for the vision processor should be cleaned once a month for best results. The filter is located underneath the user interface cabinet. If the filter has holes or is too dirty to clean, then replace it with Pressco part number 66621.

> *Note: You may need to clean the filters weekly depending on plant conditions*

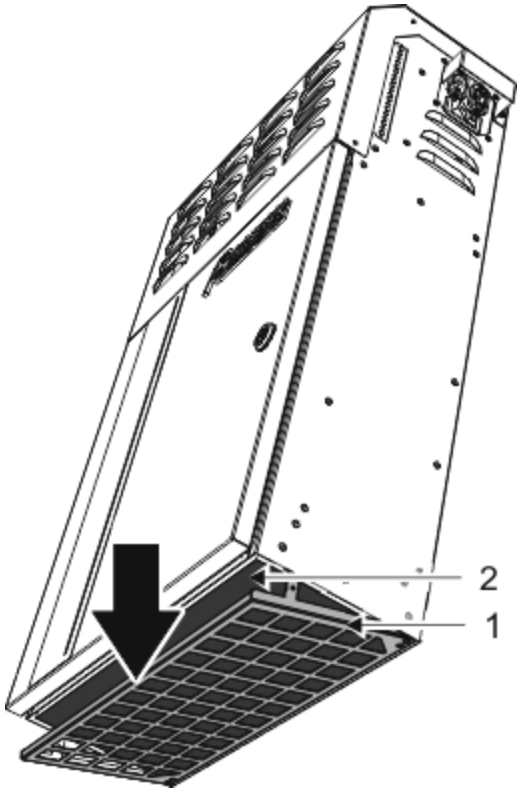
To clean the filter:

1. Pull down the front of the grate [item 1] with your fingers.
2. Remove the filter [item 2] and clean it.

If the filter contains dry dust and dirt, rinse it in plain water

If the filter contains oily dust and dirt, clean it in soapy water, then rinse in clear water

1. Dry the filter completely, then place it back underneath the user interface cabinet.
2. Push the grate closed.



1) Grate to hold filter in place

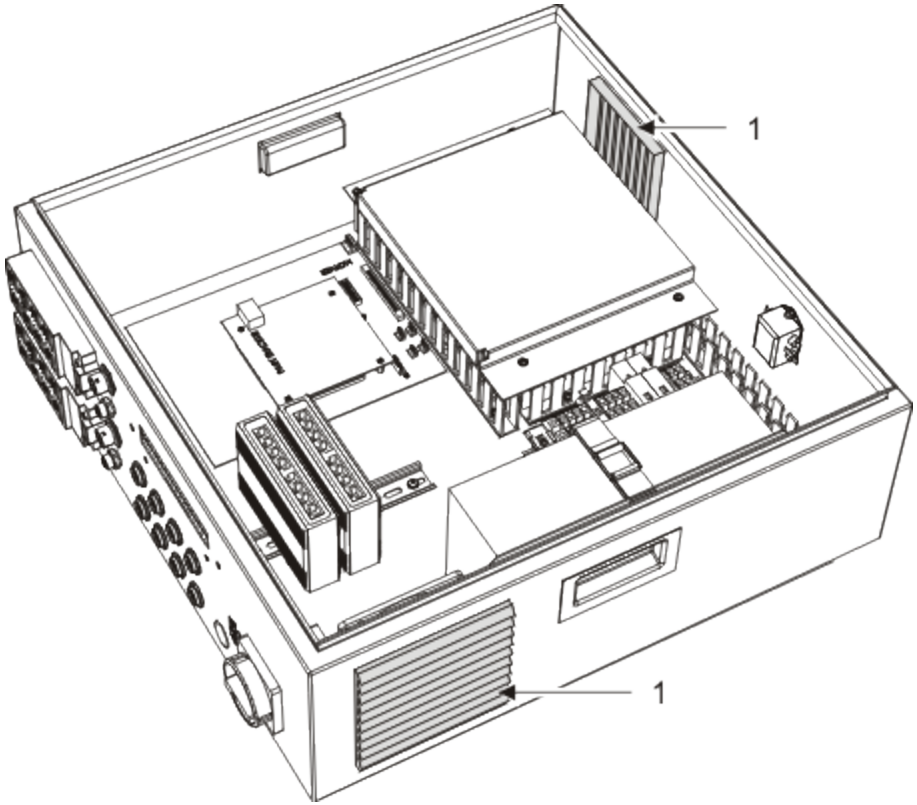
2) Part number 66621 - filter for vision processor

Cleaning the Cluster Box Filters

Clean the filter on the vents when they get dirty. We recommend that you clean them at least once a month. Remove the covers to access the filters.

- If the filter contains only dry dust and dirt, rinse it in plain water
- If it contains oily dust and dirt, clean it in soapy water

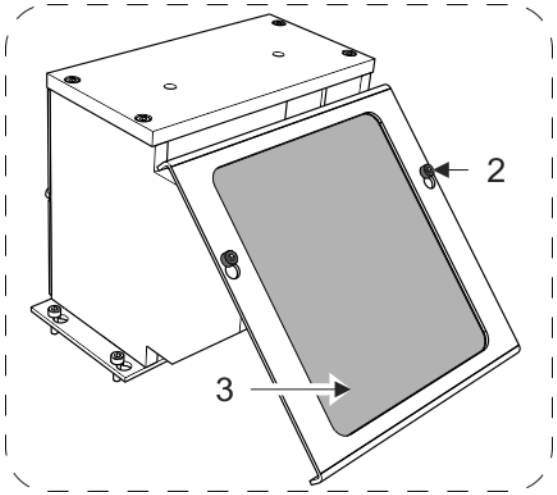
Dry the filter completely before reinstalling it



Note: the illustration shows a Classic cluster box. However, all types of cluster boxes use the same filter replacement.

To replace a filter, use part number: 65779 Replacement filter element (same part number used in both locations)

Cleaning the Beam Splitter Seal Surface module



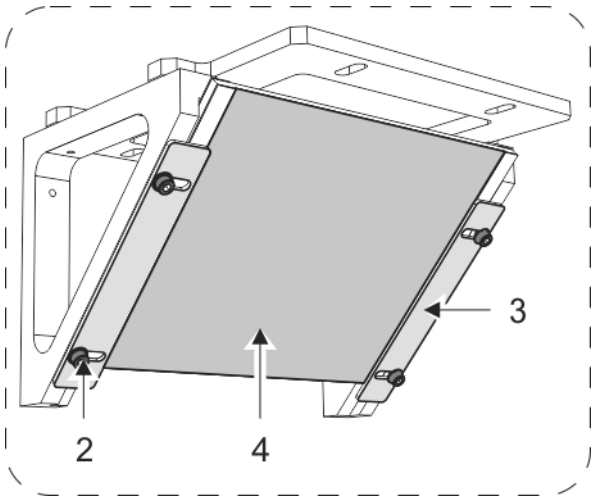
2	Screws
3	Beam Splitter

To clean the beam splitter:

1. Raise the camera if necessary. Be sure to note the camera position before moving it.
2. Loosen the two screws [item 2] and carefully remove the beam splitter.
3. Clean the beam splitter [item 3]:
   - Blow off dust from beam splitter with canned, compressed air.
   - Clean the glass on the beam splitter using lens tissue and lens cleaner.
4. Replace the beam splitter with glass to the inside. Tighten the screws.

Cleaning the Beam Splitter PSE Module

You must remove the Beam Splitter to access the bottom side for cleaning. The beam splitter is used in preform sidewall endcap (PSE) modules.



2	Screws
3	Retaining plates
4	Beam Splitter

To clean beam splitter:

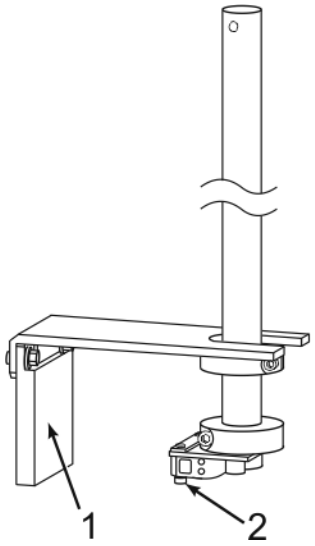
1. Raise the camera if necessary. Be sure to note the camera position before moving it.
2. Loosen the four screws [item 2].
3. Slide the retaining plates [item 3] to the sides and carefully remove the beam splitter.
4. Clean the beam splitter [item 4]. Blow off dust from beam splitter with canned, compressed air.
    - Clean the glass on the beam splitter using lens cleaner and lens tissue.
    - Replace the beam splitter with the reflective side to the outside.
5. Slide the retaining plates back in place and tighten the screws.

Cleaning the Part Detector and Reflector

The part detect sensor and reflector surfaces of the part detector must remain clean to properly detect parts. Clean these surfaces regularly to prevent dirt and oil build-up.

Clean the part detector surfaces with a soft, clean, lint-free cloth dampened with a mild soap and water solution. Do not use a glass cleaning solution or strong solvent on the plastic surfaces as they might be damaged.

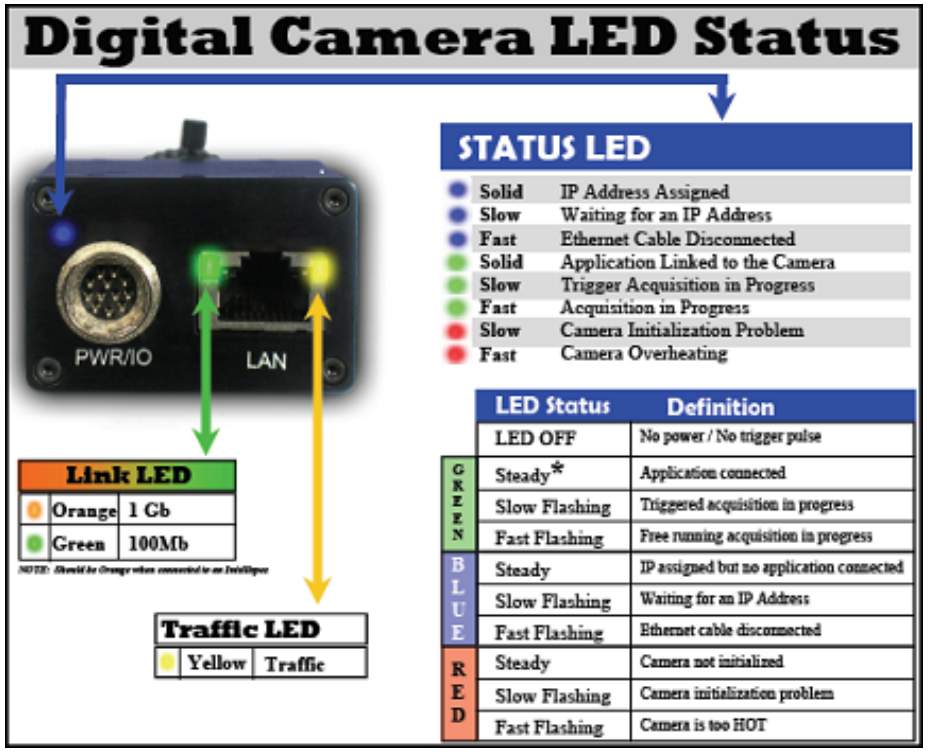
The frequency of cleaning will depend on plant and process conditions.

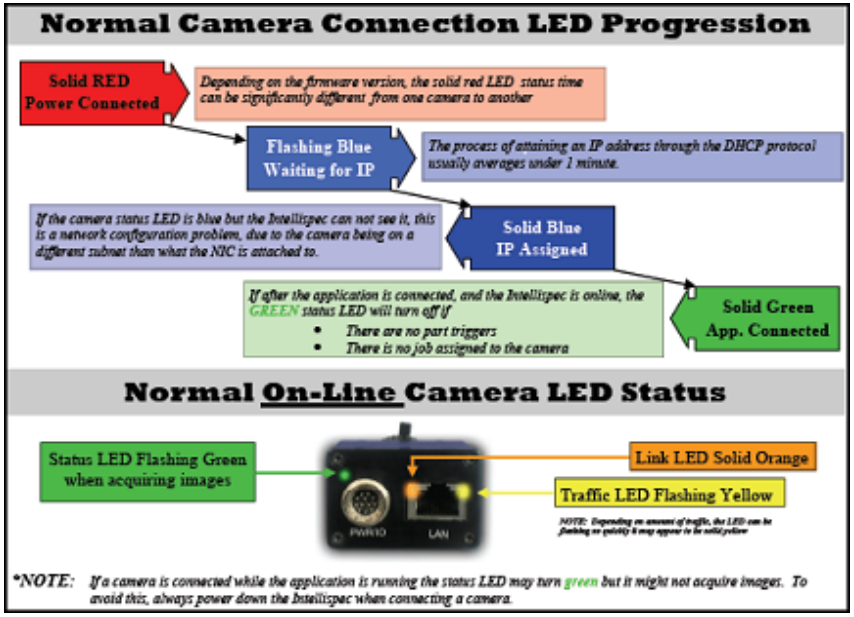


1) Part detect reflector

2) Part detect sensor

Camera LED Indicators





Help - Remote Support

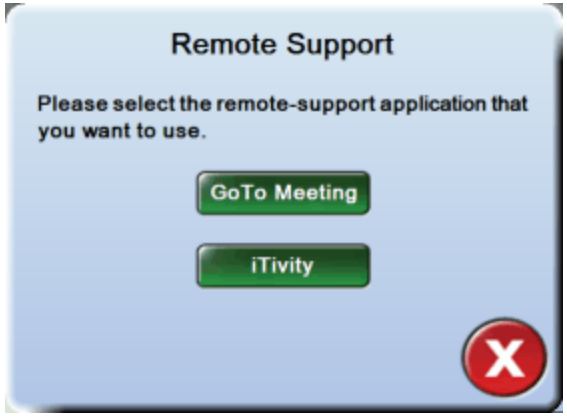
Remote Support allows remote access to the Intellispec software. iTivity software is used by Pressco to provide remote system support if a Maintenance Agreement is purchased for that Intellispec system.

You will need:

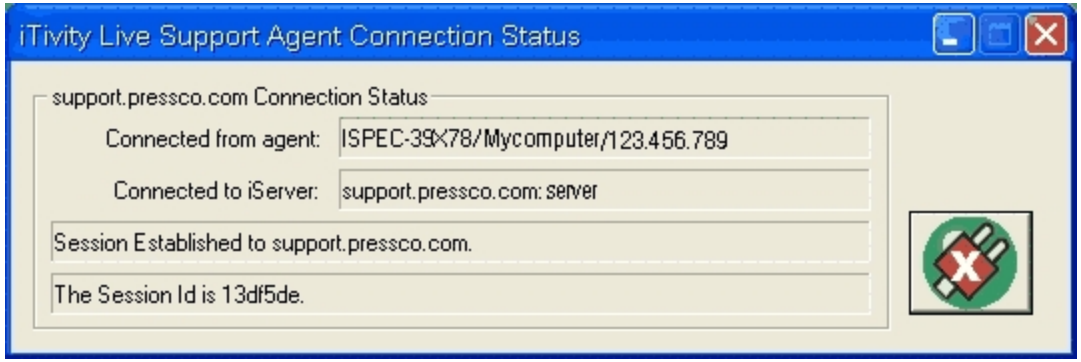
- A functioning Intellispec (systems without power, or systems that are not capable of running Intellispec software, cannot be remotely accessed)
- An internet connection to your Intellispec. This can be established through your network, and is usually set up during installation. You may use DSL, Cable, Mobile Broadband, or plant network connections to connect to the internet. Contact your network administrator for help.

To use Remote Support:

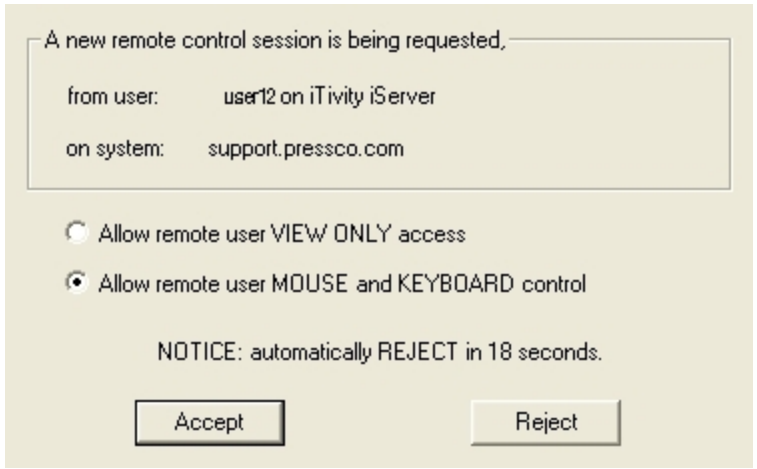
1. Notify a Technical Support representative that you require remote support. You will need to identify yourself, your location, and the Intellispec to which he should connect.
2.  In the Intellispec software, Select Help | Remote Support.



3. Select the iTivity button. If your system has a valid internet connection, the iTivity agent will attach to the server at Pressco. A connection status screen will appear indicating that the session has been established, as shown below. Intellispec systems are identified by computer name, which, in most cases, is the serial number.



4. When the Pressco Tech Support representative is connected, you will be asked to give him control of your Intellispec system. Check Allow remote user MOUSE and KEYBOARD control and select Accept. The Tech Support representative will now perform the necessary troubleshooting of your system.



5. When the Tech Support representative is finished, he will disconnect your Intellispec from the remote session.

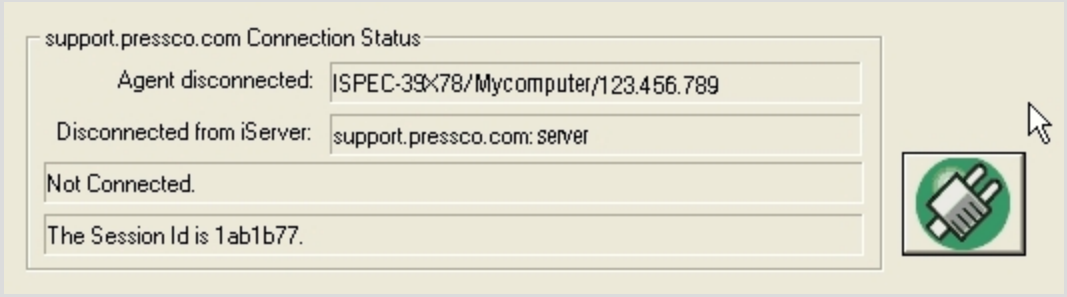
If you need to disconnect your Intellispec from the remote session yourself, follow the steps below.

To disconnect from remote support:

1. Select the X in the upper right corner of the 'iTivity Live Support Agent Connection Status' box.
2. When the system asks "Do you really wish to exit the iTivity Live Support Agent?" select OK. The system will be disconnected.

Note: if you select the button, the session will be disconnected, but this does not close the remote support program.

If the session is disconnected and you want to allow Tech Support to be able to access your system again, select the button.

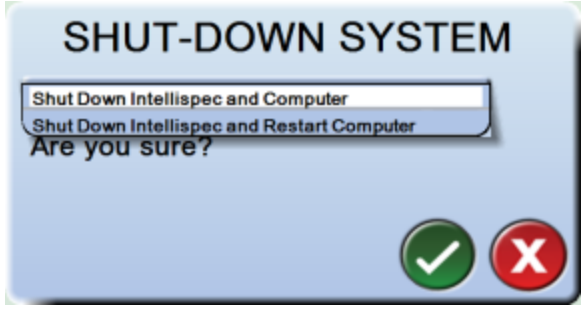


Exiting the Intellispec software

You must have proper user permissions to exit the software. This prevents unauthorized system shutdowns. Contact your system administrator if you need user permissions.

To exit Intellispec software:

1. Log in.
2.  Select Home | Tools | Exit System.
3. Select an option.



4.  Select the OK button. The Intellispec software and/or computer shuts down (and restarts if applicable).

Discovery Software - What is Discovery?

Discovery is software installed on the Intellispec hard drive that automatically looks for and identifies certain components installed on each lane. The software identifies sensors, cameras, lighting drivers, part trackers, and if used, Intellimass drivers that are attached to the system. Each one of these devices communicates with the Intellispec software via Cat -6 cabling and is assigned a unique MAC address.

> *You should rarely need to use this software. However, if a new component (for example, camera) is installed on the system the software would be used to configure the new camera.*

Additionally, during system startup, if a previously configured component fails to communicate with the Intellispec software, the discovery software screen will automatically appear on the user interface, alerting you to the problem.

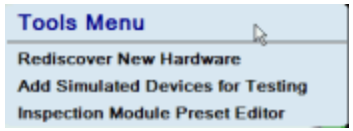
Discovery software screen

1) The Discovery menu toolbar allows you to perform additional actions.

2) The tree shows the system configuration. Red indicates unassigned hardware devices. Orange indicates missing hardware devices.

3) Select one of the buttons to perform specific actions, such as add or edit lanes or sensors.

Discovery Menu Toolbar



Tools Menu

- Rediscover New Hardware - when this command is initiated this software will perform another search of all hardware communicating with the Intellispec and displayed in the tree on the left side of the screen.
- Add Simulated Devices for Testing - this is software used by Pressco engineers to assign devices on an Intellitrainer.*
- Inspection Module Preset Editor - this is software used by Pressco engineers to assign new components as they become available.

Wizard Menu - the same choices as those listed in the green buttons in the center of the screen.

Language Menu - displays language choices that can be displayed.

Help - provides software and systems for users.

*Intellitrainer = portable Intellispec training computer.

Part Changeover

When changing parts to inspect, you only need to change the part program (if you have a part program already set up for the newly inspected part type).

This will load the proper inspections, lighting, and guide rail settings, if applicable (as long as these were previously set).

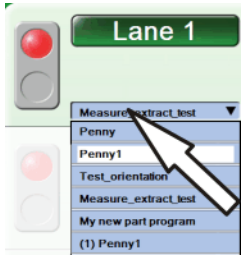
> *Some menu items are only available to advanced level users.*

What you need:

User permission to Switch Part Program

To change parts:

1. Log in.
2. Click the part drop-down menu.



3. Click the name of the new part to inspect. The new part program is loaded on the Intellispec.
4. Put the lane online to begin inspecting new parts.

Lane-specific information is contained in each Part Program. Everything you set up have previously set up is stored: camera information, lighting information, calibration information, and inspections.

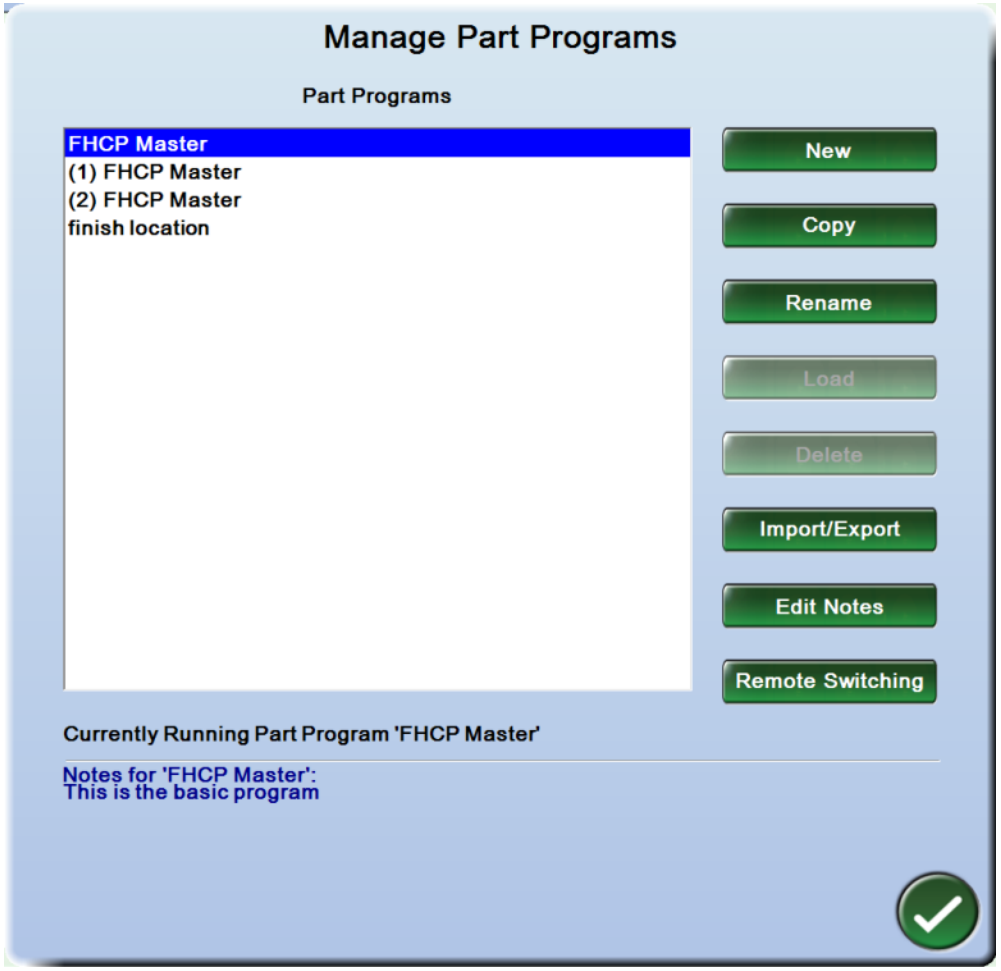
Manage Part Programs

Create new part programs or delete, edit, rename, import or export existing part programs for all the different products inspected with the system.

To load a part program, see "Part Changeover" on the previous page

To get to this screen:

-  From Lane or Sensor Overview mode, select Tools | Lane Setup | Manage Part Programs. Or:
- Right-click the Part Program drop-down.



Edit Notes - Add setup and program information about the part. This is helpful if you need to modify the part program later. These notes are displayed at the bottom of the Manage Part Programs screen when you select or change a part program.

Create, Copy, or Import a Part Program

You will need:

System permissions to create part programs

To create a Part Program:

1. Go to a Lane Overview or Sensor Overview screen.
2. Right-click over the part program drop-down menu. Choose from the available options.

Right-click

Inspection Overview

Inspection Terminology

Analysis - Analyzes the pixel shade information within a region and compares it to reference values. The inspection passes or fails based on these comparisons. There are also several analyses that make measurements. You may have many analyses for each inspection region.

Dimension - The dimension inspection type connects the results of two other inspections to do the analysis. For example, a distance inspection can connect two registrations to measure the distance between centers of two features.

Enhancements - Enhancements are used to alter images for better defect detection, or for making certain features stand out.

Inspection Module - The housing, camera, cables, and associated electronics that are installed on or over the production line to acquire an image of your product. Sometimes referred to as a tunnel. The inspection module can have a different sensor than a camera to make measurements of your product (example: Intellimass sensor).

Lane - A lane usually refers to one production line, and can contain multiple sensors.

Orientation - An orientation compensates for part rotation by finding a grayscale pattern. An analysis which must rotate with the part must follow an orientation.

Part Program - The list of regions, analyses, registrations, etc. programmed specifically for your part to detect defects or make measurements.

Part Tracking - refers to the monitoring of parts from the part detect sensor to reject station. This ensures that the correct parts are rejected at the correct time, and that good parts remain in the part stream.

Region - The Region indicates where on the part the analyses will take place. You may have as many inspections as you like in one region.

Registration - A registration compensates for part movement by finding the reference point on the part. All analyses follow a registration.

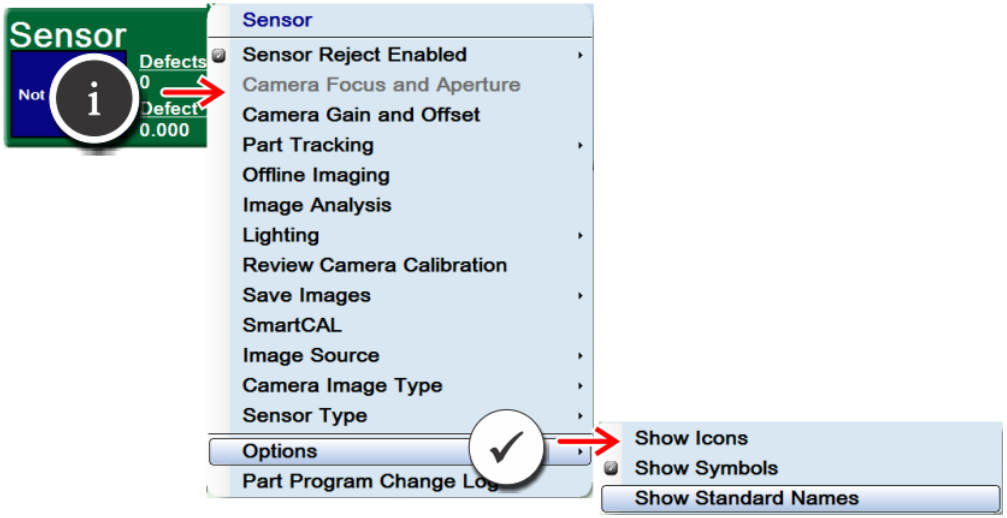
Reject - A part that failed one or more inspections from any sensor. The part can be physically rejected, or simply counted in the statistics.

Retro-Spec - The graphical interface that allows you to make quick changes to a part program. It also allows you to experiment with different parameter settings to see how changes affect the most recent inspection population, without rejecting parts.

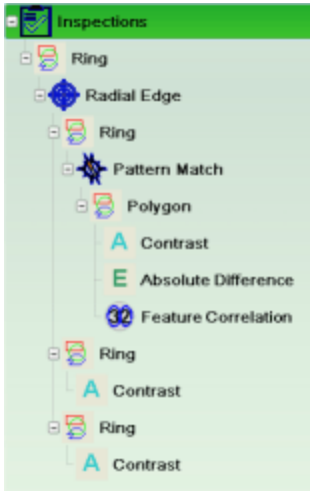
Sensor - A camera, Intellimass, or other sensor that acquires images, measurements, or other data from your product.

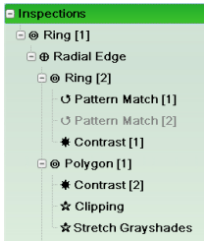
Icon or Symbol Options (Sensor Menu)

Icons or symbols indicate the General Type of inspection for each item. Checked = enabled



Show Icons	Show Symbols





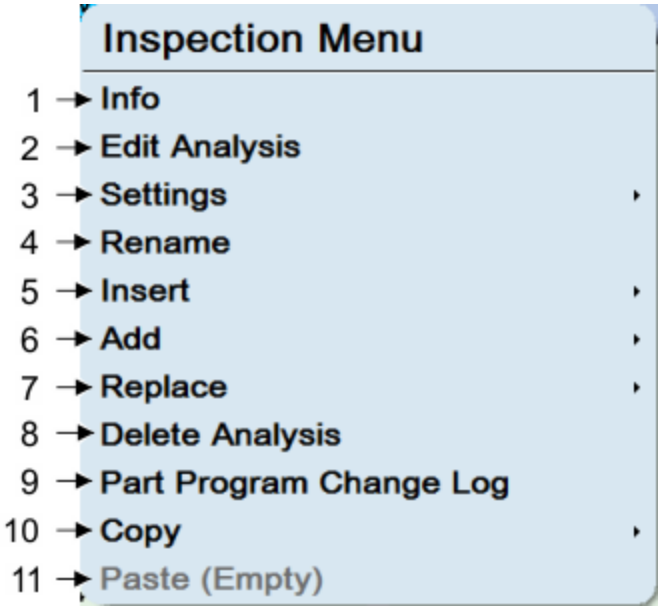
Icon	Symbol	General Inspection Type
		Region - location of inspection
		Registration - to find part center or point of reference
		Analysis - inspection
		Correlation - inspection to correlate a part to the machine part where it was made
		Orientation - to place an inspection on the same location on each part, regardless of part rotation
		Enhancement - to add image processing to make defects or part features stand out better
		Intellispec Mass inspection

Inspection Tree Configuration

Inspection menu

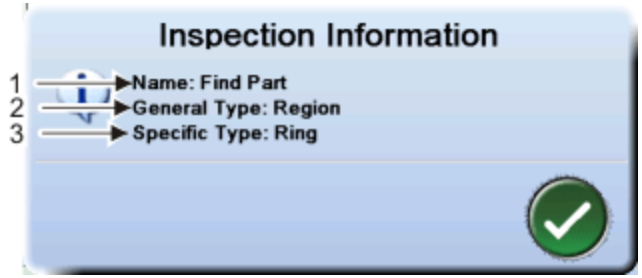
Create and edit part programs through the inspection menu. To see this menu, right-click over any inspection name.

> *We use the term 'inspection' as a generic term for analyses, regions, enhancements, registrations, dimensions, etc.*
> *some items are grayed out if you do not have user access to those items, or if they do not apply to the current selection.*



1) Info

Display general information about the inspection. The Specific Type is the name used in the Inspections section in this guide



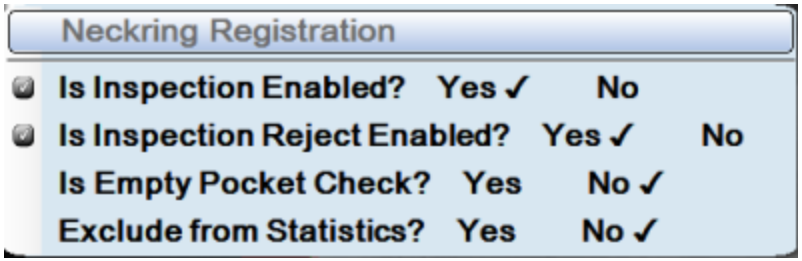
1) Name - your name for the inspection | 2) General type - Analysis, Region, Orientation, etc. | 3) Specific type - sub-category (example, Ring, Polygon, or Measurement Region)

---

2) **Edit** - Open the Inspection Editor - performs the same action as double clicking.

3) Settings

Inspection sub-menu. checked = enabled



Is Inspection Enabled? All of its dependent inspections are also enabled/disabled. The inspection name is grayed out when it is disabled.

Is Inspection Reject Enabled? If "No" is checked, then you can temporarily pass all parts regardless of whether they pass or fail the current inspection. Some items, such as Regions, do not have pass/fail criteria. This option is grayed out if reject is not applicable.

Is Empty Pocket Check? If "Yes" is checked, then inspection is being used as an empty pocket check.

Exclude from Statistics? If "Yes" is checked, then do not count failures of this inspection in the statistics. If "Yes" is checked, then:

- The inspection is not displayed in graphs
- If the inspection fails on a sensor, and no other inspection fails on the same sensor, the defect count is not increased for that sensor.
- If the inspection fails for a walk-by group and no other inspection fails in the same group, the defect count is not increased for that group.
- If the inspection fails and is the only inspection failing within a lane, the defect count is not increased for that lane.
- The inspection is still displayed in the results grid when you select the Reject Images button.
- The inspection name is still available in the drop-down selections when you select the SPC Graphs button.
- You can still view this inspection in the Inspections graph and Statistics Grid if you select the appropriate Display option (right-click over graph).

Start or Stop Auto-Learn (not shown) - [Present when Operator Trigger is enabled in Auto-Learn] Manually start or stop an Auto-Learn process. See Auto-Learn.

4) Rename the inspection

5) **Insert** - Add one item above the currently selected item.

6) Add an inspection

7) **Replace** - Replace the current item with a similar inspection.

8) **Delete** - Delete the current item. If the item has other items below it (at a lower hierarchy), those items are deleted as well. Delete All Inspections deletes all the items in the inspection tree.

9) **Part Program Change Log** - Display the "Part Program Change Log" on page 192. This lists the inspections and the edit history for each.

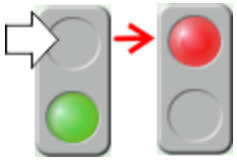
10) Copy the selected inspection

11) **Paste** - Paste the contents of the clipboard into the inspection list. The contents are pasted below the currently selected item.

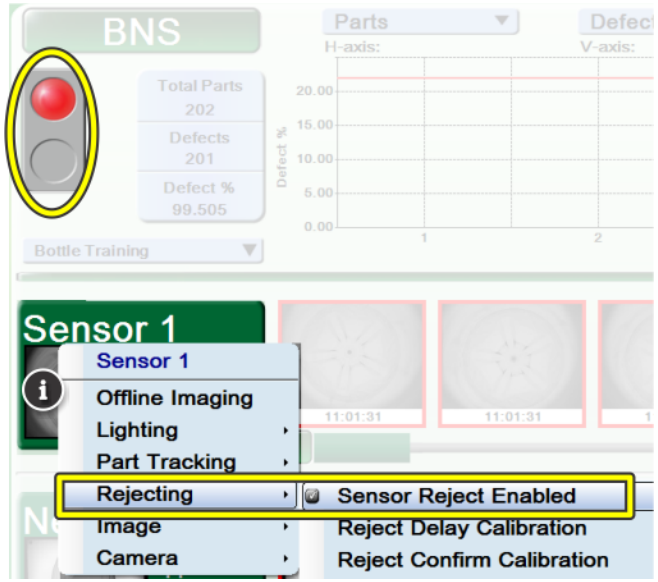
Reject Enable/ Disable for Sensor Only

If the system is rejecting excessive parts, you can quickly disable the rejecter for that sensor.

