

INTELLISPEC™

System Guide Series V (5.3) FHCP 3X EZ

Pressco Technology Inc.

71840 Rev. 02



Original Instructions

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Chapter 1

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 very powerful tool that provides inspection much more reliably than the human eye or sampling methods. The latest PC technology, powerful new 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.

About this Manual

This manual provides operating and maintenance instructions for the Pressco Fill Height/ Cap Placement Inspection System. It provides the necessary information to operate a system that is properly installed and set up.

This manual:

- Is considered an integral part of the machine and should be kept handy for future reference as long as the system is being used in your plant.
- Is your responsibility to keep in good condition, in a dry place, and ready for consultation by the **authorized users** (on page 12) of the system.
- Contains the technology implemented at the time of selling and supplying the system and shall not be considered inadequate in case of technological enhancements in the machine or in the manual's illustrations.
- Has software instructions valid as of version 5.3.009, unless otherwise specified.

Typographical Conventions

Following is a list of typographical conventions used in this manual:

- **Bold type** indicates a topic heading or an important item or statement.
- *Italicized type* indicates emphasis.
- Names of main components and system control signals have the first letter of each word capitalized. For example: Processor Cabinet.
- Caution messages appear as shown below:



Caution

Caution messages indicate important information which must be observed to prevent: loss of data, poor system performance, or equipment damage. These messages are set off from the body text as shown here.

- Warning messages appear as shown below:



Warning

Warning messages indicate the possibility of minor injury to yourself or others. These messages are set off from the body text as shown here.

- Danger messages appear as shown below:

**Danger**

Danger messages alert you to specific conditions that can cause serious or fatal personal injury.
Danger messages give you important information which must be observed to prevent injury.
These messages are set off from the body text as shown here.

- Notes appear as shown below:

❖ *Note: Notes contain special information that warrants being set off from the body text as shown here.*

- Important Notes appear as shown below:

**Important**

Important notes are set off from the body text as shown here.

Chapter 2

Safety Information and Markings

This section contains operator safety information that must be read before operating or servicing the system.



Warning

Do not, under any circumstances, tamper with sealed machine parts or devices. This could result in the removal of protections that might create potentially hazardous conditions.



Warning

This product contains no operator serviceable parts. Refer servicing to qualified personnel. To prevent electrical shock do not open cabinet doors whilst power is connected.

Safety Considerations

Observe the following safety warnings when operating the system or working near it:



Warning

Potential for projectiles to strike persons and cause injury. Keep clear of reject devices.



Warning

Sensitive electronics and High Voltages may be exposed. Keep Processor Cabinet door closed.

Static Discharge Protection



Caution

Electronic components can be damaged by static electricity discharge.

Always observe the following precautions before removing, installing or handling any electronic components within the Inspection System:

- Wear an anti-static wristband which is grounded to the Inspection System.
- Stand on an anti-static, grounded floor mat, and lay circuit boards on the mat during any board replacement.
- Keep circuit boards in static shield bags when storing and transporting. Ensure the bag is sealed.

Symbols

The following symbols are used on or near the FHCP 3X system. Be aware of potential risk hazards.

	High voltage
 WARNING Arc Flash and Shock Hazard Appropriate PPE Required Do not operate controls or open covers without appropriate personal protection equipment. Failure to comply may result in injury or death! Refer to NFPA 70E for minimum PPE requirements. 	Arc flash
 WARNING This door is electrically interlocked. • When lock is engaged, live voltage present within cabinet. • To override interlock: Complete a controlled shutdown, or use key to override. 	Electrical interlock

Residual Risk

The Intellispec system has been designed to minimize any danger of personal injury. However, the system uses rejection devices to remove defective product from the production stream. Also, the electronics cabinets contain risk of shock if they are opened.

Observe the following safety warnings when operating the system or working near it:



Warning

Potential for projectiles to strike persons and cause injury. Keep clear of reject devices.



Warning

Sensitive electronics and High Voltages may be exposed. Keep Processor Cabinet door closed.

Intended Use

Type of Process

The Intellispec system is intended to monitor container and other special manufacturing processes and identify non-conforming product.

Intended Use

The Intellispec system is designed and constructed for use in an indoor industrial environment, always sheltered from the weather.

Space Required

The Intellispec machine and accompanying sensors must be installed in a place that will enable safe and easy installation, size changeover, user operation, and maintenance procedures.

Non-intended use



Warning

If this instrument is not used as specified, the protection provided by the equipment could be impaired. This instrument must only be used in a normal condition (in which all means of protection are intact).



Important

The Intellispec system should NOT be used for any purpose other than specifically indicated in the section titled **Intended Use** (on page 9).

The following uses are **not** intended:

- Use in an explosive environment
- Use in a flammable environment
- Use in a damp, moist, or wet environment, except where specifically indicated

Personal Protective Equipment



Important

Always follow the safety requirements of your plant in addition to the recommendations below.

We recommend, at minimum, use of the following Personal Protective Equipment (PPE):

	Protective clothing
	Protective gloves
	Protective ear plugs or headphones
	Protective eye wear
	Protective foot wear

Personnel Safety

The following rules are recommended to ensure the safety of personnel in charge of machine operation and maintenance.

Do Not:

- Open safety guards during machine operation
- Perform maintenance and repair while the system is running
- Lean on the machine
- Sit on the machine components
- Use the machine for purposes other than those listed in this manual
- Modify parts of the machine
- Allow unqualified personnel to operate or perform maintenance procedures on the machine

During machine operation:

	Only one operator is needed to operate the machine. All others must keep at a safe distance.
	Operators must be familiar with all machinery connected to the Pressco equipment and know how to use emergency stop devices. <i>Note: the emergency stop devices may not be connected directly to the Pressco equipment, but it is important to know how to use them.</i>
	Before putting the Pressco system online, the operator must ensure that all safety devices used with all connected machinery are in place and operational.
	The operator must maintain maximum focus on his work and be alert throughout his shift. If this is not the case, immediately inform the shift supervisor.

When conducting maintenance or repair work:

	Follow the Machine Maintenance Lockout Procedure.
	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, authorized personnel who ensure the prevention of personal injury or damage to the machine must supervise this operation. All machine movements must be performed with limited speed and limited movements.
	Exclusively authorized and trained personnel must carry out maintenance or repair work on electrical components. 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 a structure and must always move with extreme caution. The harness must not be connected to Pressco equipment or structure as it cannot support body weight.
	Never perform lubrication or maintenance procedures on mechanical parts with the machine running.

Lifting heavy objects



Caution

Some components are heavy. Take proper precautions to prevent personal injury or damage to equipment. If you are not capable of lifting the object alone, ask a capable person to help lift the object, or use a mechanical lifting device

The components do not have handles to lift the equipment. Be sure to:

- Lift equipment from the bottom - do not use wires, brackets, nor other protrusions
- Keep fingers away from sensor lenses to keep the equipment clean
- Proceed slowly

➤ *To safely lift equipment:*



Caution

Do not twist your body when moving the load. Instead take small steps with your feet turning until you are in the correct position.

1. Stand close to the load and center yourself over it with your feet shoulder width apart.
2. Tighten your abdominal muscles.
3. Keeping your back straight, bend your knees and squat down to the floor.
4. Get a good grasp on the load with both hands.
5. Keeping the load close to your body, use your leg muscles to stand up lifting the load off the floor.
 - Your back should remain straight throughout lifting, using only the muscles in the legs to lift the load.
6. To place the load in the appropriate spot, bend at the knees using only your leg muscles to lower the load.

Authorized Users

Trained machine operators, mechanic and electrical maintenance staff, and plant managers are considered authorized users of the Intellispec system. These users should carefully read the information contained in this manual. The plant manager must ensure that the safety recommendations included in this manual are observed.



Warning

Allowing workers who are unfamiliar with the production process to operate the Intellispec system could result in hazard risk.

If you are unclear about any part of this manual, **contact Pressco Technical Support** (see "**How to Contact Pressco**" on page 357).



Important

No worker should ever operate the system outside of his/ her own area of competence and responsibility.

Proper Operation:

Only one worker is to operate the system at any given time. The correct position for the operator is in front of the user interface monitor or control enclosure (if applicable).

Repairs:

Any repair on the system shall be carried out exclusively by Pressco Technology Inc. service personnel or by other service expressly authorized by Pressco Technology Inc.

Spare Parts Usage

The following restrictions apply to replacing parts:



Warning

Using spare parts that are not designed to Pressco's specifications can compromise the safety and effectiveness of the Intellispec system.

- The use of parts that are not within Pressco's design specifications is prohibited. This prohibition applies in particular when the parts involved contain or are connected with safety devices.
- Before resuming production, make sure all safety devices are in working order.

Pressco Technology Inc. shall not be liable in any way if any of the above-described directions are not complied with.

To obtain a spare parts list, contact the customer service department at Pressco. **How to Contact Pressco** (on page 357).

Pressco's technicians are available to help customers, in their own plant, to solve any problem that might arise during use and maintenance of the Intellispec system.

Chapter 3

System Specifications

Environmental conditions

The Intellispec Series V system is designed to be safe in the following environmental conditions:

❖ *Note: Please consult Pressco Technology Inc. (see "How to Contact Pressco" on page 357) if your environmental conditions are outside of those listed.*

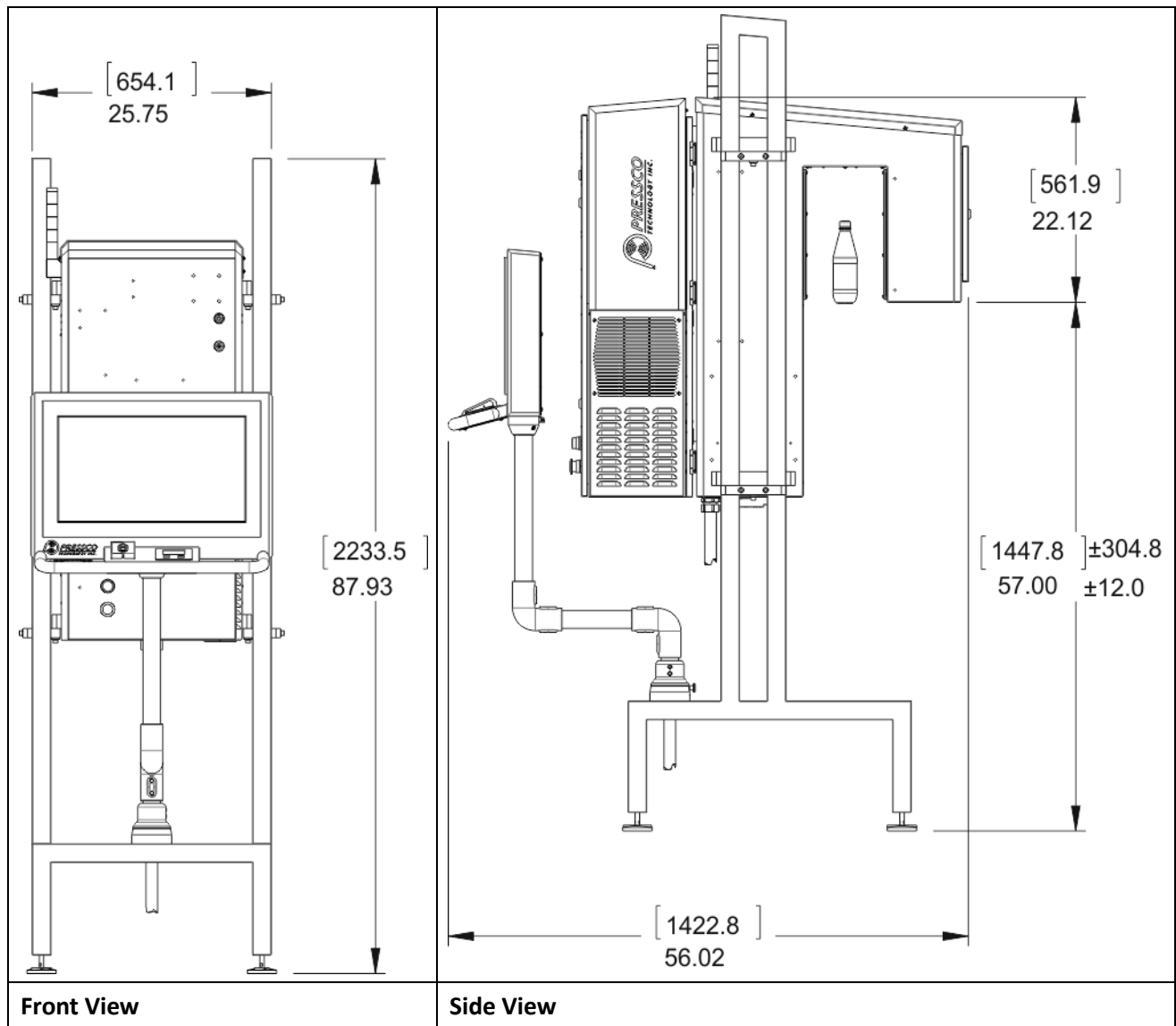
Condition	Specifications
Indoor/ outdoor use	Indoor use only
Altitude	Up to 2000 meters
Operating Temperature	5 °C to 50 °C
Storage Temperature	0 °C to 70 °C
Humidity	Maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 50 °C
Mains supply	Voltage fluctuations up to ± 10 % of the nominal voltage
Overvoltage protection rating	Transient overvoltage typically present on MAINS supply NOTE: the normal level of transient overvoltages is impulse withstand (overvoltage) category II of IEC 60364-4-443.
Rated pollution degree	This instrument is designed for use in Installation Category II and Pollution Degree 1 as per EN61010-1 and EN60664 respectively.



Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

System Measurements



The following are the maximum dimensions of the Fill Height/ Cap Placement System:

❖ *Note 1 (in side view): This surface is to be approximately flush with the conveyor top.*

Measurement	Value
Height (overall system)	87.93 inches [2233.48 mm]
Height (from conveyor to top of module)	22.12 inches [561.90 mm]
Height (from floor to conveyor) Adjustable	57.00 inches +/- 12 inches [1447.80 mm +/- 304.80 mm]
Width (of User Interface)	25.75 inches [654.10 mm]
Depth	56.02 inches [1422.80 mm]

Part and Part Handling Specifications

Closure/ Finish Size

The range of cap/finish sizes that the FHCP 3X system will handle are: **25mm to 38mm** outer diameter. Sports caps and other specialty caps must be evaluated by Pressco Technology Inc. prior to inspection.

Part inspection requirements

- Liquid droplets must be removed from the inspection area (cap and neck ring)
- The fill level inspection is based on inspecting a stable fill level that is unobstructed by the support ring or other bottle features.

Burst Rate

The maximum conveyor rate is **1100 parts per minute**, maximum. Parts will not be inspected properly above this rate.

Conveyance

Bottles must be presented such that there is no slippage between the bottle and conveyor while the bottle is between the vision inspection module part detect and rejecter.

Conveyors must have a ramp function so that upon starting and stopping, bottles do not slide on the conveyor surface.

Conveyors must have a suitable chain tension such that under normal operation, starting or stopping the conveyance surface does not stretch or compress between the vision modules and the drive wheels.

Positioning

In order to accurately measure cap application geometry, bottle must be consistently presented to the vision inspection module. Depending on the range of bottle diameters to be inspected, adjustable rails may be necessary to ensure that bottle centerlines remain consistent on the conveyor.

- Bottles should be positioned +/- 0.125 inches laterally
- Bottles should be upright and perpendicular to the conveyor +/- two degrees

Deviation from these guidelines could potentially cause bottles to be falsely rejected.

Spacing

In order to properly inspect and accurately reject bottles: Bottle Spacing on Conveyor is **> 50 mm** sidewall to sidewall gap. If this spacing is not achievable, narrower spacing will be evaluated on a case by case basis by Pressco Technology Inc.

System Electrical Specifications

The following are electrical specifications for the FHCP 3X inspection module:

Configuration	Specification
Voltage Range	120 VAC
Frequency	50/ 60 Hz
Current	5.2A for Air Conditioner 3.8A for Inspection System

Chapter 4

Installation

Preparation for Installation

Recommendations prior to installation

Before the machine is installed, the Pressco installer, together with the Customer (or representative) shall check the following criteria in the environment where the machine is to be installed:

- Work required by contract for the installation of the machine has been carried out
- The plant layout drawing that describes where the machine will be installed is the final drawing agreed to by Pressco Technology Inc.
- The space and height required for installation are actually available
- Only the components included in the installation layout are present in the area where the machine is to be mounted. Ensure no machines or components have been added at a later stage that might hinder mounting or make it more difficult. Should this be the case, immediately contact Pressco's Project Engineering personnel to arrange a suitable solution to the problem.

We recommend the following prior to machine installation:

- Transport the machine in its packaging to the area where it will be installed to minimize possibility of damage
- Carefully remove the packaging material and check components for damage
- Check tightness of mechanical components, as they can loosen during transport
- Prepare the compressed air mains line. Before making final connections, ensure that the pipes are clean and free from any debris.

Instructions for Safe Assembly Operations



IMPORTANT

The site supervisor will be responsible for ensuring that all the various mounting phases are carried out safely and in compliance with current regulations.

The site supervisor will also be required to make sure that all the members of personnel involved in the mounting operations comply with said regulations.

Shipping and Handling



Warning

Only qualified personnel must be involved in the operation of unloading, handling, and lifting the machine. Pressco Technology Inc. shall not be liable for damage to components and/or personal injury resulting from the involvement of unauthorized personnel and/or failure to comply with the directions provided in this manual in relation to lifting and transport.



Important

The site supervisor will be responsible for ensuring that all the various mounting phases are carried out safely and in compliance with current regulations.

Pressco Technology Inc. ships unassembled components in packing cases designed to protect the contents during handling and from exposure to weather.

Unless otherwise specified in the contract with the machine order, the Customer shall supply Pressco Technology Inc. with the means and equipment necessary for the unloading, lifting, and handling of machine parts.

Pressco Technology Inc. deems it important to have one of their technicians supervise the process of unloading, handling, and lifting the machine. The technician can give useful advice as to the logical sequence in which the components should be unpacked and positioned for ease of assembly.

After the machine is delivered, check for any damage that might have occurred during shipping. In case of damage, contact **Pressco Technology Inc** (see "**How to Contact Pressco**" on page 357).

In handling the machine, always keep it close to the ground.



We recommend using a forklift truck with adequate capacity and forks to suit the weight to be lifted (machine plus packaging).

The dimensions and weight of a crate are listed below. Note that this is the maximum size and weight. The size and weight of the crate may be less depending on your configuration. You may receive multiple crates depending on your configuration.

Size	1 crate, 241.3 cm x 132.08 cm x 157.48 cm (95 inches x 52 in. x 62 in.)
Weight	679 kg (1495 lbs.)

Hoisting

The machine is packaged in a wooden box, inside which the parts are individually packaged to prevent shock and sudden movements during transport. It is anchored onto a pallet.



To prevent personal injury in the event that the machine or packaging box should fall, ensure that during hoisting operations no person is standing within the range of action of the hoisting machines.



Hoisting, transporting and placement operations should be supervised by qualified technical staff trained in these specific areas.

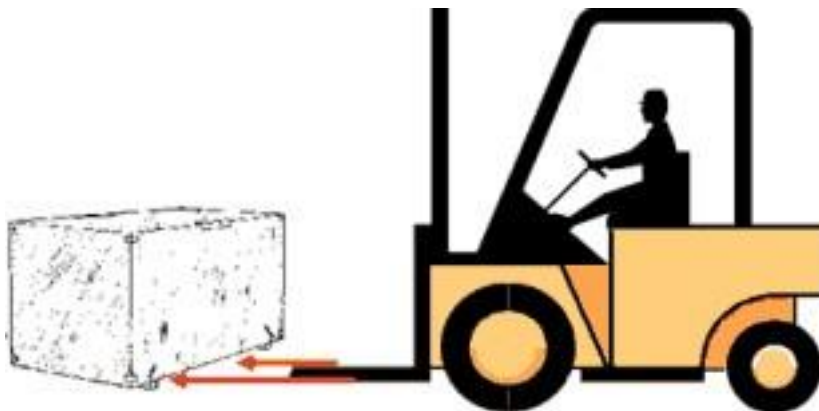


Before performing any movement, you should always ensure that the hoisting means and equipment (ropes, hooks, etc.) are suitable for lifting the weight and also verify its stability.



If using a fork lift truck, ensure that the forks extend beyond the opposite side.

Before you start moving the machine, check the stability of the element to be transported.



Storing

The machine should be stored indoors, still packed. Maintain regular temperature and humidity.

Assembly, location, and mounting requirements

The Intellispec requires the following:

Installation

Pressco Technology Inc. recommends that the machine be installed and assembled by Pressco's specialized technicians. This is of vital importance for correct machine operation.



Warning

Pressco Technology Inc. shall not be liable in case of failures or damage to property and/or personal injury resulting from or connected with assembly if this has been carried out by unauthorized personnel, or is not in compliance with the indications given in this manual.

To carry out production and cleaning/ servicing operations, it is important for the machine to have a minimum amount of space all around and away from walls.

Ventilation

Place the Intellispec Series V components in a position with adequate ventilation to allow proper air flow through the air filters.

Component	Spacing
User Interface	Leave 1 meter [39 inches] clear around machine
Cluster box (not used on all systems)	Leave 100 mm clear in front of the fan and vent

Utilities to be supplied by customer

The following utilities are required to operate the Intellispec Series V system. Before making connection, make sure the utility matches the technical specifications. More than one connection of the utilities may be required depending on the number of modules installed. Refer to specific wiring diagrams.

Utility	Requirements
Air supply for rejection device	Pipe size must be such that there will be no pressure decrease during machine operation. Air must be dry and free of oil.
Electrical supply	Provide one each electrical socket to comply with: ▪ User interface electrical specifications (see "System Electrical Specifications" on page 17) (use the specifications that apply to your system) ▪ Integrated tunnel electrical specifications (if applicable) ▪ Cluster box electrical specifications (if applicable)
Internet connection (optional)	Provide a shielded ethernet cable to use Pressco's remote support through the Internet.

Electrical Connection

Pressco recommends that you run two (2) power cables to the FHCP 3X system, capable of handling power for the air conditioner and the system, as stated in the specifications below.



Warning

The electrical connections must meet local and national codes.

Have a qualified electrician connect the correct voltage and amperage wiring to the bottom of the electrical enclosure. See nameplate on electrical enclosure door.

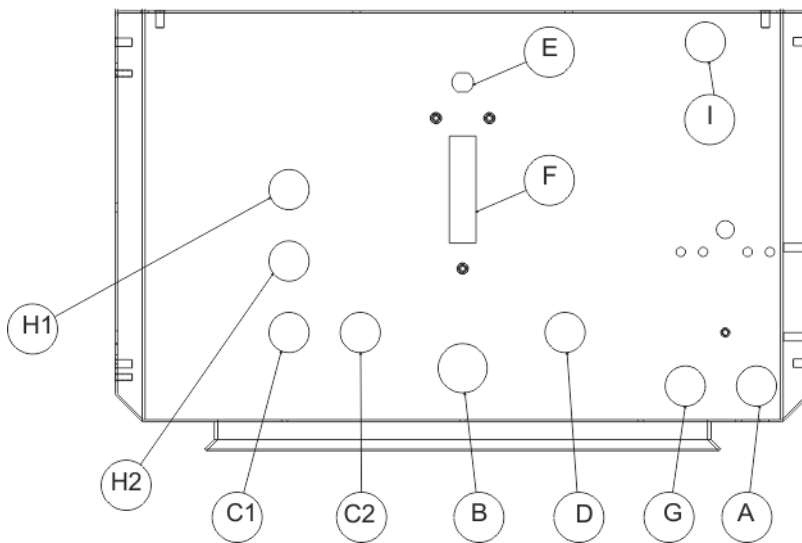
The following are electrical specifications for the FHCP 3X inspection module:

Configuration	Specification
Voltage Range	120 VAC
Frequency	50/ 60 Hz
Current	5.2A for Air Conditioner 3.8A for Inspection System

➤ **To connect power:**

1. Route both power circuits through Sealtite into enclosure through hole A, shown in the diagram below. This view shows the bottom panel looking inside the inspection module.

VIEW LOOKING INSIDE INSPECTION MODULE



A = POWER IN

B = TO MONITOR

C1 = LIS IN

C2 = LIS TO JAM BOX

D = EXTENDED I/O

E = ENCODER

F = 8-PORT I/O ENTRY

G = 120 VAC JAM BOX

H1 = DOR CAMERA

H2 = DOR PDN

I = REMOTE PENDANT (Optional)

You will terminate the power circuit conductors at terminal block TB-1. The location of the terminal block TB-1 is on the right-hand wall inside the inspection module.

2. Connect the power leads to terminal block TB-1. See **FHCP 3X Electrical Diagram** (on page 279) and **FHCP 3X Wiring Diagram 1** (on page 281).

Protective earthing

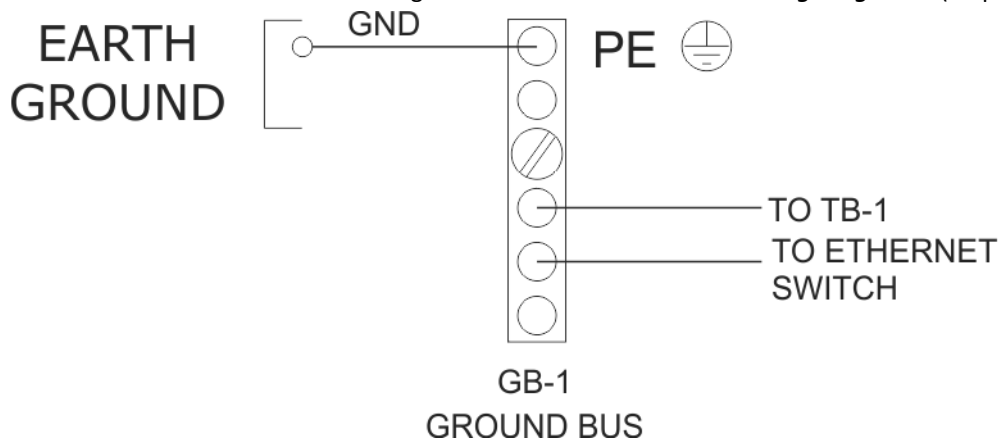


Danger

Improper connection of the equipment grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service technician if you are in doubt as to whether the product is properly grounded.

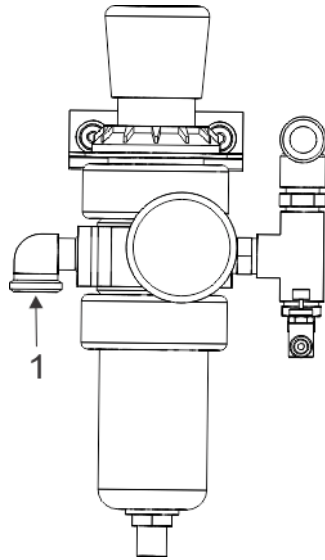
This product must be grounded (earthed). If it should malfunction or break down, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.

Located close to the entry of the incoming electrical supply, a bus bar is provided for connection of the machine to the external protective earthing conductor. This terminal will be marked PE. Other ground conductors can connect to the remaining terminals. See also **FHCP 3X Wiring Diagram 1** (on page 281).



Pneumatic Service

Connect plant air supply to the Filter Regulator Lubricator (FRL). Pneumatic requirements: 60 psi, 16 CFM, 3/8 NPT Inlet, and is for the purpose of rejecting parts.



1	Air supply connection

Adjusting Module Height to Conveyor

The height of the module should be set properly to the conveyor height during installation. It should not need further adjustment.



