



Inside of Can Inspection Series 6

Inside of Can Inspection Series 6 | Software Version 6.0

Copyright Notice / Contact Us

© 2022 Pressco Technology Inc. All rights reserved.

No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose, without the express written permission of Pressco Technology Inc.

The contents of this manual are furnished for informational use only, are subject to change without notice, and should not be construed as a commitment by Pressco Technology Inc.

Written and designed at:

Pressco Technology Inc. World Headquarters

29200 Aurora Road

Cleveland, OH USA 44139-1847

TEL +1-440-498-2600

FAX +1-440-498-2615

www.pressco.com

Business Hours: Monday - Friday, 8:00am - 5:00pm Eastern Time

Customer Support:

Request technical support and remote support: techsupport@pressco.com

24/ 7 Customer Support (for urgent system help): +1-440-498-2000

e-mail: Schedule a service visit: dispatch@pressco.com

Request technical support and remote support: techsupport@pressco.com

Customer Service Fax: +1-440-498-4761

Table of Contents

Module 1 Pressco Introduction	7
Inspection Terminology	8
Sequence of Events During Inspection	9
Module 2 Hardware Overview	10
Intellispec Cabinet and User Interface	11
Module 3 Software Overview	18
4 Software Screens	19
System Overview screen	20
Lane Overview Screen	21
Sensor Overview Screen	22
Inspection Overview Screen	23
Menu Toolbar	24
User Accounts & Login	27
Module 4 System Tools	36
Log Reader	37
Reporting	38
Alarms	42
Rejecting	59
Support Package	64
Save Images	69
Module 5 Lighting and Imaging	73
Pressco Inspection Theory	74
Part Tracker Simulation	81
Imaging	82
Lighting	87
Module 6 Part Tracking	91
Sequence of Events During Inspection	92
Part Tracking Terminology	93
Encoder	94
Encoder/ PDX "Timing Wheel"	95
Part Tracking Using a PDX	96
Part Width Calibration	97
Part Present Delay Calibration	98

Reject Delay and Dwell Calibration	99
Adaptive Reject Calibration (optional)	100
Reject Confirm Calibration (optional)	101
PDX Configuration	102
Part Width Calibration using PDX	105
Module 7 System Maintenance and Troubleshooting	106
Maintenance Frequency	107
Troubleshooting Tools and Information	110
Module 8 Part Programming - General Information	119
Part Changeover	120
Manage Part Programs	122
Create or Copy a Part Program	124
Inspection Overview	125
Inspection Tree Configuration	129
Module 9 Inside of Can Inspections - Introduction	146
Module 10 Neck Camera Inspections	148
Create the Neck Camera Inspection Tree	149
Place the Neck Empty Pocket Region of Interest	152
Set Up the Neck Empty Pocket Inspection	153
Place the Neck Reg ROI	155
Set up the Neck Registration	156
Place the Upper Neck ROI	157
Set up Clipping for Upper Neck Inspection	158
Set up the Upper Neck Inspection	159
Place the Middle Neck ROI	160
Set Up the Middle Neck Small Defect Inspection	161
Set Up the Middle Neck Large Defect Inspection	162
Set Up the Middle Neck Wrinkle Inspection	163
Place the Lower Neck ROI	164
Set Up the Lower Neck Inspection	165
Place the Shoulder Registration ROI	166
Set up the Shoulder Inspection Enhancement	167
Set up the Shoulder Registration	168
Place the Shoulder ROI	169

Set up the Shoulder Inspection Enhancement	170
Set up the Shoulder Inspection	171
Place the Upper Wall ROI	172
Set up the Upper Wall Inspection	173
Set up the Light - Dark Inspection	174
Module 11 Flange Camera Inspections	175
Create the Flange Camera Inspection Tree	176
Place the Flange Empty Pocket Region of Interest	177
Set Up the Flange Empty Pocket Inspection	178
Place the Flange Reg ROI	180
Set up the Flange Registration	182
Place the Flange Inspection ROI	183
Set up the Flange Inspection	184
Place the Short Flange Inspection ROI	185
Set up the Short Flange Inspection	186
Place the Flange Dimension ROI	187
Set up the Flange Dimension Inspection	188
Module 12 Body Camera Inspections	191
Create the Body Camera Inspection Tree	192
Place the Body Empty Pocket Region of Interest (ROI)	195
Set Up the Body Empty Pocket Inspection	196
Place the Flange Reg ROI - Body Camera	198
Set up the Flange Registration - Body Camera	200
Place the Flange-Neck ROI - Body Camera	202
Set up the Flange-Neck Inspection	203
Place the Upper Wall high ROI	204
Set up the Upper Wall high Inspection	205
Place the Upper Wall med ROI	206
Set up the Upper Wall med Inspection	207
Set up the Upper Wall Light - Dark Inspection - Body Camera	208
Place the Upper Wall low ROI	209
Set up the Upper Wall low Inspection - Body Camera	210
Place the Midwall high ROI	211
Set up the Midwall high Inspection - Body Camera	212

Place the Midwall med ROI	213
Set up the Midwall med Inspection - Body Camera	214
Place the Dome Reg ROI - Body Camera	215
Set up the Dome Registration - Body Camera	217
Place the Midwall low ROI - Body Camera	219
Set up the Midwall low Inspection - Body Camera	220
Place the Low wall high ROI - Body Camera	221
Set up Clipping for Low wall high Inspection	222
Set up the Low wall high Inspection - Body Camera	223
Place the Low wall med ROI - Body Camera	224
Set up the Low wall med Inspection - Body Camera	225
Place the Low wall low ROI - Body Camera	226
Set up the Low wall low Inspection - Body Camera	227
Place the Chime Heel-dent ROI - Body Camera	228
Set up the Chime Heel-dent Inspection - Body Camera	229
Place the Chime ROI - Body Camera	230
Set up the Chime Inspection - Body Camera	231
Place the Moat ROI - Body Camera	232
Set up the Moat Inspection - Body Camera	233
Place the Outer Dome ROI - Body Camera	234
Set up the Outer Dome Inspection - Body Camera	235
Place the Mid Dome ROI - Body Camera	236
Set up the Mid Dome Inspection - Body Camera	237
Place the Center Dome ROI - Body Camera	238
Set up the Ctr Dome Inspection - Body Camera	239

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.

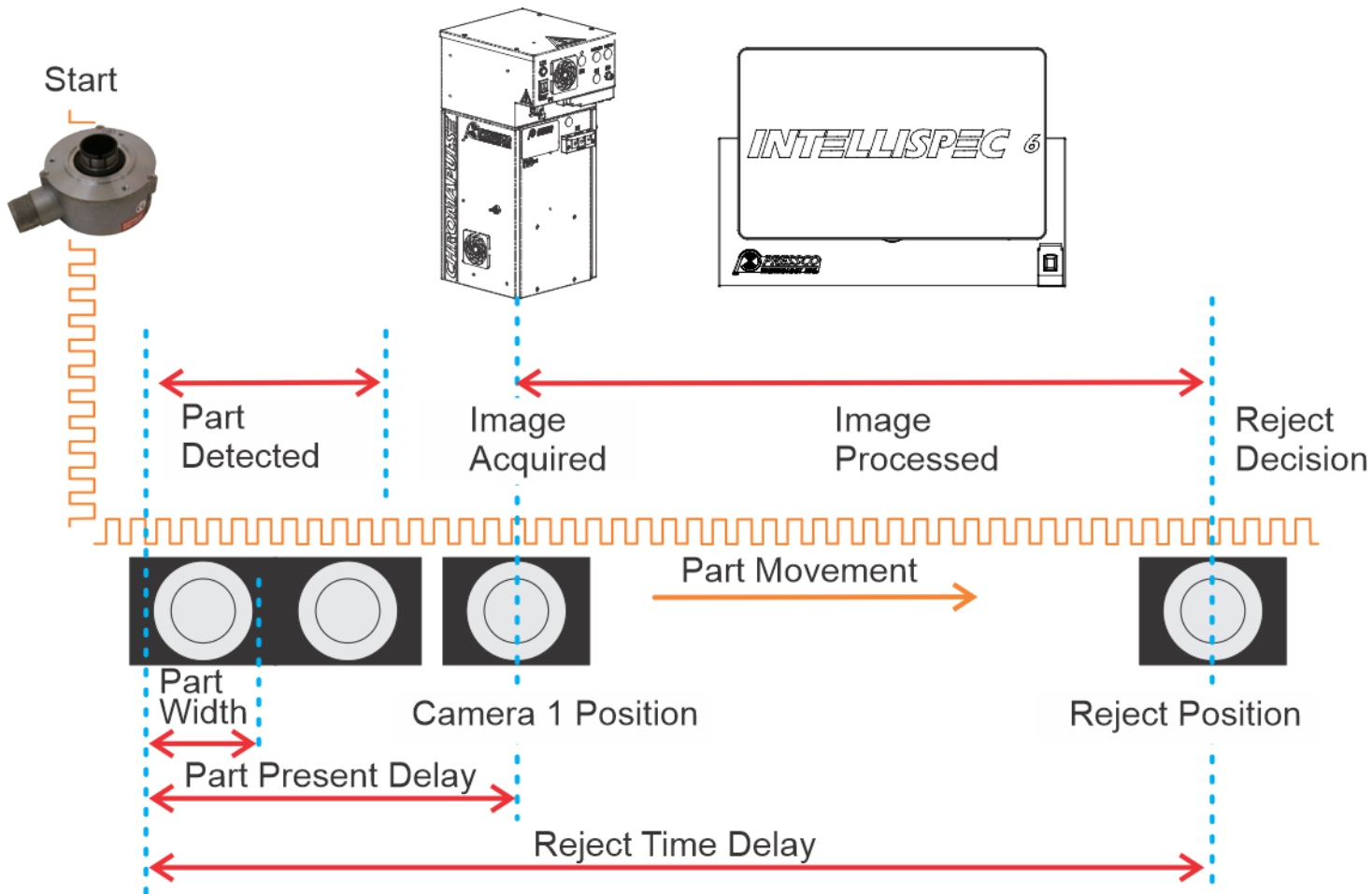
Reject - A part that failed one or more inspections from any sensor. The part can be physically rejected, or simply counted in the statistics.

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.

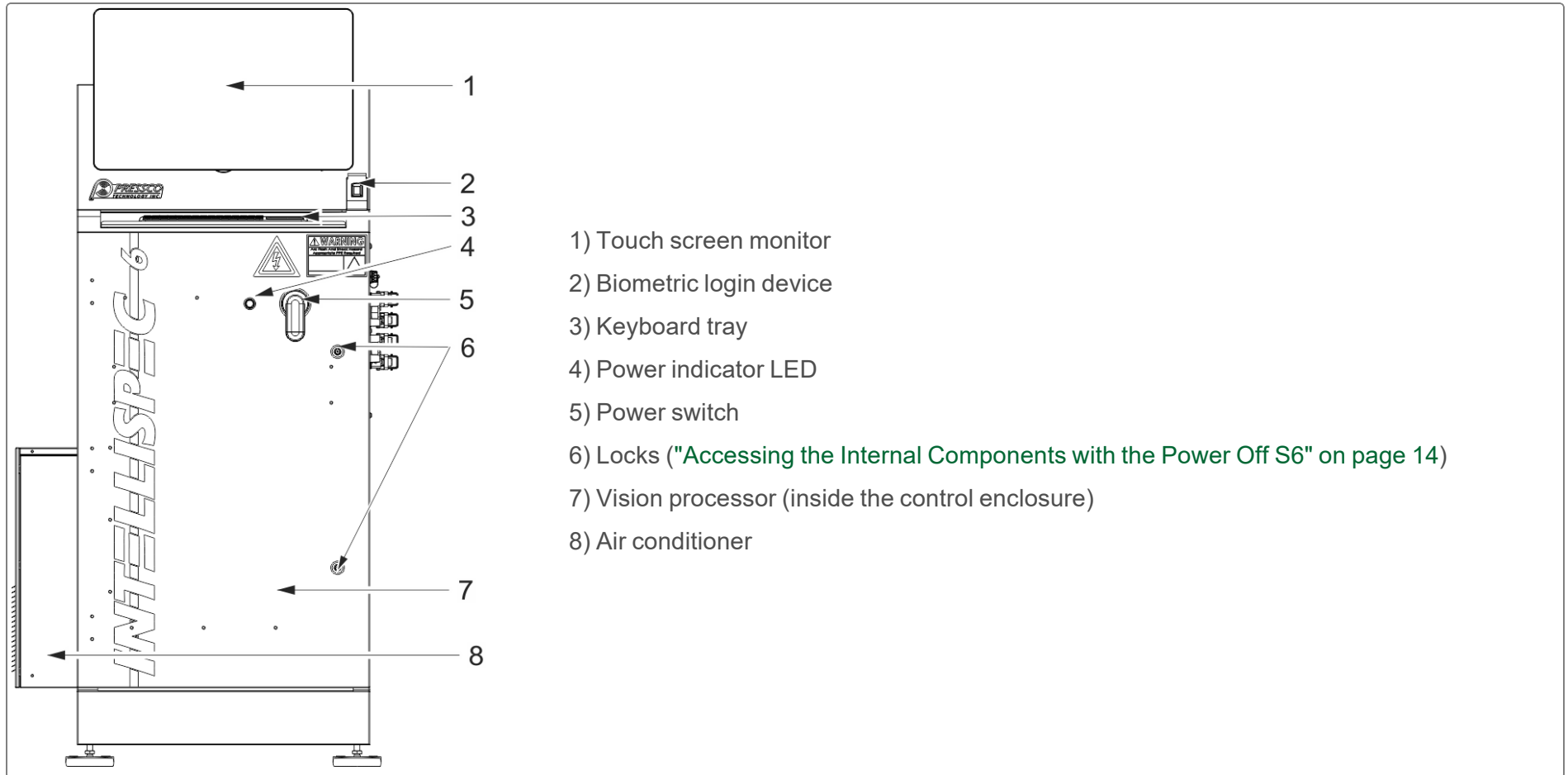
Sensor - A camera, Intellimass, or other sensor that acquires images, measurements, or other data from your product.

Sequence of Events During Inspection

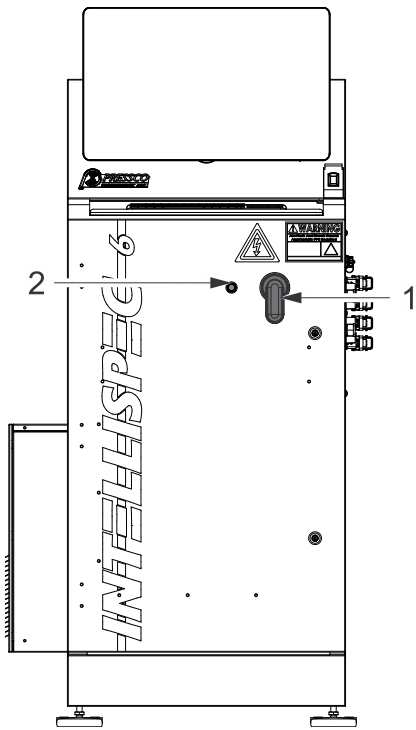
This illustration shows a typical inspection sequence of events. Note that your system configuration may involve more components, and may be different than pictured here.



Intellispec Cabinet and User Interface



Power On and Off at the Control Enclosure



Power on: Turn on the switch [1] on the front of the cabinet. The power indicator [2] will illuminate. The software will start automatically. (You must log in and put the system online to begin inspection)

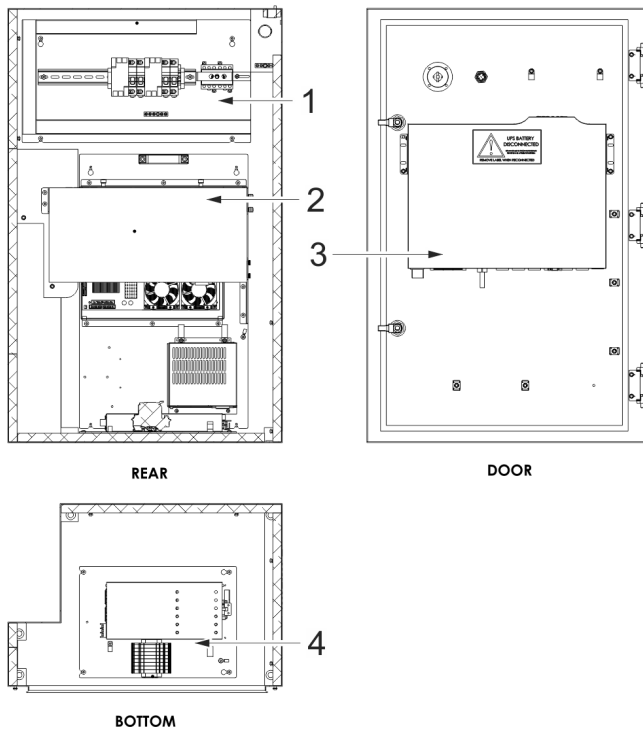
Note: it takes about a minute for the computer to start after the main power switch is turned ON

Power off: Turn off the switch on the front of the cabinet. The system, including the computer, shuts down. The UPS shuts down.

⚠ WARNING - When you shut down power using this switch, there is still voltage present on the UPS inside the unit until it discharges.

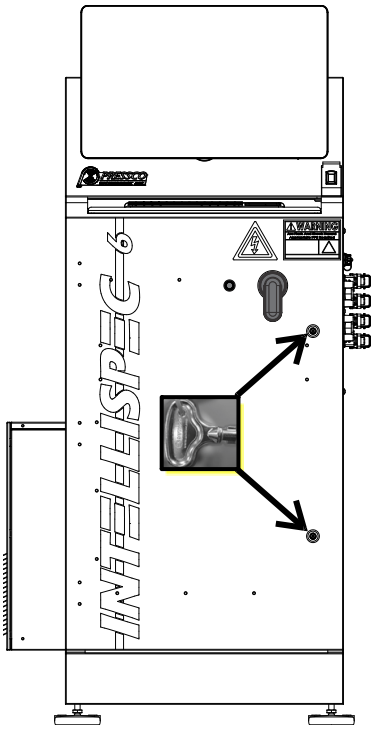
! Important - If you want to restart the system, turn off the power, let the software and components completely shut down, and leave the power off for about one minute before turning it back on. This allows the electronic components to correctly reset.

Computer Internal Components



- 1) Power Entry Panel, including terminal block TB1
- 2) Vision Processor Assembly
- 3) UPS (Uninterruptible Power Supply)
- 4) DC Power Panel, including terminal block TB2

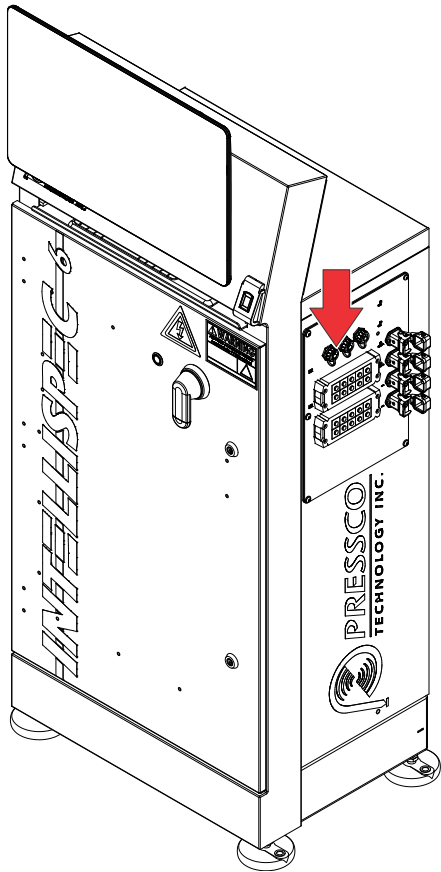
Accessing the Internal Components with the Power Off S6




To access the components inside of the control cabinet, you will need the keys (supplied by Pressco).

⚠ WARNING - When the system is powered down, there is still voltage present at the UPS. Only **AUTHORIZED PERSONNEL** should attempt to open the system. We recommend that only **AUTHORIZED PERSONNEL** have access to the keys.

USB Ports S6



There are USB ports available to back up or transfer data

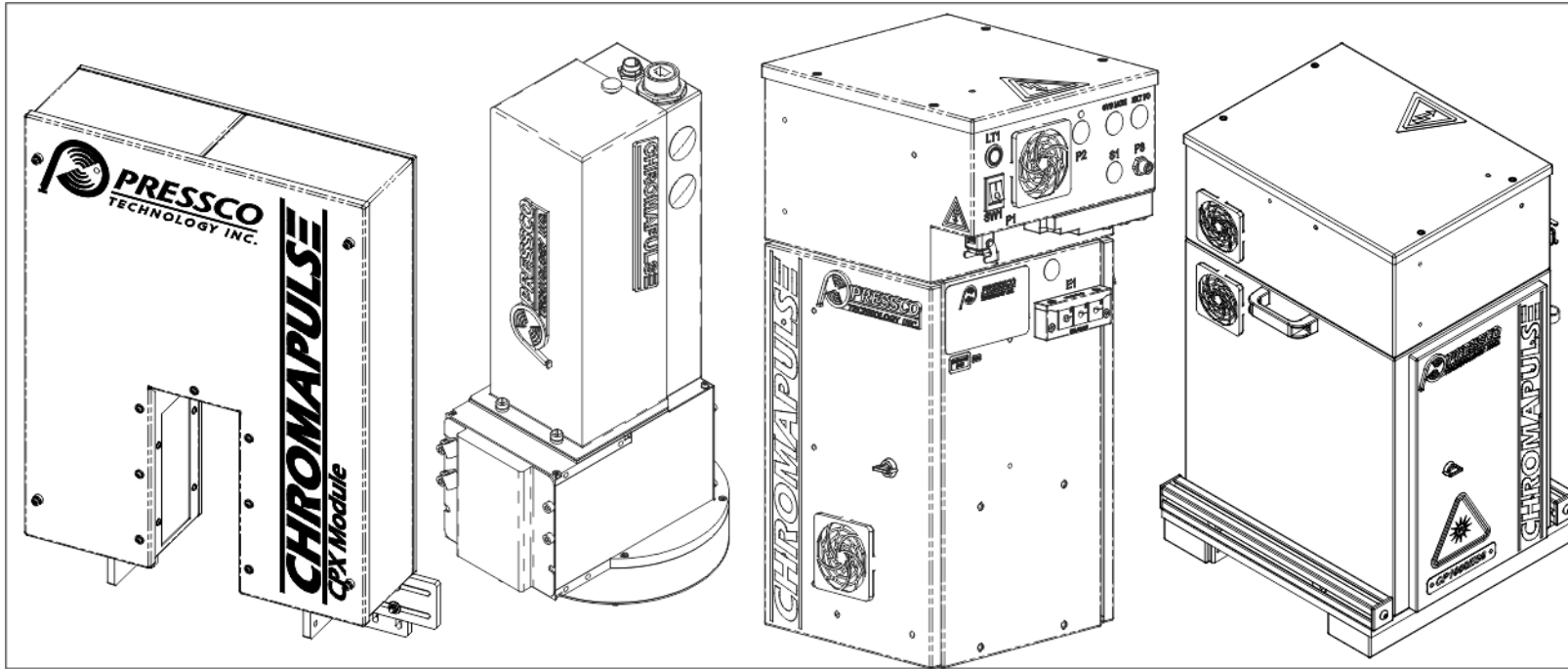
 The USB port is not for charging your phone! Only use these ports to import or export data.

Use the USB ports when you are:

- Importing or Exporting Part Programs from another system [How to Create, Copy, or Import a Part Program](#)
- Exporting user accounts
- Importing user accounts
- Creating a Support Package
- Saving images, especially to send with a support package

Chromapulse Module

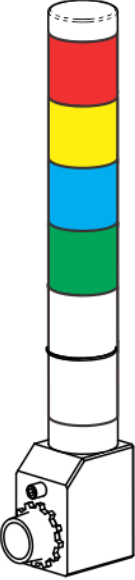
Chromapulse modules come in many shapes and sizes. Your system will have a module that is ideal for the size of the part and specific defects.



5-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

5-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 - steady	Warning alarm condition
	Amber	Off	No warning (OK)
	Amber	0.5 second flash	System automatically resets Asynchronous Correlation FIFO (not used in all systems)
	Blue	On	Not assigned
	Blue	Off	Not assigned
	Green	On - steady	Lane is online
	Green	Off	Lane is offline
	White	On - steady	Power On (Part tracker board has power)
	White	Off	Power Off (Part tracker board has no power)

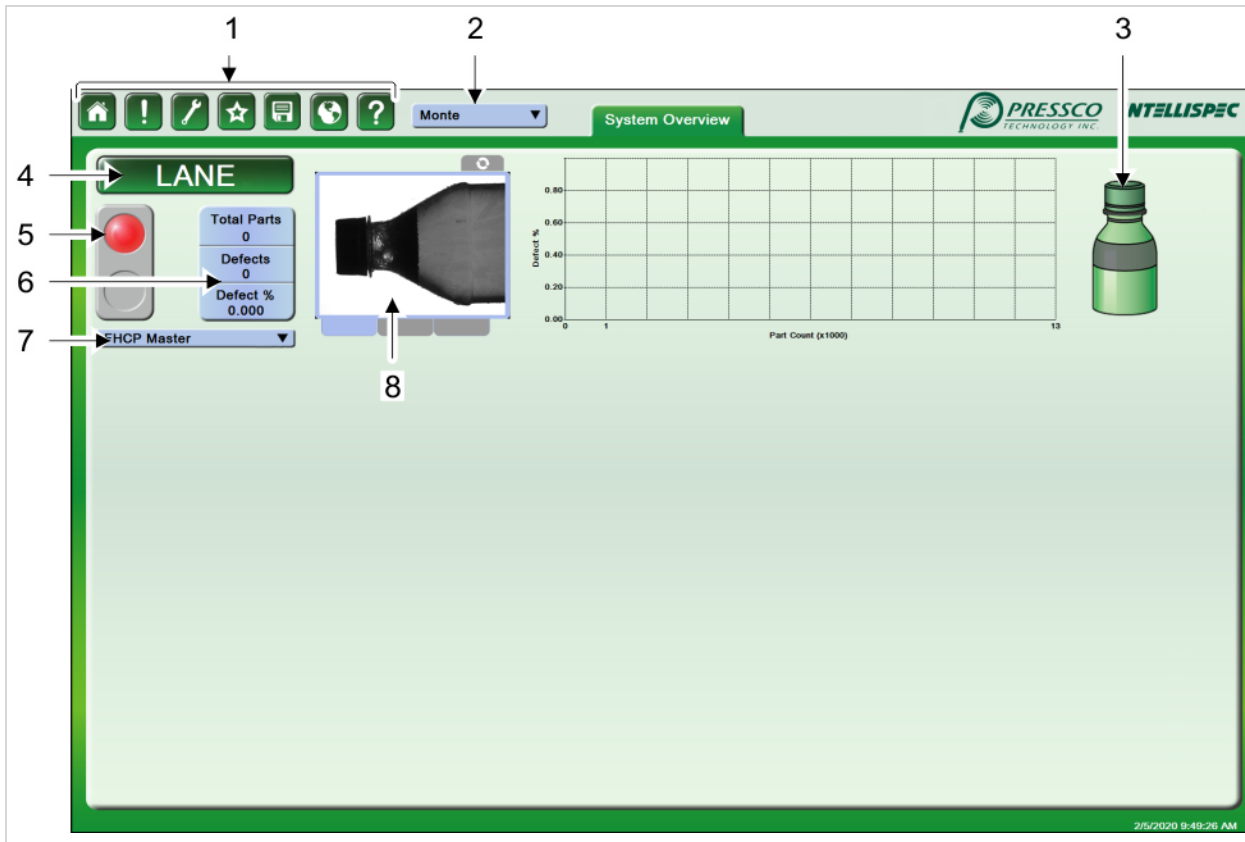
4 Software Screens

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 24
- 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.

2 →

1 →

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

2) Switch to System Overview

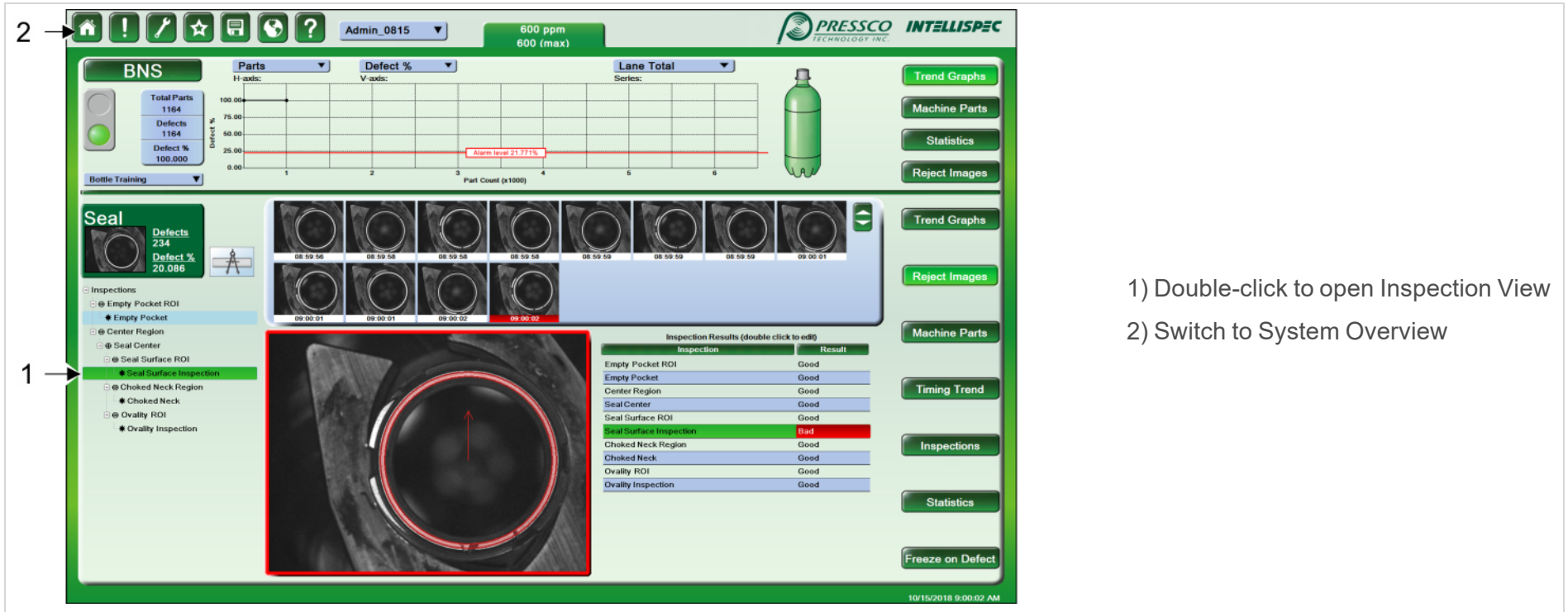
Sensor Overview Screen



Penny
Defects: 98777
Defect %: 20.000

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

2 →



1 →

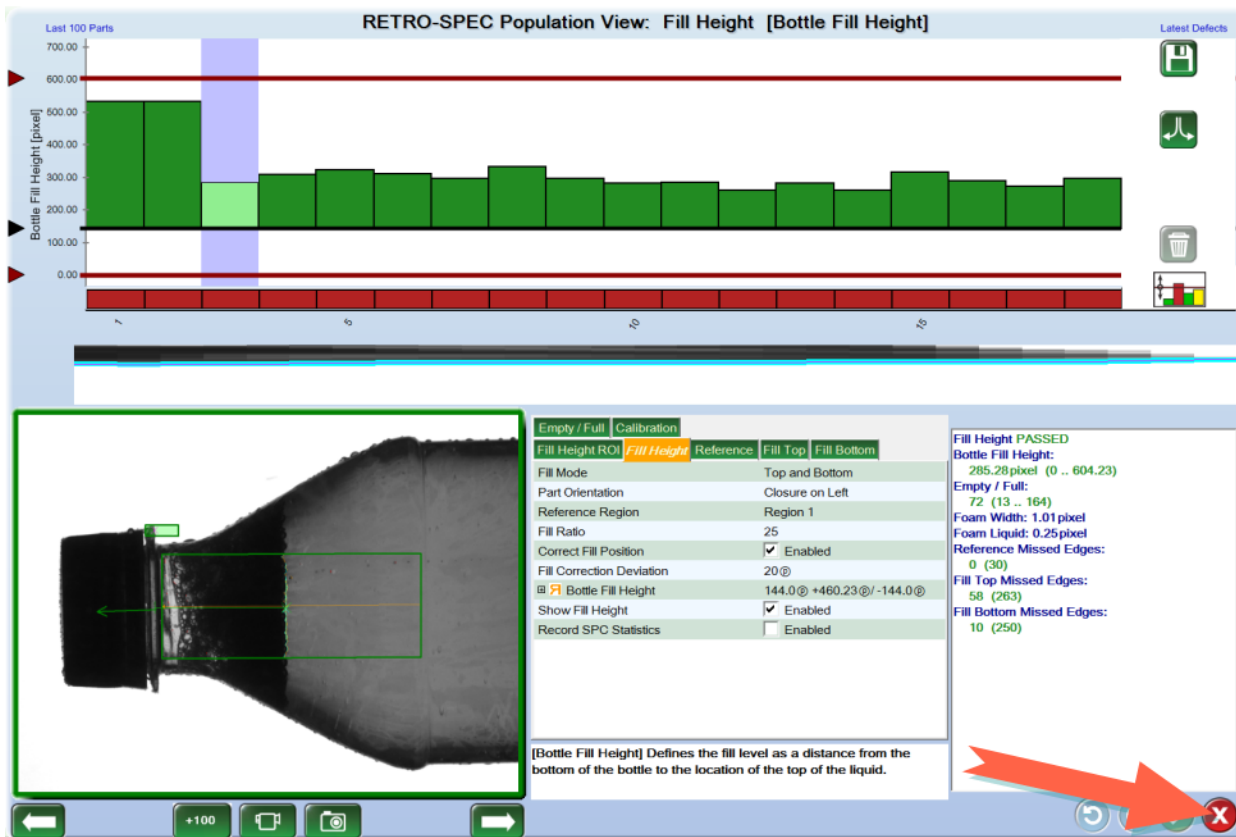
1) Double-click to open Inspection View
2) Switch to System Overview

Inspection	Result
Empty Pocket ROI	Good
Empty Pocket	Good
Center Region	Good
Seal Center	Good
Seal Surface ROI	Good
Seal Surface Inspection	Bad
Choked Neck Region	Good
Choked Neck	Good
Ovality ROI	Good
Ovality Inspection	Good

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

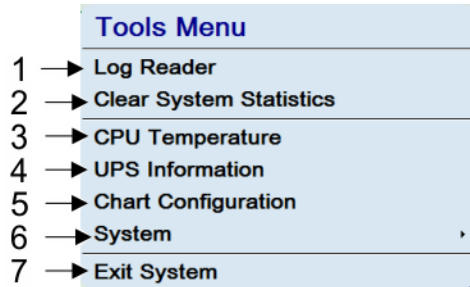
- 1) **Home** - Go to the System Overview Screen
- 2) **Alarms** - Clear, view, and set alarms
- 3) **Tools menu** - Configure system settings, reports, hardware, part tracking, rejectors, part setup, and more
- 4) **Star menu** - Take screen shots and manage background tasks, and launch the OPC Client (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.



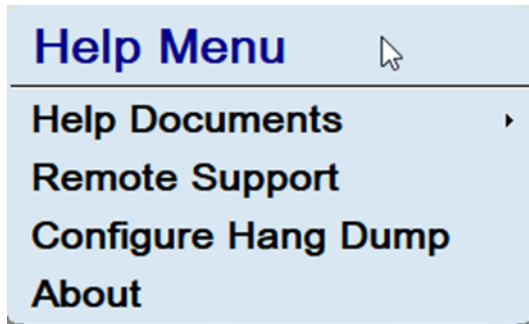
- 1) **Log Reader** - Open the Intellispec log (see also "**Log Reader**" on page 37)
- 2) **Clear System Statistics** - Clear the entire system statistics (all Lanes)
- 3) **CPU Temperature** - If a multiple core computer is used, the highest temperature is displayed. If the shutdown CPU temperature 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.
(not shown) - **OPC Configuration** - - [Only if the OPC Server is installed] This is an optional feature that must be purchased separately.
- 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 remote support
- Configure a hang dump (for administrators - troubleshooting purposes)
- 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.

Biometric Login Device

The Biometric Identification login device is used to log in and out of the Pressco system. This device is optional and must be purchased with the system.




To log in with this device, press your finger to the device. The following are conditions for use:


- You must use the same finger as initially set up by your administrator
- If you do not know how your account was set up (or which finger you used), contact your administrator
- If, after three tries, the Pressco does not recognize your finger print, you must log in using the On Screen Keyboard (OSK)

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

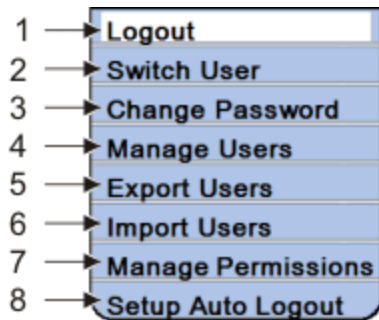
To ensure that only authorized users perform certain changes to the system, users are required to log in.* Some of these menu items are available to advanced users only.

*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

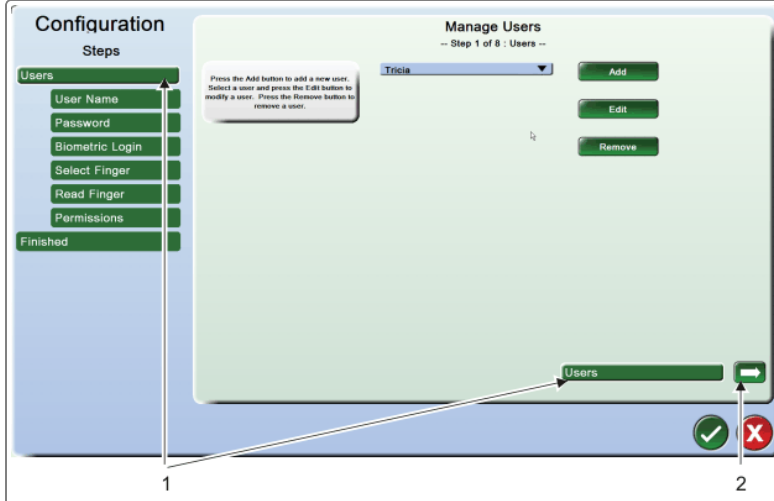
Note: There is a Pressco Technician account for use only by Pressco Service Engineers. This gives access to unsupported features (menu items are a different color). If you log into this account and use those features, do so at your own risk.

User Management


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. **Bob** 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).

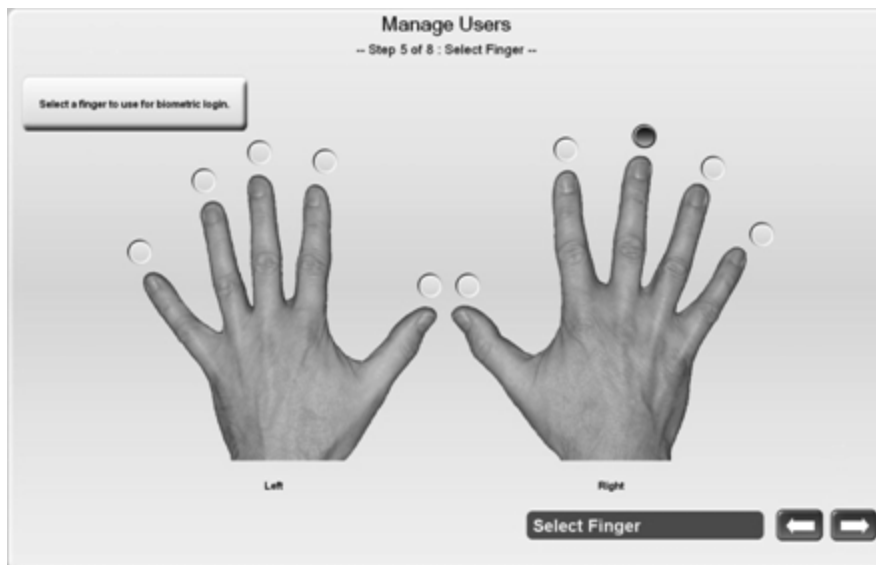
Add a user with the biometric login device


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. **Bob** 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.

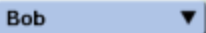
Export Users

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 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 disk icon to browse to the USB device.
6.  Select the OK button to save changes and exit. The user account is exported.

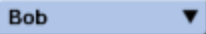
Import Users

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:

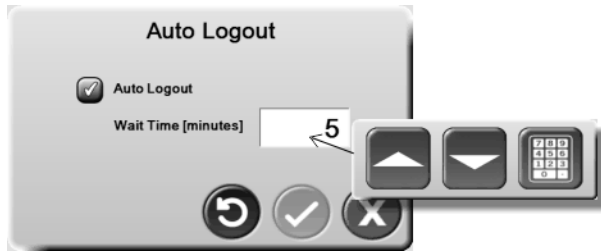
1. Insert the USB device into an available slot on the Intellispec system.
2.  Select the button with your user name | Import Users.





3. Select the user account that you want to import from the right column. If you do not see any users available, select the disk icon 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

	Date	Time	Lane	Message	User	Online	Part Program	AI
Tue	2011-11-22	17:03:05	(2) Nicke	System went offline.	Administrator	Offline	Nickel	R
Tue	2011-11-29	09:27:47	(0) System	System process starts.	Administrator	Offline	default	
Tue	2011-11-29	09:28:18	(0) System	Internal Error	Administrator	Offline	default	
Tue	2011-11-29	09:28:31	(4) Quarter	Lane process starts.	Administrator	Offline	Measurement_test	
Tue	2011-11-29	09:28:31	(4) Quarter	Version: 5.0.467 (XP, 32 bit)	Administrator	Offline	Measurement_test	
Tue	2011-11-29	09:28:31	(4) Quarter	Built: 11/28/2011 3:29:07 PM	Administrator	Offline	Measurement_test	
Tue	2011-11-29	09:28:31	(4) Quarter	Built by: dpaunescu	Administrator	Offline	Measurement_test	
Tue	2011-11-29	09:28:31	(4) Quarter	Built on machine: DPOP755	Administrator	Offline	Measurement_test	
Tue	2011-11-29	09:28:31	(4) Quarter	Built on operating system: Microsoft Windows NT 5.1.2600 Service ...	Administrator	Offline	Measurement_test	
Tue	2011-11-29	09:28:31	(4) Quarter	Build changed from '5.0.465 (XP, 32 bit)' to '5.0.467 (XP, 32 bit)'	Administrator	Offline	Measurement_test	
Tue	2011-11-29	09:28:31	(2) Nicke	Lane process starts.	Administrator	Offline	Nickel	R
Tue	2011-11-29	09:30:20	(2) Nicke	Sensor 'Neck' with Id 2 in the part program 1L squat blue was not fou...	Administrator	Offline	Nickel	
Tue	2011-11-29	09:30:20	(2) Nicke	Sensor 'Seal' with Id 3 in the part program 1L squat blue was not fou...	Administrator	Offline	Nickel	
Tue	2011-11-29	09:30:20	(2) Nicke	Sensor 'Neck' with Id 2 in the part program .5L Snapple Clear was n...	Administrator	Offline	Nickel	
Tue	2011-11-29	09:30:20	(2) Nicke	Sensor 'Seal' with Id 3 in the part program .5L Snapple Clear was no...	Administrator	Offline	Nickel	
Tue	2011-11-29	09:30:22	(0) System	Was not able to connect to a UPS	Administrator	Offline	default	
Tue	2011-11-29	09:30:41	(0) System	User 'Administrator' has logged in.	Administrator	Offline	default	
Tue	2011-11-29	09:32:03	(2) Nicke	System went offline.	Administrator	Offline	Nickel	
Tue	2011-11-29	09:41:35	(1) Penny	System went online.	Administrator	Online	Penny	
Tue	2011-11-29	09:41:36	(1) Penny	System went offline.	Administrator	Offline	Penny	



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

The log reader displays the Intellispec event history including:

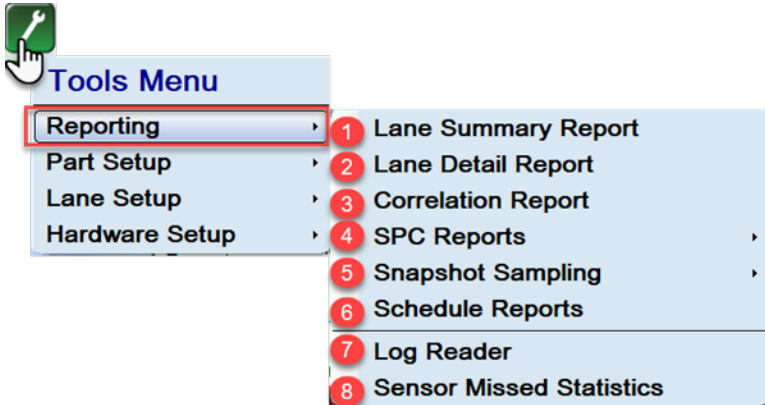
- User log in and log out information
- Notification when the part program was changed. Note: detailed changes to parameters and program changes are found in the Part Program Change Log
- Alarms, when triggered and cleared
- System errors
- System starting information
- Lane online/ offline history
- 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 40

4 - SPC Reports (SPC = Statistical Process Control)

5 - **Snapshot Sampling** - Snapshot sampling allows you to generate statistics for a limited number of future parts (up to 1,000,000). You can sample defect images (up to 1,000 per camera) and good images (up to 1,000 per camera).