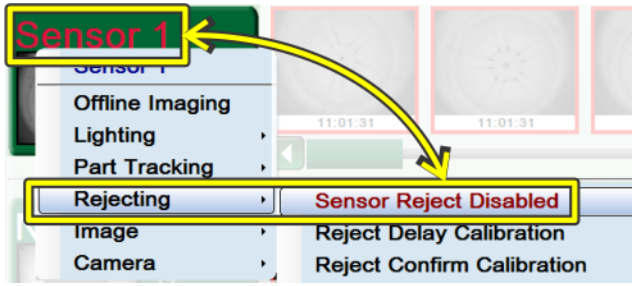
To enable or disable the rejector for one sensor only:


Take the lane offline.

From Sensor Overview mode | right-click over the sensor button | Rejecting | uncheck Sensor Reject Enabled.



This toggles to Sensor Reject Disabled. Red text = disabled.

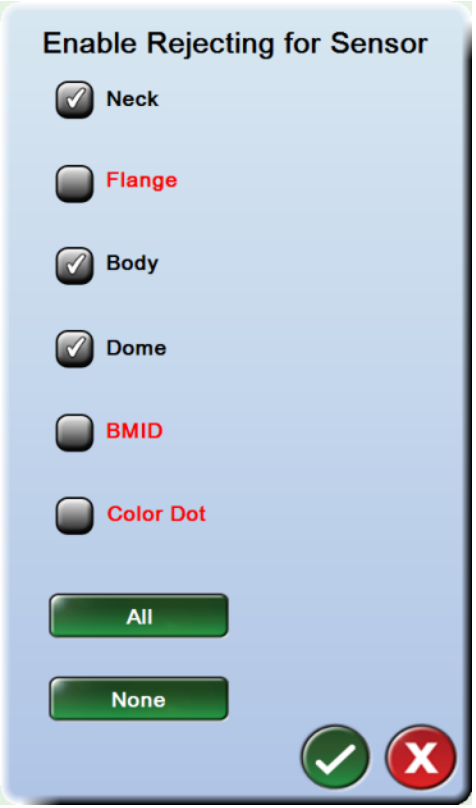


If you put the system online when the Sensor rejector is disabled, you will see a message stating "Sensor Rejector Disabled - Do you want to go online?" You may select Yes and continue online.

Reject Enable/ Disable for Multiple Sensors within a Lane

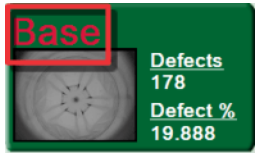
To enable or disable the rejector for one or more sensors within a lane:

1. From Lane Overview or Sensor Overview mode, select Tools | Lane Setup | Rejecting | Rejector Enable/Disable.
2. Check or un-check the box next to the sensor(s) to enable or disable the rejector.

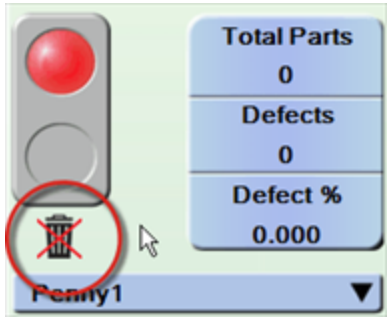


Select the OK button to save changes and exit. The new setting is applied.

If a rejector is disabled, the sensor name is displayed in red instead of white.



If the rejector for all sensors within the lane is disabled, you will see the trash can icon near the statistics for that lane.



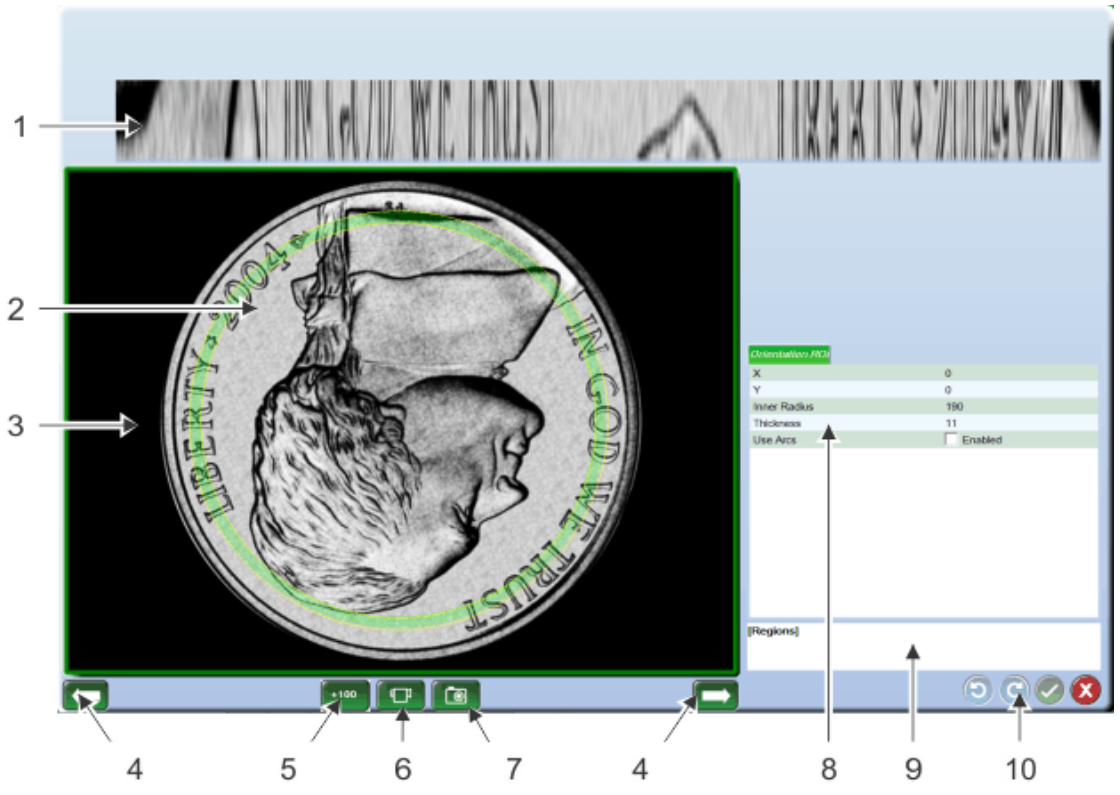
Note: the trash can symbol is only displayed if ALL sensors within the lane are disabled.

If you put the system online when the lane rejectors are disabled, you will see a message stating "Lane Rejector Disabled - Do you want to go online?" You may select Yes and continue online.

Edit Regions

This view is available when you are editing a region. Double-click a region name in the inspection tree to see the region editor. You must have user permissions to edit.

In Region editor, you will not see anything happen if you select numbers 5, 6, or 7. The data set is changed, but you will not see the data set until you view the Inspection Editor.

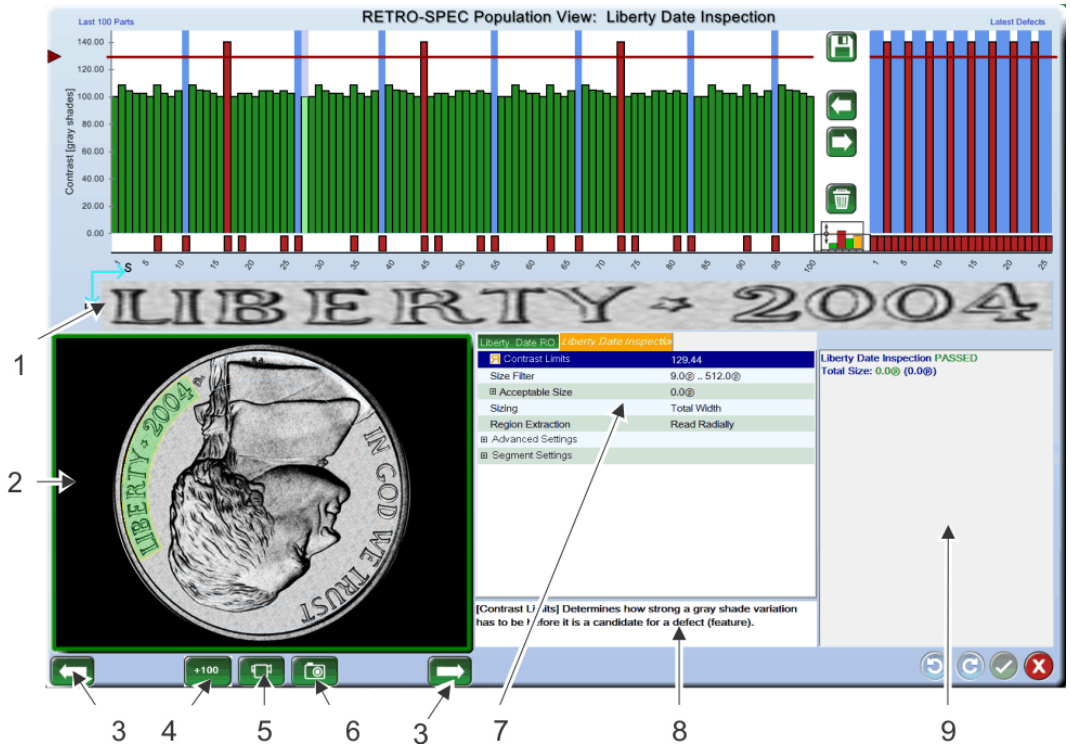


1) Unwrapped region of interest (ROI)
2) Part image
3) Editable region
4) Previous and Next image
5) Get 100 new images
6) Refresh data set
7) Snap one image
8) Edit parameters
9) Parameter description window
10) Undo/ Redo/ Accept/ Cancel

Edit Inspections

Edit an inspection. You must have user permissions to edit.

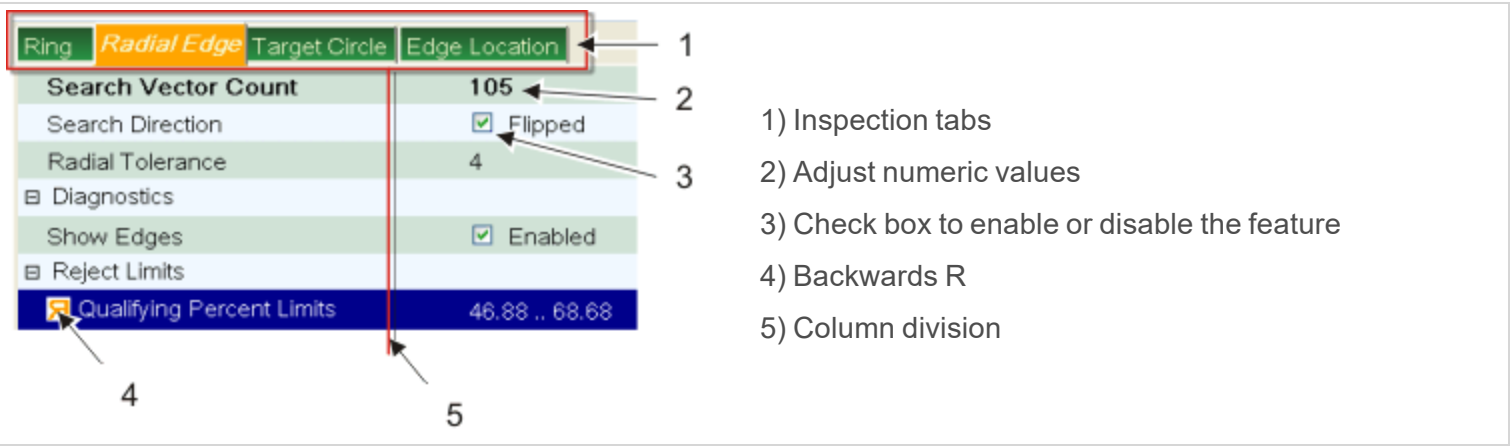
The Retro-Spec graph at the top of the screen is described separately.



1) Unwrapped region of interest (ROI)
2) Part image
3) Previous and next image
4) Get 100 new images
5) Refresh data set
6) Snap one image
7) Inspection parameters
8) Parameter description window
9) Results box

Edit Parameters

You can change options that will alter the outcome of an inspection. You must have user permissions to edit. Double-click the inspection name in the inspection tree to edit.



1) **Inspection tabs** - Select a tab to adjust parameters. The orange tab contains the parameters that can be adjusted with the bars on the Retro-Spec graph. The tabs depend on the inspection and its relationship within the inspection tree.

Adjust numeric values

Large Slider - Use a sliding bar. Changes are also applied to the red and yellow sensitivity bars in the Retro-Spec graph. If the parameter has an upper and lower limit, portions of the bar are displayed in different colors, as shown below:

Red = failure limit. A part value that falls in the red zone fails inspection.

Yellow = warning limit. A part value that falls in the yellow zone is tagged as a warning level part.

Green = passing. A part value that falls in the green zone passes (at least this parameter).

Numeric Text Entry - Type in a specific number. You can use the +1 and -1 feature to make minor adjustments.

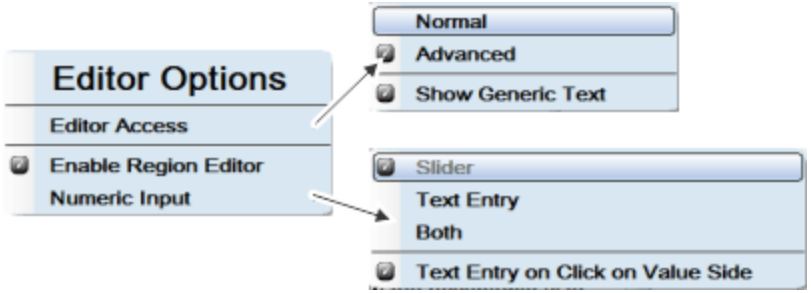
---

4) **Backwards R** - The current parameter can be adjusted in the Retro-Spec graph (example: the red and yellow limits bars).

5) **Column division** - This line is not actually displayed. You can see Large Slider AND numeric entry pad if you select in the left column, or just the numeric entry pad if you select in the right column (this only applies if Numeric Input setting = both. See Editor Options).

Editor Options

Right-click over the parameters menu to see the Editor Options. Checked = enabled



Editor Access

Normal - display the normal menus (for most users)

Advanced - display the advanced parameters (for power users)

> *you must have the appropriate permissions to see the advanced parameters: "Access advanced inspection parameters"*

Show Generic Text - default Intellispec names.

Enable Region Editor - Available when the inspection has an associated region that can be modified.

Numeric Input

Slider = Large Slider as described in "Edit Parameters" on the previous page

Text Entry = Numeric Text Entry

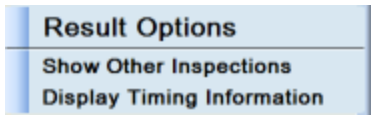
Both = both Large Slider and Numeric Text entry. After you make changes, select the OK button to close them.

Text entry on click on value side = if you select an item the right column of the menu, you will see only the Numeric Text Entry box, even if you have Both checked

---

Result Options

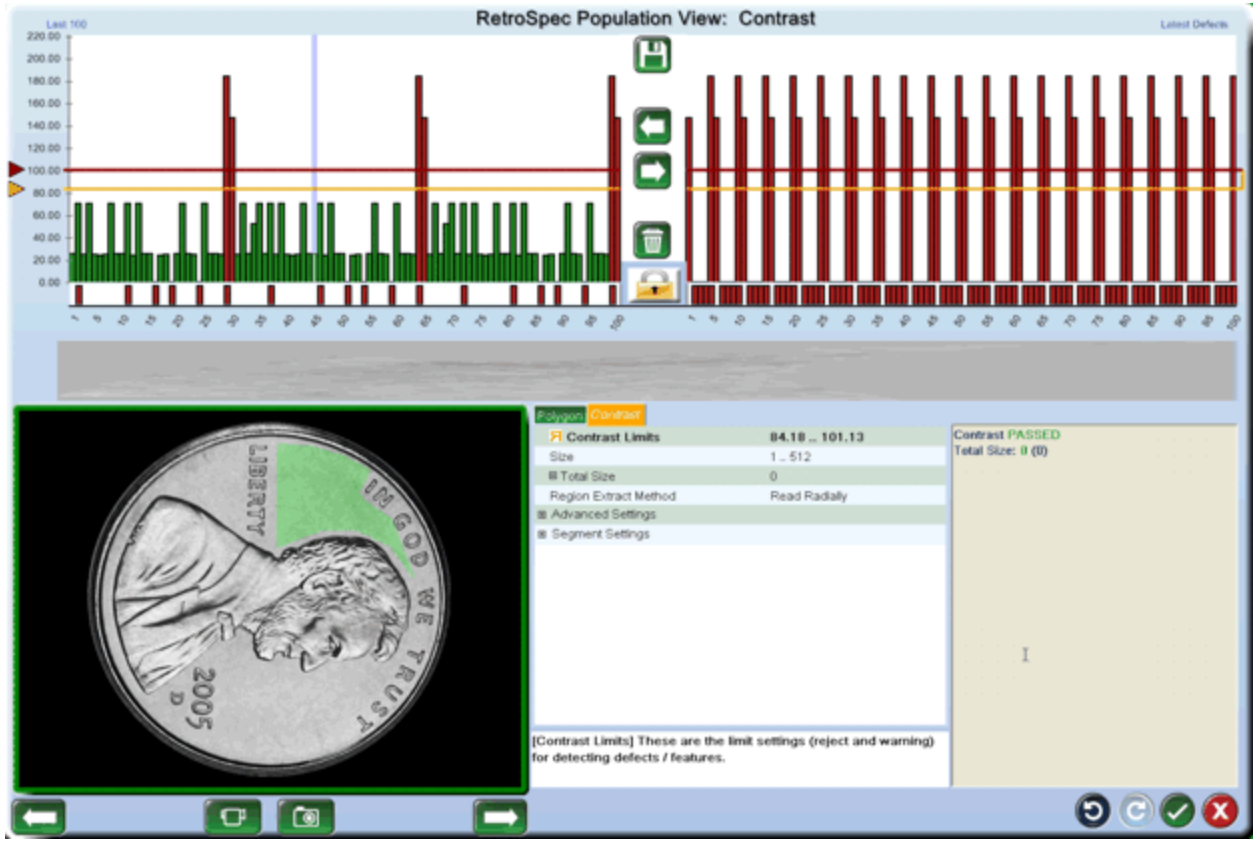
There is additional information for the Results Box. Right-click to see the menu. Checked = enabled



Show Other Inspections - Shows whether a part passed or failed other inspections on the current sensor. Right-click the menu again to see the option to hide good inspections. Double-click any inspection to show the Retro-Spec graph and images for that inspection.

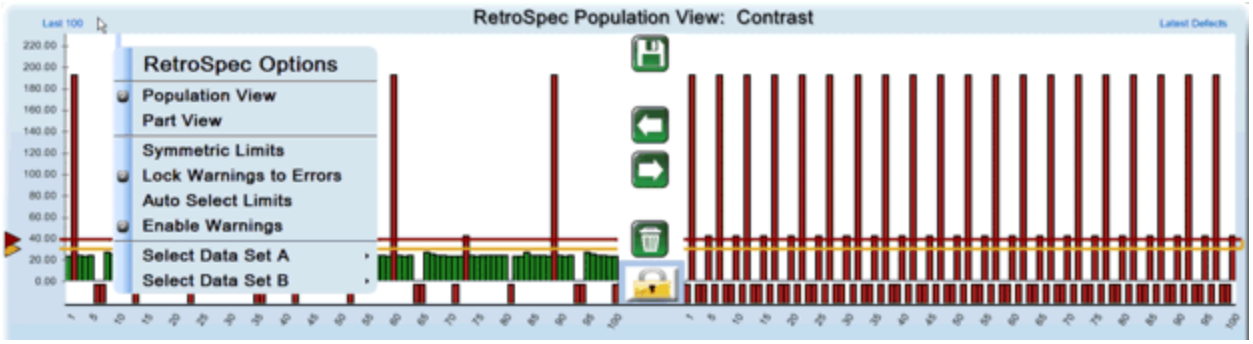
Display Timing Information - Displays timing information for each inspection on the current sensor and the total time in milliseconds.

Retro-Spec Display



Double-click an inspection name in the inspection tree to see the Retro-Spec display. There are two views available for the graph area of the screen: "Retro-Spec Population View" on the next page and "Retro-Spec Part View" on page 189.

Retro-Spec Population View

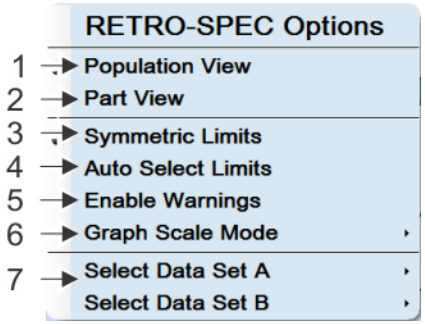


- Each peak is a different part. Red peaks are failed parts, green peaks are passed parts.
- The left side of the graph displays up to the last 100 parts that were inspected
- The right side of the graph displays up to the last 100 rejected parts
- Click on any peak to display the Part View for that part
- Right-click on the graph to select between the Part View and the Population View

Retro-Spec Options

Right-click the Retro-Spec graph to see the Retro-Spec options menu.

> *some options are not displayed if they are not applicable to the current inspection.*



1) **Population View** - Display the Retro-Spec population view graph.

2) **Part View** - Display the Retro-Spec part view graph.

3) **Symmetric Limits** - When the Retro-Spec graph has upper and lower limits (two red bars and two yellow bars), this option keeps the upper and lower limits the same distance from nominal.

Lock Warnings to Errors - [If warnings are enabled] Locks the yellow warning bar to the red reject bar in the Retro-Spec graph, keeping them the same distance apart.

4) **Auto Select Limits** - Automatically adjusts warning and reject levels to make all parts in the data set pass.

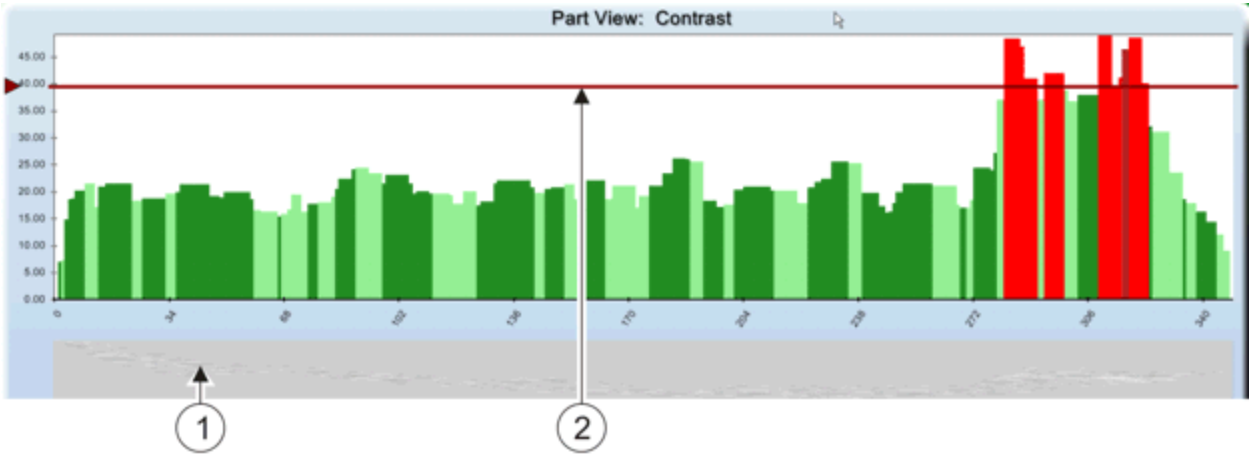
5) **Enable Warnings** - Provides a warning level (yellow) sensitivity bar. A warning does not reject parts, but indicates that the process is approaching the reject status. When you enable warnings, they are enabled for all inspections for the current sensor.

6) **Graph Scale Mode** - Change the height scale of the graph. Limits Only displays part parameter values up to and including the current inspection limits. This is useful when you want to zoom in on data without extra lines on the graph. Note that the limit lines may not be displayed on the graph. As soon as you change the parameter limits from the menu, the limit lines are displayed again on the graph. Limits and Data is the default mode that displays all the inspection data plus the limit lines.

7) **Select Data Set A or B** - For each Data Set, you can select what you want to display. You can choose files that have been previously saved to the computer. See information about Saving Images. See also Freeze on Defect Image in Retro-Spec.

[not shown] **Select Parameter** - Choose a graph to display. This is available for some inspections, such as Measurement and BMID inspections.

Retro-Spec Part View



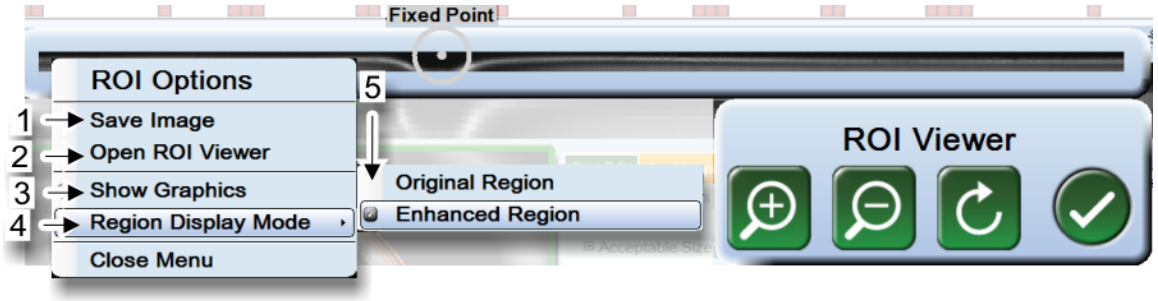
- The Part View displays a single part view. Each peak shows the contrast as the inspection moves from 0° (at left), to 360° (at right).
- Green peaks are acceptable; red peaks are where the contrast has exceeded limits.
- The height or amplitude of each peak reflects the amount of contrast (how dark or light change)
- The width of each peak reflects the physical size of the change (below the red peaks are the same width as the light and dark marks they represent)

1) Unwrapped region - Below the graph is a display of the inspection region unwrapped. The degrees represent where the unwrapped region begins and ends.

2) Sensitivity slide bar - This is the inspection's primary sensitivity parameter and is adjusted up (less sensitive) or down (more sensitive) by clicking on the bar or arrow at the left and dragging it to the desired position.

Unwrapped Region of Interest Options

Right-click in the Unwrapped Region of Interest to display this menu. Checked = enabled



1) Save Region of Interest Image

2) **Open ROI Viewer** - Display the unwrapped region at full resolution.Select a rotate button to change the orientation of the unwrapped ROI image.

3) Show Graphics - no effect

4) **Region Display Mode** - Show the original region, or the enhanced region if you use an enhancement in the part program.

[not shown] **Region Selected** - (Only available if the inspection has more than one region; example: Fill Height) Select which region to display.

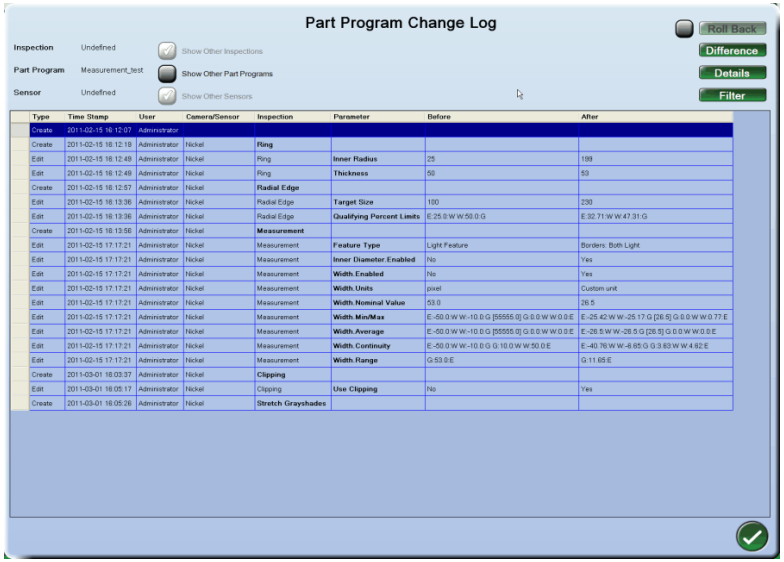
Inspection Tree Relationships

The inspection tree shows the relationship of each inspection. Indented objects are dependent on the object above it. Some items in the menu may be turned off. The ability to access some items depends on your user access.

See also "Icon or Symbol Options (Sensor Menu)" on page 171

Part Program Change Log

The part program change log lists the inspections and the edit history for each. You can view all inspections from one sensor, other sensors, or other part programs. This is helpful if you want to see the previous settings for an inspection.



To view the part change log:

1. 

Go to Sensor Overview mode.
2. Right-click over an inspection name and select Part Program Change Log from the Inspection menu. If the current inspection has never been changed since it was set up, no data is displayed.
3. Select any of the available check boxes to view other inspections, inspections from other part programs, or inspections from other sensors. Some boxes are dependent on others; for example, you must select a dark gray check box before a light gray check box becomes active.

To view a full column width, select and drag the column title to re-size that column.

Optimize

The Optimize feature automatically sets the optimum settings for many inspection parameters. It is processor-intensive and must be done off-line. For this to work correctly, ensure that you have moved all acceptable images to the left side of the Retro-Spec graph (Set A), and the defect images to the right side of the graph (Set B). Optimize is available under the Advanced Settings.

To use the Optimize feature:

1. Make sure the Retro-Spec graph is in Population view: right-click on the graph to select Population View.
2. Load a set of good images into Data Set A

Next load a set of images of bad parts into Data Set B. These parts should have defects in the current inspection's region of interest.

To finish setting up the Optimize feature:

1. In the Contrast menu, choose the Defect Type: light, dark, or both.
2. Adjust the Acceptable Size parameter to catch the size of defect you want to detect.
3. Click the Optimize button. The system will analyze the part sets and determine the best settings to pass the good parts while failing the bad parts. Wait till the optimization process is complete - this may take several seconds.
4. Scroll through the images from the Retro-Spec graph to determine whether the good parts are still passing and the bad parts are failing. You should see good parts on the left side of the graph, and bad parts on the right side of the graph.
5. Test the inspection by loading more images. You can make slight adjustments in the Contrast menu if necessary.

Part Programming for BNS

Overview of Retro-Spec Inspections

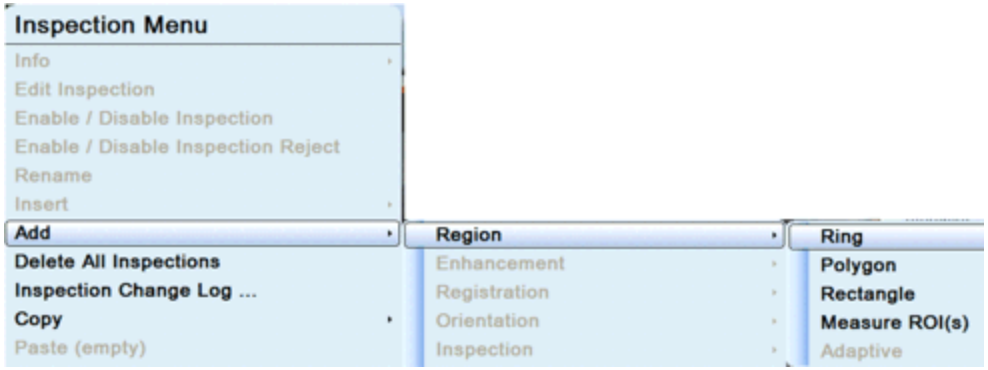
The Retro-Spec family of inspections has a unique display.

All Retro-Spec inspections, registrations, and orientations are added using the two-step process.

1. You first add a region of interest (ROI) which locates the region of interest for the following inspection. For bottles this may be a Ring, a Polygon, or an Adaptive Region.
2. Next you add a Retro-Spec inspection, normally using either a Contrast, Ambient, or Measurement inspection.

Add a Region of Interest (ROI) - BNS

Before you add a Registration, Orientation, or Inspection you must first add a Region. A Region determines where the Registration, Orientation, or Inspection is done.



To add a region of interest (ROI):

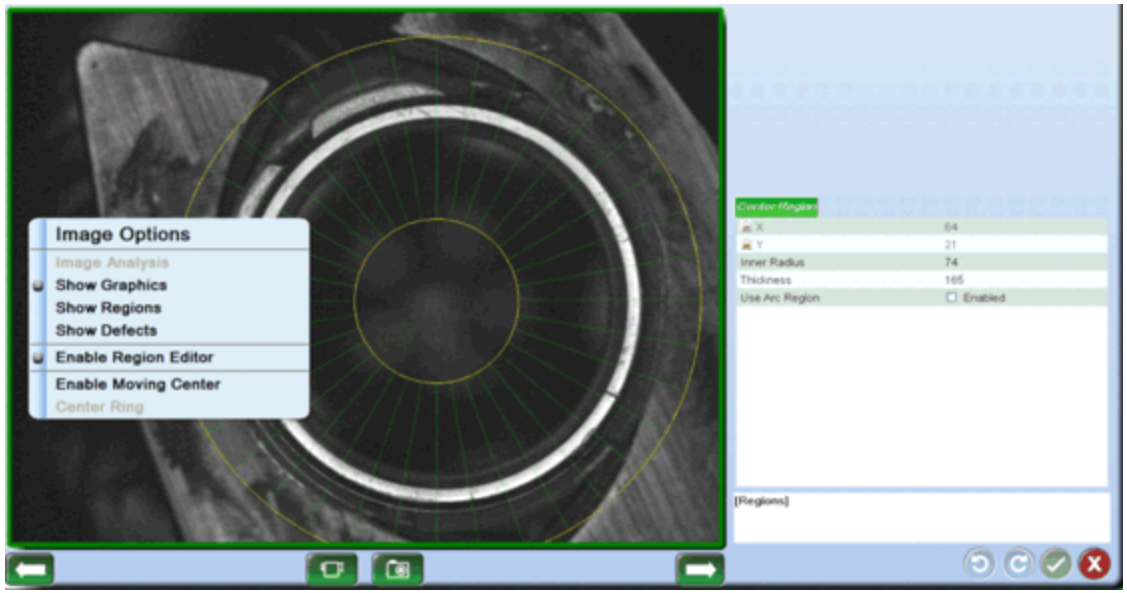
1. Right-click on the inspection tree | Add | Ring, Polygon, Rectangle, Measure or Adaptive Region.
2. Position the region over the area where you would like the registration to be done.

For bottles, a Ring, Polygon, or Adaptive Region is used most often.

To set up the region:

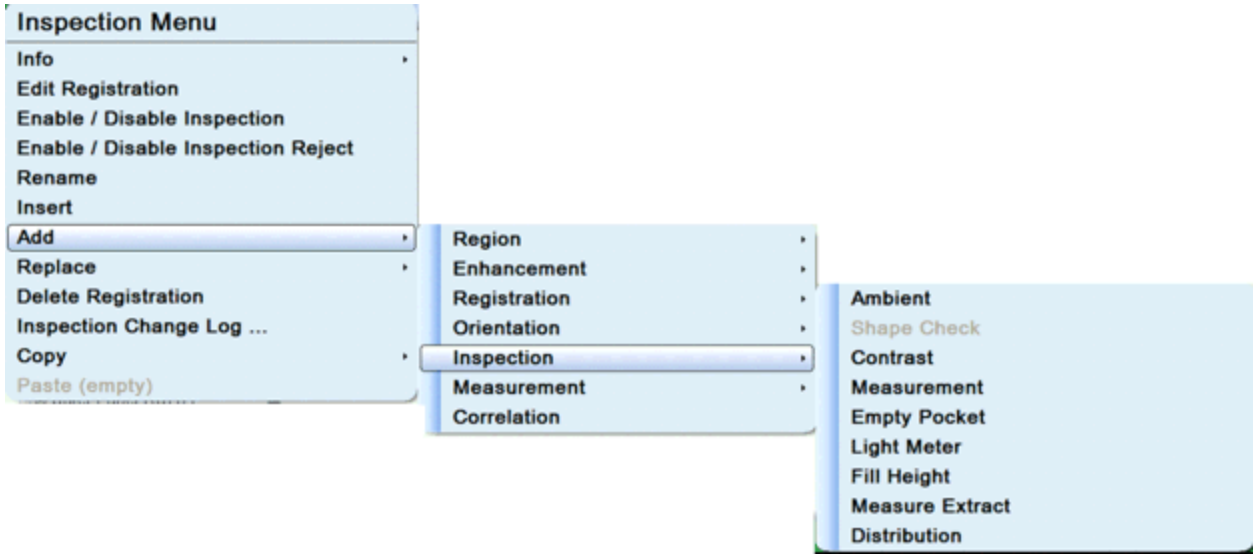
1. Right-click on the image area to see the drop-down menu.
2. From the drop-down menu enable the region editor, which allows you to click on and move the region up or down, or right or left.