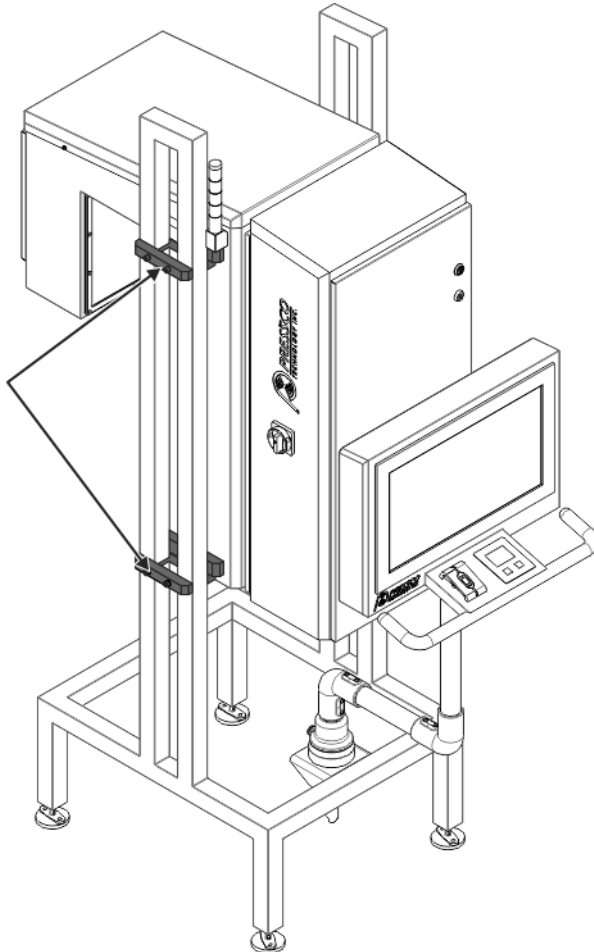
Danger

The module is extremely heavy. Get several people to help you move it if needed.

Use the yellow straps with the ratcheting mechanism to raise or lower the height of the module.



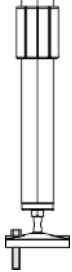
The module has brackets and bolts to make small adjustments to the overall height of the inspection module. You can also adjust it slightly forward and backward to center it over the conveyor.



Securing to Floor

The ground under the machine must be sufficiently solid to sustain the machine mass at the support points. In addition, the floor must be free of bumps, grooves and other surface irregularities. The surface must be flat enough so that the leveling feet of the machine bear weight across their entire surface.

Attach the machine to the floor by installing M12 x 50mm lag bolts into the floor through the hole on the frame foot pad. Do this on one hole in each foot.



Commissioning

Before proceeding with the commissioning procedure, a general check should be performed using the table below.

❖ *Note: You must complete these checks before requesting the assistance of our staff for the startup phase.*

Check	Yes	No
Positioning and leveling of the unit		
Connection of compressed air line to connection points		
Connection of power supply to control board using the specifications from the wiring diagrams		

Chapter 5

Operating the FHCP 3X system

Power On/ Off

Power on

➤ **Before turning on the power:**

Make sure the following are ON. Normally you can leave these ON all the time:

- Power switch on the UPS, located inside the **Intellispec Computer Enclosure (backpack)** (on page 277) [item 9]
- Circuit breakers CB1 and CB2, located inside the inspection module on TB1

➤ **To turn on the power to the Intellispec FHCP 3X system:**

1. Turn on the rotary disconnect switch (DISC 1, shown in the illustration below). The system will start, and the Intellispec software will load.
2. Verify the red E-stop button on the front panel is pulled out, and not in E-stop mode. **Emergency E-Stop Button** (on page 42)
3. Press the green reset button on the front panel until the light on the button turns green. This will ensure the guide rail and camera motors are enabled for motion. The guide rails will calibrate and move into the correct position for the currently selected part program.
4. Log in to begin using the system.

Power off

To turn the power off to the Intellispec FHCP 3X system, turn off the main power switch (DISC 1). When you shut down the system:

- The system, including the computer, shuts down,
- The UPS shuts down

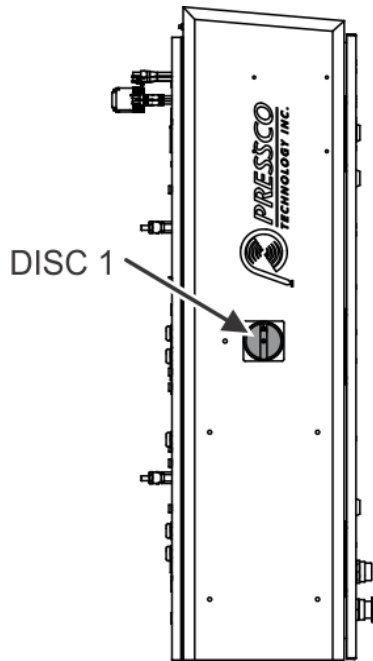
❖ *Note: there is a selectable UPS shutdown time that must expire before the computer and UPS shut down (30 seconds default) **System Alarms Description** (on page 88)*

- The software shuts down, and
- The guide rails within the inspection system go to a home position.



Warning

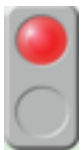
When you shut down power using this switch, there will still be voltage present on the UPS inside the unit until it discharges. The **interlock switch** (see "**Interlock for computer door**" on page 270) will be energized to prevent access to the inside of the unit.



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 40 seconds before turning it back on. This allows the electronic components to correctly reset.

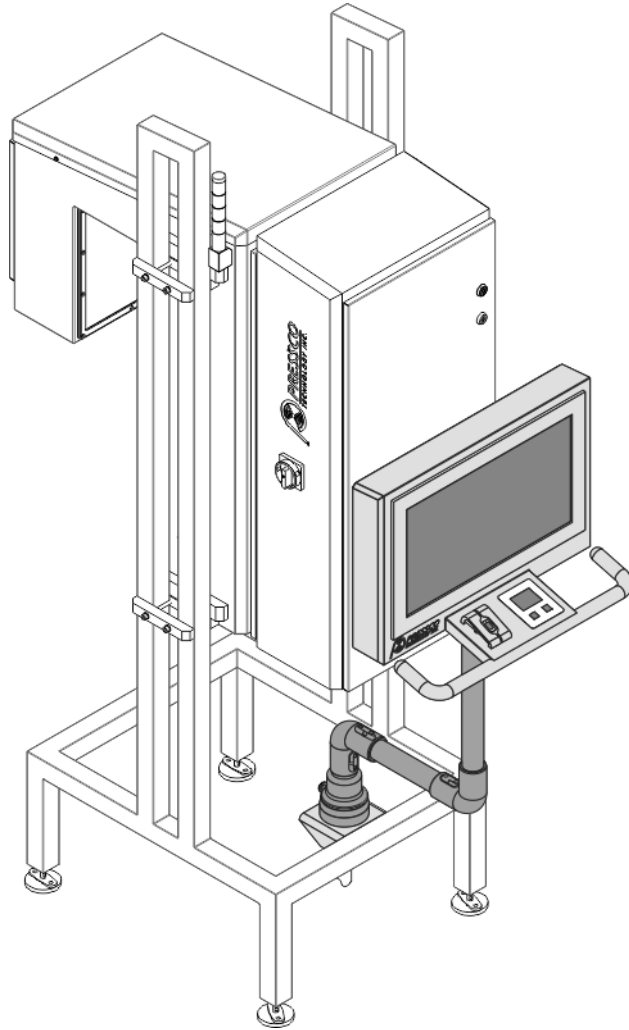
Online / Offline



- The stoplight is the online/offline indicator for each lane. A red light indicates the lane is offline; a green light indicates the lane is online.
- To switch from the online to offline mode, or vice versa, click the stoplight.
- Lanes can be put online or offline independently. If multiple lanes are configured, then one can be offline while another is online.

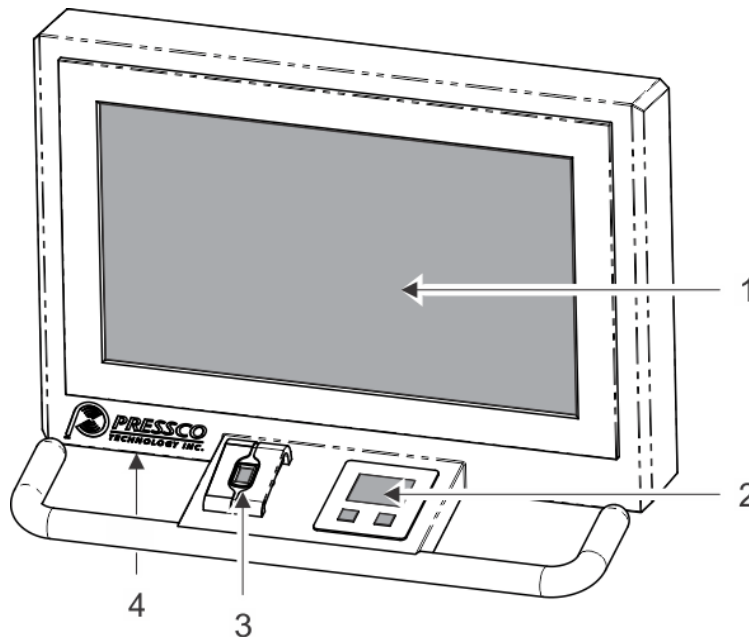
User Interface Overview

The FHCP module has a user interface that attaches to the module through a movable arm. The arm can swing 180 degrees for your convenience.



Navigation Components

To operate the software of the FHCP system, use the monitor and associated components, shown below.



The monitor housing contains:

1	User interface monitor. Touch Screen Monitor (see " Touch Screen Monitor (optional) " on page 34)
2	Glide pad with buttons to move cursor and select (see " How to select menu items " on page 30) items on the screen.
3	Biometric login device (on page 34)
4	Two USB (see " USB Port " on page 33) convenience ports - underneath: - Outside (towards left side of monitor) used for jump drive to create Support Package (see "Creating a Support Package" on page 134) - Inside (towards center of monitor) used for Mechanical keyboard (see "Mechanical keyboard (MKB)" on page 33)

User interface input devices

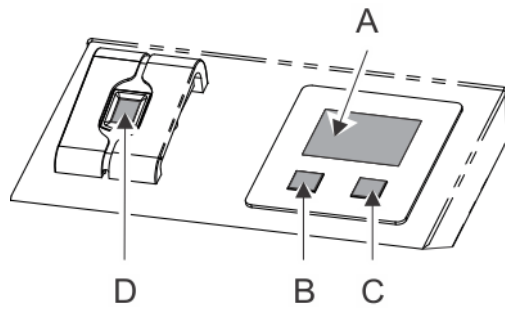
The following devices are available to input information to the Intellispec system:

- Glide pad and buttons
- **On Screen Keyboard (OSK)** (on page 31)
- **Touch Screen monitor** (see "**Touch Screen Monitor (optional)**" on page 34)
- Temporarily connected conventional **Mechanical Keyboard (MKB)** (on page 33)
- **Biometric login device** (on page 34)

How to select menu items

Use the glide pad to select, interact with, and change active objects on the screen. The glide pad will be required for all inspection editing tasks. The glide pad [item A] is located next to the **Biometric login device** (on page 34), as shown below.

Under the glide pad are two buttons. Use the left button [item B] to select and activate objects on the screen. Use the right button [item C] to call up a context-sensitive menu related to the area or object clicked.



The following table shows the actions available for the glide pad and buttons, and the results of those actions.

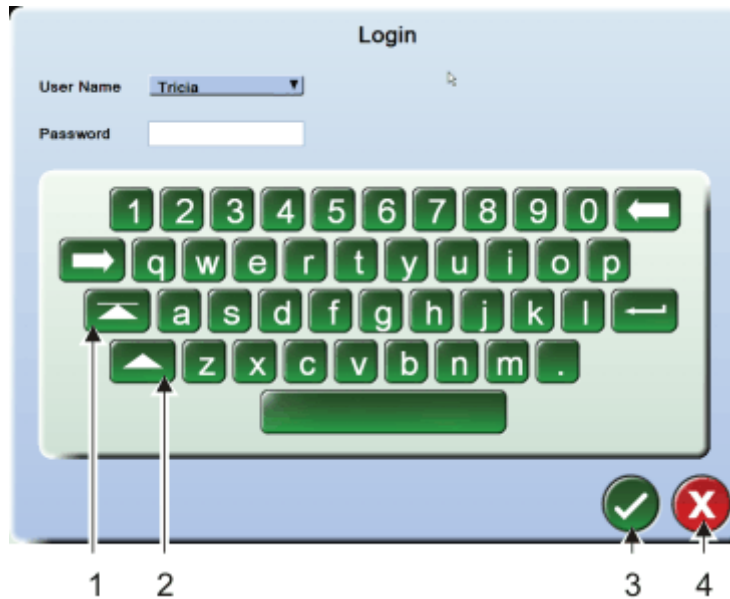
Item	Action	Result
A - glide pad	Point (move pointer with the glide pad)	Display Tool Tip when hovered over active object
B	Click (Left-click)	When the pointer is over an active object, a click initiates various actions. Nothing happens when the pointer is clicked on a disabled object.
B, B	Double-click	When the pointer is over an active object, a double-click initiates various actions. For example, edit an inspection.
C	Right-click	Display a context-sensitive menu when you click on an enabled object. The context-sensitive menu often contains functions that are also available in a menu bar or other screens. For example, add a point to a polygon.
B + A	Drag (hold the left button while moving your finger on the glide pad)	Examples: move a selected Region of Interest (ROI) around an image or move an inspection in a Tree View to change the order of execution.
D (<i>Biometric login device</i> (on page 34))	Log in or out of the software.	User is logged in or out.

On Screen Keyboard (OSK)

Different types of on screen keyboards will be displayed depending on what kind of input is needed. When you want to type text or numbers into a field, right-click or double-click on a text input field to display the appropriate keyboard.

- If alphanumeric input is needed, a full alphanumeric keyboard will be displayed
- In numeric input only is needed, a smaller, numeric keypad only will be displayed

Alphanumeric keyboard

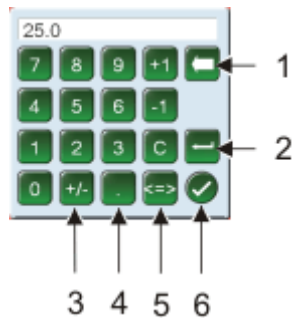


1	Shift lock button - capitalizes all letters until you press this button again.
2	Shift button - capitalizes one letter, then returns to uncapitalized letters automatically.
3	OK button - accepts the typed information and closes the keyboard screen.
4	Cancel button - disregards the typed information and closes the keyboard screen.

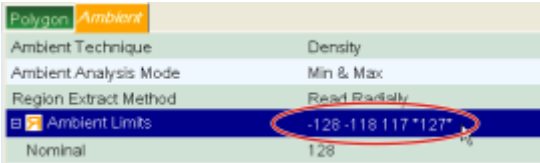
Numeric keyboard

The numeric keypad is displayed when the input field requires a numeric entry. Most of the buttons are self-explanatory. Additional buttons are described below.

❖ *Note: some buttons are not displayed if they are not appropriate for that field.*



1	Backspace - removes a digit
2	Enter - populates the field in the Intellispec screen without closing the keyboard. This is useful if you want to test a value and see the results of the change immediately.
3	[+/-] makes the number positive or negative
4	[.] available only if a decimal number is valid in the input field

5	[<=>] cycles to the next limit of the parameter. If the parameter has more than two limits, then asterisks will surround the selected value in the menu. 
6	 accepts your changes and closes the numeric keypad

Mechanical keyboard (MKB)

The system supports the temporary connection of a conventional mechanical keyboard using one of the available **USB ports** (see "**FHCP 3X User Interface Hardware**" on page 268). This keyboard will mostly be used for system level tasks such as BIOS configuration, Network configuration, and Operating System level setup.



The keyboard:

- Is primarily used by Pressco Field Service Engineers
- Is stored inside the Vision PC chassis
- Requires a stable location when in use

USB Port

The USB port on the FHCP system is located on the left side of the user interface. A protective cover can be removed when you use the USB port, and replaced when you are finished. See the drawing with the location of the USB port: **Navigation Components** (on page 30).

Use the USB port when you are:

- Importing or Exporting Part Programs from another system **How to Create, Copy, or Import a Part Program** (on page 195)
- **Exporting user accounts** (on page 53)
- **Importing user accounts** (on page 54)
- **Creating a Support Package** (on page 134)
- Using the **Mechanical keyboard** (see "**Mechanical keyboard (MKB)**" on page 33)
- Saving images, especially to send with a support package (**How to Save Images** (see "**Saving Images**" on page 174))

Biometric login device

The **Biometric Identification login device** (see "**Adding a user with the biometric login device**" on page 52) is used to log in and out of the Intellispec system. This device is optional and must be purchased with the system.

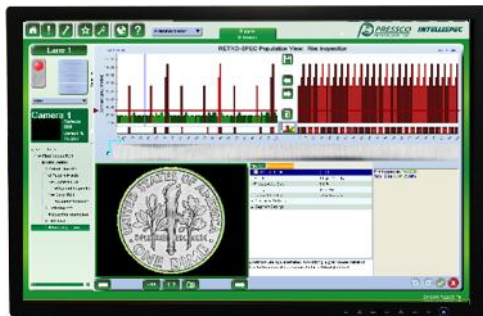


To log in with this device, press your finger to the device. The following are conditions for use:

- 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 Intellispec does not recognize your finger print, you must log in using the **on screen keyboard (OSK)** (see "**On Screen Keyboard (OSK)**" on page 31))

Touch Screen Monitor (optional)

Some Intellispec systems have a touch screen monitor installed. It has an area of 1920 x 1200 pixels and a diagonal size of about 24 inches. This is used primarily for high level navigation, obtaining information from the system, and responding to alarms. It is not to be used for inspection setup or configuration tasks, as those tasks require detailed input.



Use the touch screen to:

- Log in / out
- Put the system online / offline
- Clear statistics
- Print reports
- Acknowledge or reset Alarms
- Navigate the menus (from System Overview to Lane View to Sensor view, etc.)

User Interface Display - 4 Levels

The display on the user interface has four levels for viewing:

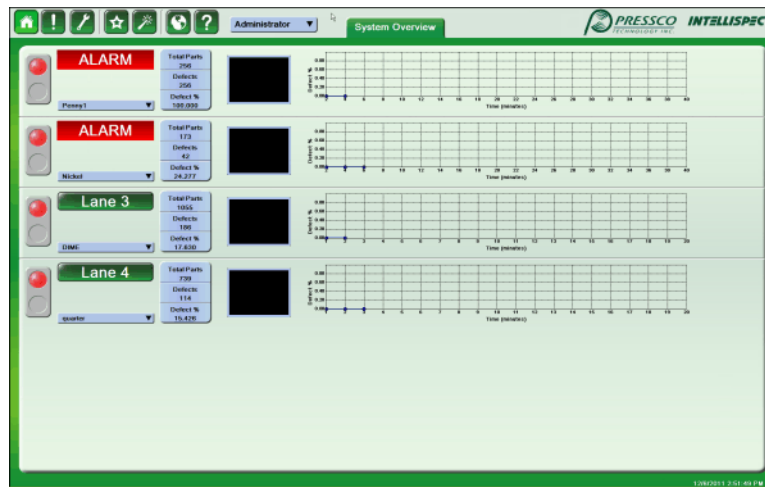


Look at the tab at the top of the screen to quickly determine which level you are viewing (from System Overview to Sensor Overview). The tab will read "System Overview" [level 1], "Lane n" [level 2], or "sensor name" [level 3]. In the Inspection Screen [level 4], the tab also reads "sensor name," but the inspection graphs and parameters are available to view and edit.

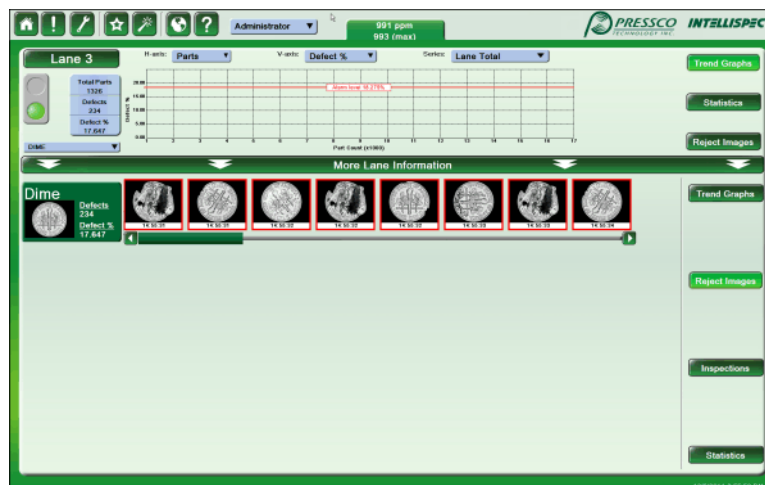
❖ *Note: when you switch between System Overview and Lane Overview modes, you will see one screen 'minimize' to the task bar while your selected screen is displayed. This is normal.*

➤ **To view the four viewing levels:**

1. Click the Home button  to go to level 1, System Overview.
 - System Overview - Displays information that represents the complete system as well as a thumbnail line for each Lane that is configured. More information about the **System Overview screen** (on page 37).

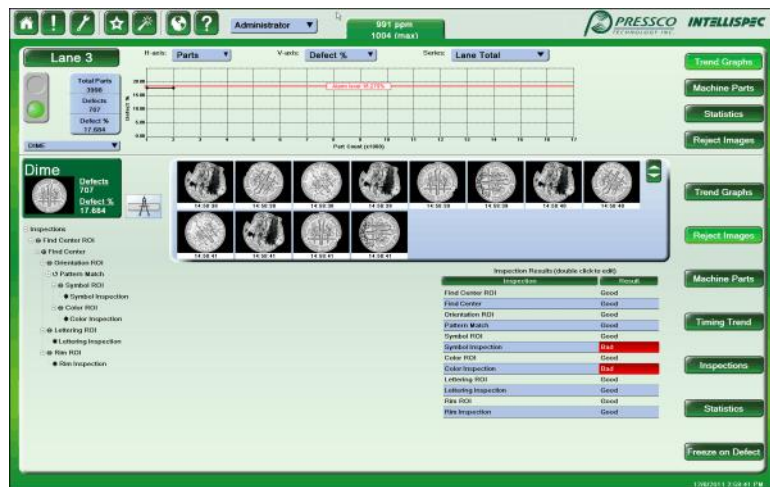


2. Click a Lane button  to go to level 2, Lane Overview.
 - Lane Overview - Displays information for a particular Lane as well as a thumbnail line for each sensor used in that Lane. More information about the **Lane Overview Screen** (on page 38).



3. Click a Sensor button  to go to level 3, Sensor Overview.

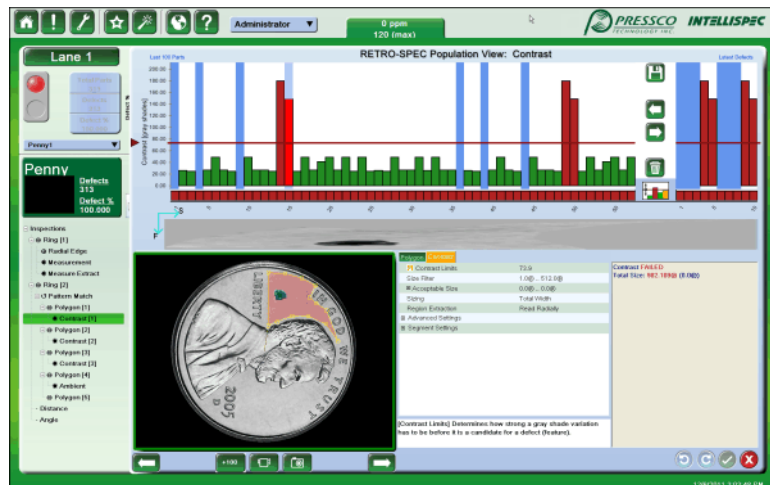
- Sensor Overview - Displays information for a particular sensor, including an image area, sensor statistics, a graphics area that displays user-selectable graphs, and a user-selectable inspection list. More information about **Sensor Overview Screen** (on page 39).



4. Double-click an inspection name in the Analysis Inspections list to get to level 4, Inspection Screen.

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

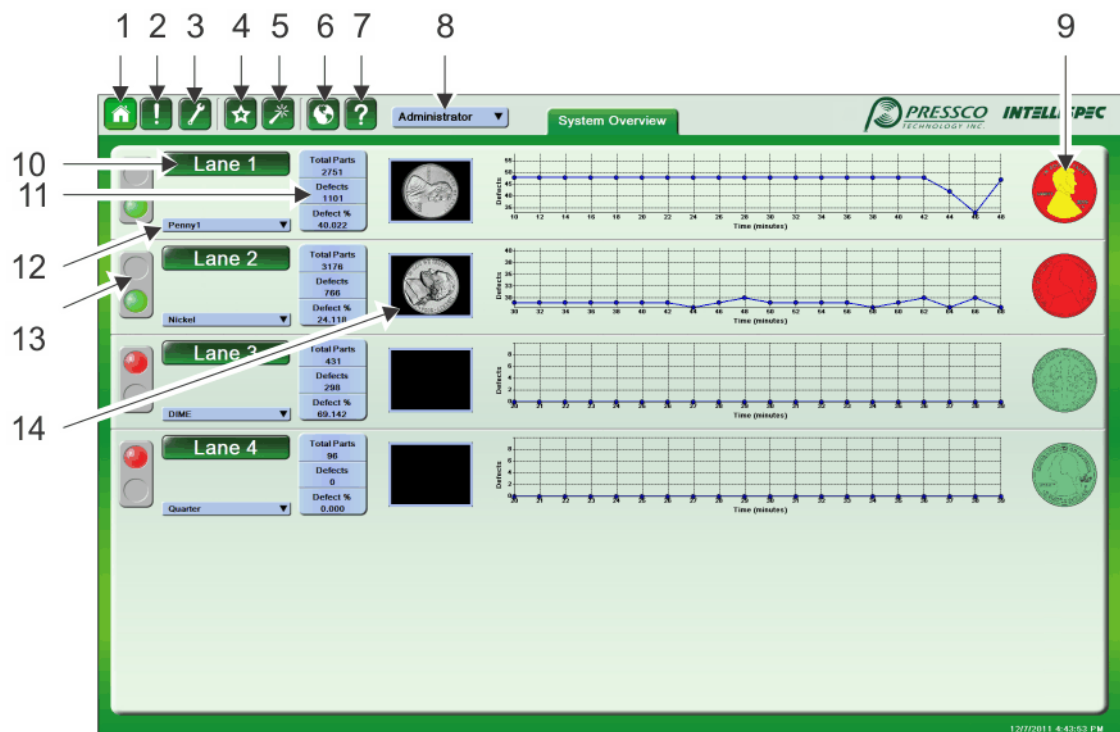
- Inspection Screen - Double-click on any inspection name to see this view, which allows you to see inspection parameters and make changes if necessary.