6 - "Schedule Reports" on page 41

7 - Log Reader

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

(not shown)- **Defect Data Viewer** - [if enabled] view the images in the defect database

(not shown)- **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.

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

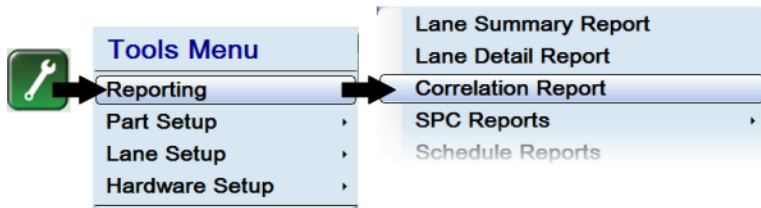
Lane Detail Report

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

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.

The screenshot shows a Notepad window titled 'Report - Notepad' with the following content:

```
File Edit Format View Help
Machine Name: TT3400
Part Program: FHCP3X Master
Current Time: 6/18/2013 1:28:37 PM
Last Reset: 6/18/2013 9:42:47 AM

'FILLER VALVE'
# Percent
28 0.18
112 0.18
136 0.18
16 0.18
76 0.18
88 0.18
100 0.18
52 0.18
40 0.18
64 0.18
124 0.17
4 0.17
144 0.16
60 0.16
24 0.16
36 0.16
96 0.16
84 0.16
108 0.16
120 0.16

'CAPPER HEAD'
# Percent
28 0.71
16 0.71
4 0.71
24 0.64
36 0.64
12 0.63
20 0.51
22 0.51
8 0.5
34 0.5
10 0.5
32 0.5
18 0.45
30 0.45
6 0.44
13 0.42
19 0.42
25 0.42
1 0.41
7 0.41
31 0.41
15 0.34
~ ~
```

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. To access: select from Lane Overview: Tools | Reporting | Schedule Reports.

The screenshot shows the 'Schedule Reports' dialog box. At the top, there is a dropdown menu (1) set to '✓Lane Summary Report' and a checked checkbox (2) for 'Enable Scheduled Report'. Below this is a green-bordered panel containing several options: a dropdown menu (3) set to 'Text File', a 'File Name' button, a 'Keep File Name' checkbox (4), a 'Clear Statistics' checkbox (5), a 'Next Scheduled Report' field (6) showing '0:00 Tomorrow', and a 'Time Between Reports' field (7) showing '12 hours' and '0 minutes'. To the right of this panel are four checkboxes: 'Print on Change-Over' (9), 'Print on Shutdown' (10), 'Print on Clear Statistics' (11), and 'Print on Shutdown Clear Statistics' (12). At the bottom of the green panel is a 'Preview' button (8). At the bottom right of the dialog are a green checkmark button and a red 'X' button.

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

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).

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.

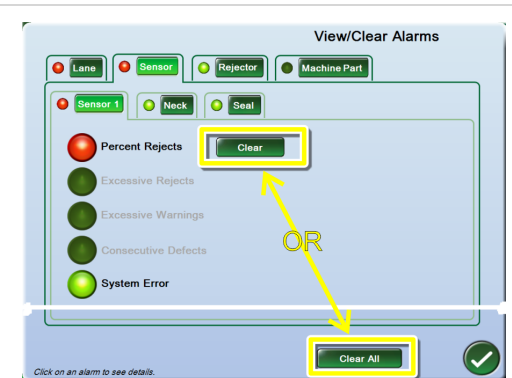
Select the Clear button to clear a single alarm, or the Clear All button to clear all alarms, including alarms in other tabs.

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:

View/Clear Alarms

Machine Part

Excessive Rejects

Correlation Alarm Details
InFeed

2. Excessive Rejects

Alarm triggers at percent: 2
Sample Size: 100

Next Triggered Item

1.	2.	3.	4.	Item	Parts	Failed	Failed %	When
●	●	●	●	1	100	4	4	15:50:37.669
●	●	●	●	2	100	4	4	15:50:37.813
●	●	●	●	3	100	3	3	15:50:35.522
●	●	●	●	15	100	4	4	15:50:36.937
●	●	●	●	16	100	4	4	15:50:37.057

Update

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).

Review Alarm Configurations



You can view all the alarm setups from one screen. Access this screen from the alarms button | Review Alarm Configurations, in Lane or Sensor Overview.

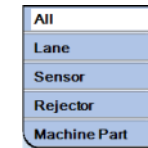
Review Configurations for All Alarms

Lane **#1 (LANE)** Source Type **All** Activation **Hide Disabled**

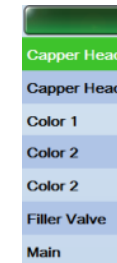
Light Tree *Extended I/O*

Lane	Source		Alarm	Activation	Visual	Audible	Digital Out
#1 (LANE)	Lane		Percent Defects	Warning	3600 s	3600 s	0x2 (Bit 1)
#1 (LANE)	Lane		System Error	Warning	10 s	2 s	-
#1 (LANE)	Sensor 1	Main	Percent Rejects	Warning	3600 s	3600 s	0x2 (Bit 1)
#1 (LANE)	Sensor 1	Main	Consecutive Defects	Warning	3600 s	3600 s	0x2 (Bit 1)
#1 (LANE)	Sensor 1	Main	System Error	Warning	10 s	2 s	-
#1 (LANE)	Sensor 2	Color 1	Percent Rejects	Warning	3600 s	3600 s	0x2 (Bit 1)
#1 (LANE)	Sensor 2	Color 1	Consecutive Defects	Warning	3600 s	3600 s	0x2 (Bit 1)
#1 (LANE)	Sensor 2	Color 1	System Error	Warning	10 s	2 s	-
#1 (LANE)	Sensor 3	Color 2	Percent Rejects	Warning	3600 s	3600 s	-
#1 (LANE)	Sensor 3	Color 2	System Error	Warning	10 s	2 s	-
#1 (LANE)	Rejector 1		Jam at Reject Confirm	Warning	3600 s	3600 s	-
#1 (LANE)	Rejector 1		Missed Reject	Warning	10 s	2 s	-
#1 (LANE)	Rejector 1		Missed Result	Warning	10 s	2 s	-
#1 (LANE)	MP1	Filler Valve	Percent Rejects	Warning	3600 s	3600 s	-
#1 (LANE)	MP2	Capper Head	Percent Rejects	Warning	3600 s	3600 s	-
#1 (LANE)	MP2	Capper Head	Excessive Rejects	Warning	3600 s	3600 s	-

Use the drop-down menus at the top of the screen to filter what you want to see. For example, view the alarm setups for only the Sensors, through the Source drop-down.



Sort data by column, by selecting a button at the top of the table. For example, sort the alarms alphabetically by sensor/machine part name, by clicking the blank button.



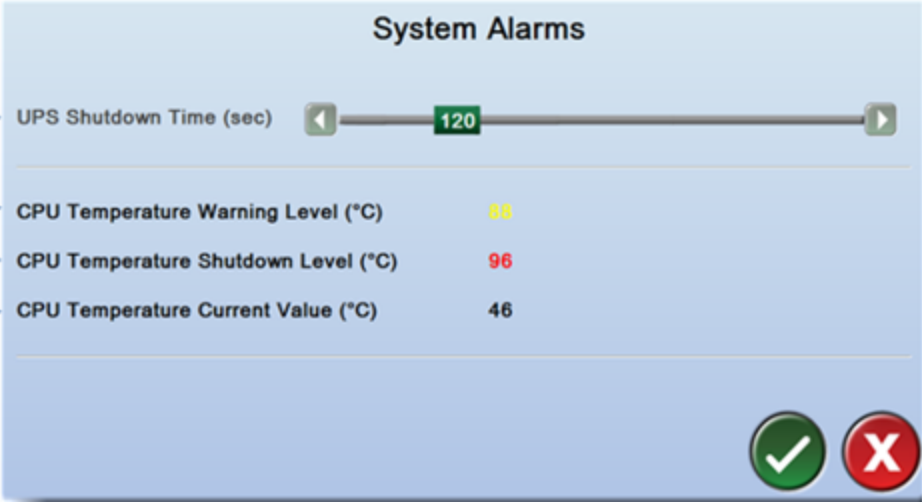
System Alarms - Description and Configuration

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.



System Alarms

1 → UPS Shutdown Time (sec) 120

2 → CPU Temperature Warning Level (°C) 88

→ CPU Temperature Shutdown Level (°C) 96

→ CPU Temperature Current Value (°C) 46

















✓ ✗

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	4-Light Tree ²	5-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	 Red
Offline ¹	Lane goes offline	Automatically resets	 Green = system is online  Red = system is offline	 Green = system is online  Red = system is offline
Chute Full ¹	Reject chute is full	Clear chute Reset alarm on screen	 Red	 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	 Red = AC power is lost  White = 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	 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	 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. 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.

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

Lane Alarm Configuration

Selected Alarm **Percent Defects** All Alarms ...

Alarm Enabled

Minimum Count 100

Trigger [%] 13.140

Audible Enabled

Visual Enabled

Duration **Seconds** 3600

Color Red Yellow

Exchange Settings

Warning Critical (linked to System Ready Bit)






Alarm Digital Outputs

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

↺ ✓ ✗

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. 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.

Some menu items are only available to advanced level users.



Sensor Alarm Configuration *Apply alarm to:*

Sensor **Base**

Selected Alarm **Percent Rejects** **All Alarms ...**

Alarm Enabled

Minimum Count 100

Trigger [%] 0.500

Audible Enabled Duration **Seconds** 5

Visual Enabled Duration **Seconds** 45


Color Red Yellow

Exchange Settings

Warning Critical (linked to System Ready Bit)




Alarm Digital Outputs

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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.

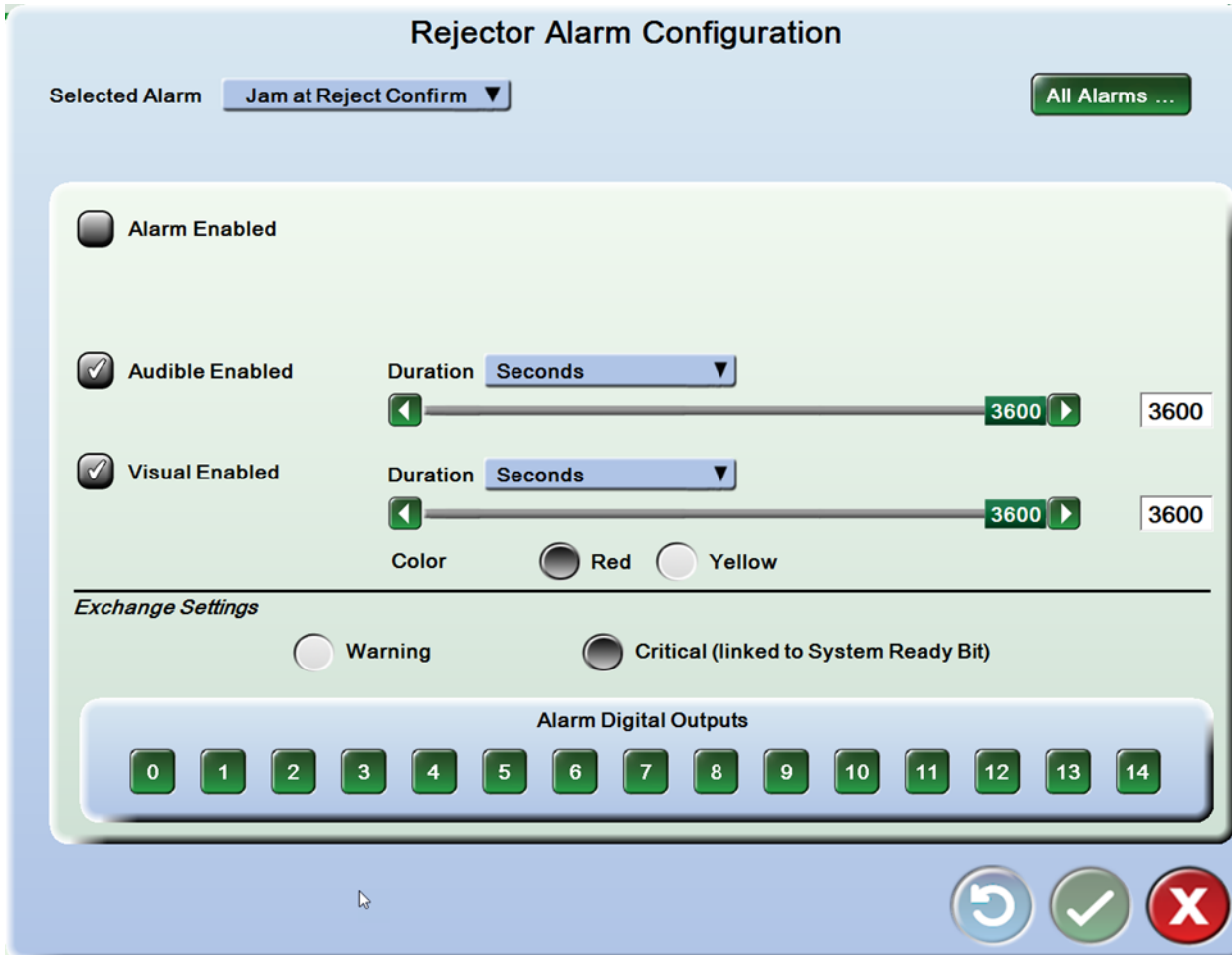
² The light tree displays this color for the Duration if Visual Enabled.

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.



The dialog box is titled "Rejector Alarm Configuration". At the top left, it shows "Selected Alarm" with a dropdown menu set to "Jam at Reject Confirm". To the right is a green button labeled "All Alarms ...".

The main configuration area has three sections:

- Alarm Enabled:** A checkbox that is currently unchecked.
- Audible Enabled:** A checked checkbox. Below it is a "Duration" dropdown set to "Seconds" and a slider control. The slider is positioned at 3600, with a green box containing "3600" and a text input field also containing "3600".
- Visual Enabled:** A checked checkbox. Below it is a "Duration" dropdown set to "Seconds" and a slider control. The slider is positioned at 3600, with a green box containing "3600" and a text input field also containing "3600".

Below the duration settings is a "Color" section with two radio buttons: "Red" (selected) and "Yellow".

A horizontal line separates the main settings from the "Exchange Settings" section, which contains two radio buttons: "Warning" (selected) and "Critical (linked to System Ready Bit)".






At the bottom is the "Alarm Digital Outputs" section, which consists of a row of 15 green buttons numbered 0 through 14.

At the bottom right of the dialog are three circular buttons: a refresh button (circular arrow), a confirm button (checkmark), and a cancel button (red circle with an X).

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

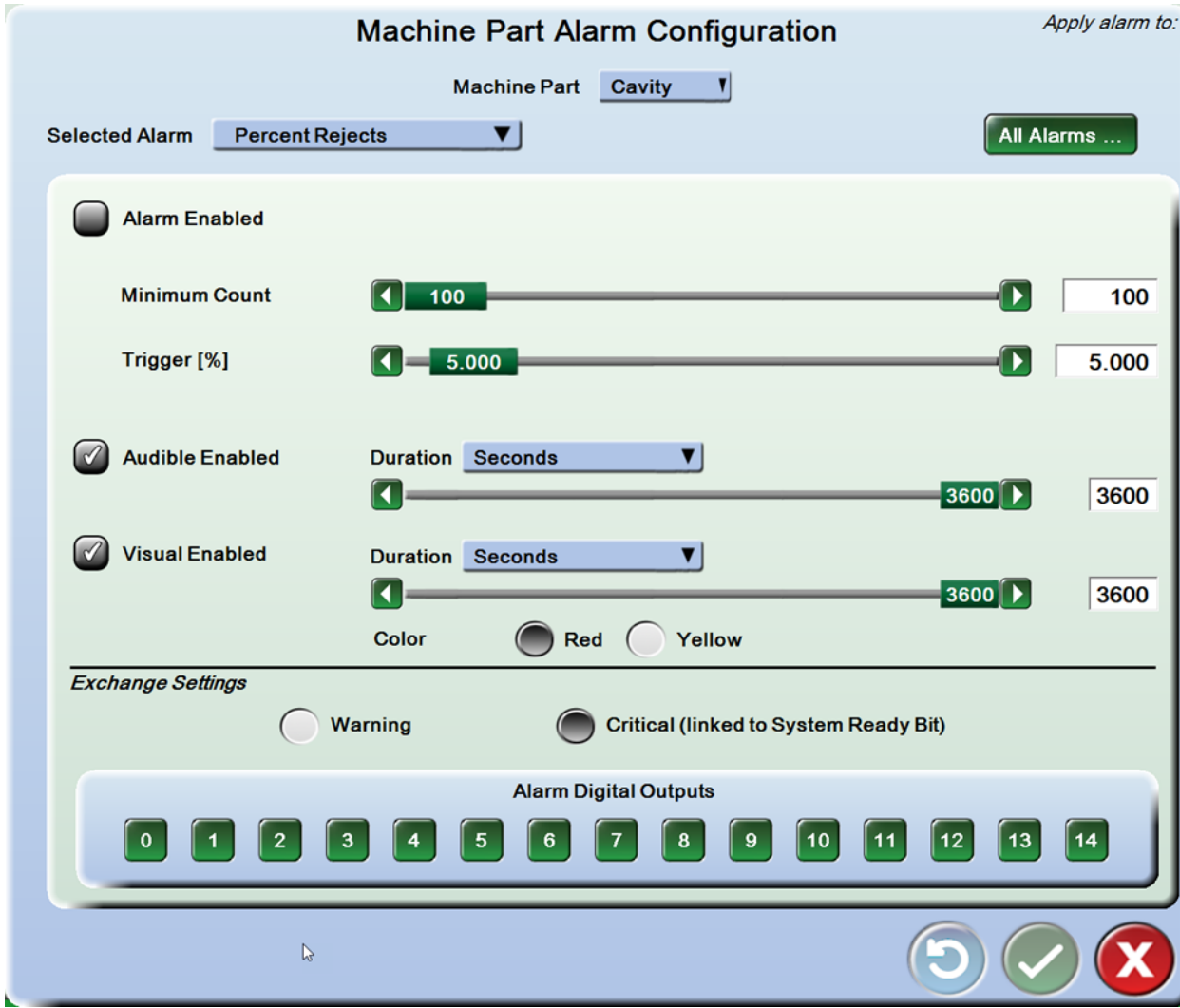
¹ If you want to connect an external monitoring device such as a PLC, an optional Extended I/O board is required for each lane.

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.



The interface is titled "Machine Part Alarm Configuration" and includes a sub-header "Apply alarm to:". Below this, there is a "Machine Part" dropdown menu set to "Cavity" and a "Selected Alarm" dropdown menu set to "Percent Rejects". A green "All Alarms ..." button is located to the right of the "Selected Alarm" menu.

The configuration area is divided into several sections:

- Alarm Enabled:** A checkbox that is currently unchecked.
- Minimum Count:** A slider control with a value of 100.
- Trigger [%]:** A slider control with a value of 5.000.
- Audible Enabled:** A checked checkbox. Below it is a "Duration" dropdown menu set to "Seconds" and a slider control with a value of 3600.
- Visual Enabled:** A checked checkbox. Below it is a "Duration" dropdown menu set to "Seconds" and a slider control with a value of 3600.
- Color:** Two radio buttons, "Red" (selected) and "Yellow".
- Exchange Settings:** Two radio buttons, "Warning" (selected) and "Critical (linked to System Ready Bit)".
- Alarm Digital Outputs:** A row of 15 numbered buttons (0-14) for selecting digital outputs.

At the bottom right of the interface are three circular buttons: a refresh button, a checkmark button, and a red "X" button.

All Alarms

All Alarms ...

All Alarms button from an alarm configuration window.

Apply the same settings to all alarms on one or all lanes and one or all sources (Sensors, Rejectors, or Machine Parts). For example, you may always want to use the same Visual Duration for all Sensor alarms. This screen applies that setting. (You still have to do it separately for each source type: Lane, Sensor, Rejector, Machine Part.)

Apply to All Alarms For:

Apply the selected settings to all alarms for:
Selected Sensors ▼

Setting Selection	Value Being Set
<input checked="" type="checkbox"/> Alarm Enabled	<input checked="" type="checkbox"/> Enabled
<input checked="" type="checkbox"/> Visual Enabled	<input checked="" type="checkbox"/> Enabled
<input checked="" type="checkbox"/> Visual Duration	<input type="range" value="45"/> 45 Seconds ▼
<input checked="" type="checkbox"/> Color	<input type="radio"/> Red <input type="radio"/> Yellow
<input checked="" type="checkbox"/> Audible Enabled	<input checked="" type="checkbox"/> Enabled
<input checked="" type="checkbox"/> Audible Duration	<input type="range" value="5"/> 5 Seconds ▼
<input checked="" type="checkbox"/> Exchange Settings	<input type="radio"/> Warning <input type="radio"/> Critical (linked to System Ready Bit)
<input checked="" type="checkbox"/> Digital Outputs	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 11 <input type="checkbox"/> 12 <input type="checkbox"/> 13 <input type="checkbox"/> 14

Encoder Rate Alarm

This alarm is raised when the encoder rate exceeds a threshold. You can also “see” the encoder rates from this alarm. This feature is available in Intellispec software versions 5.6.017, 5.7.025, 6.0.029 and later.

The Encoder Alarm is a System Error alarm. You can click on the LED of the alarm to get more details.

The screenshot displays the Intellispec software interface. At the top, there are four status indicators: Lane (red), Sensor (green), Rejector (green), and Machine Part (green). Below these, a list of system error alarms is shown for Lane 1. The 'Encoder Rate Too High' alarm is highlighted with a red LED and a hand cursor. To the right, an 'Alarm Details' panel provides information about the alarm, including the time it was cleared and raised, and the user who cleared it. A 'Show Encoder Rates' button is also visible.

System Error Alarms Lane 1

- Part Tracker Lost Communication
- Part Tracker Closed Connection
- UDP zero-length message
- Internal Error
- Extended I/O Alarm
- Encoder Rate Too High** (Clear)

Alarm Details
Encoder Rate Too High

Cleared 4/13/2020 9:42:06 AM
By System Startup

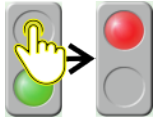
Alarm raised: 4/13/2020 10:30:04 AM

Show Encoder Rates

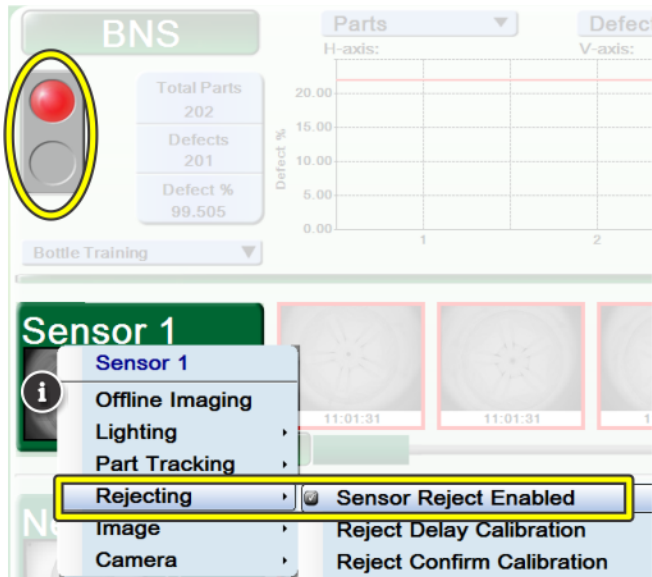
Disable or Enable the Rejector for One Sensor

Mechanic level user and higher

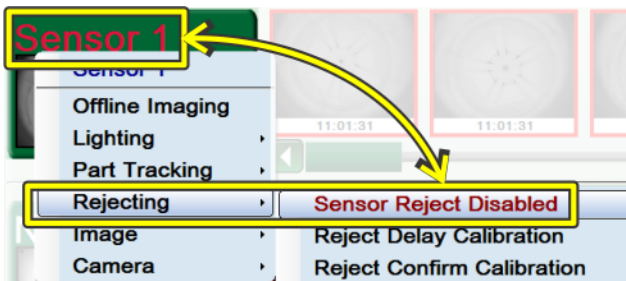
If the system is rejecting excessive parts, you can quickly disable the rejector for that camera.



1. Take the lane offline.
2. Right-click a sensor button. Select Rejecting | Sensor Reject Enabled.



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



After you have resolved the problem, be sure to Enable the rejector, using the same steps as above. Checked = enabled

Disable or Enable the Rejector for Multiple Sensors

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

 From Lane Overview or Sensor Overview mode, select Tools | Lane Setup | Rejecting | Sensor Reject Enable/Disable. Checked = enabled


Enable Rejecting for Sensor

- Neck
- Flange
- Body
- Dome
- BMID
- Color Dot

All

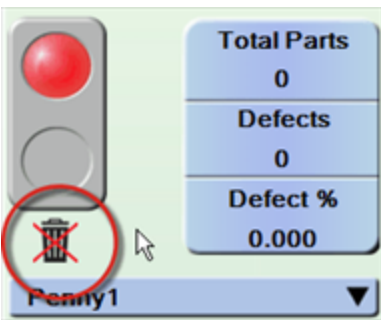
None

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



Defects	178
Defect %	19.888

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



Total Parts	0
Defects	0
Defect %	0.000

Penny1

Disable or Enable the Rejector for an Inspection

Right-click an inspection in the inspection tree. Select Settings | "Is Inspection Reject Enabled?" Make your selection.

The screenshot shows the 'Sensor 1' panel with the following data:

Not an Image	Defects
	161
	Defect %
	100.000

The 'Inspection Menu' for 'Contrast' is open, showing the following options:

- Info
- Edit Analysis
- Settings
- Rename
- Insert
- Add
- Replace

The 'Settings' option is highlighted with a yellow box. The 'Is Inspection Reject Enabled?' option is selected with a yellow box, showing the following options:

<input checked="" type="checkbox"/> Is Inspection Enabled?	Yes ✓	No
<input checked="" type="checkbox"/> Is Inspection Reject Enabled?	Yes ✓	No
<input type="checkbox"/> Is Empty Pocket Check?	Yes	No ✓
<input type="checkbox"/> Exclude from Statistics?	Yes	No ✓

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.

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).

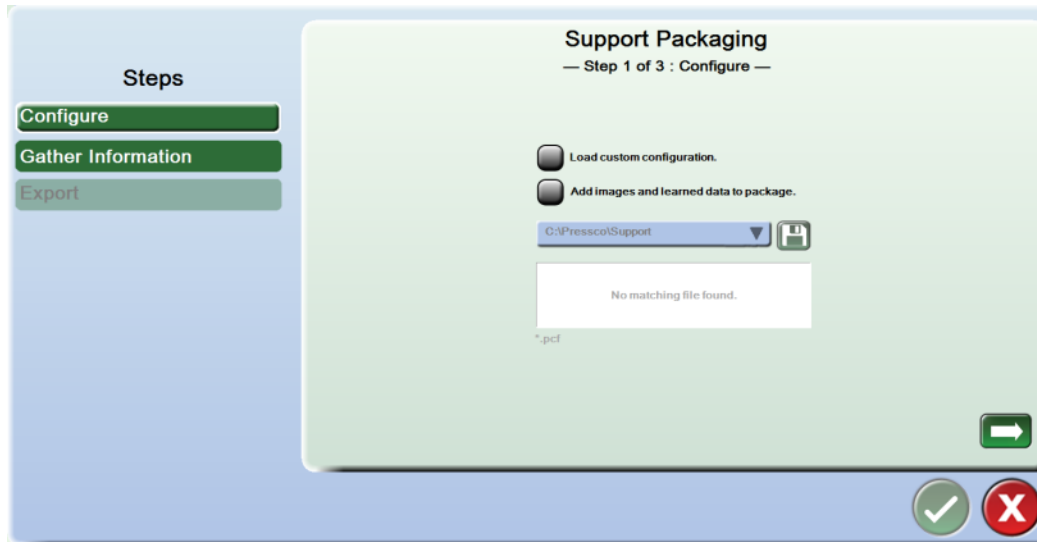
Note: On rare occasions, the Intellispec software cannot be started, so you will not be able to access the support package tool from the user interface. It is possible to create the support package without Intellispec running by starting the following executable from Windows: C:\Pressco\bin\SupportPackaging.exe.

What you need:

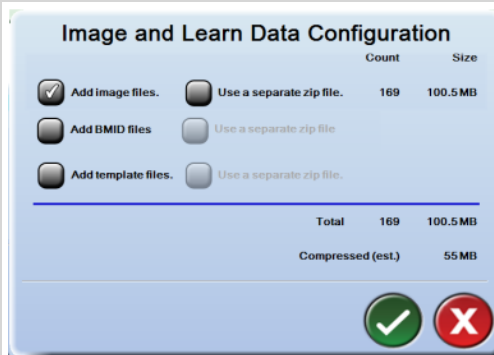
- USB flash drive (128MB or larger). Connect this to the USB port
- If you have a ".pcf" file from a Pressco Support representative (to acquire additional system information), then copy that file to the USB drive prior to connecting it to the Intellispec system
- If you want to save images to send with 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:

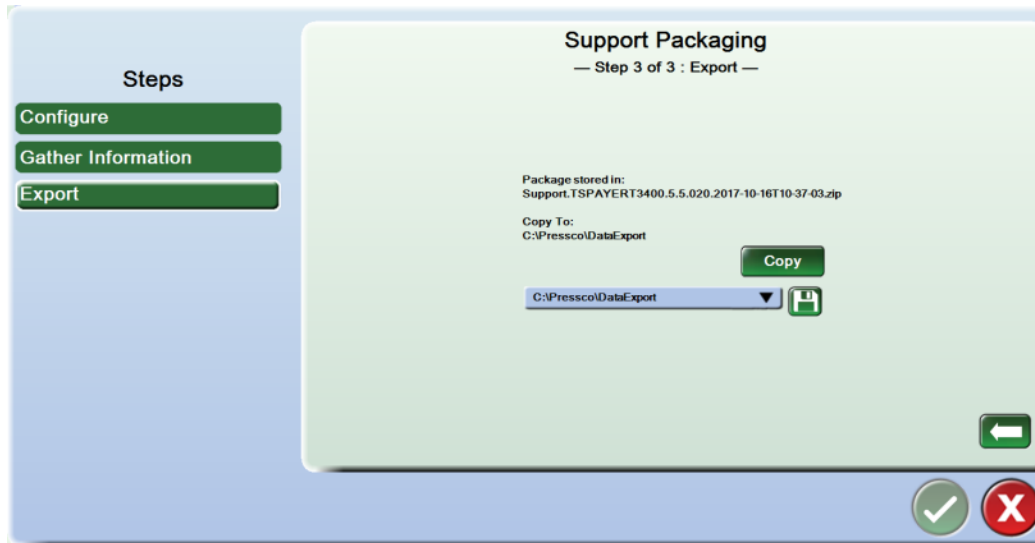
1.  Select the Backup and Restore Menu | Create Support Package. The support package wizard is displayed.
2. (optional) At Step 1: Configure: add the ".pcf" file or images.



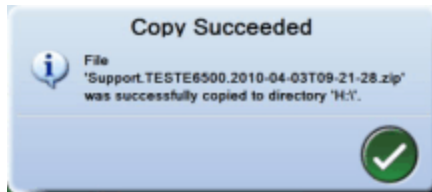
- (optional) Check the Load custom configuration box. A .pcf file is a custom Pressco configuration file that gathers information beyond the standard Support Package. If a Pressco Support representative sent you a .pcf file, then connect the USB device that contains the .pcf file. Select the disk icon and browse to the location (USB drive) where the .pcf file is stored. The system locates the .pcf file.
- (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).
- Follow the instructions on screen. Use the forward arrows to move to the next screens.
 - 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 (MKB) to enter a problem description (if backing up your current configuration)

To restore the support package:

1.  Select the Backup and Restore menu | Restore from Support Package.



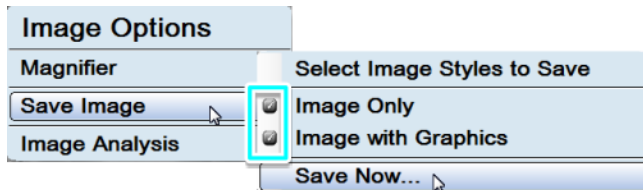
2. The system will suggest that you back up your current system. We recommend that you select the "Create Support File" button to back up the system.
3. Follow the instructions on screen, and select the location of the USB drive that contains the support package you want to restore, when prompted.
4. 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 (or 6) 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.

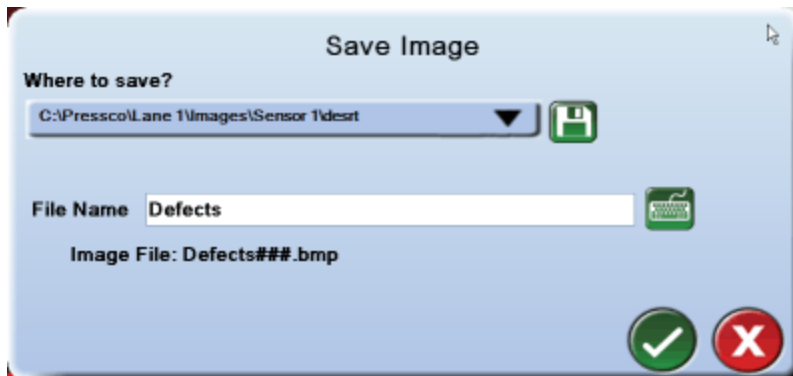


Checked = enabled. Then click Save Now...

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

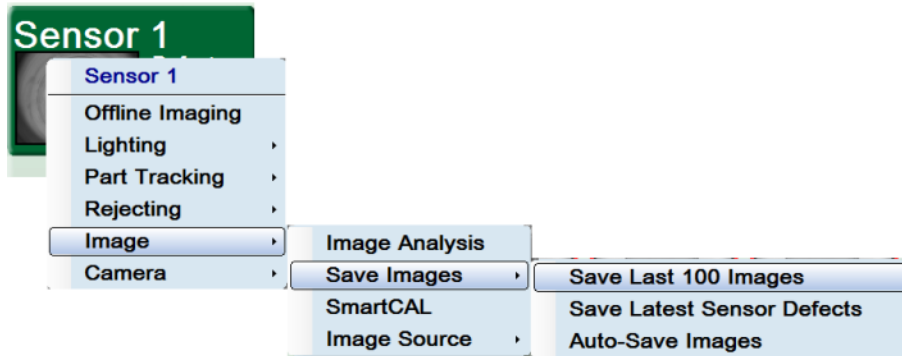
Image with Graphics - portable network graphic (.png) image with inspection graphics

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 keyboard icon to rename the image.



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.



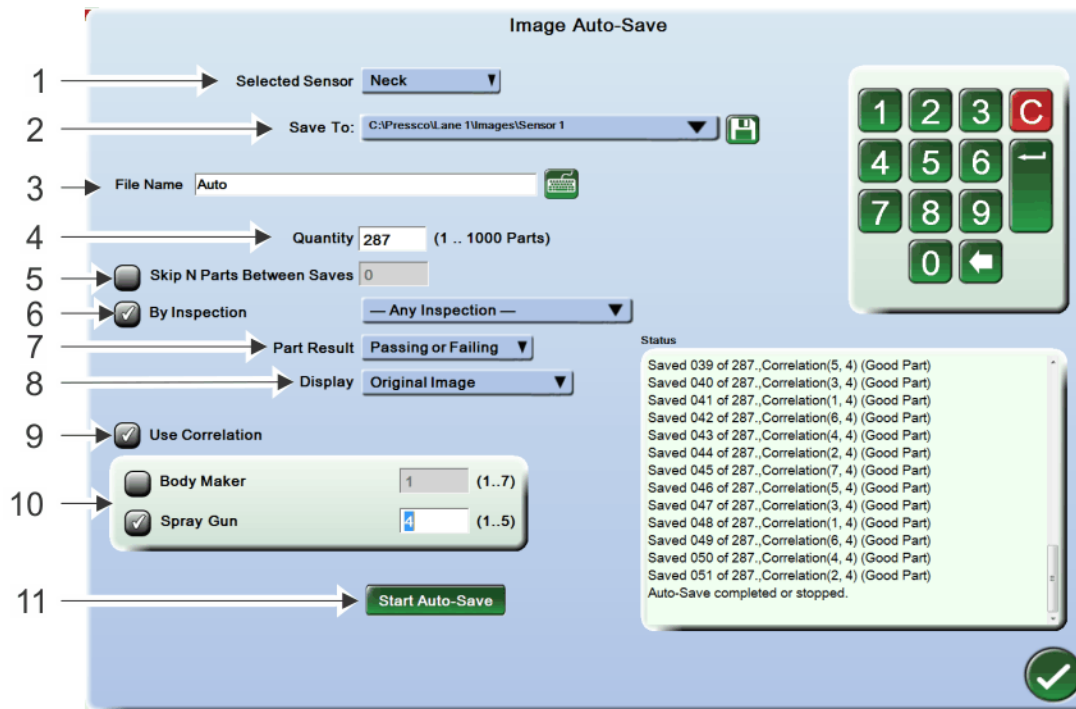
Save Last 100 Images - Save the last 100 images captured by the current sensor.

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.

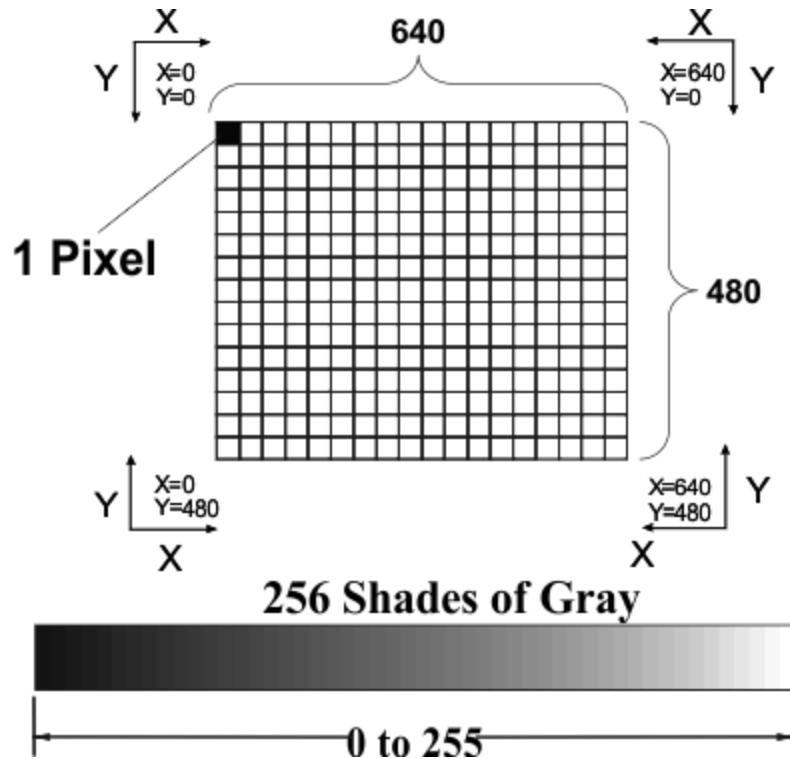
Introduction to Pressco Inspections

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



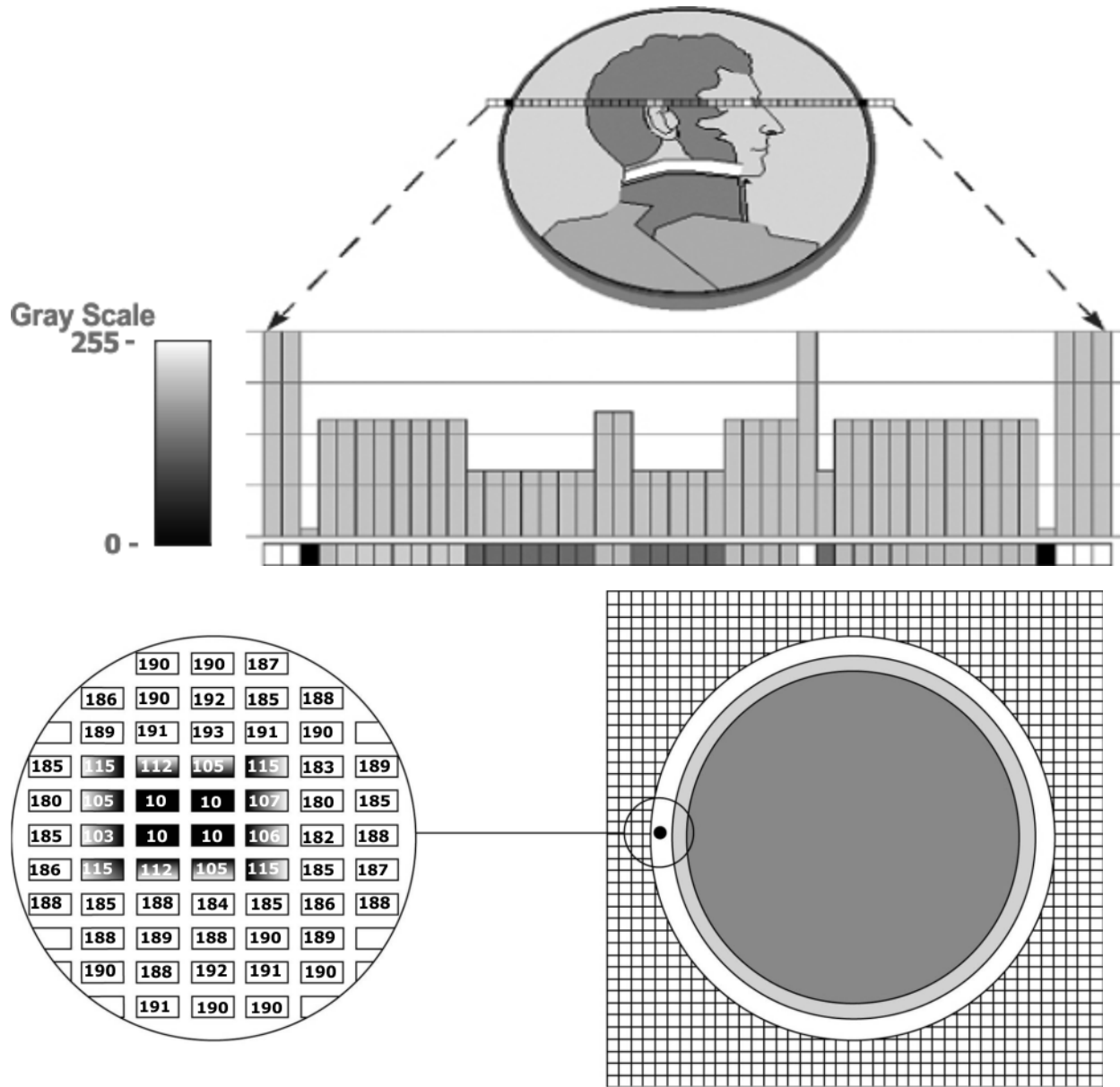
Pixel Grayscale Values

255

255	254	253	252	251	250	249	248	247	246	245	244	243	242	241	240
239	238	237	236	235	234	233	232	231	230	229	228	227	226	225	224
223	222	221	220	219	218	217	216	215	214	213	212	211	210	209	208
207	206	205	204	203	202	201	200	199	198	197	196	195	194	193	192
191	190	189	188	187	186	185	184	183	182	181	180	179	178	177	176
175	174	173	172	171	170	169	168	167	166	165	164	163	162	161	160
159	158	157	156	155	154	153	152	151	150	149	148	147	146	145	144
143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128
127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112
111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96
95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80
79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

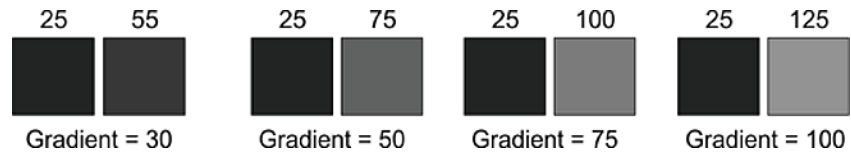
0

Examples of Grayscale

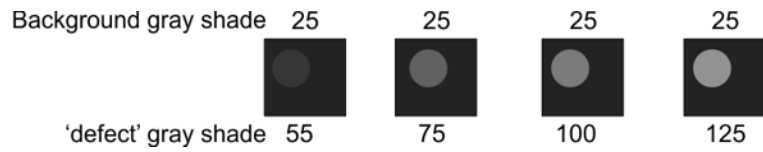


Gradient

The difference in gray shades between pixels being compared.