Shown below is a Ring Region for the Seal.



Add an inspection BNS

Once a Region has been made, a Registration, Orientation, or Inspection is added. For example, say you want to add an inspection.



To add an inspection:

Right-click in the inspection tree | select Add | Inspection. Then add your choice of inspections.

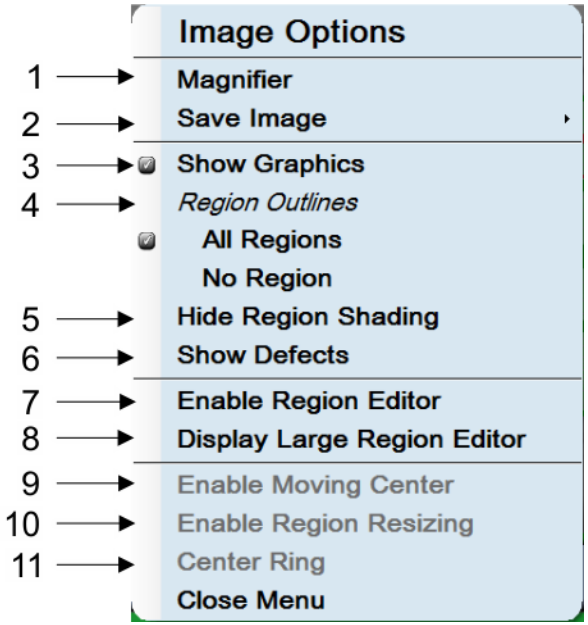
- Contrast is most frequently used to find small discrete defects
- Ambient is used to find defects of large-scale color changes
- Measurement is used to catch defects of measurement
- Empty Pocket is used to determine if the bottle is in the gripper fingers. If so it allows the inspections to be performed; if not, it stops the inspections from being done.

For bottles, the Contrast, Ambient, or Measurement inspections are most often used. If a PDX is used for part tracking, an Empty Pocket is also used.

Image Options

While editing an inspection, right-click in the part image to see the Image Options menu. Checked = enabled Options are grayed out if they do not apply to the current inspection.

> *Note: some menu items are not shown when you are viewing a registration or orientation. You see a slightly different menu in Measure ROI inspection.*



1 - **Magnifier** - Open the Image Magnifier.

2 - **Save Image** - Save an individual image. Refer to Save Individual Images While Editing an Inspection.

3 - **Show Graphics** - Display the region and graphics for the current inspection.

4 - **Selections** - Select whether to show the region outlines (All Regions or No Region)

5 - **Hide Region Shading** - Remove the shaded graphics from the screen so that you can see more of the part image.

6 - **Show Defects** - Displays the graphics highlighting the defects.

7 - **Enable Region Editor** - Change the shape and placement of the region directly on the image. You must enable one of the options in Edit Mode (or at the bottom of the menu).

8 - **Display Large Region Editor** - Display a large part image on which you can change the placement of the region. Check Enable Region Editor to make the changes to the region. Un-check Display Large Region Editor to return the image to normal size.

9 - **Enable Moving Center (or Region)** - The wording changes depending on whether you are editing a region or an inspection. Change the center of the region on the image.

10 - **Enable Region Resizing** - Resize the region directly on the image.

(not shown) **Enable Set Region Direction** - [Available in inspections such as Measure ROI] Select the region in the image. The region box will be displayed in yellow with diamonds around the box. Select one of the diamonds to make the inspection towards the direction of the selected diamond. The selected diamond is filled in solid yellow.

11 - **Center Ring** - [Available when you are using Region Editor on the image and Enable Moving Center is checked.] Select Center Ring to re-center the region on the image using the current parameters. This is a command; there will be no check mark next to this option.

Module 10 Empty Bottle Inspections - Introduction

The next sections describe how to set up the standard set of inspections for empty bottles on the Intellispec system. The size, placement, and typical sensitivity settings are shown for each region of the bottle.

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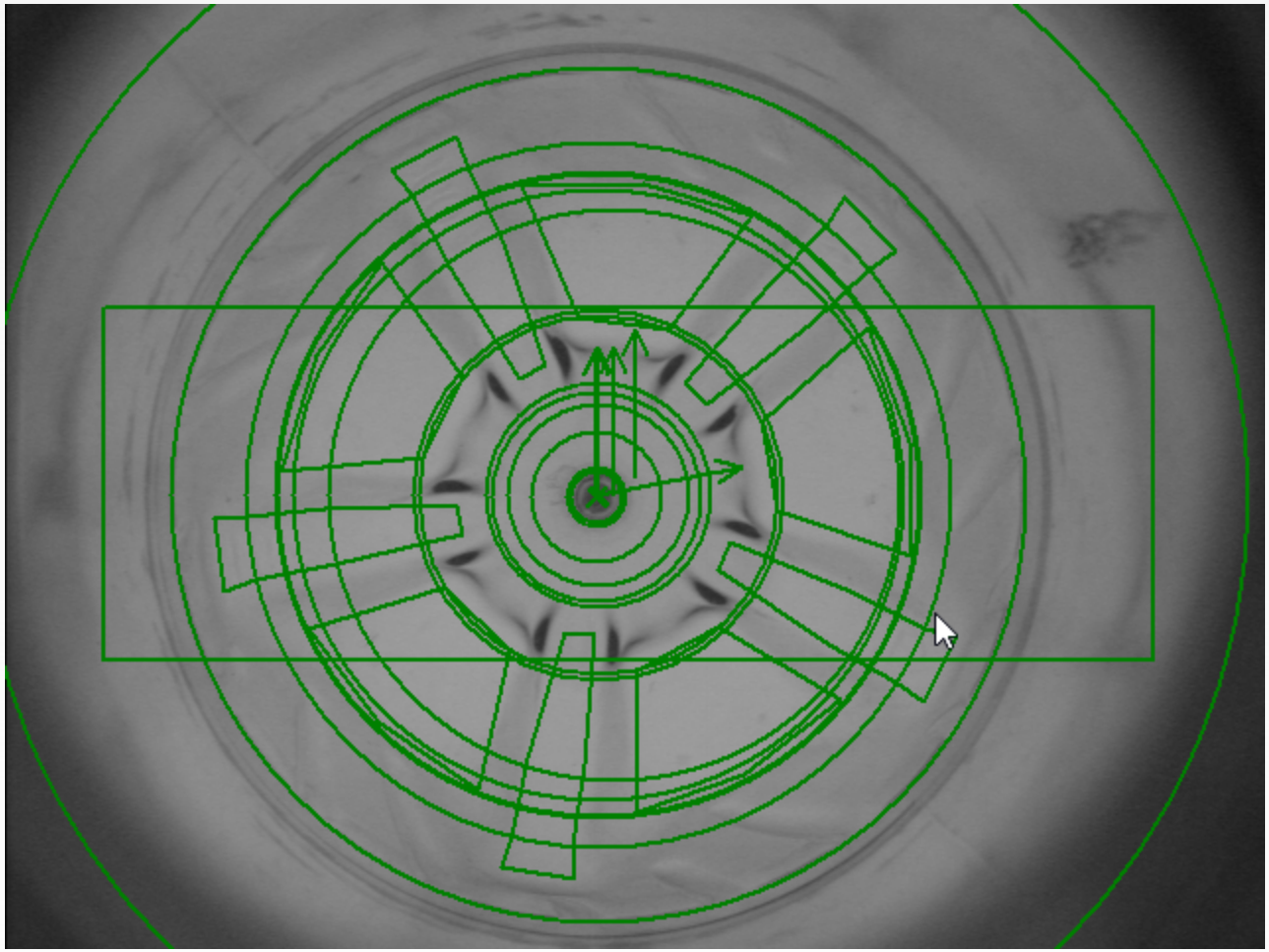
Module 11 Inspections for Base Camera

This section explains how to set up the inspections. Note that your inspections may be different, depending on your specific part, plant, and process requirements.

The picture below shows an image with all base inspection regions. We will set these up one at a time.



Create the Base Inspection Tree

The steps below will guide you through the process of building the Base Inspection Tree, while ensuring that the directory links are connected correctly. First add the inspections, then rename them to something that makes sense to you. Note that we will set up the regions and parameters later. For now, we will just build the inspection tree.

> *Note for all steps: when you add the inspection, you can rename it immediately.*
> *After each step, select the OK button to save changes, and the Exit button to exit the inspection.*

This is how the inspection tree will look	Steps to add the inspections

Note: ROI = Region of Interest

1. Inspections Right-click Inspections. Add | Region | Ribbon. Rename it Base Empty Pocket ROI.
2. Right-click Base Empty Pocket ROI. Add | Analysis | Contrast. Rename it Base Empty Pocket.
3. Inspections Right-click Inspections. Add | Region | Ring. Rename it True Center ROI.
4. Right-click True Center ROI. Add | Enhancement | Stretch Grayshades.
5. Right-click True Center ROI. Add | Registration | Hough. Rename it True Center.
6. Right-click True Center. Add | Region | Ring. Rename it Outer Base ROI.
7. Right-click Outer Base ROI. Add | Analysis | Contrast. Rename it Outer Base Inspection.
8. Right-click True Center. Add | Region | Ring. Rename it Spoke Defects ROI.
9. Right-click Spoke Defects ROI. Add | Enhancement | Clipping.
10. Right-click Spoke Defects ROI. Add | Analysis | Contrast. Rename it Spoke Defects Inspection.
11. Right-click True Center. Add | Region | Ring. Rename it Orientation ROI.
12. Right-click Orientation ROI. Add | Orientation | Pattern Match. Rename it Orientation.
13. Right-click Orientation. Add | Region | Polygon. Rename it Foot ROI.
14. Right-click Foot ROI. Add | Analysis | Contrast. Rename it Foot Inspection.
15. Right-click Orientation. Add | Region | Polygon. Rename it Between Foot ROI.
16. Right-click Between Foot ROI. Add | Analysis | Contrast. Rename it Between Foot Inspection.
17. Right-click Orientation. Add | Region | Ring. Rename it Pearling ROI.
18. Right-click Pearling ROI. Add | Analysis | Contrast. Rename it Pearling Inspection.
19. Right-click True Center. Add | Region | Ring. Rename it Gate Registration

Inspection tree- repeated

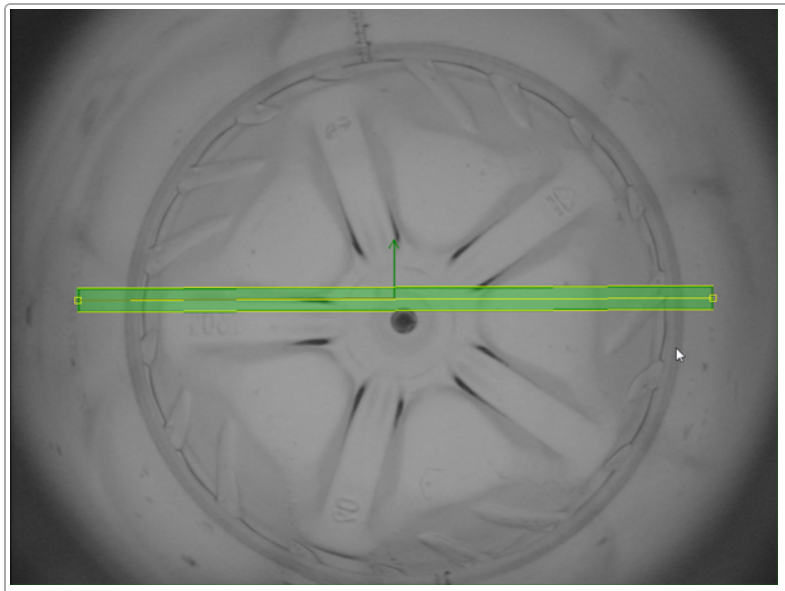
ROI.

20. Right-click Gate Registration ROI. Add | Registration | Feature. Rename it Gate Registration.
21. Right-click Gate Registration. Add | Region | Ring. Rename it Gate ROI.
22. Right-click Gate ROI. Add | Analysis | Contrast. Rename it Gate Inspection.
23. Right-click Gate Registration. Add | Region | Ring. Rename it Around Gate ROI.
24. Right-click Around Gate ROI. Add | Analysis | Contrast. Rename it Around Gate Inspection.
25. Right-click Gate Registration. Add | Region | Ring. Rename it Base Fold ROI.
26. Right-click Base Fold ROI. Add | Analysis | Ambient. Rename it Base Fold Inspection.
27. Right-click True Center ROI. Add | Dimension | Distance. Rename it Off-Center Gate Inspection.

Your inspection tree should look similar to that shown on the left.

Place the Empty Pocket ROI

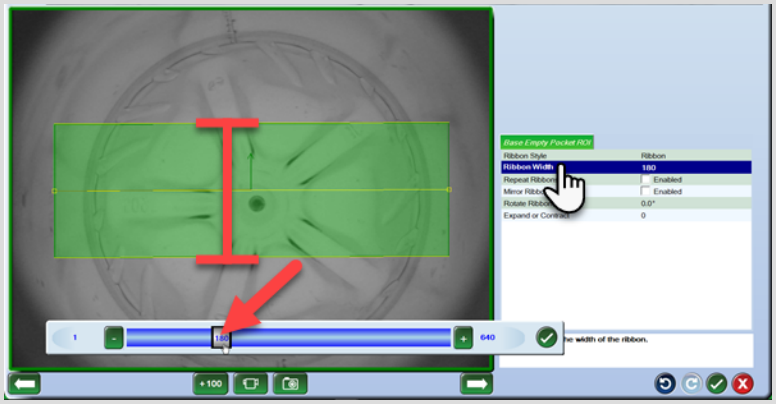
An empty pocket inspection must be applied if your system is using a PDX. The Empty Pocket is used to determine if the bottle is in the gripper fingers. If so it allows the inspections to be performed; if not, it stops the inspections from being done.



Double-click Base Empty Pocket ROI in the inspection tree.

If the Ribbon is not already set on the image: it says NEW RIBBON (Click to add points). Click in the image to place two points to span most of the image.

Then right-click over the image and select Complete New Ribbon. A ribbon with yellow lines will be displayed on the image.



We want the ribbon to cover more area over the base where we expect to see dark pixels from the gate and feet.

To cover more of the image area:

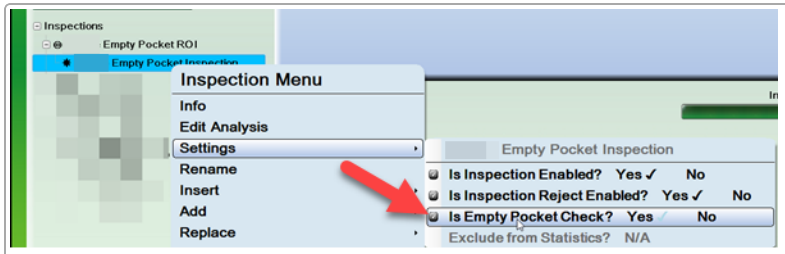
Select Ribbon Width and make it wider. In our example, we used 180 for Ribbon Width.

Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Select the OK button to save changes and exit.

Set up the Base Empty Pocket Inspection

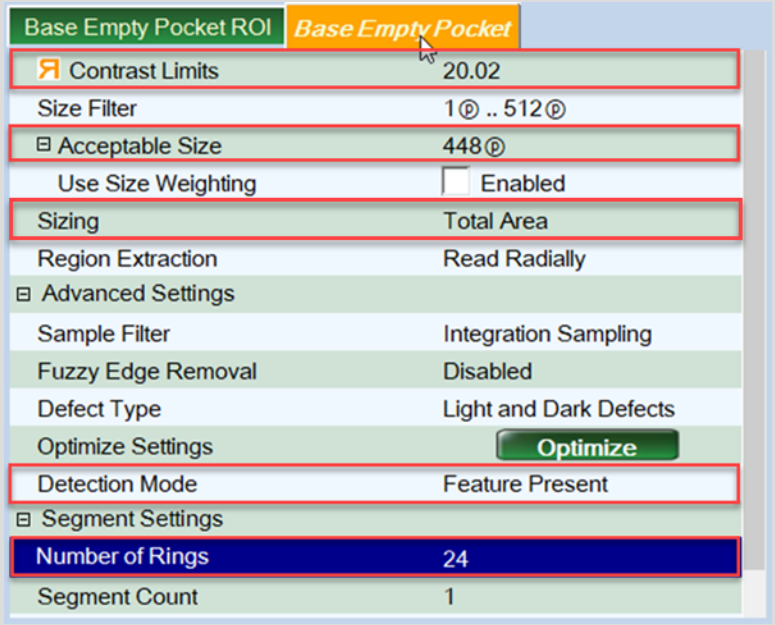
We will set up this inspection to detect some dark pixels over the gate and feet area. If these dark pixels do not appear, then the system will know that there is no bottle present, and therefore not run any further inspections.



In the Inspection Tree, right-click over the Base Empty Pocket. Select Settings | Is Empty Pocket Check? Click to enable it.

The system will give a warning that rejecting is off. This is OK.

The name of the Empty Pocket inspection will have a blue background in the inspection tree.

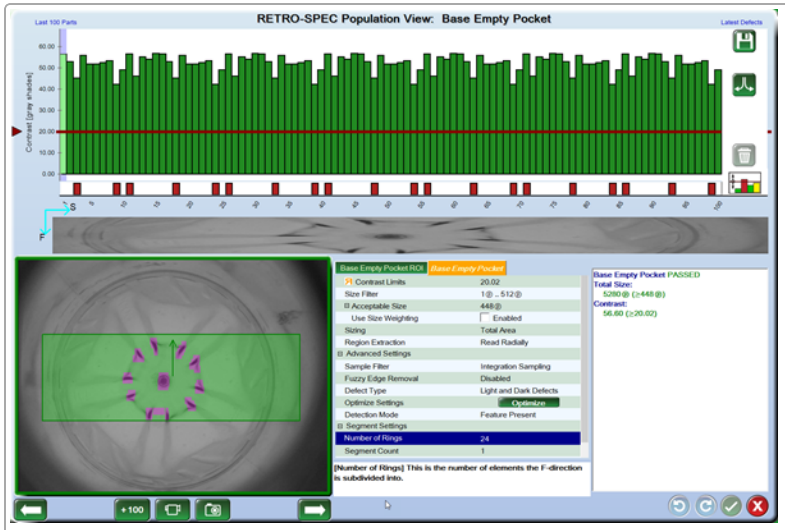


Double-click Base Empty Pocket (in the inspection tree) to edit it.

If you need to see images, put the lane online to acquire several images. Take the lane offline, and select the [+100] button below the image.

To set the parameters:

1. Set Contrast Limits to approximately 20.
2. Set Acceptable size to approximately 448. This allows the system to accept many pixels, to consider that a part is present.
3. Set Sizing to Total Area. This allows the system to count the total number of pixels instead of groups of pixels.
4. Set Detection Mode to Feature Present. This means that a feature should be present, and if it is not, then the absence of a feature means there is no part.
5. Set the Number of Rings to 24. This makes the inspection more sensitive.
6. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

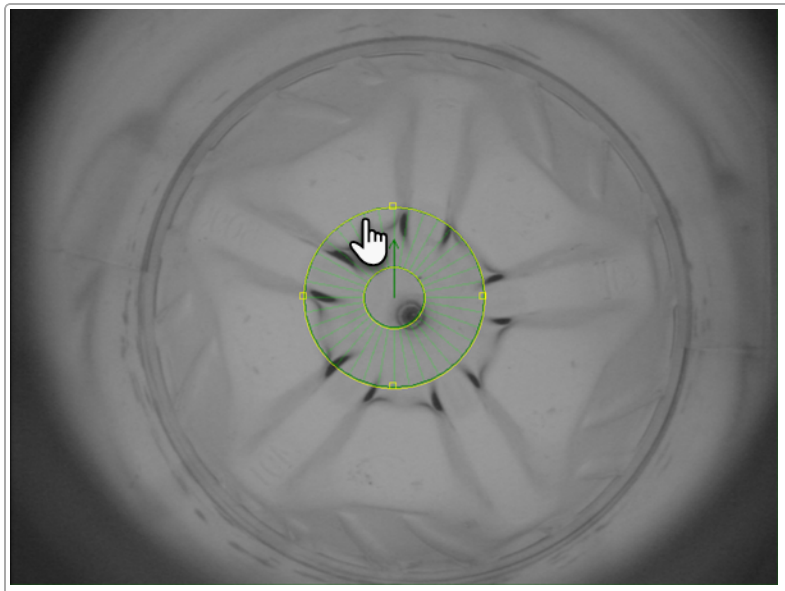


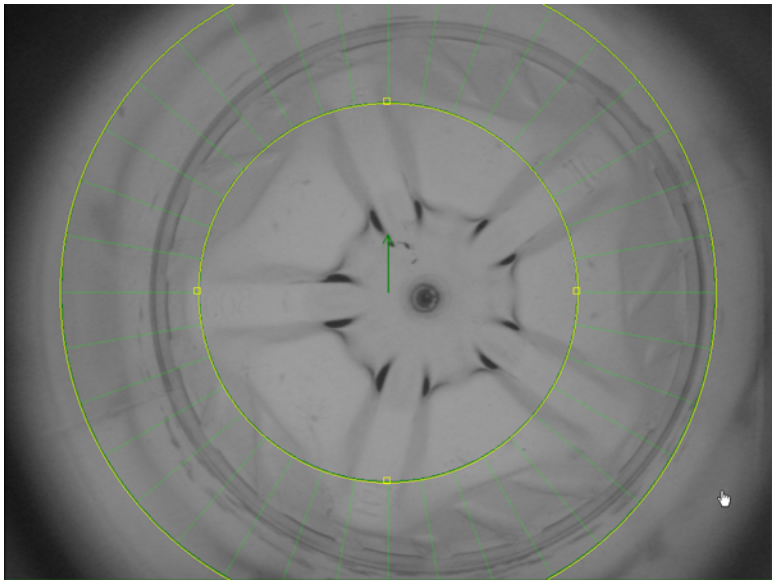
Images with parts in the field of view should pass the inspection. If a part was missing, it would fail.

Select the OK button to save changes and exit.

Place the True Center ROI

We will set up the Region of Interest (ROI) so that the system knows where to search for the "true center" of the base. Since bottles change position slightly from part to part, the True Center Registration finds the center for each bottle. Once this point is found, the remaining inspections are run to inspect the base.





Double-click True Center ROI in the inspection tree to edit it.

To edit the region:

1. Click inside the default region.
2. Select one of the yellow boxes on the outer region border, and drag it outside of the perimeter of the base. It is OK for the region to fall outside of the inspection window (in a Hough registration, which is what we are using).
3. Click in the center of the region. You will see yellow boxes on the inner region border.
4. Drag one of the yellow boxes so that the inner border falls inside of the perimeter of the outer base.
5. Scroll through a few images to make sure the outer base perimeter falls inside the inspection region. You may need to make the inner region smaller to accommodate all bottles.
6. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

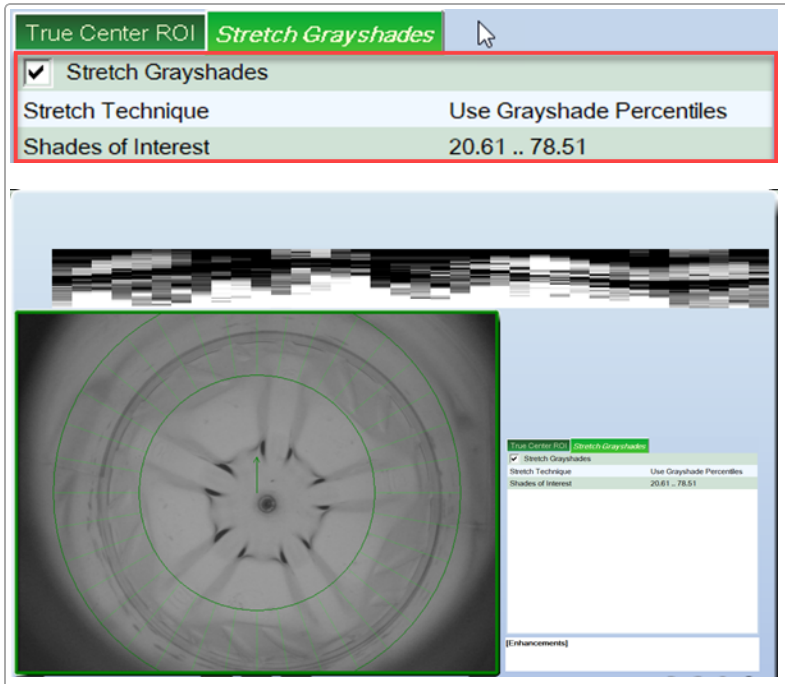
True Center ROI	
X Offset	-11
Y Offset	9
Inner Radius	145
Thickness	177

7. Select the OK button to save changes and exit.

Set up the Base Inspection Enhancement

We are using Stretch Grayshades to increase the image contrast, so that the system can locate the perimeter of the base.

Note: your system may have this enhancement disabled, based on your part. On some systems, the inspections work better without this enhancement.



Double-click Stretch Grayshades to edit it.

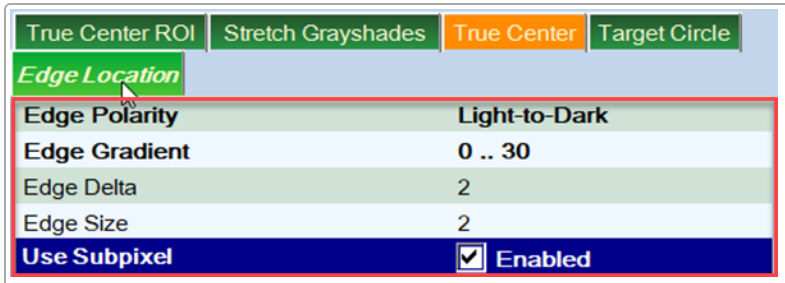
To set up the enhancement:

1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3. Select the OK button to save changes and exit.

The unwrapped region of interest shows the effect of the enhancement.

Set up the True Center Registration

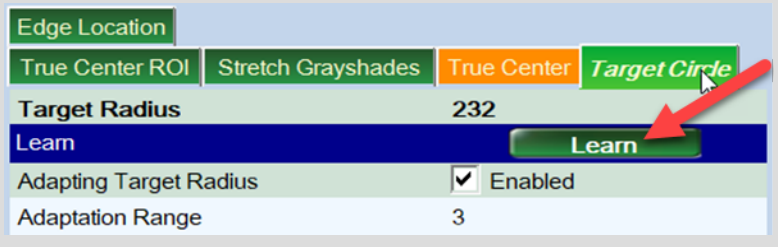
The Registration does the search for edges, to find the true center of the base.



Double-click True Center to edit it.

In the Edge Location menu, set Edge Polarity to Light-to-Dark. This allows the system to find only dark edges.

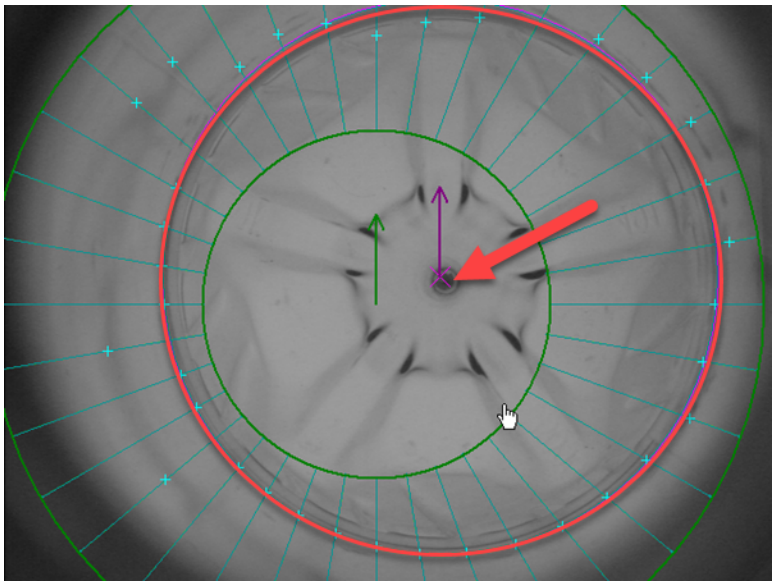
Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.



Go to the Target Circle tab.

Enable Adapting Target Radius. This increases the accuracy of finding the edges.

Click the Learn button. This allows the system to learn where the edges will fall.



The system should now find the edge transitions on the outer base, and the center of the part.

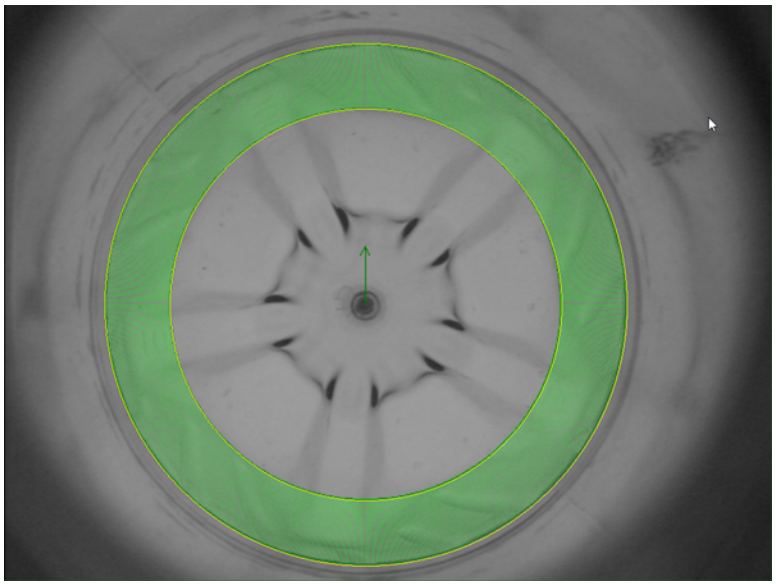
Important: this is a critical step to make sure the following inspections work correctly. Be sure to test several parts and make sure the (approximate) gate is found as the center (if it is a good part). Make adjustments as needed.

Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Select the OK button to save changes and exit.

Place the Outer Base ROI

We will set up the Region of Interest (ROI) to position the inspection on the outer base.



Double-click Outer Base ROI in the inspection tree to edit the region.

To edit the region:

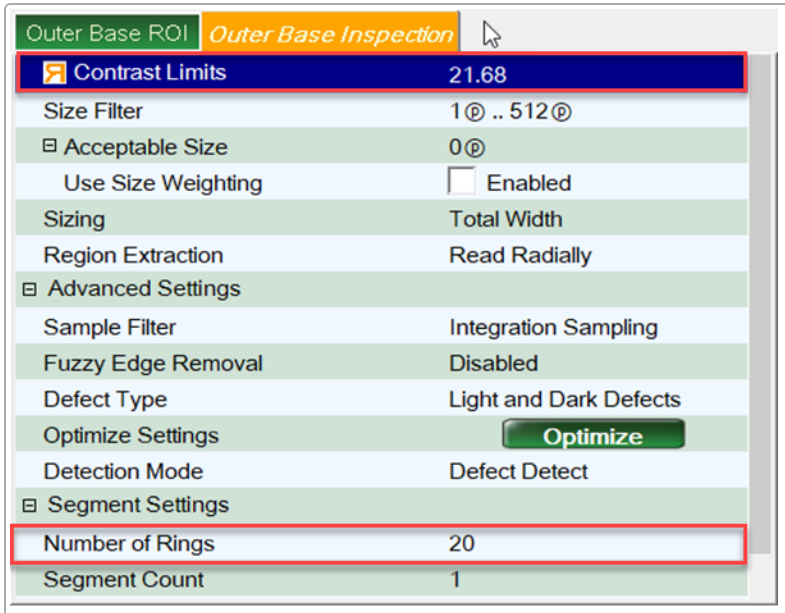
1. Click inside the two circles of the default region.
2. Place the region on the outer base as shown.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

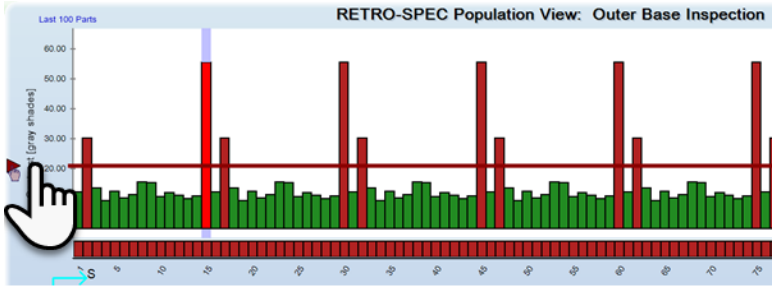
Outer Base ROI	
X	0
Y	0
Inner Radius	163
Thickness	54
Use Arc Segments	☐ Enabled
Perimeter Type	Normal

4. Select the OK button to save changes and exit.

Set up the Outer Base Inspection

We are using a Contrast inspection to find defects in the outer base.

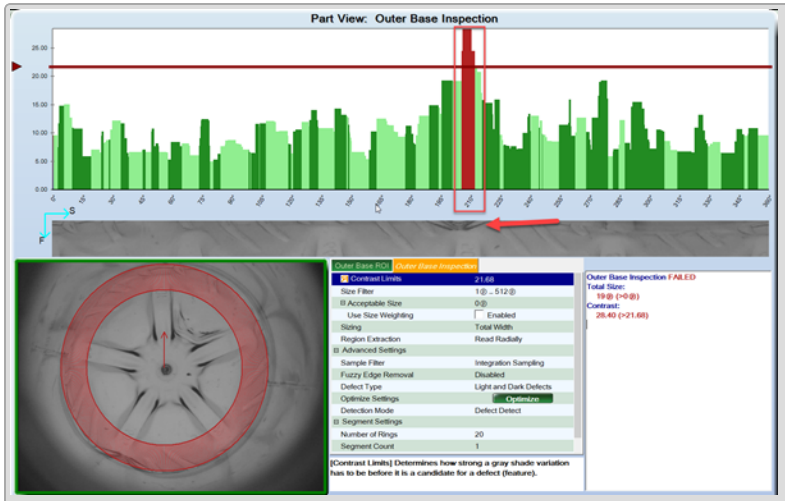




Double-click Outer Base Inspection to edit it.

To set up the inspection:

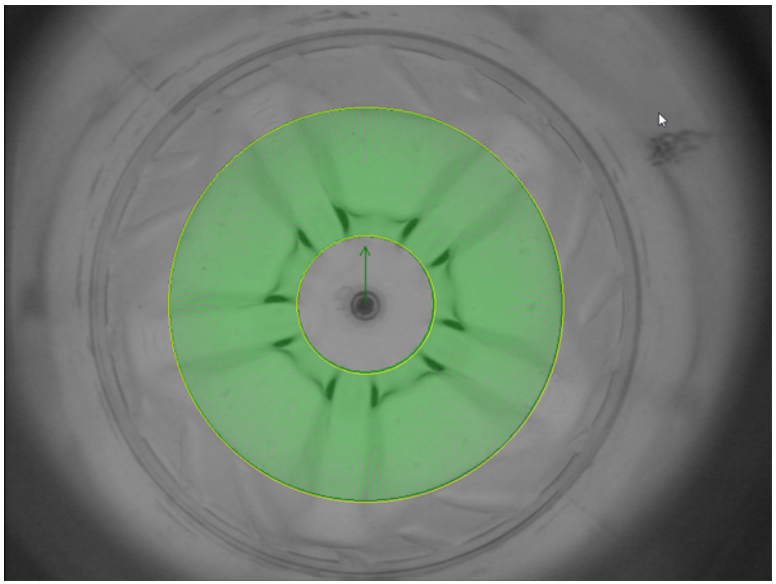
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Scroll through several images to make sure the inspection is passing or failing as desired.
3. You can move the red horizontal bar in the graph closer to zero to make the inspection more sensitive, or further from the center to make the inspection less sensitive.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
5. Select the OK button to save changes and exit.



In this example, you can see the failure from the Part View graph. The system found a base fold that fell outside the limits we set.

Place the Spoke Defects ROI

We will set up the Region of Interest (ROI) to position the inspection for spoke defects.



Double-click Spoke Defects ROI in the inspection tree to edit the region.