5. Click the exit button  to go back to level 3 Sensor Overview mode.

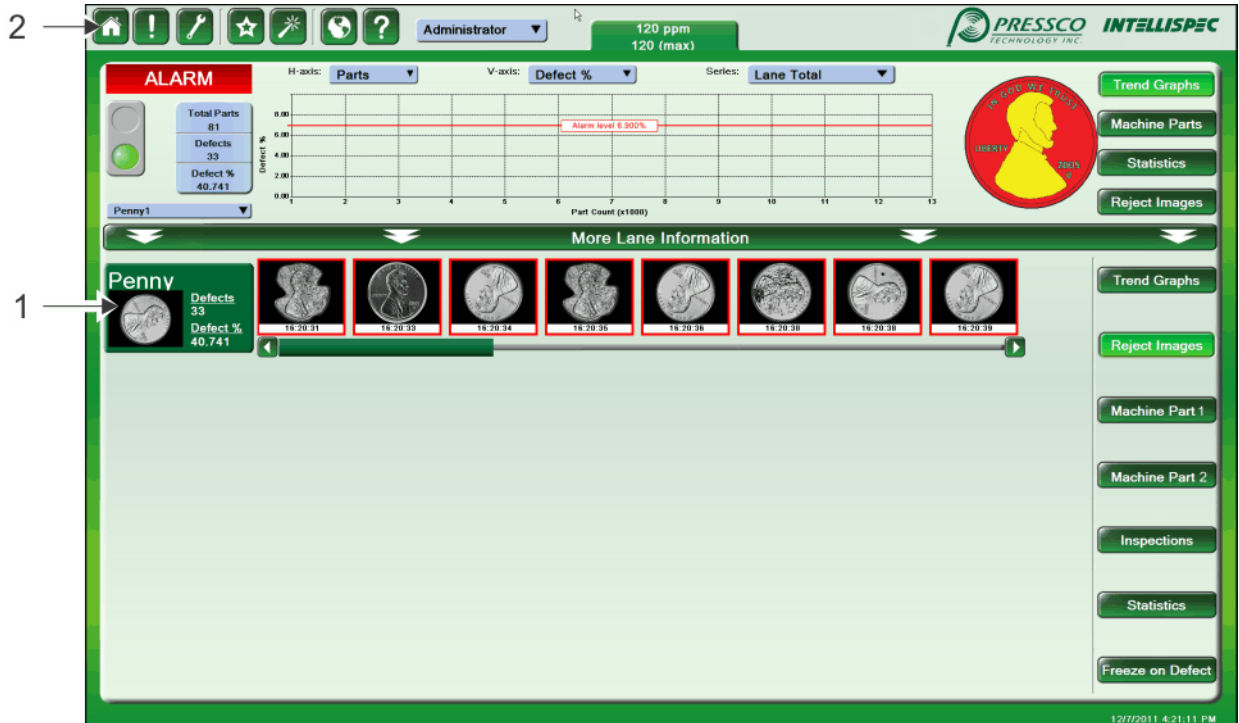
System Overview screen

For a description of the toolbar icons, see **Menu Toolbar** (on page 40).



1	Home
2	Alarms
3	System Settings
4	Favorites
5	Wizards
6	Language
7	Help menu (Remote support only at System Overview)
8	Log in
9	Walk By Graphic
10	Click to go to Lane Overview
11	Lane Statistics
12	Current Part Program
13	Online/ Offline
14	Heartbeat Image

Lane Overview Screen



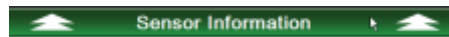
1	Click the sensor button to toggle to detailed Sensor View and back
2	Switch to System Overview

More Lane Information



Under the Lane Overview screen, click the More Lane Information bar to display additional graphs, statistics, or an additional Walk By graphic. Buttons on the right side of the screen provide different viewing options.

Sensor Information



Under the Lane Overview screen, click the Sensor Information bar (at the bottom of the screen) to display the default sensor information. Graphs, images, or statistics are displayed depending which button on the right is selected.

Statistics menu

Use the Statistics menu in the Lane Overview screen to view, reset, or print statistics.

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

➤ To view the Statistics menu:

1. Go to the Lane Overview screen by clicking a Lane n button.

- Click over a statistics box. The Statistics menu is displayed. The items in the menu are described below.



Clear Lane Statistics

Clear the statistics for the lane only.

Clear Lane Statistics and Clear Images

Clear the statistics for the lane and empty the defective image buffer.

Clear SPC Statistics Only

(Only available if you have Retro-Spec inspections enabled to keep SPC data) Clear the statistics statistical process control. See **Statistical Process Control** (see "**Statistical Process Control (SPC) Charting**" on page 81).

Clear Machine Part Statistics Only

(Only available if machine part correlation is enabled on your system) Clear the statistics for the machine parts. See **Machine Part Correlation** (on page 109).

Print Lane Report

Send the lane statistics report to the default configured printer.

Statistics Last Reset

Display the date and time when the lane statistics were last reset.

Sensor Overview Screen

2 →

The screenshot shows the 'Sensor Overview Screen' for 'Lane 2'. It includes a top navigation bar with icons and a dropdown menu set to 'Administrator'. The main area displays a graph of 'Defect %' vs 'Part Count (x1000)' with an 'Alarm level 6.800%'. Below the graph is a 'Nickel' section showing 'Defects 228' and 'Defect % 24.101'. A list of inspection items is shown, including 'Registration ROI', 'Orientation', 'Rim ROI', 'Rim Inspection', 'Orientation ROI', 'Btwn Letter ROI', 'Liberty Date ROI', 'Liberty Date Inspection', 'IGWT ROI', 'IGWT Inspection', 'Left Bkgd ROI', 'Left Bkgd Inspection', 'Right Bkgd ROI', 'Right Bkgd Inspection', and 'Collar ROI'. A table at the bottom provides detailed statistics for each inspection item.

Inspection	Total	Defects	Defect %	Last N	Last N %
Registration ROI	734	0	0.000	0	0.000
Registration	734	0	0.000	0	0.000
Rim ROI	734	0	0.000	0	0.000
Rim Inspection	734	75	10.218	45	9.000
Orientation ROI	734	0	0.000	0	0.000
Orientation	734	75	10.218	45	9.000
Btwn Letter ROI	734	75	10.218	45	9.000
Btwn Letter Inspection	734	100	13.624	60	12.000
Liberty Date ROI	734	75	10.218	45	9.000
Liberty Date Inspection	735	101	13.742	60	12.000
IGWT ROI	735	75	10.204	45	9.000
IGWT Inspection	735	100	13.605	60	12.000
Left Bkgd ROI	735	75	10.204	45	9.000
Left Bkgd Inspection	735	126	17.143	75	15.000
Right Bkgd ROI	735	75	10.204	45	9.000
Right Bkgd Inspection	735	126	17.143	75	15.000
Collar ROI	735	75	10.204	45	9.000

1 →

1 Double-click to open Inspection View

2	Switch to System Overview

Inspection Overview Screen

2

1

1	Close the Inspection View
2	The inspection window must be closed first to switch to System Overview

Menu Toolbar



1	Home
2	Alarms
3	Tools
4	Favorites

5	Wizards
6	Language
7	Help

Home

Click Home to return to the System Overview Screen. If a region or inspection editor menu is open, you must close it before anything else can be selected. The Home button is highlighted in the System Overview screen.

Alarms

When this icon is selected, a different pop-up window appears depending on what screen you are on. For more information, refer to the section about **alarms** (on page 85).

Tools

When this icon is selected, a different pop-up window appears depending on what screen you are on. For more information, refer to the section about **tools** (see "**Tools Menus**" on page 97).

Favorites

From the Lane and Sensor Overview screens, you can select Take Screen Shot or Background Tasks. For more information, refer to the section about **favorites** (see "**Favorites Menu**" on page 140).

Wizards

From the Lane or Sensor Overview screens, select wizards that assist in setting up certain features. At the present time the only wizard is for setting up the Walk By graphic. This allows you to select group names, inspections assigned to each group, and values that determine when areas of the Walk By graphic turn to yellow, red, or back to normal (green).

Language

Select an available language from this menu.

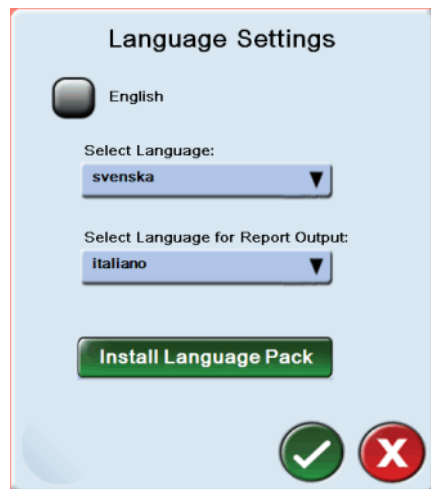
Help

From the Lane or Sensor Overview screens, access the help documents, support package utility, remote support option, and software version.

Language



Click the language button to select a different language. Choose from the available options.



English

If this box is checked, the names of the available languages are displayed in US English (example: *Swedish* instead of *svenska*).

Select Language

Select the language to display on the user interface.

Select Language for Report Output

Select the language for the reports, such as the Lane Report from the **Statistics menu** (on page 38).

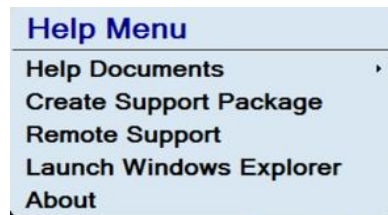
Install Language Pack button

When a new language is available, use this option to install the proper files. You will receive instructions from Pressco to install the language pack.

Help

Click the Help icon  to:

- use the help files
- **create a support package** (see "**Creating a Support Package**" on page 134)
- access Pressco **remote support** (see "**Help - Remote Support**" on page 136)
- open Windows Explorer (administrators only)
- obtain your current software version

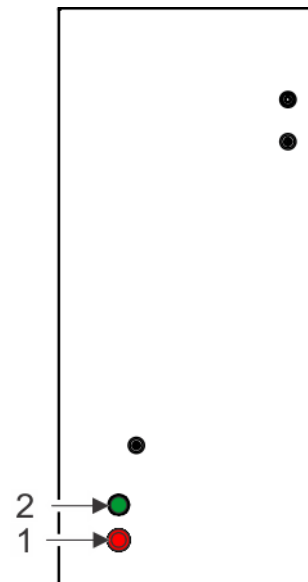


➤ To access the user manuals:

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

Emergency E-Stop Button

The FHCP 3X has a red E-Stop button [item 1] to stop motor power. The motors are those that move the inspection module up and down, and move the guide rails within the inspection module in and out. The green reset button [item 2] returns power to the motors.



1	E-Stop Button stops motors
2	Green pushbutton restarts motors

➤ **To use the E-Stop buttons:**

1. Press the red E-Stop button [item 1] to stop the motors.
2. Perform service, or clear part jams.
3. When you have completed servicing the unit, press the green button to reset the motors.

Part Changeover Adjustment

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, as well as proper guide rail settings (as long as these were previously set).

Part Changeover

When you change your production line from one part type to another, you can quickly change the part program.

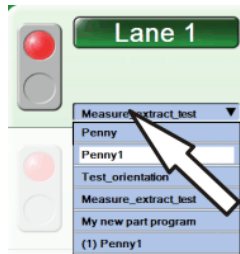
❖ *Note: Some menu items are only available to advanced level users.*

➤ **What you need:**

- User permission to Switch Part Program

➤ **To change parts:**

1. **Log in** (see "**Logging in and logging out**" on page 49).
2. Click the part drop-down menu.



3. Click the name of the new part to inspect. The new part program is loaded on the Intellispec.
4. Put the system 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, regions, enhancements, and analyses.

Lane Specific Information	Definition
Cameras (or other sensor)	All information for each camera or other sensor is contained in the Part Program.
Lighting	Each camera has different lighting settings for each part. When you load your Part Program after a Part Changeover, the lighting will be specific for that part and save any changes you make.
Calibration	Calibration setup for Part Present Delay and Reject Delay is saved for each part you will run. Part Present and Reject Delay will only need to be set up once.
Regions, Registrations,	All Inspections will be contained in your Part Program. Also, parameter

Camera Height Adjustment

The camera height for the Main and Color cameras is adjusted by motors that you control through the user interface software. You only need to adjust the camera height when you set up a new part program. After you adjust the camera height, save and exit the screen, the adjustment data is saved with the current part program.

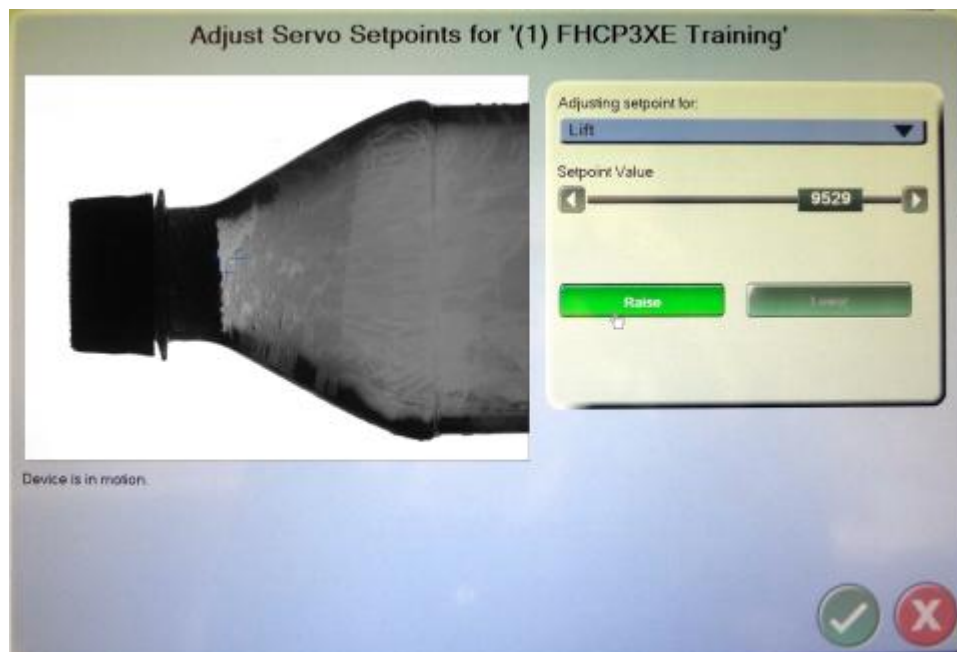
❖ *Note: you only need to adjust camera height once for the color cameras. Both cameras are on a plate and they move together. Once you save the settings for one color camera, you do not need to repeat the procedure for the other color camera. You will need to adjust height for the main camera separately.*

➤ You will need:

- A stopped conveyor. You need to adjust the height using a part that is not moving.
- A part that represents the part you are going to inspect and set up a part program for.

➤ To adjust camera height:

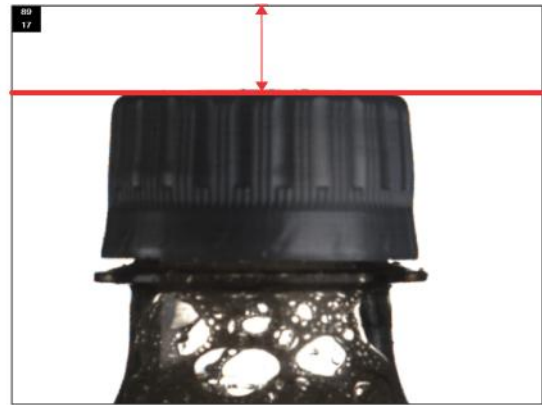
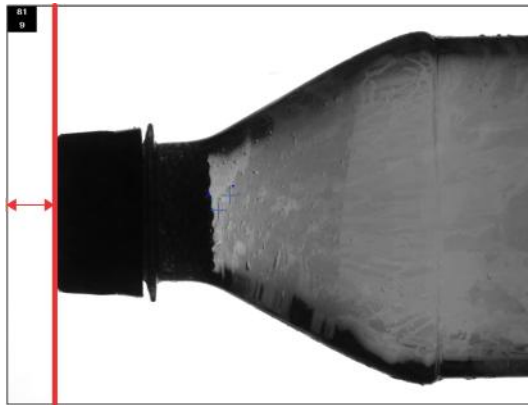
1. Make sure the system is offline.
2. Make sure the desired part program is selected.
3. Place a part in the center of the inspection tunnel.
4. From Lane Overview or Sensor Overview mode, select the Tools button  > Part Setup > Adjust Servo Setpoints.
5. If you selected the menu from Lane Overview mode, select the camera you want to adjust. This is already selected if you entered the screen from Sensor Overview mode.
6. Select "Adjust Lift" from the drop-down menu.



7. Press either the **Raise** or **Lower** button, depending which way you want to move the camera. The camera(s) will start moving inside the inspection module. You should see the lights flashing and an image on the screen.

8. Look at the image on the screen and **wait** until the part moves in the image. When the part is almost where you want it, press the **Raise** or **Lower** button again (the button you pressed in the previous step). The motor continues to run a couple seconds after you press the button.
9. Repeat steps 7 and 8 until the part image is at the desired height, as shown below.
10. If you are done adjusting the camera and guide rails, click the OK button and exit. The settings are saved with the current part program.
11. Repeat this procedure the other camera. NOTE: you only need to adjust the height once for both color cameras - they are on a plate and move together. You will adjust the main camera separately.

We recommend that the part image is approximately 100 pixels from the top of the image.



Guide Rail Adjustment

The **Guide Rails** (on page 272) are adjusted by a motor that you control through the user interface software. You only need to adjust the guide rails when you set up a new part program. After you adjust the guide rails, save and exit the screen, the adjustment data is saved with the current part program.

- When the system shuts down, the guide rails move to home position.
- When the system powers up, the guide rails calibrate themselves and move into the correct position for the currently selected part program.

➤ You will need:

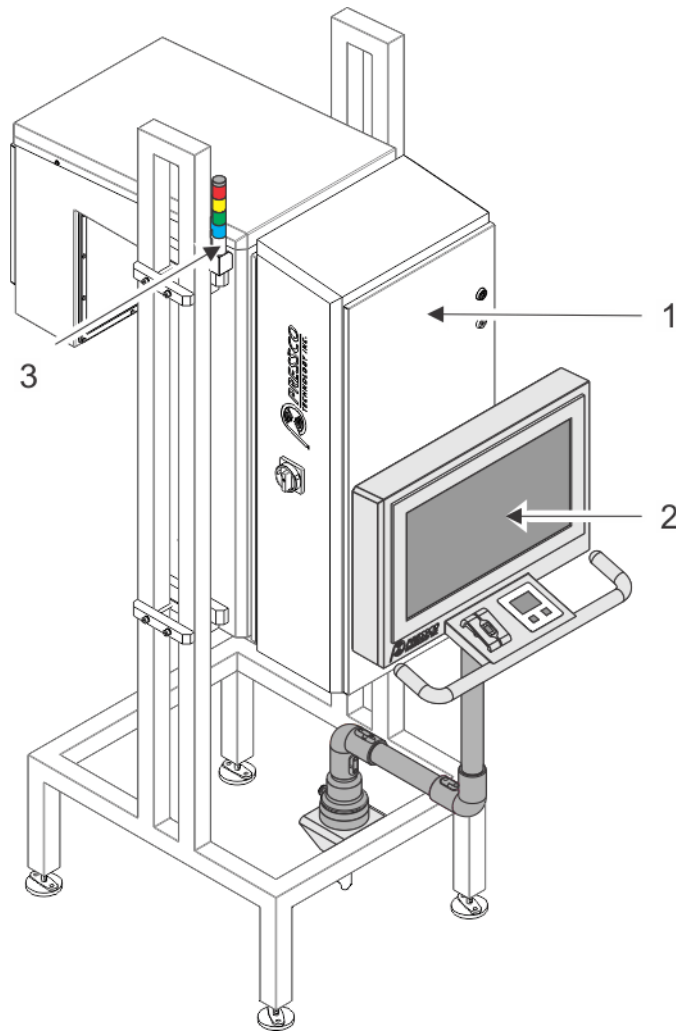
- A stopped conveyor. You need to adjust the rails using a part that is not moving.
- A part that represents the part you are going to inspect and set up a part program for.

➤ To adjust the guide rails:

1. Make sure the system is offline.
2. Make sure the desired part program is selected.
3. Place a part in the center of the inspection tunnel.
4. From Lane Overview or Sensor Overview mode, select the Tools button  > Part Setup > Adjust Servo Setpoints.
5. If you selected the menu from Lane Overview mode, select a sensor. This is already selected if you entered the screen from Sensor Overview mode.
6. Select "Adjust Rails" from the drop-down menu.
7. Press either the **Narrower** or **Wider** button, depending which way you want to move the rails. The rails will start moving inside the inspection module.
8. Look at the bottle and rails and wait for the rails to move. When the rails are almost where you want them, press the **Narrower** or **Wider** button again (the button you pressed in the previous step). The motor continues to run a couple seconds after you press the button.
9. Repeat steps 7 and 8 until the rails are in the desired position for your part. Make sure that the bottles have enough room to pass through the rails without touching them.
10. If you are done adjusting the camera and guide rails, click the OK button and exit. The settings are saved with the current part program.

Light Tree

Each FHCP 3X system will have a light tree [item 3] mounted on it.



1	Heavy duty stainless steel enclosure housing, including inspection module and vision processor computer
2	Integrated NEMA4X Operator Interface with trackball
3	Four segment light tree device

Light tree status

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. The table below lists the different states for each light.

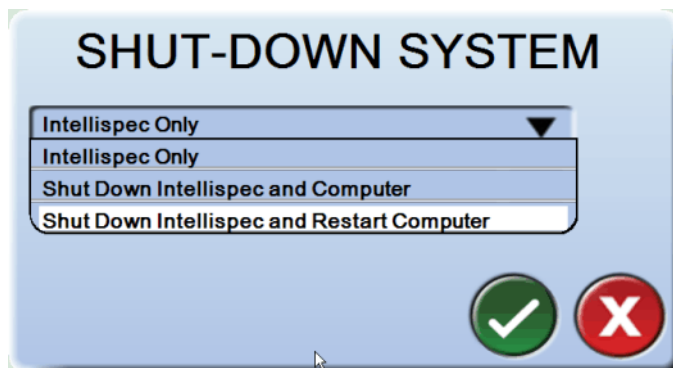
Light color	Condition	What it means
Red	On - steady	Alarm condition
Red	On - blinking	Part tracker board lost communication with the host PC or has an error and needs to initiate an alarm
Red	Off	No alarm (OK)
Amber	On	Warning alarm condition
Amber	Off	No warning (OK)
Amber	0.5 second flash	Auto reset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

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. Click the Home button .
3. Click the Tools button  to display the Tools menu.
4. Click the Exit System option.
5. A drop-down menu allows you to choose an option:
 - Shut down the Intellispec software only
 - Shut down the Intellispec software and computer
 - Shut down the Intellispec software and restart the computer



6. Choose the desired option from the menu and click the OK  button. The Intellispec software and/or computer shuts down (and restarts if applicable).

Chapter 6

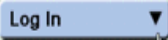
User Accounts and Login Information

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

Logging in and logging out

Each user account has a list of permissions and restrictions. This is to give administrators more control over the system, and restrict others from performing tasks like changing lighting, or adding and editing inspections. When you log in, you can perform the tasks made available to you.

➤ **To log in, follow either of the steps below:**

- Click the Log In button  to display the login dialog box. Select your user name from the drop-down list. Enter your password using the On Screen Keyboard by touch screen or trackball and buttons. The password characters will not be shown for security reasons.
- [With the optional **biometric sensor**] Press your finger to the sensor. The system will automatically determine your identity and log you in. If the system fails to recognize your identity after three attempts, the log in dialog box will appear, to allow you to log in with your user name and password.

➤ **To log out, follow either of the steps below:**

- Click the Log In button that displays your user name. The account drop-down menu appears. Select the Log Out button. The system logs you out.
- [With the optional **biometric sensor**] Press your finger to the sensor. The system logs you out.

❖ *Note: When another users logs in, the system automatically logs you out.*

Log in menu

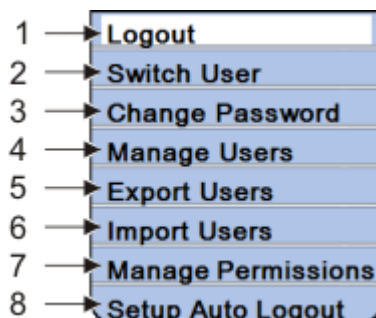
To ensure that only authorized users perform certain changes to the system, users are required to log in.*

*Some tasks can be configured so that users do not need to log in. This is done through **Manage Permissions** (see "**Managing Permissions**" on page 55).

❖ *Note: Accounts may be shared by a group of people (example: Shift 1).*

➤ **To view the Log In menu:**

1. Click the Log In button  and enter your password. The text on the button changes to indicate who is logged in.
2. Click the Log In button again (which has your user name displayed on it). The Log In menu is displayed. Some options in this menu are only available to authorized users.



1	Logout - Logs out whoever is logged in
2	Switch user - Allows you to switch from one user to another
3	Change Password (see " Changing your password " on page 50)- Allows you to change only your password
4	Manage Users (see " Managing user accounts " on page 51) – Used to assign, remove, or edit users. This is where users are given access to specific tasks (example: one user is given the access to edit inspections and another is not given this access). You can also give users access to specific tasks through Manage Permissions (see " Managing Permissions " on page 55).
5	Export Users (see " Exporting user accounts " on page 53) - Allows you to export user profiles from one Intellispec to another
6	Import Users (see " Exporting user accounts " on page 53) - Allows you to import user profiles from one Intellispec to another
7	Manage Permissions (see " Managing Permissions " on page 55) – This is where the system can be configured to allow pre-defined tasks to be performed with no log-in
8	Setup Auto Logout (see " Setting up Auto Logout " on page 59)– This feature will automatically log you out if there is no activity for a defined amount of 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.*

Switching users

The Switch Users option from the Log In menu logs out the current user, and allows a new user to log in.

➤ To switch users:

1. Click the Log in button (which has the current user's name displayed).
2. Select Switch Users from the menu.
3. Select the new user name from the drop-down menu.
4. Enter the new user's password. The new user is logged in. The previous user is logged out.

➤ If you have a biometric sensor:

Press your finger to the biometric sensor device to log in. The previous user will be automatically logged out by the system.

Changing your password

The Change Password function is available to all users.

❖ *Note: an Administrator can reset a password if necessary.*

➤ To change your password:

1. Log in.
2. Click the Log In button with your user name to see the Log In menu.
3. Select Change Password. The Change Password dialog box is displayed.
4. Enter your Old Password.
5. Enter a New Password.
6. Confirm your New Password.

- Click the OK button  to accept the changes. The dialog box closes and your password is changed.

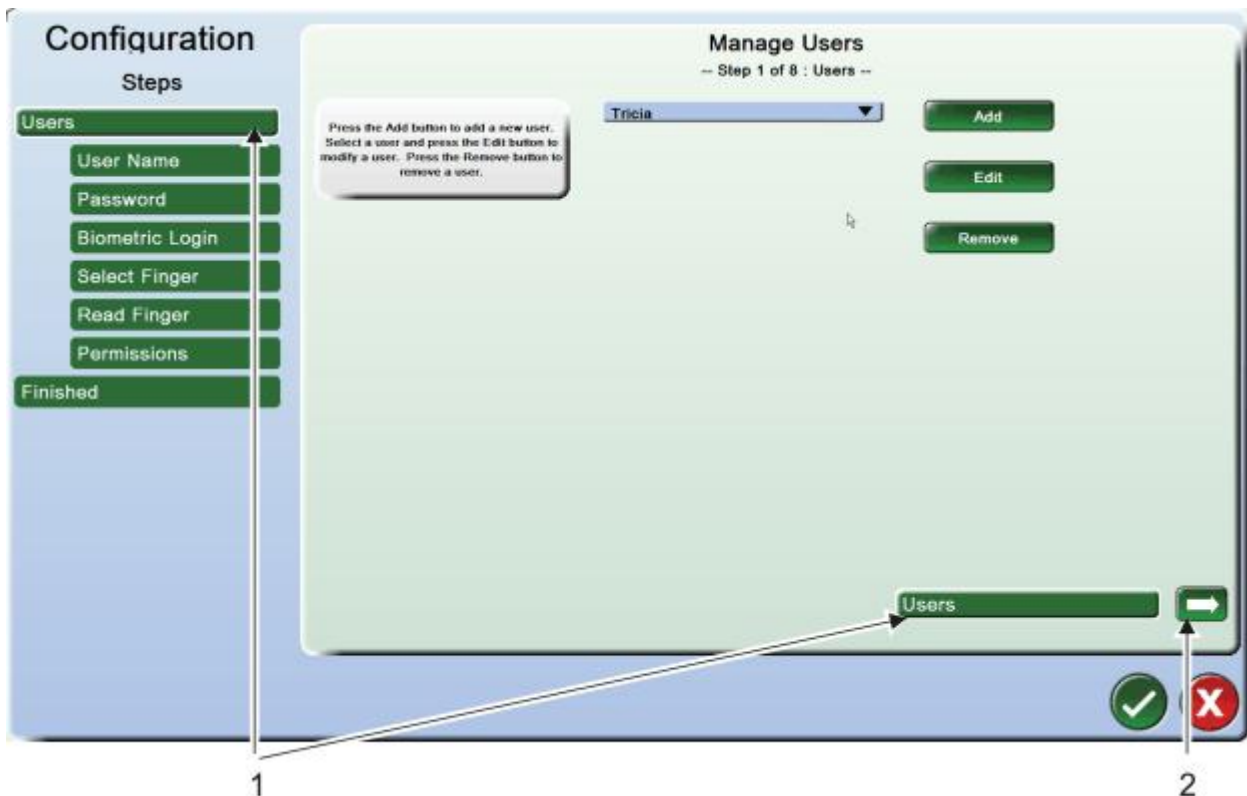
Managing user accounts

The Manage Users button is only available to those with the Manage Users permission. This feature provides a wizard that allows you to Add a new user, Edit a current user or Remove any user. You may create one user account for a group of people and give that group the password to the account (example: Shift 1).