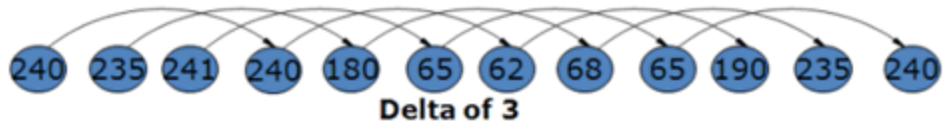
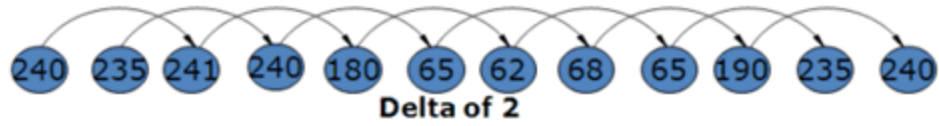


The illustration below shows the same gradient values as above, but displayed as an example 'defect.' In each case, the background is the same - 25 gray shade.



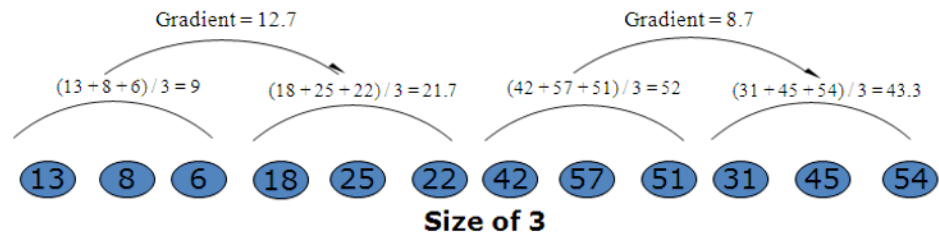
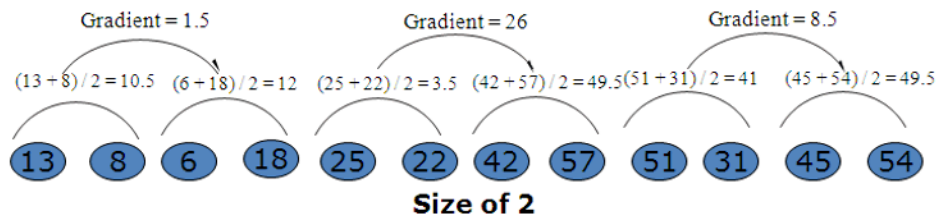
Delta

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



Size

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



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. Select the desired check box(es) and then enter the desired values.

Part Tracker Simulation

1200 Part Rate [PPM]

5000 Encoder Rate [Hz]

8192 Encoder Resolution (Pulses Per Rev)

Simulate Part Detect

Simulate Encoder

Navigation buttons: Up arrow, Down arrow, Numeric keypad.

Confirmation buttons: Green checkmark, Red X.

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.

Image Analysis for Sensor 'Body'

Measure grayscale variations across a straight line

Measure grayscale variations in a circular area

1 move

2 get more images

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:

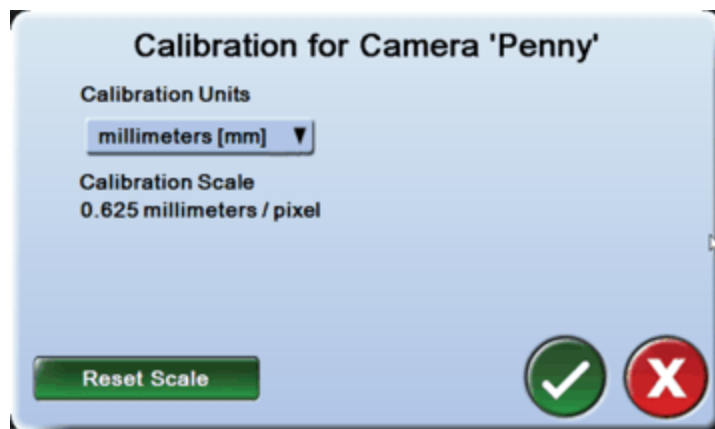
- Measurement
- Fill Height
- Fill Height - Segmented
- Neckring Registration
- Distance

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

Camera 1 J. Smith

Lane 1

Total Parts: 55271
Defects: 10228
Defect %: 18.505

H-axis: Parts V-axis: Defect %

Defect %

Part Count (x1000)

ALARM LEVEL 6.900%

Camera 1
Defects: 10228
Defect %: 18.505

Analysis Inspections

- Find Center ROI
- Find Center
- Orientation ROI

Camera Gain and Offset
Part Tracking
Offline Imaging
Image Analysis
Lighting
Basic Adjust Lighting
Advanced Adjust Lighting

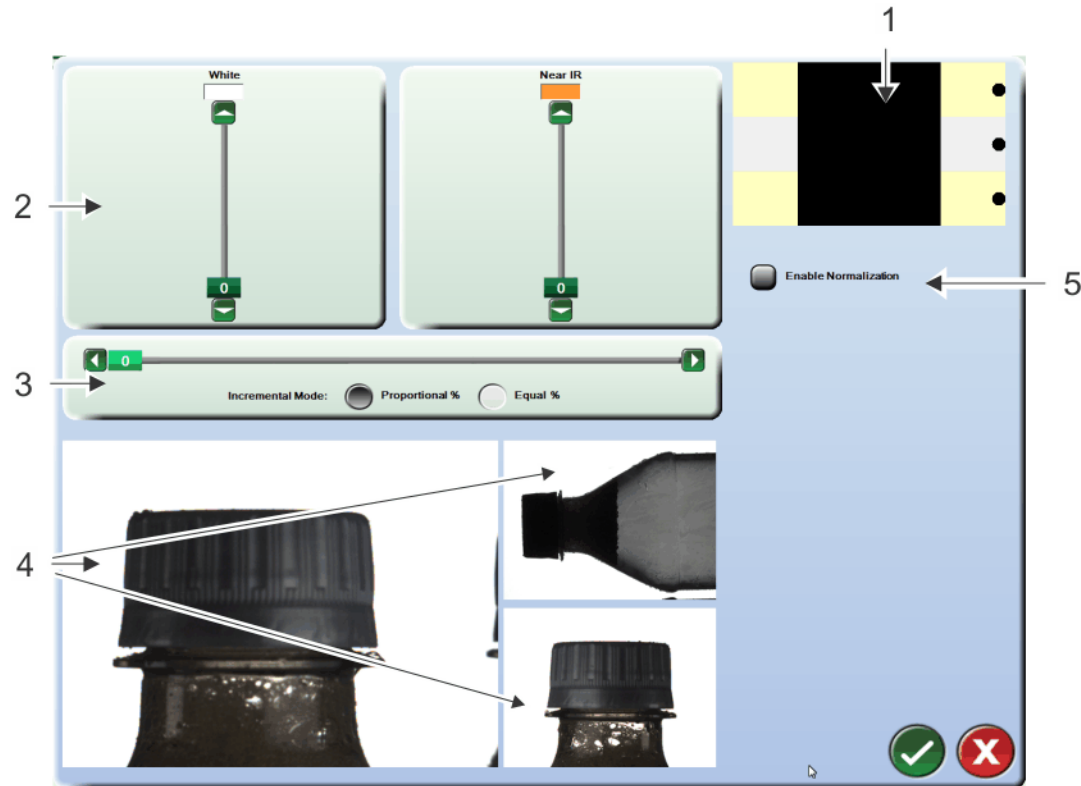
To access the lighting software:

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.

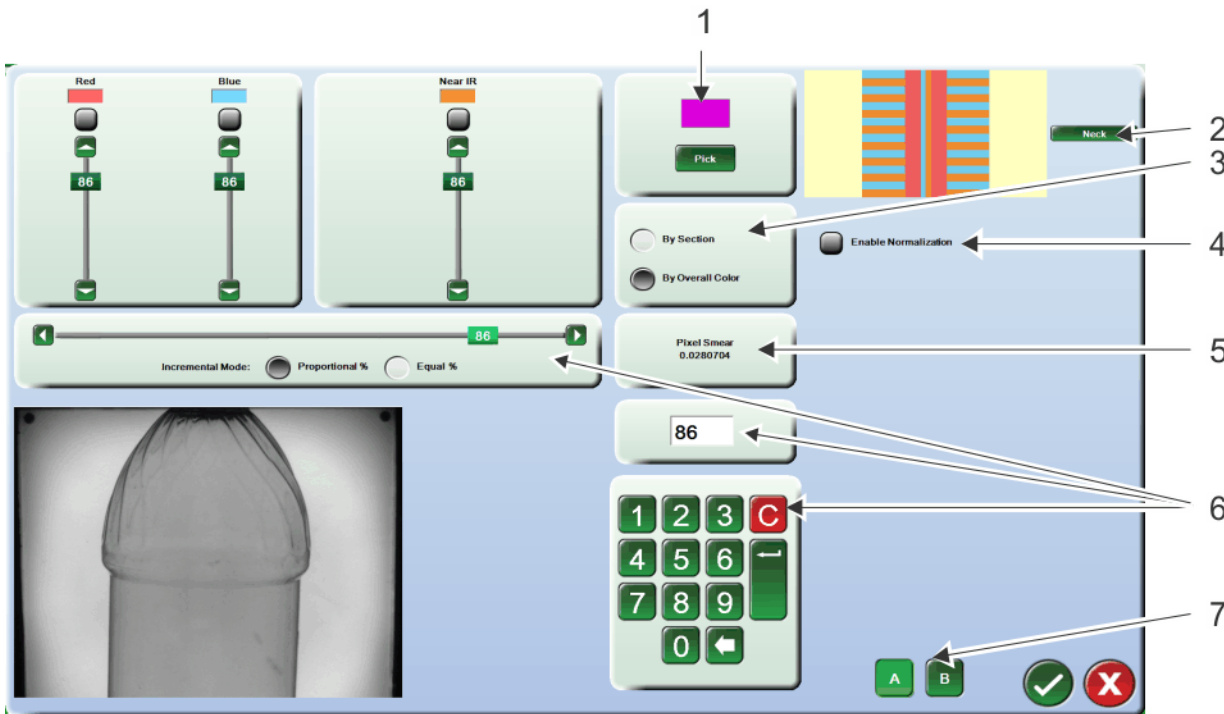


- 1) Select a zone to adjust it. You can select a single zone or multiple zones. As lighting is changed, the zone and the button next to it change color.
- 2) Separate slider bars for each color (red, green, blue, and infrared) allow individual adjustment.
- 3) Proportional % - Moving the slider bar 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.

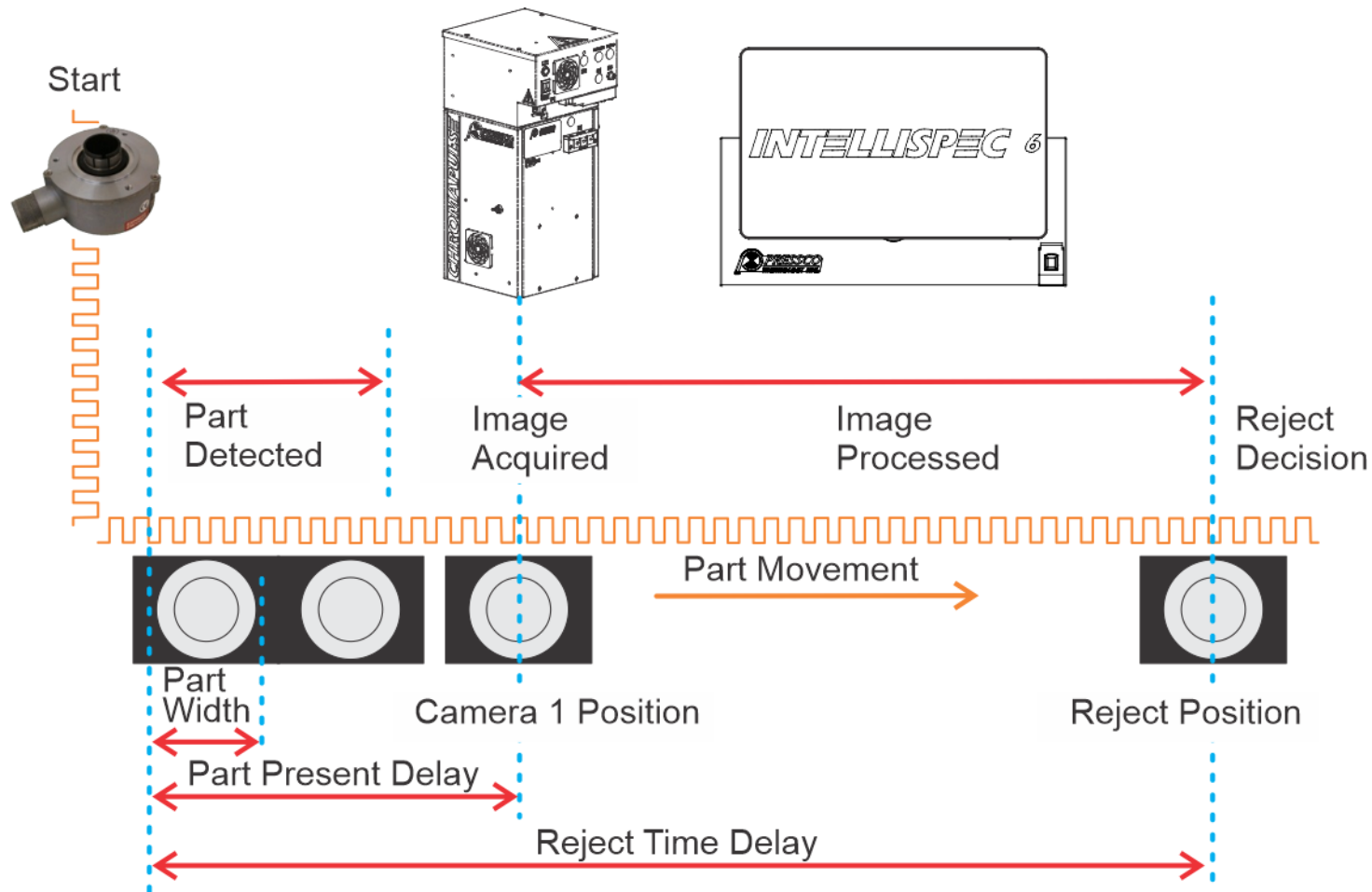
To get to this screen: Right-click over a sensor button | Lighting | Advanced Adjust Lighting.



- 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.

Sequence of Events During Inspection

This illustration shows a typical inspection sequence of events. Note that your system configuration may involve more components, and may be different than pictured here.



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



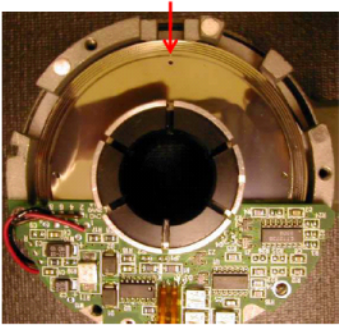
Encoder - A device used to indicate mechanical motion with a pulse rate directly proportional to line/ conveyor speed. The system tracks part movement through encoder ticks, from the moment the part is detected until it passes the reject station.

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.

Part-Width Calibration				
	In Use	New Value		
Part Width	0	72	(Encoder Ticks)	
Part-Present Disable Time	0	3	(Encoder Ticks)	

Start Calibration

Calibration Results (Part Width)

Parts	Avg.	σ	Min	Max
127	71.46	14.89	45	94

Simulation

To calibrate the Part Width:

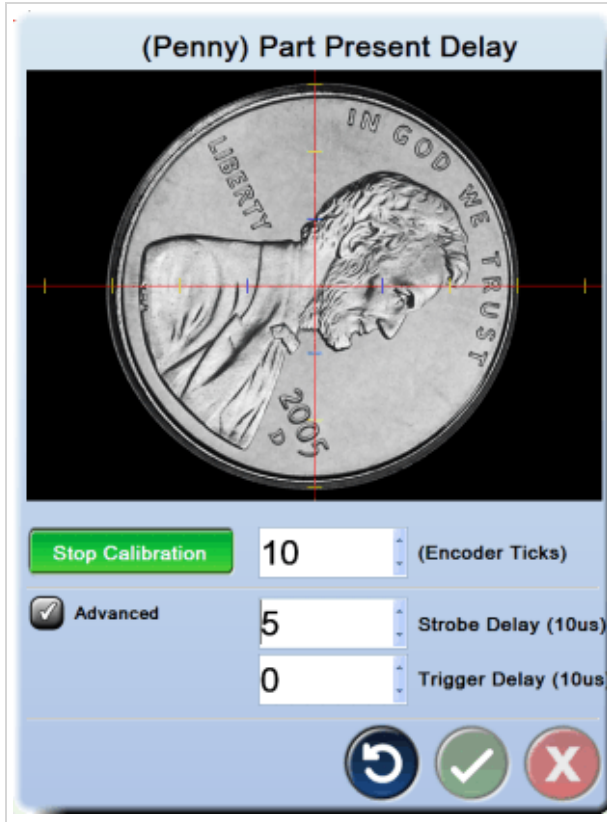
1. From Sensor Overview mode, right-click a sensor button | Part Tracking | Part Width Calibration.
2. With parts running under the camera or sensor, select Start Calibration. As each part goes by its width is displayed in Part Width field.
3. After a sufficient number of parts have gone by (we recommend 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.

Confirm changes

Do you want to apply the following changes to the system?

Part width changes from 0 to 72 encoder ticks.
Part present disable time changes from 0 to 3 encoder ticks.

Part Present Delay Calibration

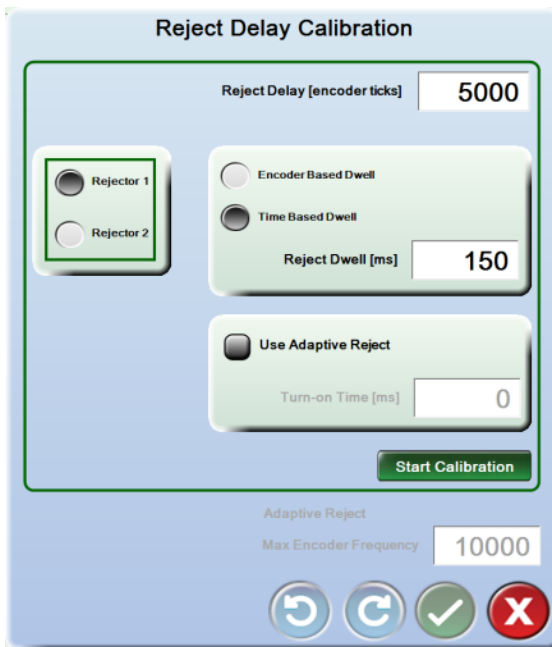


To calibrate the Part Present Delay:


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.

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.

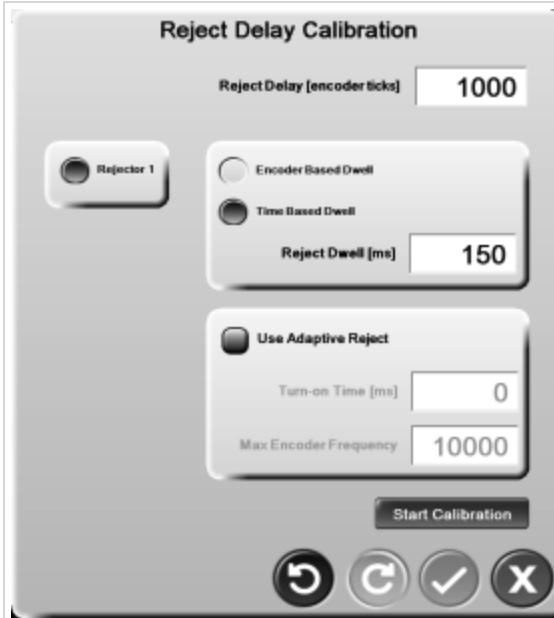


To calibrate the Reject Delay:


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.

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)

Reject Confirm Calibration

Reject Confirm Delay [ms] 56

Start Calibration

Rejector 1 Enable Confirm Time Based


Rejector 2 Enable Confirm Time Based

Gate Size 1 10 milliseconds Sensor Noise Filter 1 0 milliseconds

Gate Size 2 10 milliseconds Sensor Noise Filter 2 0 milliseconds

Jam Detection Timeout 42 ms

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.

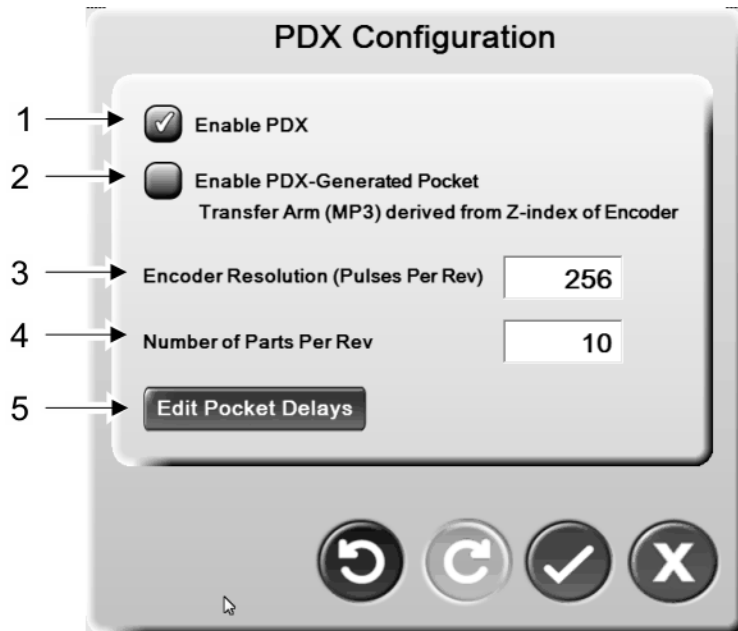
Sensor Noise Filter - The shortest pulse width (in milliseconds) that the reject confirm sensor will pass. This is used to filter out glitches or noise. This is usually set much smaller than part width, but larger than glitches or noise. The valid range is 0 to 4 milliseconds.


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.

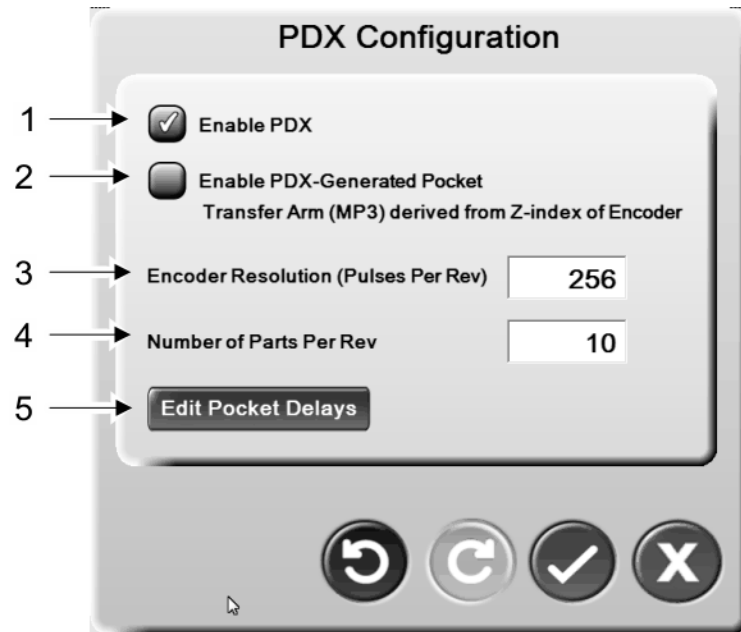
3) **Encoder Resolution (Pulses Per Rev)** - Enter the resolution of the encoder installed on your machine.

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

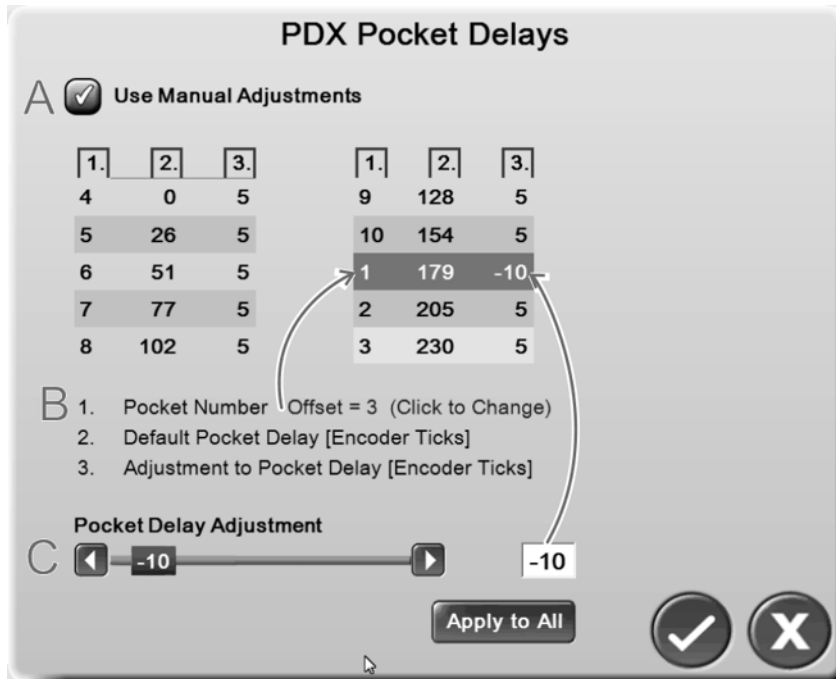
5) Edit Pocket Delays

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

Item	Description	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
Plastic surfaces	Clean with soft, clean, oil-free cloth dampened with mild soap and water solution	Daily
Part Detect Sensor and Reflector	Clean with soft, clean, oil-free cloth dampened with mild soap and water solution. Wipe dry.	Weekly
Create a Support Package	Create a snapshot of your Intellispec settings.	Monthly
Clean the Control Cabinet Filters	Rinse in clean water; use mild soap and water solution if oily.	Monthly
Acronis Backup	Create a full System Backup.	Yearly

Note: please refer to the manual for your inspection module(s) for maintenance procedures

Maintenance Cautions

When carrying out maintenance or repair work:



Disconnect master switch. For switch locations, refer to the Power Up and Power Down section.



Before starting the machine, ensure that no person is close to the machine.



If maintenance or repair requires the disconnection or removal of safety or protection systems, this operation must be supervised by authorized personnel who must ensure the prevention of personal injury or damage to the machine. All machine movements must be performed with limited speed and limited movements.



Maintenance or repair work on electrical components must be carried out exclusively by authorized, trained personnel. When running tests with power connected, you must strictly comply with the rules provided.



Personnel working on higher parts of a machine must wear a harness and hook it on to the structure and must always move with extreme caution.



Never perform lubrication or maintenance procedures on mechanical parts with the machine running.

LED Caution:



CAUTION - Possible hazardous optical radiation from LEDs. Do not stare at lamps.

Clean the Control Cabinet Filters

The filter should be cleaned once a month for best results. The filter is located on the side of the cabinet. Replace with a new filter when necessary.

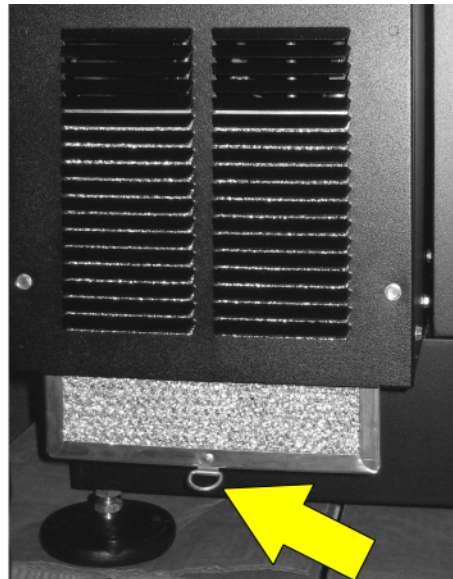
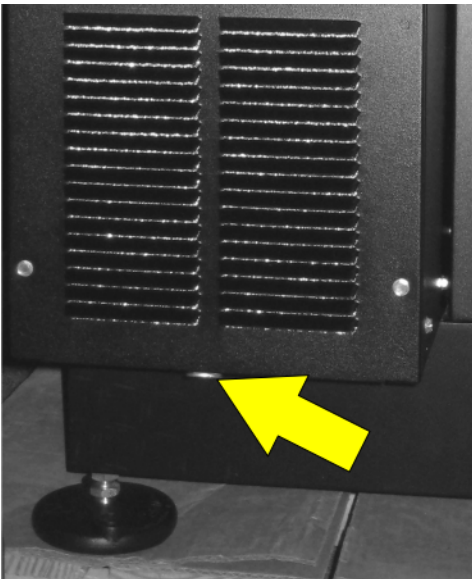
Note: You may need to clean the filters weekly depending on plant conditions

What you need:

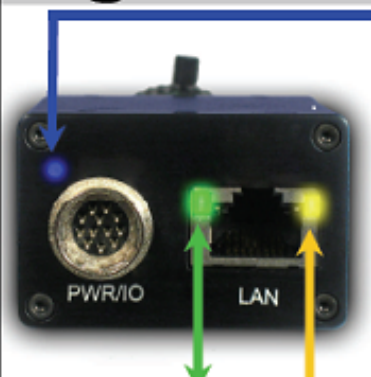
Recommended: "RP Super Filter Coat Adhesive." Find this on the Internet or in a hardware store near you.

To clean the filter:

1. Pull the ring on the bottom of the filter cover, and pull the filter down to remove it. (see photo below)
2. Remove the filter and clean it. DO NOT use caustic solutions.
 - If the filter contains dry dust and dirt, flush the filter with warm water from the exhaust side to the intake side
 - If the filter contains oily dust and dirt, clean it in soapy water, then rinse in clear water
3. Dry the filter completely [placing it with a corner down will assure complete drainage].
4. Recoat the filter with "RP Super Filter Coat Adhesive." Spray both sides for best results.
5. Place the filter back inside the filter cover.



Digital Camera LED Status



STATUS LED

- Solid IP Address Assigned
- Slow Waiting for an IP Address
- Fast Ethernet Cable Disconnected
- Solid Application Linked to the Camera
- Slow Trigger Acquisition in Progress
- Fast Acquisition in Progress
- Slow Camera Initialization Problem
- Fast Camera Overheating

LED Status	Definition	
LED OFF	No power / No trigger pulse	
GREEN	Steady*	Application connected
	Slow Flashing	Triggered acquisition in progress
	Fast Flashing	Free running acquisition in progress
BLUE	Steady	IP assigned but no application connected
	Slow Flashing	Waiting for an IP Address
	Fast Flashing	Ethernet cable disconnected
RED	Steady	Camera not initialized
	Slow Flashing	Camera initialization problem
	Fast Flashing	Camera is too HOT

Link LED

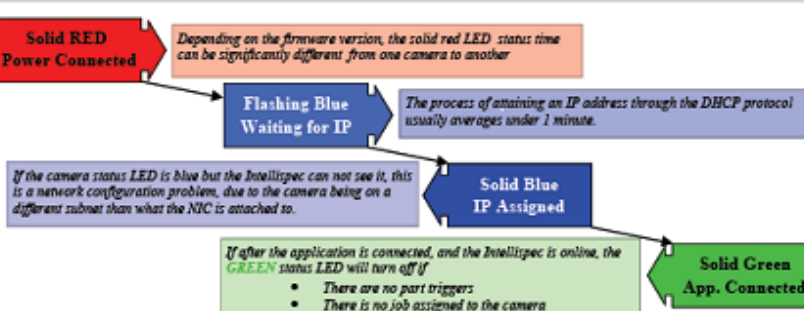
Orange	1 Gb
Green	100Mb

*NOTE: Always be Orange when connected to an IntelliSpec

Traffic LED

Yellow	Traffic
--------	---------

Normal Camera Connection LED Progression



Solid RED Power Connected → *Depending on the firmware version, the solid red LED status time can be significantly different from one camera to another*


→ **Flashing Blue Waiting for IP** → *The process of attaining an IP address through the DHCP protocol usually averages under 1 minute.*

→ **Solid Blue IP Assigned** → *If the camera status LED is blue but the IntelliSpec can not see it, this is a network configuration problem, due to the camera being on a different subnet than what the NIC is attached to.*

→ **Solid Green App. Connected** → *If after the application is connected, and the IntelliSpec is online, the GREEN status LED will turn off if*

- There are no part triggers
- There is no job assigned to the camera

Normal On-Line Camera LED Status



Status LED Flashing Green when acquiring images

Link LED Solid Orange

Traffic LED Flashing Yellow

*NOTE: Depending on amount of traffic, the LED can be flashing or steady. It may appear to be solid yellow.

*NOTE: If a camera is connected while the application is running the status LED may turn green but it might not acquire images. To avoid this, always power down the IntelliSpec when connecting a camera.


Help - Remote Support

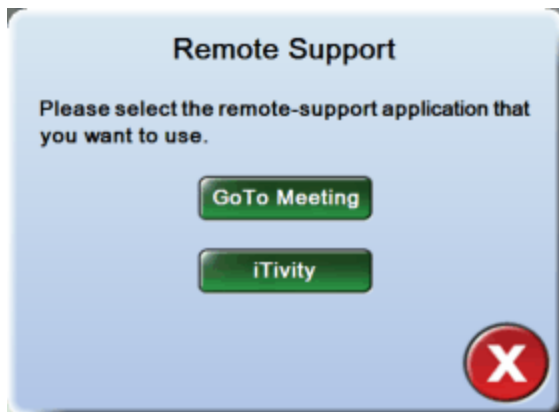
Remote Support allows remote access to the Intellispec software. iTivity software is used by Pressco to provide remote system support if a Maintenance Agreement is purchased for that Intellispec system.

You will need:

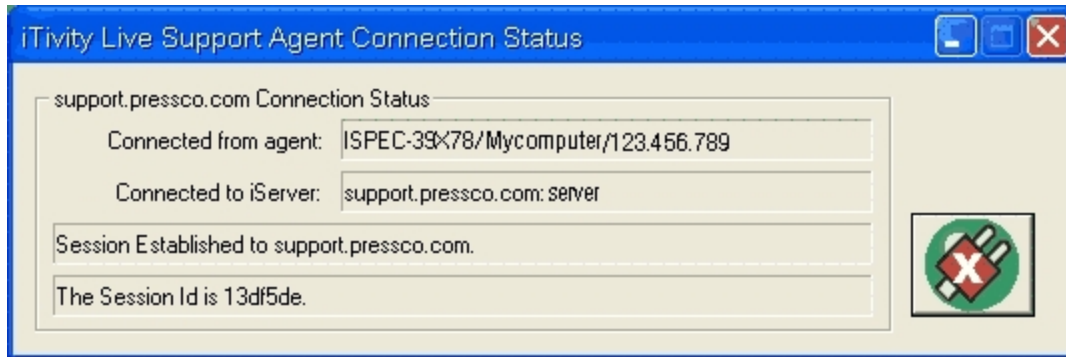
- A functioning Intellispec (systems without power, or systems that are not capable of running Intellispec software, cannot be remotely accessed)
- An internet connection to your Intellispec. This can be established through your network, and is usually set up during installation. You may use DSL, Cable,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

To use Remote Support:

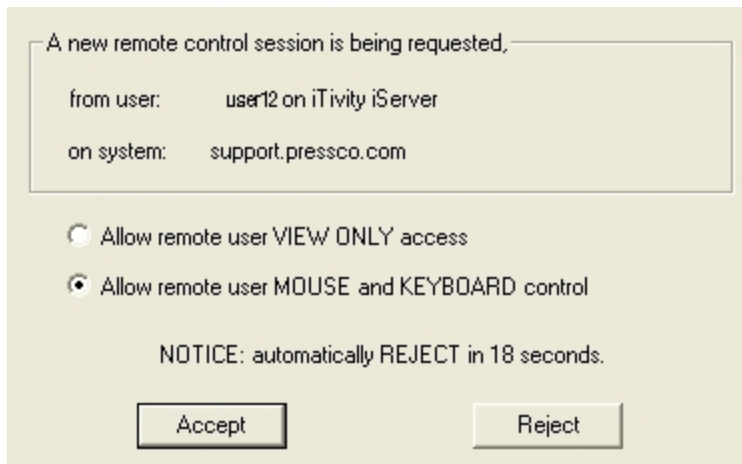
1. Notify a Technical Support representative that you require remote support. You will need to identify yourself, your location, and the Intellispec to which he should connect.
2.  In the Intellispec software, Select Help | Remote Support.



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.



support.pressco.com Connection Status



Agent disconnected:	ISPEC-39X78/Mycomputer/123.456.789
Disconnected from iServer:	support.pressco.com: server
Not Connected.	
The Session Id is 1ab1b77.	

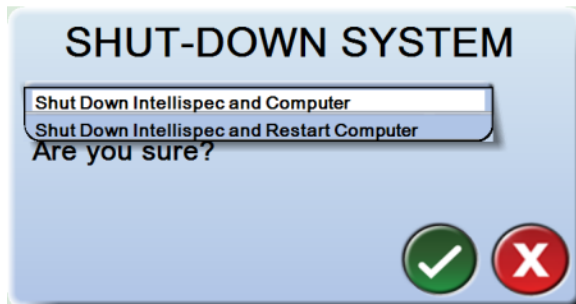
A green circular icon with a white network cable symbol inside, identical to the one on the left, but with a mouse cursor pointing at it from the top right.

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.

Note: 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).

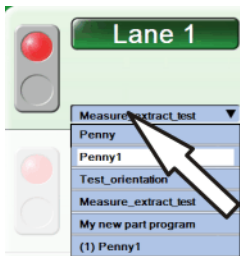
Note: Some menu items are available to advanced users only

What you need:

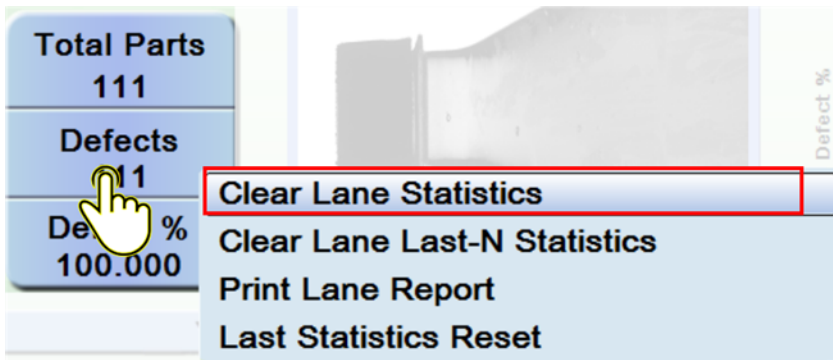
User permission to Switch Part Program

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. Click the statistics panel and select Clear Lane Statistics, to begin counting statistics for the new production run.



5. 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.

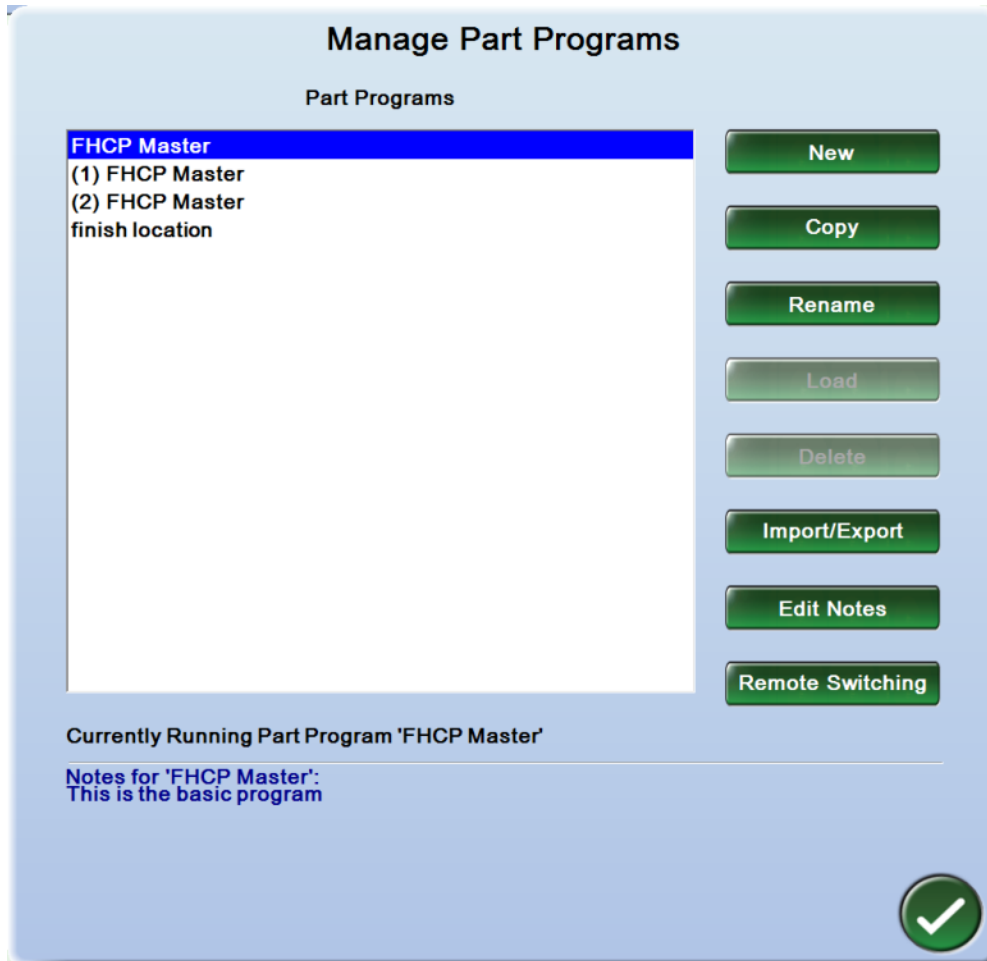
Manage Part Programs

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](#)

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 or Copy a Part Program

You will need:

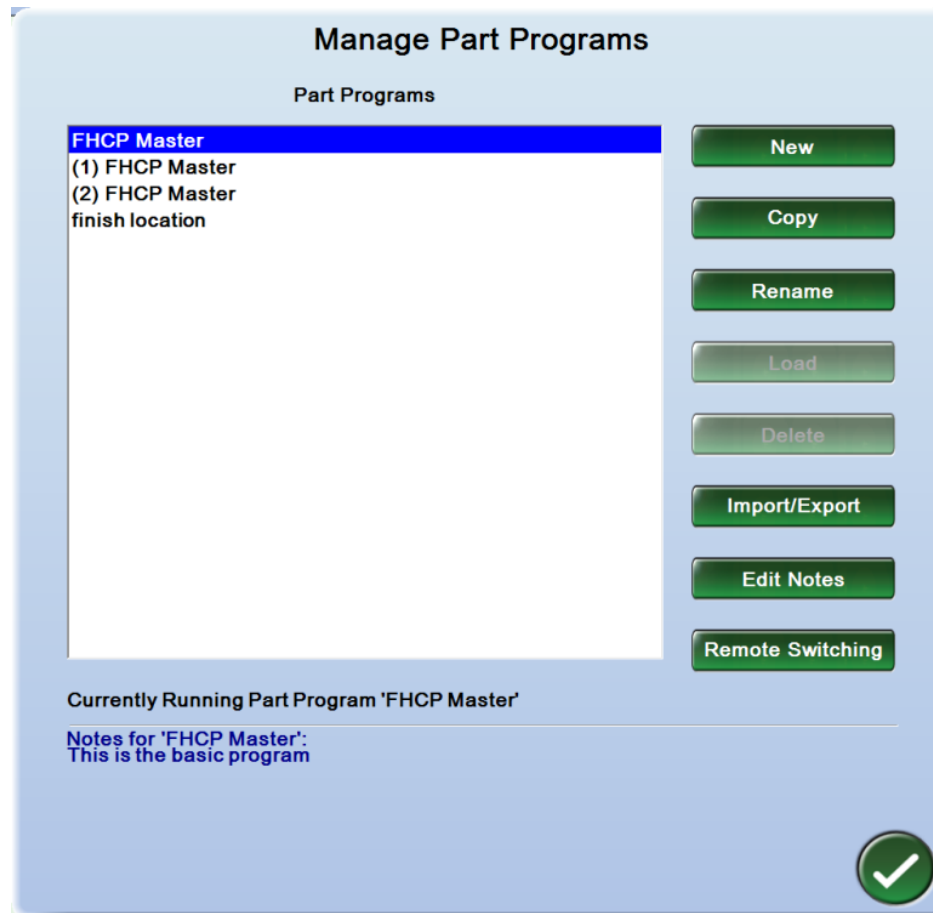
System permissions to create part programs

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 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.