To edit the region:

1. Click inside the two circles of the default region.
2. Place the region to surround the spokes as shown.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

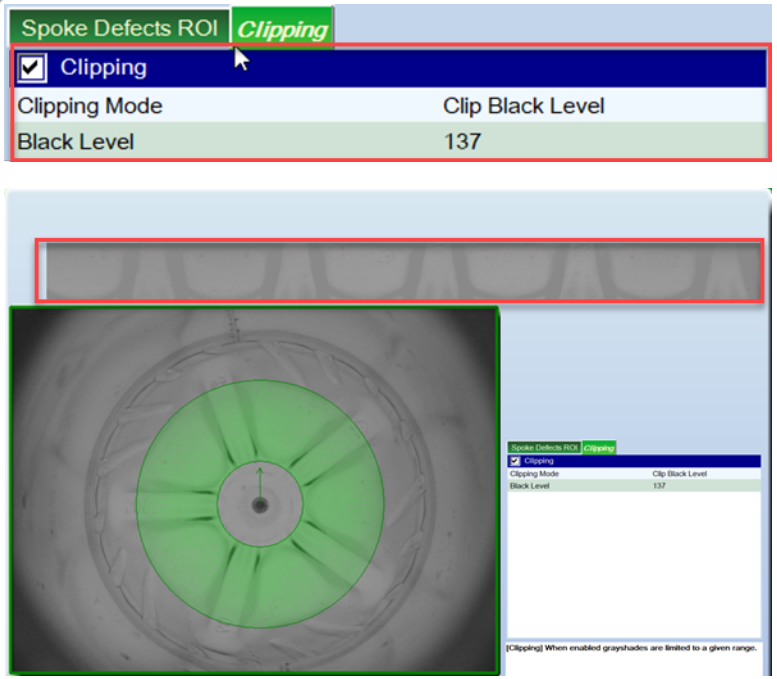
Spoke Defects ROI	
X	0
Y	0
Inner Radius	57
Thickness	107
Use Arc Segments	☐ Enabled
Perimeter Type	Normal

4. Select the OK button to save changes and exit.

Set up the Spoke Defects Enhancement

We are using Clipping to decrease the contrast between the spokes.

Note: Clipping may be disabled on your system, depending on your part. On some systems, the inspections work better without the enhancement.



Double-click Clipping to edit it.

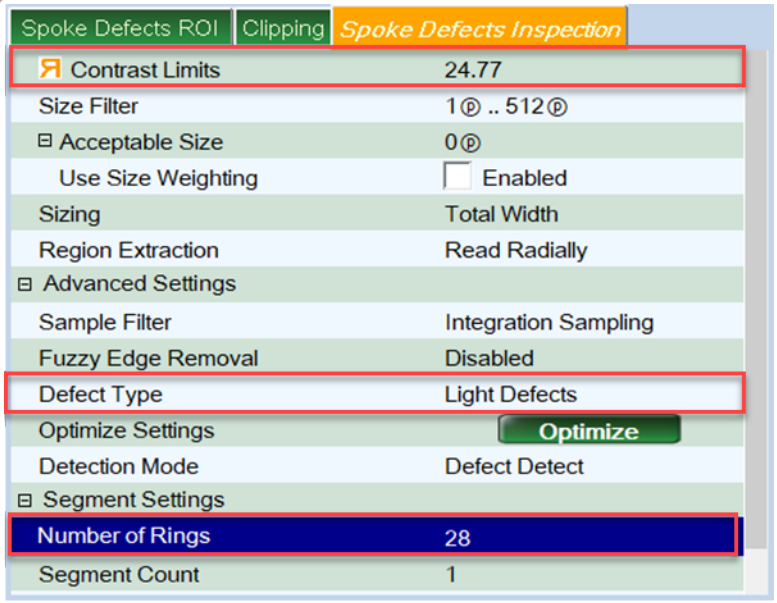
To set up the enhancement:

1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3. Select the OK button to save changes and exit.

The unwrapped region of interest shows the effect of the enhancement.

Set up the Spoke Defects Inspection

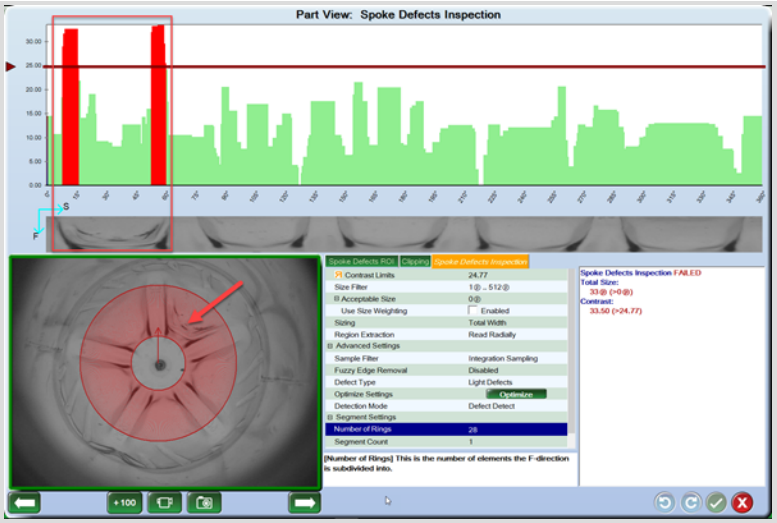
We are using a Contrast inspection to find defects in the spokes area.



Double-click the Spoke Defects Inspection to edit it.

To set up the inspection:

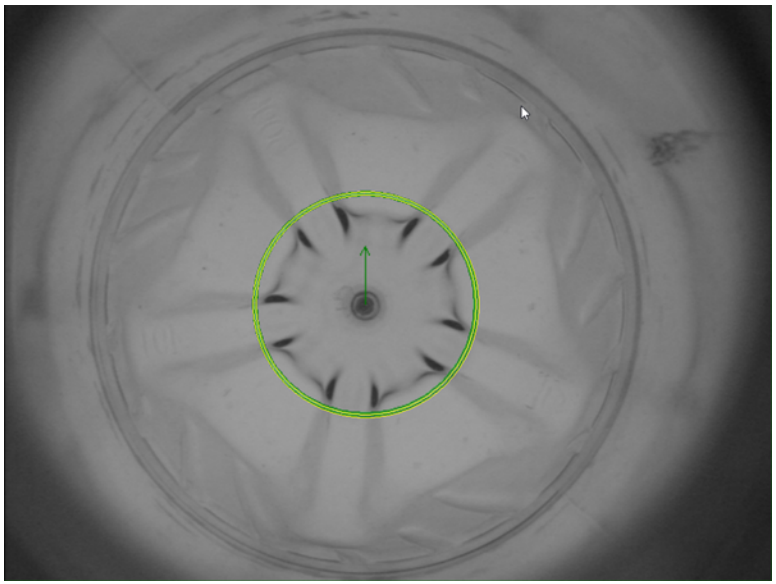
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3. Select the OK button to save changes and exit.



In this example, you can see the failure from the Part View graph. The system found a base fold that fell outside the limits we set.

Place the Orientation ROI

We will set up the Region of Interest (ROI) to determine the orientation of the part.



Double-click Orientation ROI in the inspection tree to edit the region.

To edit the region:

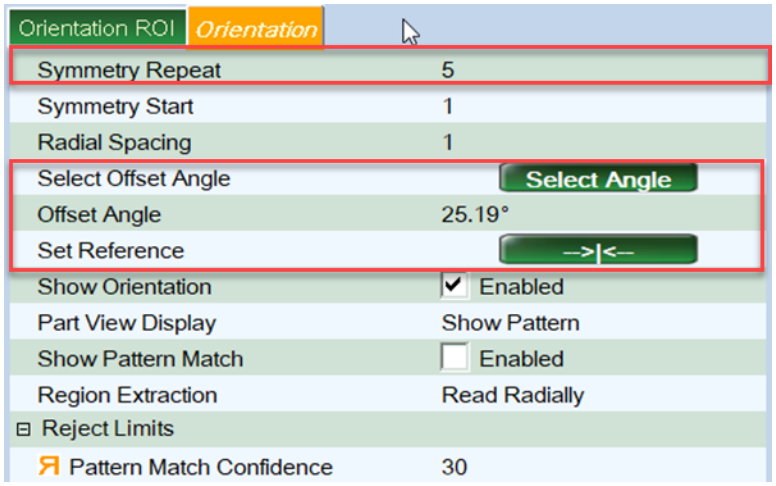
1. Click inside the two circles of the default region.
2. Place the region as shown.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Orientation ROI	
X Offset	0
Y Offset	0
Inner Radius	91
Thickness	3
Use Arc Segments	☐ Enabled
Perimeter Type	Normal

4. Select the OK button to save changes and exit.

Set up the Base Orientation

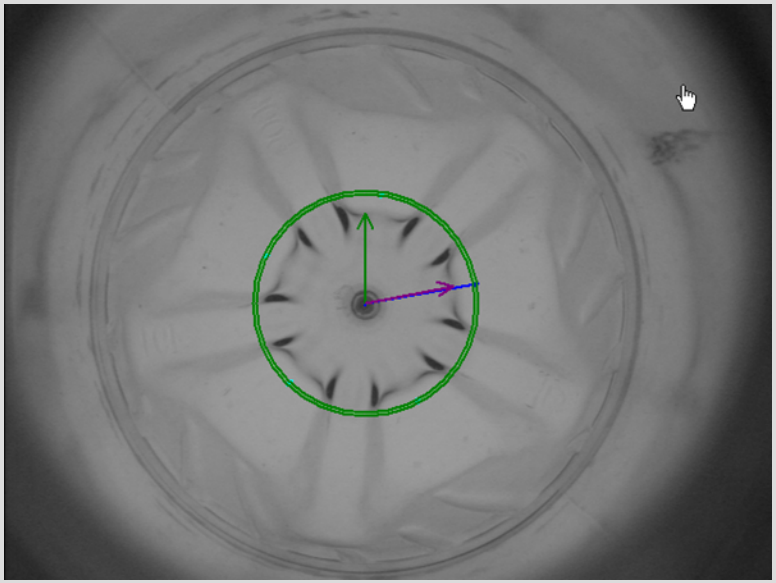
We are using a Pattern Match orientation to find defects on and between the feet of the bottle. The system uses the bottle's geometry to place the inspections.



Double-click the Orientation to edit it.

To set up the orientation:

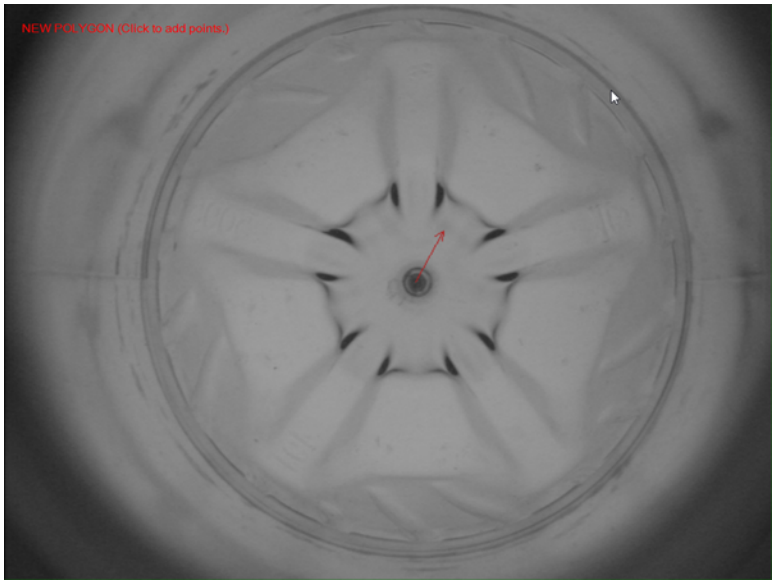
1. Set Symmetry Repeat to 5 (depending on your bottle). If your bottle's base has feet, then use the number of feet your bottle has.
2. Click the Set Reference button. The system will automatically compute the reference point based on your part and Offset Angle.
3. Click the Select Angle button. On the image, select a spot on the base that is repeatable from part to part. (see our example below) Click the Select Angle button again to save the selection. The system updates Offset Angle automatically.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
5. Select the OK button to save changes and exit.



Orientation example.

Place the Foot ROI

We are using a Polygon region to place this inspection.



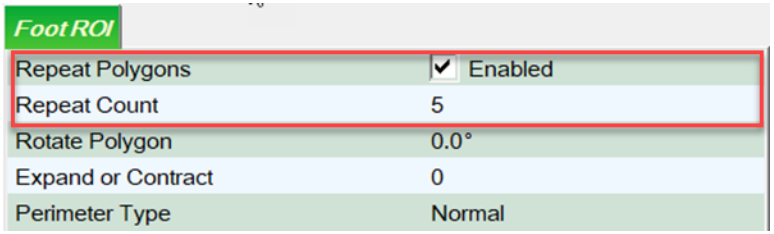
Double-click Foot ROI to edit it.

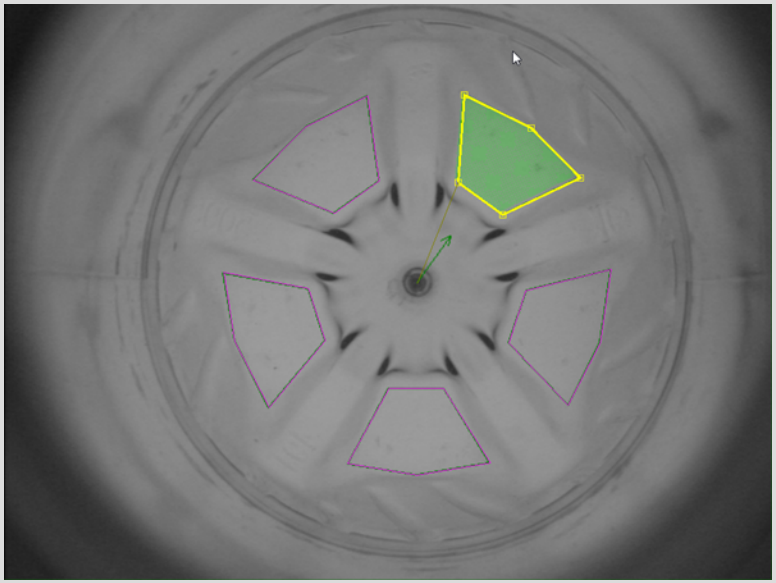
If this is your first time editing this region, it will say "New Polygon (click to add points)." First, set some parameters.

This region uses the orientation we set up previously to place the inspection on the feet.

To set up the menu:

1. In the Foot ROI menu, check Repeat Polygons to enable it.
2. Set Repeat Count to 5 (or the number you used in previous Orientation).



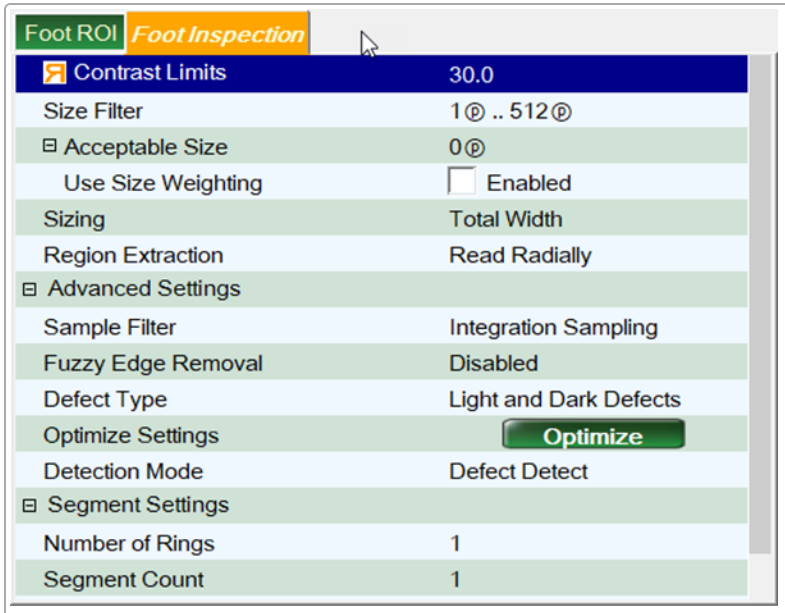


To place the regions:

1. Click in the image to place points to create a polygon to cover the foot, as shown. (It does not matter which point you place first)
2. Click again over the first point. This will close the polygon.
3. The system automatically repeats the region around the base.
4. *Note: if the polygons go outside the feet - overlapping darker areas, for example, then 1) make sure your True Center is working correctly, and 2) move the polygon points inwards so that the region is not too large.*
5. Select the OK button to save changes and exit.

Set up the Foot Inspection

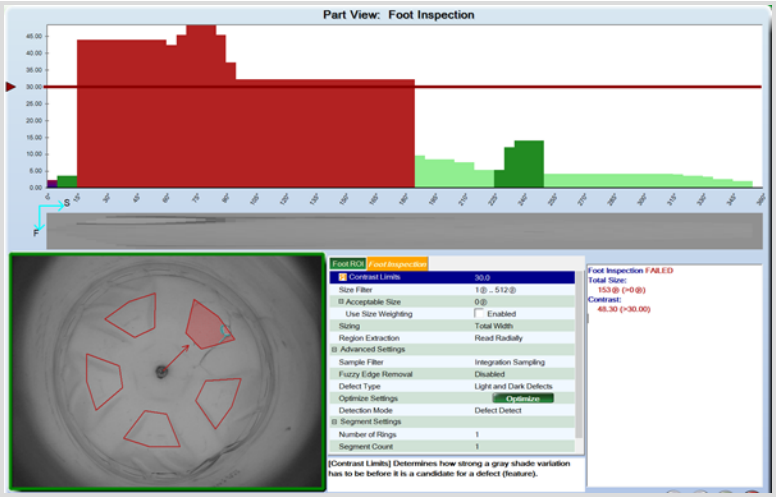
We are using a Contrast inspection to find defects in the feet.



Double-click the Foot Inspection to edit it.

To set up the inspection:

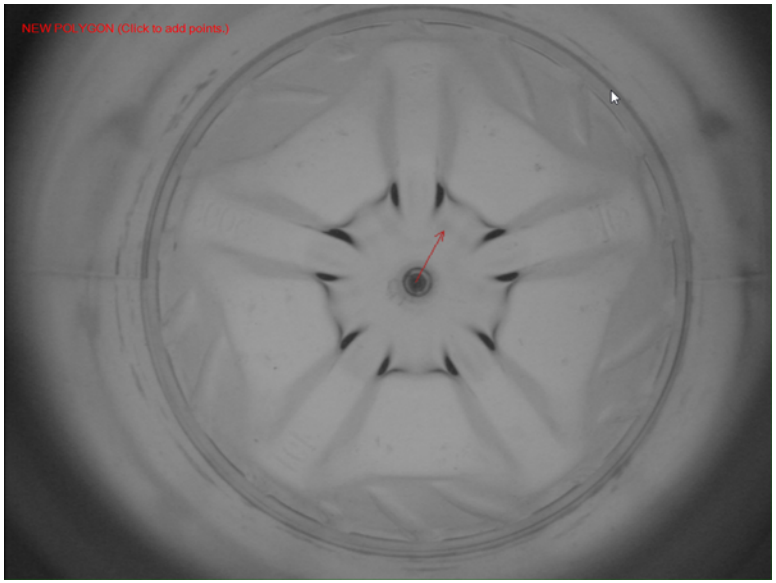
1. For the most part, you can leave the parameters at the default values. Your values may vary, based on your part and system setup.
2. Select the OK button to save changes and exit.



In this example, you can see the failure from the Part View graph. The system found a base hole.

Place the Between Foot ROI

We are using a Polygon region to place this inspection.



Double-click Between Foot ROI to edit it.

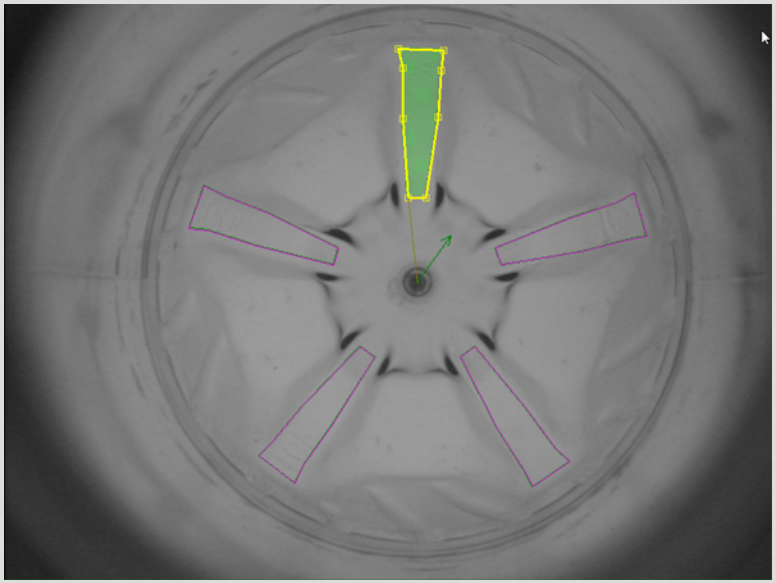
If this is your first time editing this region, it will say "New Polygon (click to add points)." First, set some parameters.

This region uses the orientation we set up previously to place the inspection between the feet.

To set up the menu:

1. In the Between Foot ROI menu, check Repeat Polygons to enable it.
2. Set Repeat Count to 5 (or the number you used in previous Orientation).

Between Foot ROI	
Repeat Polygons	☑ Enabled
Repeat Count	5
Rotate Polygon	0.0°
Expand or Contract	0
Perimeter Type	Normal

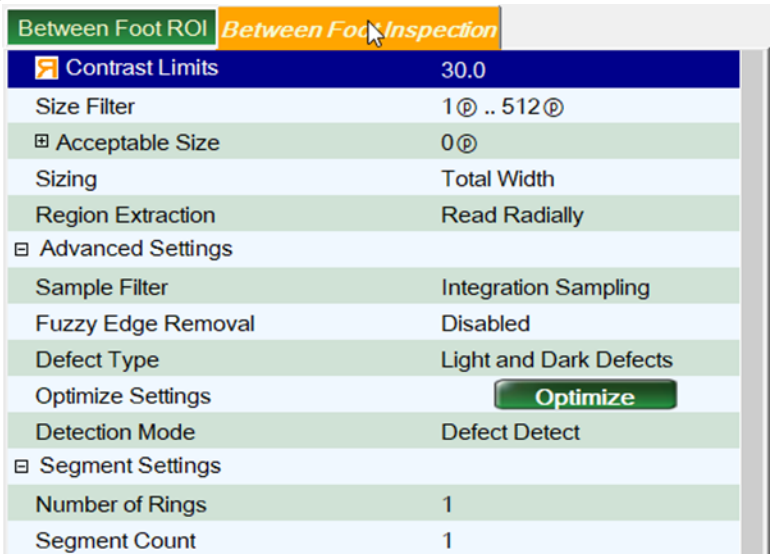


To set up the regions:

1. Click in the image to place points to create a polygon to cover the areas between the feet, as shown. (It does not matter which point you place first, nor how many points you use)
2. Click again over the first point. This will close the polygon.
3. The system automatically repeats the region around the base.
4. If you find that some regions are overlapping dark areas, then try making the region smaller.
5. Select the OK button to save changes and exit.

Set up the Between Foot Inspection

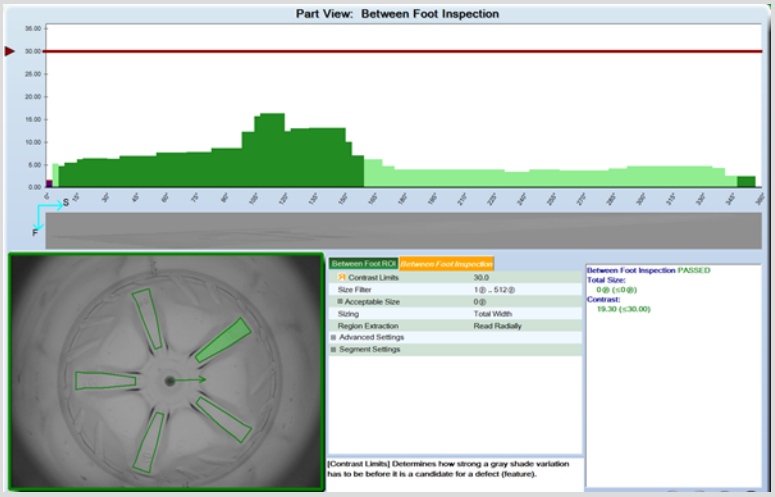
We are using a Contrast inspection to find defects between the feet.



Double-click Between Foot Inspection in the inspection tree.

To set up the inspection:

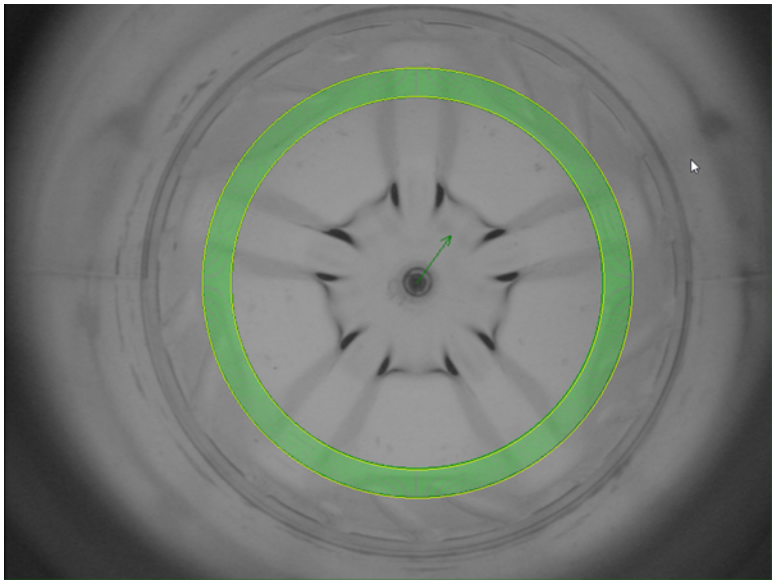
1. For the most part, you can leave the parameters at the default values. Your values may vary, based on your part and system setup.
2. Select the OK button to save changes and exit.



Between Foot inspection example

Place the Pearling ROI

We will set up the Region of Interest (ROI) to position the inspection on the base where pearling typically occurs.



Double-click Pearling ROI in the inspection tree to edit.

To edit the region:

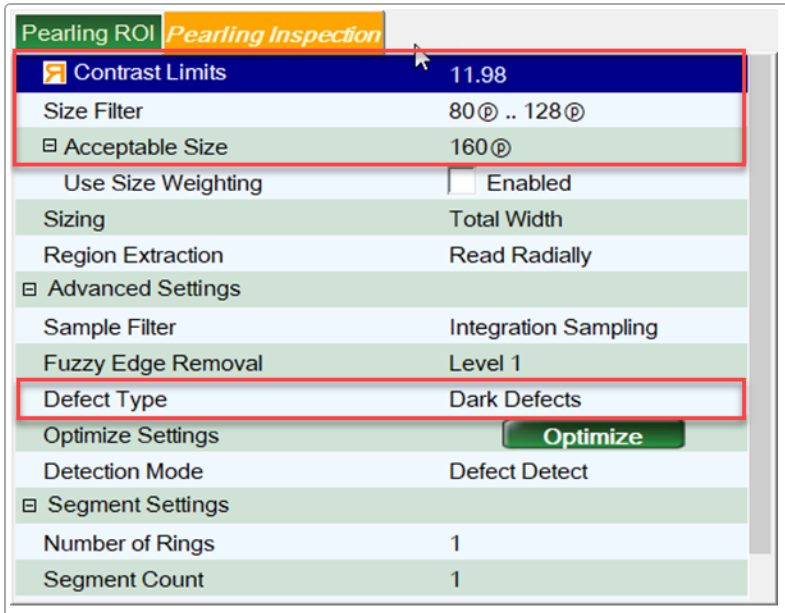
1. Click inside the two circles of the default region.
2. Place the region on the base as shown.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Pearling ROI	
X	0
Y	0
Inner Radius	155
Thickness	24
Use Arc Segments	☐ Enabled
Perimeter Type	Normal

4. Select the OK button to save changes and exit.

Set up the Pearling Inspection

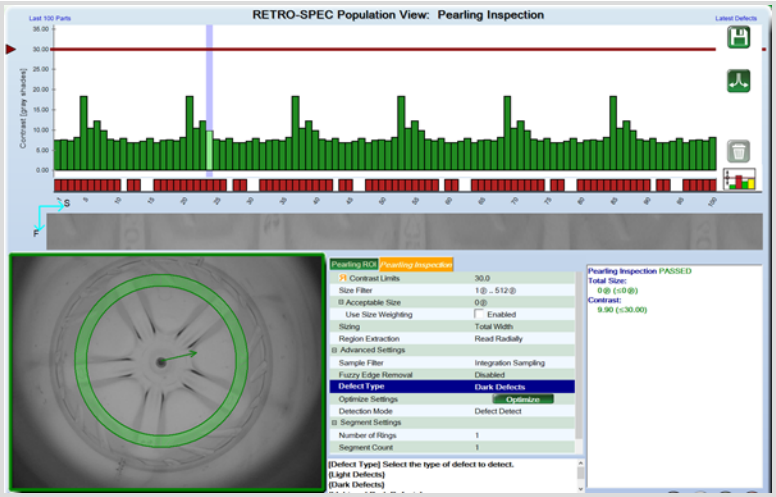
We are using a Contrast inspection to find pearling on the base.



Double-click the Pearling Inspection to edit it.

To set up the inspection:

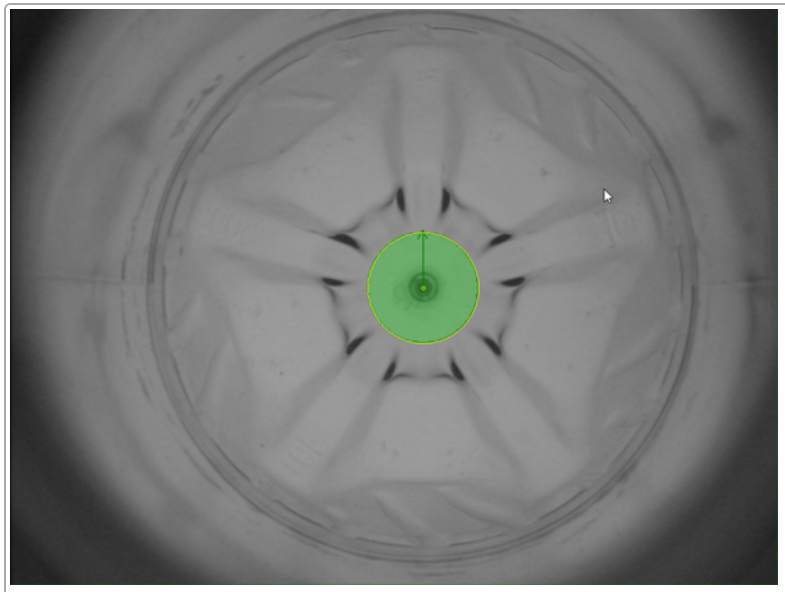
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3. Select the OK button to save changes and exit.



Pearling inspection example

Place the Gate Registration ROI

We will set up the Region of Interest (ROI) to position the inspection on the gate area.



Double-click Gate Registration ROI in the inspection tree to edit.

To edit the region:

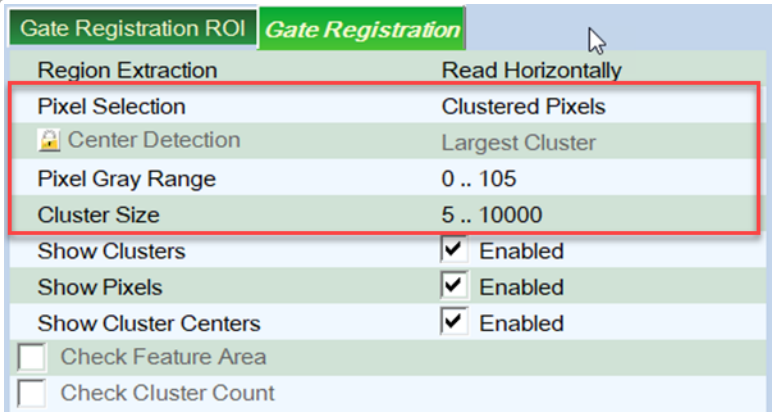
1. Place the region on the gate area as shown.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Gate Registration ROI	
X Offset	0
Y Offset	0
Inner Radius	1
Thickness	45
Perimeter Type	Normal

3. Select the OK button to save changes and exit.

Set up the Gate Registration

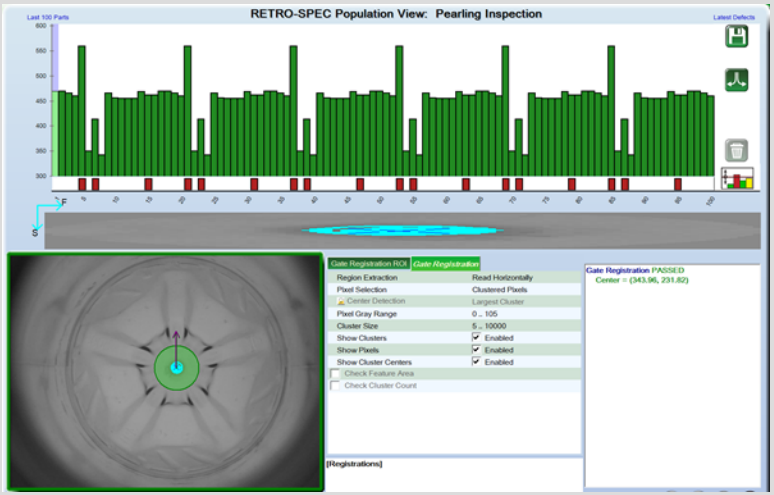
We are using a Feature Registration to find the gate. This registration looks for all the pixels within a specified gray shade range, or a cluster of pixels.



Double-click Gate Registration to edit it.

To set up the registration:

Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.



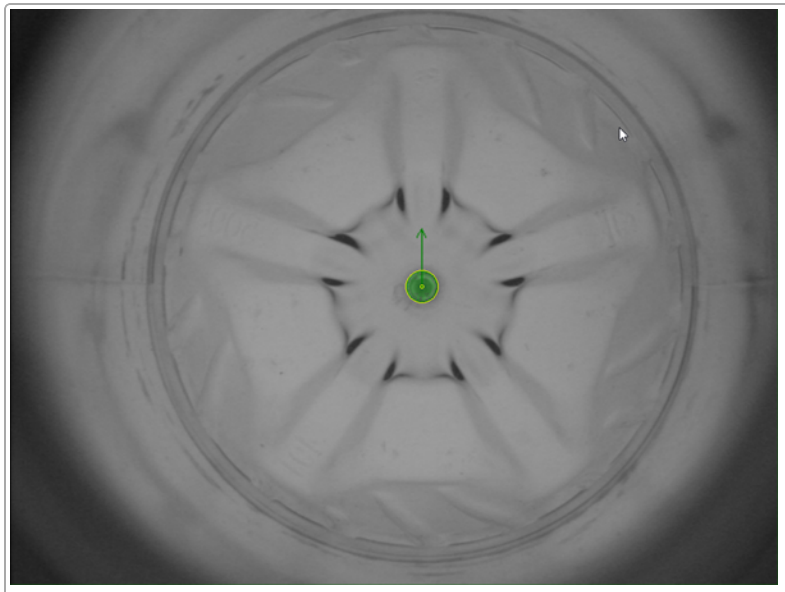
The system should now find the gate on your part.

Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Select the OK button to save changes and exit.

Place the Gate ROI

We will set up the Region of Interest (ROI) to position the inspection on the gate.



Double-click Gate ROI in the inspection tree to edit.