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

➤ To manage a user account:

- Log in as an administrative user.
- Click the button with your user name to see the login drop-down menu.
- Select Manage Users. The Manage Users dialog box is displayed.
- Select Add, Edit, or Remove a user. Follow the information on screen to complete these actions. The current step is highlighted on the left side of the configuration screen [item 1 in illustration below], and is repeated at the bottom of the screen.
- Use the forward arrow button [item 2] to move to the next screen after you have entered the appropriate information. Use the back arrow button (not shown in first step) to return to the previous step. You do not need to enter information in each screen to move from one screen to the next.



1	Current step in the wizard is highlighted.
2	Forward navigation to move to the next step. A back arrow (not shown) is available in later steps.

Adding a user with the biometric login device

When you have the optional biometric login device installed, you will need the user present. The biometric login uses finger recognition software to log in rather than selecting a user name and entering a password. You can always **log in** (see "**Logging in and logging out**" on page 49) using your user name and password, even if you have a biometric login device. The maximum number of biometric accounts is 40.

- ❖ *Note: use of one account by a group of people is not supported with the biometric device. Each user must have his or her own account.*
- ❖ *Additionally, 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 an administrative user.
2. Click the button with your user name to see the login drop-down menu.
3. Select Manage Users. The Manage Users dialog box is displayed.
4. Click the Add button.
5. Add the user name when prompted. Click the forward arrow.
6. Enter a password, then Confirm it. Click the forward arrow.
7. [Biometric login] The next screen gives you the option of creating a biometric login or skipping over it. If you chose Skip, go to step 10. If you chose Create, go to step 8.
8. [Select Finger] Choose which finger the biometric sensor will read. Select any finger by using the touch screen or trackball and buttons to choose the circle above the finger. Only one finger can be used, and you must use this finger every time when logging in. Click the forward arrow.



9. [Read Finger] Click the Start Button at the top of the screen. The system will ask you to place the finger you selected on the biometric sensor. To ensure an accurate biometric measurement, you are asked for three readings. Instruct the user to place his or her finger on the biometric sensor three times when prompted. Click the forward arrow.
10. [Permissions] This is where you can set up what each user can and cannot do within the system. After you have selected the desired permissions, click the forward arrow. You can also change permissions later. For more information, see **Managing Permissions** (on page 55).
11. [Finished] Click the OK button  to accept changes and exit.

Exporting user accounts

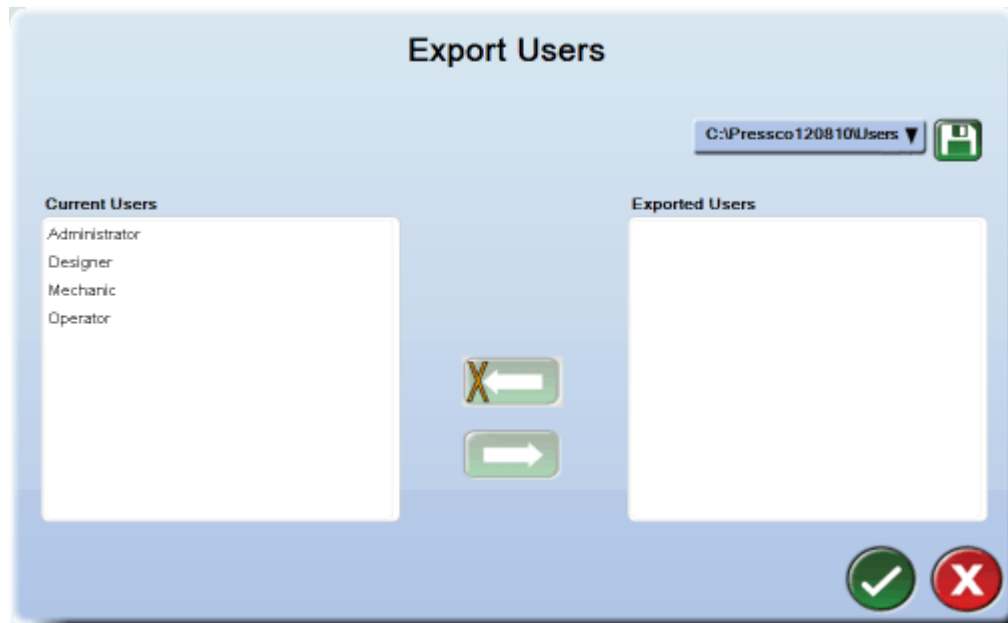
This allows you to export user accounts from one system to another. The user accounts may be used in other Intellispec Series V systems in your plant. You may also want to back up your user accounts in the event they are changed in the system.

➤ What you need:

- A USB memory device to export or import data
- User access permission to change permissions

➤ To export a user account:

1. Log in as an administrative user.
2. Insert the **USB** (see "**FHCP 3X User Interface Hardware**" on page 268) device into an available slot on the Intellispec Series V system.
3. Click the button with your user name to see the login drop-down menu.
4. In the user login drop-down menu, click Export Users. The Export Users dialog box is displayed.



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

Importing user accounts

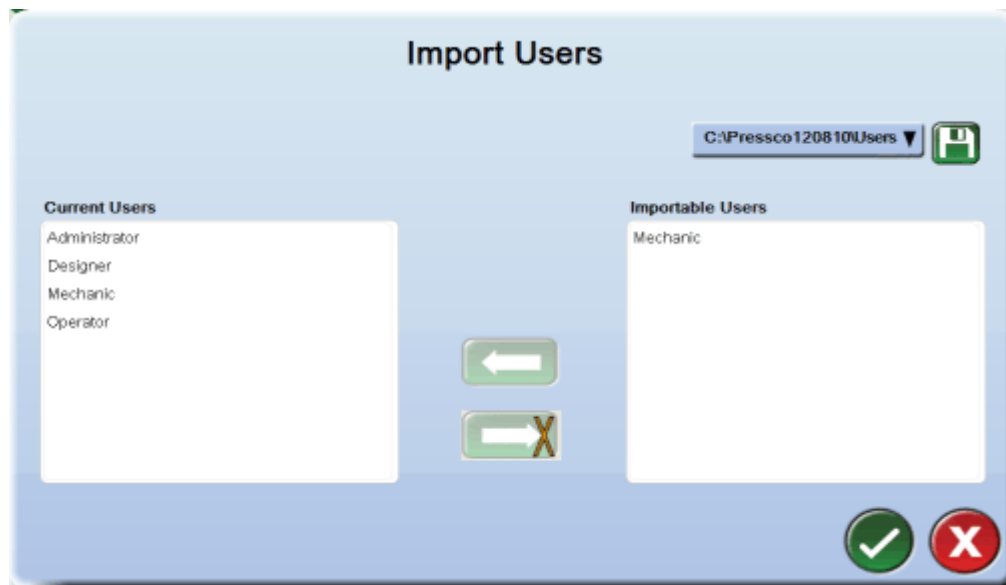
This allows you to import user accounts from one system to another. The user accounts may be used from other Intellispec Series V systems in your plant.

➤ **What you need:**

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

➤ **To import a user account:**

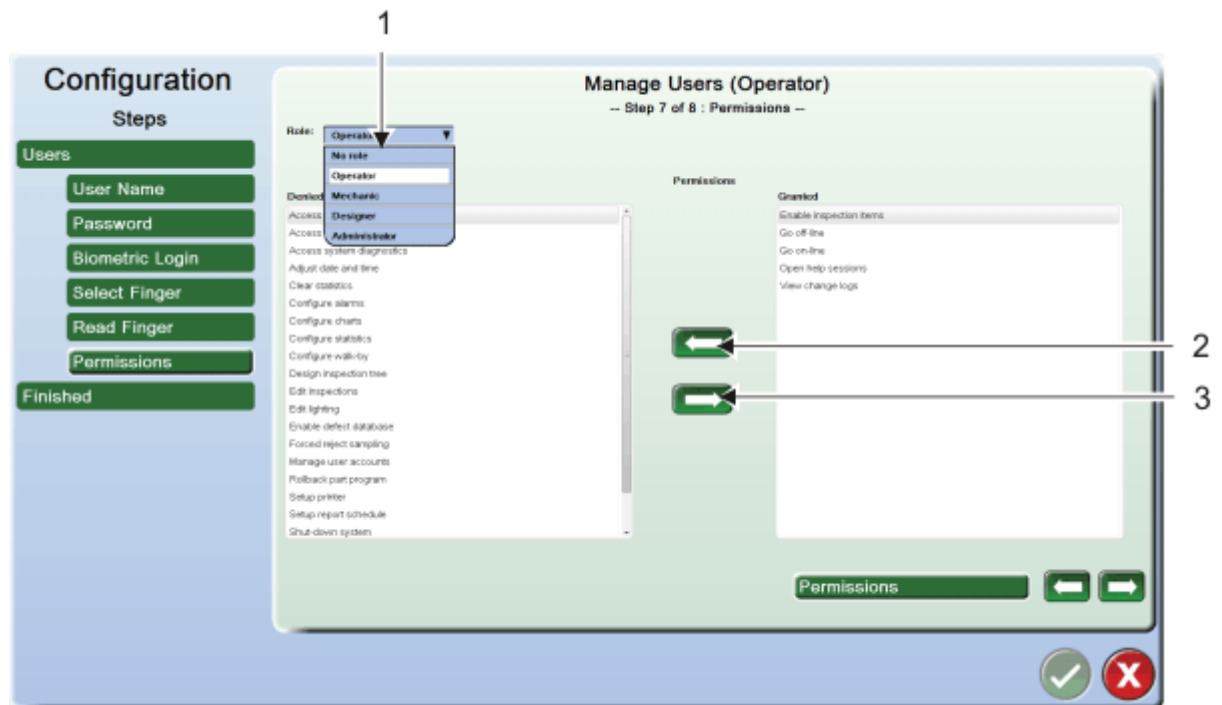
1. Log in as an administrative user.
2. Insert the **USB** (see "**FHCP 3X User Interface Hardware**" on page 268) device into an available slot on the Intellispec Series V system.
3. Click the button with your user name to see the login drop-down menu.
4. In the user login drop-down menu, click Import Users. The Import Users dialog box is displayed.



5. Select the user account that you want to Import from the right column. If you do not see any users available, click the Save button  to browse to a location where the user account is saved.
6. Click the left arrow  to import the user account.
7. Click OK  to accept changes and exit the screen. The user account is imported.

Managing Permissions

The Intellispec has some default permissions that you can use to quickly set up users. To grant these permissions, click the appropriate button in the Manage Users screen. When you select these default permissions, you could also add or subtract specific permissions for the user.



1	Choose from one of the predefined Roles to use the default permissions
2	Subtract one of the Granted Permissions. First highlight the permission in the list, then click the left arrow.
3	Grant one of the Denied Permissions to the selected user. First highlight the permission in the list, then click the right arrow.

Notes about roles and permissions:

- Granted permissions have priority over roles. If you change the permissions of a role, or change the role of a user, the granted permissions persist.
- When you change permissions for a role, all users with that role get the new permissions of that role. This is useful to change permissions for groups of users.

The following table provides a brief description of all the available default permissions. Note that some permissions may not be available in your list. For more information, refer to **Editing Permissions** (on page 58).

Key: ROLES: **O** = Operator; **M** = Mechanic; **D** = Designer; **A** = Administrator

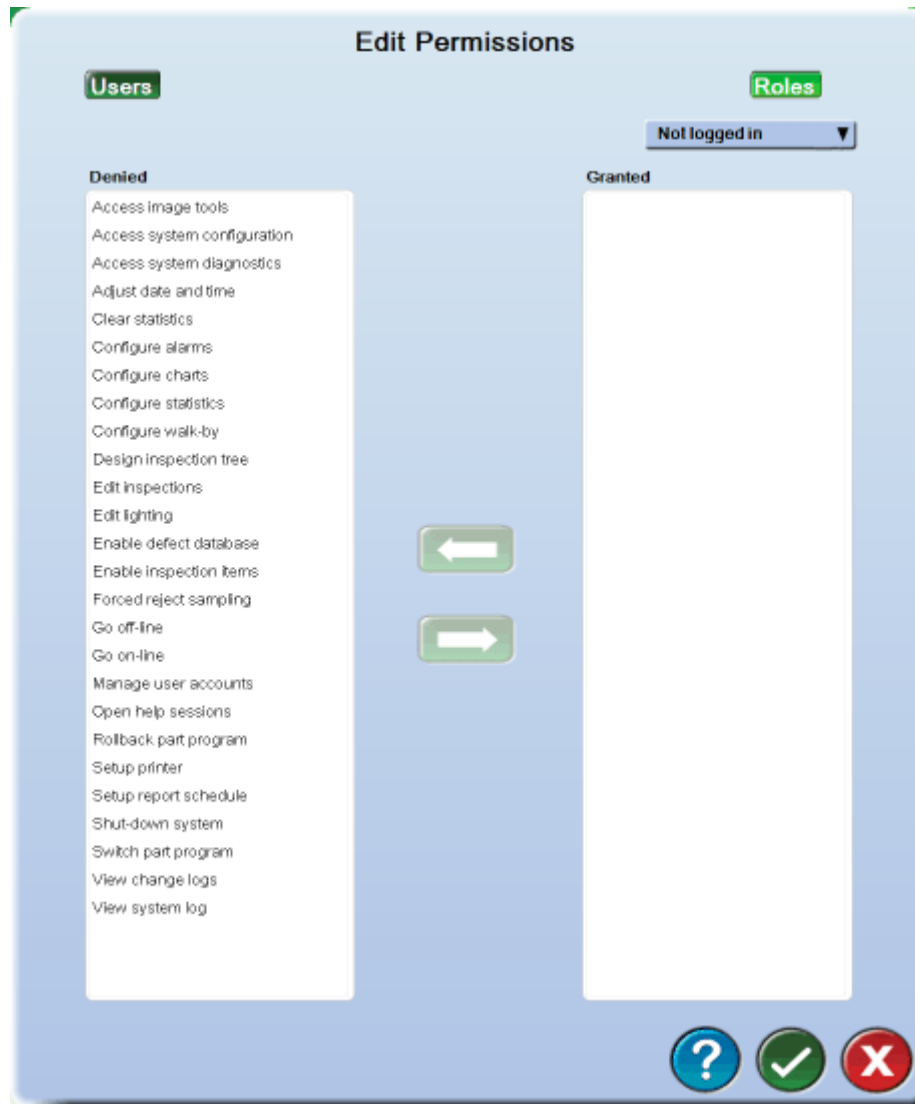
	Permission	Description	O	M	D	A
1	Access advanced inspection parameters (Editor Options (on page 209))	Access advanced parameters inside of the inspections, and access some inspection tree items (such as regions).			X	X
2	Access image tools (see " Image Analysis " on page 158)	Access the Image Analysis Tools.		X	X	X

	Permission	Description	O	M	D	A
3	Access system configuration (see " Lane Setup " on page 107)	Change system configuration values.		X	X	X
4	Access system diagnostics	Perform system functions including I/O (see " I/O Diagnostics " on page 121) and correlation diagnostics (on page 122).		X	X	X
5	Adjust date and time (see " Adjusting Date and Time " on page 133)	Adjust Intellispec system date and time.				X
6	Allow Task Manager Access	Access Windows Task Manager.		X	X	X
7	Apply X-Ray Power	[only applicable to x-ray modules] Turn on the x-ray power to the module.		X	X	X
8	Cancel Background Task (see " Background Tasks " on page 141)	Cancel a background task if it is interfering with inspection.				X
9	Clear statistics (see " Statistics menu " on page 38)	Reset inspection statistics.	X	X	X	X
10	Configure alarms (see " Lane Alarm Configuration " on page 88, " Sensor Alarm Configuration " on page 92)	Configure the lane and sensor alarms.		X	X	X
11	Configure charts (see " Lane Setup " on page 107)	Configure trend charts and other statistics charts.		X	X	X
12	Configure statistics (see " Statistics Configuration " on page 78)	Configure how the statistics graphs are displayed.		X	X	X
13	Configure walk-by (see " Walk By Setup " on page 62)	Name, set up alarms, and set up which inspections will be used with a particular region on a part. These regions are displayed in the walk-by graphic.		X	X	X
14	Design inspection tree (see " Inspection menu " on page 197)	Add or delete inspections.			X	X
15	Edit inspections	Edit existing inspections.		X	X	X
16	Edit Lighting (see " Sensor menu " on page 155)	Change the lighting settings for each camera.		X	X	X
17	Edit Part Notes (see " Part Setup " on page 105)	Add information to the part setup file.		X	X	X
18	Enable defect database (see " Reporting " on page 98)	Enable the optional defect database.			X	X
19	Enable inspection items (see " Inspection menu " on page 197)	Enable or disable individual inspections and the rejecter for those individual inspections.		X	X	X
20	Forced Reject (on page 118) Sampling	Request forced reject sampling.	X	X	X	X

	Permission	Description	O	M	D	A
21	Go Offline (see " Online / Offline " on page 28)	Put a lane offline.	X	X	X	X
22	Go Online (see " Online / Offline " on page 28)	Put a lane online.	X	X	X	X
23	Install language pack (see " Language " on page 41)	Update the language files for the user interface, if provided by Pressco.				X
24	Launch Windows Explorer	Launch Windows Explorer from Task Manager or from the desktop.				X
25	Manage part programs (see " How to Create, Copy, or Import a Part Program " on page 195)	Create, import, export, copy, or load part programs.		X	X	X
26	Manage user accounts (see " Managing user accounts " on page 51)	Open Manage Users which lets you add, edit and remove users.				X
27	Open help sessions (see " Help - Remote Support " on page 136)	Start a remote help session with Pressco Technical Support.	X	X	X	X
28	Rollback part program (see " Part Program Change Log " on page 200)	Roll the current part program back to a previous state.		X	X	X
29	Run Mass Manager	Used with mass sensors - select appropriate Scaling Recorder sessions to scale the Intellispec readings.		X	X	X
30	Run Mass Recorder	Used with mass sensors - enter sample data from cut and weighed bottles.	X	X	X	X
31	Setup printer (see " Setting up a printer " on page 134)	Set up a printer for Intellispec reports.				X
32	Setup report schedule (see " Schedule Reports " on page 101)	Schedule statistics reports to be generated periodically.		X	X	X
33	Shut down system (see " Exiting the Intellispec software " on page 47)	Shut down the Intellispec system.		X	X	X
34	Switch part program	Change the currently running part program. This also allows you to add a new part program.	X	X	X	X
35	Switch report language (see " Language " on page 41)	Choose a language for the Intellispec reports.				X
36	View change logs (see " Part Program Change Log " on page 200)	View the inspection change logs.		X	X	X
37	View system logs (see " Log Reader " on page 103)	View the system logs.	X	X	X	X

Editing Permissions

This feature allows you to set up permissions that will be available when no one is logged in. It also gives the selected permissions to all users. Once a permission has been selected, it will no longer appear in the available or selected columns when adding or editing a user in the Manage Users option. This feature is only available to Administrators (with Manage Users permissions).



➤ To grant permissions to all users:

1. Log in as Administrator.
2. Click the Log in button with your name on it to see the Log in menu.
3. Select Manage Permissions. The Edit Permissions screen is displayed.
4. Click the **Roles** button.
5. From the drop-down menu below Roles, select "Not Logged In."
6. Highlight the desired permission in the left column.
7. Click the right arrow  to move the permission to the right column.
8. Repeat the above two steps for all desired permissions.
9. Click the OK button  to accept changes and exit.

You can also remove permissions from all users that are assigned specific roles.



Caution

Be sure you select the User name from the drop-down menu before you change Roles. Otherwise, you could change your Administrator permissions (example: from Administrator to Operator, and not be able to Manage User Permissions afterwards).

➤ *To remove permissions from a role:*

1. Log in as Administrator.
2. Click the Log in button with your name on it to see the Log in menu.
3. Select Manage Permissions. The Edit Permissions screen is displayed.
4. Click the **Roles** button.
5. From the drop-down menu below Roles, select the role from which you want to remove the permissions.
6. Highlight the desired permission in the right column.
7. Click the left arrow  to move the permission to the left column.
8. Repeat the above two steps for all desired permissions.
9. Click the OK button  to accept changes and exit.

You can also manage permissions for any user.

➤ *To edit a user's permissions:*

1. Log in as Administrator.
2. Click the Log in button with your name on it to see the Log in menu.
3. Select Manage Permissions. The Edit Permissions screen is displayed.
4. Select a user from the User drop-down menu.
 - Move the desired permissions between Denied and Granted. Or:
 - Assign that user a new role. For example, change Jane's permissions from Operator to Mechanic. The user will acquire all permissions for that role, including any that you have assigned separately from Pressco's default settings.
5. Repeat the above step for all desired permissions.
6. Click the OK button  to accept changes and exit.

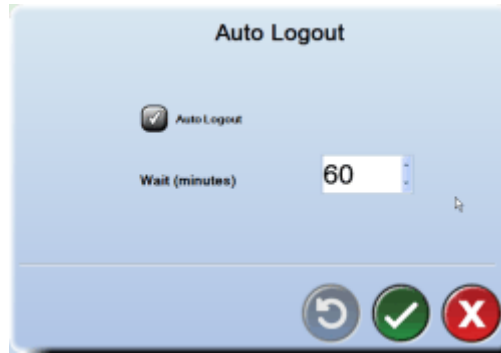
Setting up Auto Logout

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

➤ *To set up Auto Logout:*

1. Log in as an administrative user.
2. Click the button with your user name to see the login drop-down menu.
3. Select Setup Auto Logout. The setup menu is displayed.
4. Click the box next to "Auto Logout" to enable the feature. A check mark is displayed in the box when it is enabled.
5. Set the Wait time in minutes by clicking the up or down arrows, or by highlighting the number of minutes and typing a new value (from 1 to 9999 minutes).

6. Click the OK button . All users will be logged out automatically after the set number of minutes of inactivity.



Chapter 7

Graphs and Image Displays

Several graphs are available on the user interface to help you view inspection trends. This section discusses the buttons on the right side of the screen in the Lane Overview and Sensor Overview modes.

Walk By Graphic

Walk-by

This feature uses a graphic representation of a part so that you can quickly identify which area of the part is failing. It is called Walk By because you can quickly walk by the Intellispec and look at the graphic to determine the status of inspection:

- **Green** areas indicate that parts are passing inspection.
- **Yellow** warning areas notify you that the spoilage rate is approaching, but has not yet reached a critical level. This allows you to make necessary changes to the manufacturing process before the failure rate gets too high.
- **Red** areas indicate the spoilage rate has exceeded user defined limits.

The defect percentage rate at which each group reaches warning or failure limits is defined in **Walk By Setup** (on page 62).

There are two available Walk By Graphics:

- A small Walk By Graphic is displayed in System Overview, Lane Overview, and Sensor Overview modes
- A large Walk By Graphic can be displayed in Lane Overview mode

➤ To see the large Walk By Graphic:

1. Click a Lane n button to view the Lane Overview mode.
2. Click the More Lane Information bar in the center of the screen to display more graph options.

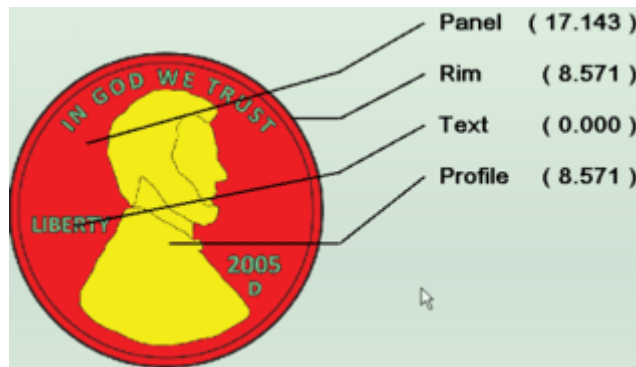
More Lane Information

3. Click the Walk By button on the right side of the screen. The Walk By Graphic is displayed in the center of the screen.

Lane n

Walk-by

The large Walk By Graphic displays the group names, pointing to the appropriate areas on the part. It also displays the current defect percentage for each of those groups, from inspection results.



Using the Walk By Graphic

You can view inspection information by clicking on the areas of the graphic. The Intellispec will display the configured inspection group and detail. The example below shows:

- The Panel group was clicked - all the inspections for Panel are displayed in the table
- The Panel area in the Walk By Graphic is red - The average defect % for the group of inspections exceeds the failure limit from the **Walk By setup** (on page 62)

Lane 1

Show: **Groups** Detail: **Panel**

Inspection	Total	Defects	Defect %	Last N	Last N %
Polygon	312615	26794	8.571	78	7.800
Contrast	312615	44658	14.285	130	13.000
Polygon	312615	26794	8.571	78	7.800
Contrast	312616	35727	11.428	105	10.500
Polygon	312616	26795	8.571	79	7.900
Contrast	312616	44659	14.286	131	13.100

Total Parts: 312998
Defects: 62599
Defect %: 20.000

Penny1

Double-click an inspection from the table (example: a Contrast inspection) to open and edit that inspection. Note: Some menu items are only available to advanced level users.

Walk By Setup

This screen allows you to set up the Walk By Image. Each Lane can be set up differently if needed.

Each area of the part graphic display is:

- Assigned a group name.
- Assigned the correct inspections for that group.
- Configured to turn the area yellow or red when defined defect statistics are achieved.

❖ *Note: you must have correct user permissions to set up the Walk By Graphic. You must also have a part program loaded.*

➤ To get to this screen:

From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu > Lane set up > Walk By Setup.

Walk By Groups
-- Step 2 of 5 : Group Name --

Outer Edge

Enter or edit the group name.

Group Name

➤ To set up the Walk By graphic:

1. Follow the instructions on screen, and navigate using the buttons at the bottom of the screen. Some parameters are explained below.

- After the last screen, the system takes you back to the first screen so that you can set up another group. If you are finished, click the OK button  at the bottom of the screen to accept your changes and exit the screen.

Group

Each graphical area on the part is assigned to a group - this is defined in the graphic file. Assign as many inspections as you wish to a group, preferably those inspecting that area of the part. Inspections can be from any sensor within the same part program on the lane. Some drop-down menus on the user interface refer to 'groups' - these represent groups of inspections that inspect one area of a part.

A group can be a contiguous area, or a group of related areas on a part, as shown in red below.



Warning Percent

Set the value at which the group on the Walk By Graphic turns yellow. **Yellow** warning areas notify you that the spoilage rate is approaching, but has not yet reached a critical level. This allows you to make necessary changes to the manufacturing process before the failure rate gets too high.

❖ *Note: this warning percentage is not connected to inspection warning limits. Those limits are set separately. Additionally, this warning percentage does not affect the Excessive Warnings alarm.*

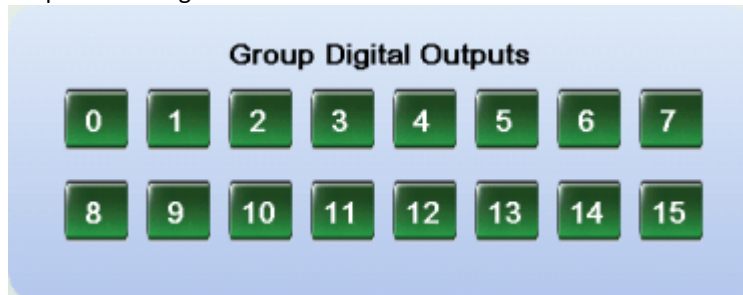
Failure Percent

Set the value at which the group on the Walk By Graphic turns red. **Red** areas indicate the spoilage rate has exceeded user defined limits.