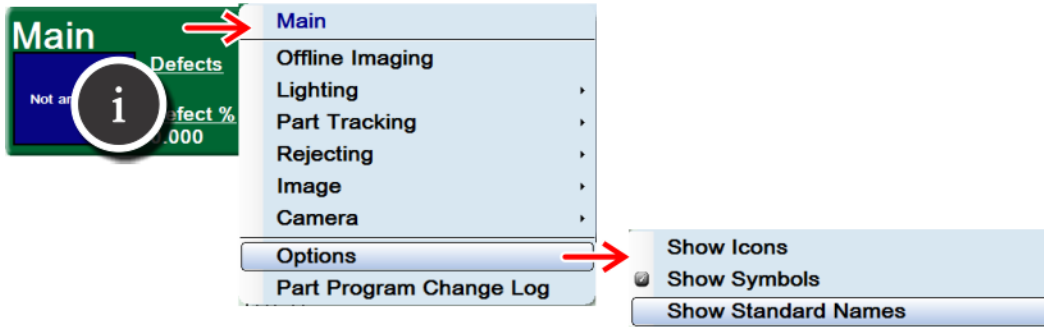
Reject - A part that failed one or more inspections from any sensor. The part can be physically rejected, or simply counted in the statistics.

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.

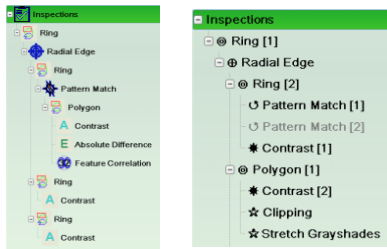
Sensor - A camera, Intellimass, or other sensor that acquires images, measurements, or other data from your product.

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

Icon	Symbol	General Inspection Type
		Enhancement - to add image processing to make defects or part features stand out better
		Intellispec Mass inspection

Show Standard Names

Displays the default Intellispec inspection names. You may use other inspection names that make sense for your part (example: upper wall).

Showing Standard Names is useful to Pressco engineers or to someone troubleshooting your machine, so that they quickly know the exact inspection type.

The Standard Names are used in the Pressco manuals.

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.

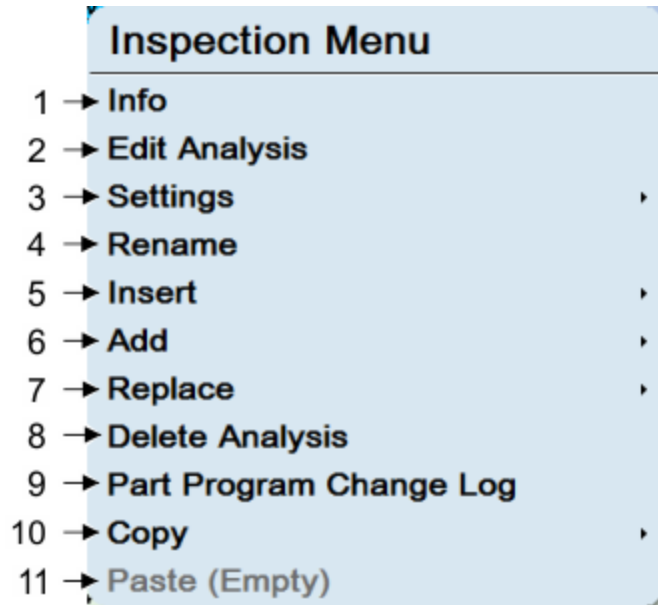


See also ["Icon or Symbol Options \(Sensor Menu\)"](#) on page 127

Inspection menu

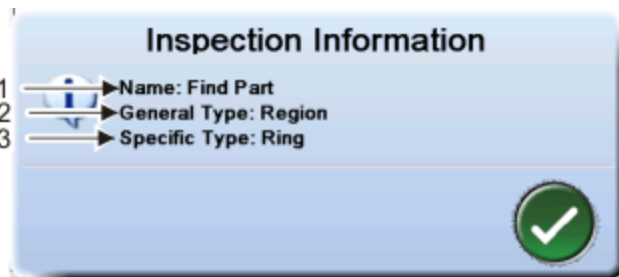
Create and edit part programs through the inspection menu. To see this menu, right-click over any inspection name.

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

Neckring Registration		
<input checked="" type="checkbox"/>	Is Inspection Enabled?	Yes ✓ No
<input checked="" type="checkbox"/>	Is Inspection Reject Enabled?	Yes ✓ No
<input type="checkbox"/>	Is Empty Pocket Check?	Yes No ✓
<input type="checkbox"/>	Exclude from Statistics?	Yes No ✓

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.

Note: if you enable Empty Pocket Check, then Inspection Reject is automatically disabled. The system provides a warning that the rejector is being disabled.

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**. This lists the inspections and the edit history for each.

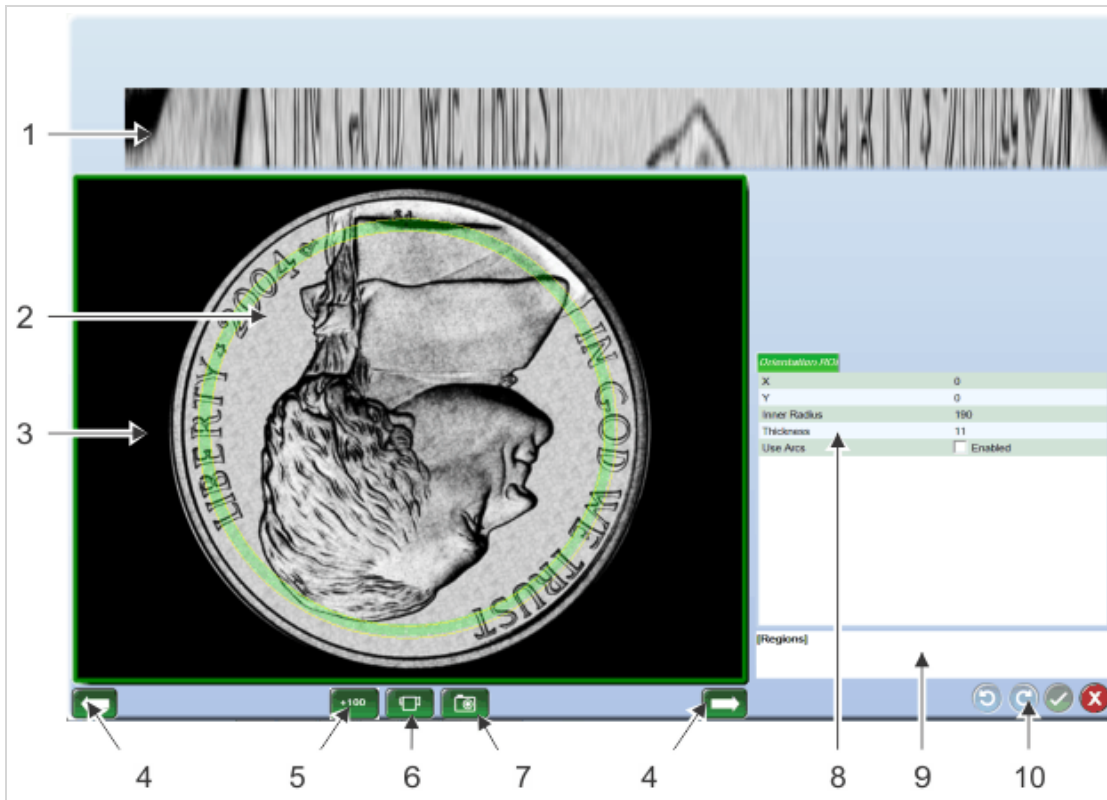
10 - Copy the selected inspection

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

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.

The screenshot displays the RETRO-SPEC software interface for a 'Liberty Date Inspection'. At the top, a 'RETRO-SPEC Population View' graph shows 'Contrast [gray shades]' on the y-axis (0.00 to 140.00) and 'Last 100 Parts' on the x-axis. The graph features green bars representing individual parts, with a red horizontal line at approximately 130.00. A blue vertical line marks a specific part. To the right, a 'Latest Defects' graph shows red bars. Below the graphs is a large image of a coin with the text 'LIBERTY • 2004'. A green rectangular region of interest (ROI) is overlaid on the coin. A smaller, magnified view of the ROI is shown in a window on the left, with a green border. The interface includes a settings panel on the right with the following parameters:

Parameter	Value
Contrast Limits	129.44
Size Filter	9.0@ - 512.0@
Acceptable Size	0.0@
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Segment Settings	

Below the settings panel, a status box indicates 'Liberty Date Inspection PASSED' and 'Total Size: 0.0@ (0.0@)'. A descriptive text box states: '[Contrast L / ats] Determines how strong a gray shade variation has to be before it is a candidate for a defect (feature)'. At the bottom, a toolbar contains icons for navigation and control, with numbered callouts 1 through 9 pointing to specific elements: 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.

- 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.

Parameter	Value
Search Vector Count	105
Search Direction	<input checked="" type="checkbox"/> Flipped
Radial Tolerance	4
Show Edges	<input checked="" type="checkbox"/> Enabled
Qualifying Percent Limits	46.88 .. 68.68

- 1) Inspection tabs
- 2) Adjust numeric values
- 3) Check box to enable or disable the feature
- 4) Backwards R
- 5) Column division

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).

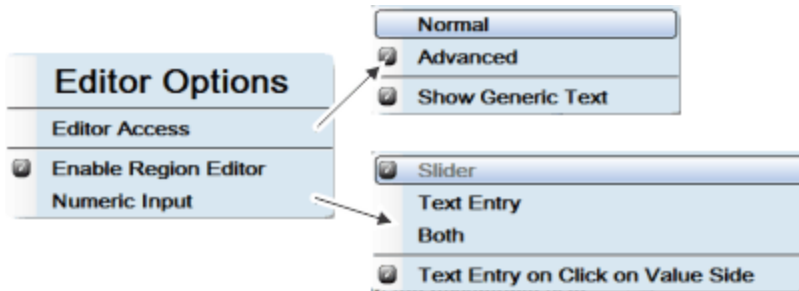
Numeric Text Entry - Type in a specific number. You can use the +1 and -1 feature to make minor adjustments.

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](#)

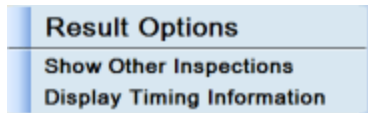
Text Entry = Numeric Text Entry

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

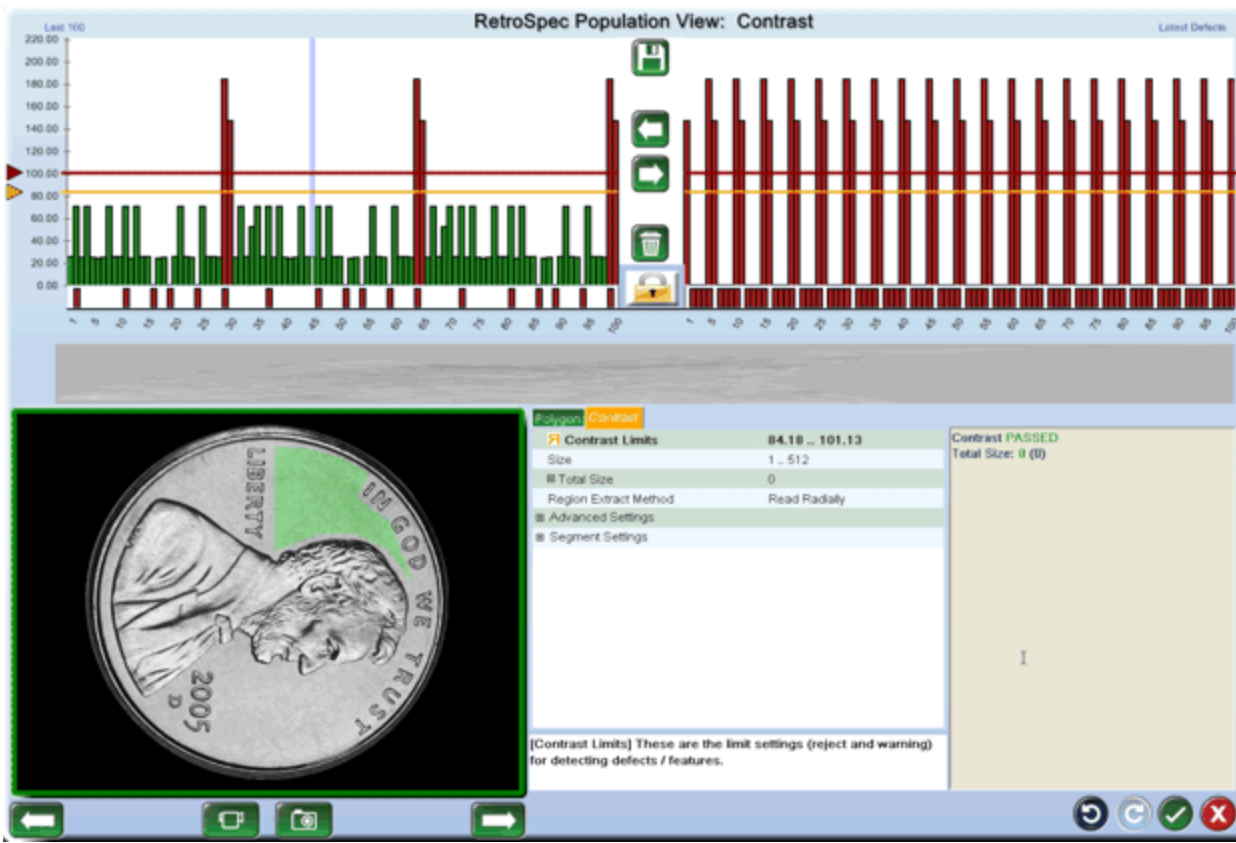
There is additional information for the Results Box. Right-click to see the menu. Checked = enabled



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.

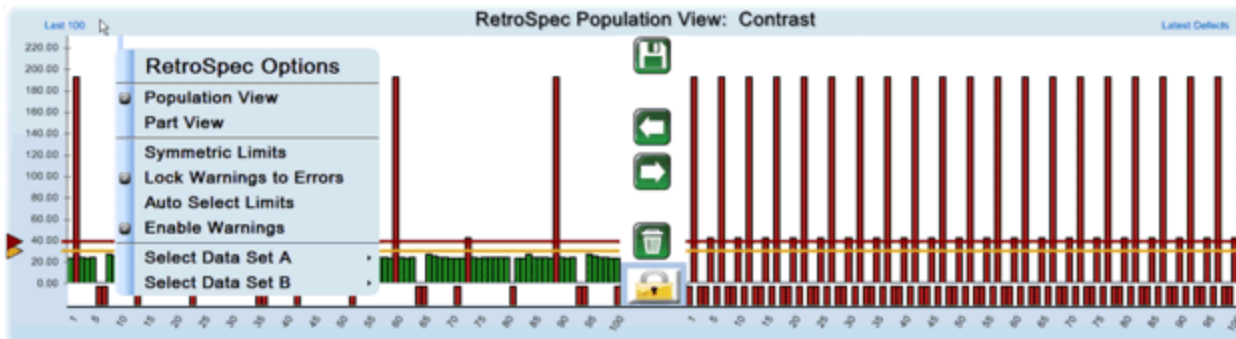
Display Timing Information - Displays timing information for each inspection on the current sensor and the total time in milliseconds.

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 142.

Retro-Spec Population View

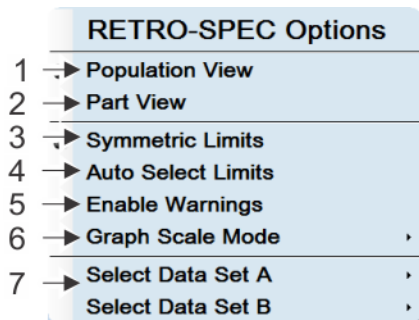


- Each peak is a different part. Red peaks are failed parts, green peaks are passed parts.
- The left side of the graph displays up to the last 100 parts that were inspected
- The right side of the graph displays up to the last 100 rejected parts
- Click on any peak to display the Part View for that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



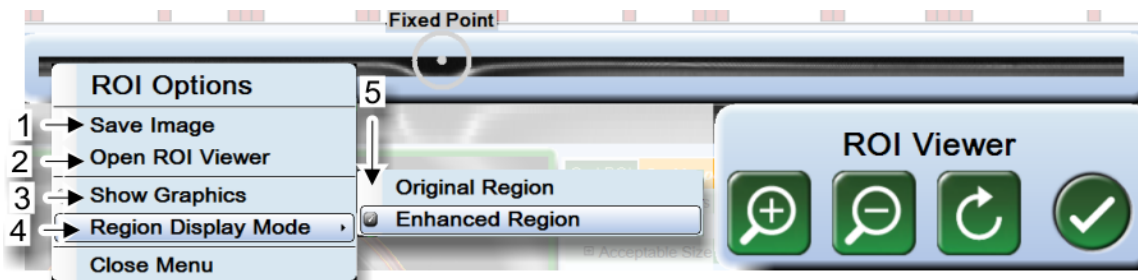
- The Part View displays a single part view. Each peak shows the contrast as the inspection moves from 0° (at left), to 360° (at right).
- Green peaks are acceptable; red peaks are where the contrast has exceeded limits.
- The height or amplitude of each peak reflects the amount of contrast (how dark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

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.

Part Program Change Log

Inspection: Undefined Show Other Inspections
 Part Program: Measurement_test Show Other Part Programs
 Sensor: Undefined Show Other Sensors

Roll Back
Difference
Details
Filter

Type	Time Stamp	User	Camera/Sensor	Inspection	Parameter	Before	After
Create	2011-02-15 16:13:57	Administrator	Nickel	Ring			
Create	2011-02-15 16:12:18	Administrator	Nickel	Ring	Inner Radius	25	189
Edit	2011-02-15 16:12:48	Administrator	Nickel	Ring	Thickness	50	50
Create	2011-02-15 16:12:57	Administrator	Nickel	Radial Edge	Target Size	100	230
Edit	2011-02-15 16:13:36	Administrator	Nickel	Radial Edge	Qualifying Percent Limits	E:25.0 W:50.0 G	E:32.71 W:47.31 G
Create	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Feature Type	Light Feature	Borders: Both Light
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Inner Diameter Enabled	No	Yes
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Enabled	No	Yes
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Units	pixel	Custom unit
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Nominal Value	53.0	26.5
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Min/Max	E:-50.0 W:W-10.0 G:3055.0 G:0.0 W:W:0.0 E:-25.0 W:W:-25.17 G:(E:5) G:0.0 W:W:0.77 E	
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Average	E:-50.0 W:W-10.0 G:3055.0 G:0.0 W:W:0.0 E:-28.5 W:W:-28.5 G:(E:5) G:0.0 W:W:0.0 E	
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Continuity	E:-20.0 W:W-10.0 G:18.0 W:W:0.0 E:-40.76 W:W:-8.65 G:3.83 W:W:4.82 E	
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Range	G:53.0 E	G:11.85 E
Create	2011-03-01 18:03:37	Administrator	Nickel	Clipping	Use Clipping	No	Yes
Edit	2011-03-01 18:05:17	Administrator	Nickel	Clipping	Use Clipping	No	Yes
Create	2011-03-01 18:05:08	Administrator	Nickel	Stretch Grayshades			

To view the part change log:



- Go to Sensor Overview mode.
- 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.
- 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.

Type	Time Stamp	User	Part Program	Inspection
Create	2010-09-20 08:26:29	Tricia	Penny1	

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.

Module 9 Inside of Can Inspections - Introduction

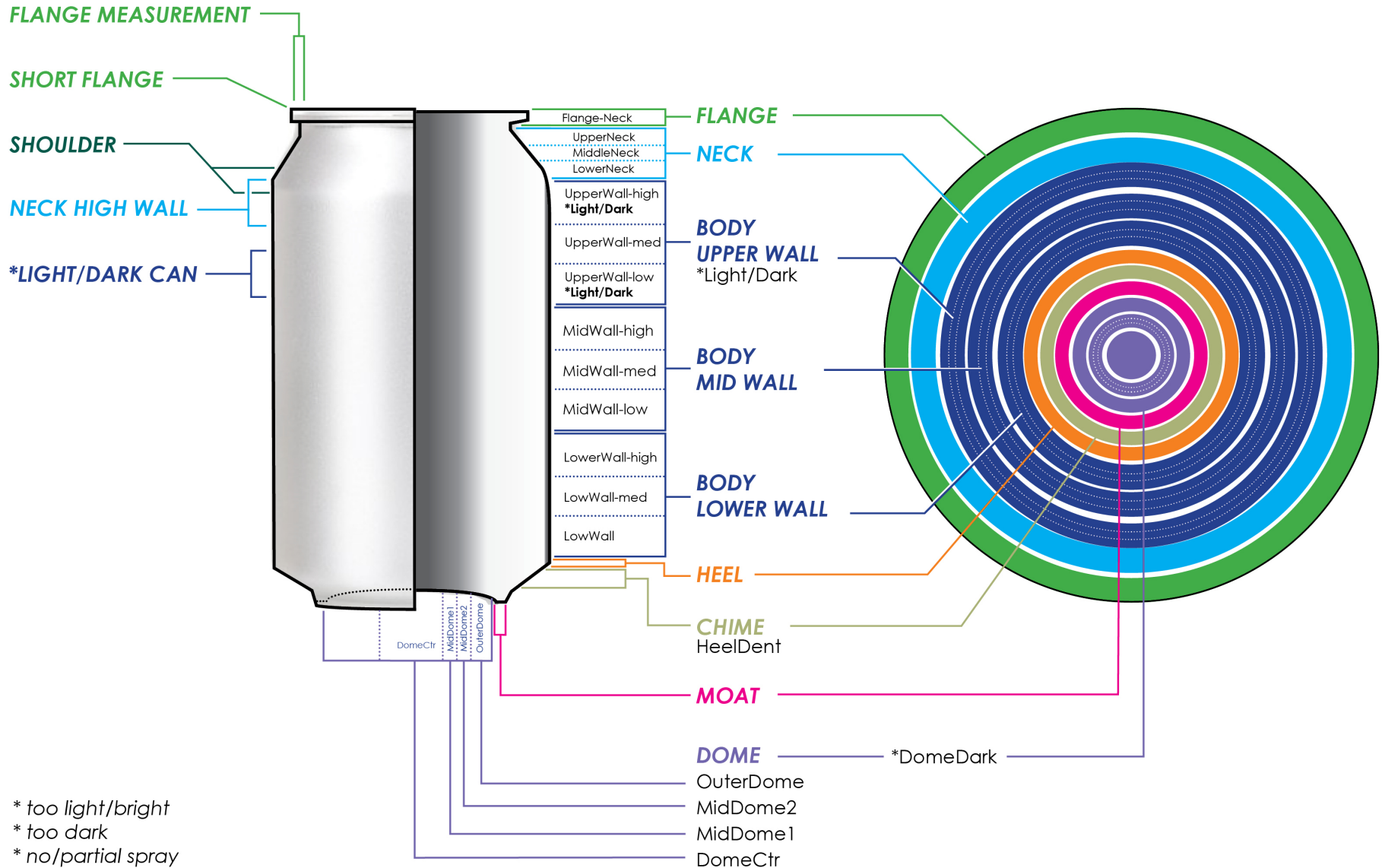
The next sections describe how to set up the standard set of inspections for aluminum beverage cans on the Intellispec system. The size, placement, and typical sensitivity settings are shown for each region of the can.

There are sections for each view of the can - the Neck, Flange, and Body.

Note: The inspections and parameters shown in this guide are sized for a 12 ounce x 202 can. Inspection regions can be scaled up or down to accommodate a wide variety of can sizes. The inspections outlined here are intended to provide complete coverage of the critical can areas and a typical level of defect detection. Your specific application may require some modifications to obtain the level of defect detection you require.

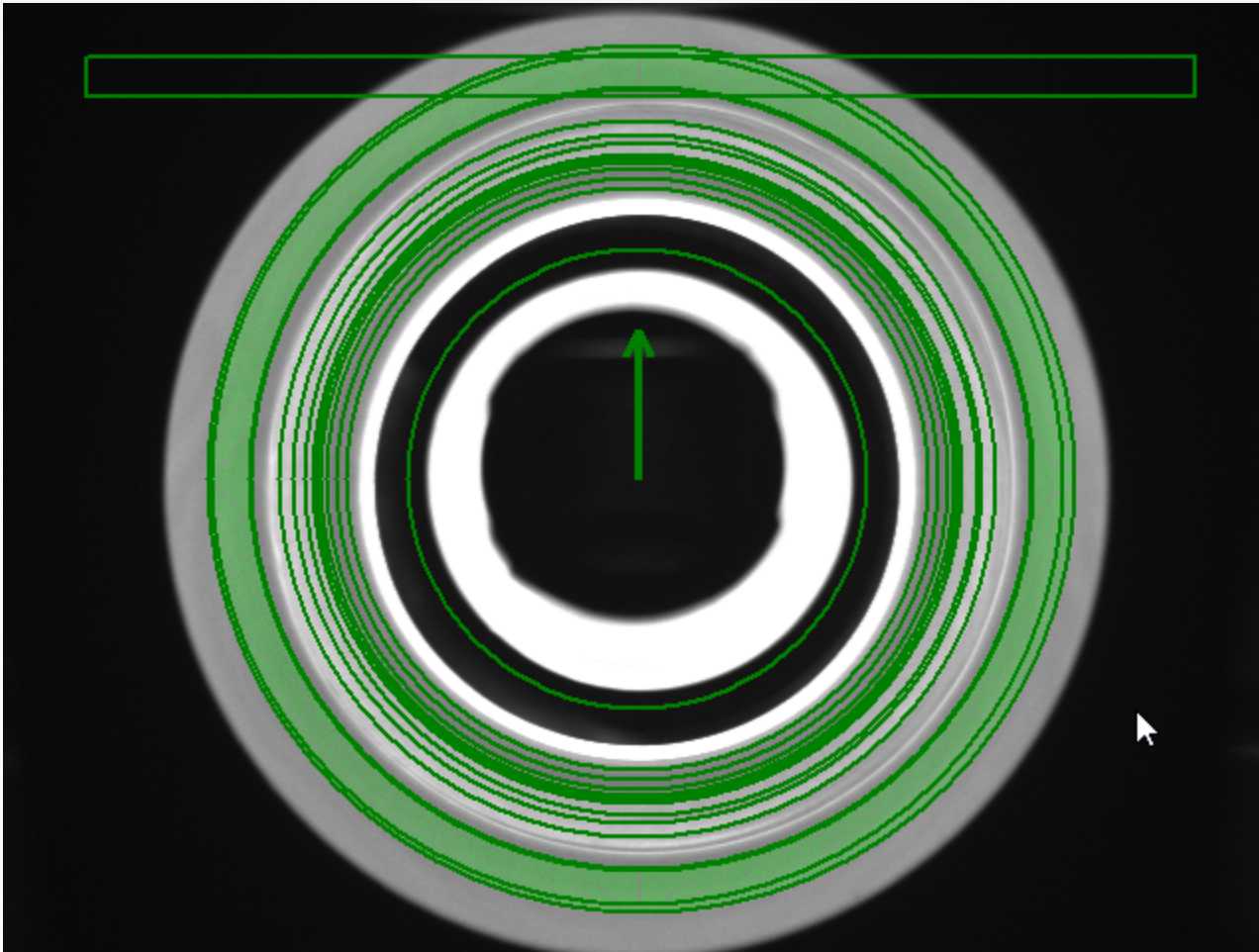
The image below shows the typical inspection setup and where these inspections are placed on the can.

GROUPS



Module 10 Neck Camera Inspections

This section covers how to set up all the neck inspections. The picture below shows an image with all neck inspection regions. We will set these up one at a time.

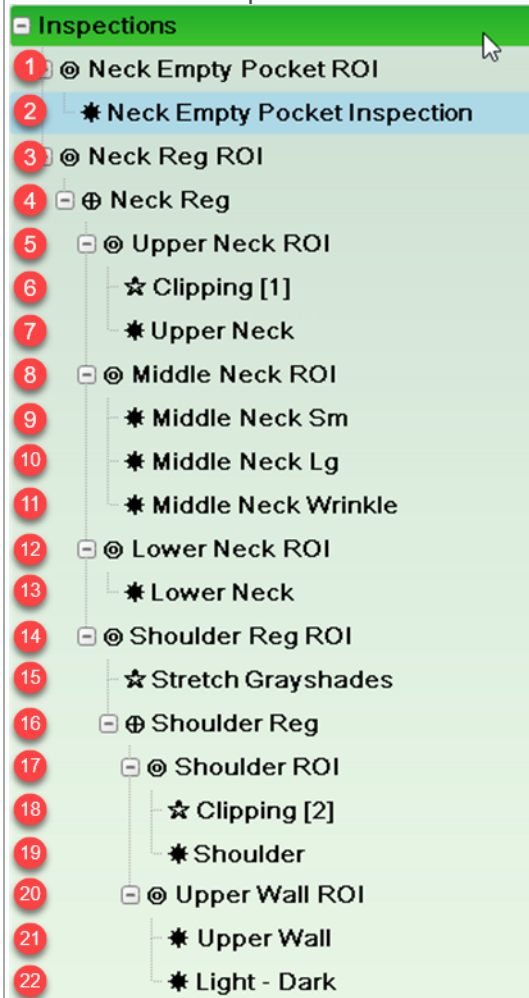


Create the Neck Camera Inspection Tree

The steps below will guide you through the process of building the Neck Camera 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. We have added inspection names that correspond to the location on the part. Note that we will set up the regions and parameters later. For now, we will just build the inspection tree.

Note: ROI = Region of Interest

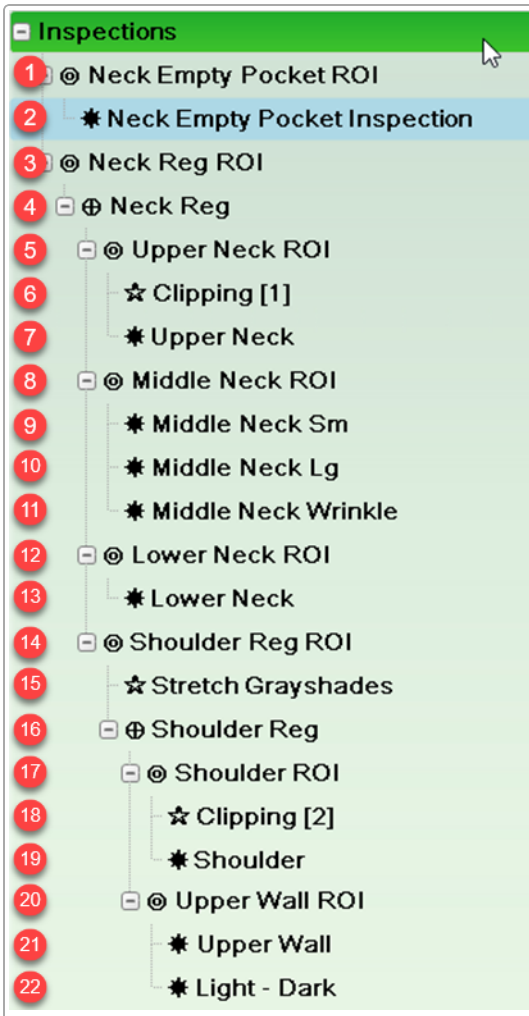
This is how the inspection tree will look



Inspection tree creation continues on the next page

Note: After each step, select the OK button to save changes, and the Exit button to exit the inspection.

1. **Inspections** Right-click Inspections. Add | Region | Ribbon. Rename it Neck Empty Pocket ROI.
2. Right-click Neck Empty Pocket ROI. Add | Analysis | Contrast. Rename it Neck Empty Pocket Inspection.
3. **Inspections** Right-click Inspections. Add | Region | Ring. Rename it Neck Reg ROI.
4. Right-click Neck Reg ROI. Add | Registration | Radial Edge. Rename it Neck Reg.
5. Right-click Neck Reg. Add | Region | Ring. Rename it Upper Neck ROI.
6. Right-click Upper Neck ROI. Add | Enhancement | Clipping.
7. Right-click Clipping. Add | Analysis | Contrast. Rename it Upper Neck.
8. Right-click Neck Reg. Add | Region | Ring. Rename it Middle Neck ROI.
9. Right-click Middle Neck ROI. Add | Analysis | Contrast. Rename it Middle Neck Sm.
10. Right-click Middle Neck ROI again. Add | Analysis | Contrast. Rename it Middle Neck Lg.
11. Right-click Middle Neck ROI again. Add | Analysis | Contrast. Rename it Middle Neck Wrinkle.
12. Right-click Neck Reg. Add | Region | Ring. Rename it Lower Neck ROI.
13. Right-click Lower Neck ROI. Add | Analysis | Contrast. Rename it Lower Neck.
14. Right-click Neck Reg. Add | Region | Ring. Rename it Shoulder Reg ROI.
15. Right-click Shoulder Reg ROI. Add | Enhancement | Stretch Grayshades.
16. Right-click Shoulder Reg ROI. Add | Registration | Radial Edge. Rename it Shoulder Reg.
17. Right-click Shoulder Reg. Add | Region | Ring. Rename it Shoulder ROI.
18. Right-click Shoulder ROI. Add | Enhancement | Clipping.
19. Right-click Shoulder ROI. Add | Analysis | Contrast. Rename it Shoulder.

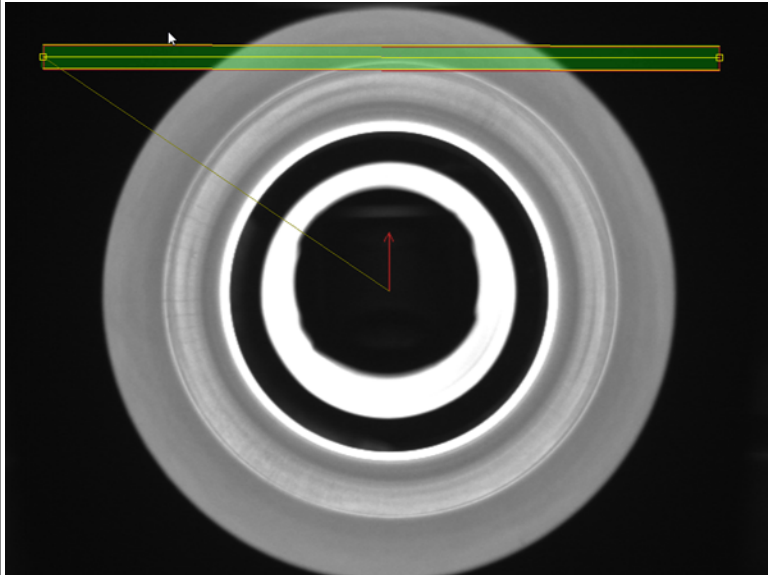


20. Right-click Shoulder Reg. Add | Region | Ring. Rename it Upper Wall ROI.
21. Right-click Upper Wall ROI. Add | Analysis | Contrast. Rename it Upper Wall.
22. Right-click Upper Wall ROI. Add | Analysis | Ambient. Rename it Light - Dark.

Place the Neck Empty Pocket Region of Interest

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.

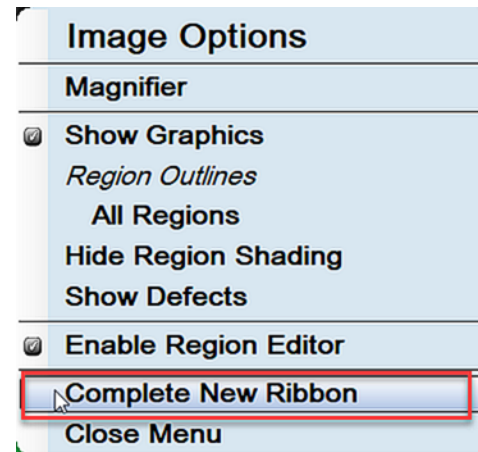
The type of region we are editing is Ribbon. In our inspection tree example, we renamed it "Neck Empty Pocket ROI." Double-click the name in the inspection tree to edit.



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.

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, making a thin ribbon across the top 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.



Neck Empty Pocket ROI

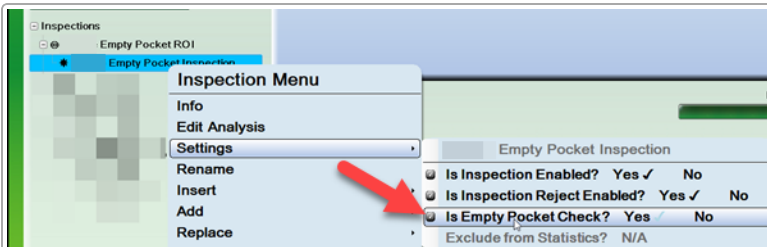
Ribbon Style	Ribbon
Ribbon Width	20
Repeat Ribbons	<input type="checkbox"/> Enabled
Mirror Ribbon	<input type="checkbox"/> Enabled
Rotate Ribbon	0.0°
Expand or Contract	0

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 Neck Empty Pocket Inspection

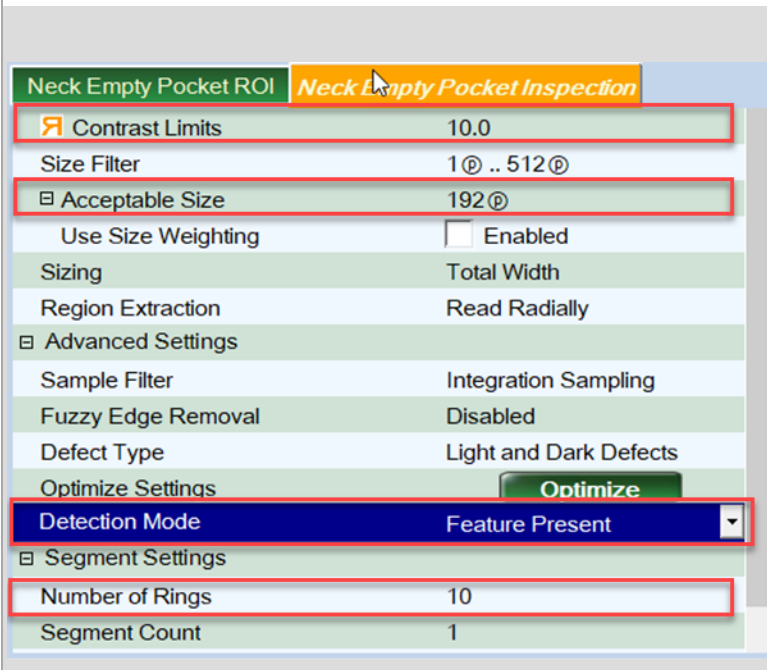
We will set up this inspection to detect some light pixels on the neck. If these light pixels do not appear, then the system will know that there is no can present, and therefore not run any further inspections.



In the Inspection Tree, right-click over the Neck 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.

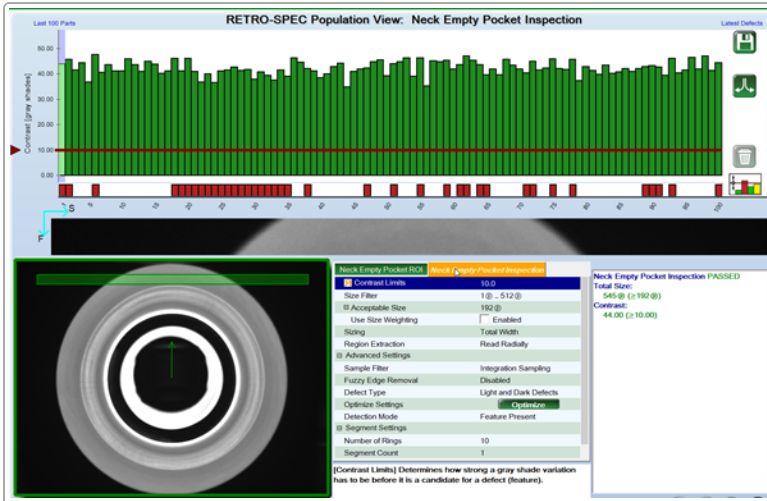
The name of the Empty Pocket inspection will have a blue background in the inspection tree.



Double-click the inspection name in the inspection tree. Pay attention to the parameters discussed below. Leave the remaining parameters at their default setting unless otherwise instructed by a Pressco representative.

To detect empty pockets:

1. Set Contrast Limits to approximately 10. This allows a lower variation in gray shades.
2. For Acceptable Size, move the slider to approximately 192. This allows the system to detect a large number of pixels. This would indicate that a part is present.
3. Click the [+] next to Advanced Settings.
4. For Detection Mode, select Feature Present from the drop-down menu.
5. Click the [+] next to Segment Settings.
6. Set the Number of Rings to 10.