To edit the region:

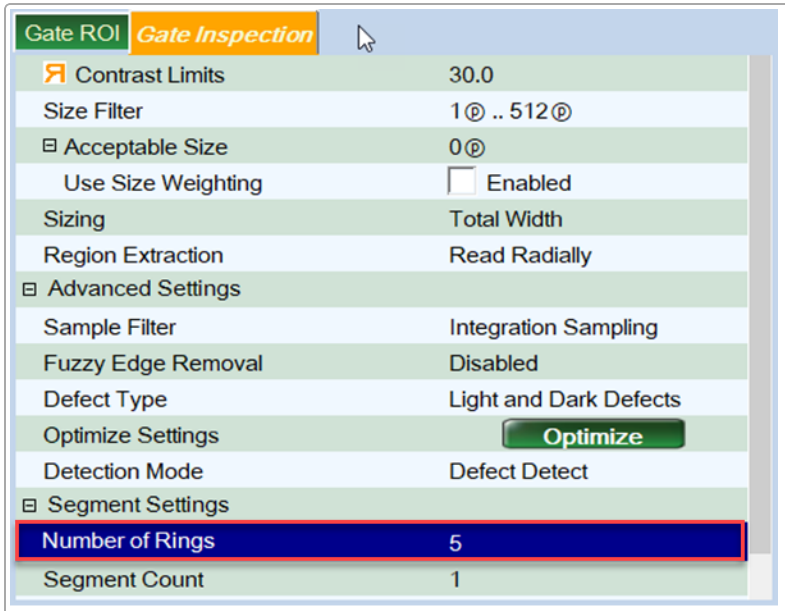
1. Place the region on the gate as shown.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Gate ROI	
X	0
Y	0
Inner Radius	1
Thickness	12
Use Arc Segments	☐ Enabled
Perimeter Type	Normal

3. Select the OK button to save changes and exit.

Set up the Gate Inspection

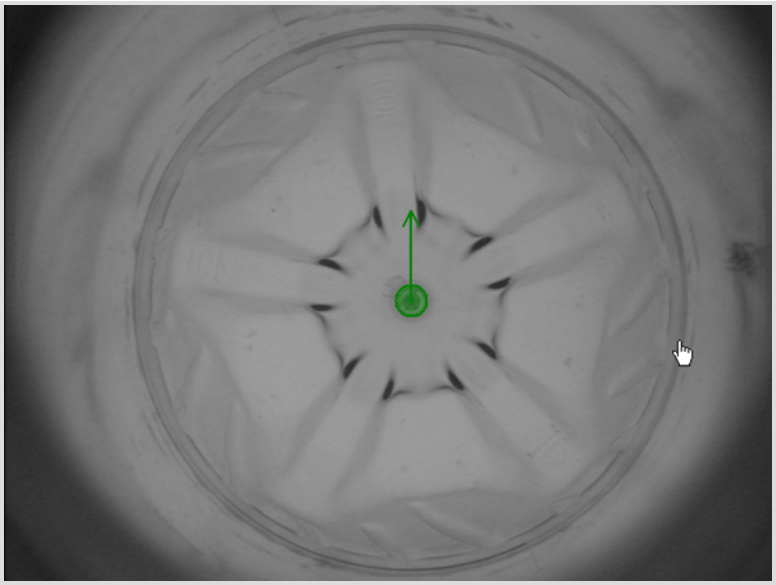
We are using a Contrast inspection to find defects on the gate.



Double-click Gate Inspection to edit it.

To set up the inspection:

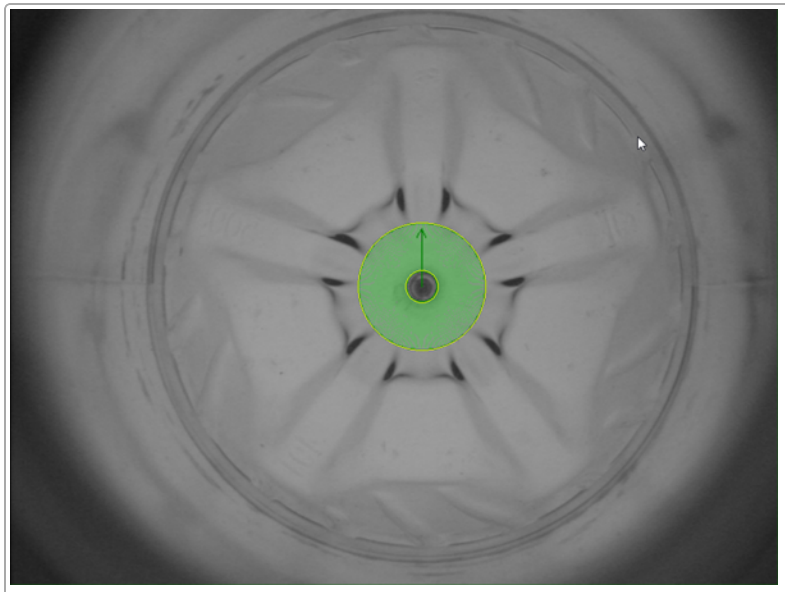
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3. Select the OK button to save changes and exit.



Gate inspection example

Place the Around Gate ROI

We will set up the Region of Interest (ROI) to position the inspection around the gate.



Double-click Around Gate ROI in the inspection tree to edit.

To edit the region:

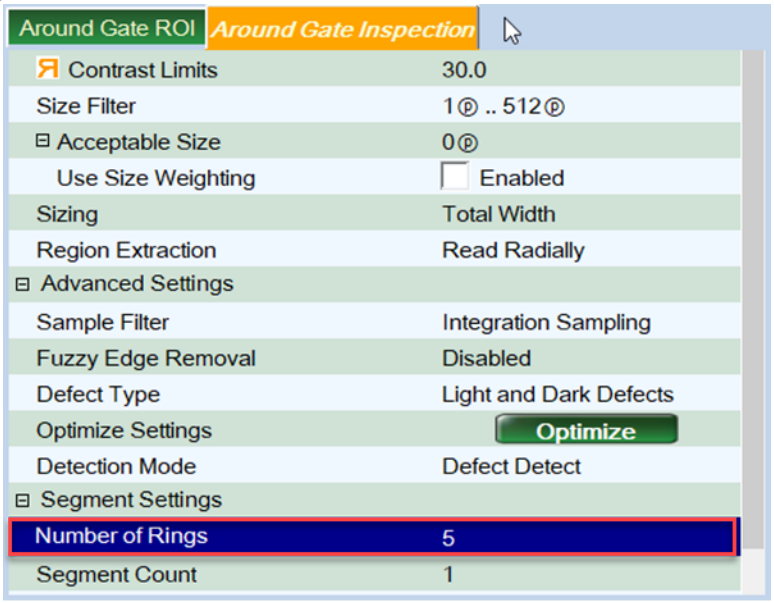
1. Place the region around the gate as shown.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Around Gate ROI	
X	0
Y	0
Inner Radius	13
Thickness	40
Use Arc Segments	Enabled
Perimeter Type	Normal

3. Select the OK button to save changes and exit.

Set up the Around Gate Inspection

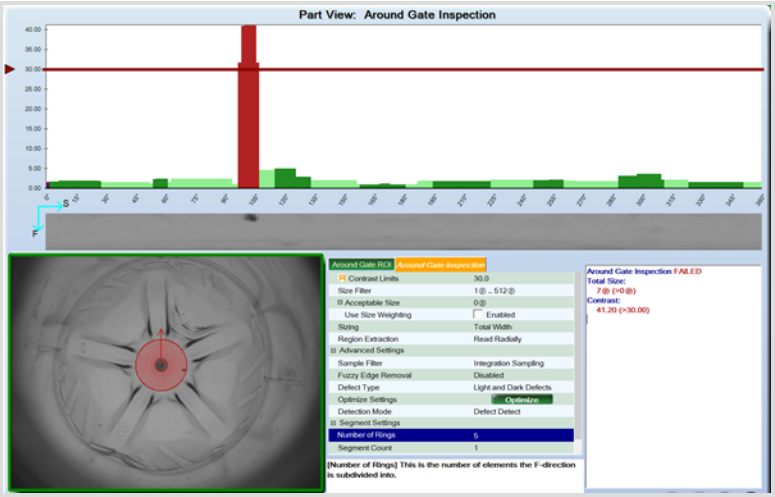
We are using a Contrast inspection to find defects around the gate.



Double-click Around Gate Inspection to edit.

To set up the inspection:

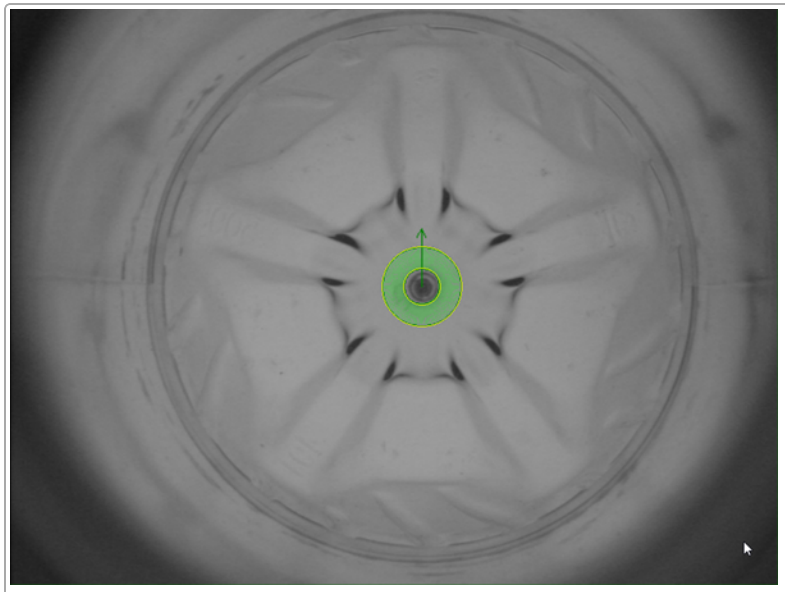
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3. Select the OK button to save changes and exit.



Around Gate inspection example

Place the Base Fold ROI

We will set up the Region of Interest (ROI) to position the inspection where base folds typically occur.



Double-click Base Fold ROI in the inspection tree to edit.

To edit the region:

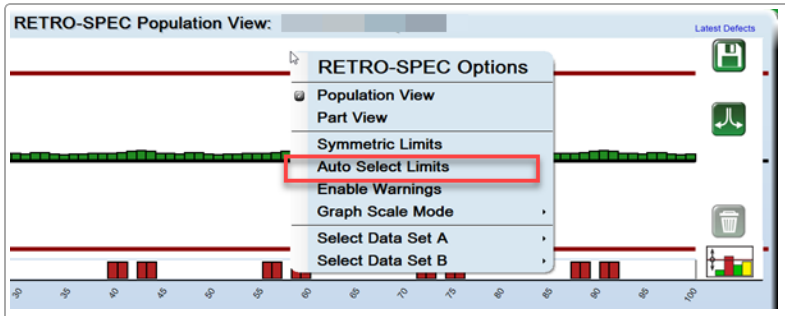
1. Place the region around the gate as shown.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

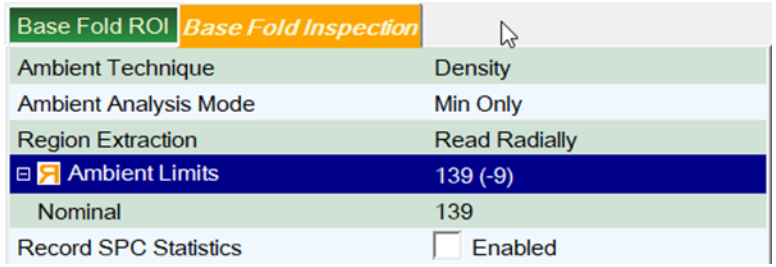
Base Fold ROI	
X	0
Y	0
Inner Radius	15
Thickness	18
Use Arc Segments	☐ Enabled
Perimeter Type	Normal

3. Select the OK button to save changes and exit.

Set up the Base Fold Inspection

We are using an Ambient inspection to find base folds.

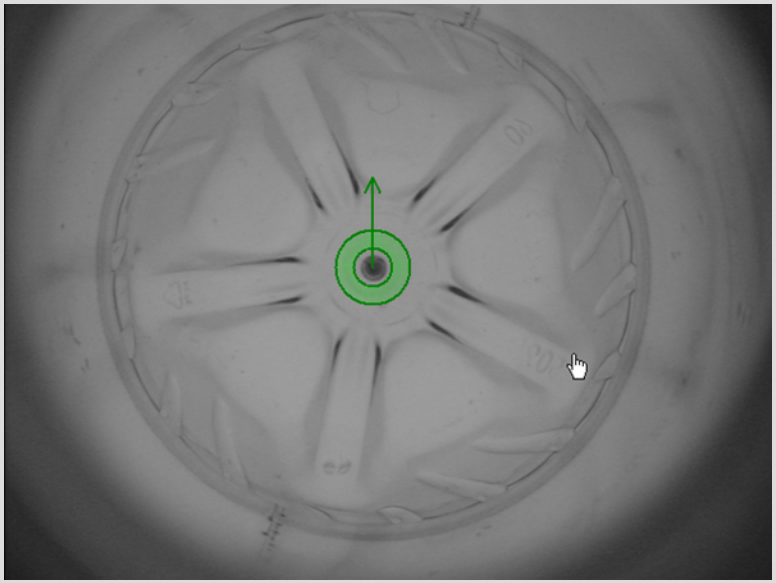




Double-click Base Fold Inspection to edit.

To set up the inspection:

1. +100 Put the lane online to acquire several images, and select the [+100] button.
2. Take the lane offline.
3. Right-click over the Retro-Spec Population View graph and choose Auto-Select Limits. The system will automatically set the inspection limits based on your parts.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.



To test the inspection:

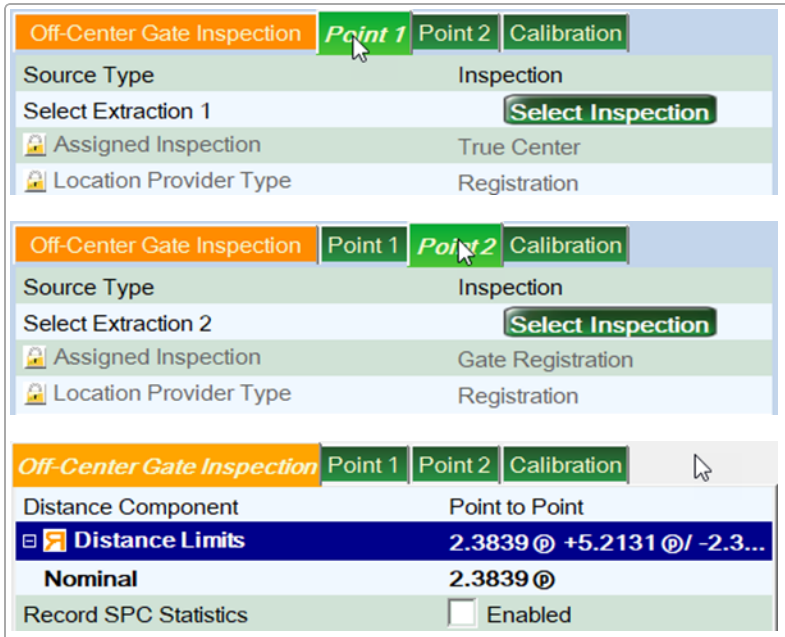
1. Scroll through the images to make sure parts are passing (or failing) as expected.
2. You can make the inspection more sensitive by moving the red horizontal bars on the Retro-Spec graph closer to center, or less sensitive by moving the red horizontal bars away from center.

Base Fold inspection example

Select the OK button to save changes and exit.

Set up the Off-Center Gate Inspection

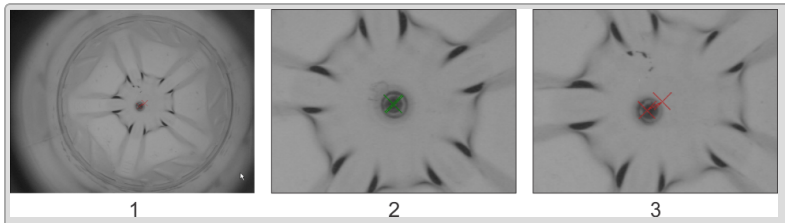
We are using a Distance Measurement to detect off-center gates.



Double-click Off-Center Gate Inspection to edit.

To set up the inspection:

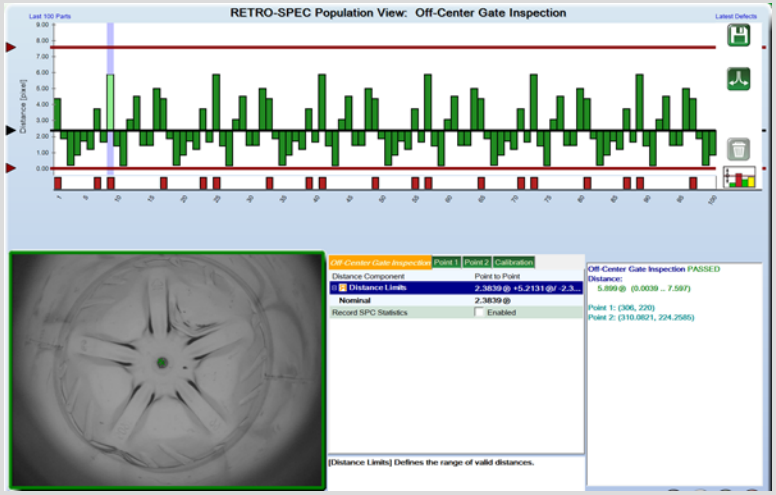
1. Go to the Point 1 menu and click the Select Inspection button.
2. Select True Center from the inspection tree. Click the Apply Reference button to complete the selection.
3. Go to the Point 2 menu and click the Select Inspection button.
4. Select Gate Registration from the inspection tree. Click the Apply Reference button to complete the selection.
5. Right-click over the Retro-Spec Population View graph and choose Auto-Select Limits. The system will automatically set the inspection limits based on your part.
6. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
7. Select the OK button to save changes and exit.



1) Full image with swung gate

2) Enlarged image of good part,

3) Enlarged image of bad part showing incorrect position of gate



To test the inspection:

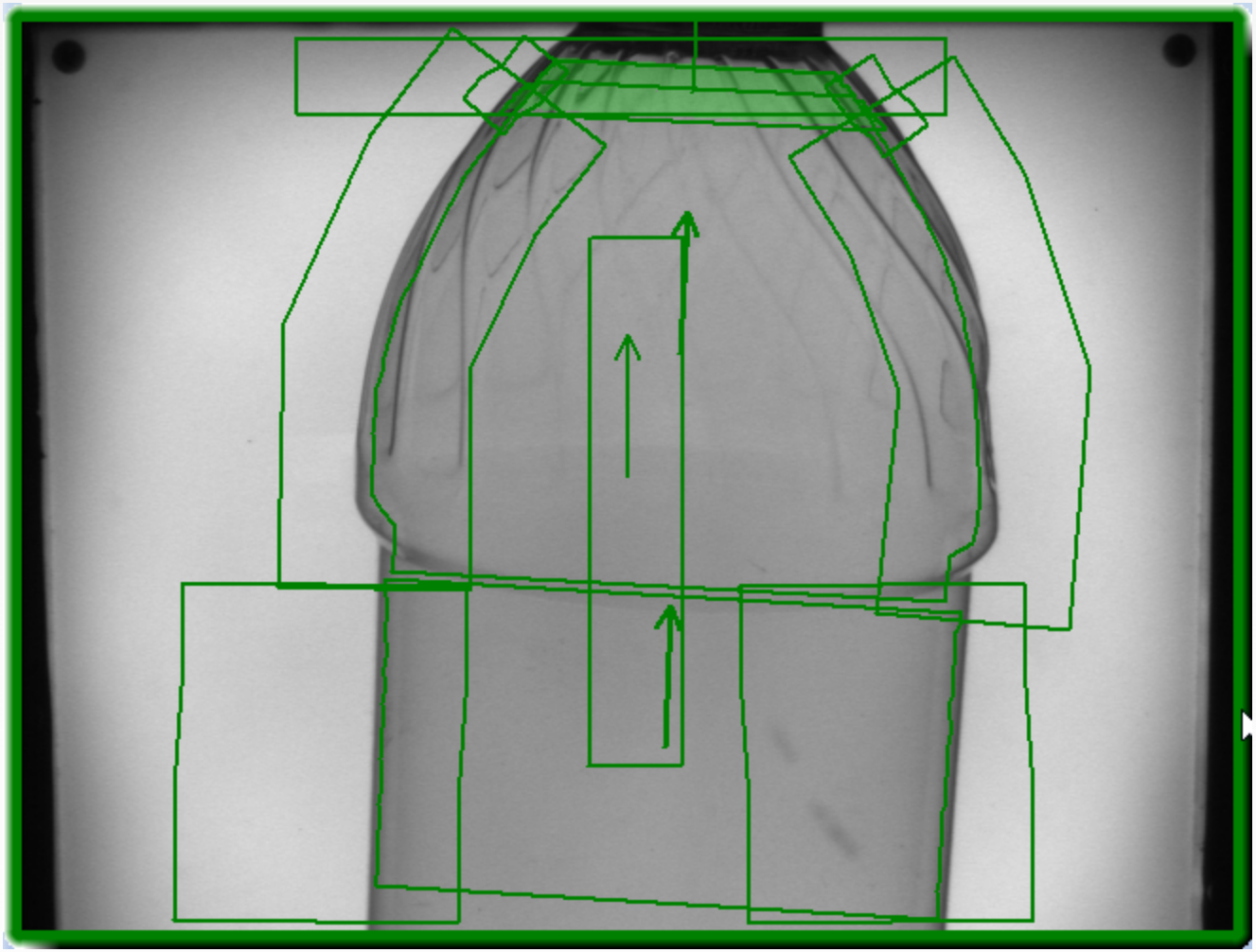
1. Scroll through the images to make sure parts are passing (or failing) as expected.
2. You can make the inspection more sensitive by moving the red horizontal bars on the Retro-Spec graph closer to center, or less sensitive by moving the red horizontal bars away from center.

An example of off-center gate inspection is shown to the left

Module 12 Inspections for Neck Camera

This section explains how to set up the inspections. Note that your inspections may be different, depending on your specific part, plant, and process requirements.

The picture below shows an image with all neck inspection regions. We will set these up one at a time.



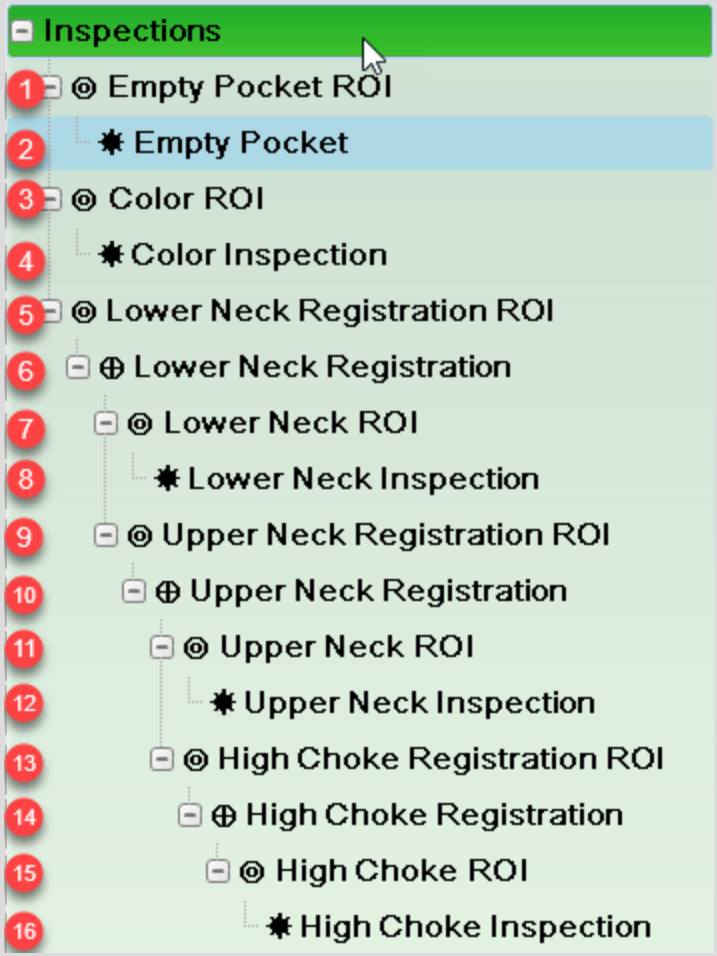
Create the Neck Inspection Tree

The steps below will guide you through the process of building the Neck Inspection Tree, while ensuring that the directory links are connected correctly. First add the inspections, then rename them to something that makes sense to you. Note that we will set up the regions and parameters later. For now, we will just build the inspection tree.

> *Note for all steps: when you add the inspection, you can rename it immediately.*
> *After each step, select the OK button to save changes, and the Exit button to exit the inspection.*

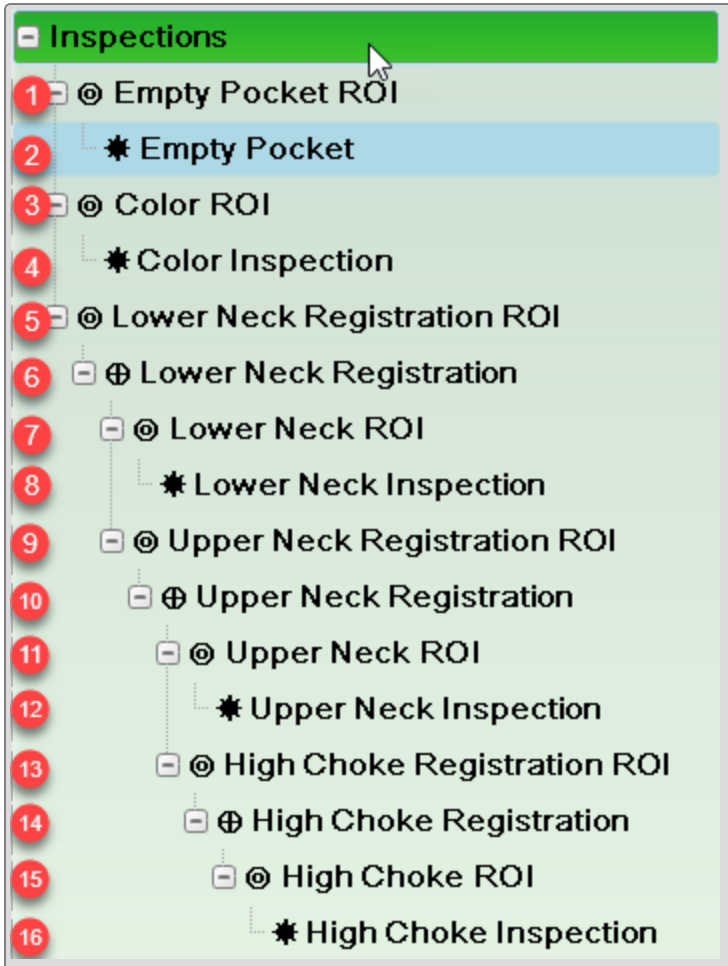
This is how the inspection tree will look	Steps to add the inspections

Note: ROI = Region of Interest



Inspection tree- repeated

1. Inspections Right-click Inspections. Add | Region | Ribbon. Rename it Empty Pocket ROI.
2. Right-click Empty Pocket ROI. Add | Analysis | Contrast. Rename it Empty Pocket.
3. Inspections Right-click Inspections. Add | Region | Ribbon. Rename it Color ROI.
4. Right-click Color ROI. Add | Analysis | Ambient. Rename it Color Inspection.
5. Inspections Right-click Inspections. Add | Region | Ribbon. Rename it Lower Neck Registration ROI.
6. Right-click Lower Neck Registration ROI. Add | Registration | Centerline. Rename it Lower Neck Registration.
7. Right-click Lower Neck Registration. Add | Region | Adaptive. Rename it Lower Neck ROI.
8. Right-click Lower Neck ROI. Add | Analysis | Contrast. Rename it Lower Neck Inspection.
9. Right-click Lower Neck Registration. Add | Region | Ribbon. Rename it Upper Neck Registration ROI.
10. Right-click Upper Neck Registration ROI. Add | Registration | Centerline. Rename it Upper Neck Registration.
11. Right-click Upper Neck Registration. Add | Region | Adaptive. Rename it Upper Neck ROI.
12. Right-click Upper Neck ROI. Add | Analysis | Contrast. Rename it Upper Neck Inspection.
13. Right-click Upper Neck Registration. Add | Region | Ribbon. Rename it High Choke Registration ROI.
14. Right-click High Choke Registration ROI. Add | Registration | Centerline. Rename it High Choke Registration.
15. Right-click High Choke Registration. Add | Region | Adaptive. Rename it High Choke ROI.
16. Right-click High Choke ROI. Add | Analysis | Contrast. Rename it High

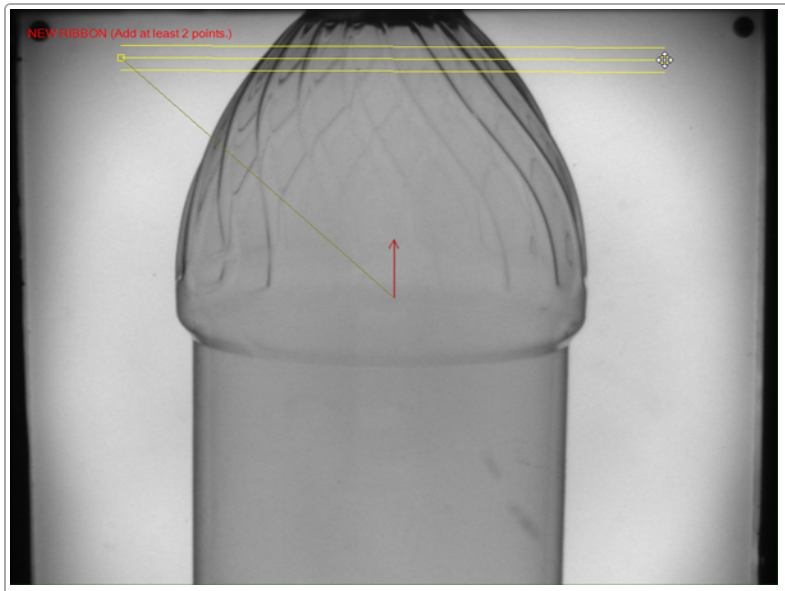


Choke Inspection.

Your inspection tree should look similar to that shown on the left.

Place the Empty Pocket ROI

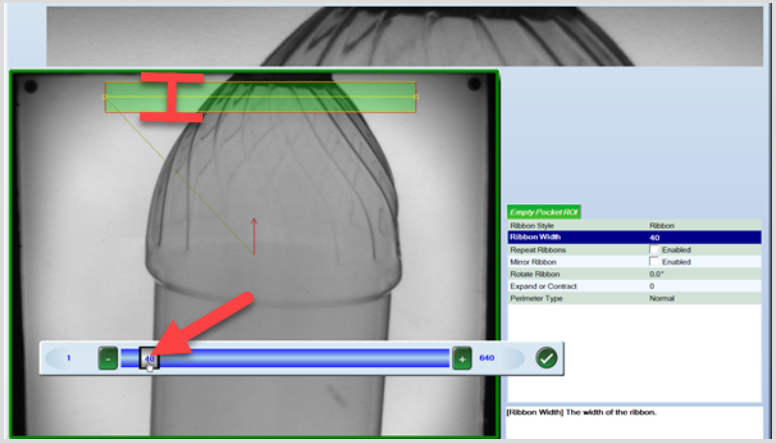
An empty pocket inspection must be applied if your system is using a PDX. The Empty Pocket is used to determine if the bottle is in the gripper fingers. If so it allows the inspections to be performed; if not, it stops the inspections from being done.



Double-click Empty Pocket ROI in the inspection tree.

If the Ribbon is not already set on the image: it says NEW RIBBON (Click to add points). Click in the image to place two points to create a line as shown.

Then right-click over the image and select Complete New Ribbon. A ribbon with yellow lines will be displayed on the image.



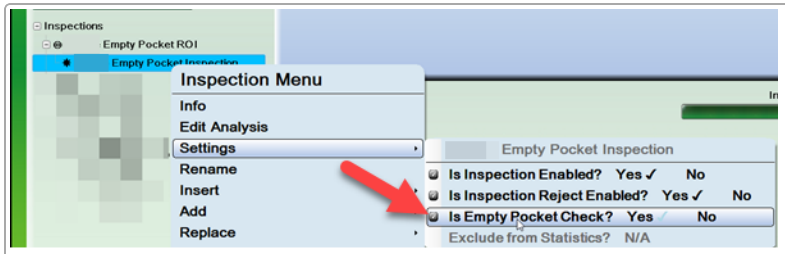
We want the ribbon to locate the top of the bottle in each image.

To make the ribbon wider:

1. Select Ribbon Width and make it wider. In our example, we used 40 for Ribbon Width.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3.  Select the OK button to save changes and exit.

Set up the Neck Empty Pocket Inspection

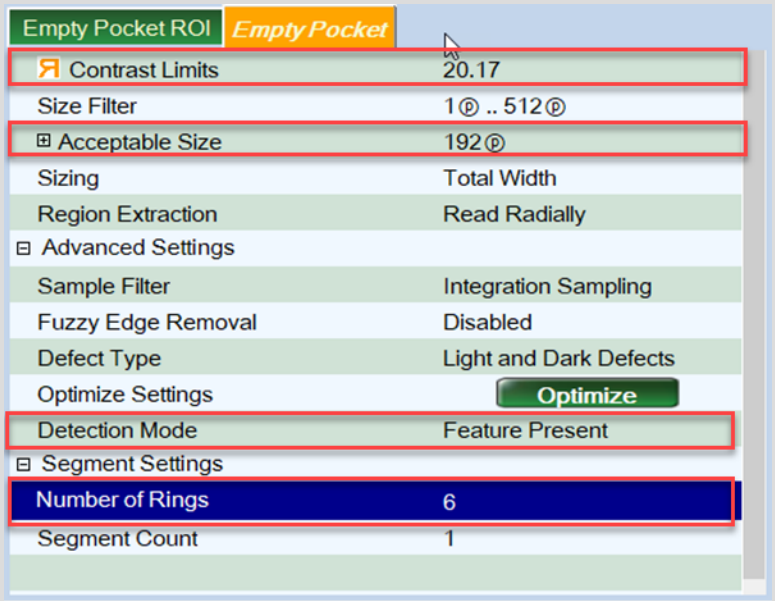
We will set up this inspection to detect some dark pixels over the top neck area. If these dark pixels do not appear, then the system will know that there is no bottle present, and therefore not run any further inspections.



In the Inspection Tree, right-click over the Empty Pocket Inspection. Select Settings | Is Empty Pocket Check? Click to enable it.

The system will give a warning that rejecting is off. This is OK.

The name of the Empty Pocket inspection will have a blue background in the inspection tree.

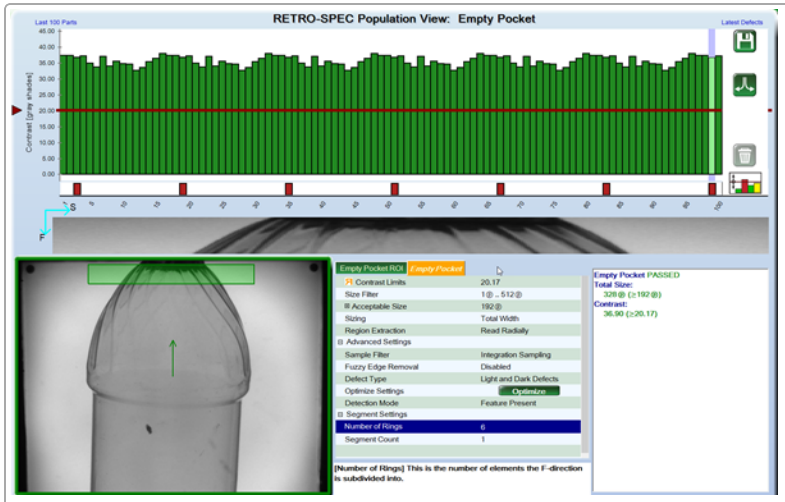


Double-click Empty Pocket (in the inspection tree) to edit it.

If you need to see images, put the lane online to acquire several images. Take the lane offline, and select the [+100] button below the image.

To set the parameters:

1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

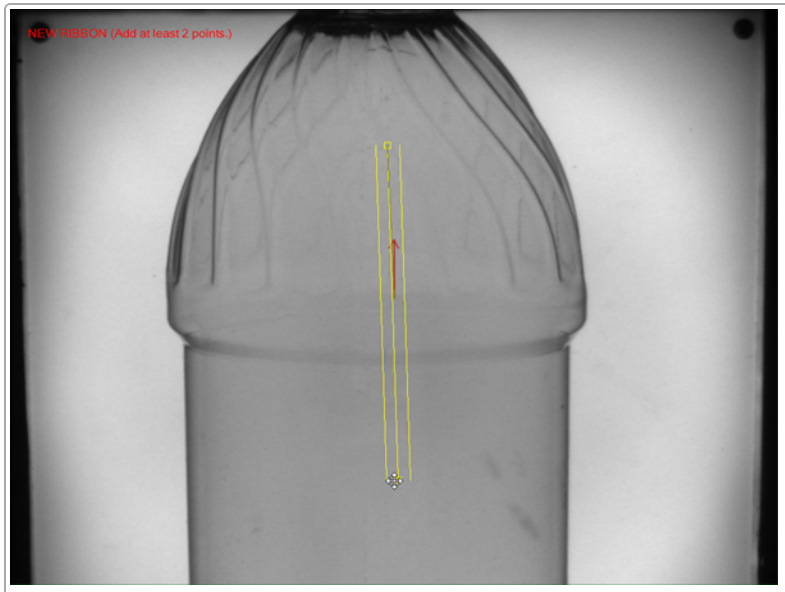


Images with parts in the field of view should pass the inspection. If a part was missing, it would fail.

Select the OK button to save changes and exit.