❖ *Note: this failure percentage is not connected to inspection limits. Those limits are set separately. Additionally, this failure percentage does not affect the rejects alarms.*

Group Digital Outputs (for Extended I/O option)

Select the group number (Group 0 through 15) to trigger an output signal through the **Extended I/O board** (on page 305). If your system has firmware version lower than F168, then you will have outputs 0 through 14 available.



The outputs go active when any inspection within the assigned group fails. You can use these outputs to monitor the process within your plant and make adjustments as necessary.

You can assign multiple groups to one output. The groups can contain inspections from any sensor within their corresponding lane part program. Each lane may have its own Extended I/O board, so you cannot combine inspections from different lanes.

Group Priority Level

This feature allows you to assign a priority to each group within the Walk By graphic. You can designate which defects are more important and prioritize the reporting structure accordingly.

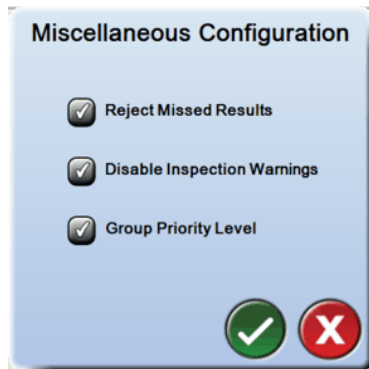
Group Priority Level ensures that only one defect per part is counted for each of the groups. This differs from normal group reporting where there can be counts in multiple groups depending on which inspections fail. If no defects are found in the first priority level group, then the priority falls to the second priority group, and so forth for all groups configured. See example below.

Notes about Group Priority Level:

- Group Priority Level must be enabled before use.
- You can assign only one priority level per group.
- You do not need to use every group in the Walk By graphic.

➤ To enable Group Priority Level:

1. From Lane or Sensor Overview mode, click the Tools button  > Lane Setup > Miscellaneous Configuration.
2. Enable Group Priority Level in the Miscellaneous Configuration menu.



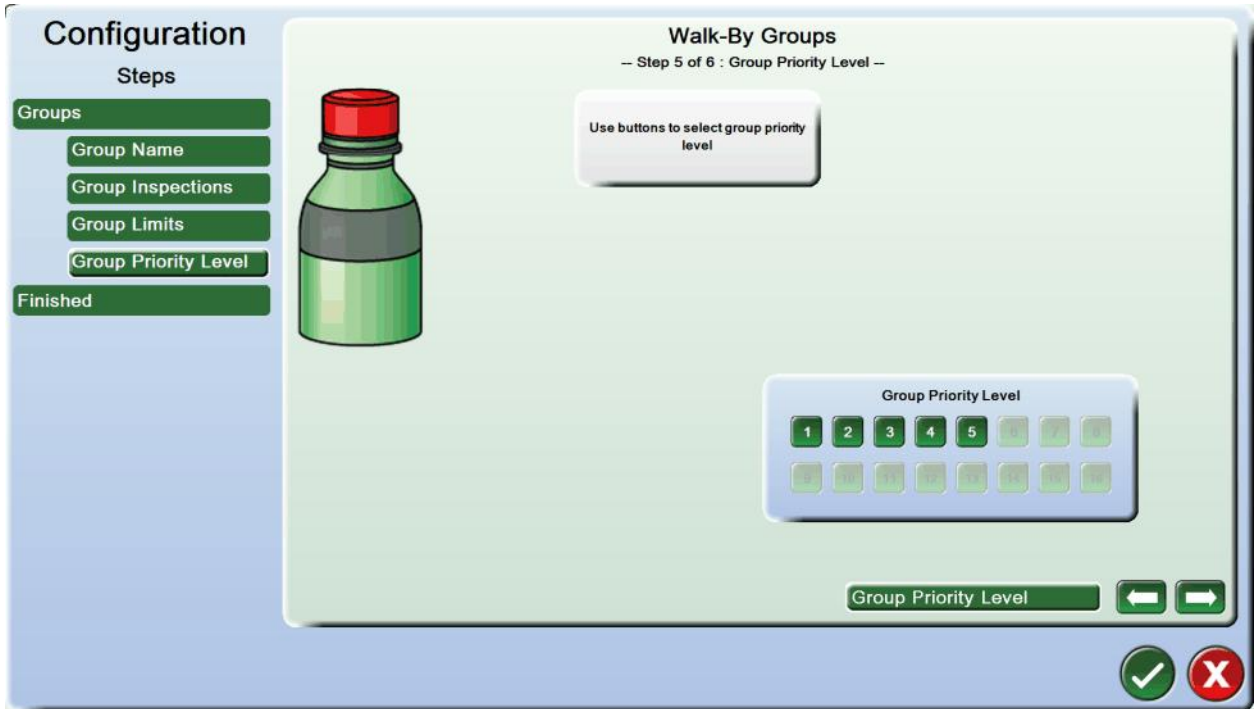
3. Click the OK button to save changes and exit.

Next, set up Group Priority Level in the Walk By Setup. If you need information about setting up the Walk By Graphic, see **Walk By Setup** (on page 62).

➤ To set up Group Priority Level:

1. From Lane or Sensor Overview mode, click the Tools button  > Lane Setup > Walk By Setup. You will see an additional step (six instead of five) in the wizard.
2. Follow the instructions on screen for steps one through four. This is where you assign inspections to a group.

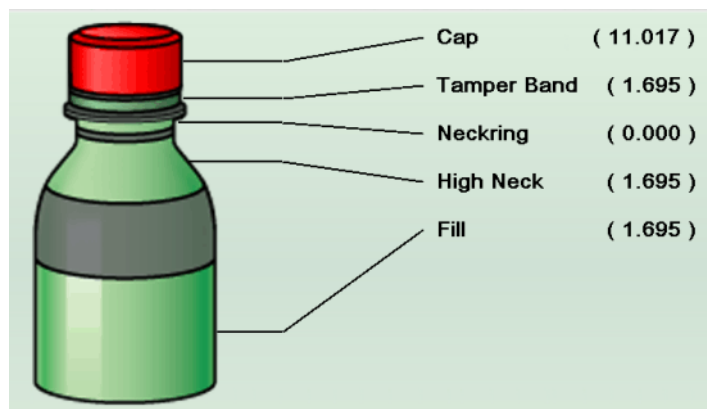
3. In step five of the wizard, choose a priority for the group you have just set up. Level 1 is the highest priority. In this example, we have five group priority levels available because that is the total number of groups available on this type of part. The priority number you assign will become highlighted. If you try to use a priority level that has already been assigned, the system will prompt you to either delete the previously assigned group, or allow you to select another priority.



4. After you select a group priority in Step 5, the wizard will return to Step 1 so that you can set up another group and assign a priority. Repeat Steps 1 through 5 of the wizard for each group you want to assign.
5. Click the OK button to finish and exit.

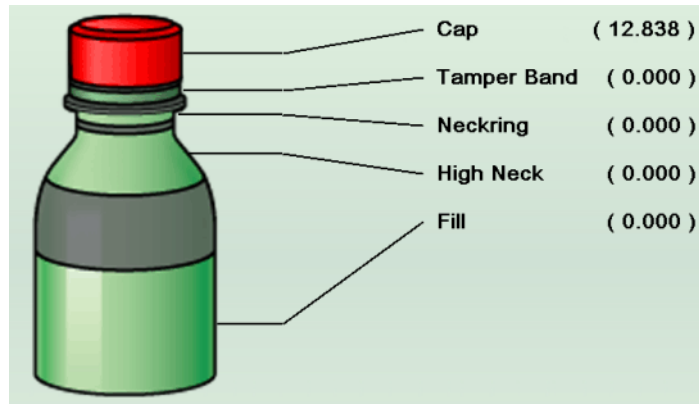
Example

Example 1 below shows a normal group reporting with Group Priority Level **disabled**. Notice that almost all of the groups show a defect percentage.



Example 2 below shows group reporting with Group Priority **enabled**, and the inspections were run similar to the above example. Notice that only one group shows a defect percentage. In this example, we set the "Cap" group as the highest priority. This means that only one defect per part was counted, and each failed inspection was part of the "Cap" group. Other defects for each part are recorded by the system, but not reported in the Walk By Graphic or output through the Group Digital Outputs.

If the "Fill" group was set at Priority 2, and a part had a defect for one of the inspections in the Fill group but NOT the Cap group, then you would see a defect percentage for that group.



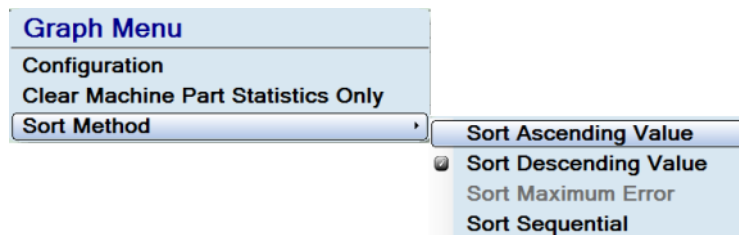
Sorting Data in Graphs (Option)

You can change the order of the displayed data in the **Machine Part Graphs** (on page 73). The Machine Part graphs are only displayed if your system is configured for machine parts.

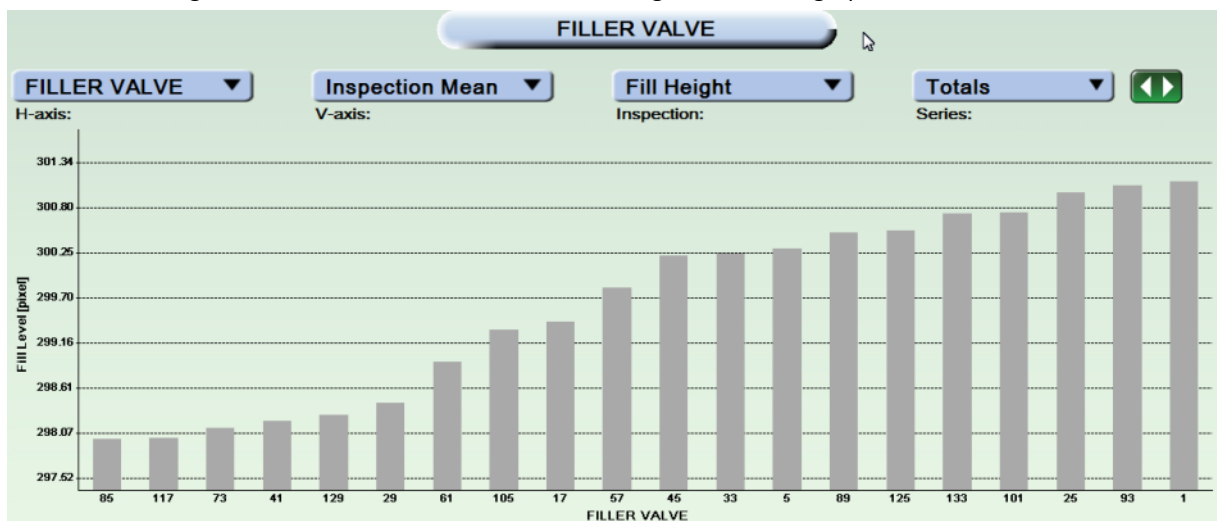
❖ *Note: when you change sorting order, it affects the **Machine Part Graphs** in the upper and lower screens. Other graphs are not affected.*

➤ To sort the graph data:

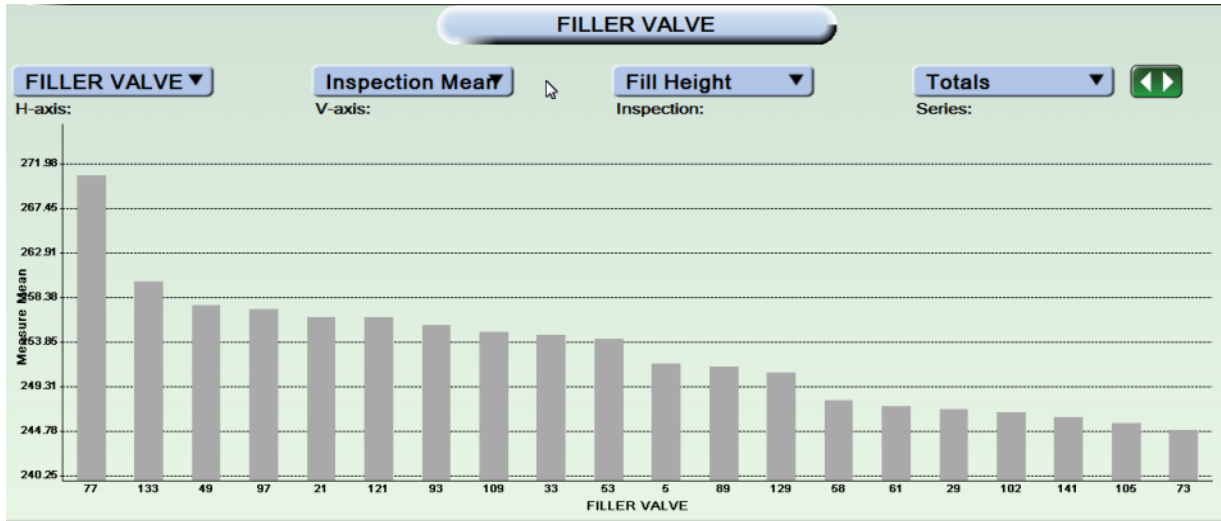
1. Right-click over a Machine Part Graph. The Graph Menu is displayed.
2. From the Graph Menu, select Sort Method, and select an option. The data on the graph is sorted. The options are explained below.



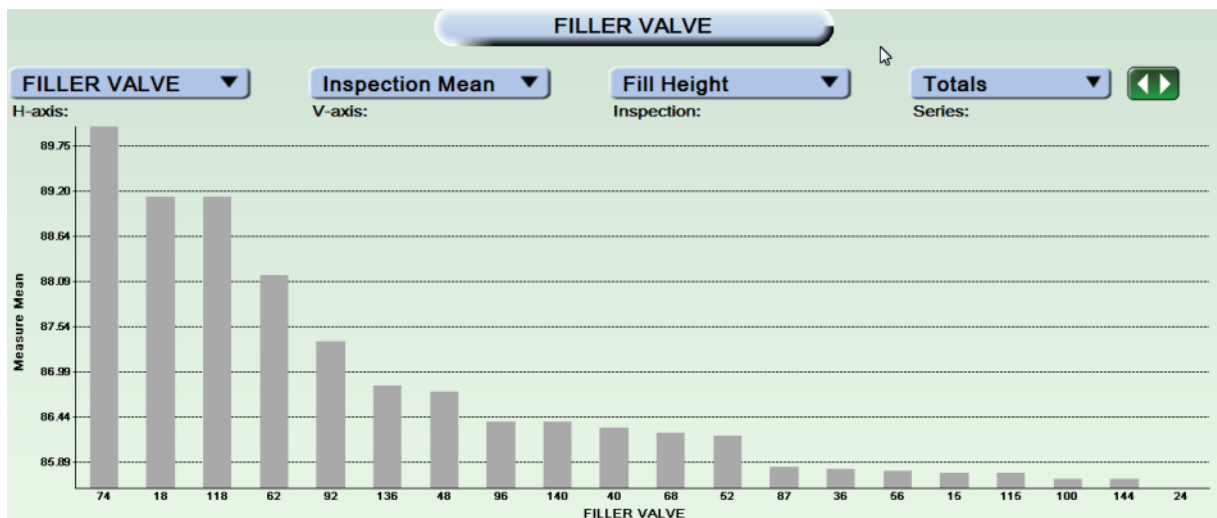
- **Sort Ascending Value** – Sort from low to high result. In the example below, the machine part with the highest number of defects is shown on the right side of the graph.



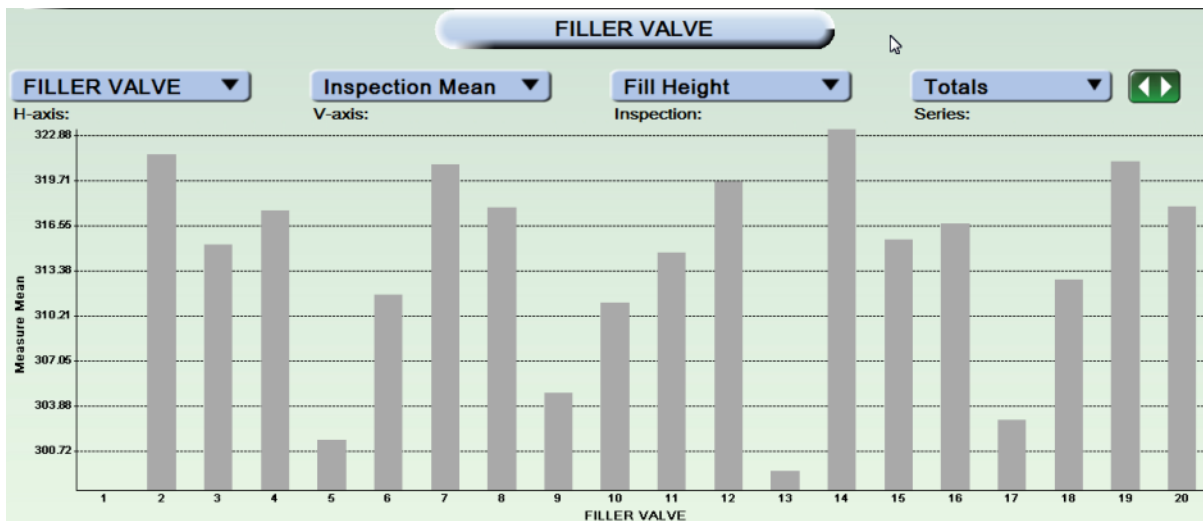
- **Sort Descending Value** – Sort from high to low result. In the example below, the machine part with the highest number of defects is shown on the left side of the graph.



- **Sort Maximum Error** – [Available when Keep Retro-Spec Statistics is enabled for an inspection, Totals is selected for the graph Series, and Inspection Mean is selected for V-Axis] Sort the data by machine part where the highest peak shows the furthest value from nominal, as an absolute value.



- **Sort Sequential** – Display an ordered list of machine parts.

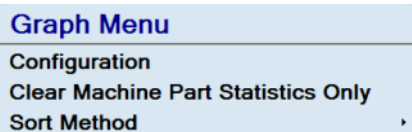


Clearing Machine Part Graph Data

This option is only available if machine part correlation is enabled on your system. You can clear the statistics for the machine parts only, if desired. This does not affect the remaining system statistics.

➤ To clear Machine Part statistics:

1. Right-click over one of the trend graphs or machine part graphs.



2. From the Graph Menu, select Clear Machine Part Statistics Only. The machine part statistics are cleared. The remaining statistics are unchanged.

Scrolling in Graphs

Scrolling in Trend Graphs

When the data falls outside of the current viewing range (example, time) a scroll button  becomes available next to the Series drop-down box.

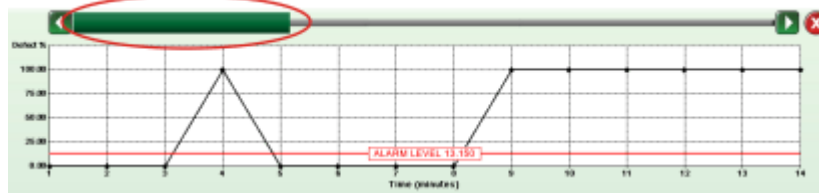
The data goes back to when the system was powered up, or 2880 data points, whichever is more recent. The trend data is reset when the system is restarted.

- In a time-based graph, if the graph time per update is set to one minute, then the data goes back 48 hours
- In a part-based graph, if parts per update is set at 1000 parts, then the data goes back 2,880,000 parts

See **Trend Chart Configuration - System Overview** (on page 70) or **Trend Chart Configuration - Lane Overview** (on page 71) to learn more about setting the time per update or number of parts on a graph.

➤ **To view other data:**

1. Click the scroll button . A scroll bar becomes available.



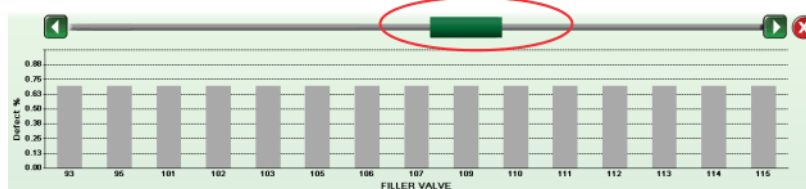
2. Click and drag the scroll bar to view the desired data.
3. To exit, click the exit button . The graph returns to the current data.

Scrolling in Machine Part Graphs (option)

When there are more machine parts than can be plotted on the graph, a scroll button  becomes available to view other filler machine parts.

➤ **To view other data:**

1. Click the scroll button . A scroll bar becomes available.



2. Click and drag the scroll bar to view the desired data.
3. To exit, click the exit button . The graph returns to the current data.

Trend Graphs

Trend Graphs

➤ **To view the Lane trend graphs:**

1. Select a lane (click a Lane n button).
2. Click a Trend Graphs button on the right side of the screen. The trend graph is displayed.

❖ **Note:** There are two Trend Graphs buttons available. One is for the lane; the other is for the sensor. If you are viewing **Lane Overview** mode, then the trend graph in the upper screen is where you select the viewing options. The trend graphs in the lower screen follow the settings from the upper screen. In **Sensor Overview** mode, you can select viewing options separately within the upper and lower screens.

Trend graphs are available to view statistics based on specified criteria. These graphs are available for each lane and each sensor within that lane. You can select criteria for the H-axis, the V-axis, and Series. There is an adjustable Alarm Level for Defect %. Both the H-axis and V-axis adjust automatically to higher and lower values. The Alarm Level will adjust as well. Below is a list of possible combinations for Time and Parts based graphs.

If you have an inspection enabled that collects **Retro-Spec Statistics** (on page 74), then an additional column of **Inspection*** data is available.

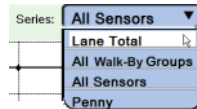
*These items are available for Trend Graphs (only in the upper screen) if:

- You have an inspection that collects Retro-Spec Statistics, and that feature is enabled, AND
- You select Inspection Mean, Inspection STD, or Inspection CPK for the V-axis, AND
- You select Lane Total from the Series drop-down menu

For more information about these items, see **Retro-Spec Statistics** (on page 74)

H-axis	V-axis	Inspection*	Series
Time	▪ Defect % ▪ Defect Count ▪ Defect Cost ▪ Parts and Defect % ▪ Inspection Mean* ▪ Inspection STD* ▪ Inspection STK*	Inspection name (the names of the inspections that have Retro-Spec statistics enabled)	▪ Lane Total ▪ All Walk-By Groups ▪ All Sensors ▪ Individual Sensors (list)
Parts	▪ Defect % ▪ Defect Count ▪ Defect Cost ▪ Inspection Mean* ▪ Inspection STD* ▪ Inspection STK*	Inspection name (the names of the inspections that have Retro-Spec statistics enabled)	▪ Lane Total ▪ All Walk-By Groups ▪ All Sensors ▪ Individual Sensors (list)

For Trend Graphs, you can select which data to display. Select from the Series drop-down menu.



Lane Total

Displays the statistics averaged for all sensors within the lane.

All Walk-By Groups

Displays the statistics for inspection groups. These groups are defined in the Walk By Graphic setup, and pertain to a specific area of a part.

All Sensors

Displays the statistics for each sensor.

Individual Sensors [names vary]

Displays the statistics for only the selected sensor.

Note: A key (to explain color-coding and data point shape) is displayed to the right of the graph for All Walk-By Groups and All Sensors.

➤ To change the graph criteria:

1. Click any button (next to H-axis, V-axis, Inspection, or Series) to view the drop-down menu options.
2. Select the desired criteria. The graph is updated to display based on your chosen criteria.

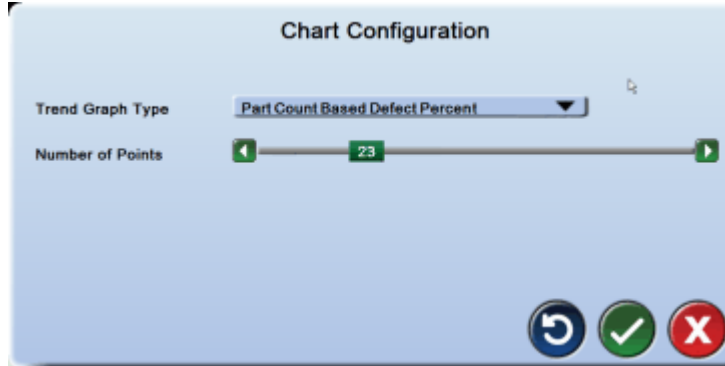
Trend Chart Configuration - System Overview

This is the setting for the trend chart displayed on System Overview screen.

❖ Note: the vertical axis setting is automatically scaled to best represent the data on the chart.

➤ **To change the chart configuration:**

1. Click the Home button  to view the System Overview screen.
2. Right-click over the trend chart. The Chart Configuration menu is displayed.



3. Choose from the available trend chart types, and select the number of points to display on the chart.
4. Click the OK button  to accept changes and exit the menu. The selected chart is displayed in the System Overview screen.

❖ *Note: these changes affect all trend charts in the System Overview screen*

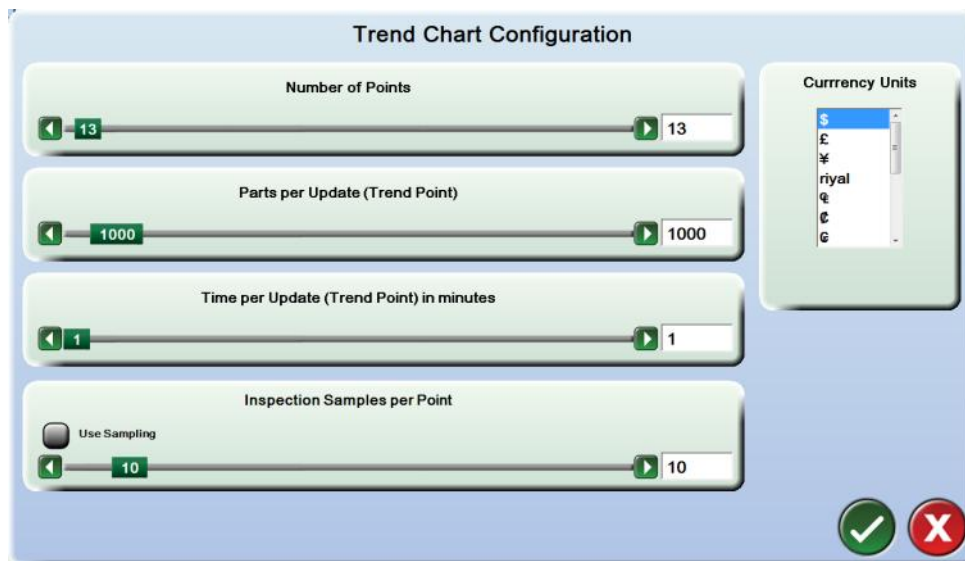
Trend Chart Configuration - Lane Overview

These settings affect the display of all the trend charts in the Lane Overview or Sensor Overview screens.

❖ *Note: the statistics for the lane are reset when you change a configuration setting.*

➤ **To change the trend chart display:**

1. View the Lane Overview or Sensor Overview screen by clicking either a Lane n button or a Sensor n button.
2. Click one or all of the Trend Charts buttons on the right side of the screen to display a trend chart.
3. Right-click over one of the trend charts. The Graph Menu is displayed.
4. From the Graph menu, select Configuration. The Trend Chart Configuration menu is displayed.