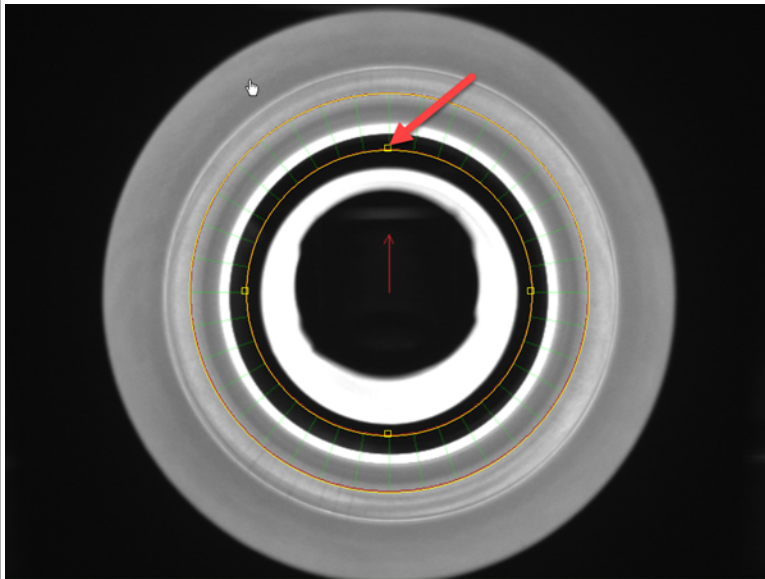
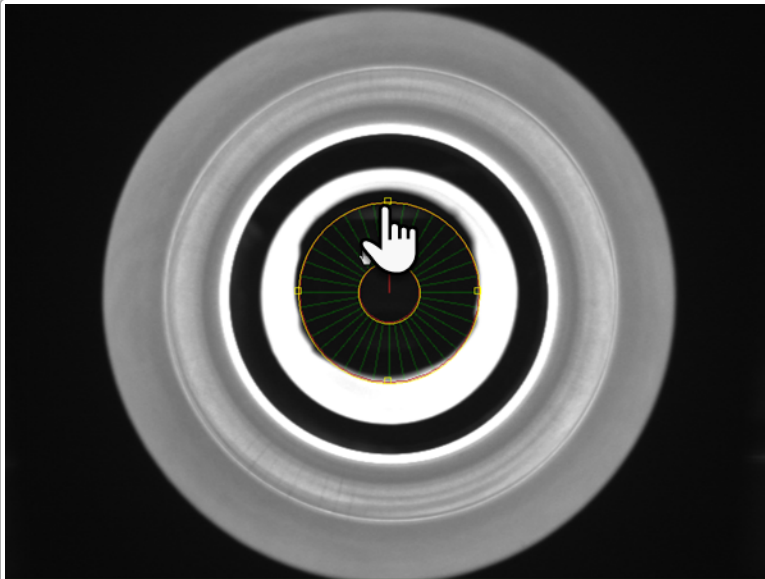
Images with parts in the field of view should pass the inspection. If a part was missing, it would fail.



Select the OK button to save changes and exit.

Place the Neck Reg ROI

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



Double-click the name of the Neck Reg ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region to detect the transition from the dark area to the bright white area.

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 bright white area of the can. Leave enough room to accommodate part movement from can to can.
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 in the dark area of the can as shown to the left.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Neck Reg ROI	
X	0
Y	0
Inner Radius	116
Thickness	46
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Neck Registration

The Registration searches for edges to find the true center of the can.

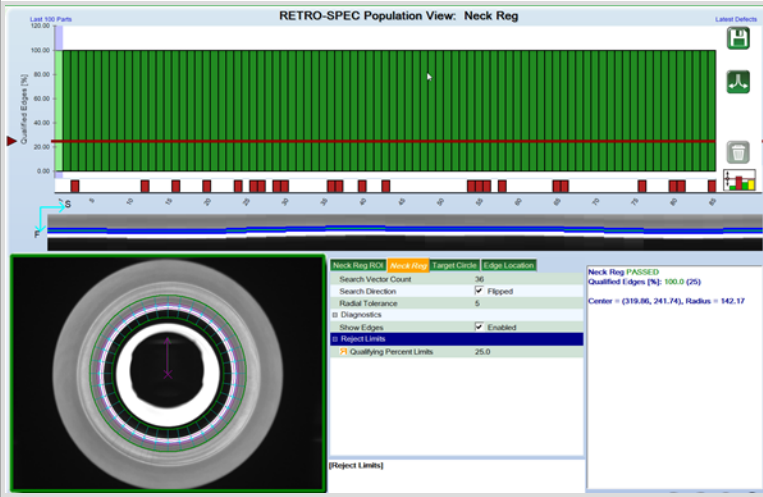


Double-click the name of the Neck Reg to edit it.

By default, the registration will likely fail due to not enough edges found.


To set up the registration:

Go to the Target Circle tab. Click the Learn button. This allows the system to learn where the edges will fall.



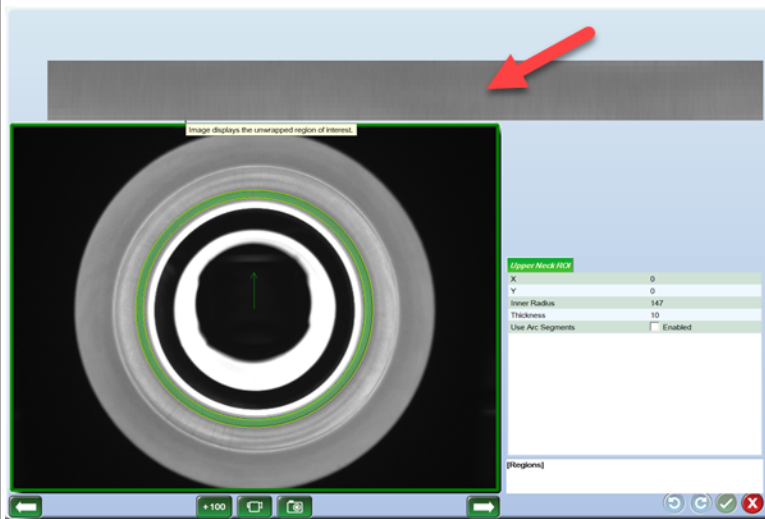
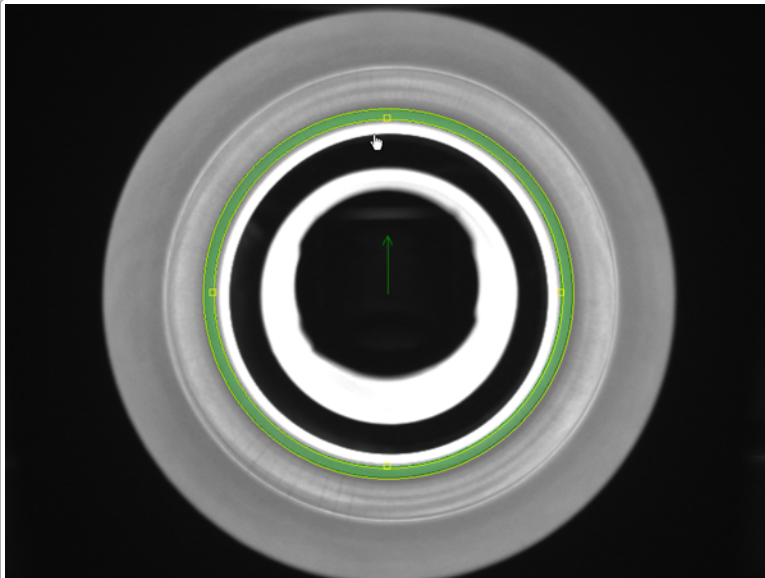
The system should now find the edge transitions between the gray area of the can and the bright white area.

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 Upper Neck ROI

We will set up the location for the system to inspect the upper neck.



Double-click the Upper Neck ROI name in the inspection tree to edit it.

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 at the smooth area under the flange. Pleats typically do not show up here, so this is a good area to inspect the upper neck.
3. Look at the unwrapped region of interest to make sure that you are excluding the white area.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

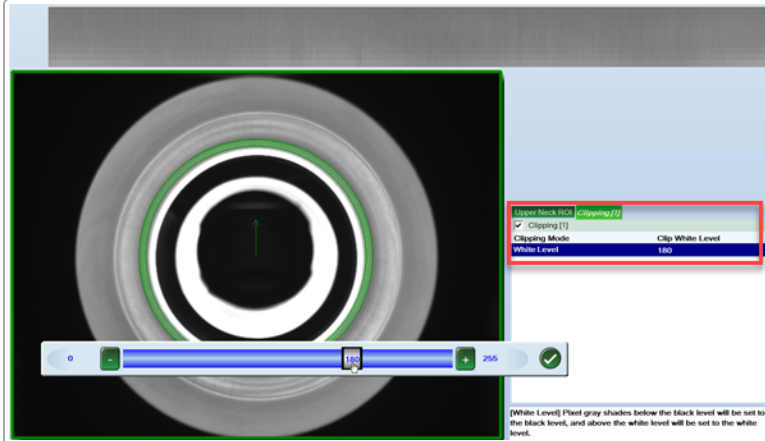
Upper Neck ROI	
X	0
Y	0
Inner Radius	147
Thickness	10
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up Clipping for Upper Neck Inspection


We use Clipping to allow the system to ignore white hair-like lines or lacquer blobs that may occur in this area.

Note: if you want to reject parts that have these hair-like marks on the cans, then keep Clipping disabled.



Double-click the name of Clipping [1] in the inspection tree to edit it.

To set up Clipping:


1. In the Clipping [1] tab, enable Clipping.
2. Set Clipping Mode to Clip White Level.
3. Set White Level to 180.
4.  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. Double-click the Upper Neck inspection to edit it.

Upper Neck ROI	Clipping [1]	Upper Neck
<input checked="" type="checkbox"/> Contrast Limits		10.0
<input checked="" type="checkbox"/> Size Filter		1 @ .. 68 @
<input checked="" type="checkbox"/> Acceptable Size		0 @
Sizing		Total Width
Region Extraction		Read Radially
<input checked="" type="checkbox"/> Advanced Settings		
<input checked="" type="checkbox"/> Segment Settings		
<input checked="" type="checkbox"/> Number of Rings		3
Segment Count		1

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.

Part View: Upper Neck

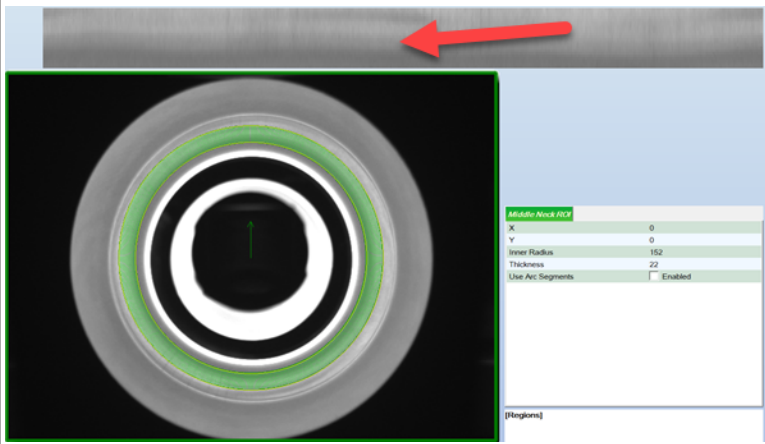
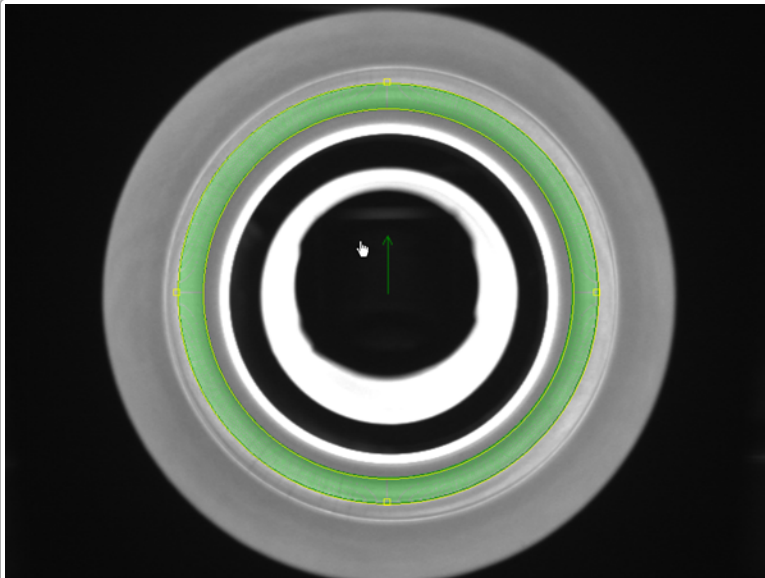
Upper Neck FAILED
Total Size: 13 @ (+0 @)
Contrast: 12.00 (+10.00)

(Size Filter) Restricts the size to this range; defects (features) outside this range (too small or too large) are ignored. Only applies to variations along the F-direction.

In this example, you can see the failure from the Part View graph. The system found a stain that fell outside the limits we set. You can choose to make the inspection less sensitive to pass stain marks like this.

Place the Middle Neck ROI

We will set up the location for the system to inspect the middle neck.



Double-click the Middle Neck ROI name in the inspection tree to edit it.

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 on the middle neck as shown.
3. Look at the unwrapped region of interest to make sure it does not include upper or lower neck areas.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Middle Neck ROI	
X	0
Y	0
Inner Radius	152
Thickness	22
Use Arc Segments	<input type="checkbox"/> Enabled

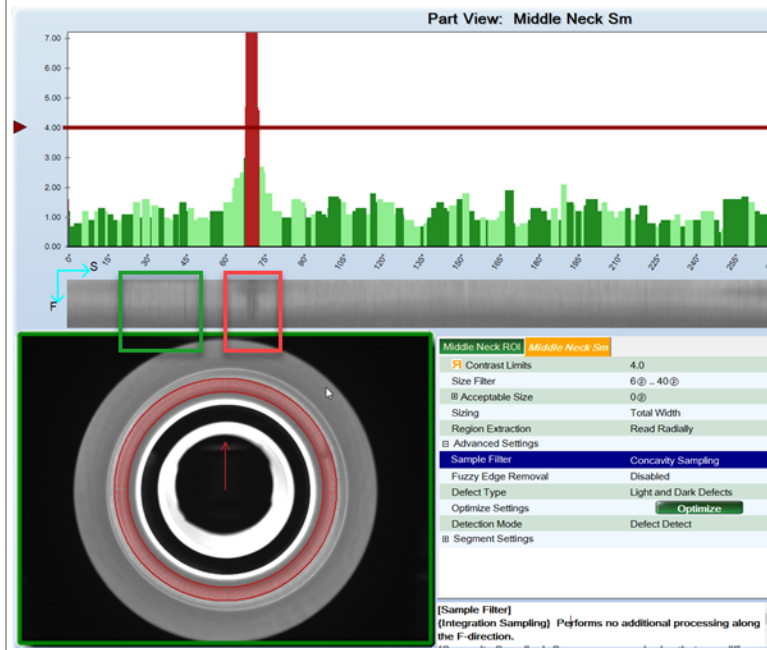
5.  Select the OK button to save changes and exit.

Set Up the Middle Neck Small Defect Inspection

We are using a Contrast inspection to detect small defects. Double-click the name of the Middle Neck Sm to edit it.

The screenshot shows the 'Middle Neck Sm' inspection settings. The 'Contrast Limits' section is set to 4.0, and the 'Size Filter' is set to 6 @ .. 40 @. The 'Sample Filter' is set to 'Concavity Sampling'. The 'Number of Rings' is set to 6. The 'Segment Count' is set to 1. The 'Optimize' button is highlighted.

Section	Parameter	Value
Contrast Limits	Contrast Limits	4.0
	Size Filter	6 @ .. 40 @
	Acceptable Size	0 @
	Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Sizing	Total Width
	Region Extraction	Read Radially
Advanced Settings	Sample Filter	Concavity Sampling
	Fuzzy Edge Removal	Disabled
	Defect Type	Light and Dark Defects
	Optimize Settings	<input type="button" value="Optimize"/>
Segment Settings	Detection Mode	Defect Detect
	Number of Rings	6
Segment Count	Segment Count	1



To set up the inspection:

1. Change Contrast to 4. This is a typical (low) number when using the Concavity filter.
2. Change Size Filter to catch defects between 6 and 40 pixels. This catches small defects.
3. Change Sample Filter to Concavity Sampling. This feature allows the system to detect and ignore draw marks, so that we do not reject cans with draw marks.
4. Change Number of Rings to 6. This is the typical setting (a fairly low number) when using Concavity, so that the draw marks are detected.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
6. Select the OK button to save changes and exit.

In the example to the left, a pleat was caught using these settings (outlined in red). Using the Concavity filter and associated settings, the system ignored the draw marks (outlined in green). Parts with draw marks pass this inspection (but you can set up the inspection for parts to fail if your plant requires that).

Set Up the Middle Neck Large Defect Inspection


We are using a Contrast inspection to detect large defects. Double-click the name of the Middle Neck Lg to edit it.

The screenshot shows the 'Middle Neck Lg' inspection settings panel. The following parameters are highlighted with red boxes:

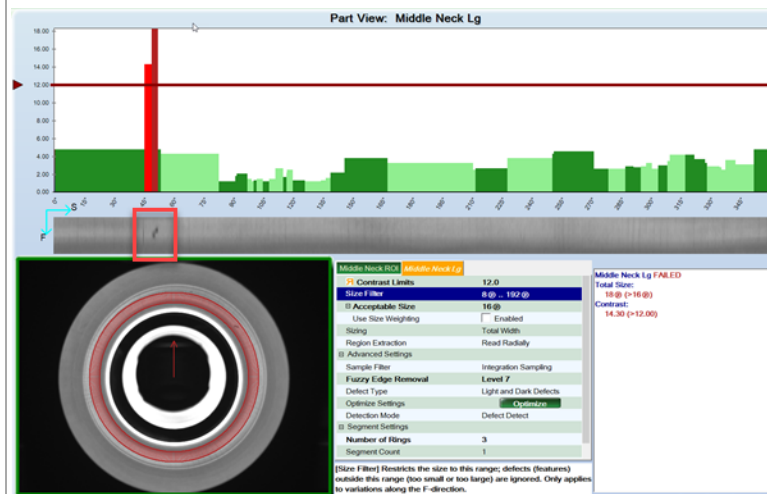
Contrast Limits	12.0
Size Filter	8 @ .. 192 @
Acceptable Size	16 @
Fuzzy Edge Removal	Level 7
Number of Rings	3

Other visible settings include: Use Size Weighting (Enabled), Sizing (Total Width), Region Extraction (Read Radially), Sample Filter (Integration Sampling), Defect Type (Light and Dark Defects), and Segment Count (1). An 'Optimize' button is also present.

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 the example to the left, contamination was caught using these settings.




Set Up the Middle Neck Wrinkle Inspection

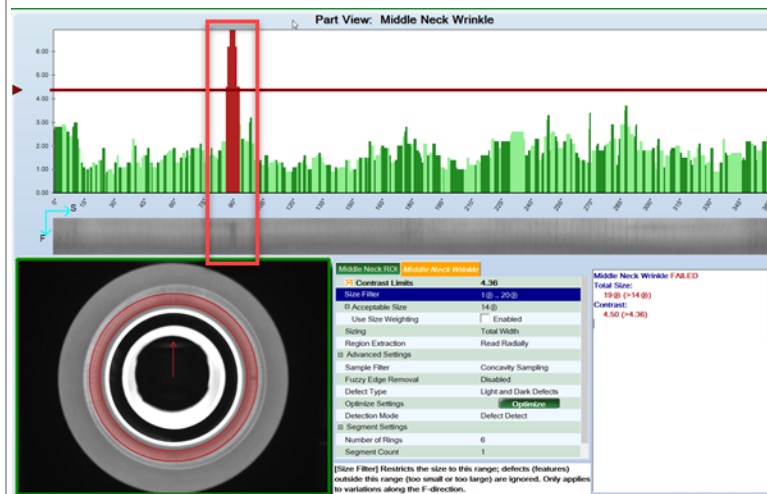
We are using a Contrast inspection to detect wrinkles. Double-click the name of the Middle Neck Wrinkle to edit it.

Contrast Limits	3.2
Size Filter	1 @ .. 20 @
Acceptable Size	14 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Concavity Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	Optimize
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	6
Segment Count	1

To set up the inspection:

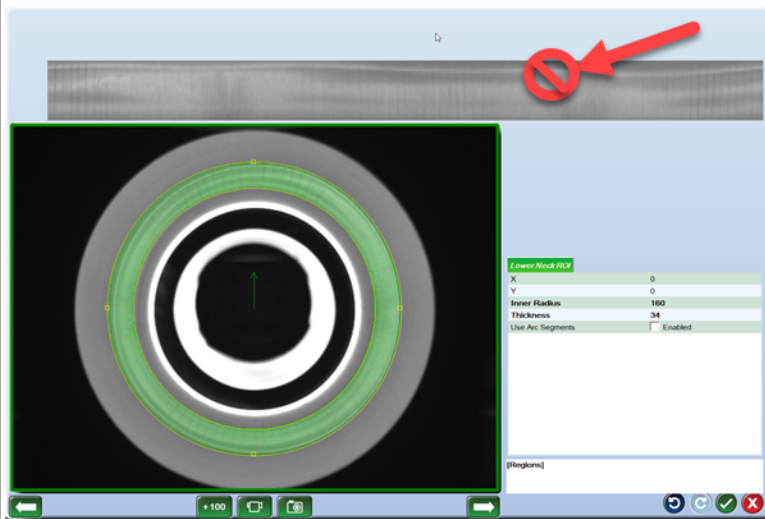
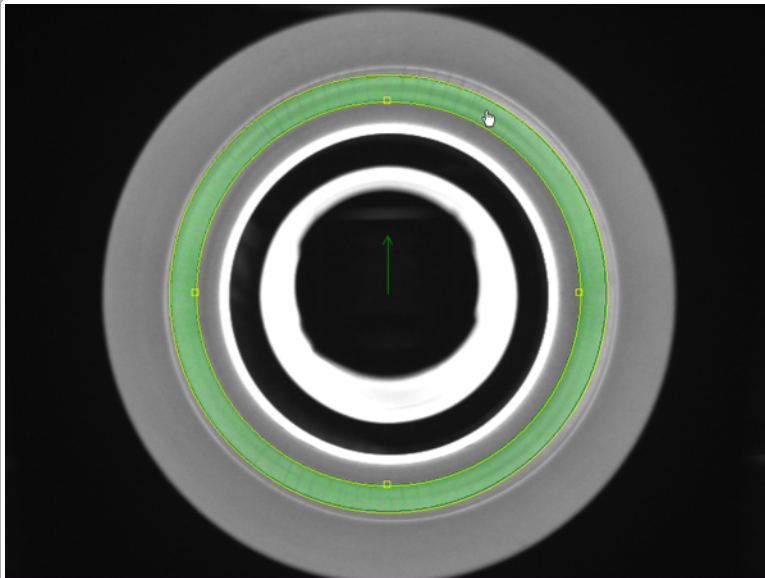
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3.  Select the OK button to save changes and exit.

In the example to the left, a wrinkle was caught using these settings.



Place the Lower Neck ROI

We will set up the location for the system to inspect the lower neck.



Double-click the Lower Neck ROI name in the inspection tree to edit it.

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 at the smooth area midway between the flange and shoulder where pleats typically show up.
3. Look at the unwrapped region of interest to make sure it does not include transition areas. In our example, we need to decrease the outer edge.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Lower Neck ROI	
X	0
Y	0
Inner Radius	160
Thickness	21
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set Up the Lower Neck Inspection

We are using a Contrast inspection to detect defects. Double-click the name of the Lower Neck to edit it.


The screenshot shows the 'Lower Neck ROI' configuration window. The 'Lower Neck' tab is selected. The following parameters are highlighted with red boxes:

- Contrast Limits**: 4.0
- Size Filter**: 6 @ .. 40 @
- Sample Filter**: Concavity Sampling
- Number of Rings**: 6

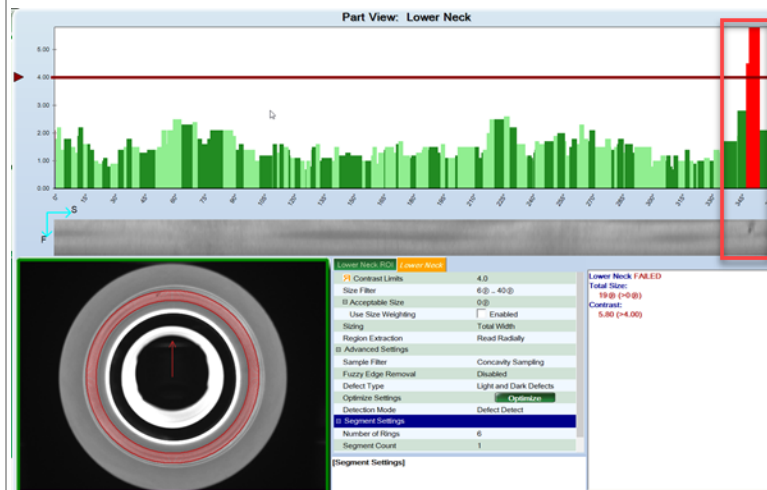
Other visible settings include:

- Acceptable Size: 0 @
- Use Size Weighting: Enabled
- Sizing: Total Width
- Region Extraction: Read Radially
- Advanced Settings: Fuzzy Edge Removal (Disabled), Defect Type (Light and Dark Defects), Optimize Settings (Optimize button), Detection Mode (Defect Detect)
- Segment Settings: Segment Count (1)

To set up the inspection:

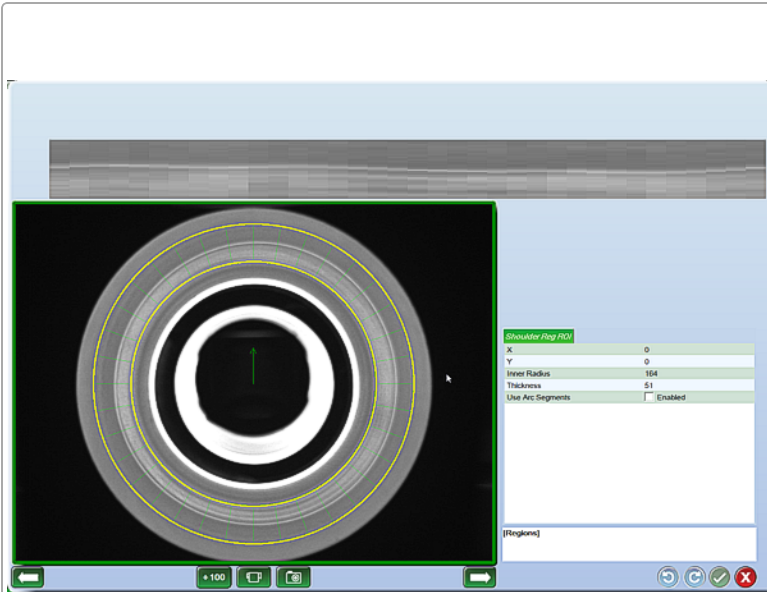
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3.  Select the OK button to save changes and exit.

In the example to the left, a wrinkle was caught using these settings.



Place the Shoulder Registration ROI

We will set up the location for the system to inspect the shoulder.



Double-click the Shoulder Reg ROI name in the inspection tree to edit it.

To place the region:

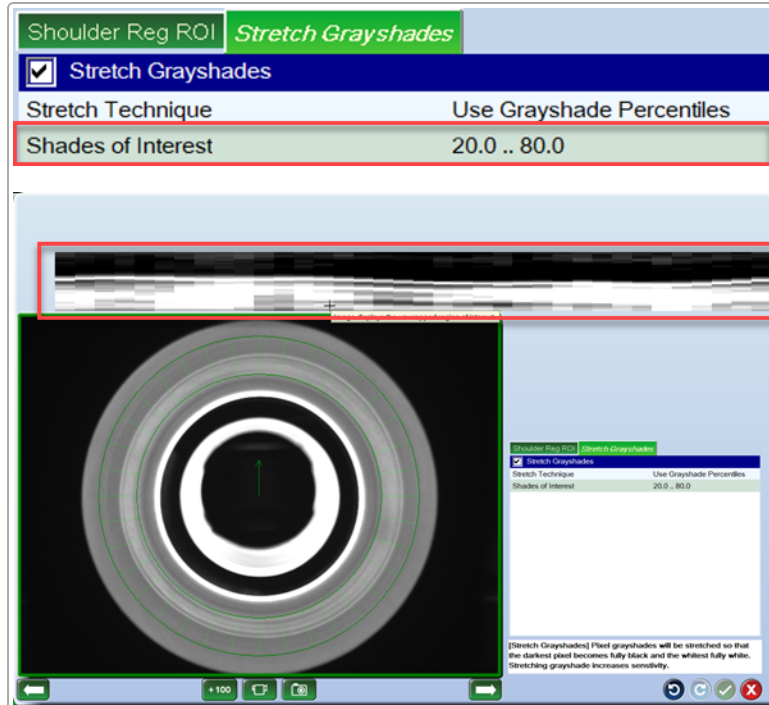
1. Click on the outer edge to move it, and then the inner edge to move it.
2. Position this region midway between the lower neck and across the shoulder edge. Pleats typically show up at the lower neck but not as far as the shoulder edge.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Shoulder Reg ROI	
X	0
Y	0
Inner Radius	164
Thickness	51
Use Arc Segments	<input checked="" type="checkbox"/> Enabled

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


Set up the Shoulder Inspection Enhancement

We are using Stretch Grayshades to increase the contrast between the shoulder and neck, so that the system can locate the shoulder area.



Double-click the name of the Stretch Grayshades enhancement 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.

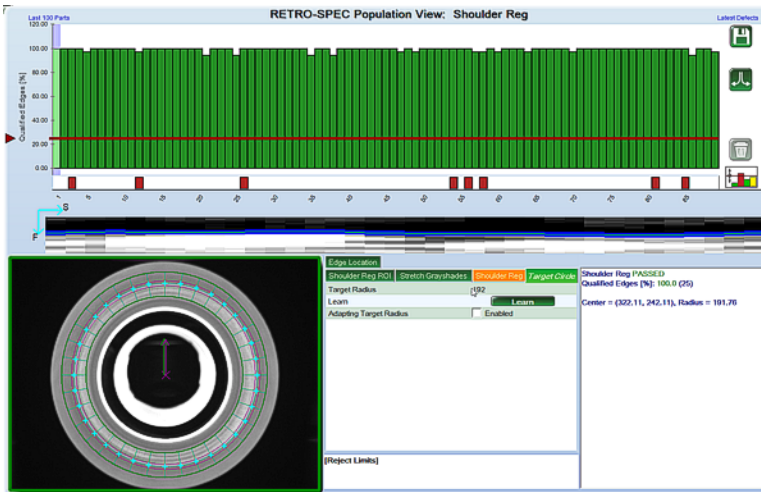
The unwrapped region of interest shows the effect of the enhancement.

Set up the Shoulder Registration

The Registration searches for edges to find the center of the outer part of the can.

Shoulder Reg ROI	Stretch Grayshades	Shoulder Reg	Target Circle
Edge Location			
Edge Polarity	Dark-to-Light		
Edge Gradient	15 .. 40		
Edge Delta	2		
Edge Size	2		
Use Subpixel	<input type="checkbox"/> Enabled		

Neck Reg ROI	Neck Reg	Target Circle	Edge Location
Target Radius	100		
Learn	<input type="button" value="Learn"/>		
Adapting Target Radius	<input type="checkbox"/> Enabled		



Double-click the name of the Shoulder Reg to edit it.

By default, the registration will likely fail due to not enough edges found.

To set up Edge Location:

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

To set up the registration:

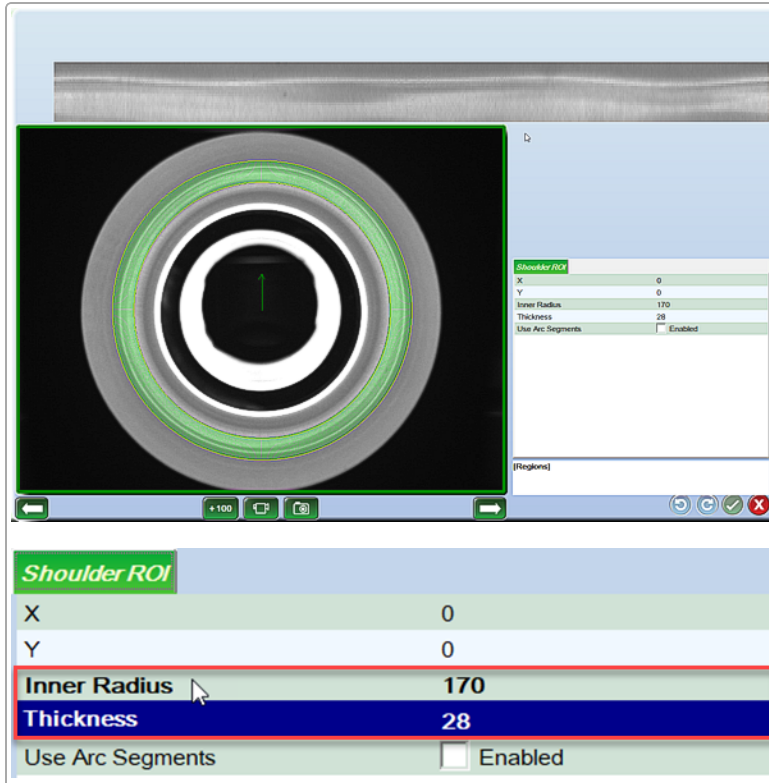
Go to the Target Circle tab. Click the Learn button. This allows the system to learn where the edges will fall.

The system should now find the edge transitions between the darker area and the brighter area, to locate the shoulder. You will see the results, enhanced by the previous Stretch Grayshades, in the unwrapped region of interest.

- Select the OK button to save changes and exit.

Place the Shoulder ROI

We will set up the location for the system to inspect the shoulder.




The screenshot shows the inspection software interface. At the top, there is a small preview of the part. Below it, a large circular ROI is overlaid on a grayscale image of a shoulder. The ROI is defined by two concentric green circles. To the right of the image is a configuration panel for the 'Shoulder ROI'. The panel includes a table with the following parameters:

Shoulder ROI	
X	0
Y	0
Inner Radius	170
Thickness	28
Use Arc Segments	<input type="checkbox"/> Enabled

Below the configuration panel, there is a section labeled '(Regions)' which is currently empty. At the bottom of the interface, there is a toolbar with various icons, including a checkmark icon.

Double-click the Shoulder ROI name in the inspection tree to edit it.

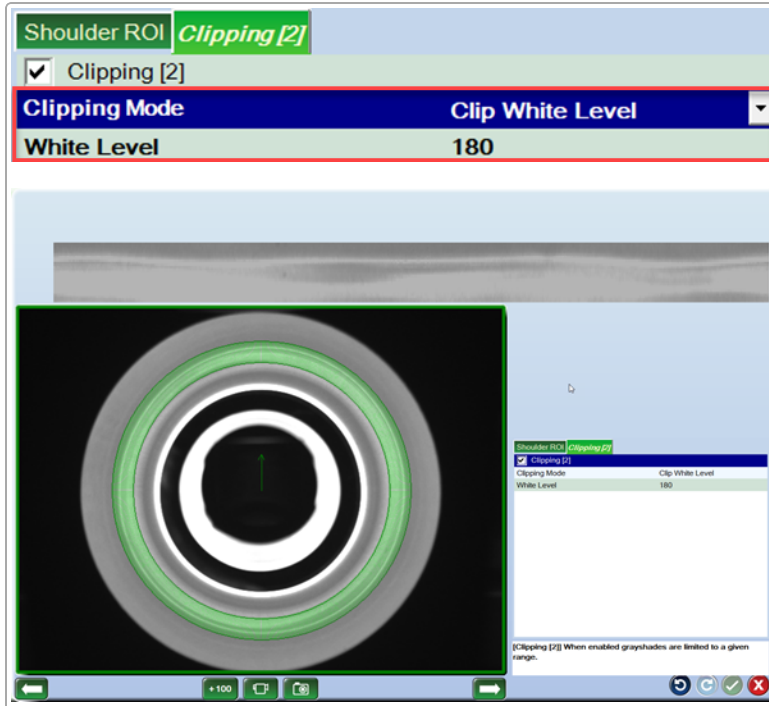
To place the region:

1. Click on the outer edge to move it, and then the inner edge to move it.
2. Position this region midway between the lower neck and across the shoulder edge. Pleats typically show up at the lower neck but not as far as the shoulder edge.
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 Shoulder Inspection Enhancement


! Clipping is very important for the system to find defects in the shoulder area.

We are using Clipping to neutralize the bright spots that might show up on the can. If the can is very shiny, the system might see reflections from the dome or other parts of the can. Those reflections could be very bright, but they are not defects. Clipping makes the bright spots one gray shade, so that you can make the shoulder inspections more sensitive to actual defects.



Double-click the name of the Clipping [2] enhancement 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 Shoulder Inspection

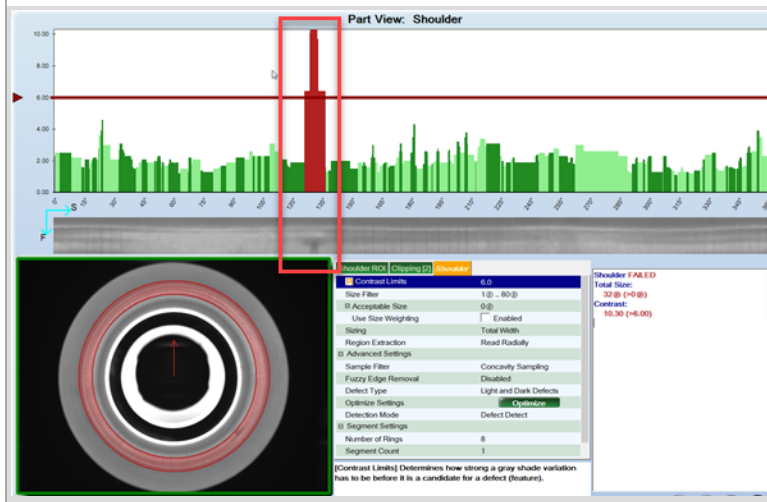
We are using a Contrast inspection to find defects in the shoulder.

Shoulder ROI	Clipping [2]	Shoulder
Contrast Limits	6.0	
Size Filter	1 @ .. 80 @	
Acceptable Size	0 @	
Use Size Weighting	<input type="checkbox"/> Enabled	
Sizing	Total Width	
Region Extraction	Read Radially	
Advanced Settings		
Sample Filter	Concavity Sampling	
Fuzzy Edge Removal	Disabled	
Defect Type	Light and Dark Defects	
Optimize Settings	<input type="button" value="Optimize"/>	
Detection Mode	Defect Detect	
Segment Settings		
Number of Rings	8	
Segment Count	1	

Double-click the Shoulder inspection to edit it.

To set up the inspection:

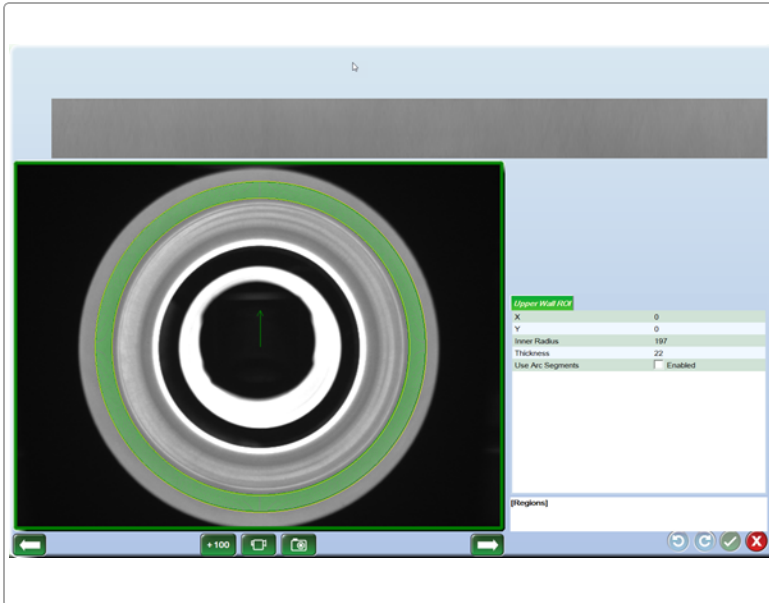
1. Pay attention to the parameters (outlined in red) shown to the left. Start with these settings, and adjust if needed for your part.
2. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
3. Select the OK button to save changes and exit.



In this example, you can see the failure from the Part View graph.

Place the Upper Wall ROI

We will set up the location for the system to inspect the upper wall.



Double-click the Upper Wall ROI name in the inspection tree to edit it.

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

Upper Wall ROI	
X	0
Y	0
Inner Radius	197
Thickness	22
Use Arc Segments	<input checked="" type="checkbox"/> Enabled

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

Set up the Upper Wall Inspection

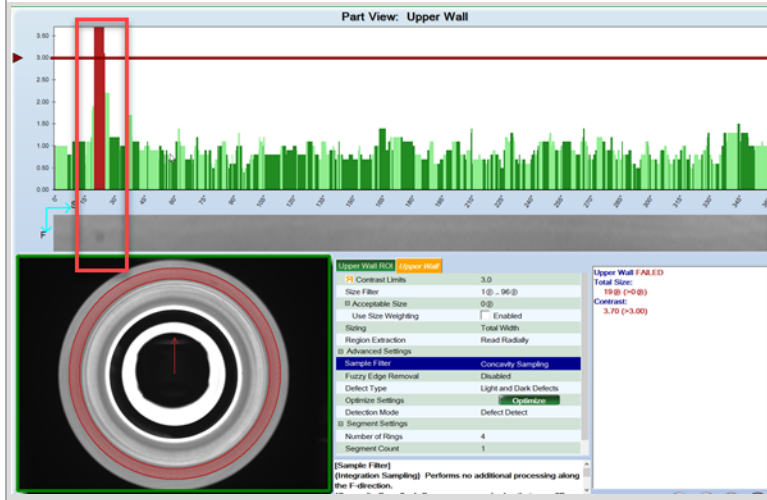
We are using a Contrast inspection to find defects in the upper wall.

Upper Wall ROI	Upper Wall
Contrast Limits	3.0
Size Filter	1 @ .. 96 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Concavity Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	4
Segment Count	1

Double-click the Upper Wall 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 contamination on the upper wall.

Set up the Light - Dark Inspection

We are using an Ambient inspection to find no spray or partial spray on cans.

RETRO-SPEC Options

- Population View
- Part View
- Symmetric Limits
- Auto Select Limits**
- Enable Warnings
- Graph Scale Mode

Ambient Technique	Density
Ambient Analysis Mode	Min & Max
Region Extraction	Read Radially
<input type="checkbox"/> Ambient Limits	123 +30/ -30
Nominal	123
Record SPC Statistics	<input type="checkbox"/> Enabled

RETRO-SPEC Population View: Light - Dark

Light - Dark PASSED
Ambient Value: 109
(93 - (102 - 144) - 153)
Lower Limit = 93 - 123 - 30
Upper Limit = 153 - 123 + 30

[Ambient Technique] Determines which pixels are included in the average grayscale of the region to make up the ambient value.

Double-click the Light - Dark inspection to edit it.

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. 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.