Place the Color ROI

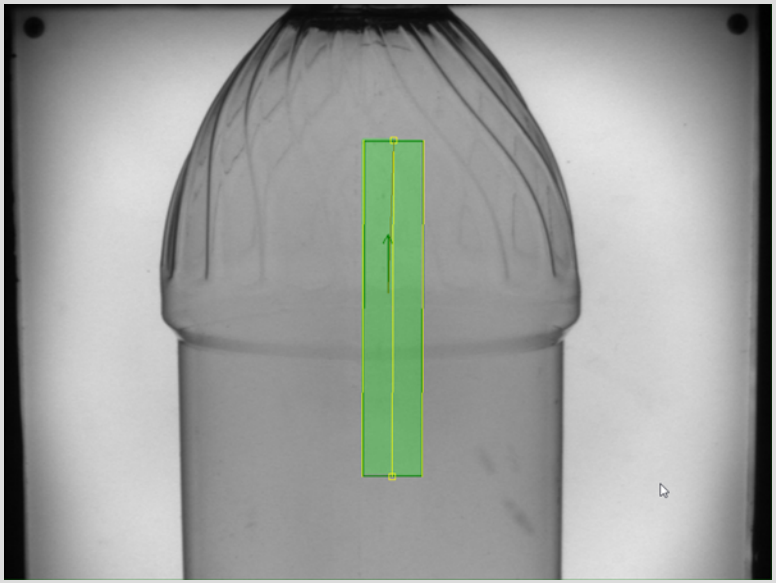
We are using a ribbon for the small region to check if the bottle is the correct color.



Double-click Color ROI in the inspection tree.

If the Ribbon is not already set on the image: it says NEW RIBBON (Click to add points). Click in the image to place two points to create a line as shown.

Then right-click over the image and select Complete New Ribbon. A ribbon with yellow lines will be displayed on the image.



We want the ribbon wide enough to determine the gray shade of the bottle.

To make the ribbon wider:

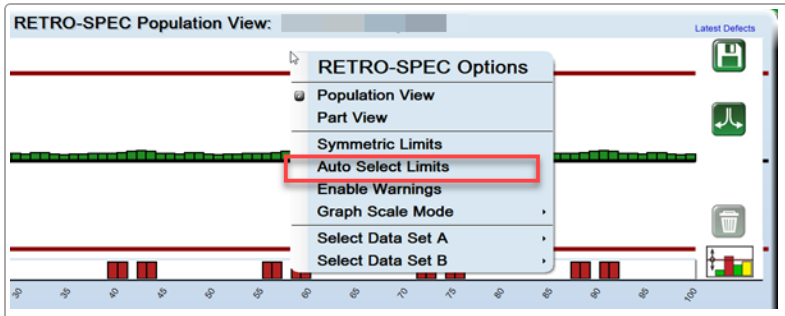
1. Select Ribbon Width and make it wider. In our example, we used 50 for Ribbon Width.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3. Select the OK button to save changes and exit.

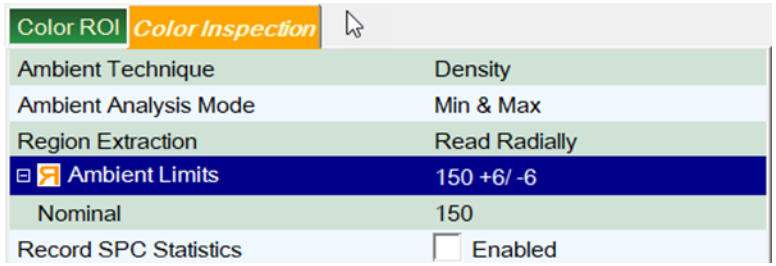
Color ROI

Ribbon Style	Ribbon
Ribbon Width	50
Repeat Ribbons	Enabled
Mirror Ribbon	Enabled
Rotate Ribbon	0.0°
Expand or Contract	0
Perimeter Type	Normal

Set up the Color Inspection

We are using an Ambient inspection to verify the correct color bottles.





Double-click Color Inspection to edit it.

To set up the inspection:

1. +100 Put the lane online to acquire several images, and select the [+100] button.
2. Take the lane offline.
3. Right-click over the Retro-Spec Population View graph and choose Auto-Select Limits. The system will automatically set the inspection limits based on your parts.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

To test the inspection:

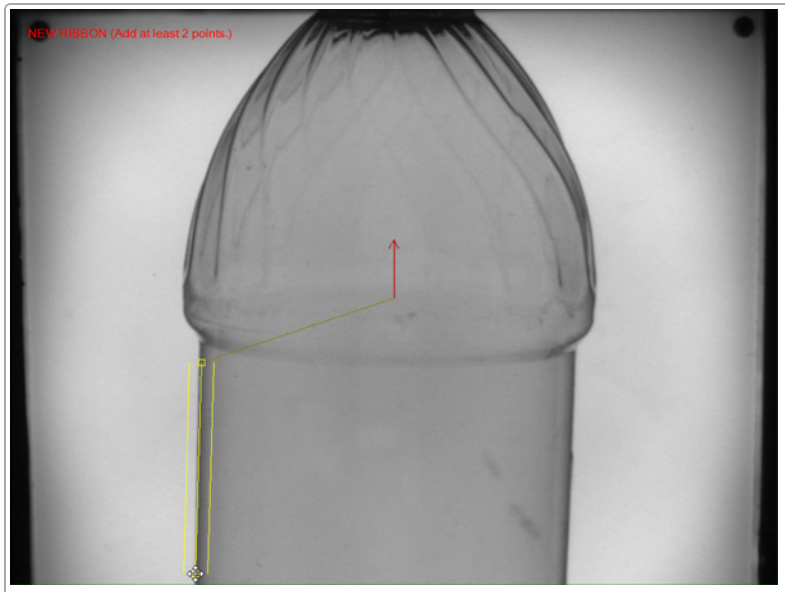
1. Scroll through the images to make sure parts are passing (or failing) as expected.
2. You can make the inspection more sensitive by moving the red horizontal bars on the Retro-Spec graph closer to center, or less sensitive by moving the red horizontal bars away from center.

Color inspection example

Select the OK button to save changes and exit.

Place the Lower Neck Registration ROI

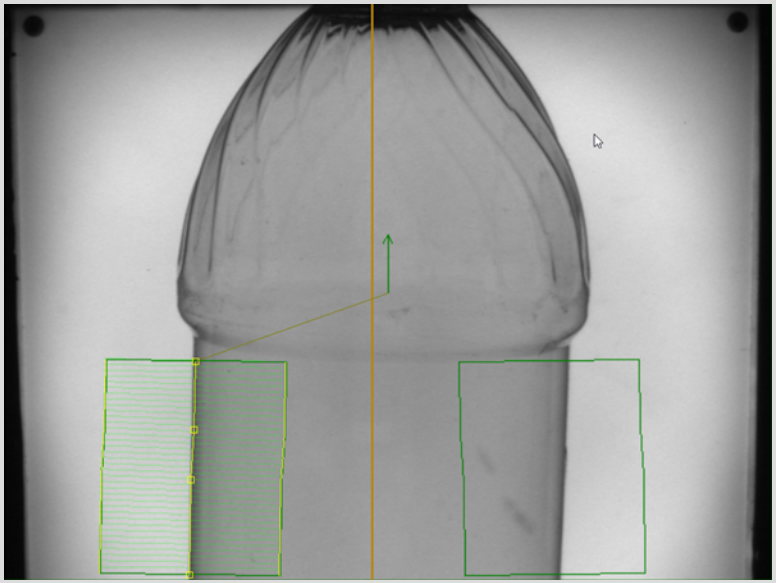
We are using a ribbon to locate the lower neck. This will ensure proper placement of inspections on the lower neck.



Double-click Lower Neck Registration ROI in the inspection tree.

If the Ribbon is not already set on the image: it says NEW RIBBON (Click to add points). Click in the image to place two points (on the side of the bottle) to create a line as shown.

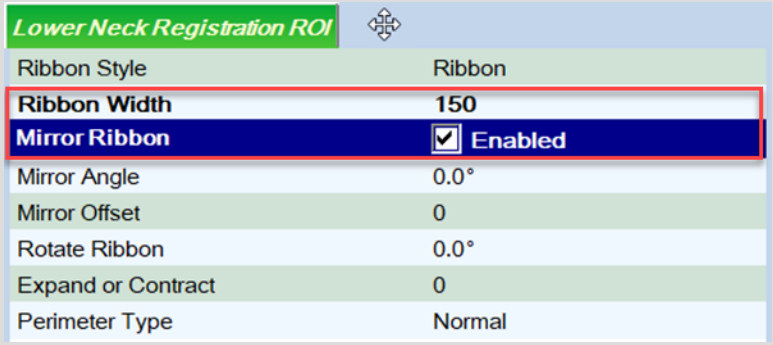
Then right-click over the image and select Complete New Ribbon. A ribbon with yellow lines will be displayed on the image.



We want the ribbon to locate the sides of the bottle in each image.

To adjust the ribbon:

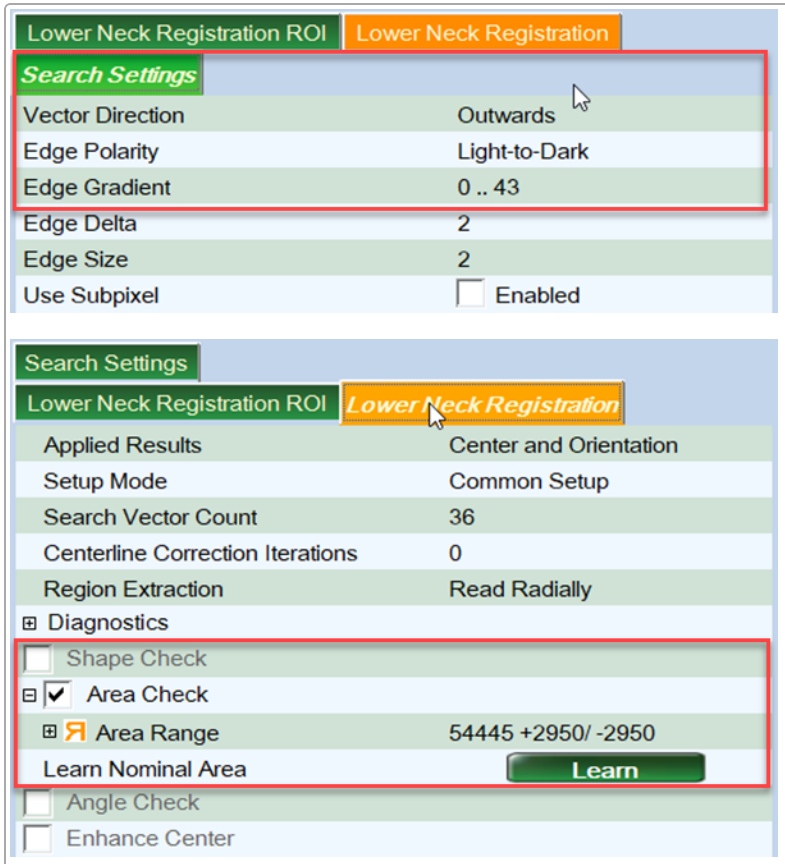
1. Select Ribbon Width and make it wider. In our example, we used 150 for Ribbon Width.
2. Check Mirror Ribbon. This creates another ribbon on the other side of the bottle.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.



Select the OK button to save changes and exit.

Set up the Lower Neck Registration

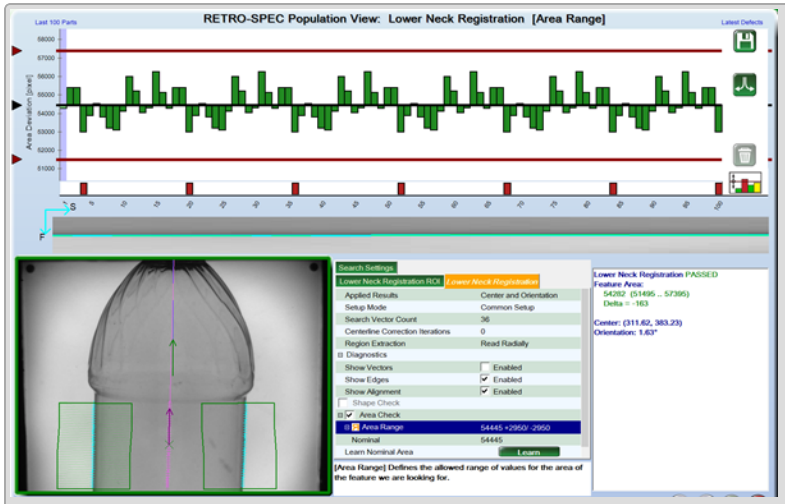
We are using a Centerline Registration to find the sides of the part. This allows the system to place the following inspections properly on the part.



Double-click Lower Neck Registration in the inspection tree.

To set up the registration:

1. Go to the Search Settings tab. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.This allows the system to find the edges of the bottle.
2. Go to the Lower Neck Registration menu.
3. Uncheck Shape Check.
4. Check Area Check. We are using an Area Check to make sure the system finds the correct points on the bottle.
5. Click the Learn button. The system will automatically determine the area we are searching for.



To test the inspection:

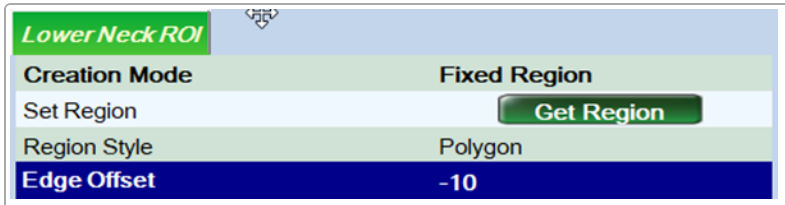
1. Scroll through several images to make sure the inspection is passing (or failing) as expected.
2. You can move the red horizontal bars towards the black line in the upper graph to make the inspection more sensitive (fail more bottles), or away from the black line to make it less sensitive (pass more bottles).

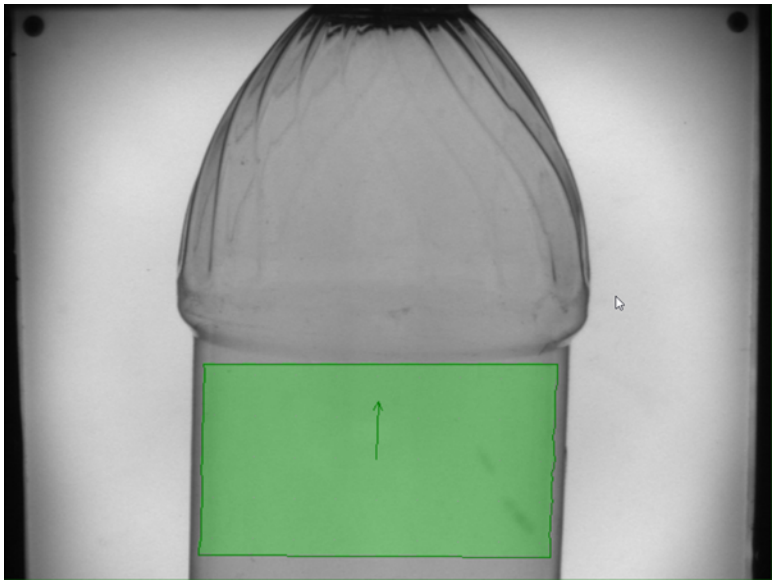
The system displays cyan [+] where it is finding the edges of the bottles.

Select the OK button to save changes and exit.

Place the Lower Neck ROI

We are using an Adaptive Region to position inspections on the lower neck.





Double-click Lower Neck ROI in the inspection tree.

To place the region:

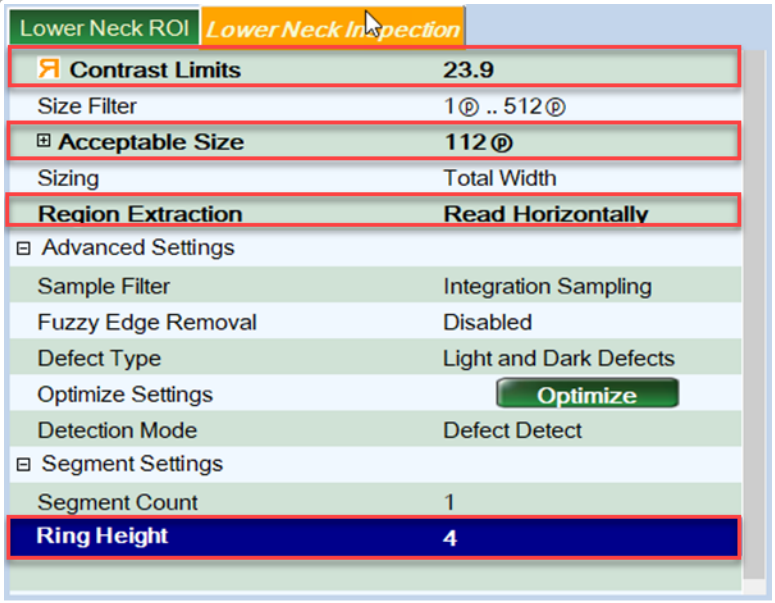
1. Change Creation Mode to Fixed Region.
2. Click the Get Region button. The system will automatically create the region based on the points found in the Lower Neck Registration.
3. Set Edge Offset at approximately -10. This allows the system to ignore edges of the bottle.

The region should look similar to the example shown.

Select the OK button to save changes and exit.

Set up the Lower Neck Inspection

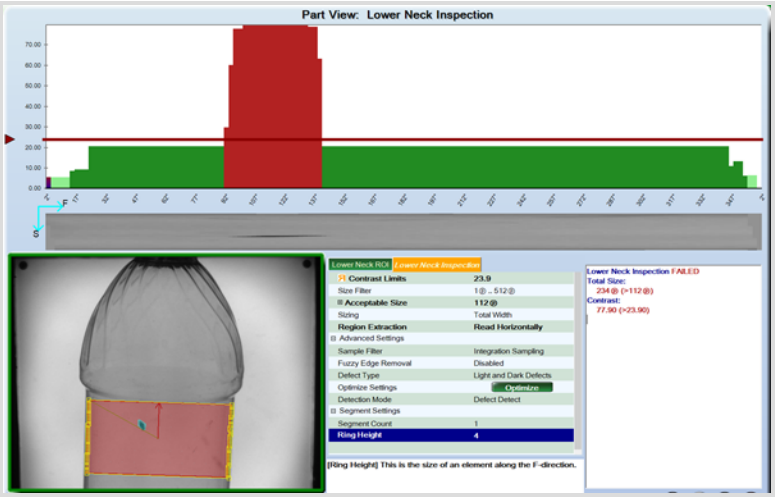
We are using a Contrast inspection to find defects in the lower neck.



Double-click Lower Neck Inspection to edit it.

To set up the inspection:

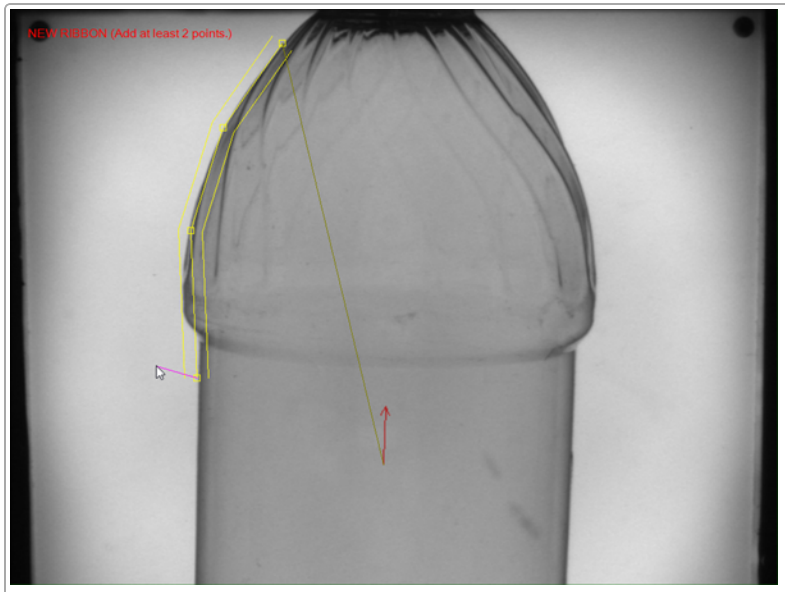
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Select the OK button to save changes and exit.



This example shows contamination found on the lower neck - Part View shown.

Place the Upper Neck Registration ROI

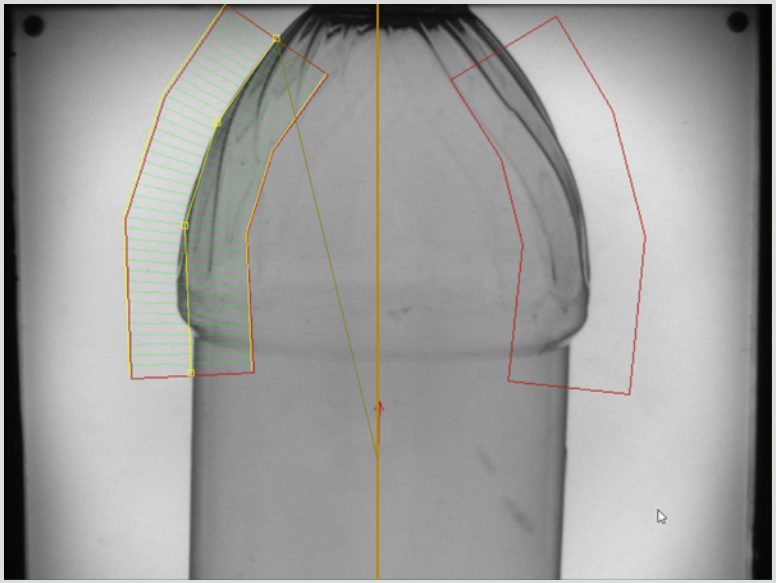
We are using a ribbon to allow the system to find the sides of the upper neck.



Double-click Upper Neck Registration ROI in the inspection tree.

If the Ribbon is not already set on the image: it says NEW RIBBON (Click to add points). Click in the image to place points (on the side of the upper neck) to create a line as shown. Place points according to the size and shape of your bottle.

Then right-click over the image and select Complete New Ribbon. A ribbon with yellow lines will be displayed on the image.



We want the ribbon to locate the sides of the bottle in each image.

To adjust the ribbon:

1. Select Ribbon Width and make it wider. In our example, we used 102 for Ribbon Width.
2. Check Mirror Ribbon. This creates another ribbon on the other side of the bottle.
3. Make sure the ribbon points do not touch the edge of the image. If they do, right-click over the image and select Enable Region Editor. Move the points downward if necessary.

Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

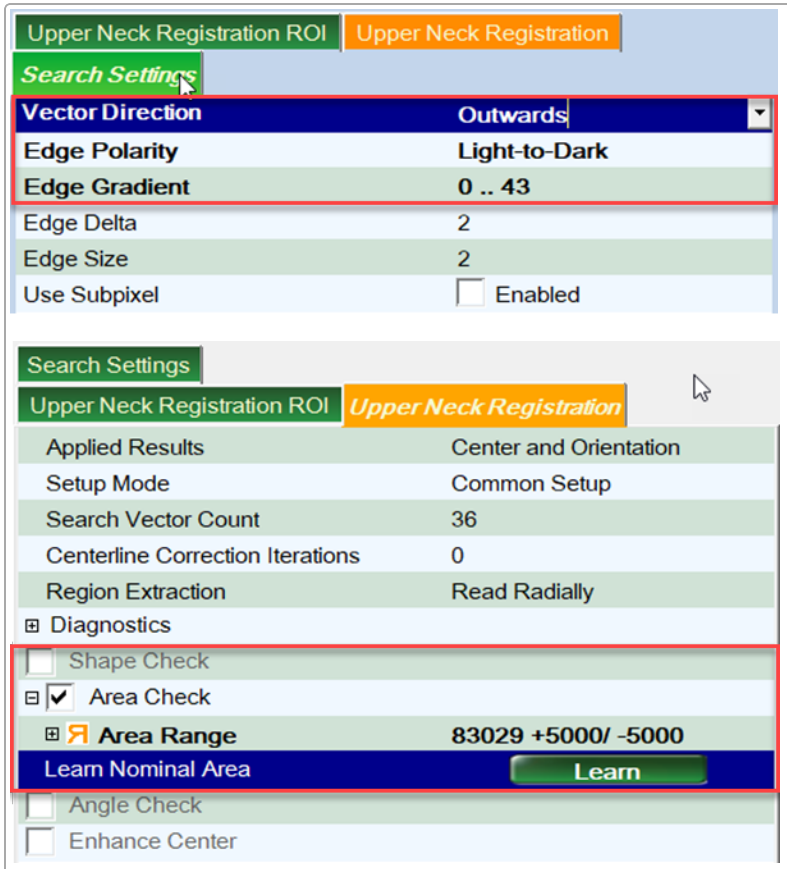
Upper Neck Registration ROI

Ribbon Style	Ribbon
Ribbon Width	**102**
Mirror Ribbon	☑ Enabled
Mirror Angle	0.0°
Mirror Offset	0
Rotate Ribbon	0.0°
Expand or Contract	0
Perimeter Type	Normal

Select the OK button to save changes and exit.

Set up the Upper Neck Registration

We are using a Centerline Registration to find the sides of the part. This allows the system to place the following inspections properly on the part.



Double-click Upper Neck Registration in the inspection tree.

To set up the registration:

1. Go to the Search Settings tab. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.This allows the system to find the edges of the bottle.
2. Go to the Upper Neck Registration menu.
3. Uncheck Shape Check.
4. Check Area Check. We are using an Area Check to make sure the system finds the correct points on the bottle.
5. Click the Learn button. The system will automatically determine the area we are searching for.

To test the inspection:

1. Scroll through several images to make sure the inspection is passing (or failing) as expected.
2. You can move the red horizontal bars towards the black line in the upper graph to make the inspection more sensitive (fail more bottles), or away from the black line to make it less sensitive (pass more bottles).

Select the OK button to save changes and exit.

Place the Upper Neck ROI

We are using an Adaptive Region to position inspections on the upper neck.

Double-click Upper Neck ROI in the inspection tree.

To place the region:

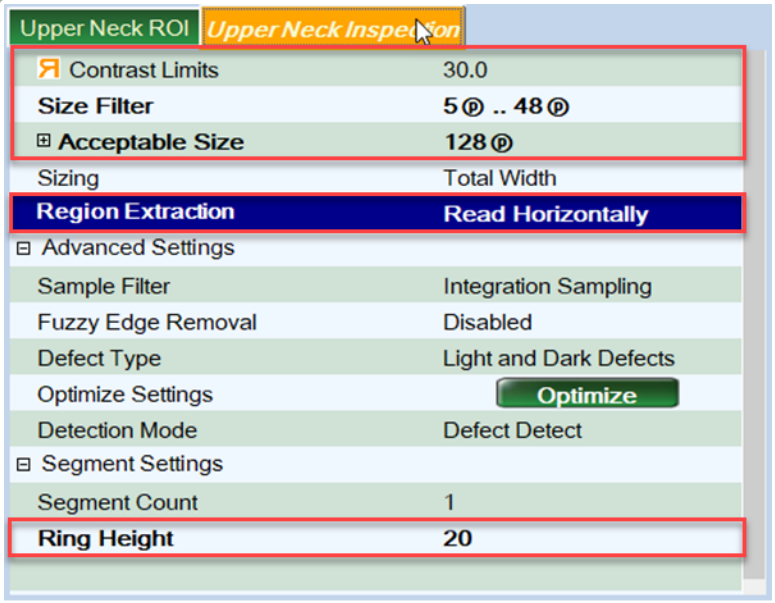
1. Change Creation Mode to Fixed Region.
2. Click the Get Region button. The system will automatically create the region based on the points found in the Upper Neck Registration.
3. Set Edge Offset at approximately -10. This allows the system to ignore edges of the bottle.

The region should look similar to the example shown.

Select the OK button to save changes and exit.

Set up the Upper Neck Inspection

We are using a Contrast inspection to find defects in the upper neck.

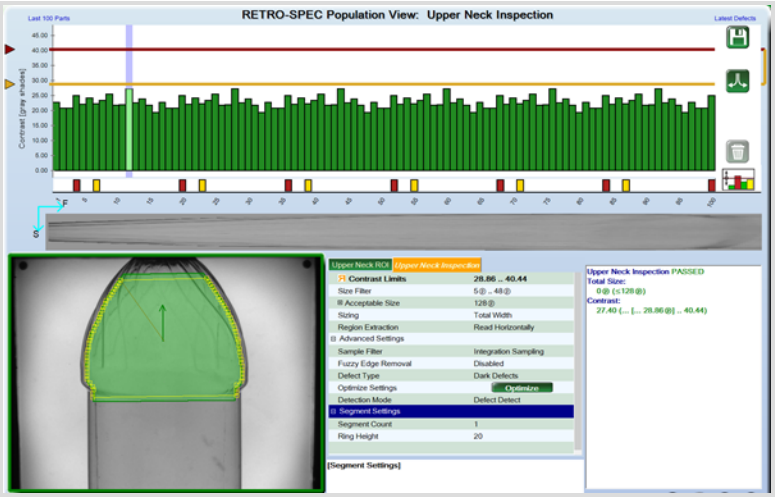


This inspection is set up to ignore the geometry of the bottle and only find defects.

Double-click Upper Neck Inspection to edit it.

To set up the inspection:

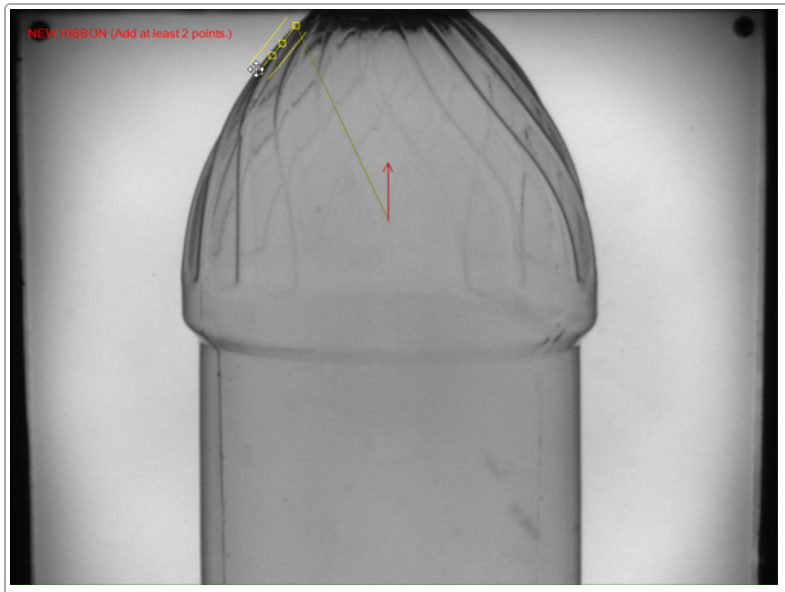
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Select the OK button to save changes and exit.



Upper Neck example

Place the High Choke Registration ROI

We are using a ribbon to allow the system to find the sides of the upper neck.



Double-click High Choke Registration ROI in the inspection tree.

If the Ribbon is not already set on the image: it says NEW RIBBON (Click to add points). Click in the image to place points to create a line as shown (near the top of the bottle). Place points according to the size and shape of your bottle.

Then right-click over the image and select Complete New Ribbon. A ribbon with yellow lines will be displayed on the image.

We want the ribbon to locate the sides of the bottle in each image.

To adjust the ribbon:

1. Select Ribbon Width and make it wider. In our example, we used 30 for Ribbon Width.
2. Check Mirror Ribbon. This creates another ribbon on the other side of the bottle.

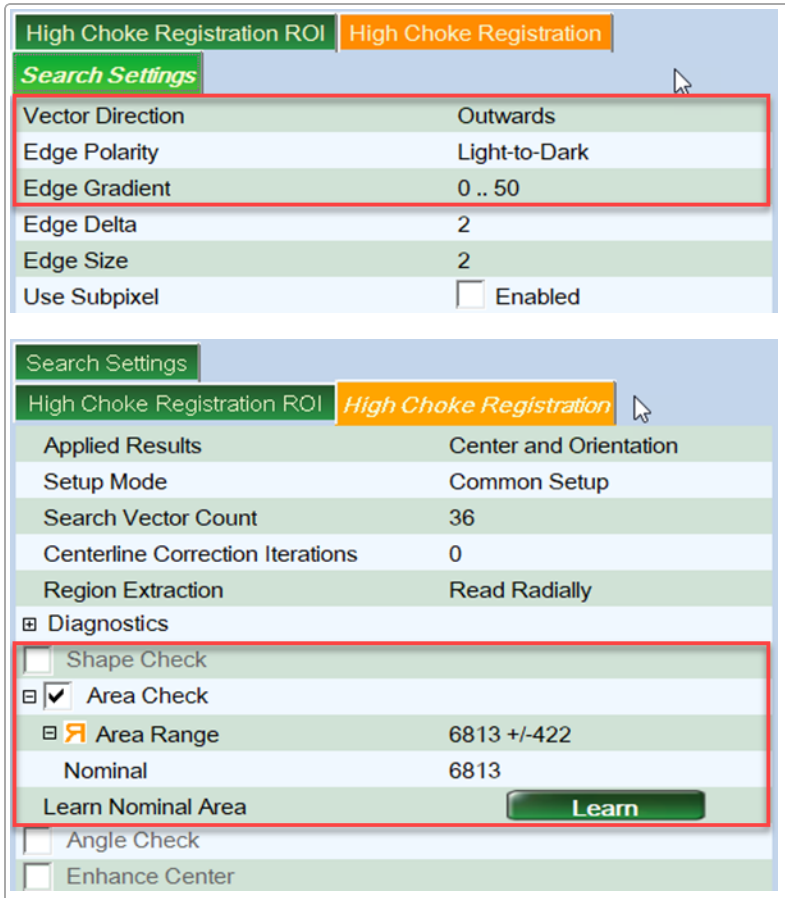
Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

High Choke Registration ROI	
Ribbon Style	Ribbon
Ribbon Width	**30**
Mirror Ribbon	☑ Enabled
Mirror Angle	0.0°
Mirror Offset	0
Rotate Ribbon	0.0°
Expand or Contract	0
Perimeter Type	Normal

Select the OK button to save changes and exit.

Set up the High Choke Registration

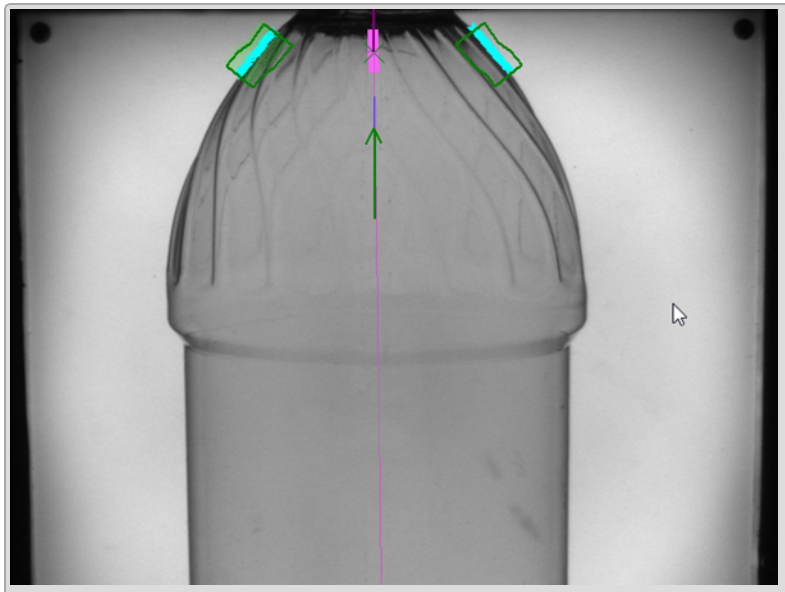
We are using a Centerline Registration to find the sides of the part. This allows the system to place the following inspections properly on the part.



Double-click High Choke Registration in the inspection tree.

To set up the registration:

1. Go to the Search Settings tab. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.This allows the system to find the edges of the bottle.
2. Go to the High Choke Registration menu.
3. Uncheck Shape Check.
4. Check Area Check. We are using an Area Check to make sure the system finds the correct points on the bottle.
5. Click the Learn button. The system will automatically determine the area we are searching for.