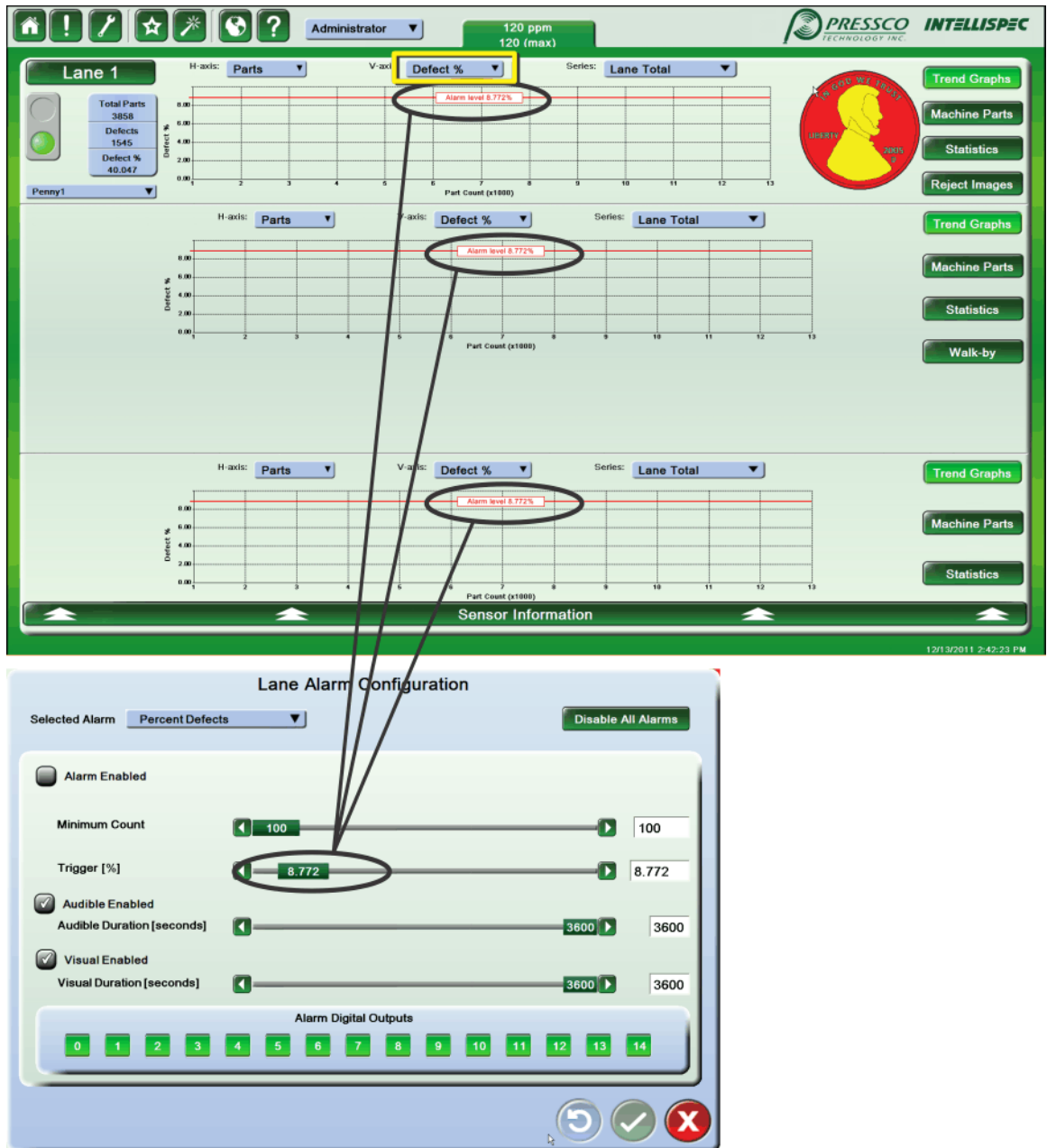
5. Select the desired settings from all the available parameters.

- Click the OK button to save your changes and exit the screen. All the trend charts for the selected lane are updated to reflect your changes.

Alarm Percentages in Trend Charts

The alarm level can be adjusted when Defect % is selected for the V-axis. Click and drag on the red Alarm Level line to adjust it. This also changes the alarm percentage in the **Lane Alarm Configuration** (on page 88) menu. The illustration below shows Sensor Overview mode with Trend Charts displayed for both Lane and Sensor. Changing the alarm percentage in any one of the Trend Charts or Lane Configuration menu changes the percentage in all the other locations.

❖ *Note: Changing this alarm percentage does not affect the alarm percentage level in the Walk By Graphic.*



Machine Part Graphs

Machine Parts

Machine Part Graphs are available when you have the Correlation option installed. Machine Parts Graphs display defect information for each machine part. Below is a list of possible combinations for the machine part graphs. The name on the button(s) matches your system configuration. Examples of machine parts include "Cavity," "Filler Valve," or "Capper."

If you have an inspection enabled that collects **Retro-Spec Statistics** (on page 74), then an additional column of **Inspection** data is available.

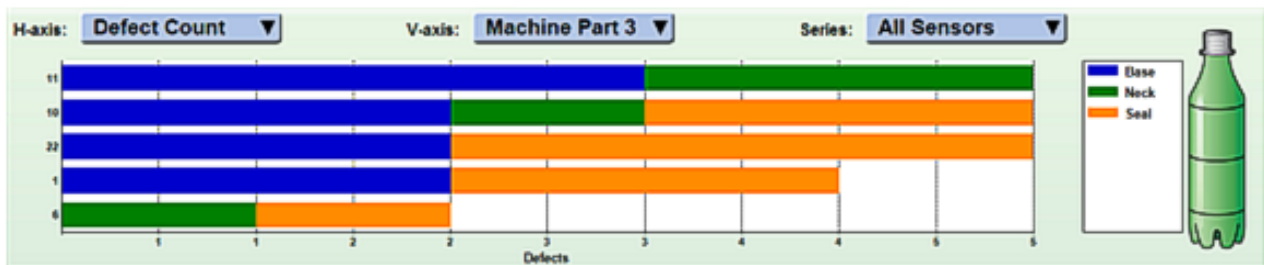
H-axis	V-axis	Inspection*	Series
Machine Part (depending on correlation configuration)	- Defect % - Defect Count - Inspection Mean* - Inspection STD* - Inspection CPK*	Inspection name (the names of the inspections that have Retro-Spec statistics enabled)	In the upper screen: - Lane Total - All Sensors In the lower screen: - Latest Defects - Totals

*These items are available for Machine Parts graphs if:

- You have an inspection that collects Retro-Spec Statistics, and that feature is enabled, AND
- You select Lane Total (upper screen) or Total (lower screen) from the Series drop-down menu

For more information about these items, see **Retro-Spec Statistics** (on page 74).

An example graph is displayed below. It shows defects for a machine part type, and the number of defects correlated to each sensor.

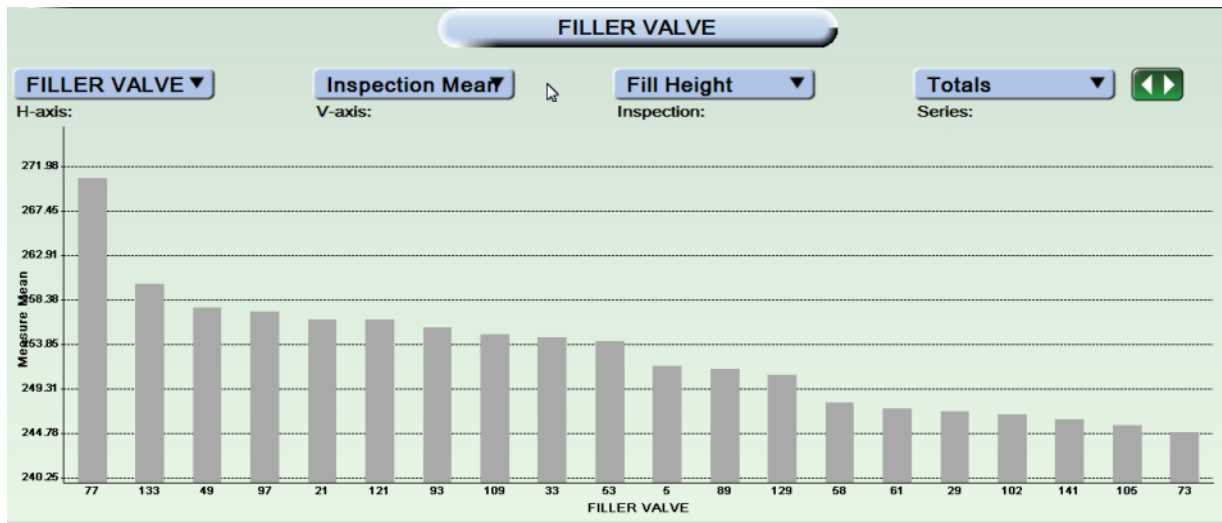


The example below shows machine part data for the mean fill height for each machine part, for one camera. The machine part numbers are displayed at the bottom of the graph. Use the scroll button



to view other filler machine parts. Use the "X" button to close the scroll bar.

To change the sorting order, right-click on the graph. For more information, see **Sorting Data in Graphs** (see "**Sorting Data in Graphs (Option)**" on page 66).



Retro-Spec Statistics

Inspections that collect measurement data have the ability to collect Retro-Spec statistics, which can be displayed in Machine Parts or SPC graphs. These inspections have a check box called "**Keep Retro-Spec Statistics**.*" This feature must be enabled in each inspection in order for the system to keep this data. The inspections include:

- Ambient
- Measurement
- Fill Height
- **Fill Height - Segmented** (on page 240)
- Label Skew Extract
- **Distance** (on page 258)
- Angle

*In Measurement Inspection, the graphs are enabled by "**Plotting**" check boxes.

For Fill Height applications

You can use the system graphs to plot fill level over time. First, you must check the box to **Keep Retro-Spec Statistics** in the Fill Height inspection menu.

Empty / Full Calibration	
Measure ROI(s)	Fill Height
Reference	Fill Top
Fill Mode	Top and Bottom
Part Orientation	Closure on Left
Reference Region	Region 1
Fill Ratio	53
Correct Fill Position	☒ Enabled
Fill Correction Deviation	59.0@
☒ Fill Height Limits	50.0@ +405.92@/-40.0@
Show Fill Height	☒ Enabled
Keep RetroSpec Statistics	☒ Enabled

The statistics that are kept include:

- Defect % (percentage)
- Defect Count
- Inspection Mean
- Inspection STD (Standard Deviation)
- Inspection CPK (statistical value, showing how well-centered the data population is within the reject specification)

➤ **To view the statistics:**

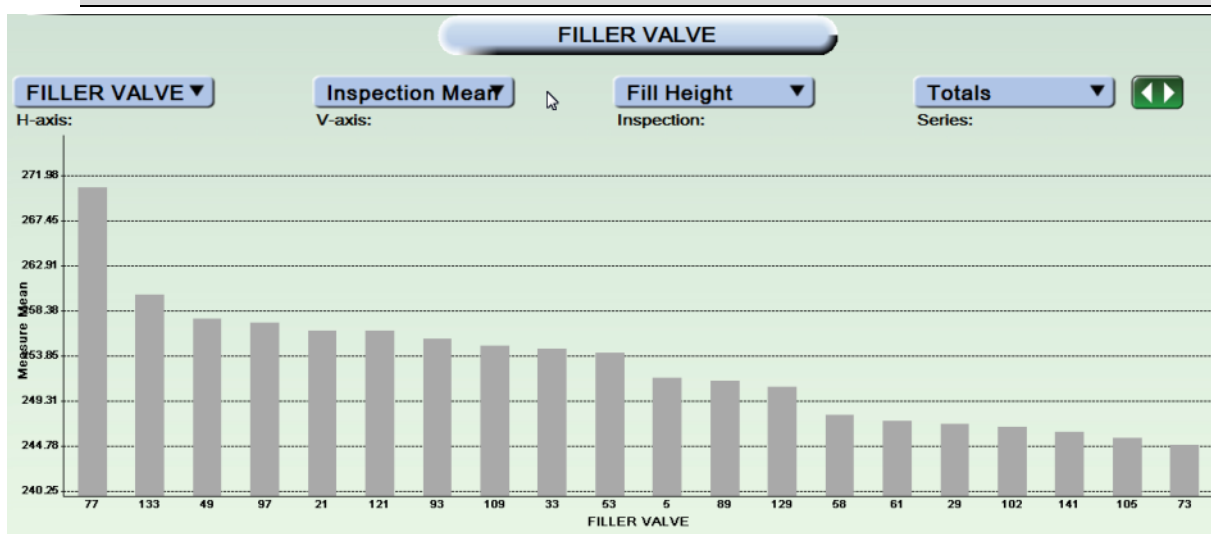
In either the **Lane Overview Screen** (on page 38) or **Sensor Overview Screen** (on page 39), click the **Machine Parts** button on the right side of the screen. A machine parts correlation graph is displayed.



There are **Machine Parts** buttons in both the top and lower portions of the screen. The button in the upper screen allows you to view machine part data for the entire lane. If you are viewing the Sensor Overview screen, the Machine Parts button in the lower screen allows you to view machine part data for one sensor.

From the drop-down menus, select an option for H-axis, V-axis, Inspection (if shown), and Series. In our example, we have selected **Filler Valve** as the correlation graph, **Inspection Mean** as the type of graph to display, **Fill Height** as the inspection, and **Totals** as the series.

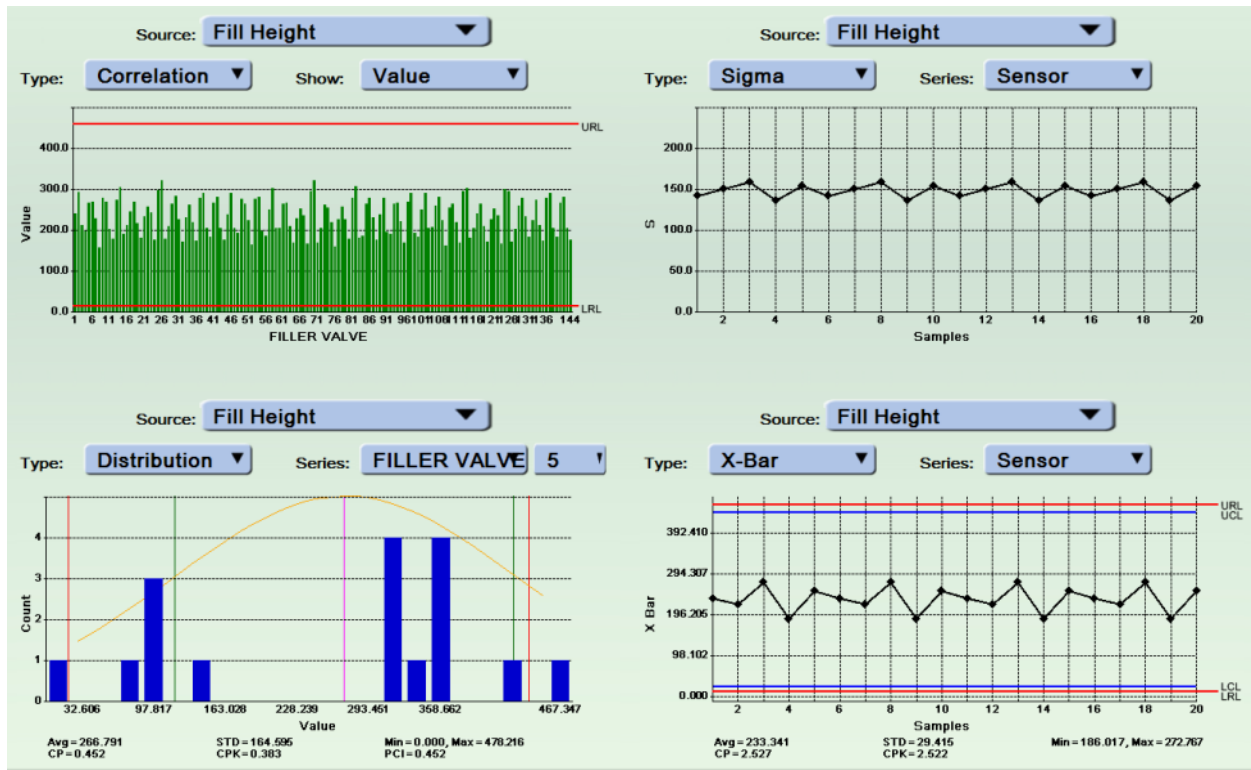
❖ *Note: to choose an inspection to view (in this example: "Fill Height"), you must select Inspection Mean, Inspection STD, or Inspection CPK in the **V-axis** drop-down menu. In addition, you must select "Lane Total" in the upper screen or "Totals" in the lower screen from the **Series** drop-down menu.*



The example above shows the mean fill height for each valve, for one camera. The valve numbers are displayed at the bottom of the graph. Use the scroll button to view other filler valves. Use the "X" button to close the scroll bar.

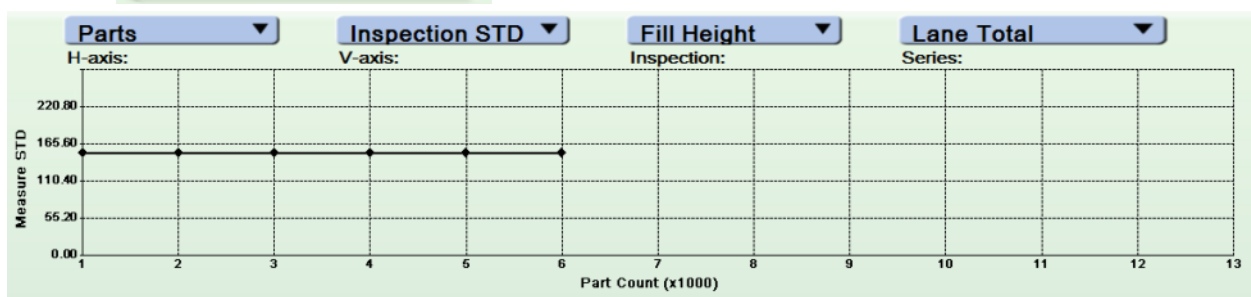
In addition to displaying fill height data in the Machine Parts graphs, you can plot the fill level in the **SPC graphs** (see "**Statistical Process Control (SPC) Charting**" on page 81) to show the data for the inspection in several different ways.

SPC Graphs



Another way to view fill height data is through the **Trend Graphs** (on page 69) in the upper screen.

Trend Graphs



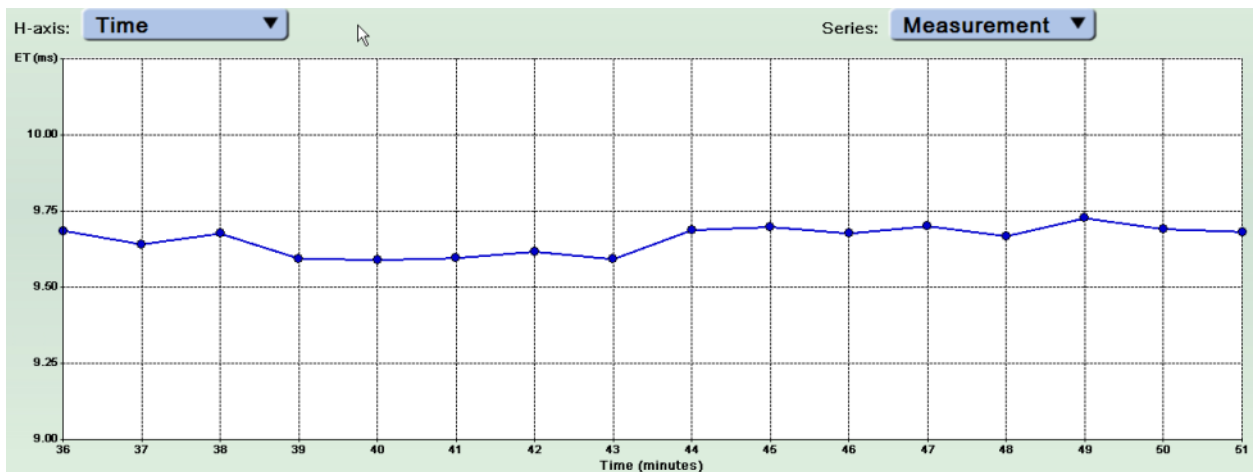
Timing Trend

Timing Trend

❖ Note: this chart is mostly used by Pressco service engineers during installation, or it can be used when additional inspections or hardware have been added to the system.

This chart displays the time required to run inspections. It is important to view the inspection timing, especially if you have multiple sensors or multiple lanes, to make sure that the system is inspecting all parts before they reach the reject station.

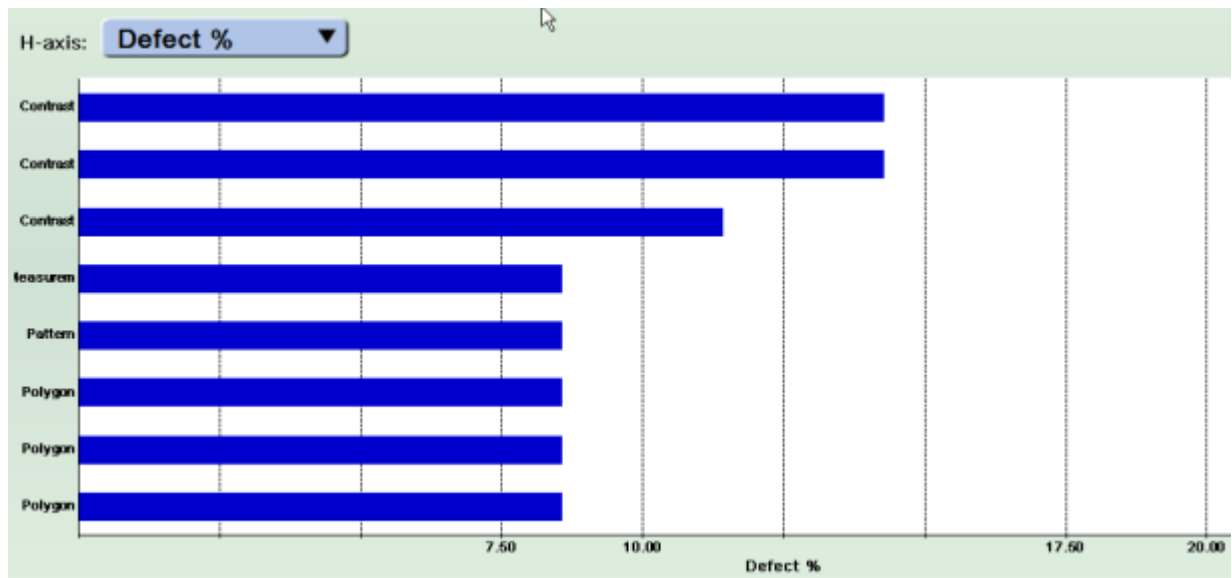
The choices for the Series in the Timing Trend chart allow you to choose Sensor Total, which is all inspections for that sensor, or any individual inspection for that sensor.



Inspections graph



Click the Inspections button on the right side of the screen to see the Inspections Graph. This graph displays the Defect Count or Defect % for the selected sensor. It displays the failed inspections in descending order of failure. The example below is the graph shown in Sensor Overview mode. In Lane Overview mode, the bars are displayed vertically instead of horizontally.



Statistics Grid



The Statistics Grid displays information about each Sensor. There are two different types of Statistics Grids: Lane and Sensor.

Lane Statistics Grid

The Lane Statistics Grid (in Lane Overview mode) displays general information about each Sensor. It shows the Total number of parts run, Sensor, Defects, Defect %, Last N, and Last N %.

Show: Sensors ▼	Detail: All ▼					
Sensor		Total	Defects	Defect %	Last N	Last N %
Rivet		56748	56748	100.000	953	95.300
Panel		56748	56748	100.000	953	95.300

Sensor Statistics Grid

This grid is available when you display Sensor information. It shows specific information for each sensor, including Inspection, Total number of parts run, Defects, Defect %, Last N, and Last N %.

Inspection	Total	Defects	Defect %	Last N	Last N %
Pattern Match	56748	56748	100.000	953	95.300
Radial Edge	56748	0	0.000	0	0.000
Ring	56748	0	0.000	0	0.000
Ring	56748	0	0.000	0	0.000

❖ *Note: you can **configure** (see "Statistics Grid options" on page 80) the statistics display. Your system may not display all of the above-mentioned items.*

To display the statistics grid, click the Statistics button on the right side of the screen. There may be multiple buttons, depending which screen you are viewing.

Sorting order

To sort any column in ascending or descending order, click the button at the top of the column. Click it again to toggle to the opposite order. Right-click to clear sorting in the statistics grid.

Inspection	Total	Defects	Defect %	Last N	Last N %
Pattern Match	56748	56748	100.000	953	95.300
Radial Edge	56748	0	0.000	0	0.000
Ring	56748	0	0.000	0	0.000
Ring	56748	0	0.000	0	0.000

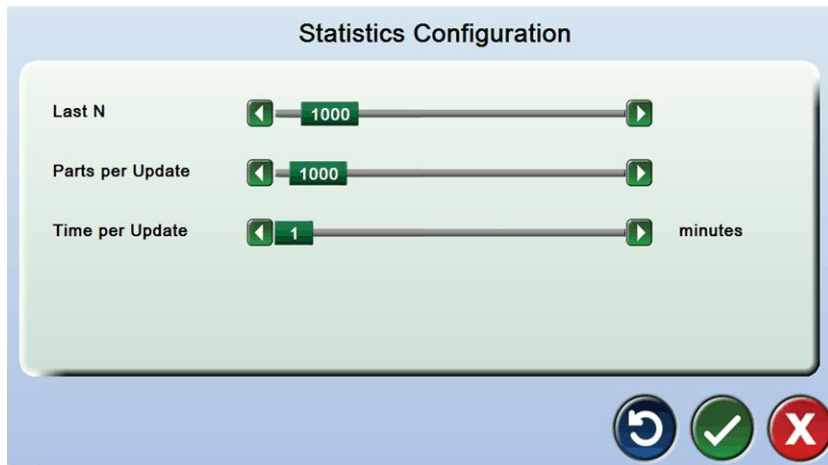
Statistics Configuration

All the statistics grids in the current lane will use these settings.

➤ To get to this screen:

1. From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu.

2. Choose Lane Setup, then Statistics Configuration.

The image shows a 'Statistics Configuration' dialog box with a light blue header and a light green body. It contains three horizontal sliders. The first slider is labeled 'Last N' and has a green box with the number '1000'. The second slider is labeled 'Parts per Update' and also has a green box with the number '1000'. The third slider is labeled 'Time per Update' and has a green box with the number '1', followed by the word 'minutes'. At the bottom right of the dialog are three circular buttons: a blue one with a circular arrow, a green one with a checkmark, and a red one with an 'X'.

Last N

Specify how many parts to include in recent statistics, such as the column "Last N" which displays the number of defects in the Last N parts, or "Last N %" which displays the percentages of defects within the Last N parts.

This feature allows you to continue to collect inspection data (Total inspected, total defects, and defect %) without clearing the statistics to see how the most recent batch of parts has done.