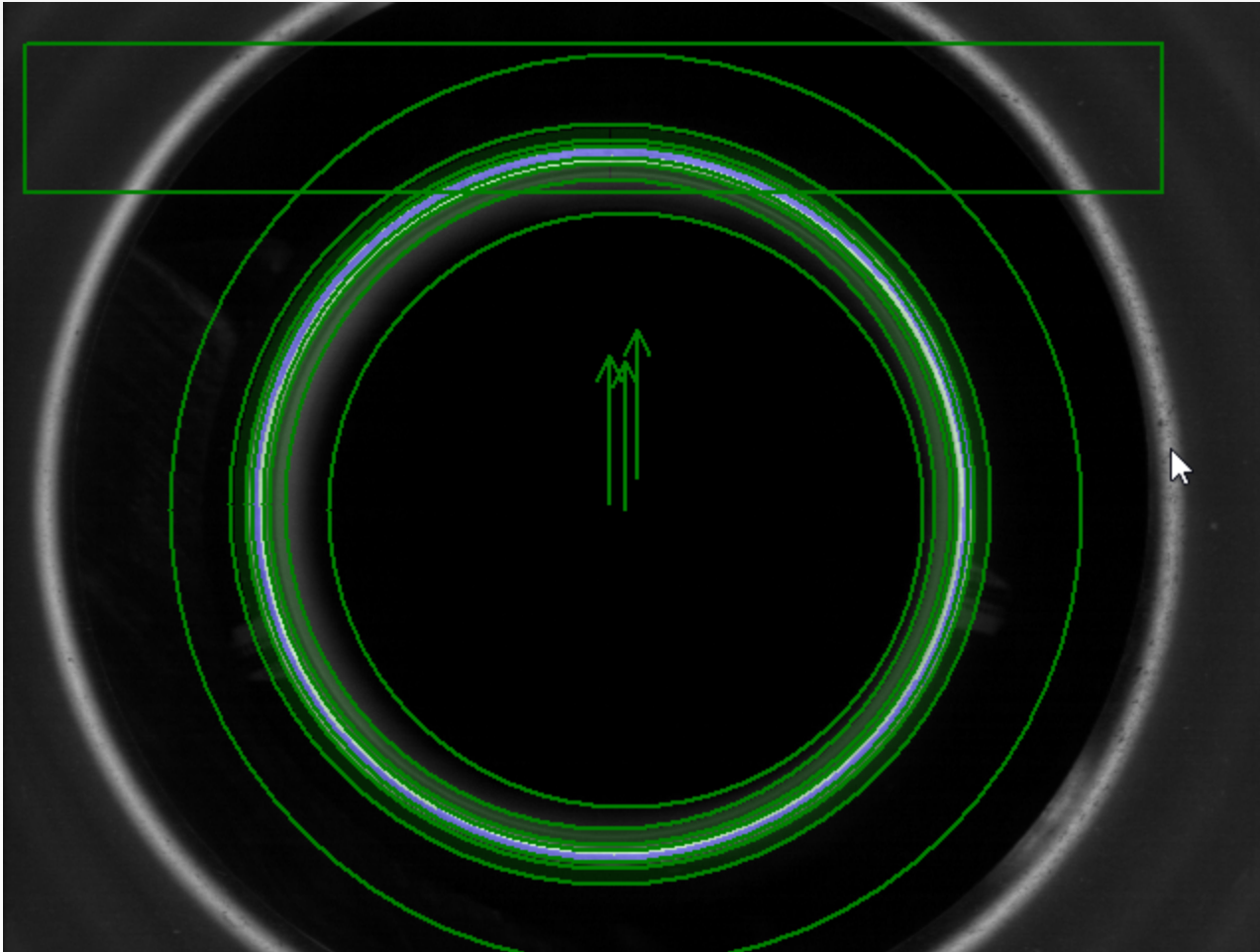
To test the inspection:

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.

Select the OK button to save changes and exit.

Module 11 Flange Camera Inspections

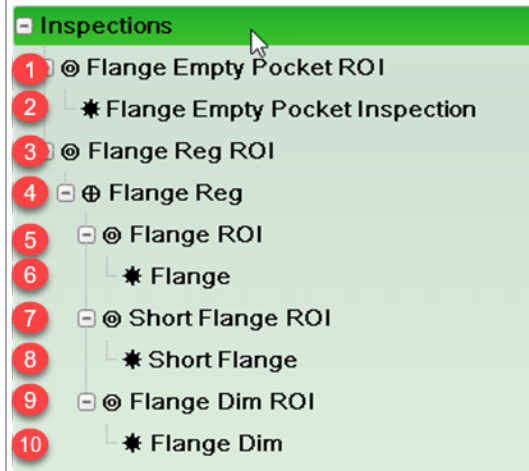
This section covers how to set up all the flange inspections. The picture below shows an image with all flange inspection regions. We will set these up one at a time.



Create the Flange Camera Inspection Tree

The steps below will guide you through the process of building the Flange Camera 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. We have used names that correspond to the location on the part. Note that we will set up the regions and parameters later. For now, we will just build the inspection tree.

This is how the inspection tree will look



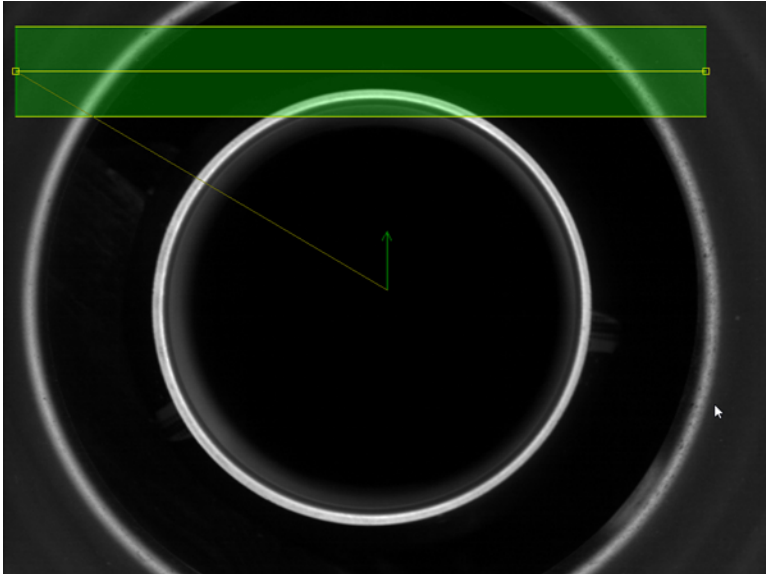
Note: After each step, select the OK button to save changes, and the Exit button to exit the inspection.

1. **Inspections** Right-click Inspections. Add | Region | Ribbon. Rename it Flange Empty Pocket ROI.
2. Right-click Flange Empty Pocket ROI. Add | Analysis | Contrast. Rename it Flange Empty Pocket Inspection.
3. Right-click Flange Empty Pocket ROI. Add | Region | Ring. Rename it Flange Reg ROI.
4. Right-click Flange Reg ROI. Add | Registration | Radial Edge. Rename it Flange Reg.
5. Right-click Flange Reg. Add | Region | Ring. Rename it Flange ROI.
6. Right-click Flange ROI. Add | Analysis | Contrast. Rename it Flange.
7. Right-click Flange Reg. Add | Region | Ring. Rename it Short Flange ROI.
8. Right-click Short Flange ROI. Add | Analysis | Ambient. Rename it Short Flange.
9. Right-click Flange Reg. Add | Region | Ring. Rename it Flange Dim ROI.
10. Right-click Flange Dim ROI. Add | Analysis | Measurement. Rename it Flange Dim.

Place the Flange Empty Pocket Region of Interest

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.

The type of region we are editing is Ribbon. In our inspection tree example, we renamed it "Flange Empty Pocket ROI."

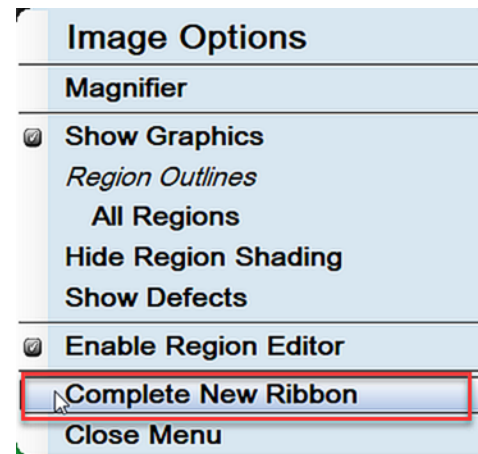


Double-click the name in the inspection tree to edit.

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.

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, making a thin ribbon across the top 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.



Flange Empty Pocket ROI	
Ribbon Style	Ribbon
Ribbon Width	75
Repeat Ribbons	<input type="checkbox"/> Enabled
Mirror Ribbon	<input type="checkbox"/> Enabled
Rotate Ribbon	0.0°
Expand or Contract	0

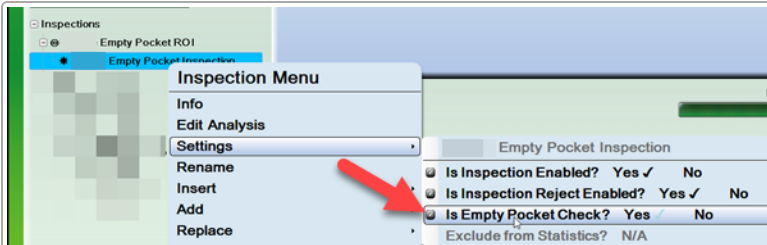
Make the Ribbon Width wide enough to catch the flange within the camera's field of view.

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 Flange Empty Pocket Inspection

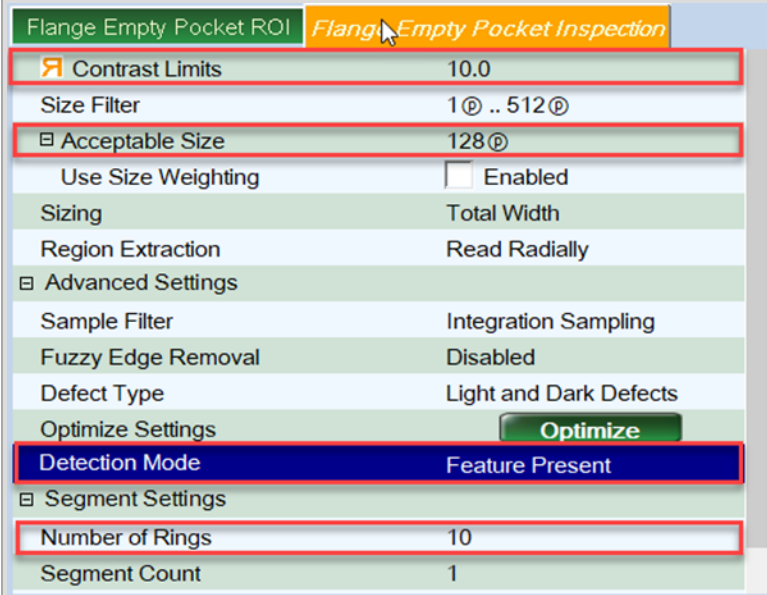
We will set up this inspection to detect some light pixels on the flange. If these light pixels do not appear, then the system will know that there is no can present, and therefore not run any further inspections.



In the Inspection Tree, right-click over the Flange 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.

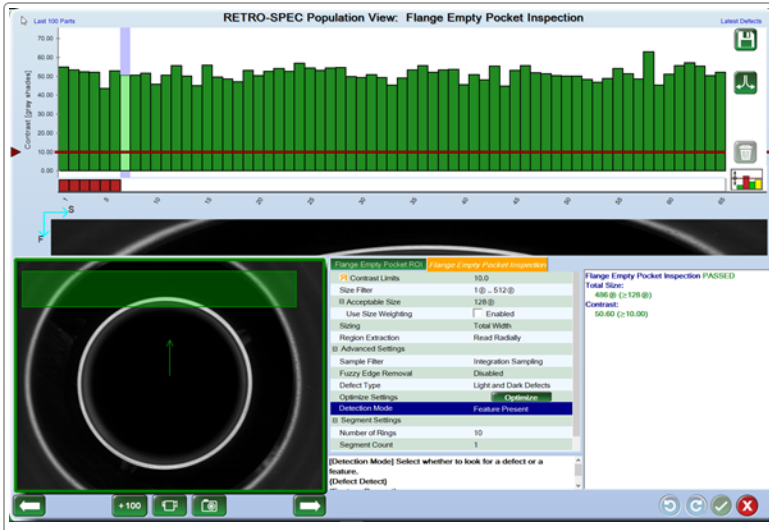
The name of the Empty Pocket inspection will have a blue background in the inspection tree.



Double-click the inspection name in the inspection tree. Pay attention to the parameters discussed below. Leave the remaining parameters at their default setting unless otherwise instructed by a Pressco representative.

To detect empty pockets:

1. Set Contrast Limits to approximately 10. This allows a lower variation in gray shades.
2. Set Acceptable Size to approximately 128.
3. For Detection Mode, select Feature Present from the drop-down menu.
4. Set the Number of Rings to 10.



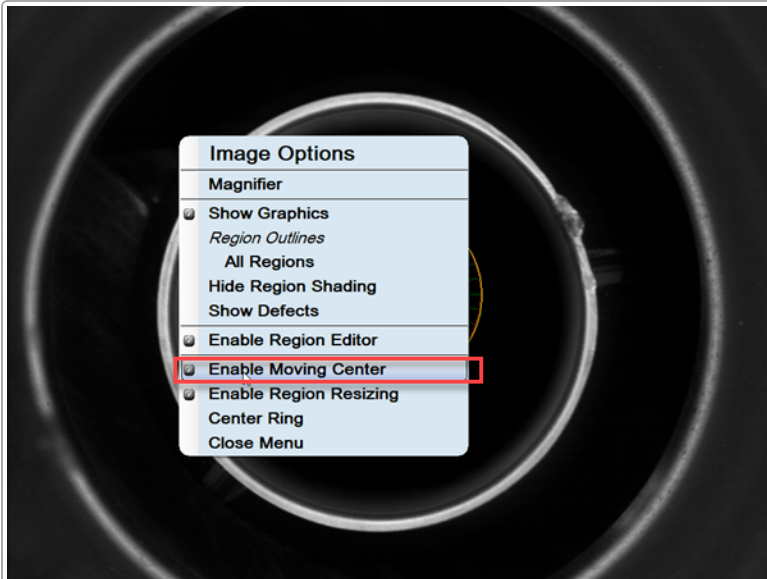
Images with parts in the field of view should pass the inspection. If a part was missing, it would fail.



Select the OK button to save changes and exit.

Place the Flange Reg ROI

We will set up the Region of Interest (ROI) so that the system knows where to search for the center of the flange. Since cans change position slightly from can to can, the Flange Registration finds the center for each part. Once this point is found, the remaining inspections are run to inspect the flange.



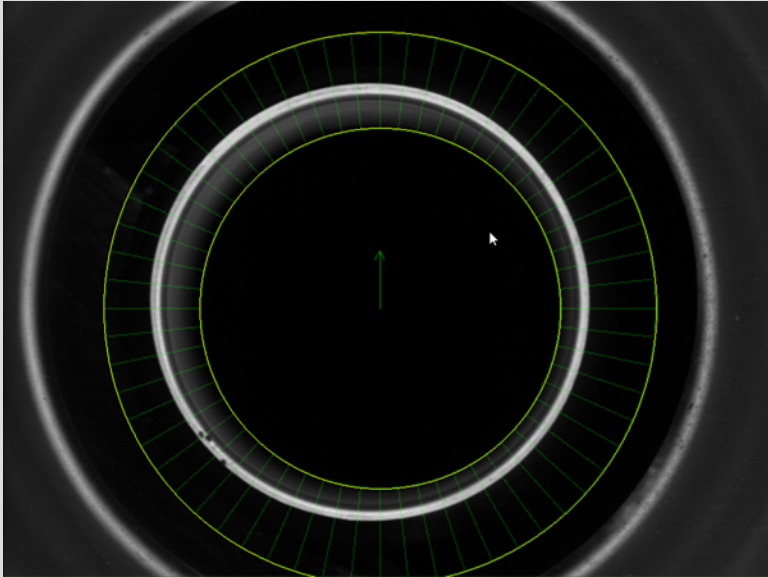
Double-click the name of the Flange Reg ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region to detect the transition from the dark area to the bright white area.

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 edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it outside of the bright white area of the flange. Leave enough room to accommodate part movement from can to can. It is OK to leave part of the region falling outside of the image.
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 flange as shown to the left.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Flange Reg ROI	
X	-6
Y	16
Inner Radius	150
Thickness	80
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Flange Registration

The Registration searches for edges to find the true center of the flange. Since cans change position slightly from can to can, the registration finds the center for each can. Once this point is found, the remaining inspections are run to inspect the flange.

Flange Reg ROI	Flange Reg	Target Circle	Edge Location
Search Vector Count	60		
Search Direction	<input type="checkbox"/> Flipped		
Radial Tolerance	5		
Diagnostics			
Show Edges	<input checked="" type="checkbox"/> Enabled		
Reject Limits			
Qualifying Percent Limits	25.0		
Flange Reg ROI	Flange Reg	Target Circle	Edge Location
Target Radius	174		
Learn	<input type="button" value="Learn"/>		
Adapting Target Radius	<input type="checkbox"/> Enabled		

Double-click the name of the Flange Reg to edit it.

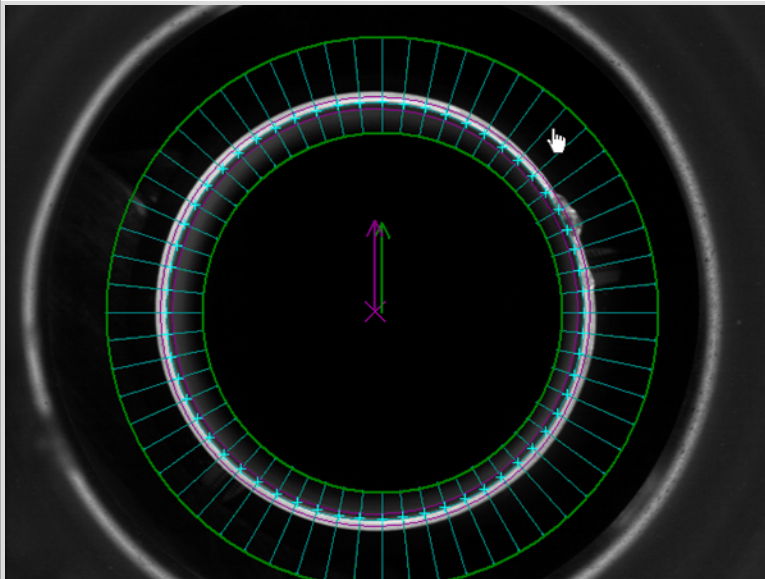
By default, the registration will likely fail due to not enough edges found.

To set up the registration:

In the Flange Reg menu, uncheck Flipped for Search Direction. This allows the system to search from inside the can towards outside the can. It will locate the inner edges of the flange.

Set the Search Vector Count to 60. This provides a more accurate registration.

Go to the Target Circle tab. Click the Learn button. This allows the system to learn where the edges will fall.



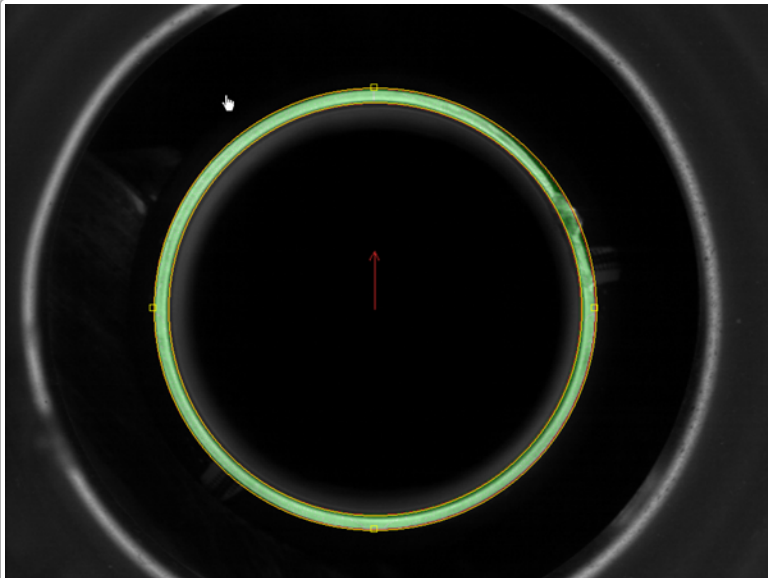
The system should now find the edges of the flange.

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 Flange Inspection ROI

We will set up the location for the system to inspect the flange.



Flange ROI	
X	0
Y	0
Inner Radius	172
Thickness	12
Use Arc Segments	<input type="checkbox"/> Enabled

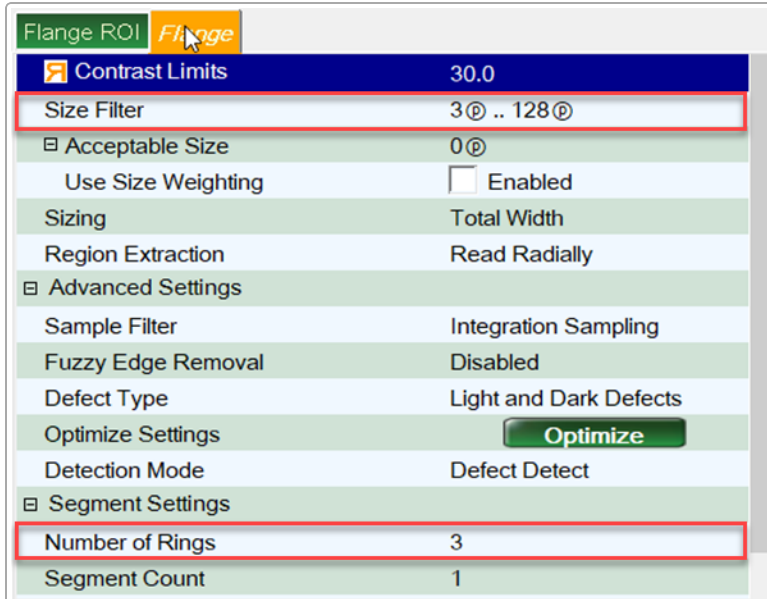
Double-click the Flange ROI name in the inspection tree to edit it.

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 a couple pixels inside and outside of the flange, to completely cover the flange and allow for slight oval variation.
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 Flange Inspection


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

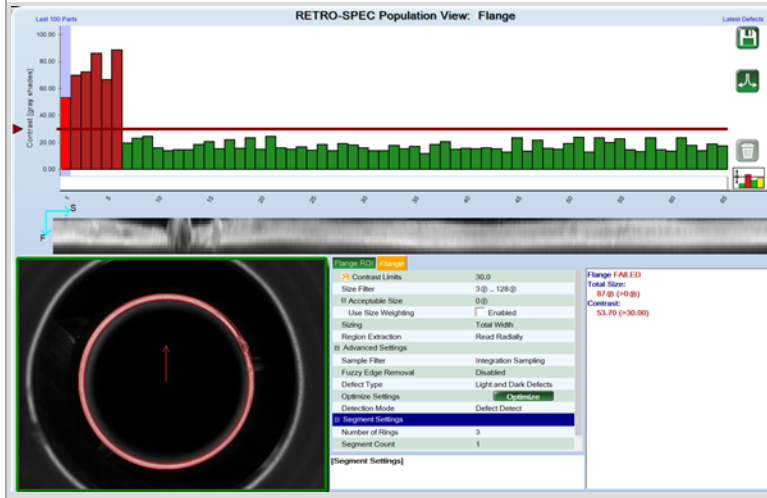


Flange ROI	
Contrast Limits	30.0
Size Filter	3 @ .. 128 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	Optimize
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	3
Segment Count	1

Double-click the Flange inspection to edit it.

To set up the inspection:

1. Change Size Filter to a range from approximately 3 to 128 pixels
2. Change Number of Rings to 3.
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.



RETRO-SPEC Population View: Flange

Contrast (gray intensity)

Flange FAILED

Total Size: 37 @ (115 @)

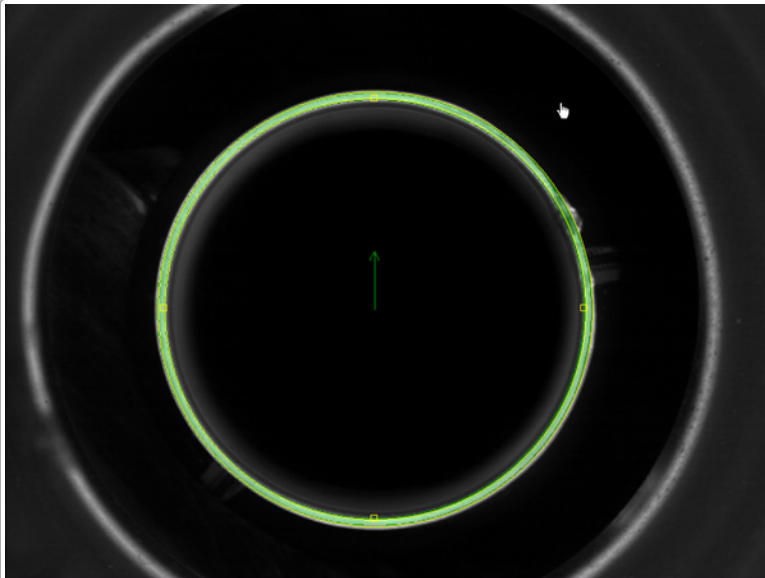
Contrast: 53.70 (-30.00)


Flange ROI	
Contrast Limits	30.0
Size Filter	3 @ .. 128 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	Optimize
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	3
Segment Count	1

This example shows a failed Flange inspection.

Place the Short Flange Inspection ROI


We will set up the location for the system to inspect for short flanges.



Short Flange ROI 	
X	0
Y	0
Inner Radius	175
Thickness	6
Use Arc Segments	<input type="checkbox"/> Enabled

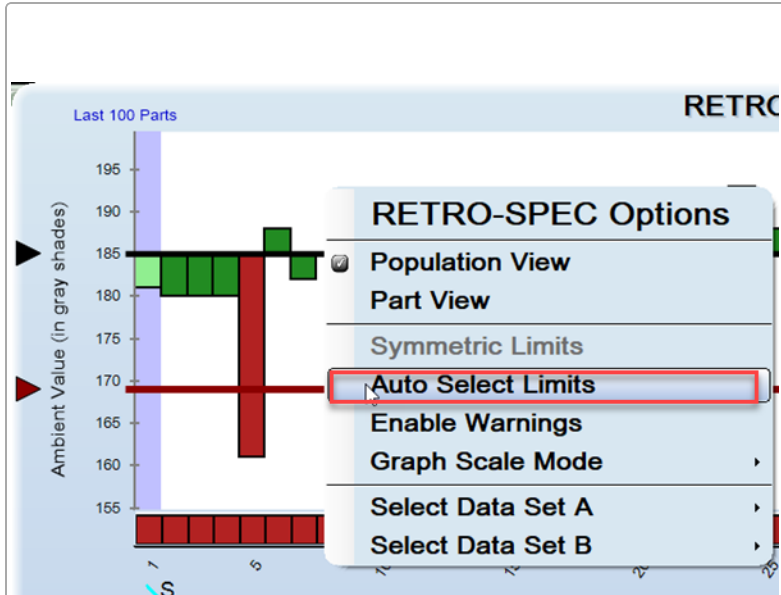
Double-click the Short Flange ROI name in the inspection tree to edit it.

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 flange.
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 Short Flange Inspection

We are using an Ambient inspection to detect short flanges.



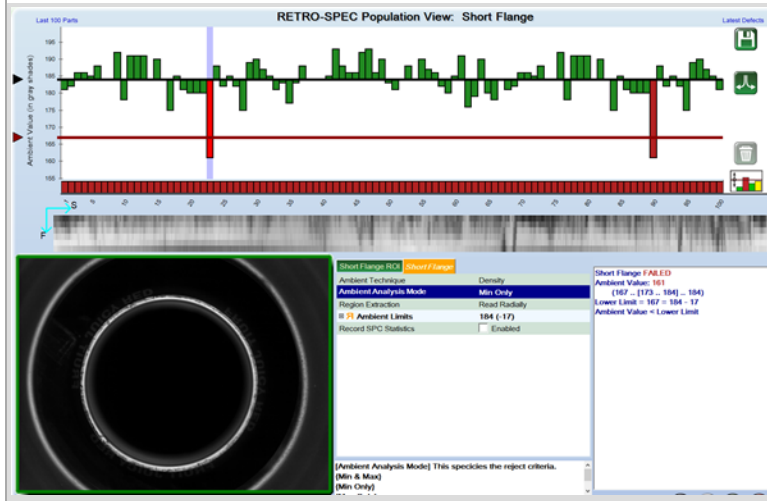
Double-click the Short Flange inspection to edit it.

To set up the inspection:

1. Change Ambient Analysis to Min Only.
2. Right-click over the Retro-Spec graph and select Auto Select Limits. This will set the inspection parameters to work with your part images.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Short Flange ROI	Short Flange
Ambient Technique	Density
Ambient Analysis Mode	Min Only
Region Extraction	Read Radially
<input checked="" type="checkbox"/> Ambient Limits	190 (-40)
Nominal	190
Record SPC Statistics	<input type="checkbox"/> Enabled

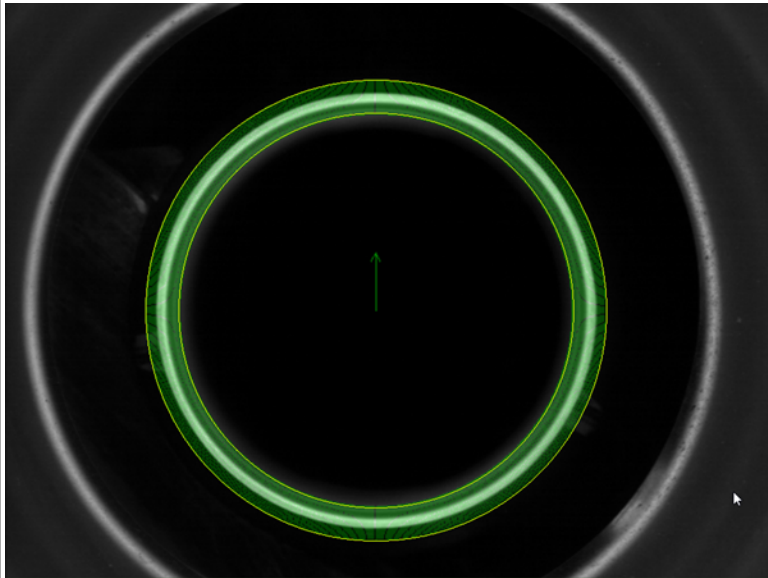
4. Select the OK button to save changes and exit.



This example shows the Short Flange inspection.

Place the Flange Dimension ROI

We will set up the location for the system to measure the flange.



Double-click the Flange Dim ROI name in the inspection tree to edit it.

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 about 10 pixels both inside and outside of the flange, allowing room for the system to search for the inner and outer edge.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

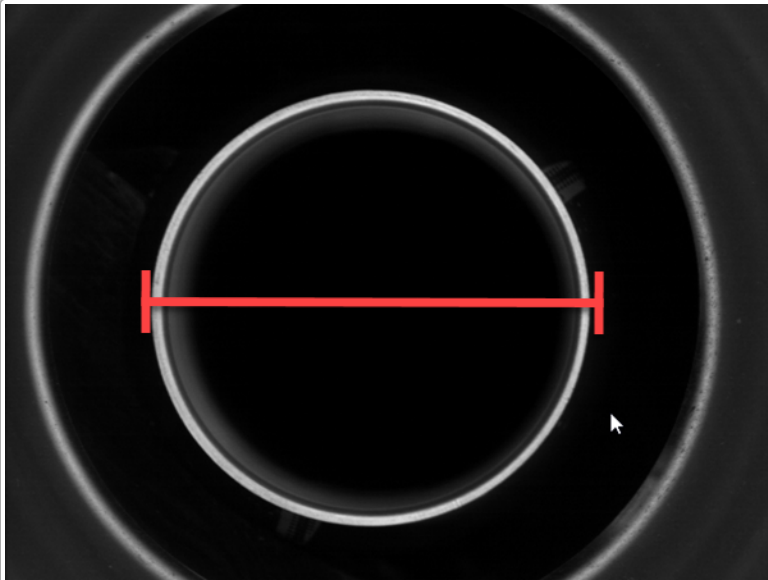
Flange Dim ROI	
X	0
Y	0
Inner Radius	164
Thickness	28
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Flange Dimension Inspection

Note: This inspection is optional, depending on your plant's quality requirements.

We are using a Measurement inspection to measure the flange. This inspection can detect ovality on a flange.



Before you start:

You will need a measurement of the outer flange. Use either your plant's specifications for the can, or use calipers to measure the diameter of a good can.

Keep this number handy while setting up the inspection.

In our example, we measured 2.6 inches.

Calibration

Flange Dim ROI **Flange Dim** Inner Outer Width Contrast

Learn Settings **Learn**

Fuzzy Edge Removal	Disabled
Feature Type	Borders: Both Dark
Feature Selection Logic	Highest Contrast
Border Sharpness	1 .. 9
Balance	1.0
Balance Side	Disabled
Sample Count	36
Allowed Gap Size	0 .. 0

Calibration

Flange Dim ROI Flange Dim Inner **Outer** Width Contrast

<input checked="" type="checkbox"/> Outer Diameter	2.6"
<input type="checkbox"/> Min/Max	2.6" +0.0"/ -0.27"
<input checked="" type="checkbox"/> Average	2.6" +0.01"/ -0.02"
<input type="checkbox"/> Range	0.41"
<input type="checkbox"/> Continuity	+0.21"/ -0.21"
Units	inch
Calibration Factor	1.0
Measured Distance	2.6"


Flange Dim ROI Flange Dim Inner Outer Width Contrast

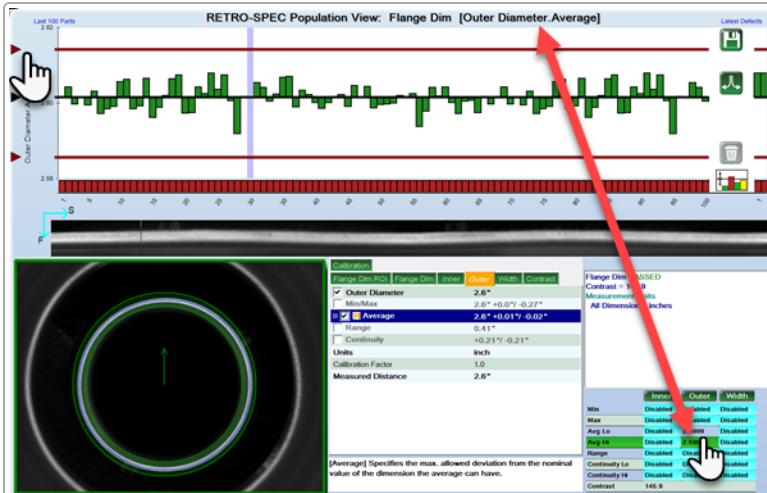
Calibration

Calibration Provider	Inspection Calibration
Dimension	Outer Diameter
Units	inch
Calibrate on Part	Calibrate on Part
Calibrate on Set A	Calibrate on Set A
Save Calibration	Save Calibration
Conversion Factor	0.0071

Double-click the Flange Dim (Measurement) inspection to edit it.

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 Flange Dim menu, select a Feature Type. We are using Borders: Both Dark in our example because the outside of the flange has dark pixels on both sides.
4. Go to the Outer menu and enable Outer Diameter.
5. Uncheck Min/Max, Range, and Continuity.
6. Select your desired units - the unit in which your part is typically measured by your quality department. Our example uses inches.
7. For Measured Distance, enter the measurement that the outer flange is supposed to have, according to your physical measurement.
8. Leave Inner and Width menus disabled.
9. Go to the Calibration menu. Select Inspection Calibration for Calibration Provider.
10. Select Outer Diameter for Dimension.
11. Change Units to your desired measurement unit.
12. Click the Calibrate on Part button. This will automatically set the Conversion Factor.
13. Go to the Flange Dim menu.
14. Select the Learn button. The system will automatically set the values in the measurement menus based on your part population.
15. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.



The average outer diameter is reported in the results window. Select a measurement to view the measurements of all the parts in the upper graph.

To test the inspection:

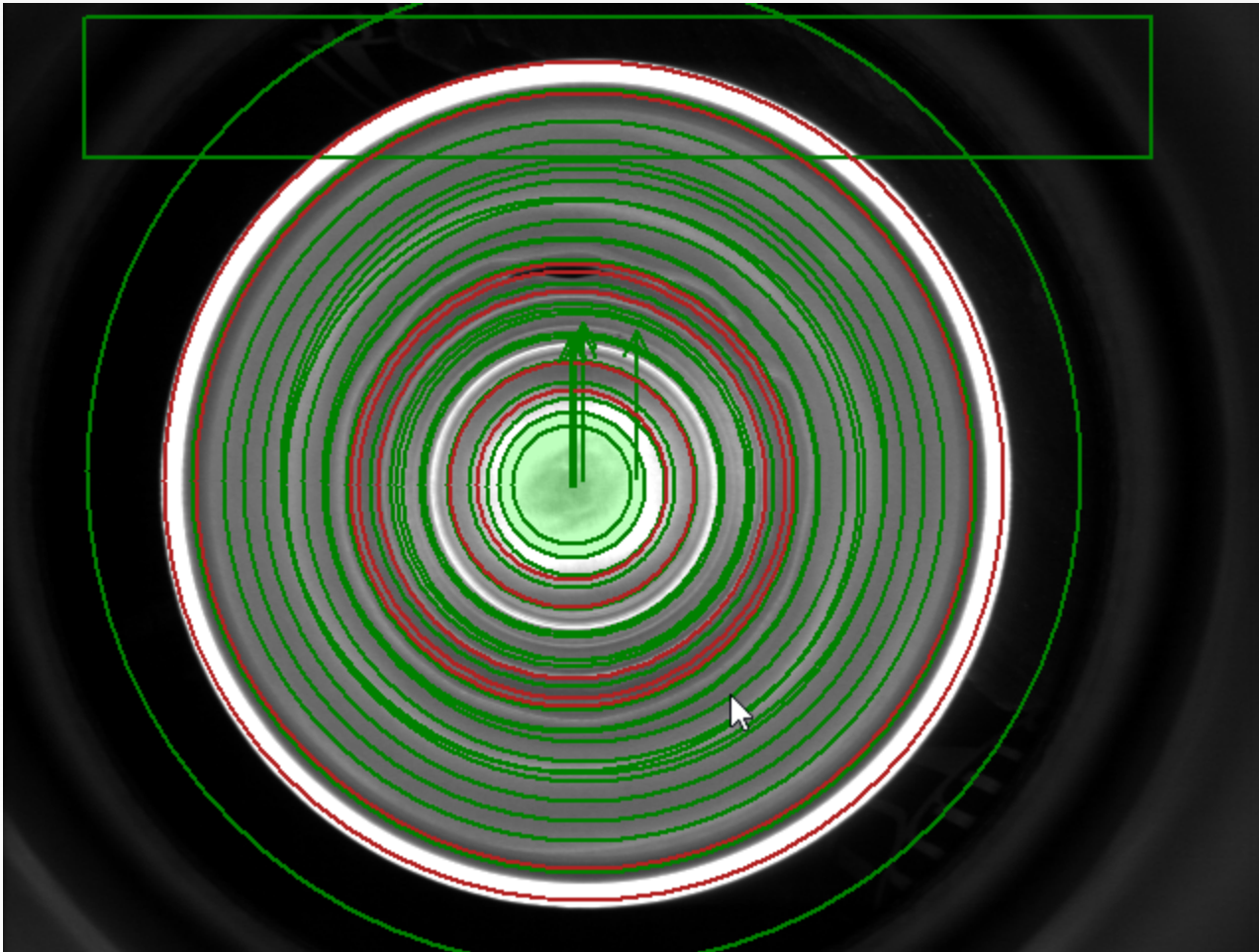
1. Scroll through the images to make sure parts are passing (or failing) as expected.
2. You can make the inspection more sensitive by moving the red horizontal bars on the Retro-Spec graph closer to center, or less sensitive by moving the red horizontal bars away from center.



Select the OK button to save changes and exit.

Module 12 Body Camera Inspections

This section covers how to set up all the body inspections. The picture below shows an image with all body inspection regions. We will set these up one at a time.

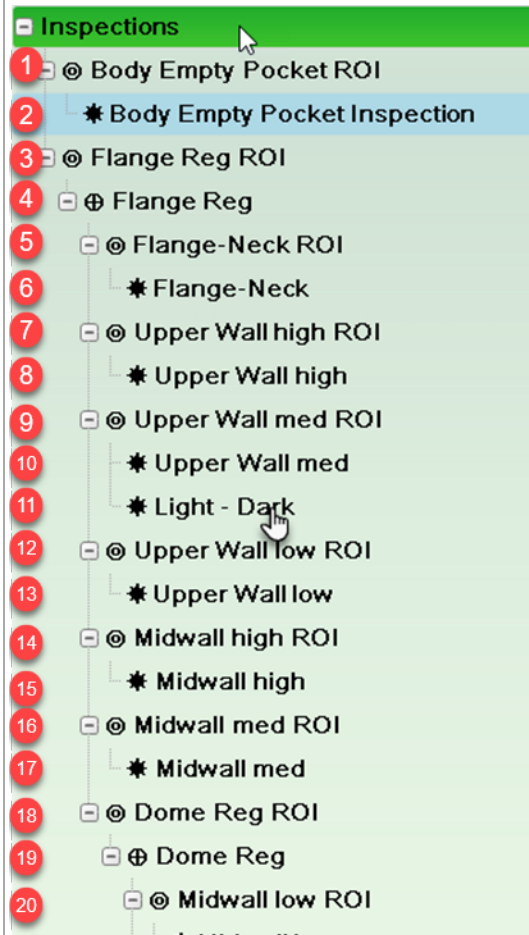


Create the Body Camera Inspection Tree

The steps below will guide you through the process of building the Body Camera 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. We are using names that correspond to the location on the part. Note that we will set up the regions and parameters later. For now, we will just build the inspection tree.

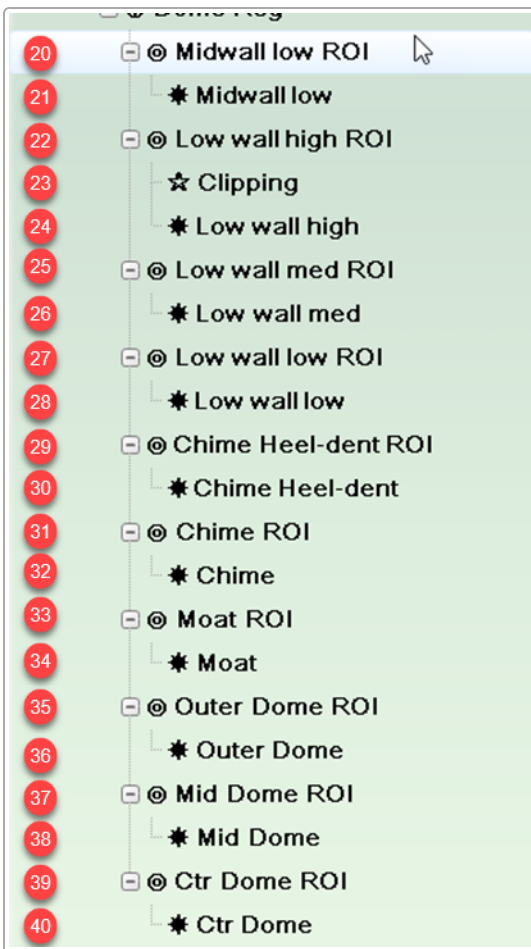
Note: After each step, select the OK button to save changes, and the Exit button to exit the inspection.

This is how the inspection tree will look



the inspection tree continues on the next page

1. **Inspections** Right-click Inspections. Add | Region | Ribbon. Rename it Body Empty Pocket ROI.
2. Right-click Body Empty Pocket ROI. Add | Analysis | Contrast. Rename it Body Empty Pocket Inspection.
3. **Inspections** Right-click Inspections. Add | Region | Ring. Rename it Flange Reg ROI.
4. Right-click Flange Reg ROI. Add | Registration | Radial Edge. Rename it Flange Reg.
5. Right-click Flange Reg. Add | Region | Ring. Rename it Flange-Neck ROI.
6. Right-click Flange-Neck ROI. Add | Analysis | Contrast. Rename it Flange-Neck.
7. Right-click Flange Reg. Add | Region | Ring. Rename it Upper Wall high ROI.
8. Right-click Upper Wall high ROI. Add | Analysis | Contrast. Rename it Upper Wall high.
9. Right-click Flange Reg. Add | Region | Ring. Rename it Upper Wall med ROI.
10. Right-click Upper Wall Med ROI. Add | Analysis | Contrast. Rename it Upper Wall med.
11. Right-click Upper Wall Med ROI. Add | Analysis | Ambient. Rename it Light - Dark.
12. Right-click Flange Reg. Add | Region | Ring. Rename it Upper Wall low ROI.
13. Right-click Upper Wall low ROI. Add | Analysis | Contrast. Rename it Upper Wall low.
14. Right-click Flange Reg. Add | Region | Ring. Rename it Midwall high ROI.
15. Right-click Midwall high ROI. Add | Analysis | Contrast. Rename it Midwall high.
16. Right-click Flange Reg. Add | Region | Ring. Rename it Midwall med ROI.
17. Right-click Midwall med ROI. Add | Analysis | Contrast. Rename it Midwall med.
18. Right-click Flange Reg. Add | Region | Ring. Rename it Dome Reg ROI.
19. Right-click Dome Reg ROI. Add | Registration | Radial Edge. Rename it Dome Reg.
20. Right-click Dome Reg. Add | Region | Ring. Rename it Midwall low ROI.
21. Right-click Midwall low ROI. Add | Analysis | Contrast. Rename it Midwall low.
22. Right-click Dome Reg. Add | Region | Ring. Rename it Low wall high ROI.