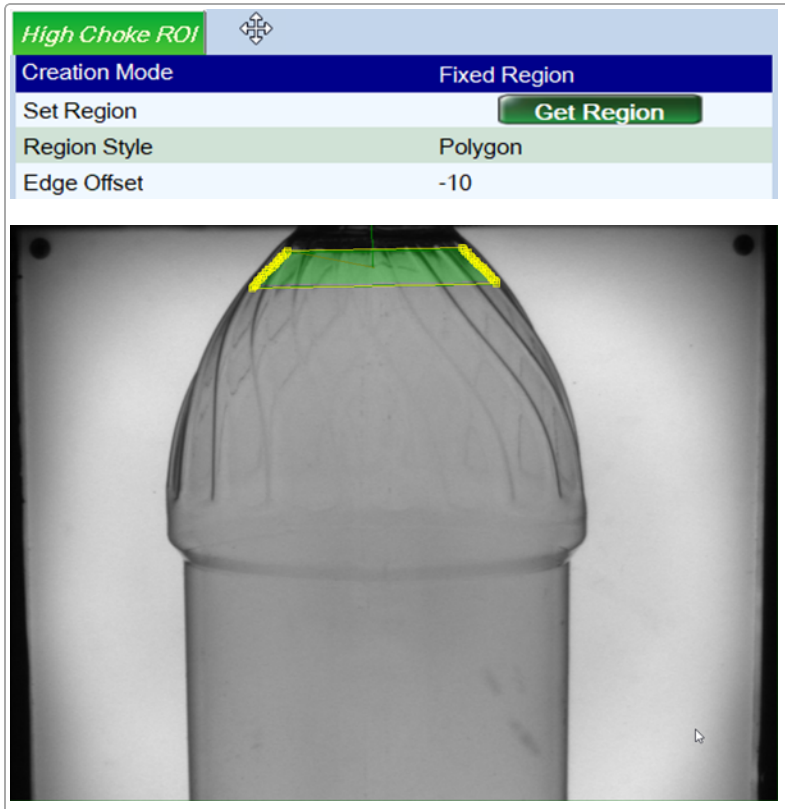


Scroll through several images to verify that the system is finding edges consistently on all bottles. Make adjustments if necessary.

Select the OK button to save changes and exit.

Place the High Choke ROI

We are using an Adaptive Region to position inspections to detect high chokes.



Double-click High Choke ROI in the inspection tree.

To place the region:

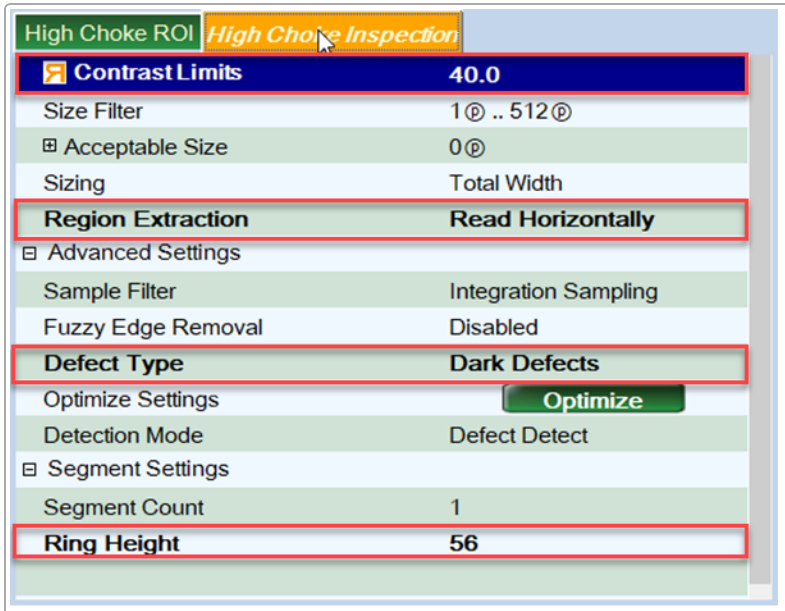
1. Change Creation Mode to Fixed Region.
2. Click the Get Region button. The system will automatically create the region based on the points found in the High Choke Registration.
3. Set Edge Offset at approximately -10. This allows the system to ignore edges of the bottle.

The region should look similar to the example shown.

Select the OK button to save changes and exit.

Set up the High Choke Inspection

We are using a Contrast inspection to detect high choke.

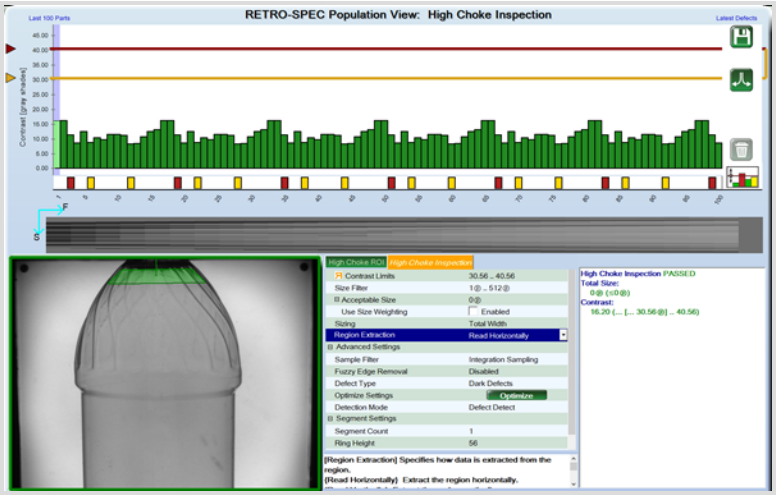


This inspection is set up to ignore the geometry of the bottle and only find defects.

Double-click the High Choke Inspection to edit it.

To set up the inspection:

1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Select the OK button to save changes and exit.

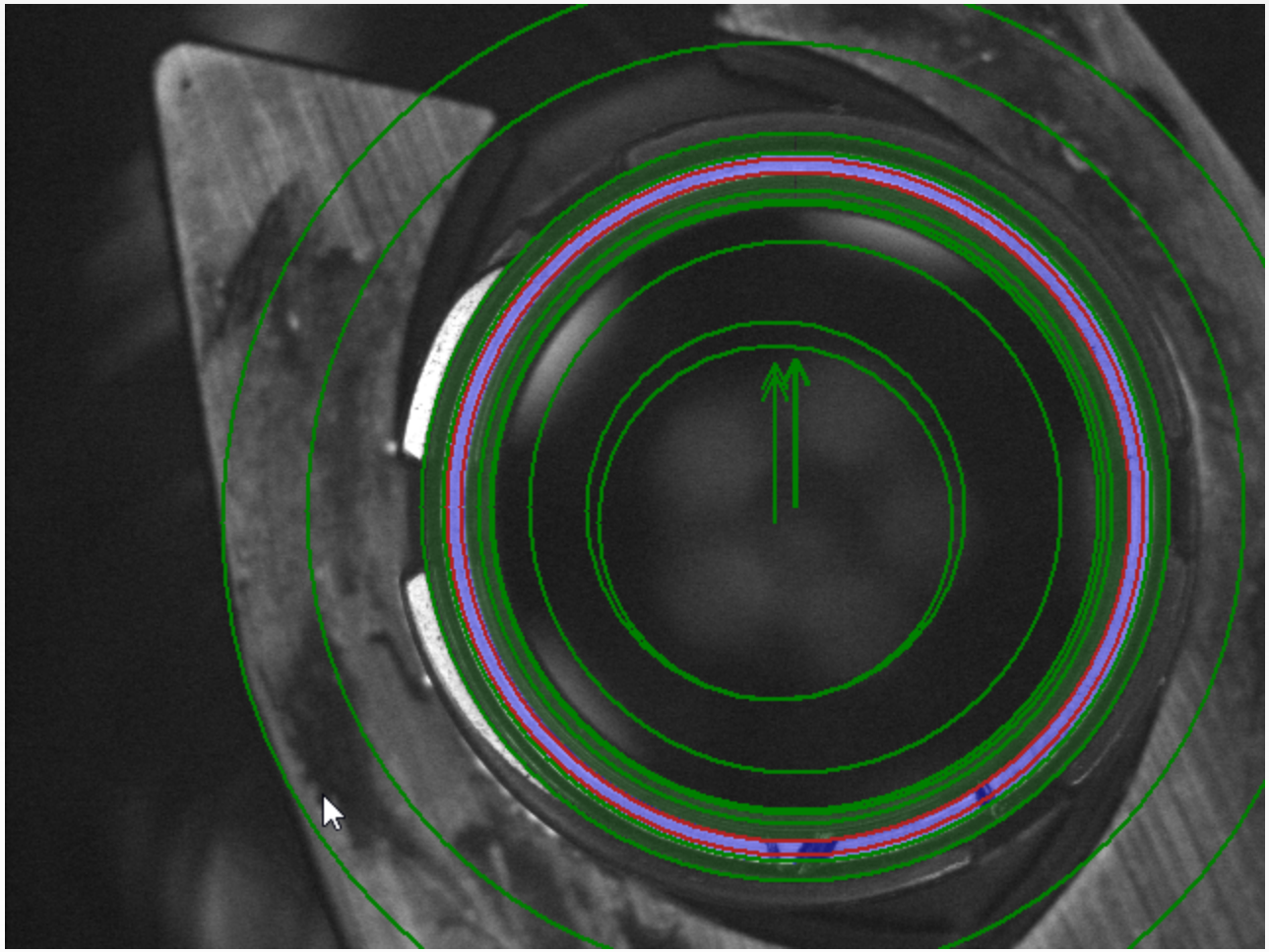


High Choke inspection example

Module 13 Inspections for Seal Camera

This section explains how to set up the inspections. Note that your inspections may be different, depending on your specific part, plant, and process requirements.

The picture below shows an image with all seal inspection regions. We will set these up one at a time.



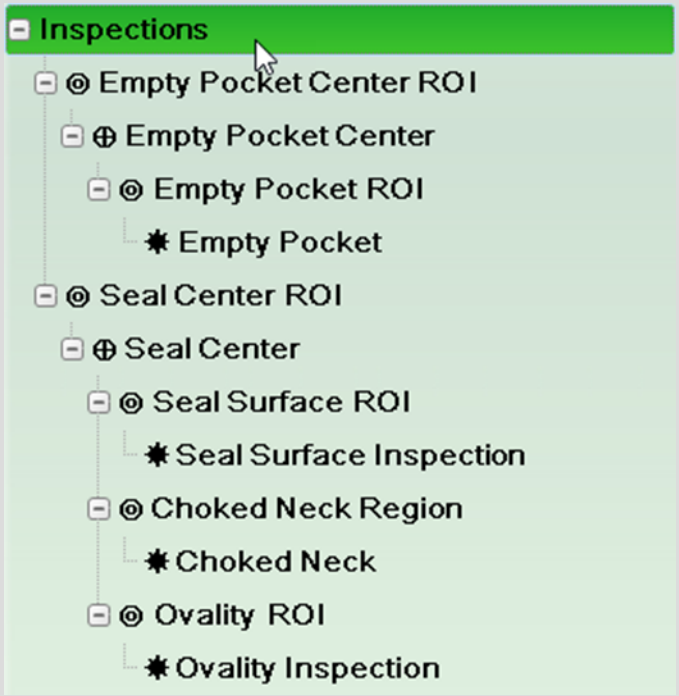
Create the Seal Inspection Tree

The steps below will guide you through the process of building the Seal Inspection Tree, while ensuring that the directory links are connected correctly. First add the inspections, then rename them to something that makes sense to you. Note that we will set up the regions and parameters later. For now, we will just build the inspection tree.

Note for all steps: when you add the inspection, you can rename it immediately.
After each step, select the OK button to save changes, and the Exit button to exit the inspection.

This is how the inspection tree will look

Note: ROI = Region of Interest



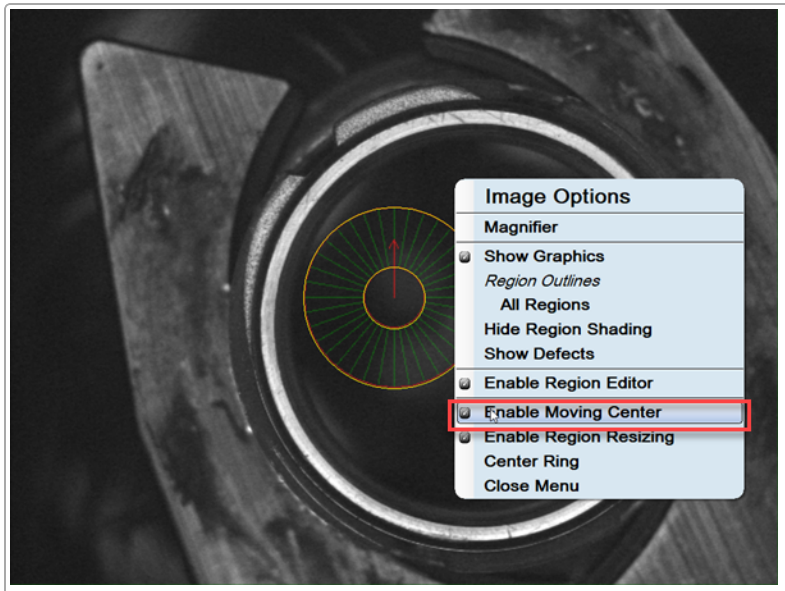
Steps to add the inspections

1. Inspections Right-click Inspections. Add | Region | Ring. Rename it Empty Pocket Center ROI.
2. Right-click Empty Pocket Center ROI. Add | Registration | Radial Edge. Rename it Empty Pocket Center.
3. Right-click Empty Pocket Center. Add | Region | Ring. Rename it Empty Pocket ROI.
4. Right-click Empty Pocket ROI. Add | Analysis | Contrast. Rename it Empty Pocket.
5. Inspections Right-click Inspections. Add | Region | Ring. Rename it Seal Center ROI.
6. Right-click Seal Center ROI. Add | Registration | Radial Edge. Rename it Seal Center.
7. Right-click Seal Center. Add | Region | Ring. Rename it Seal Surface ROI.
8. Right-click Seal Surface ROI. Add | Analysis | Contrast. Rename it Seal Surface Inspection.
9. Right-click Seal Center. Add | Region | Ring. Rename it Choked Neck Region.
10. Right-click Choked Neck Region. Add | Analysis | Ambient. Rename it Choked Neck.
11. Right-click Seal Center. Add | Region | Ring. Rename it Ovality ROI.
12. Right-click Ovality ROI. Add | Analysis | Measurement. Rename it Ovality Inspection.

Your inspection tree should look similar to that shown on the left.

Place the Empty Pocket Center ROI

An empty pocket inspection must be applied if your system is using a PDX. The Empty Pocket is used to determine if the bottle is in the gripper fingers. If so it allows the inspections to be performed; if not, it stops the inspections from being done.



Double-click Empty Pocket Center ROI in the inspection tree.

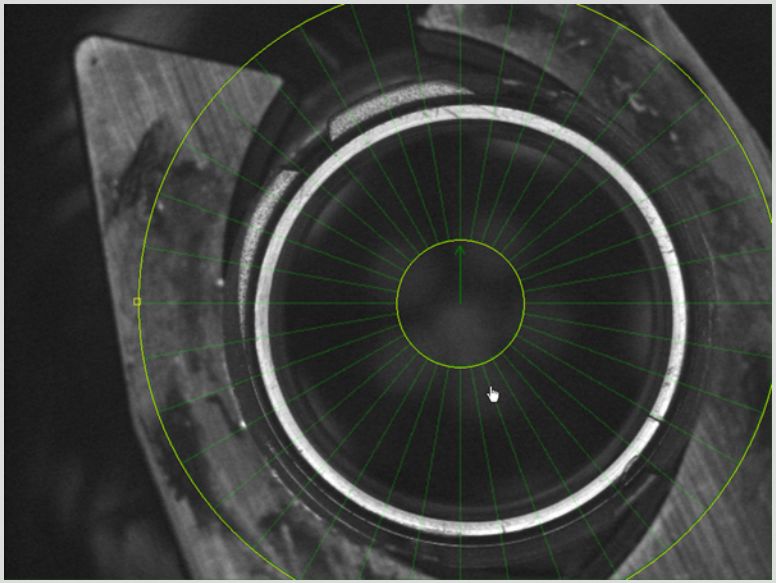
If you need to see images, put the lane online to acquire several images. Take the lane offline, and select the [+100] button below the image.

We will set up the region of interest so the system knows where to search for the center of the part.

Since the part may be offset from center in the camera's field of view, you may need to move the center of the region.

To move the region:

1. Right-click over the image to see Image Options.
2. Enable Moving Center.
3. Click in the center of the region. A four-way arrow cursor will appear. Click and drag the region to the center of the part (what you see as the center - it does not have to be perfect).



Move the region to surround the seal as shown. Leave enough room for movement from part to part. Scroll through several images to make sure the region surrounds the seal.

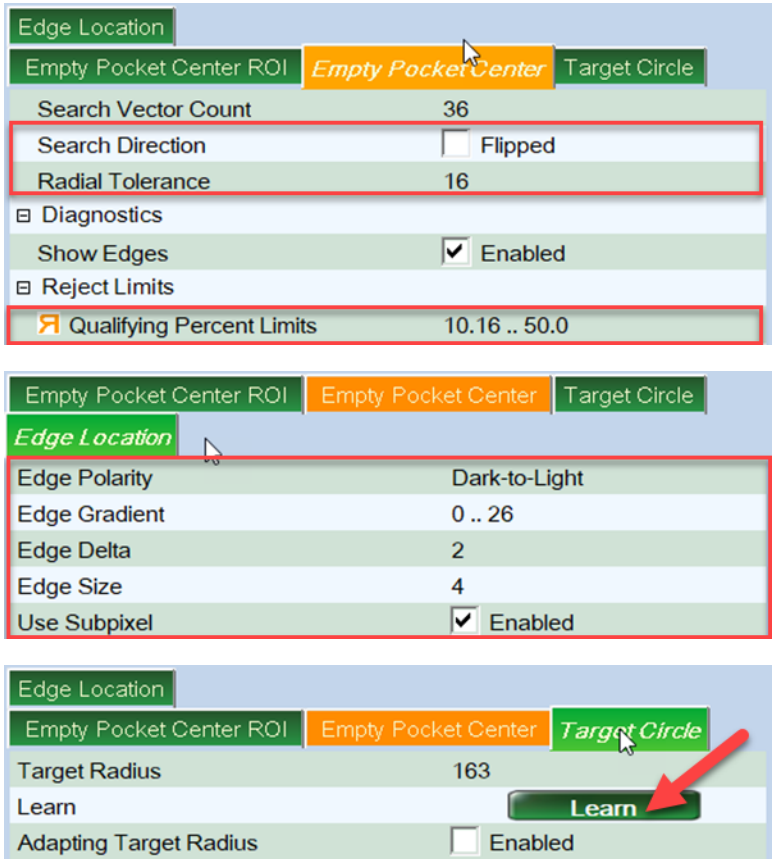
Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Empty Pocket Center ROI	
X	60
Y	9
Inner Radius	53
Thickness	215
Use Arc Segments	☐ Enabled
Perimeter Type	Normal

Select the OK button to save changes and exit.

Set up the Empty Pocket Center Registration

The Registration searches for edges, to find the center of the part. Since the position changes slightly from part to part, the registration finds the center for each bottle. Once this point is found, the remaining inspections are run to inspect the seal.

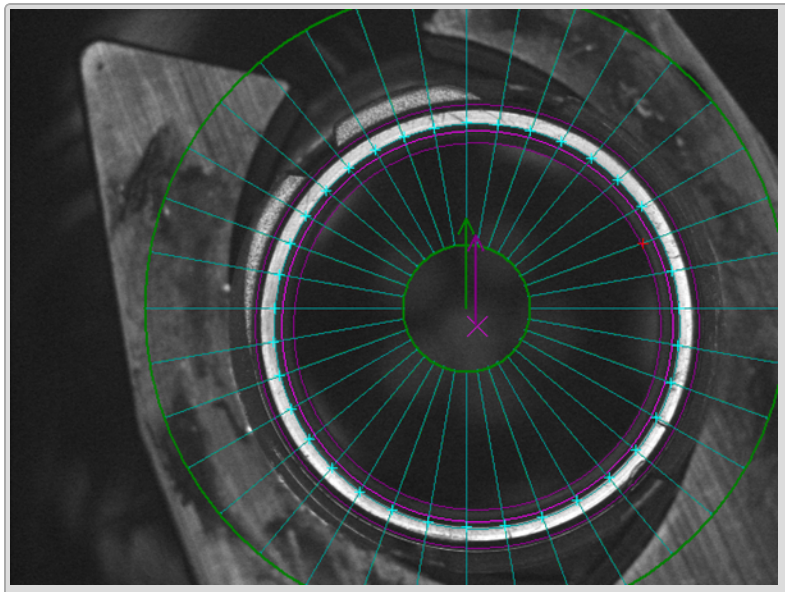


Double-click Empty Pocket Center in the inspection tree.

By default, the registration will likely fail due to not enough edges found.

To set up the registration:

1. In the Empty Pocket Center menu, uncheck Flipped for Search Direction. This allows the system to search from inside the bottle towards outside the bottle. It will locate the inner edges of the seal.
2. Go to the Edge Location menu.
3. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
4. Go to the Target Circle tab. Click the Learn button. This allows the system to learn where the edges will fall.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.



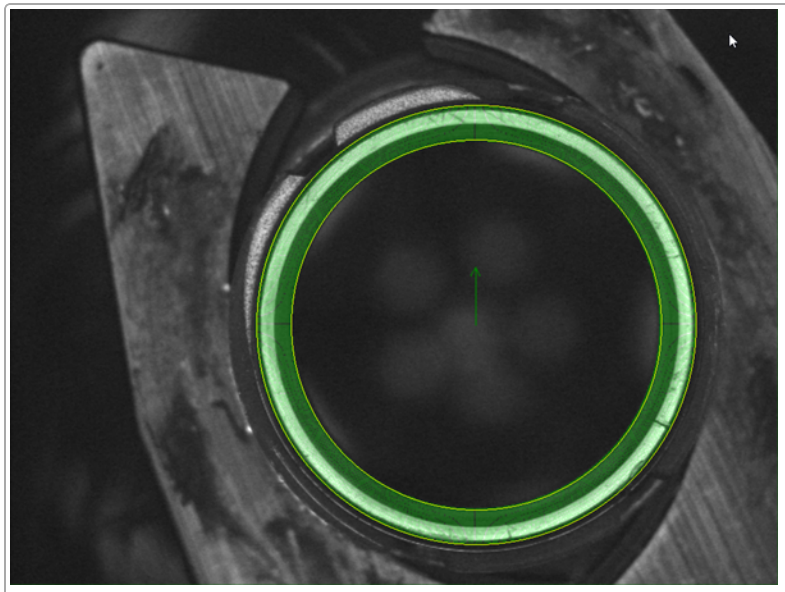
The system should now find the edges of the seal.

Scroll through several images to make sure the seal is located consistently. Make adjustments if needed.

Select the OK button to save changes and exit.

Place the Empty Pocket ROI

We will set up the location for the system to check for empty pockets.



Empty Pocket ROI	
X	0
Y	0
Inner Radius	154
Thickness	29
Use Arc Segments	☐ Enabled
Perimeter Type	Normal

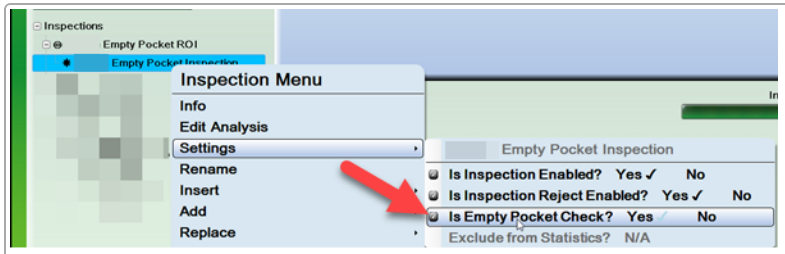
Double-click Empty Pocket ROI in the inspection tree to edit it.

To place the region:

1. Click on the outer edge to move it outside of the seal, and then the inner edge to move it inside of the seal edge, as shown.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3. Select the OK button to save changes and exit.

Set Up the Seal Empty Pocket Inspection

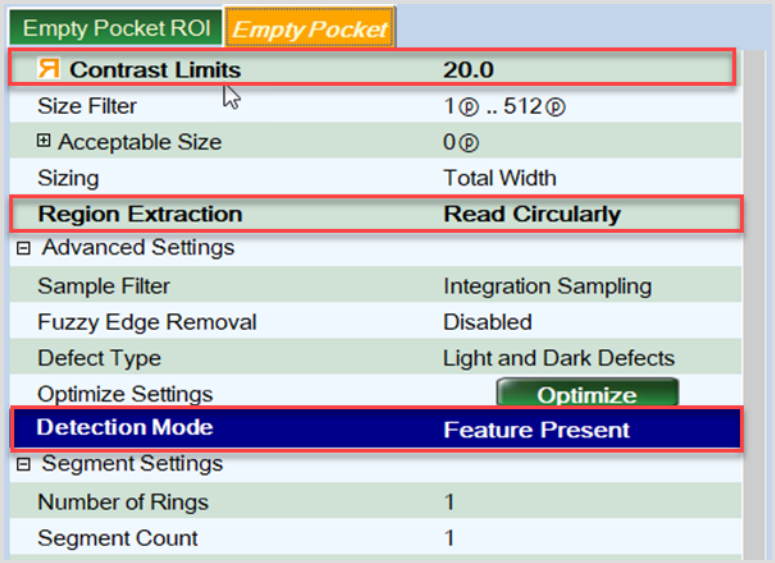
The Empty Pocket inspection allows us to determine whether a part is present in the camera's field of view. If there is no part, then subsequent inspections will not run. This saves processing time, as well as keeping statistics correct.



In the Inspection Tree, right-click over Empty Pocket. Select Settings | Is Empty Pocket Check? Click to enable it.

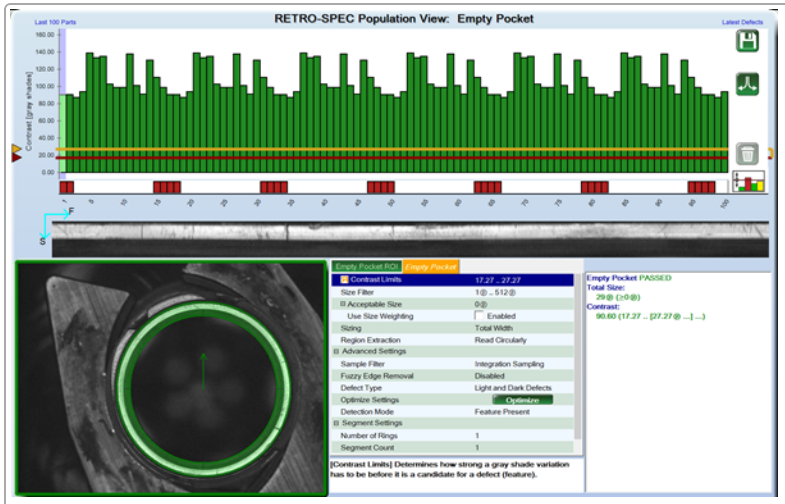
The system will give a warning that rejecting is off. This is OK.

The name of the Empty Pocket inspection will have a blue background in the inspection tree.



Double-click Empty Pocket in the inspection tree.

Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.



Images with parts in the field of view should pass the inspection. If a part was missing, it would fail.

Select the OK button to save changes and exit.

Place the Seal Center ROI

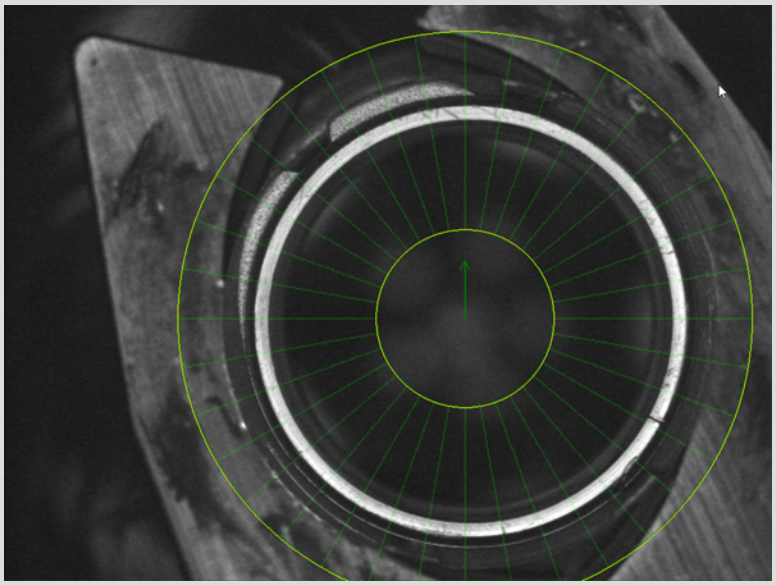
We will set up the location for the system to inspect the seal.

Double-click Seal Center ROI name in the inspection tree.

Since the part may be offset from center in the camera's field of view, you may need to move the center of the region.

To move the region:

1. Right-click over the image to see Image Options.
2. Enable Moving Center.
3. Click in the center of the region. A four-way arrow cursor will appear. Click and drag the region to the center of the part (what you see as the center - it does not have to be perfect).



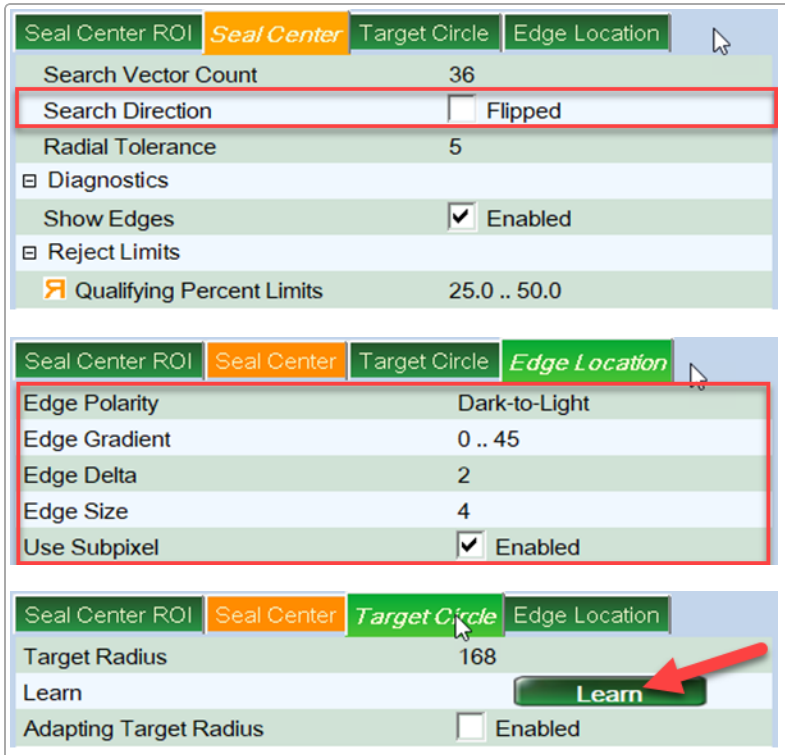
To place the region:

1. Click on the outer edge to move it outside of the seal surface, and then the inner edge to move it inside the seal surface, as shown below.
2. Scroll through several images to make sure the seal is surrounded regardless of part position.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
4. Select the OK button to save changes and exit.

Seal Center ROI	
X	64
Y	21
Inner Radius	74
Thickness	165
Use Arc Segments	Enabled
Perimeter Type	Normal

Set up the Seal Center Registration

The Registration searches for edges, to find the center of the part. Since the position changes slightly from part to part, the registration finds the center for each bottle. Once this point is found, the remaining inspections are run to inspect the seal.

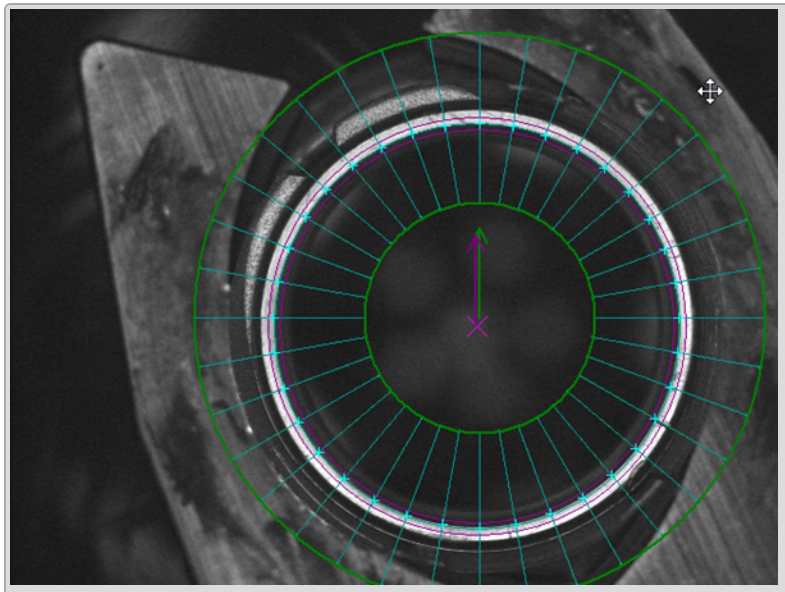


Double-click Seal Center in the inspection tree.

By default, the registration will likely fail due to not enough edges found.

To set up the registration:

1. In the Seal Center menu, uncheck Flipped for Search Direction. This allows the system to search from inside the bottle towards outside the bottle. It will locate the inner edges of the seal.
2. Go to the Edge Location menu.
3. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
4. Go to the Target Circle tab. Click the Learn button. This allows the system to learn where the edges will fall.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.



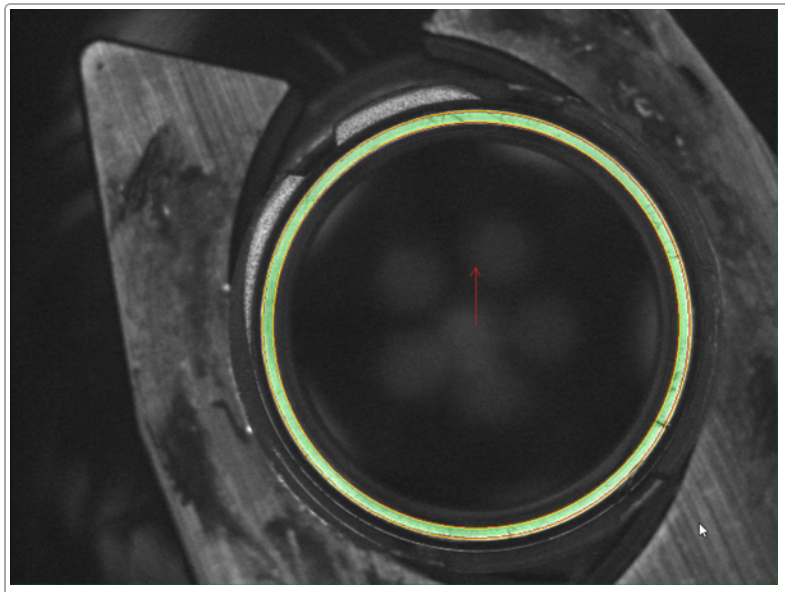
The system should now find the edges of the seal.

Scroll through several images to make sure the inner edge of the seal is found consistently. Make adjustments if needed.

Select the OK button to save changes and exit.

Place the Seal Surface ROI

We will place the region to detect defects on the seal surface.



Seal Surface ROI	
X	0
Y	0
Inner Radius	169
Thickness	9
Use Arc Segments	Enabled
Perimeter Type	Normal

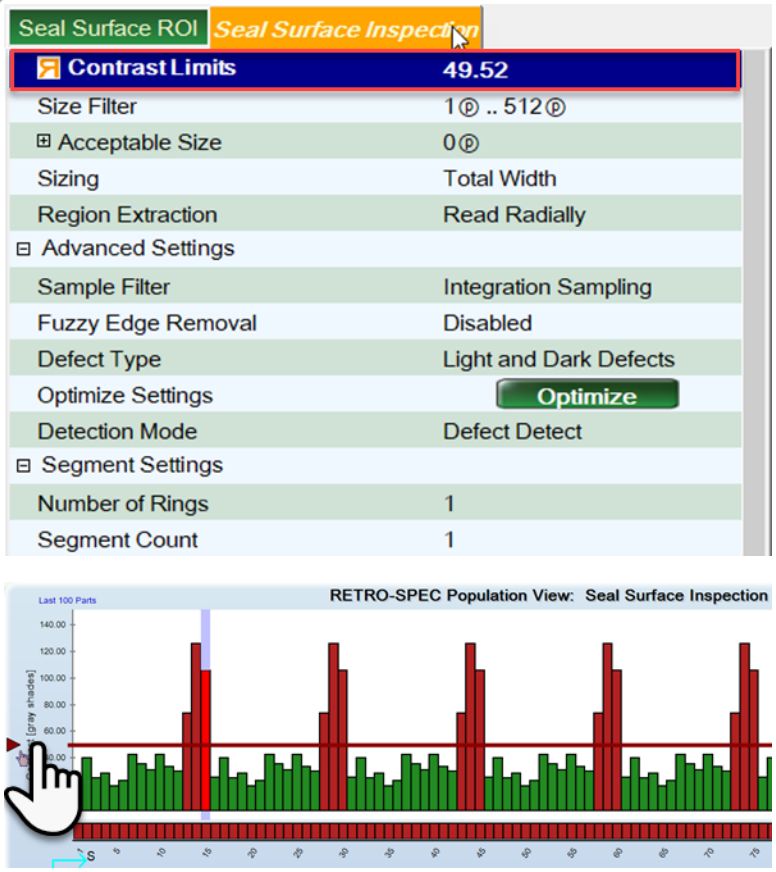
Double-click Seal Surface ROI in the inspection tree.