Parts per Update

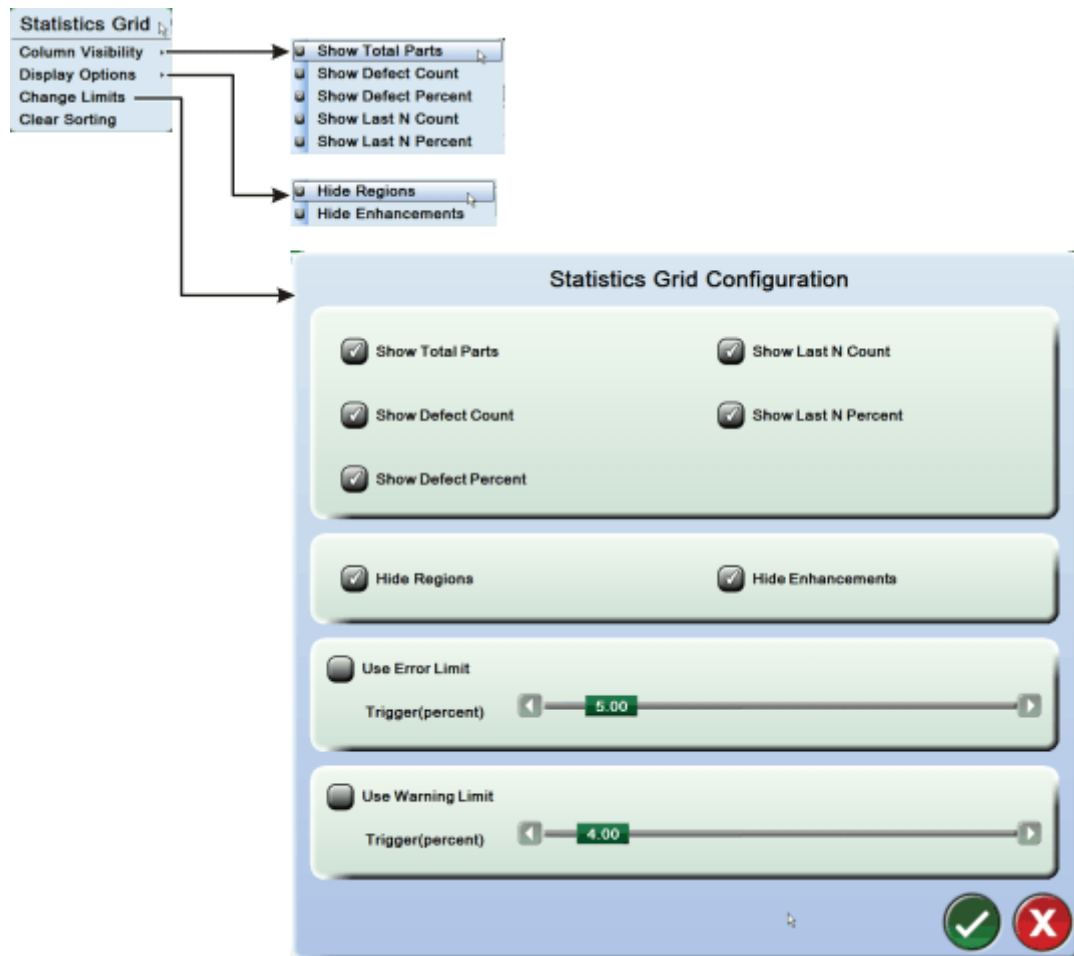
Determines the graduations on the horizontal axis for the Trend Chart and Timing Trend if "Parts" is selected.

Time per Update

Determines the graduations on the horizontal axis on the Trend Chart and Timing Trend if "Time" is selected.

Statistics Grid options

To change what is displayed in the statistics grids, use the options menu. These settings are applied to all statistics grids, whether in the Lane Overview screen, or Sensor Overview screen. Right-click over any statistics grid to see the options. These are explained below.



Column Visibility

Change the number of columns that are displayed in the grid.

Display Options

Change the number of rows that are displayed in the grid. This only affects the statistics grids in the Sensor Overview level.

Hide Regions

If this is checked, then the inspection regions are not displayed in the grid. This means the Ring, Polygon, Rectangle, or Adaptive regions that identify the inspection area, but do not have any reject criteria.

Hide Enhancement

If this is checked, then the inspection enhancements such as Clipping, Stretch Grayshades, or Power Filter are not displayed in the grid.

Change Limits

This menu allows you to change the number of columns and rows of the grids in the first two sections of the menu. These are the same as Column Visibility and Display Options.

The lower two sections of this menu allow you to enable and change limits for inspection.

Use Error Limit

Causes the **Defect %** and **Last N %** columns to display in red if the trigger percentage is exceeded. This allows you to see these statistics from a distance.

Use Warning Limit

Causes the **Defect %** and **Last N %** columns to display in yellow if the trigger percentage is exceeded. This allows you to see these statistics from a distance.

Clear Sorting

Puts the sorting order back to the default setting. To sort any column in ascending or descending order, click the button at the top of the column. Click it again to toggle to the opposite order.

Statistical Process Control (SPC) Charting

This option is available if you have a sensor that measures specific data, or you have an inspection with "Keep Retro-Spec Statistics" enabled. The measured data can be displayed in a number of views. To view more than one graph at once, select a sensor button (Sensor Overview mode), and then select the SPC graph button on the right side of the screen.



There are four sections to the SPC graph, each of which can be setup to display a unique view of the data. Select from the following options for each view:

- Source
- Type
- Show / Series

Source

Select the inspection from which the data is derived.

- For mass sensors, the only choice under Source is the mass inspection because the empty pocket inspection does not have appropriate data for these views.
- For camera sensors, the choices for Source depend what inspections are included and enabled in the part program. Only the inspections that keep **Retro-Spec Statistics** (on page 74) have SPC graph data.
- For other sensors (such as X-Ray), the choice for Source depends on the available inspection(s).

Type

Select the type of chart. The choices are:

- **X-Bar** - the history of the average values from this sensor
- **Range** - the history of the range of values from this sensor
- **Sigma** - the history of the standard deviation of the values from this sensor
- **Trend** - similar to X-Bar, with the addition of a trend line that shows the historical trend of the data from this sensor
- **Distribution** - the histogram of the data values. A curve of a standard distribution is shown in yellow to indicate a normal distribution around the average value.
- **Correlation** - the display of the average sensor values by individual cavity

Series/ Show

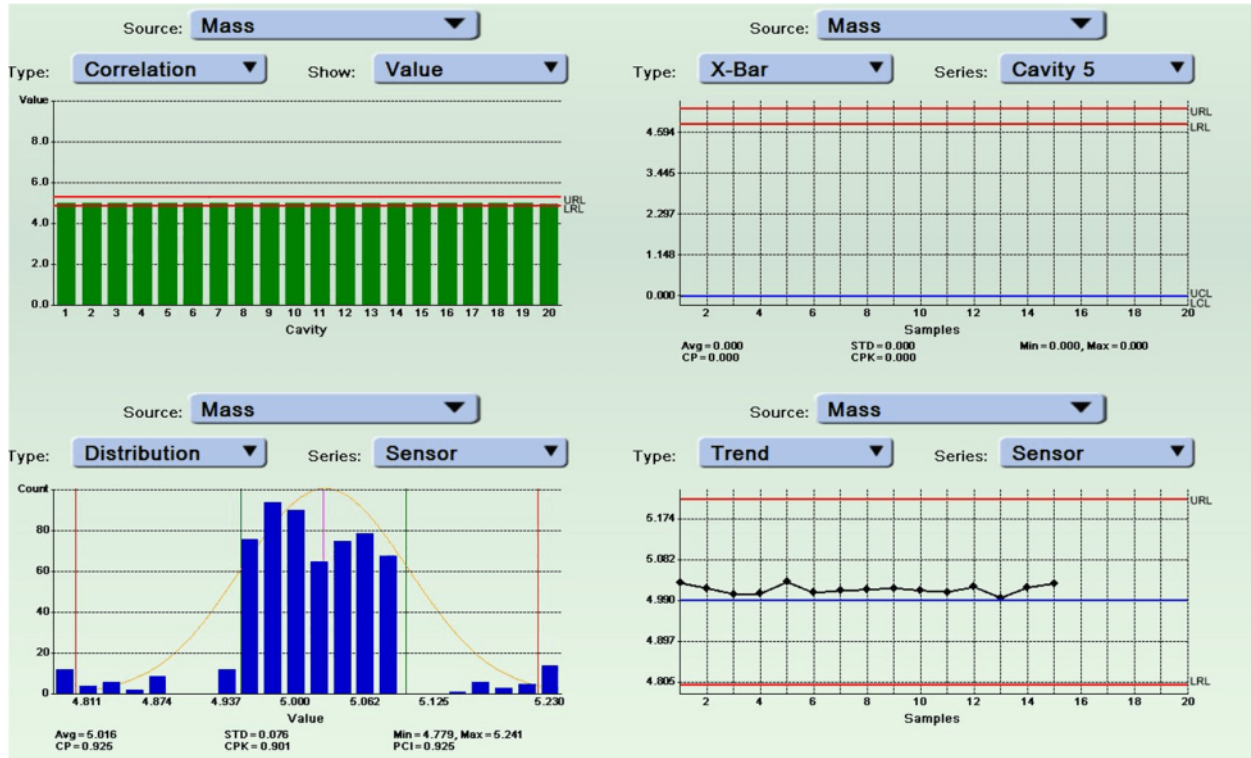
On the first five chart types listed above, the **Series** category selects the source of the data. The available settings are 'Sensor,' which is the average value for the sensor, or the name of a machine part, such as 'Cavity' which selects the data from an individual machine part. You can choose a machine part from a drop-down menu displayed next to the Series drop-down menu.

When the Correlation chart is selected, the **Show** category allows the selection of:

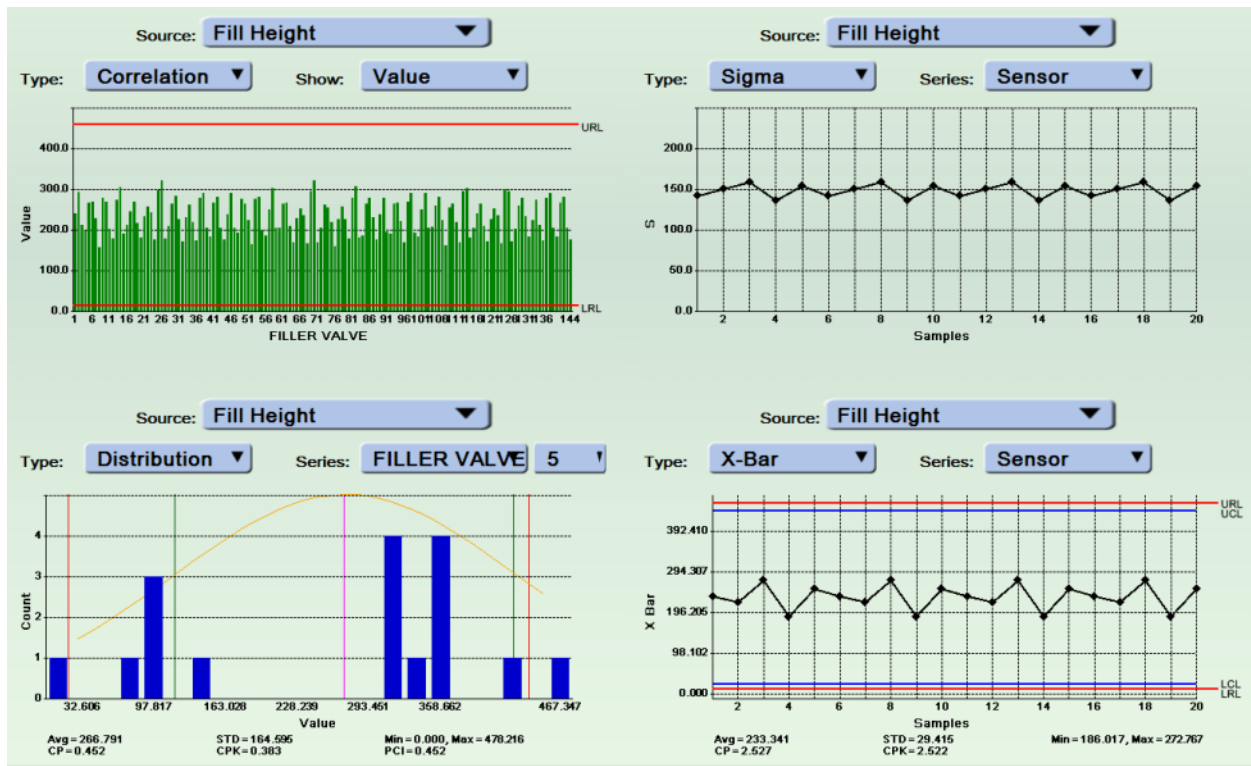
- **Value** - the average data value
- **Sigma** - the standard deviation

- **Defects** - a defect count from when the data was last reset

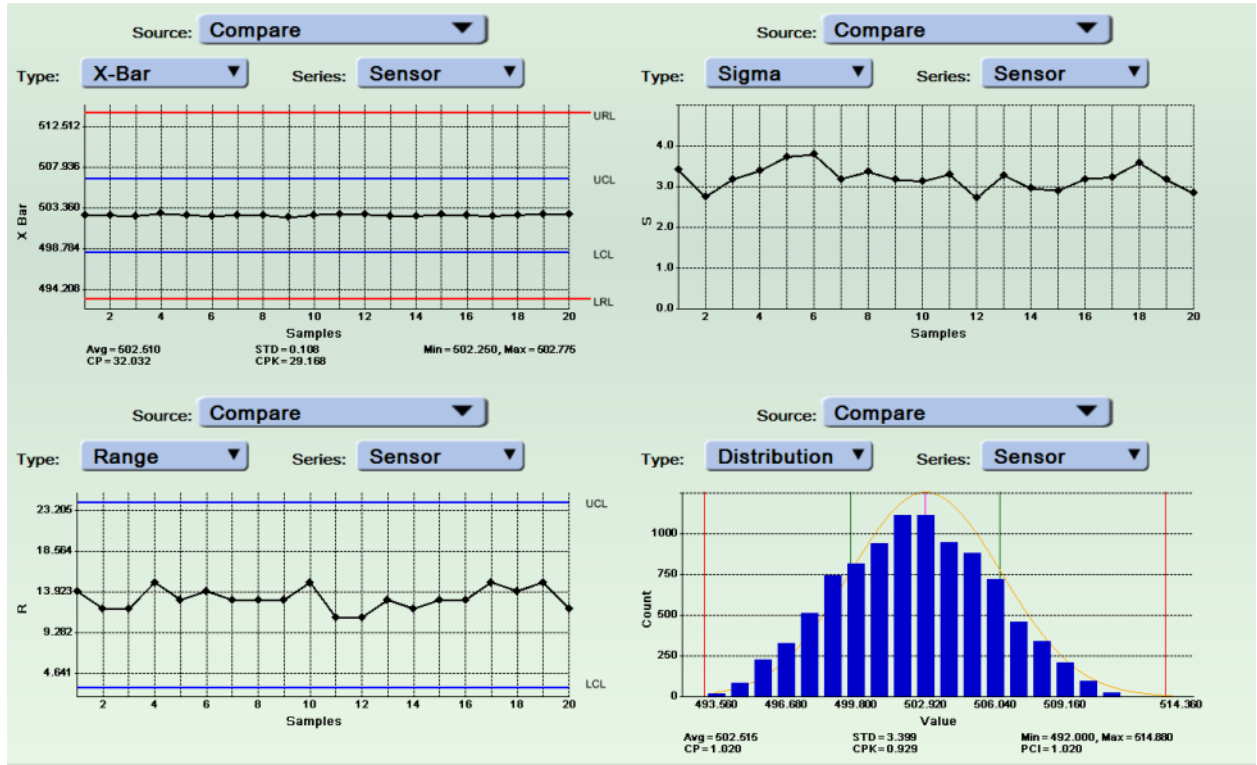
The picture below shows sample data from **mass** sensors.



The picture below shows sample data from **camera** sensors.



The picture below shows sample data from x-ray sensors.



Chapter 8

Alarms

There are three levels of alarms within the Intellispec system: System, Lane, and Sensor alarms. Most of these are configurable. The table below lists the alarms, possible causes for triggering the alarm, the reset mechanism, and color of the indicator on the light tree. Also refer to the **light tree status** (on page 46) for more information about the lights.

The information in this section is valid as of software version 5.0.475.

❖ *Note: Alarms are recorded in the system log reader (on page 103), even when the alarms are automatically cleared.*

Alarm Name	Cause	Reset Mechanism	Color in light tree
System Alarms (see "System Alarms Description" on page 88)			
Note: If a system alarm occurs, an alarm icon is displayed in the lower right of the screen (in the Windows system tray)			
UPS	Battery is dead. Or:	Manually [you must first replace battery]	Not applicable (N/A)
	Plant power is lost and the UPS shutdown time is exceeded. The Intellispec shuts down.	If plant power is restored before the Intellispec shuts down, then the alarm condition is automatically cleared. Otherwise, you must restart the system manually.	N/A
Over temperature	CPU temperature exceeds highest recommended operating temperature. The Intellispec system shuts down. You must wait till the processor cools before resuming operation.	Manually	N/A
Lost network connection	If the plant network is configured to communicate with the Intellispec and the network connection is lost, a lost network icon appears in the Windows system tray	Restoring plant network connection	N/A
Lane Alarms (see "Lane Alarms Description" on page 91)			
Percent Defects ¹	Percentage of defects exceeds the set limit	Manually	Red

Alarm Name	Cause	Reset Mechanism	Color in light tree
Offline ¹	Lane goes offline	Manually	Green when system is online Red when system goes offline
Chute Full ¹	Reject chute is full	Manually [you must first clear chute]	Red
Blow Molder Door Open ¹	Blow molder door is open	Automatically [by closing blow molder door]	Red
Power Status ¹	Lane AC Power is lost	Automatically	Off when AC power is lost Blue when power is OK
Good Parts ¹	Used as a part counter. When specified number of parts is reached, then alarm is triggered.	Manually	Red
System Error ¹	Missed rejects, part tracker, or other internal system errors	Manually	Red
Sensor Alarms (see "Sensor Alarms Description" on page 95)			
Percent Rejects ¹	Percentage of rejected parts exceeds the set limit	Manually	Red
Excessive Rejects ¹	Excessive number of rejects	Manually	Red
Excessive Warnings ¹	Excessive number of warnings	Manually	Amber
Consecutive Defects ¹	Too many consecutive defects	Manually	Red
System Error ¹	Missed part, missed acquisition, missed result, or other internal error	Manually	Red

¹ If you want to connect an external monitoring device such as a PLC, an optional **Extended I/O** (on page 305) board is required for each lane.

Viewing and Clearing Alarms

Use the View/Clear Alarms menu to see which alarms are enabled and disabled. A green light indicates that the alarm has not been triggered, while a red light indicates the alarm has been triggered.

➤ To get to the View/Clear Alarms menu:

- Click an Alarm button . The View/Clear Alarms menu is displayed.

Or:

- View the Lane Overview or Sensor Overview screen by clicking either a Lane n button or Sensor button.
- Click the Alarms button  to view the Alarms menu.
- Select View/Clear Alarms from the menu. The menu shown below is displayed.

➤ **To view when an alarm was triggered and who last cleared it:**

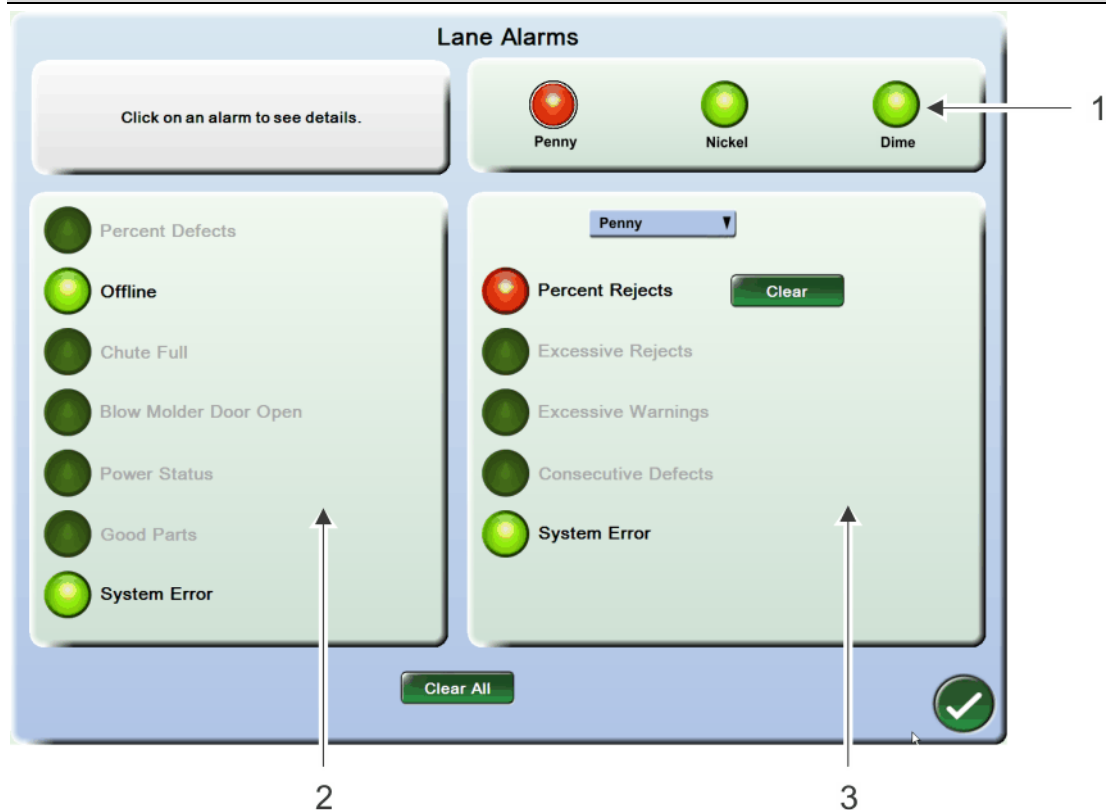
Click an LED in the View/Clear Alarms screen.



➤ **To clear an alarm:**

- Click the Clear button next to any alarm to clear a single alarm. Or:
- Click the Clear All button at the bottom of the screen to clear all alarms.

❖ *Note: some triggered alarms may be from another sensor - click the red sensor indicator [in item 1] to see that sensor's alarms*



1	List of sensors in the selected lane. Click an LED to select a sensor.
2	List of Lane alarms
3	List of Sensor alarms. Use the drop-down menu to select a sensor.

❖ *Note: The LED with a white circle around it in the list of sensors [item 1] is the selected sensor. The drop-down menu also indicates the selected sensor.*

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

	Green Off - the alarm is not enabled nor triggered
	Green On - the alarm is enabled, but has not been triggered

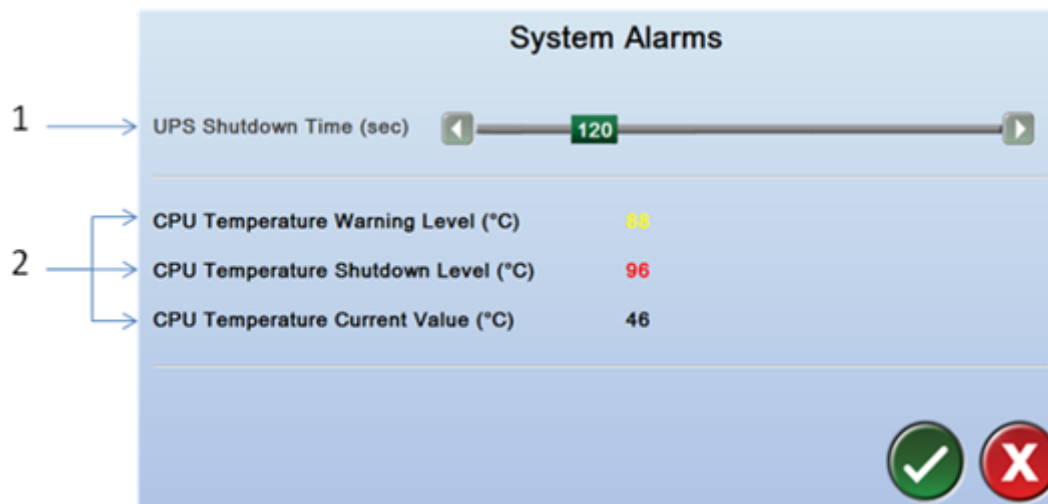
	Red On - the alarm is both enabled and triggered

System Alarms Description

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

➤ To get to this menu:

1. Click the Home button  to view the System Overview screen.
2. Click the Alarms button  to view the system alarms. The screen shown below is displayed.



1	UPS Shutdown Time – Set 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 – Displays the current, warning, and shutdown temperatures associated with the computer CPU. 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 Alarm Configuration

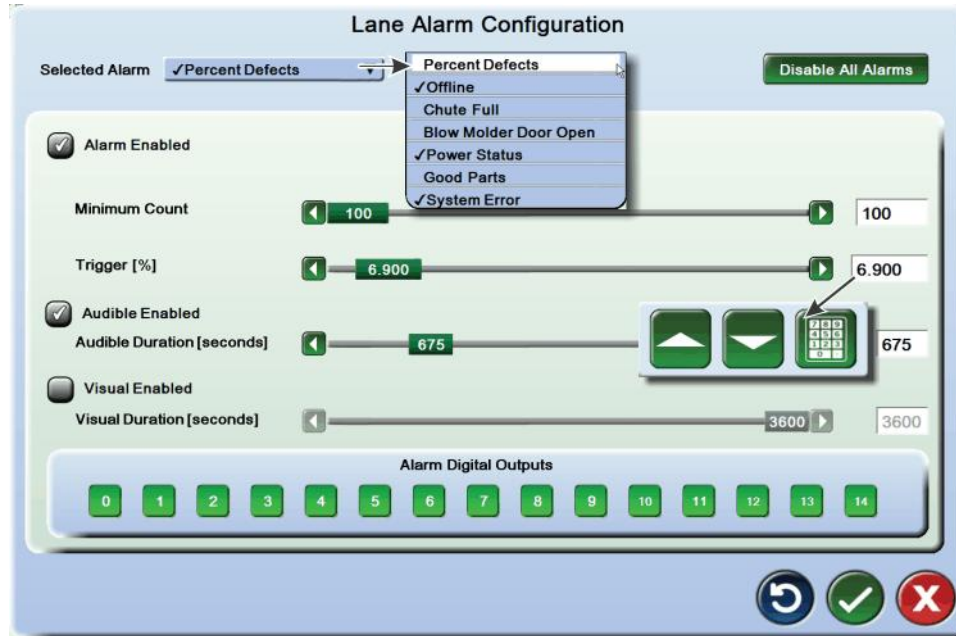
In the Lane Alarm Configuration menu, you can edit alarms for an entire lane. To see a description for each type of alarm, see **Lane alarms description** (on page 91).

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

➤ To get to this menu:

1. Log in.
2. View the Lane Overview screen by clicking a Lane n button.
3. Click the Alarms button  to view the Alarms menu.

- From the Alarms menu, select Lane Alarm Configuration.



Select an alarm from the drop-down menu to configure that alarm. You can enable or disable parameters for each alarm individually. A check mark appears in the box next to the parameter, and the name of the alarm, when it is enabled. The parameters are described below.

For numeric values, you can change the numbers with the slider bars or click in the box to the right of the slider to nudge the number up or down, or bring up a numeric keypad to enter a new value.

Alarm Enabled

Enables alarm.

Minimum Count

Specify the minimum number of parts that must be inspected before the alarm can be triggered. This prevents the alarm from being triggered too soon, when only a small number of parts may make the statistics trigger the alarm.

Minimum Count is used in the **Percent Defects** alarm.

Trigger [%]

Define the percentage of parts inspected that must fail to trigger the Percent Defects alarm. This number is selectable between zero and 100. The default value is five percent.

Trigger [%] is used in the **Percent Defects** alarm.

❖ *Note: you can change this percentage in the **Trend Charts** (see "**Alarm Percentages in Trend Charts**" on page 72) in Lane Overview mode when Defect % is selected for the V-axis.*

Trigger (thousands)

[Good Parts alarm] The number of parts that must pass inspection to trigger the alarm. The number is expressed in thousands.

Audible Enabled

If this parameter is enabled, the audible alarm will sound when triggered.

Audible Duration

The number of seconds the audible alarm will sound if triggered. It will remain on until the alarm is cleared. Use the slider to set values up to 3600 seconds (60 minutes).

Visual Enabled

If this parameter is enabled, this alarm will switch on the appropriate light on the light tree when triggered.

Visual Duration

The number of seconds the light will remain on when the alarm is triggered. It will remain on until the alarm is cleared. Use the slider to set values up to 3600 seconds (60 minutes).

Alarm Outputs

Select an output (**Inspection Alarm 0-14**) to be toggled on the optional **Extended I/O** (see "**Extended I/O board**" on page 305) kit when the alarm is triggered.