23. Right-click Low wall high ROI. Add | Enhancement | Clipping. Leave the name as is.
24. Right-click Low wall high ROI. Add | Analysis | Contrast. Rename it Low wall high.
25. Right-click Dome Reg. Add | Region | Ring. Rename it Low wall med ROI.
26. Right-click Low wall med ROI. Add | Analysis | Contrast. Rename it Low wall med.
27. Right-click Dome Reg. Add | Region | Ring. Rename it Low wall low ROI.
28. Right-click Low wall low ROI. Add | Analysis | Contrast. Rename it Low wall low.
29. Right-click Dome Reg. Add | Region | Ring. Rename it Chime Heel-dent ROI.
30. Right-click Chime Heel-dent ROI. Add | Analysis | Contrast. Rename it Chime Heel-dent.
31. Right-click Dome Reg. Add | Region | Ring. Rename it Chime ROI.
32. Right-click Chime ROI. Add | Analysis | Contrast. Rename it Chime.
33. Right-click Dome Reg. Add | Region | Ring. Rename it Moat ROI.
34. Right-click Moat ROI. Add | Analysis | Contrast. Rename it Moat.
35. Right-click Dome Reg. Add | Region | Ring. Rename it Outer Dome ROI.
36. Right-click Outer Dome ROI. Add | Analysis | Contrast. Rename it Outer Dome.
37. Right-click Dome Reg. Add | Region | Ring. Rename it Mid Dome ROI.
38. Right-click Mid Dome ROI. Add | Analysis | Contrast. Rename it Mid Dome.
39. Right-click Dome Reg. Add | Region | Ring. Rename it Ctr Dome ROI.
40. Right-click Ctr Dome ROI. Add | Analysis | Contrast. Rename it Ctr Dome.

Place the Body Empty Pocket Region of Interest (ROI)

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.

The type of region we are editing is Ribbon. In our inspection tree example, we renamed it "Body Empty Pocket ROI."

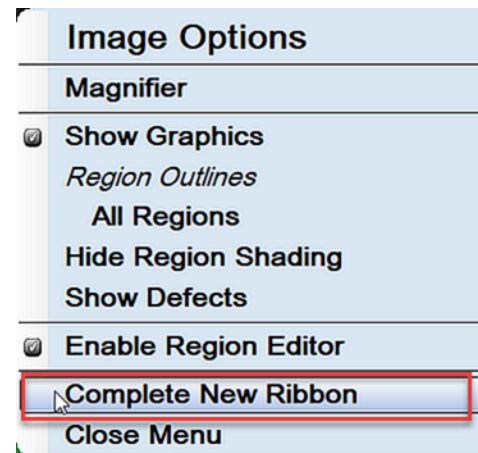


Double-click the name in the inspection tree to edit.

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.

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, making a thin ribbon across the top 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.



Body Empty Pocket ROI

Ribbon Style	Ribbon
Ribbon Width	71
Repeat Ribbons	<input type="checkbox"/> Enabled
Mirror Ribbon	<input type="checkbox"/> Enabled
Rotate Ribbon	0.0°
Expand or Contract	0

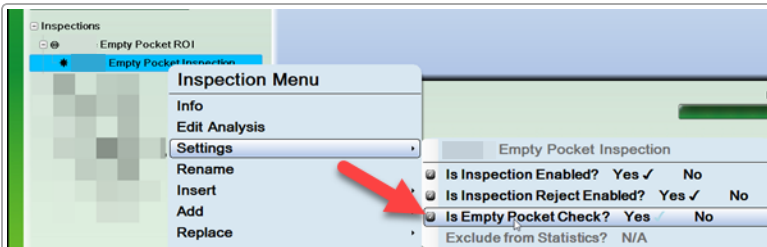
Make the ribbon wider as shown in our example.

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 Body Empty Pocket Inspection

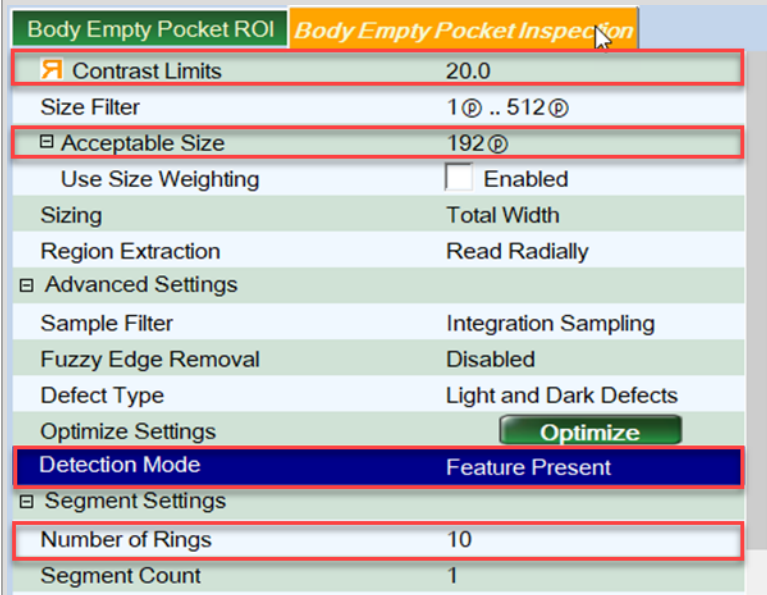
We will set up this inspection to detect some light pixels on the body of the can. If these light pixels do not appear, then the system will know that there is no can present, and therefore not run any further inspections.



In the Inspection Tree, right-click over the Body 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.

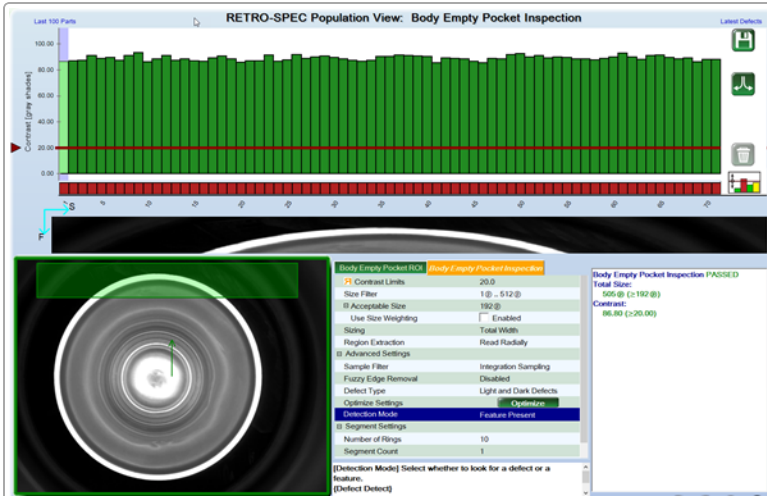
The name of the Empty Pocket inspection will have a blue background in the inspection tree.



Double-click the inspection name in the inspection tree. Pay attention to the parameters discussed below. Leave the remaining parameters at their default setting unless otherwise instructed by a Pressco representative.

To detect empty pockets:

1. Set Contrast Limits to approximately 20.
2. Set Acceptable Size to approximately 192.
3. For Detection Mode, select Feature Present from the drop-down menu.
4. Set the Number of Rings to 10.



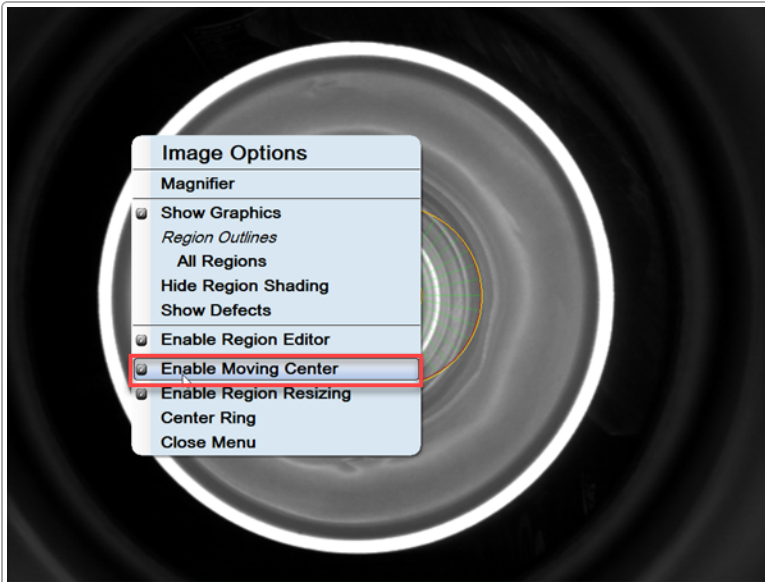
Images with parts in the field of view should pass the inspection. If a part was missing, it would fail.



Select the OK button to save changes and exit.

Place the Flange Reg ROI - Body Camera

We will set up the Region of Interest (ROI) so that the system knows where to search for the center of the can. Once this point is found, the remaining inspections are run to inspect the body of the can.



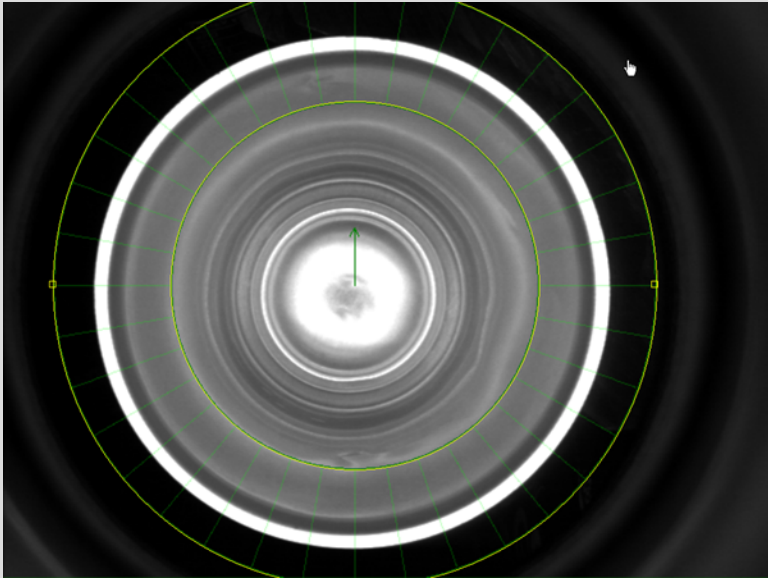
Double-click the name of the Flange Reg ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region to detect the transition from the dark area to the bright white area.

Since the can 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 edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it outside of the bright white area of the flange. Leave enough room to accommodate part movement from can to can. It is OK to leave part of the region falling outside of the image.
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 flange as shown to the left.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Flange Reg ROI	
X	-27
Y	-4
Inner Radius	153
Thickness	98
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Flange Registration - Body Camera

The Registration searches for edges, to find the true center of the flange. Since cans change position slightly from can to can, the registration finds the center for each can. Once this point is found, the remaining inspections are run to inspect the body.

The image displays three screenshots of a software interface for configuring Flange Registration. The first screenshot shows the 'Flange Reg ROI' tab with 'Flange Reg' selected. The 'Search Direction' checkbox is unchecked, and 'Use Subpixel' is checked. The second screenshot shows the 'Edge Location' tab with 'Edge Polarity' set to 'Dark-to-Light' and 'Use Subpixel' checked. The third screenshot shows the 'Target Circle' tab with a red arrow pointing to the 'Learn' button.

Flange Reg ROI	Flange Reg	Target Circle	Edge Location
Search Vector Count	36		
Search Direction	<input type="checkbox"/> Flipped		
Radial Tolerance	5		
Diagnosics	<input type="checkbox"/>		
Show Edges	<input checked="" type="checkbox"/> Enabled		
Reject Limits	<input type="checkbox"/>		
Qualifying Percent Limits	25.0		

Flange Reg ROI	Flange Reg	Target Circle	Edge Location
Edge Polarity	Dark-to-Light		
Edge Gradient	15 .. 30		
Edge Delta	2		
Edge Size	2		
Use Subpixel	<input checked="" type="checkbox"/> Enabled		

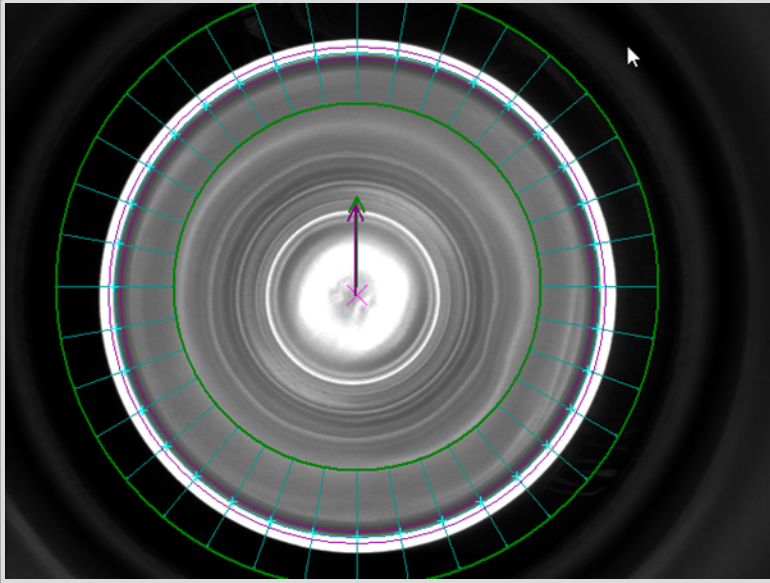
Flange Reg ROI	Flange Reg	Target Circle	Edge Location
Target Radius	202		
Learn	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Adapting Target Radius	<input type="checkbox"/> Enabled		

Double-click the name of the Flange Reg to edit it.

By default, the registration will likely fail due to not enough edges found.

To set up the registration:

1. In the Flange Reg menu, uncheck Flipped for Search Direction. This allows the system to search from inside the can towards outside the can. It will locate the inner edges of the flange.
2. Go to the Edge Location menu and select Dark-to-Light for Edge Polarity. This makes the system look for the bright flange.
3. Check Use Subpixel. This provides a more accurate location.
4. Go to the Target Circle tab. Click the Learn button. This allows the system to learn where the edges will fall.



The system should now find the edges of the flange.

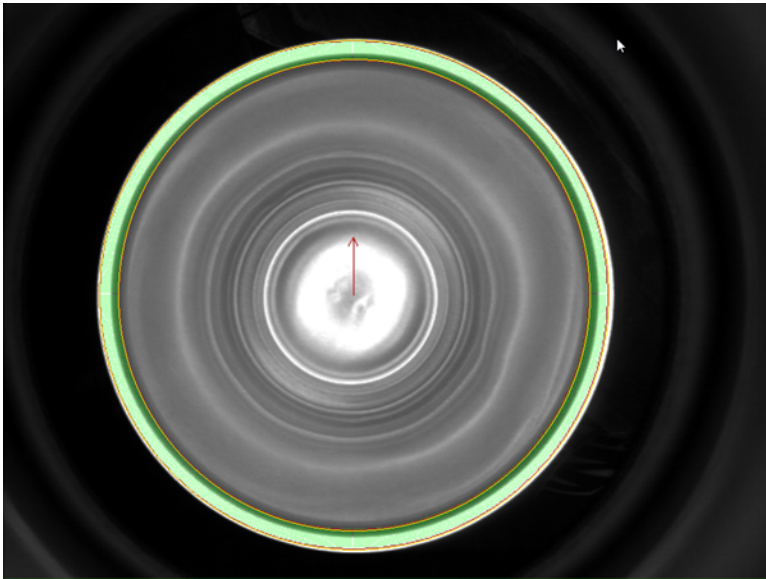
Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.



Select the OK button to save changes and exit.

Place the Flange-Neck ROI - Body Camera

We will set up the Region of Interest (ROI) for the Flange-Neck inspection placement.



The unwrapped region is shown below



Double-click the name of the Flange-Neck ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region to cover the flange and the very top of the neck.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it to the outside edge of the flange.
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 flange as shown to the left.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Flange Neck ROI	
X	0
Y	0
Inner Radius	196
Thickness	16
Use Arc Segments	<input type="checkbox"/> Enabled

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


Set up the Flange-Neck Inspection

We are using a Contrast inspection to find defects in the flange-neck transition.

Flange-Neck ROI	Flange-Neck
Contrast Limits	28.22
Size Filter	3 @ .. 52 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	4
Segment Count	1

Double-click the Flange-Neck inspection to edit it.

To set up the inspection:

1. Change Size Filter to a range from approximately 3 to 52 pixels
2. Change Number of Rings to 4.
3. Leave the remaining parameters at their default values.
4.  Select the OK button to save changes and exit.

RETRO-SPEC Population View: Flange-Neck

Contrast (gray values)

Flange Neck FAILED

Total Size: 6 @ (19.8)

Contrast: 28.20 (~28.22)

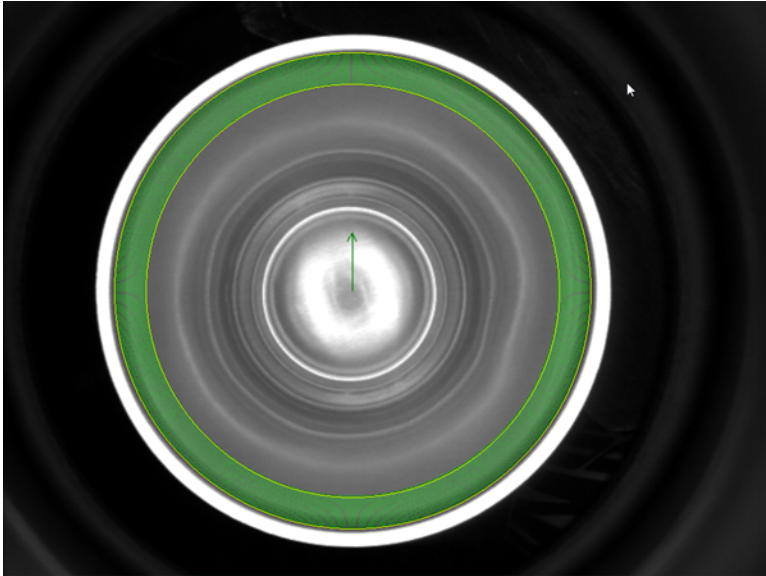
Flange-Neck ROI	Flange-Neck
Contrast Limits	28.22
Size Filter	3 @ .. 52 @
Acceptable Size	0 @
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	4
Segment Count	1

(Size Filter) Restricts the size to this range; defects (features) outside this range (too small or too large) are ignored. Only applies to variations along the F-direction.

This example shows a failed Flange-Neck inspection.

Place the Upper Wall high ROI

We will set up the Region of Interest (ROI) for the Upper Wall high inspection placement.



The unwrapped region is shown below



Double-click the name of the Upper Wall high ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region on the upper wall, very close to the neck, in the smooth area.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it inside of the flange.
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 to cover the upper wall as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Upper Wall high ROI	
X	0
Y	0
Inner Radius	172
Thickness	26
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Upper Wall high Inspection

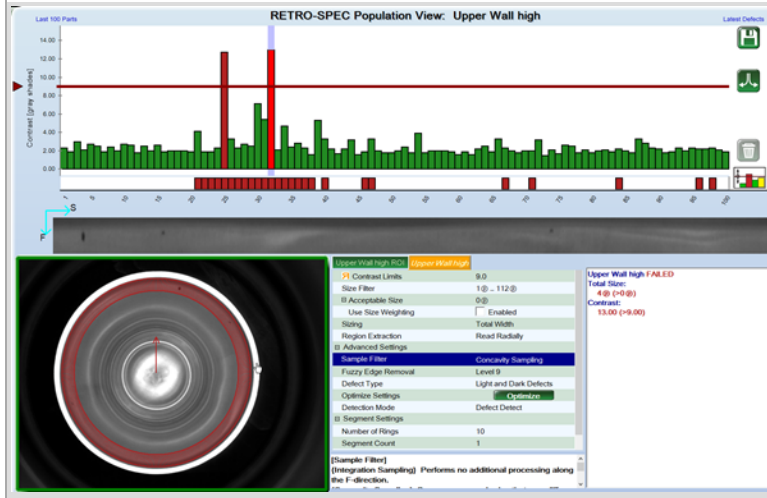
We are using a Contrast inspection to find defects in the upper wall.

Upper Wall high ROI	Upper Wall high
Contrast Limits	9.0
Size Filter	1 @ .. 112 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Concavity Sampling
Fuzzy Edge Removal	Level 9
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	10
Segment Count	1

Double-click the Upper Wall high inspection to edit it.

To set up the inspection:

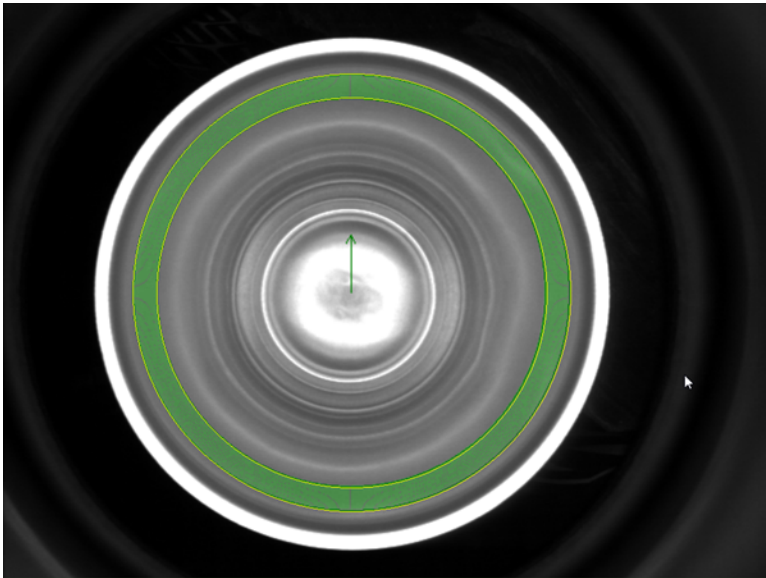
1. Change Contrast Limits to 9.
2. Change Size Filter to a range from approximately 1 to 112 pixels
3. Change Sample Filter to Concavity Sampling.
4. Change Fuzzy Edge Removal to Level 9.
5. Change Number of Rings to 10.
6. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
7. Select the OK button to save changes and exit.



This example shows a failed Upper Wall high inspection.

Place the Upper Wall med ROI

We will set up the Region of Interest (ROI) for the Upper Wall medium inspection placement.



The unwrapped region is shown below



Double-click the name of the Upper Wall med ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region on the upper wall, in the smooth area.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it to the upper wall as shown.
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 to cover the upper wall as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Upper Wall med ROI	
X	0
Y	0
Inner Radius	162
Thickness	20
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Upper Wall med Inspection

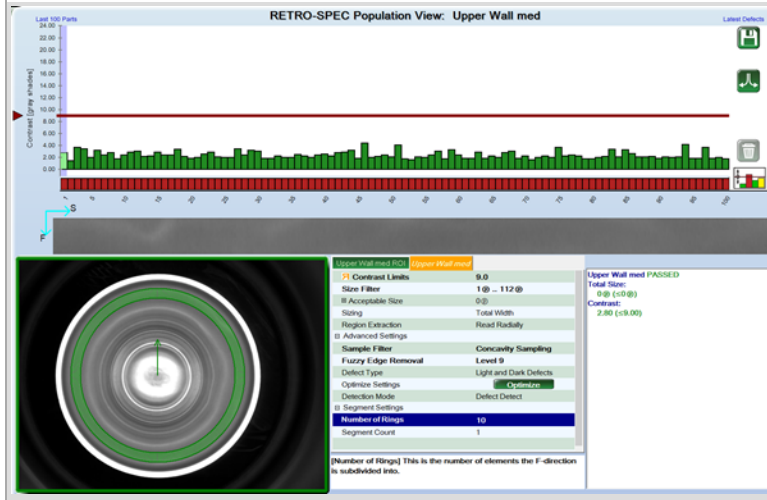
We are using a Contrast inspection to find defects in the upper wall.

Upper Wall med ROI		Upper Wall med	
Contrast Limits	9.0		
Size Filter	1 @ .. 112 @		
Acceptable Size	0 @		
Use Size Weighting	<input type="checkbox"/> Enabled		
Sizing	Total Width		
Region Extraction	Read Radially		
Advanced Settings			
Sample Filter	Concavity Sampling		
Fuzzy Edge Removal	Level 9		
Defect Type	Light and Dark Defects		
Optimize Settings	<input type="button" value="Optimize"/>		
Detection Mode	Defect Detect		
Segment Settings			
Number of Rings	10		
Segment Count	1		

Double-click the Upper Wall med inspection to edit it.

To set up the inspection:

1. Change Contrast Limits to 9.
2. Change Size Filter to a range from approximately 1 to 112 pixels
3. Change Sample Filter to Concavity Sampling.
4. Change Fuzzy Edge Removal to Level 9.
5. Change Number of Rings to 10.
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.



This is an example Upper Wall med inspection.

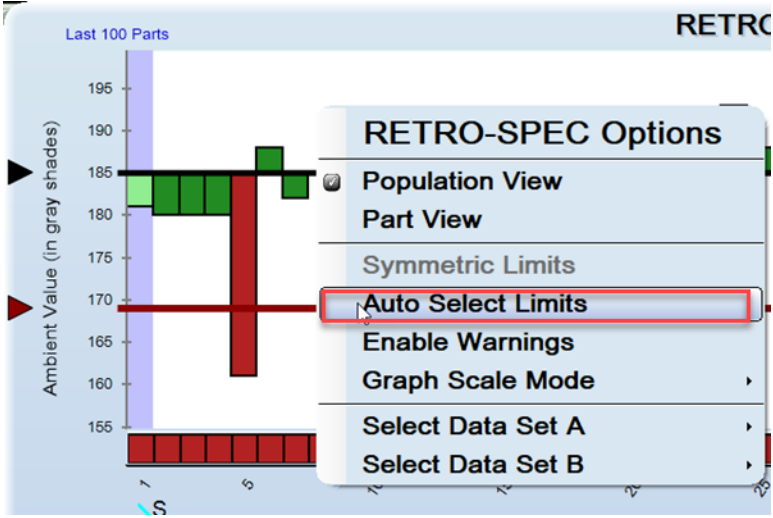
Set up the Upper Wall Light - Dark Inspection - Body Camera

We are using an Ambient inspection to find light or dark cans using the upper wall region. The purpose is to reject cans that are too bright or too dark.

Double-click the Light-Dark inspection to edit it.

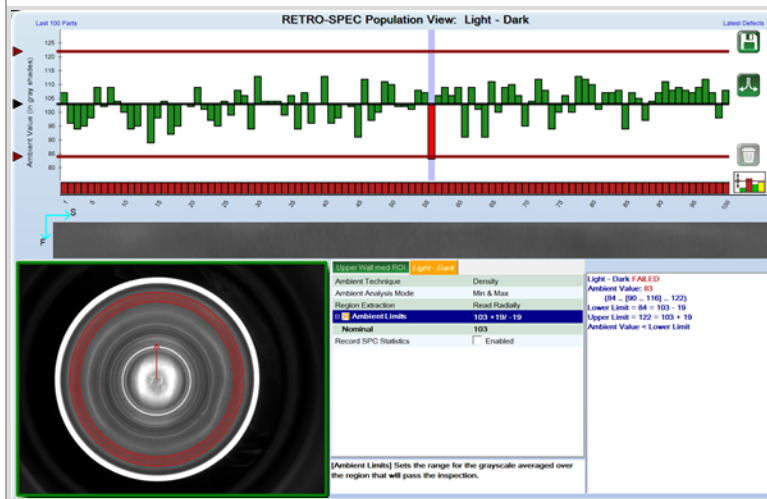
To set up the inspection:

1. Right-click over the Retro-Spec graph and select Auto Select Limits. This will set the inspection parameters to work with your part images.
2. 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.
3. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.



Upper Wall med ROI Light - Dark	
Ambient Technique	Density
Ambient Analysis Mode	Min & Max
Region Extraction	Read Radially
<input checked="" type="checkbox"/> Ambient Limits	115 +50/ -50
Nominal	115
Record SPC Statistics	<input type="checkbox"/> Enabled

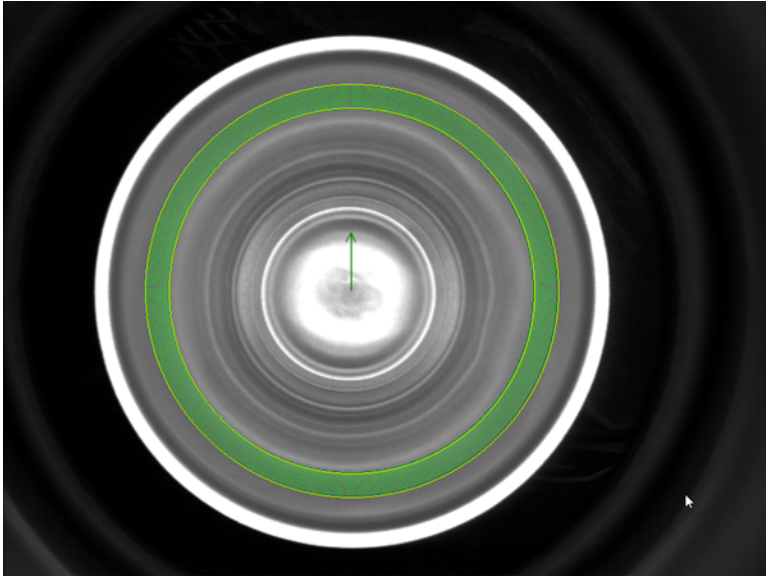
4.  Select the OK button to save changes and exit.



This example shows the Light-Dark inspection.

Place the Upper Wall low ROI

We will set up the Region of Interest (ROI) for the Upper Wall low inspection placement.



The unwrapped region is shown below



Double-click the name of the Upper Wall low ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region on lower area of the upper wall.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it to the upper wall as shown.
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 to cover the upper wall as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Upper Wall low ROI	
X	0
Y	0
Inner Radius	152
Thickness	20
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Upper Wall low Inspection - Body Camera

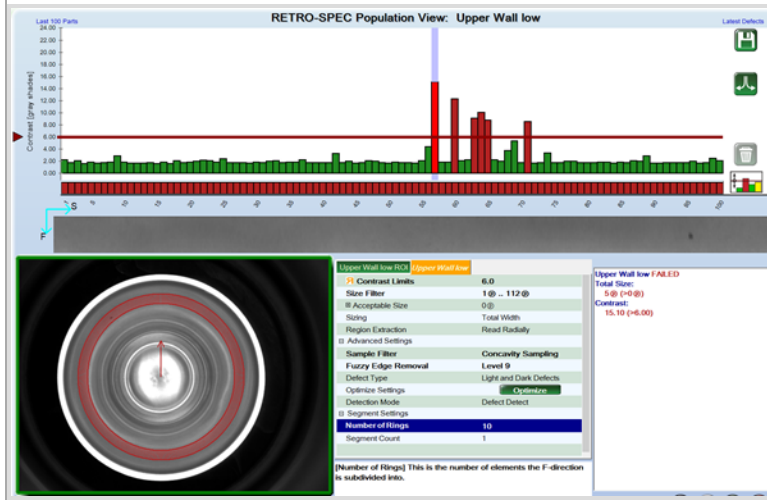
We are using a Contrast inspection to find defects in the lower area of the upper wall. This inspection is set up to ignore the smooth bright reflections from the dome, but still detect defects, especially body creases.

Upper Wall low ROI	Upper Wall low
Contrast Limits	6.0
Size Filter	1 @ .. 112 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Concavity Sampling
Fuzzy Edge Removal	Level 9
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	10
Segment Count	1

Double-click the Upper Wall low inspection to edit it.

To set up the inspection:

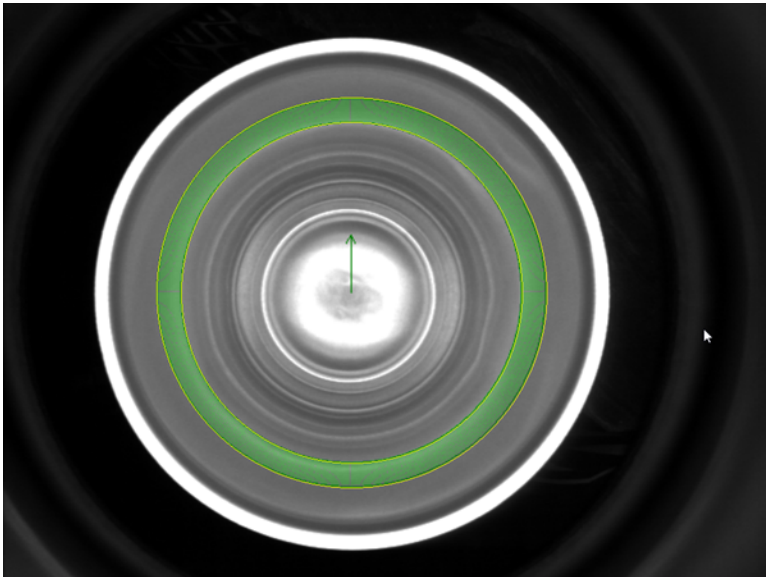
1. Change Contrast Limits to approximately 6.
2. Change Size Filter to a range from approximately 1 to 112 pixels
3. Change Sample Filter to Concavity Sampling.
4. Change Fuzzy Edge Removal to Level 9.
5. Change Number of Rings to 10.
6. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
7. Select the OK button to save changes and exit.



This is an example Upper Wall low inspection.

Place the Midwall high ROI

We will set up the Region of Interest (ROI) for the Midwall high inspection placement.



The unwrapped region is shown below



Double-click the name of the Midwall high ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region at the beginning of the reflection from the dome.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it to the midwall as shown.
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 to cover the midwall as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Midwall high ROI	
X	0
Y	0
Inner Radius	142
Thickness	20
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Midwall high Inspection - Body Camera

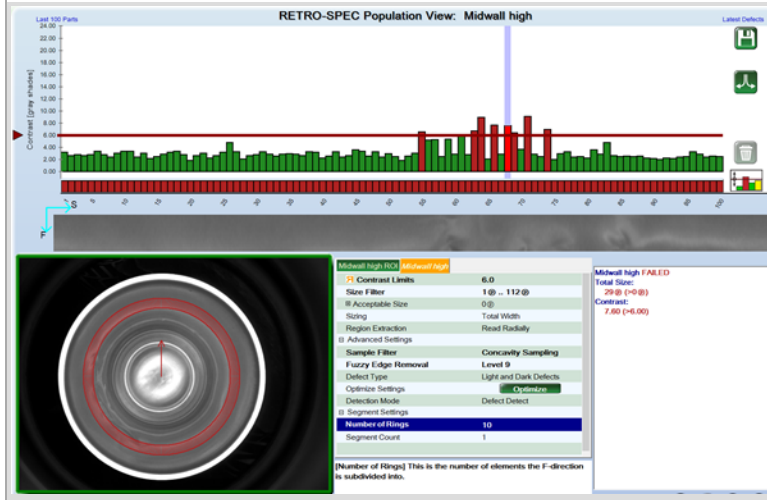
We are using a Contrast inspection to find defects in the mid wall.

Contrast Limits	6.0
Size Filter	1 @ .. 112 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Concavity Sampling
Fuzzy Edge Removal	Level 9
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	10
Segment Count	1

Double-click the Midwall high inspection to edit it.

To set up the inspection:

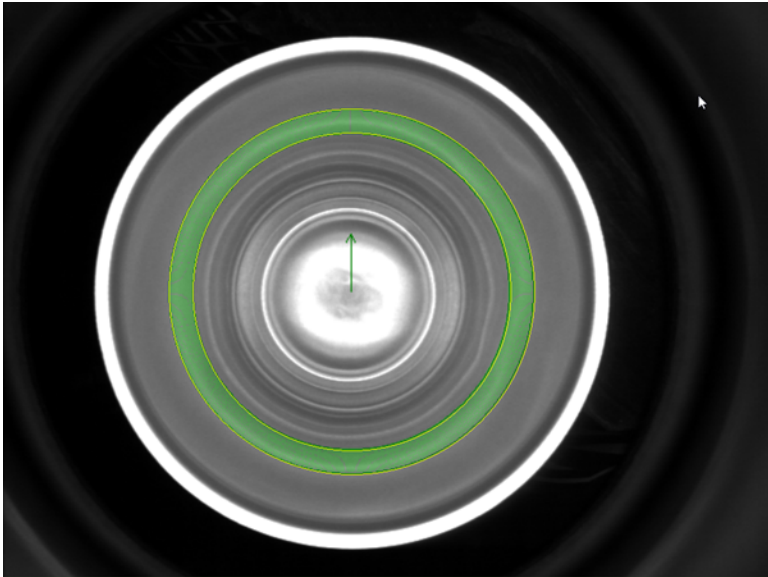
1. Change Contrast Limits to approximately 6.
2. Change Size Filter to a range from approximately 1 to 112 pixels
3. Change Sample Filter to Concavity Sampling.
4. Change Fuzzy Edge Removal to Level 9.
5. Change Number of Rings to 10.
6. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup..
7. Select the OK button to save changes and exit.



This is an example Midwall high inspection.

Place the Midwall med ROI

We will set up the Region of Interest (ROI) for the Midwall med inspection placement.



The unwrapped region is shown below



Double-click the name of the Midwall med ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region at the beginning of the reflection from the dome.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it to the mid wall as shown.
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 to cover the mid wall as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Midwall med ROI	
X	0
Y	0
Inner Radius	132
Thickness	20
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Midwall med Inspection - Body Camera

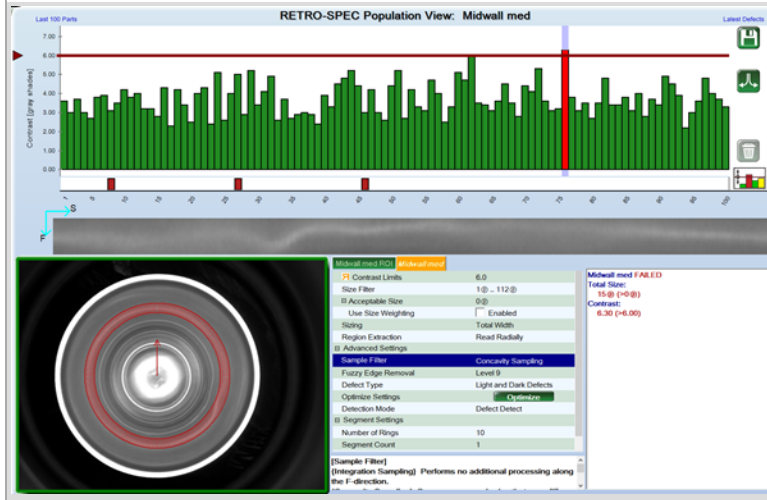
We are using a Contrast inspection to find defects in the mid wall.

Contrast Limits	6.0
Size Filter	1 @ .. 112 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Concavity Sampling
Fuzzy Edge Removal	Level 9
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	10
Segment Count	1

Double-click the Midwall med inspection to edit it.

To set up the inspection:

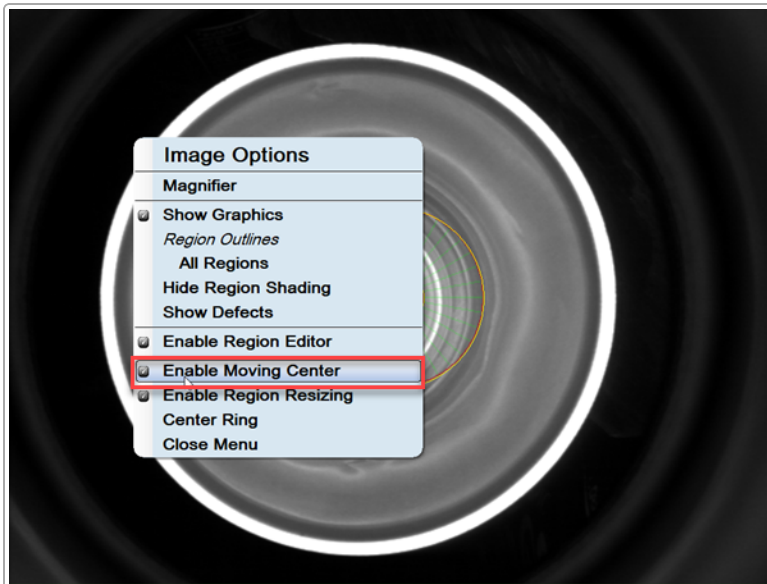
1. Change Contrast Limits to approximately 6.
2. Change Size Filter to a range from approximately 1 to 112 pixels
3. Change Sample Filter to Concavity Sampling.
4. Change Fuzzy Edge Removal to Level 9.
5. Change Number of Rings to 10.
6. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
7. Select the OK button to save changes and exit.



This is an example Midwall med inspection.

Place the Dome Reg ROI - Body Camera

We will set up the Region of Interest (ROI) so that the system knows where to search for the 'true' center of the dome. Once this point is found, the remaining lower wall and bottom can inspections run.



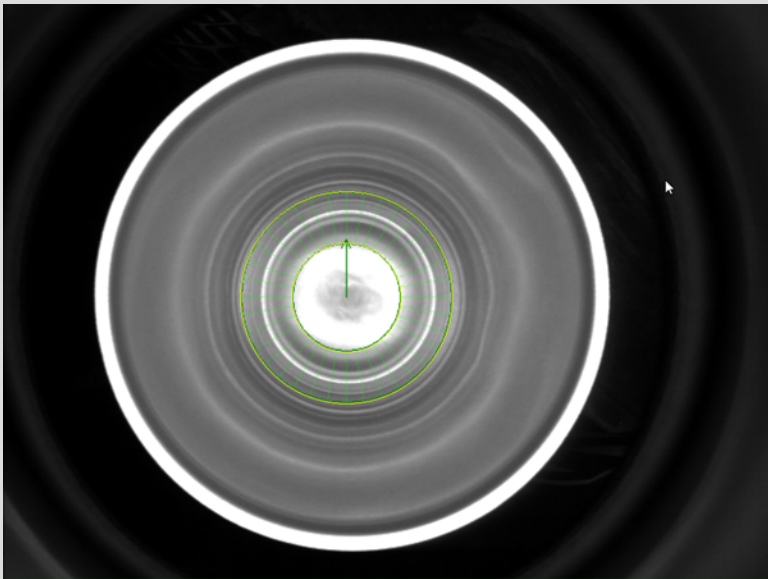
Double-click the name of the Dome Reg ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region to detect the transition from the dark area to the bright white area.

Since the can 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).




The unwrapped region is shown below



To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it outside of the bright white area of the moat. Leave enough room to accommodate part movement from can to can. It is OK to leave part of the region falling outside of the image.
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 moat as shown to the left.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Dome Reg ROI	
X	-4
Y	3
Inner Radius	45
Thickness	43
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Dome Registration - Body Camera

The Registration searches for edges, to find the true center of the dome. Since cans change position slightly from can to can, the registration finds the center for each can. Once this point is found, the remaining inspections are run to inspect the body.

The image shows three screenshots of the Dome Registration configuration interface. The first screenshot shows the 'Dome Reg' tab with 'Search Direction' set to 'Flipped'. The second screenshot shows the 'Edge Location' tab with 'Edge Polarity' set to 'Dark-to-Light' and 'Edge Gradient' set to '15..60'. The third screenshot shows the 'Target Circle' tab with 'Target Radius' set to '69' and a 'Learn' button highlighted with a red arrow.