To place the region:

1. Click on the outer edge to move it, and then the inner edge to move it.
2. Position this region directly over the seal.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
4. Select the OK button to save changes and exit.

Set up the Seal Surface Inspection

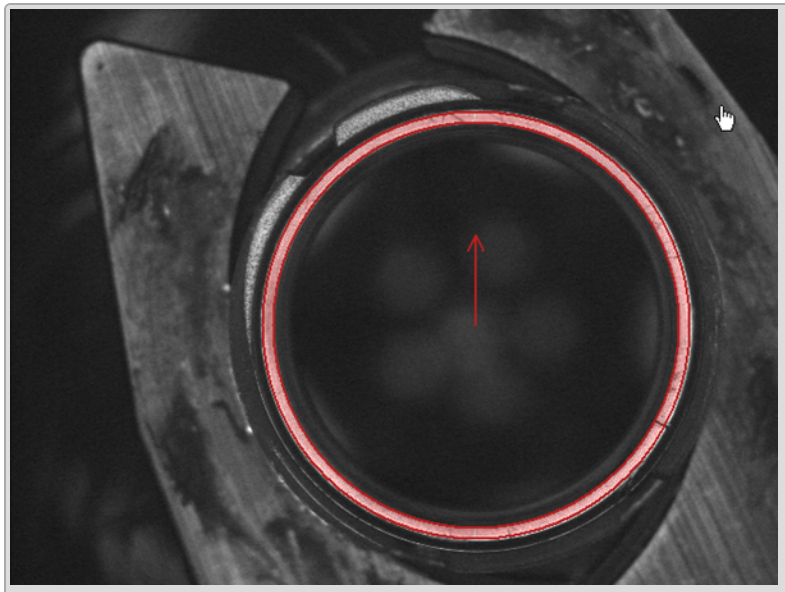
We are using a Contrast inspection to find defects on the seal surface.



Double-click Seal Surface in the inspection tree.

To set up the inspection:

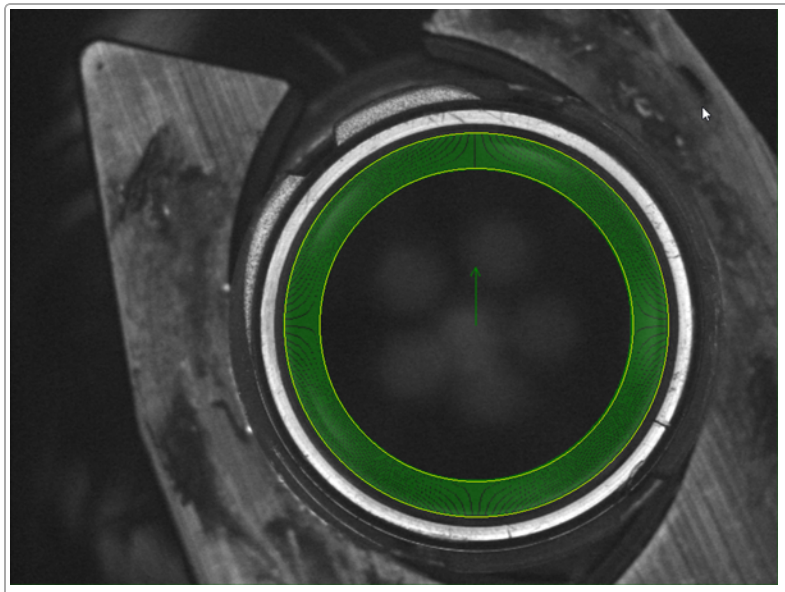
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Make sure parts are passing or failing as expected. An example is shown below.
3. You can move the red horizontal bar in the graph closer to zero to make the inspection more sensitive, or further from the center to make the inspection less sensitive.
4. Select the OK button to save changes and exit.



Example seal surface defect

Place the Choked Neck ROI

We will place the region in the area where choked necks typically appear in the image.



Choked Neck Region	
X	0
Y	0
Inner Radius	130
Thickness	30
Use Arc Segments	Enabled
Perimeter Type	Normal

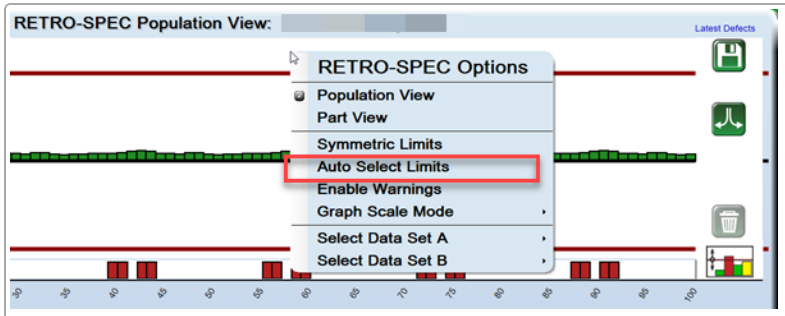
Double-click Choked Neck Region in the inspection tree.

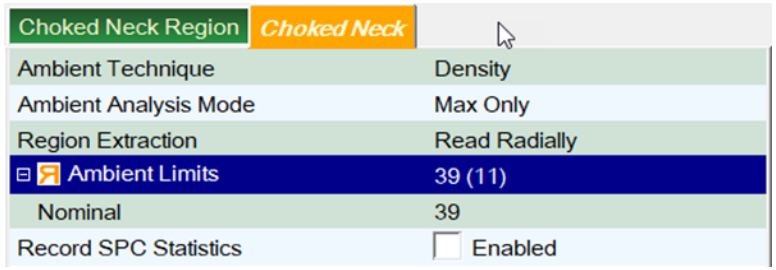
To place the region:

1. Click on the outer edge to move it, and then the inner edge to move it.
2. Position this region inside of the seal, where choked necks typically occur.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
4. Select the OK button to save changes and exit.

Set up the Choked Neck Inspection

We are using an Ambient inspection to detect choked necks.





Double-click Choked Neck in the inspection tree.

To set up the inspection:

1. +100 Put the lane online to acquire several images, and select the [+100] button.
2. Take the lane offline.
3. Right-click over the Retro-Spec Population View graph and choose Auto-Select Limits. The system will automatically set the inspection limits based on your parts.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

To test the inspection:

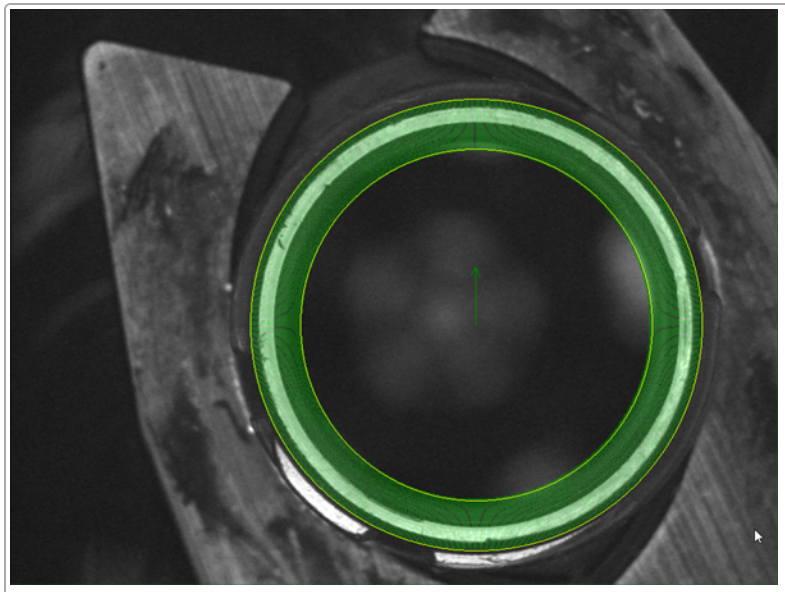
1. Scroll through the images to make sure parts are passing (or failing) as expected.
2. You can make the inspection more sensitive by moving the red horizontal bars on the Retro-Spec graph closer to center, or less sensitive by moving the red horizontal bars away from center.

Choked Neck inspection example

Select the OK button to save changes and exit.

Place the Ovality ROI

We will place the region to surround the seal surface.



Ovality ROI	
X	0
Y	0
Inner Radius	146
Thickness	42
Use Arc Segments	Enabled
Perimeter Type	Normal

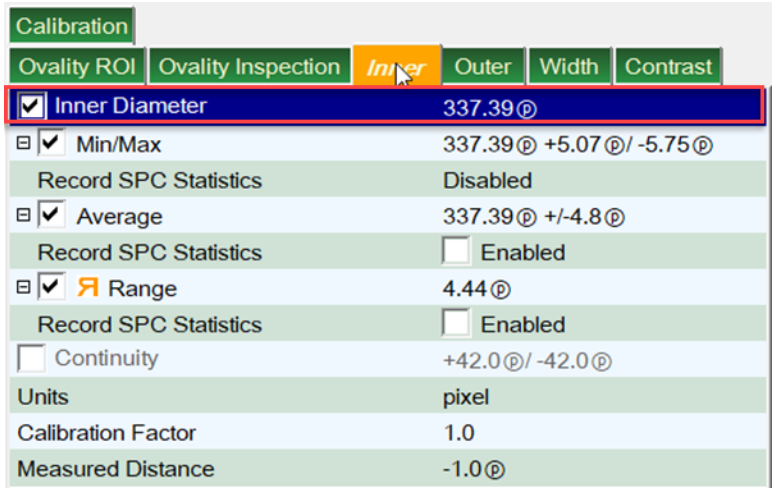
Double-click Ovality ROI in the inspection tree.

To place the region:

1. Click on the outer edge to move it, and then the inner edge to move it.
2. Position this region over the seal as shown.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
4. Select the OK button to save changes and exit.

Set up the Ovality Inspection

We are using a Measurement inspection to detect ovality on the seal. It determines the inner and outer width, and compares it to a standard that you set.

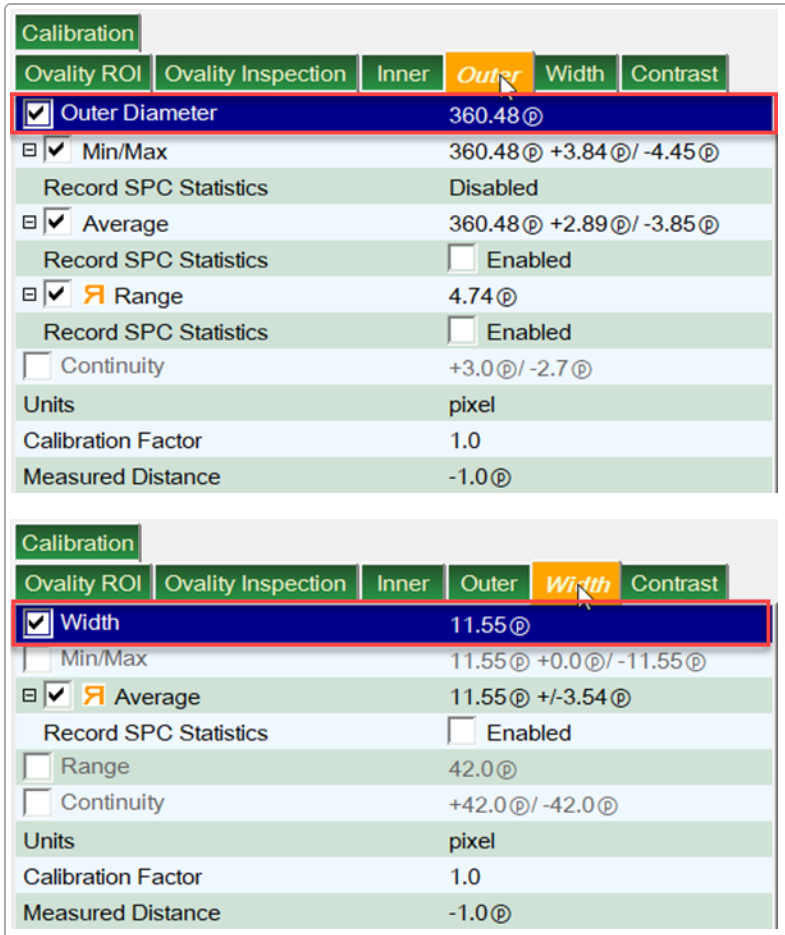


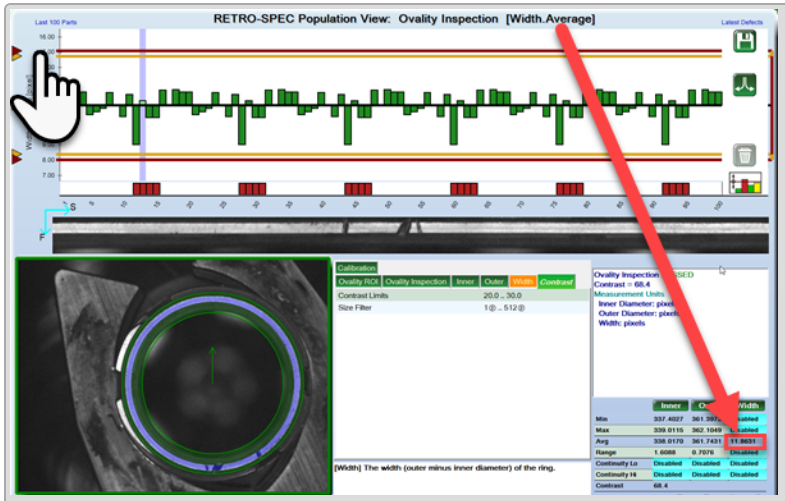
Double-click Ovality Inspection in the inspection tree.

To set up the inspection:

1. 

Put the lane online to acquire several images, and select the [+100] button.
2. Take the lane offline.
3. In the Ovality Inspection menu, select a Feature Type. We are using Borders: Both Dark in our example because the outside of the seal has dark pixels on both sides.
4. Go to the Inner menu and enable Inner Diameter.
5. Uncheck Continuity.
6. Go to the Outer menu and enable Outer Diameter.
7. Uncheck Continuity.
8. Go to the Width menu and enable Width.
9. Uncheck Range and Continuity.
10. Go to the Ovality Inspection menu.
11. Select the Learn button. The system will automatically set the values in the menus based on your part population.
12. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.


Calibration
Ovality ROI
Ovality Inspection
Inner
Outer
Width
Contrast
Outer Diameter 360.48
Min/Max 360.48 +3.84/ -4.45
Record SPC Statistics Disabled
Average 360.48 +2.89/ -3.85
Record SPC Statistics Enabled
Range 4.74
Record SPC Statistics Enabled
Continuity +3.0/ -2.7
Units pixel
Calibration Factor 1.0
Measured Distance -1.0
Calibration
Ovality ROI
Ovality Inspection
Inner
Outer
Width
Contrast
Width 11.55
Min/Max 11.55 +0.0/ -11.55
Average 11.55 +/-3.54
Record SPC Statistics Enabled
Range 42.0
Continuity +42.0/ -42.0
Units pixel
Calibration Factor 1.0
Measured Distance -1.0

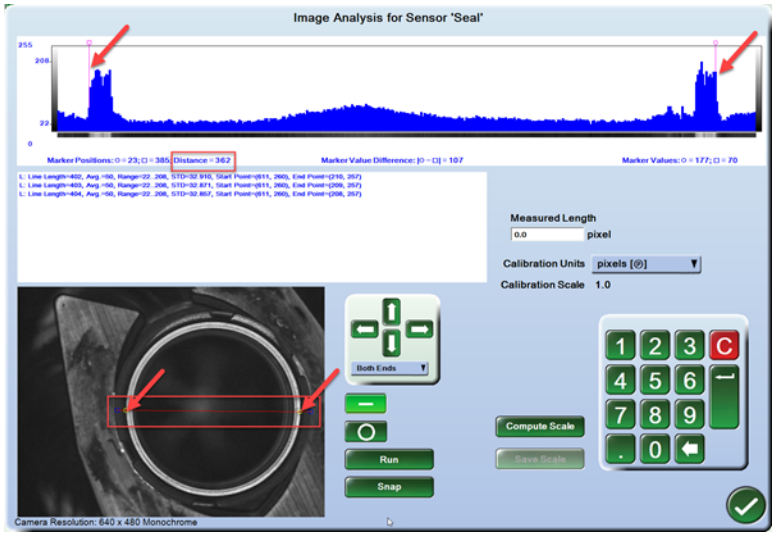


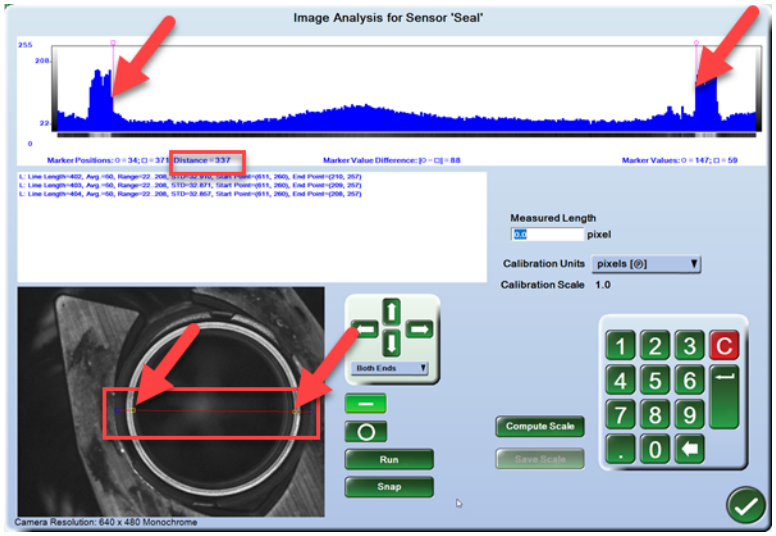
To test the inspection:

1. Scroll through several images to make sure the inspection is passing (or failing) as expected.
2. You can move the red horizontal bars towards the black line in the upper graph to make the inspection more sensitive (fail more bottles), or away from the black line to make it less sensitive (pass more bottles).

Select any of the measurements in the lower right corner. The graph changes depending which measurement you are looking at. You can adjust the sensitivity for any of the measurements separately.

Select the OK button to save changes and exit.

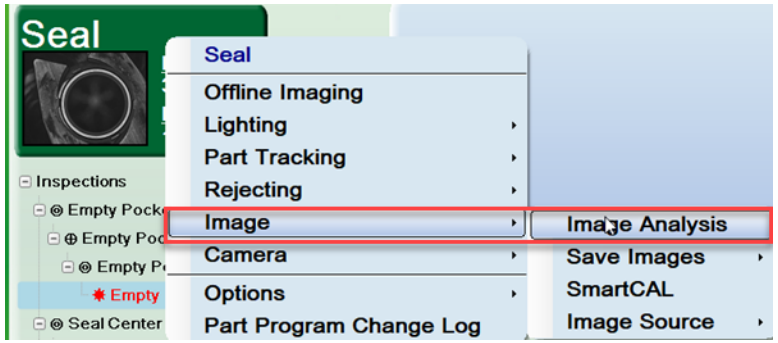




OPTIONAL: you can verify measurements. You will need to measure a good seal to get the measurements to which the system will compare.

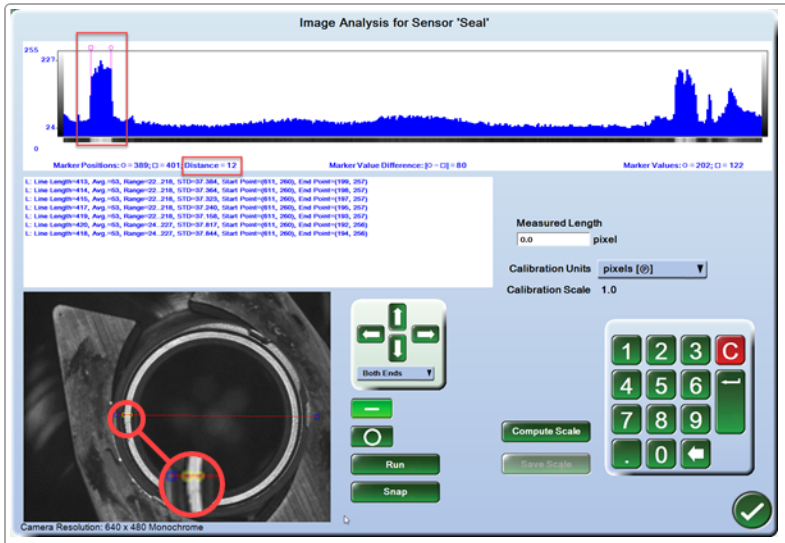
To get measurements:

1. Right-click over the Seal button. Select Image | Image Analysis.



2. Click the Snap button to see a good seal image. You may need to click the button several times until you see a typical good seal.
3.  Select the line button in Image Analysis.
4. Move the line and stretch it so the line crosses the seal at the widest point.
5. Move the yellow box and circle (markers) so they fall on the outside of the seal. You can use the upper graph to position these points more precisely (where the change in grey level drops off).
6. Write down the Distance value between these points. This will be the value we use for Outer Diameter.
7. Move the markers to the inner edges of the seal.
8. Write down the Distance value between these points. This will be the value we use for Inner Diameter.
9. Move the markers to the edges of one side of the seal.
10. Write down the Distance between these points. This will be the value we use for Width.
11.  Select the OK button to save changes and exit.

With your written measurements, go back to the Ovality Inspection and run the



inspection. Compare your written values to the values measured by the inspection.

Module 13 Inspections for Intellimass

This section explains how to set up the inspections. Note that your inspections may be different, depending on your specific part, plant, and process requirements.

> *Note: The Intellimass modules are optional additional modules that must be purchased separately.*

This section explains how to set up the Intellimass inspections. The modules do not have cameras; they are infrared sensors that measure the overall thickness of the base or sidewall of a part. Therefore, the images on screen are measurements instead of pictures of the part.

Create the Base Mass Inspection Tree

The steps below will guide you through the process of building the Base Mass Inspection Tree, while ensuring that the directory links are connected correctly. First add the inspections, then rename them to something that makes sense to you. Note that we will set up the regions and parameters later. For now, we will just build the inspection tree.

Note for all steps: when you add the inspection, you can rename it immediately.
After each step, select the OK button to save changes, and the Exit button to exit the inspection.

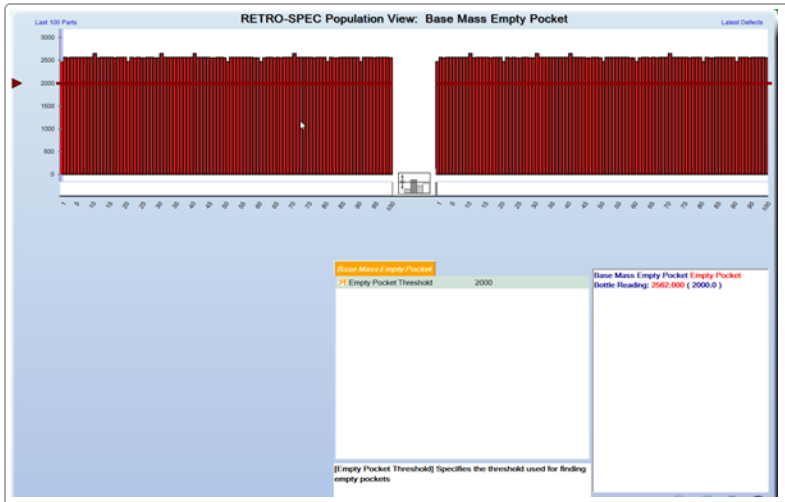
This is how the inspection tree will look	Steps to add the inspections
	1. Inspections Right-click Inspections. Add | Mass Empty Pocket. Rename it Base Mass Empty Pocket. 2. Right-click Base Mass Empty Pocket. Add | Mass Inspection. Rename it Base Mass. *Note: only one Empty Pocket and one Mass inspection are permitted for each mass sensor part program. If you have already added either of these to the part program, then they are not available to add from the Inspection menu (even if one is disabled).* Your inspection tree should look similar to that shown on the left.

Set Up the Base Mass Empty Pocket Inspection

The Empty Pocket inspection determines whether a part is present. If no part is present, then subsequent inspections will not take place. This keeps statistics correct, and saves inspection time.

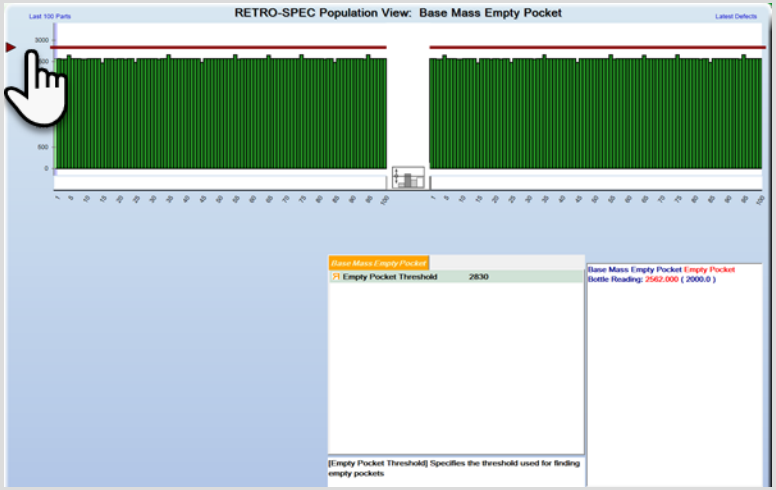
Note that the system already considers this an empty pocket inspection (that is, you do not have to enable Empty Pocket in the settings).

The name of the Empty Pocket inspection will have a blue background in the inspection tree.



Put the lane online and allow the system to acquire several images, then take the lane offline. You may see a warning about "Side Mass" having no inspections. This is OK. We will set that up later.

Double-click Base Mass Empty Pocket in the inspection tree. The inspection will likely show failed parts initially. The red bars indicate the base mass measurements.

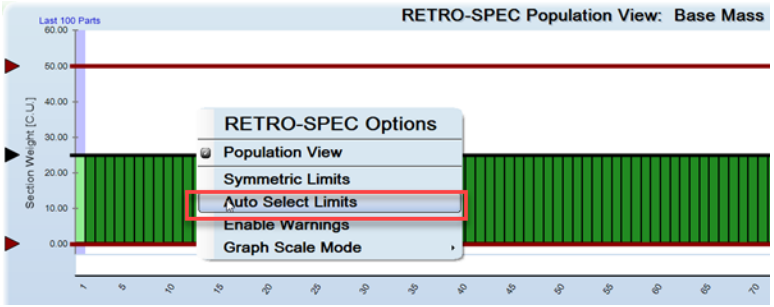


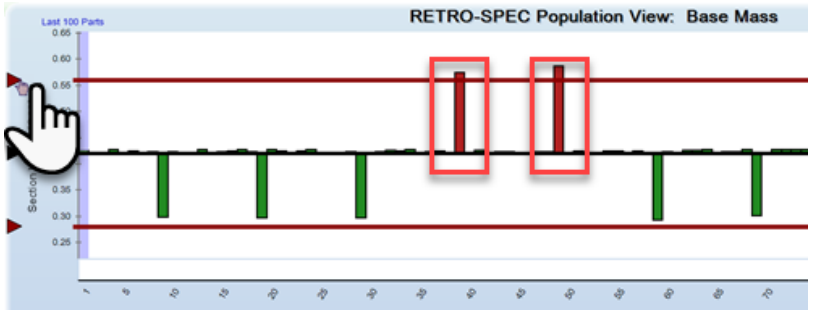
Move the red horizontal line above the vertical bars so that the bars turn green. This allows the inspection to pass.

Select the OK button to save changes and exit.

Set up the Base Mass Inspection

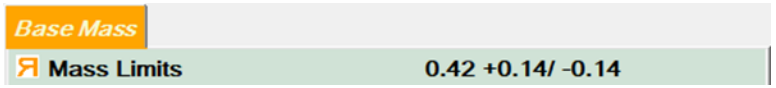
We are using a Mass inspection to set the limits that determine whether parts pass or fail.



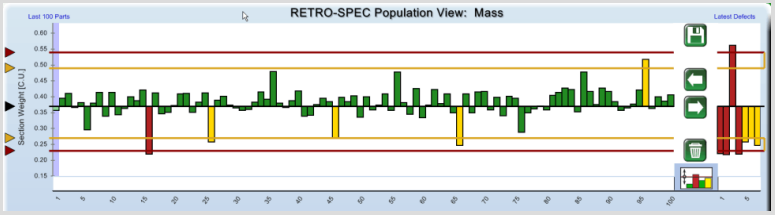


To set up the inspection:

1. Before editing the inspection, put the lane online to acquire several readings.
2. Double-click Base Mass in the inspection tree.
3. Take the lane offline.
4. Right-click over the Retro-Spec Population View graph and choose Auto-Select Limits. The system will automatically set the inspection limits based on your parts.
5. You can move the red horizontal bars in the graph closer to center to make the inspection more sensitive, or further from center to make the inspection less sensitive.
6. In our example, the parts with red bars will fail. This means those parts are outside of the Mass limits we set.



7. Select the OK button to save changes and exit.

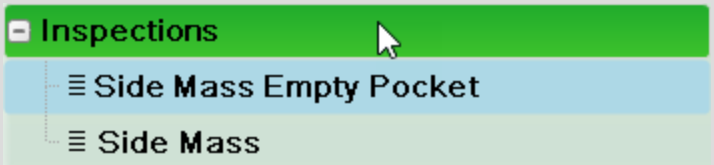


Example Base Mass inspection

Create the Sidewall Mass Inspection Tree

The steps below will guide you through the process of building the Sidewall Mass Inspection Tree, while ensuring that the directory links are connected correctly. First add the inspections, then rename them to something that makes sense to you. Note that we will set up the regions and parameters later. For now, we will just build the inspection tree.

Note: the setup procedure for Sidewall mass is the same as Base mass
Note for all steps: when you add the inspection, you can rename it immediately.
After each step, select the OK button to save changes, and the Exit button to exit the inspection.

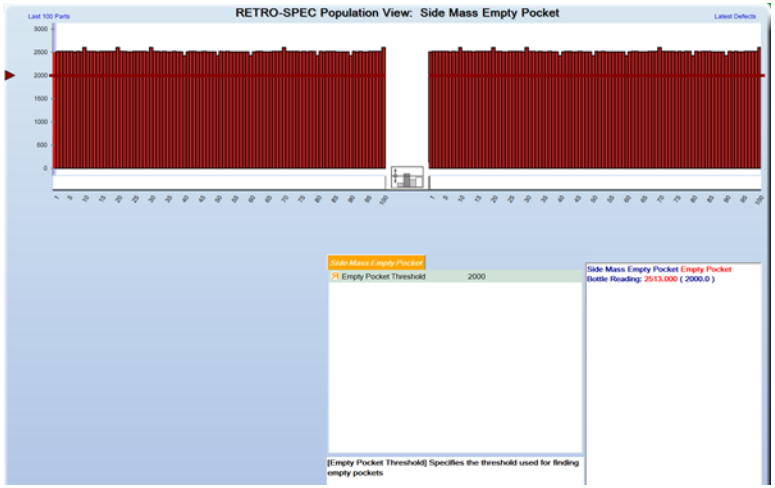
This is how the inspection tree will look	Steps to add the inspections
	1. Inspections Right-click Inspections. Add | Mass Empty Pocket. Rename it Side Mass Empty Pocket. 2. Right-click Side Mass Empty Pocket. Add | Mass Inspection. Rename it Side Mass. *Note: only one Empty Pocket and one Mass inspection are permitted for each mass sensor part program. If you have already added either of these to the part program, then they are not available to add from the Inspection menu (even if one is disabled).* Your inspection tree should look similar to that shown on the left.

Set Up the Side Mass Empty Pocket Inspection

The Empty Pocket inspection determines whether a part is present. If no part is present, then subsequent inspections will not take place. This keeps statistics correct, and saves inspection time.

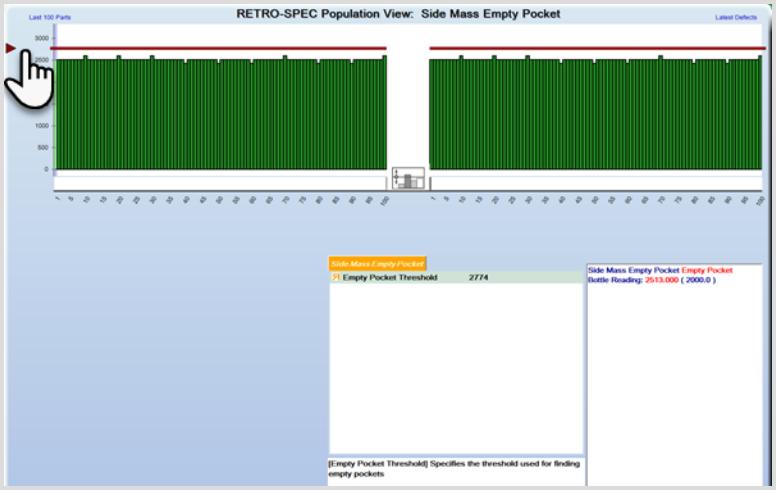
Note that the system already considers this an empty pocket inspection (that is, you do not have to enable Empty Pocket in the settings).

The name of the Empty Pocket inspection will have a blue background in the inspection tree.



Put the lane online and allow the system to acquire several images. Take the lane offline.

Double-click the Empty Pocket inspection in the inspection tree. The inspection will likely show failed parts initially. The red bars indicate the side mass measurements.

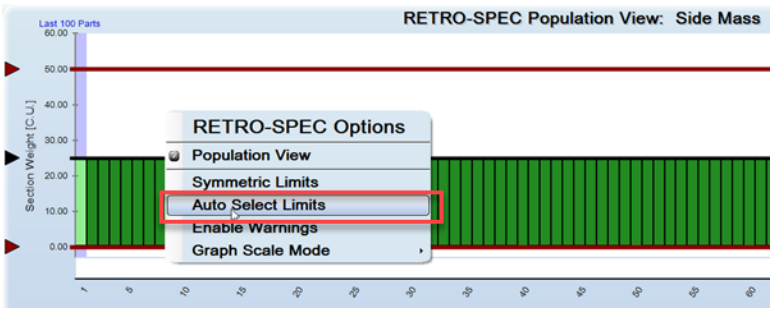


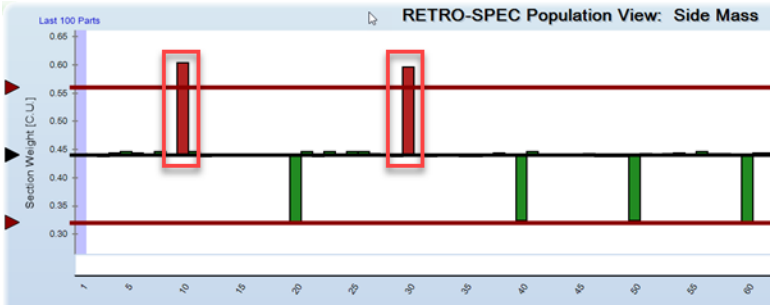
Move the red horizontal line above the vertical bars so that the bars turn green. This allows the inspection to pass.

Select the OK button to save changes and exit.

Set up the Side Mass Inspection

We are using a Mass inspection to set the limits that determine whether parts pass or fail.

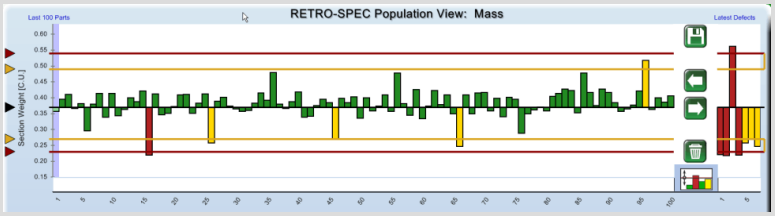




To set up the inspection:

1. Before editing the inspection, put the lane online to acquire several readings. Take the lane offline.
2. Double-click the Side Mass inspection name in the inspection tree.
3. Right-click over the Retro-Spec Population View graph and choose Auto-Select Limits. The system will automatically set the inspection limits based on your parts.
4. You can move the red horizontal bars in the graph closer to center to make the inspection more sensitive, or further from center to make the inspection less sensitive.
5. In our example, the parts with red bars will fail. This means those parts are outside of the Mass limits we set.

6. Select the OK button to save changes and exit.



Example Mass inspection