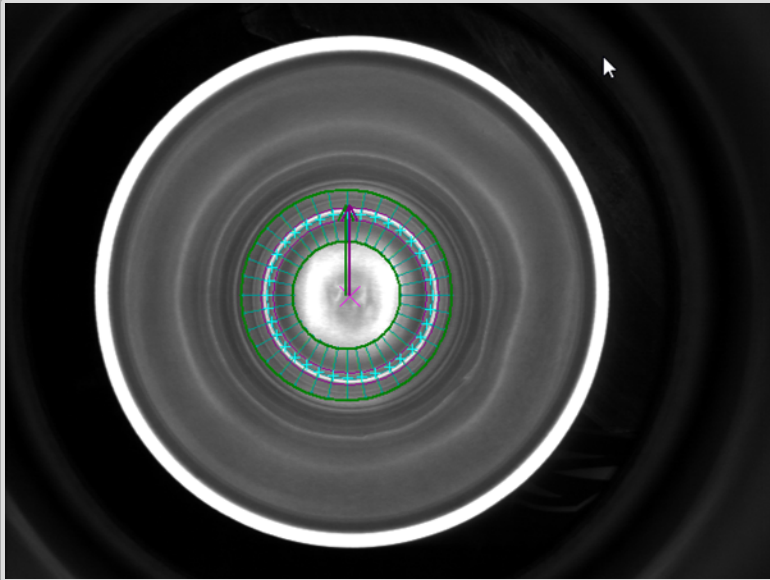
Tab	Property	Value
Dome Reg	Search Vector Count	36
	Search Direction	Flipped
	Radial Tolerance	5
	Qualifying Percent Limits	25.0
Edge Location	Edge Polarity	Dark-to-Light
	Edge Gradient	15..60
	Edge Delta	2
	Edge Size	2
Target Circle	Target Radius	69
	Learn	Learn
	Adapting Target Radius	Enabled

Double-click the name of the Dome Reg to edit it.

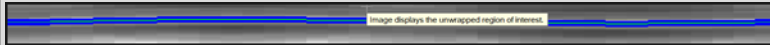
By default, the registration will likely fail due to not enough edges found.

To set up the registration:

1. In the Dome Reg menu, uncheck Flipped for Search Direction. This allows the system to search from inside the can towards outside the can. It will locate the bright edges of the moat.
2. Go to the Edge Location menu and select Dark-to-Light for Edge Polarity. This makes the system look for the bright moat.
3. Change the Edge Gradient to allow a wider change in gray shades.
4. Go to the Target Circle tab. Click the Learn button. This allows the system to learn where the edges will fall.



The unwrapped region is shown below



The system should now find the edges of the moat.

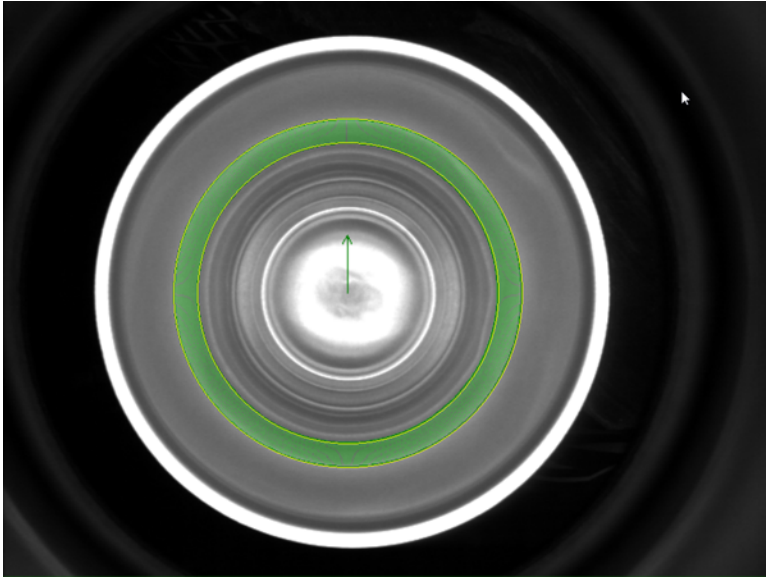
Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.



Select the OK button to save changes and exit.

Place the Midwall low ROI - Body Camera

We will set up the Region of Interest (ROI) for the Midwall low ROI inspection placement.



The unwrapped region is shown below



Double-click the name of the Midwall low ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region below the dome reflection, but just above the chime/ moat reflection.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it to the midwall as shown.
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 to cover the mid wall as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Midwall low ROI	
X	0
Y	0
Inner Radius	125
Thickness	20
Use Arc Segments	<input type="checkbox"/> Enabled

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


Set up the Midwall low Inspection - Body Camera

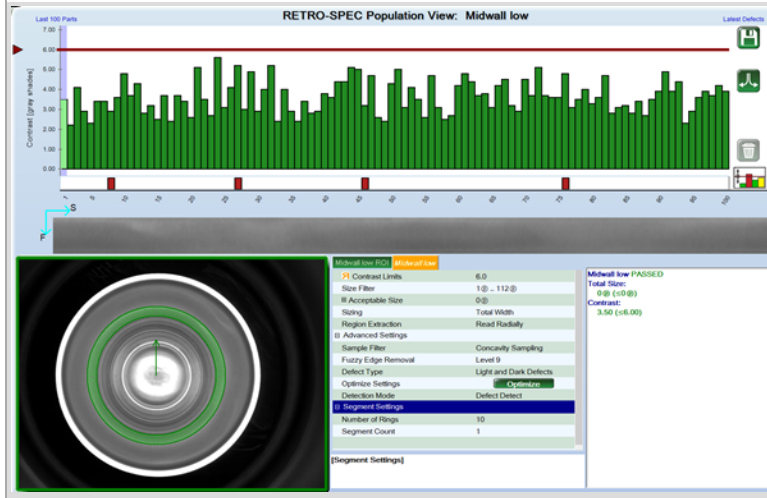
We are using a Contrast inspection to find defects in the mid wall.

Midwall low ROI	Midwall low
Contrast Limits	6.0
Size Filter	1 @ .. 112 @
Acceptable Size	0 @
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Concavity Sampling
Fuzzy Edge Removal	Level 9
Defect Type	Light and Dark Defects
Optimize Settings	Optimize
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	10
Segment Count	1

Double-click the Midwall low inspection to edit it.

To set up the inspection:

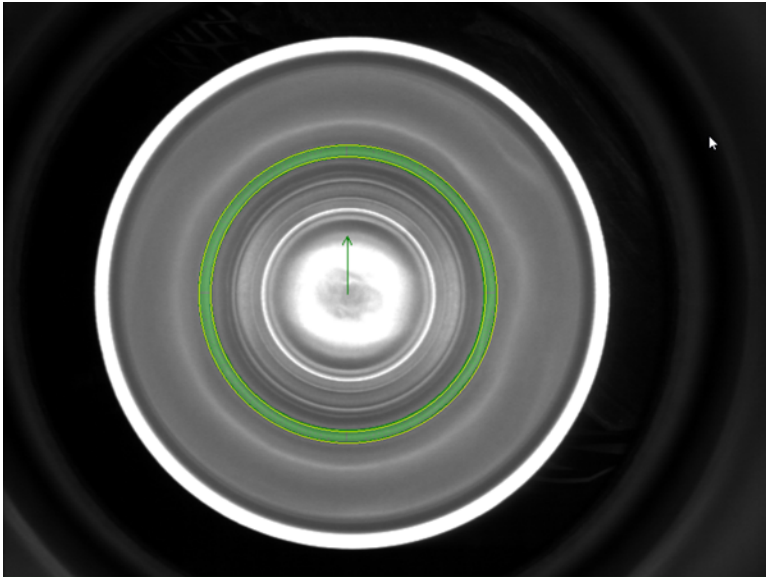
1. Change Contrast Limits to approximately 6.
2. Change Size Filter to a range from approximately 1 to 112 pixels
3. Change Sample Filter to Concavity Sampling.
4. Change Fuzzy Edge Removal to Level 9.
5. Change Number of Rings to 10.
6. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
7.  Select the OK button to save changes and exit.



This is an example Midwall low inspection.

Place the Low wall high ROI - Body Camera

We will set up the Region of Interest (ROI) for the Low wall high inspection placement.



The unwrapped region is shown below



Double-click the name of the Low Wall high ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region on the lower wall, directly on the chime/moat reflection line.

To edit the region:

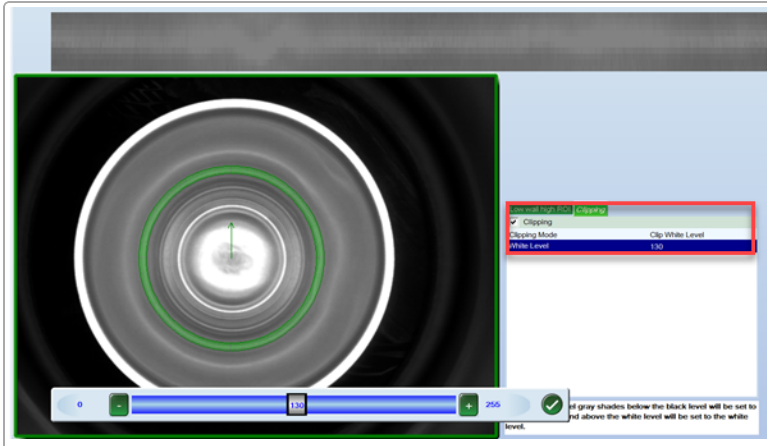
1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it outside of the chime reflection area.
3. Click in the center of the region. You will see yellow boxes on the inner region border.
4. Drag one of the yellow boxes to inside of the chime reflection area as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Low wall high ROI	
X	0
Y	0
Inner Radius	114
Thickness	10
Use Arc Segments	<input type="checkbox"/> Enabled

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


Set up Clipping for Low wall high Inspection

We use Clipping to reduce reflections that may occur if the surface is shiny.



Double-click the name of Clipping in the inspection tree to edit it.

To set up Clipping:

1. In the Clipping tab, enable Clipping.
2. Set Clipping Mode to Clip White Level.
3. Set White Level to 130.
4.  Select the OK button to save changes and exit.


Set up the Low wall high Inspection - Body Camera

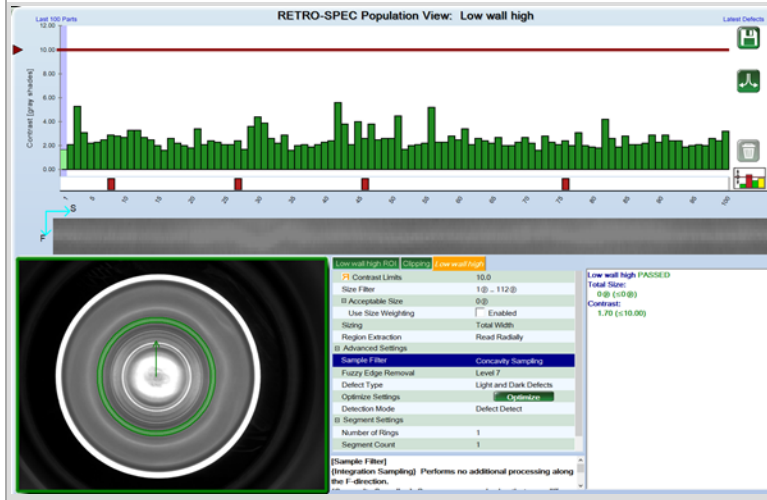
We are using a Contrast inspection to find defects in the low wall.

Low wall high ROI	Clipping	Low wall high
Contrast Limits	10.0	
Size Filter	1 @ .. 112 @	
Acceptable Size	0 @	
Use Size Weighting	<input type="checkbox"/> Enabled	
Sizing	Total Width	
Region Extraction	Read Radially	
Advanced Settings		
Sample Filter	Concavity Sampling	
Fuzzy Edge Removal	Level 7	
Defect Type	Light and Dark Defects	
Optimize Settings	<input type="button" value="Optimize"/>	
Detection Mode	Defect Detect	
Segment Settings		
Number of Rings	1	
Segment Count	1	

Double-click the Low wall high inspection to edit it.

To set up the inspection:

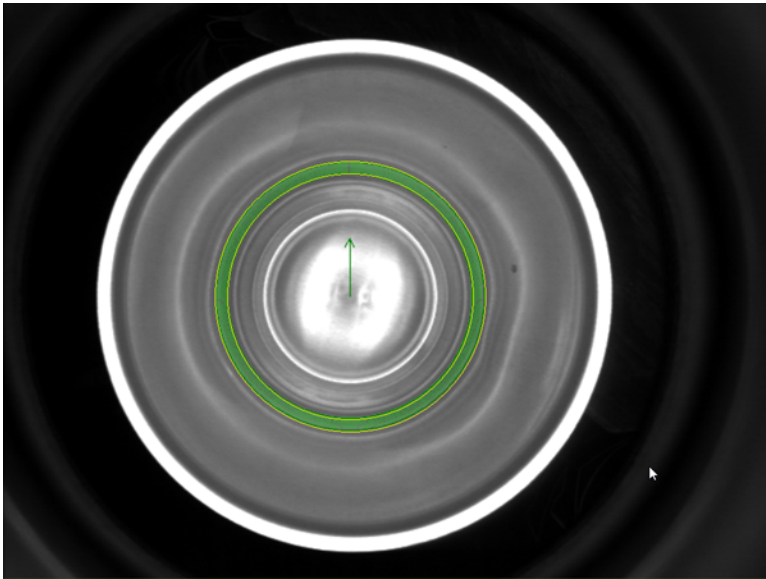
1. Change Contrast Limits to approximately 10.
2. Change Size Filter to a range from approximately 1 to 112 pixels
3. Change Sample Filter to Concavity Sampling.
4. Change Fuzzy Edge Removal to Level 7.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
6.  Select the OK button to save changes and exit.



This is an example Low wall high inspection.

Place the Low wall med ROI - Body Camera

We will set up the Region of Interest (ROI) for the Low wall med inspection placement.



The unwrapped region is shown below



Double-click the name of the Low Wall med ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region on the lower wall, before the chime/moat reflection line into the smooth area.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it before the chime reflection area.
3. Click in the center of the region. You will see yellow boxes on the inner region border.
4. Set the inner region border several pixels inside of the outer border as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Low wall med ROI	
X	0
Y	0
Inner Radius	102
Thickness	10
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Low wall med Inspection - Body Camera


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

The screenshot shows the 'Low wall med ROI' settings panel. The 'Contrast Limits' and 'Sample Filter' settings are highlighted with red boxes. The 'Number of Rings' is set to 3.

Contrast Limits	6.0
Size Filter	2 @ .. 30 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Concavity Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	3
Segment Count	1

Double-click the Low wall med inspection to edit it.

To set up the inspection:

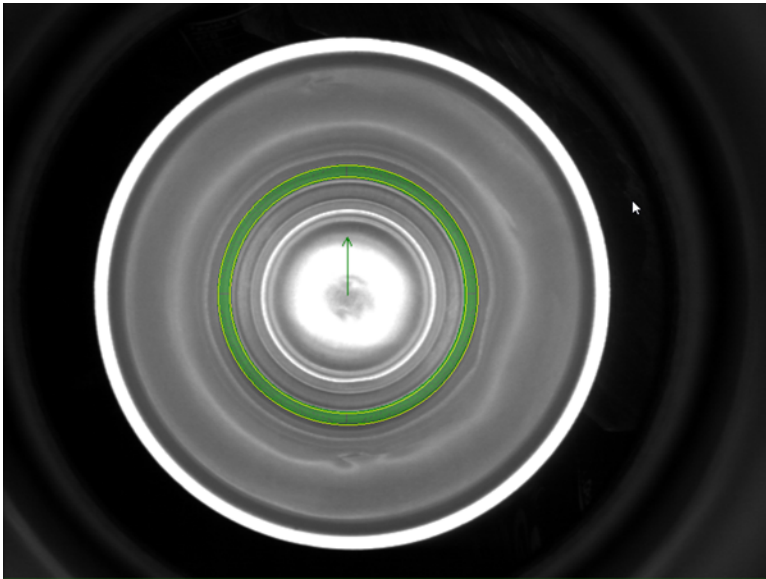
1. Change Contrast Limits to approximately 6.
2. Change Size Filter to a range from approximately 2 to 30 pixels.
3. Change Sample Filter to Concavity Sampling.
4. Set the Number of Rings to 3.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
6.  Select the OK button to save changes and exit.

The screenshot shows the 'RETRO-SPEC Population View: Low wall med'. It features a histogram of contrast values for 150 parts. A red vertical line indicates the current contrast limit. Below the histogram is a circular image of the part being inspected, with a red circle highlighting the low wall area. The settings panel on the right shows the current configuration, which matches the settings shown in the previous screenshot. A 'Low wall med FAILED' message is visible in the bottom right corner.

This is an example Low wall med inspection.

Place the Low wall low ROI - Body Camera

We will set up the Region of Interest (ROI) for the Low wall low inspection placement.



The unwrapped region is shown below



Double-click the name of the Low Wall low ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region on the lowest point of the wall into the smooth area.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it to the low wall.
3. Click in the center of the region. You will see yellow boxes on the inner region border.
4. Set the inner region border so that the lowest part of the wall is covered as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Low wall low ROI	
X	0
Y	0
Inner Radius	98
Thickness	10
Use Arc Segments	<input type="checkbox"/> Enabled

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


Set up the Low wall low Inspection - Body Camera

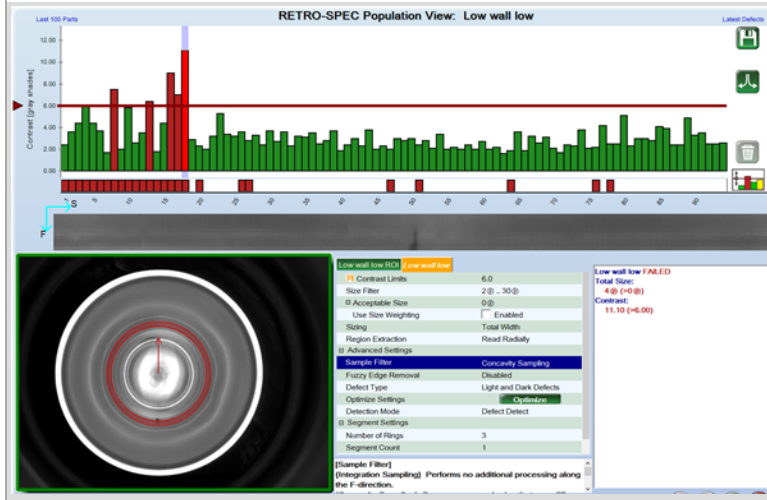
We are using a Contrast inspection to find defects in the lowest part of the wall.

Contrast Limits	6.0
Size Filter	2 @ .. 30 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Concavity Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	Optimize
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	3
Segment Count	1

Double-click the Low wall low inspection to edit it.

To set up the inspection:

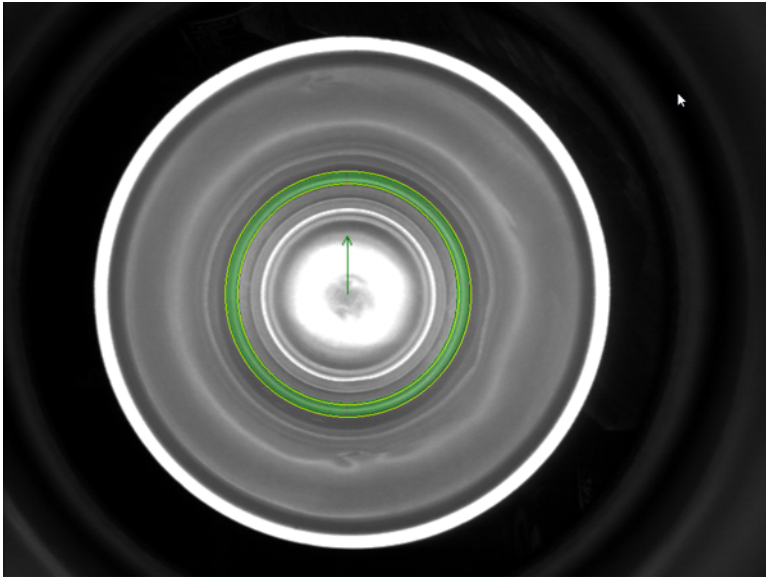
1. Change Contrast Limits to approximately 6.
2. Change Size Filter to a range from approximately 2 to 30 pixels.
3. Change Sample Filter to Concavity Sampling.
4. Set the Number of Rings to 3.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
6.  Select the OK button to save changes and exit.



This is an example Low wall low inspection.

Place the Chime Heel-dent ROI - Body Camera

We will set up the Region of Interest (ROI) for the Chime Heel-dent inspection placement.



The unwrapped region is shown below



Double-click the name of the Chime Heel-dent ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region at the edge of the bell/chime (corner of the can).

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it to edge of the bell/chime.
3. Click in the center of the region. You will see yellow boxes on the inner region border.
4. Set the inner region border inside the bell/chime as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Chime Heel-dent ROI	
X	0
Y	0
Inner Radius	92
Thickness	10
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Chime Heel-dent Inspection - Body Camera

We are using a Contrast inspection to find defects on the chime. This inspection only looks for darker gray shades than the bell/chime.

Chime Heel-dent ROI	Chime Heel-dent
Contrast Limits	10.0
Size Filter	2 @ .. 30 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	3
Segment Count	1

Double-click the Chime Heel-dent inspection to edit it.

To set up the inspection:

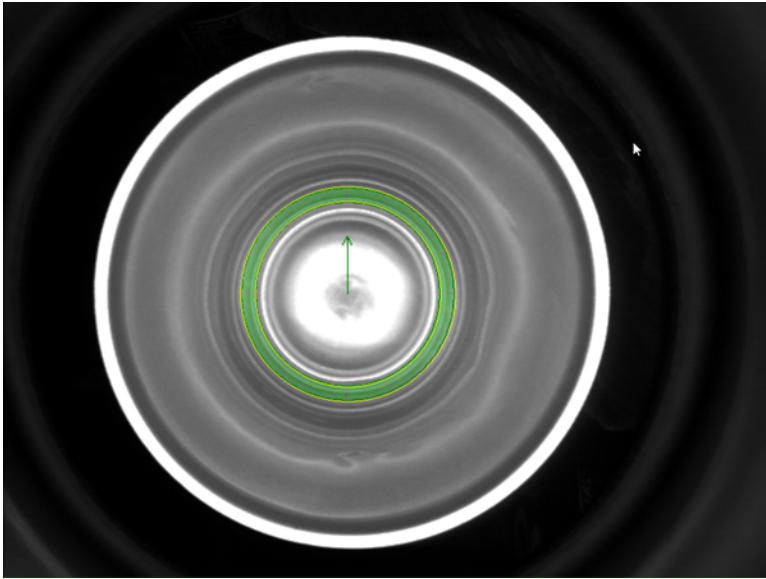
1. Change Contrast Limits to approximately 10.
2. Change Size Filter to a range from approximately 2 to 30 pixels.
3. Set the Number of Rings to 3.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
5. Select the OK button to save changes and exit.



This is an example Chime Heel-dent inspection.

Place the Chime ROI - Body Camera

We will set up the Region of Interest (ROI) for the Chime inspection placement.



The unwrapped region is shown below



Double-click the name of the Chime ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region over the chime.

To edit the region:

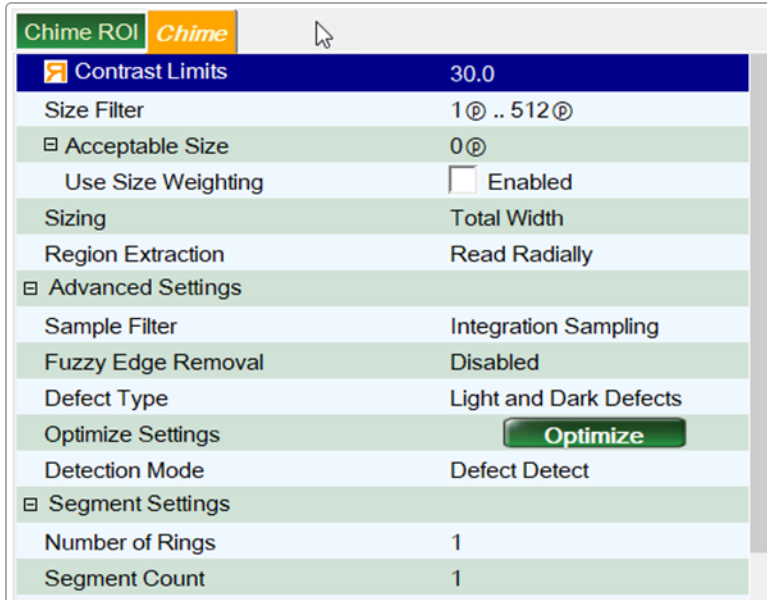
1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it outside of the chime.
3. Click in the center of the region. You will see yellow boxes on the inner region border.
4. Set the inner region border inside the chime as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Chime ROI	
X	0
Y	0
Inner Radius	77
Thickness	12
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Chime Inspection - Body Camera


We are using a Contrast inspection to find defects on the chime. This inspection only looks for darker gray shades than the bell/chime.

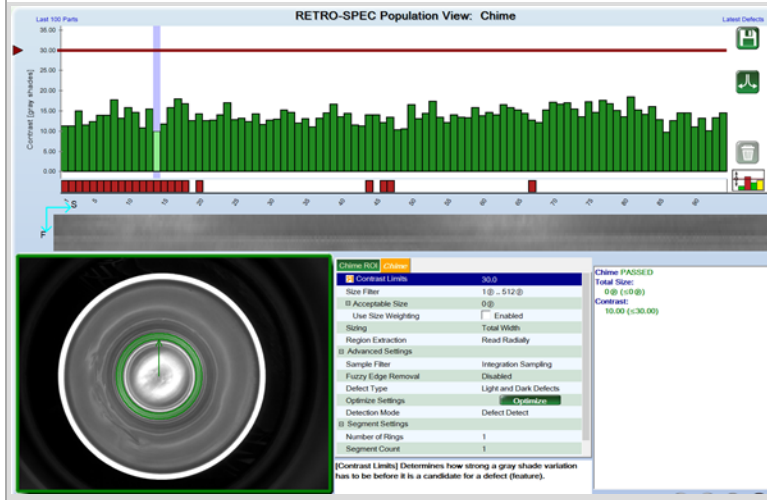


Chime ROI	Chime
Contrast Limits	30.0
Size Filter	1 @ .. 512 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	Optimize
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	1
Segment Count	1

Double-click the Chime inspection to edit it.

To set up the inspection:

1. Leave the remaining 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.



RETRO-SPEC Population View: Chime

Contrast (gray shades)

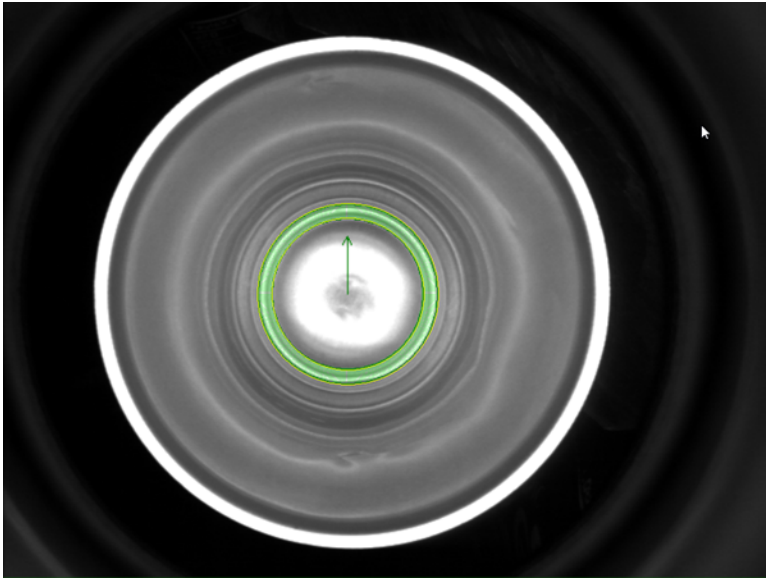
Chime PASSED
Total Size: 0 @ (0 @)
Contrast: 10.00 (<30.00)

[Contrast Limits] Determines how strong a gray shade variation has to be before it is a candidate for a defect (feature).

This is an example Chime inspection.

Place the Moat ROI - Body Camera

We will set up the Region of Interest (ROI) for the Moat inspection placement.



The unwrapped region is shown below



Double-click the name of the Moat ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region at the edge of the dome, across the moat, and into the chime.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it into the chime area.
3. Click in the center of the region. You will see yellow boxes on the inner region border.
4. Set the inner region border at the edge of the moat.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Moat ROI	
X	0
Y	0
Inner Radius	63
Thickness	12
Use Arc Segments	<input type="checkbox"/> Enabled

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


Set up the Moat Inspection - Body Camera

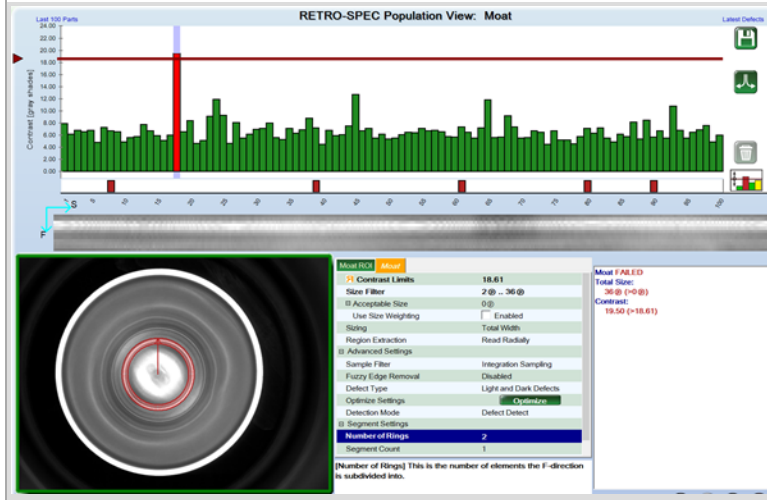
We are using a Contrast inspection to find defects on the moat.

Moat ROI	Moat
Contrast Limits	20.0
Size Filter	3 @ .. 36 @
Acceptable Size	0 @
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	Optimize
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	2
Segment Count	1

Double-click the Moat inspection to edit it.

To set up the inspection:

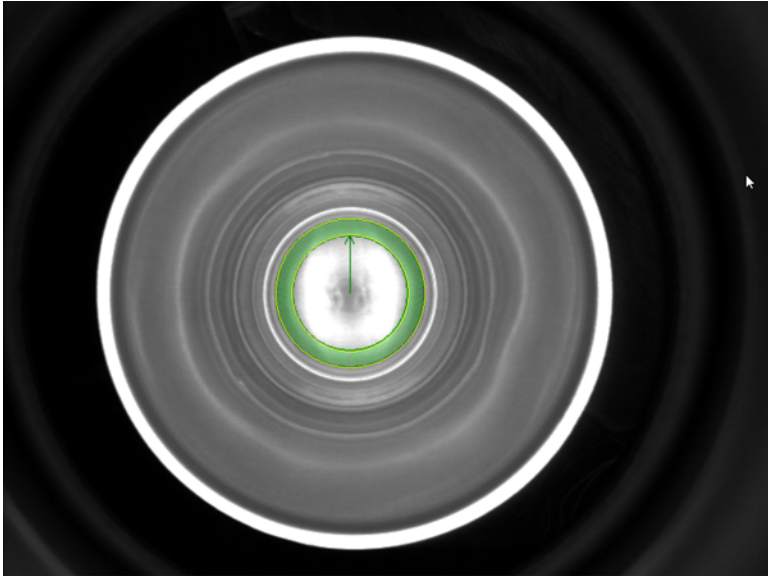
1. Change Contrast Limits to approximately 20.
2. Change Size Filter to a range from approximately 3 to 36 pixels.
3. Set the Number of Rings to 2.
4. Fuzzy Edge filter is optional, and depends on the consistency of the tooling. It will not be needed if you are searching for smaller defects.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
6.  Select the OK button to save changes and exit.



This is an example Moat inspection.

Place the Outer Dome ROI - Body Camera

We will set up the Region of Interest (ROI) for the Outer Dome inspection placement.



The unwrapped region is shown below




Double-click the name of the Outer Dome ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region at the edge of the dome in the darker area.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it into the dome as shown
3. Click in the center of the region. You will see yellow boxes on the inner region border.
4. Set the inner region border further into the dome as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Outer Dome ROI	
X	0
Y	0
Inner Radius	48
Thickness	14
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Outer Dome Inspection - Body Camera

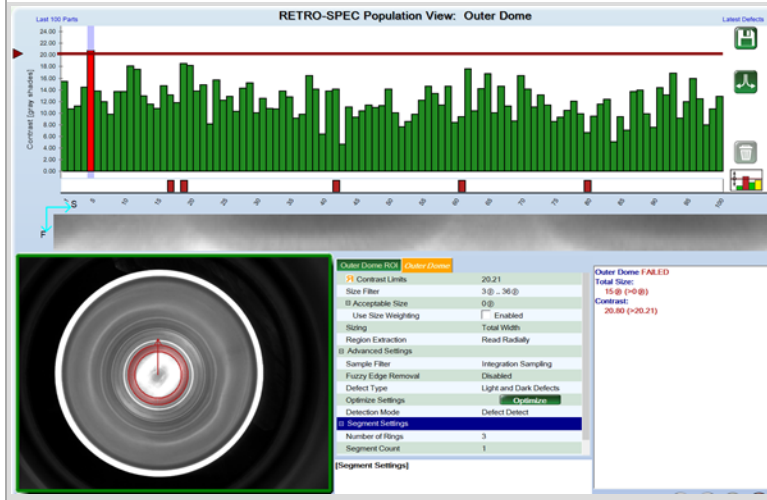
We are using a Contrast inspection to find defects on the outer dome. This inspection looks for low wall dents and other general defects.

Outer Dome ROI	
Contrast Limits	20.21
Size Filter	3 @ .. 36 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	Optimize
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	3
Segment Count	1

Double-click the Outer Dome inspection to edit it.

To set up the inspection:

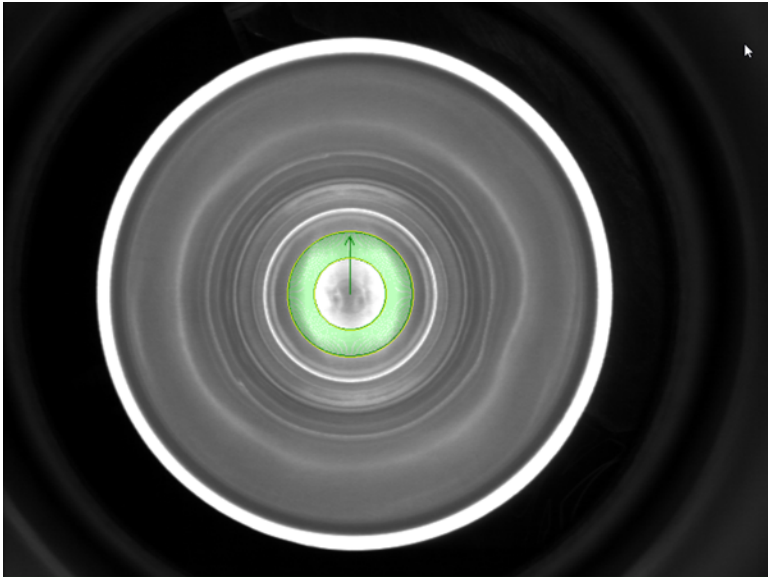
1. Change Contrast Limits to approximately 20.
2. Change Size Filter to a range from approximately 3 to 36 pixels.
3. Set the Number of Rings to 3.
4. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
5. Select the OK button to save changes and exit.



This is an example Outer Dome inspection.

Place the Mid Dome ROI - Body Camera

We will set up the Region of Interest (ROI) for the Mid Dome inspection placement.



The unwrapped region is shown below



Double-click the name of the Mid Dome ROI in the inspection tree to edit the region.

We will place a doughnut-shaped region in the mid dome where there are mostly light gray levels.

To edit the region:

1. Click inside the two circles of the default region.
2. Select one of the yellow boxes on the outer region border, and drag it into the dome as shown
3. Click in the center of the region. You will see yellow boxes on the inner region border.
4. Set the inner region border further into the dome as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Mid Dome ROI	
X	0
Y	0
Inner Radius	30
Thickness	22
Use Arc Segments	<input type="checkbox"/> Enabled

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


Set up the Mid Dome Inspection - Body Camera

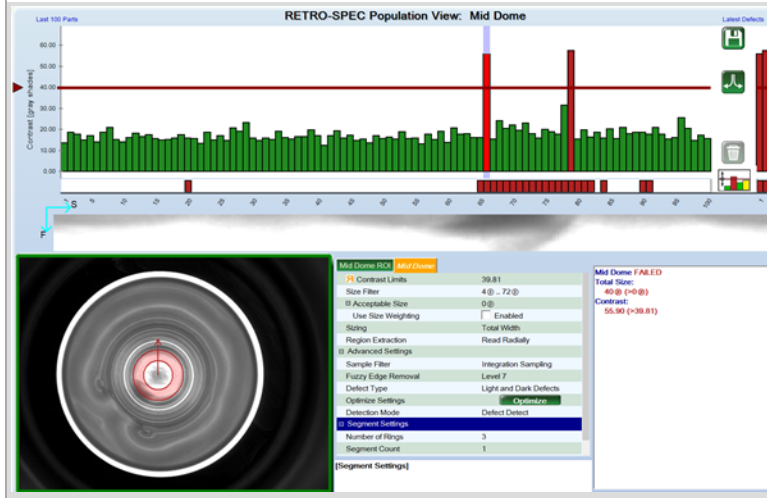
We are using a Contrast inspection to find defects on the mid dome. This inspection looks for both light and dark defects.

Mid Dome ROI	Mid Dome
Contrast Limits	39.81
Size Filter	4 @ .. 72 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Radially
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Level 7
Defect Type	Light and Dark Defects
Optimize Settings	Optimize
Detection Mode	Defect Detect
Segment Settings	
Number of Rings	3
Segment Count	1

Double-click the Mid Dome inspection to edit it.

To set up the inspection:

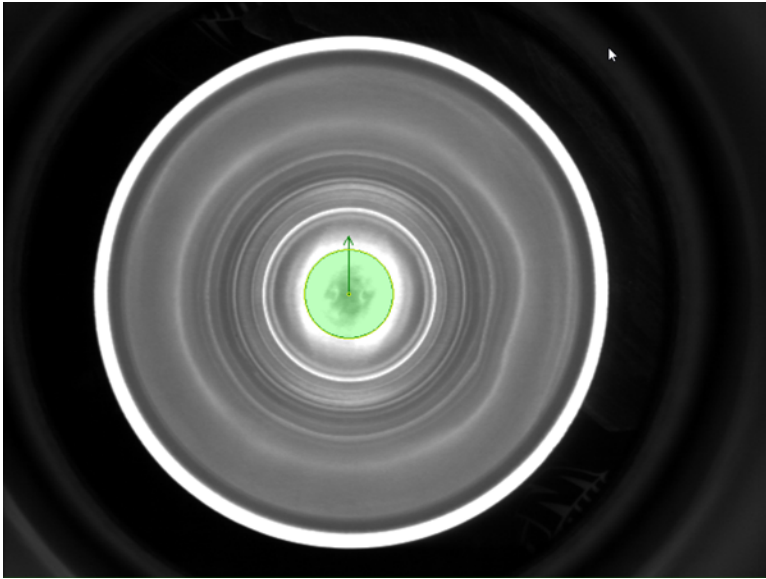
1. Change Contrast Limits to approximately 40.
2. Change Size Filter to a range from approximately 4 to 72 pixels.
3. Set Fuzzy Edge Filter at 7. This is used to ignore the large grain/ metal reflection when searching for larger defects.
4. Set the Number of Rings to 3.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.
6.  Select the OK button to save changes and exit.



This is an example Mid Dome inspection.

Place the Center Dome ROI - Body Camera

We will set up the Region of Interest (ROI) for the Center Dome inspection placement.



The unwrapped region is shown below



Double-click the name of the Ctr Dome ROI in the inspection tree to edit the region.

We will place a region in the center of the dome.

To edit the region:

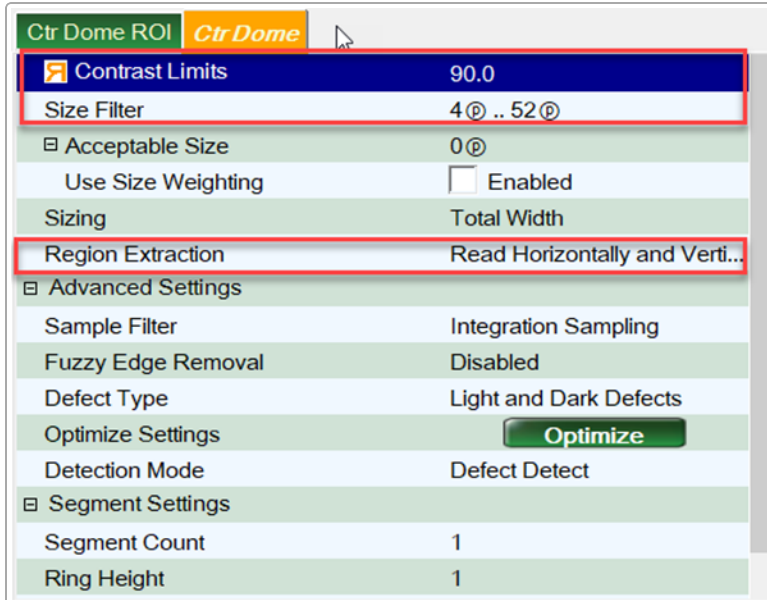
1. Click in the center of the region. You will see yellow boxes on the inner region border.
2. Drag the inner region closed (to a value of 1).
3. Click inside the two circles of the default region.
4. Set the outer region border to cover the center of the dome as shown.
5. Leave the remaining parameters at the default values. Your values may vary, based on your part and system setup.

Ctr Dome ROI	
X	0
Y	0
Inner Radius	1
Thickness	36
Use Arc Segments	<input type="checkbox"/> Enabled

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

Set up the Ctr Dome Inspection - Body Camera

We are using a Contrast inspection to find defects on center of the dome. This inspection looks for both light and dark defects.

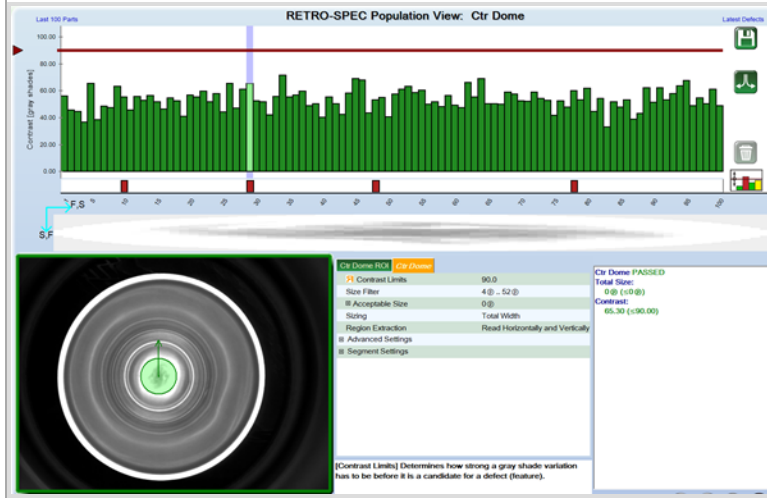


Section	Value
Contrast Limits	90.0
Size Filter	4 @ .. 52 @
Acceptable Size	0 @
Use Size Weighting	<input type="checkbox"/> Enabled
Sizing	Total Width
Region Extraction	Read Horizontally and Vertically
Advanced Settings	
Sample Filter	Integration Sampling
Fuzzy Edge Removal	Disabled
Defect Type	Light and Dark Defects
Optimize Settings	<input type="button" value="Optimize"/>
Detection Mode	Defect Detect
Segment Settings	
Segment Count	1
Ring Height	1

Double-click the Ctr Dome inspection to edit it.

To set up the inspection:

1. Change Contrast Limits to approximately 90.
2. Change Size Filter to a range from approximately 4 to 52 pixels.
3. Set Region Extraction to Read Horizontally and Vertically. Since this is a circular region instead of a doughnut-shaped region, we inspect it in two directions.
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.



This is an example Ctr Dome inspection.