❖ *Note: if your system has firmware version F168 or higher, there are 16 Alarm Digital Outputs. They are numbered 0-15. Firmware versions below F168 support 15 Alarm Digital Outputs numbered 0-14.*

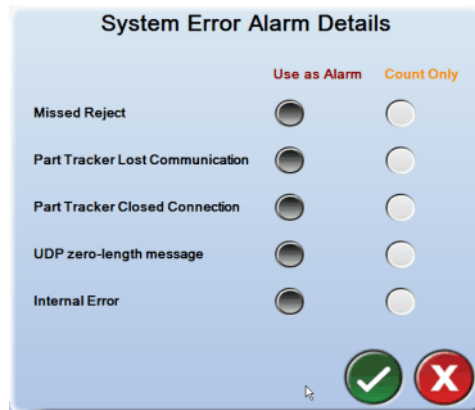
- There are 15 available **Inspection Alarm** outputs that correspond to the **extended I/O signals** (on page 306). Click one of the output numbers to assign the current alarm to an output.
- These outputs go active when the alarm is triggered, and go inactive when the alarm is cleared.
- The outputs can be monitored by your plant equipment, such as a PLC, to notify you when certain alarms are triggered.

Disable All Alarms

Click this button to disable all the current alarms at once. This disables only the alarms for the current sensor or lane. This is used in emergencies when you cannot repair a situation immediately, or when setting up the system. The remaining parameter settings for each alarm are saved for future use. You must re-enable each alarm individually when you are ready.

System Error Alarm Details

The System Error Alarm cannot be disabled. However, there is a **Details** button that shows whether it is being used as an alarm (to light the red light of the light tree, turn on the horn, or turn on the audible alarm). Alarms may be added or subtracted from the software without notice.



Use as Alarm

This is the normal setting.

Count Only

If one or more of the System Error alarms have Count Only selected, then those alarms will be used as a warning. In the View/Clear Alarms screen, the LED will be yellow if the alarm is triggered (instead of red). The Count Only alarms will NOT light any light in the light tree, sound the horn, nor cause the red flashing ALARM button over the Lane button.

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

Click the OK button  to apply changes and exit the menu.

Lane Alarms Description

The available Lane alarms are as follows:

Percent Defects

This alarm is triggered when the percentage of defective parts from a Lane exceeds the Percent Trigger. It will remain triggered until you clear the alarm. It uses the red light of the light tree as a visual indicator.

Offline

This alarm indicates whether the system is online or offline. The green light of the light tree is on when the system is online. The green light turns off and the red light turns on when the system goes offline.

Chute Full

This alarm is mainly used in systems that have inspection modules installed within a blow molder, and use the blow molder's internal reject chute. It is triggered when the blow molder's internal reject chute is full. This alarm may not apply to your system. It uses the red light of the light tree as a visual indicator.

If this alarm is enabled and triggered, the blow molder's internal rejector will be disabled, thus not allowing any more defective parts to be rejected. The rejector will remain disabled until you clear the chute and then clear the alarm from the alarms tab. If you clear the alarm without clearing the chute, the alarm will be triggered again.

❖ *Note: This alarm is disabled when the Intellispec is offline.*

Blow Molder Door Open

This alarm is used for systems that have inspection modules installed within a blow molder. It is triggered when the blow molder door is opened. It will remain triggered until the door is closed. It uses the red light of the light tree as a visual indicator. This alarm may not apply to your system.

❖ *Note: In PET Preform applications, this alarm is triggered when the Bypass Gate opens.*

Power Status

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

The red light of the light tree will switch on when Lane AC power is lost. The blue light should remain on as long as the Lane power is on.

Good Parts

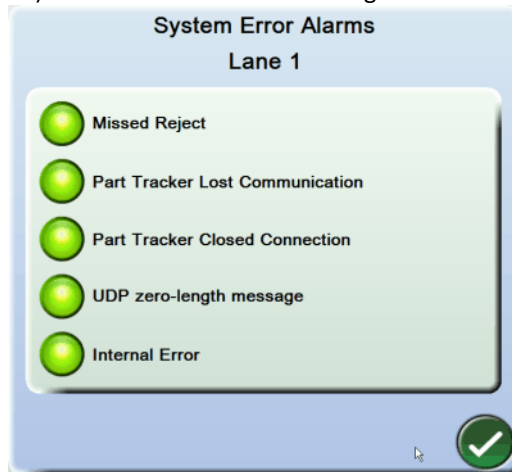
This alarm can be used as a part counter. For example, say you are inspecting preforms, and have a box at the end of the conveyor (after inspection) that holds 5000 preforms. This alarm will count the number of good inspected parts, and notify you when 5000 good parts have reached that box. The Alarm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

This alarm is triggered when a number of good inspected parts [Trigger (thousands)] has been reached. It will remain triggered until you clear the alarm. It uses the red light of the light tree as a visual indicator. Note that clearing this alarm also clears the Good Parts count.

See also information about the optional **Extended I/O** (see "**Extended I/O board**" on page 305) module.

System Error

System Error is a group of several internal system alarms. Click the System Error LED on the Lane Alarms screen to see all the alarms and their statuses. See also **Lane Alarm Configuration** (on page 88) to see how this alarm is configured.



These errors are recorded in the **Log Reader** (on page 103). Some of these are described below. Other system error alarms may be added and shown on the screen, or removed without notice.

- **Missed Reject** - This alarm works in conjunction with **Reject Confirm** (see "**Reject Confirm Calibration (Optional)**" on page 130). It is triggered when a missed reject occurs. It uses the red light of the light tree as a visual indicator. There will be two Missed Reject alarms available if two **rejectors** (see "**Rejector Enable/ Disable**" on page 116) are enabled and two **Reject Confirm rejectors** (see "**Reject Confirm Calibration (Optional)**" on page 130) are enabled.
- **Part Tracker Lost Communication** - You may be able to reset the Part Tracker to re-establish communication. See **Resetting the Part Tracker Board in FHCP 3X** (on page 264).
- **Internal Error** - an internal error was logged. This usually requires Pressco technical assistance.

Sensor Alarm Configuration

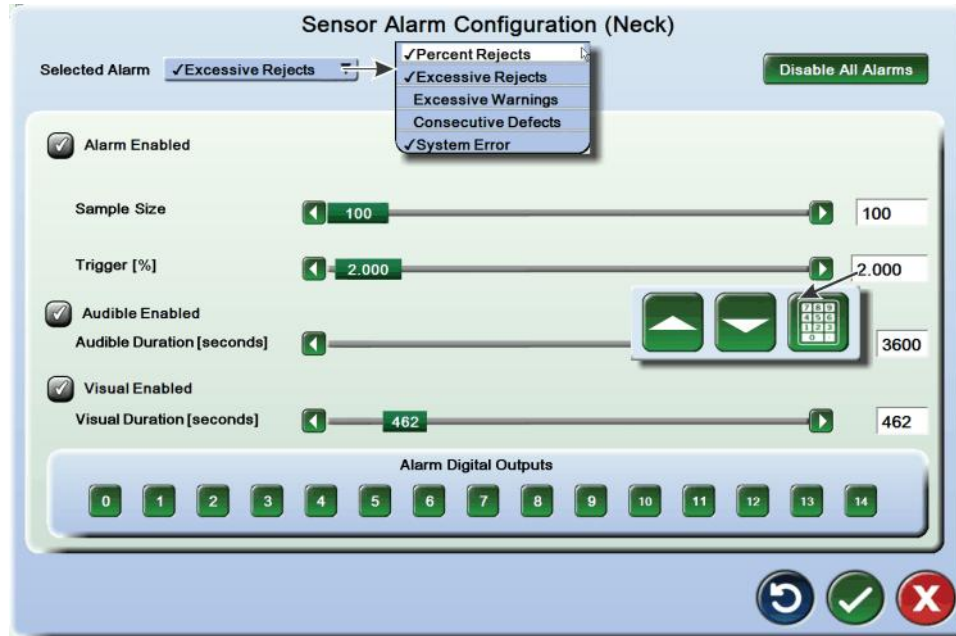
In the Sensor Alarm Configuration pop up window, you can edit alarm settings for an entire Sensor. To see a description of each type of alarm, see **Sensor alarms description** (on page 95).

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

➤ To get to this menu:

1. Log in.
2. View either the Lane Overview or Sensor Overview screen by clicking a Lane n or Sensor n button.
3. Click the Alarms button  to view the Alarms menu.
4. From the Alarms menu, select 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. You can enable or disable parameters for each alarm individually. A check mark appears in the box next to the parameter, and the name of the alarm, when it is enabled. The parameters are described below.

For numeric values, you can change the numbers with the slider bars or click in the box to the right of the slider to nudge the number up or down, or bring up a numeric keypad to enter a new value.

Alarm Enabled

Enables alarm.

Minimum Count

Specify the minimum number of parts that must be inspected before the alarm can be triggered. This prevents the alarm from being triggered too soon, when only a small number of parts may make the statistics trigger the alarm.

Minimum Count is used in the **Percent Rejects** alarm.

Sample Size

Define the number of parts that must be inspected to determine the excessive warning percentage. This number is selectable between one and 100,000. The default value is 100. This is a sliding window: for example assume Sample Size = 1,000 and Percent Trigger = 3. If three percent of the last 1000 parts have had a warning status, the alarm is triggered.

Sample Size is used in the **Excessive Rejects** and **Excessive Warnings** alarms.

Trigger [%]

Define the percentage of parts inspected that must fail to trigger the Percent Defects alarm. This number is selectable between zero and 100. The default value is five percent.

Trigger [%] is used in the **Percent Rejects**, **Excessive Rejects**, and **Excessive Warnings** alarms.

❖ *Note: you can change this percentage in the **Trend Charts** (see "**Alarm Percentages in Trend Charts**" on page 72) in Sensor Overview mode when Defect % is selected for the V-axis.*

Consecutive Triggers

Define the number of defects in a row that the system must have to trigger the alarm. This number is selectable between two and 100. The default value is 25.

Consecutive Triggers is used with the **Consecutive Defects** alarm.

Audible Enabled

If this parameter is enabled, the audible alarm will sound when triggered.

Audible Duration

The number of seconds the audible alarm will sound if triggered. It will remain on until the alarm is cleared. Use the slider to set values up to 3600 seconds (60 minutes).

Visual Enabled

If this parameter is enabled, this alarm will switch on the appropriate light on the light tree when triggered.

Visual Duration

The number of seconds the light will remain on when the alarm is triggered. It will remain on until the alarm is cleared. Use the slider to set values up to 3600 seconds (60 minutes).

Alarm Outputs

Select an output (**Inspection Alarm 0-14**) to be toggled on the optional **Extended I/O** (see "**Extended I/O board**" on page 305) kit when the alarm is triggered.

❖ *Note: if your system has firmware version F168 or higher, there are 16 Alarm Digital Outputs. They are numbered 0-15. Firmware versions below F168 support 15 Alarm Digital Outputs numbered 0-14.*

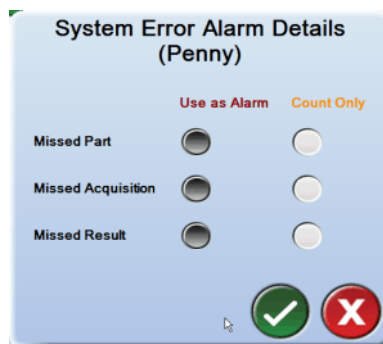
- There are 15 available **Inspection Alarm** outputs that correspond to the **extended I/O signals** (on page 306). Click one of the output numbers to assign the current alarm to an output.
- These outputs go active when the alarm is triggered, and go inactive when the alarm is cleared.
- The outputs can be monitored by your plant equipment, such as a PLC, to notify you when certain alarms are triggered.

Disable All Alarms

Click this button to disable all the current alarms at once. This disables only the alarms for the current sensor or lane. This is used in emergencies when you cannot repair a situation immediately, or when setting up the system. The remaining parameter settings for each alarm are saved for future use. You must re-enable each alarm individually when you are ready.

System Error Alarm Details

The System Error Alarm cannot be disabled. However, there is a **Details** button that shows whether it is being used as an alarm (to light the red light of the light tree, turn on the horn, or turn on the audible alarm). Alarms may be added or subtracted from the software without notice.



Use as Alarm

This is the normal setting.

Count Only

If one or more of the System Error alarms have Count Only selected, then those alarms will be used as a warning. In the View/Clear Alarms screen, the LED will be yellow if the alarm is triggered (instead of red). The Count Only alarms will NOT light any light in the light tree, sound the horn, nor cause the red flashing ALARM button over the Lane button.

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

Click the OK button  to apply changes and exit the menu.

Sensor Alarms Description

The available Sensor alarms are as follows:

❖ *Note: parameters, such as Percent Trigger, are adjusted in the **Sensor Alarm Configuration** (on page 92).*

Percent Rejects

This alarm is triggered when the total percentage of defects for the current sensor exceeds a defined percentage. This percentage is defined with the Trigger [%] parameter. It will remain triggered until you clear the alarm. It uses the red light of the light tree as a visual indicator.

Excessive Rejects

This alarm is triggered when a percentage of the last n parts have been found defective. It will remain triggered until you clear the alarm. n = Sample Size. The percentage is defined with the Trigger [%] parameter. It uses the red light of the light tree as a visual indicator.

Excessive Warnings

This alarm is triggered when a percentage of the last n parts have been found with a warning status. It will remain triggered until you clear the alarm. n = Sample Size. The percentage is defined with the Trigger [%] parameter. It uses the amber light of the light tree as a visual indicator.

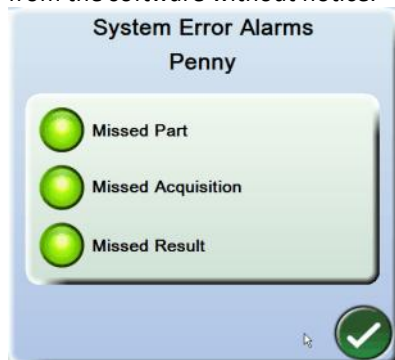
Warnings are enabled in the **Retro-Spec Options** (on page 213) when you are editing an inspection.

Consecutive Defects

This alarm is triggered when the sensor has had too many consecutive defects. The number of defects is defined by the Consecutive Triggers parameter. It will remain triggered until you clear the alarm. It uses the red light of the light tree as a visual indicator.

System Error

System Error is a group of several internal system alarms. Click the System Error LED on the right side of the View/Clear Alarms screen to see all the alarms and their statuses. See also **Sensor Alarm Configuration** (on page 92) to see how this alarm is configured. Alarms may be added or subtracted from the software without notice.



These errors are recorded in the **Log Reader** (on page 103).

- **Missed Part** - No current function.
- **Missed Acquisition** - This alarm is triggered if the sensor misses acquiring the image of a part. For example, the inspection time was too high, or the part was too deformed to properly detect. It will remain triggered until you clear the alarm. It uses the red light of the light tree as a visual indicator. See also **Sequence of Events** (see "**Sequence of Events During Inspection**" on page 194).
- **Missed Result** - This alarm is triggered if the sensor misses the inspection results of a part. For example, the inspection time was too high, or the processor was too busy to process the inspection results before the part reached the reject position. It will remain triggered until you

clear the alarm. It uses the red light of the light tree as a visual indicator. See also ***Sequence of Events*** (see "***Sequence of Events During Inspection***" on page 194).

Chapter 9

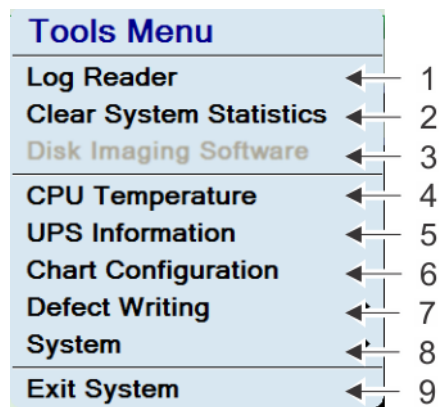
Tools Menus

This section covers the tools menus that are available through System Overview or Lane/Sensor Overview modes.

Tools menu - System Overview Screen

➤ *To view the Tools menu:*

1. Log in. (Some items may be grayed out if you do not have permissions to use the items)
2. Click the Home button  to view the System Overview screen.
3. Click the Tools button  to view the Tools menu.



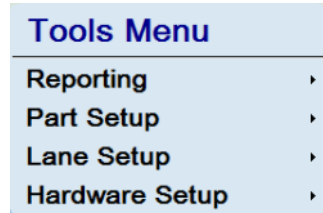
1	Log Reader (on page 103) – Open the Intellispec log
2	Clear System Statistics – Clear the entire system statistics (all Lanes)
3	Disk Imaging Software – Open Acronis Echo software for backing up system hard drive
4	CPU Temperature – Displays the current, warning, and shutdown temperatures associated with the computer CPU. If a multiple core computer is used, the highest temperature is displayed. If the shutdown CPU temperature is reached, the Intellispec system shuts down.
5	UPS Information – Display Uninterruptible Power Supply (UPS) information and settings
6	Chart Configuration – Choose the Trend Graph Type and the number of divisions for the horizontal axis for the chart displayed in the System Overview Screen
7	Defect Writing (see " Enabling/ Disabling Defect Writing " on page 328) - [Only available if Defect Database option is installed and enabled] Enable or disable defect recording for multiple lanes.
8	System - Set system date and time or set up a printer
9	Exit System – Shut down Intellispec software

Tools menu - Lane Overview and Sensor Overview Screens

The Tools menu is the same in both Lane Overview and Sensor Overview screens.

➤ To view the Tools menu:

1. Log in. (Some items may be grayed out if you do not have permissions to use the items)
2. Click a Lane *n* button to view the Lane Overview screen.
3. Click the Tools button  to view the Tools menu.



Reporting (on page 98)

Part Setup (on page 105)

Lane Setup (on page 107)

Hardware Setup (on page 120)

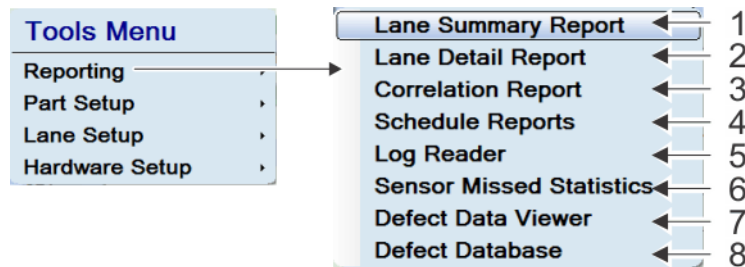
Reporting

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:

1. View the Lane Overview screen by clicking a Lane *n* button.
2. Click the Tools button  to view the Tools menu.
3. From the Tools menu select Reporting, then select your desired option. These are described below.



1	Lane Summary Report (on page 99) - Generate a summary of the statistics for the current lane.
2	Lane Detail Report (on page 100) - Generate a report with the lane and sensor defect statistics broken down to inspection-by-inspection data.
3	Correlation Report (on page 101) - (Only available if correlation is enabled on your system) Generate a report with the percentage of defects by machine part
4	Schedule Reports (on page 101) - Define the frequency and destination for automatic statistics reporting.
5	Log Reader (on page 103) – Open the Intellispec log

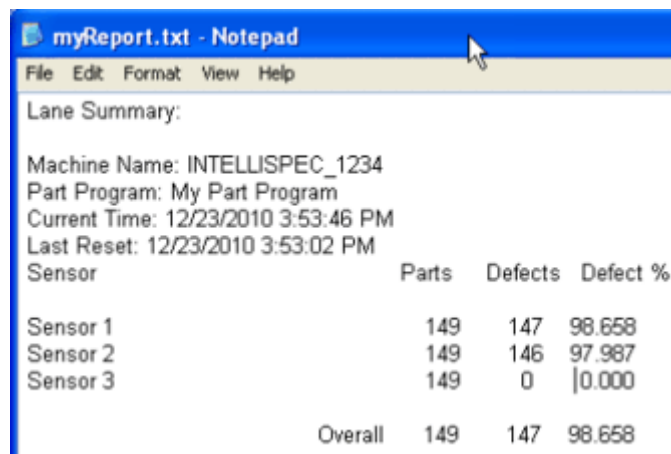
6	Sensor Missed Statistics (on page 104) - Display the number of missed parts for the lane.
7	Defect Data Viewer (see " Defect Data (Images) Viewer " on page 329) - [Only shown if this option is enabled] View the images in the defect database
8	Defect Database (see " Defect Database Viewer " on page 331) - [Only shown if this option is enabled] View the inspection data and reports from the defect database

Lane Summary Report

This report lists the statistics summary 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.



```

myReport.txt - Notepad
File Edit Format View Help
Lane Summary:
Machine Name: INTELLISPEC_1234
Part Program: My Part Program
Current Time: 12/23/2010 3:53:46 PM
Last Reset: 12/23/2010 3:53:02 PM
Sensor          Parts   Defects  Defect %
Sensor 1        149     147    98.658
Sensor 2        149     146    97.987
Sensor 3        149       0     0.000
Overall         149     147    98.658

```

Lane Detail Report

This report contains all the information in the **Lane Summary Report** (on page 99), plus inspection detail for each sensor with the number of defects found by each inspection. An example is shown below.

mySummary.txt - WordPad

Lane Summary:

Machine Name: INTELLISPEC_1234
Part Program: MyPartProgram
Current Time: 12/23/2010 3:54:39 PM
Last Reset: 12/23/2010 3:53:02 PM

Sensor	Parts	Defects	Defect %
Sensor 1	149	147	98.658
Sensor 2	149	146	97.987
Overall	149	147	98.658

Machine Name: INTELLISPEC_1234
Part Program: MyPartProgram
Current Time: 12/23/2010 3:54:39 PM
Last Reset: 12/23/2010 3:53:02 PM

Sensor 1 :

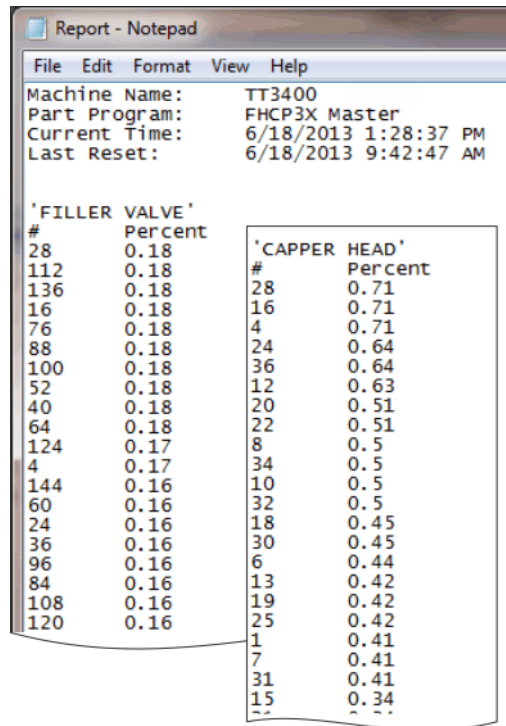
Inspection	Parts	Defects	Defect %
Ring	149	0	0.000
Measurement	149	147	98.658
Ambient	149	0	0.000
Contrast	149	147	98.658
Polygon	149	0	0.000
Centerline	149	147	98.658
Adaptive	149	147	98.658
Ring	149	0	0.000
Ambient	149	0	0.000
Measure Extract	149	57	38.255
Distance	149	147	98.658
Overall	149	147	98.658

Sensor 2 :

Inspection	Parts	Defects	Defect %
Polygon	149	0	0.000
Centerline	149	146	97.987
Overall	149	146	97.987

Correlation Report

This report contains the percentage of defects by machine part, sorted from highest to lowest percentage of failure. An example is shown below.



Report - Notepad

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
~	~

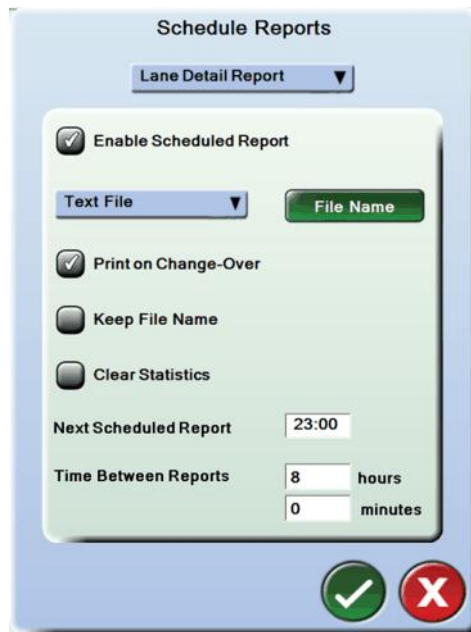
Schedule Reports

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 schedule reports:

1. Go to the Lane Overview screen by clicking a Lane n button.
2. Click the Tools button  to view the Tools menu.
3. From the Tools menu, select Reporting, then select Schedule Reports. The screen shown below is displayed.
4. Change the settings as desired. These are described below.

5. Click the OK button  to save changes and exit the screen.



Report drop-down menu

Select which report to schedule, then change the settings in the menu. Each report must be set up separately.

See also **Lane Summary Report** (on page 99) and **Lane Detail Report** (on page 100).

Report settings

Enable Scheduled Report

Choose whether to schedule the selected report. When this box is checked, the settings below are active.

Destination drop-down menu

Choose whether to send the report to the default printer or a file. When Text File is selected, you can enter a file name by clicking the **File Name** button.

If you do not name the file, then the file is named "PresscoReportnn.txt" where *nn* is the number of the next generated report. It is saved at the hard disk location "c:\Pressco." Subsequently saved reports overwrite the file.

Print on Change-Over

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

See **Change-over Report Example** (on page 103).

Keep File Name

When a report is printed to file and this feature is enabled, the system will write the inspection statistics to the same file name each time, rather than creating new files with unique names. The system overwrites the file each time. You will need to click the **File Name** button, browse to the location where you want to save it, and create a name for your report.

An example of where this feature might be used is a plant where the Intellispec is networked. Say the office computer is programmed to poll the Intellispec at regular intervals to get the latest statistics report. With the same file name, the office computer just needs to request the same file name each time, regardless of the date and time the report was saved.

Reset Statistics

The Lane statistics are cleared after each print.

Next Scheduled Report

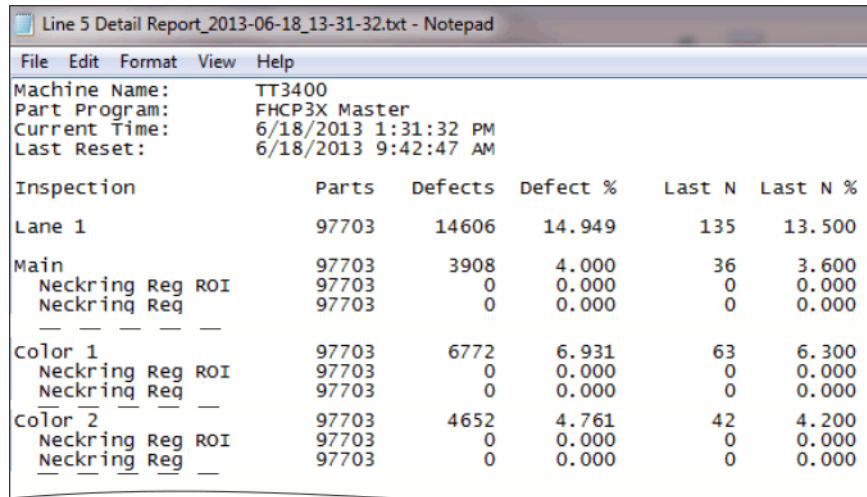
Using a 24 hour clock, set the time when the Intellispec should save or print the next report.

Time Between Reports

Set the time interval when the Intellispec should save or print the following reports. This interval is used after the Next Scheduled Report, and is repeated the set number of hours and/or minutes thereafter.

Change-over Report Example

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



Machine Name: TT3400						
Part Program: FHCP3X Master						
Current Time: 6/18/2013 1:31:32 PM						
Last Reset: 6/18/2013 9:42:47 AM						
Inspection	Parts	Defects	Defect %	Last N	Last N %	
Lane 1	97703	14606	14.949	135	13.500	
Main	97703	3908	4.000	36	3.600	
Neckring Reg ROI	97703	0	0.000	0	0.000	
Neckring Reg	97703	0	0.000	0	0.000	
Color 1	97703	6772	6.931	63	6.300	
Neckring Reg ROI	97703	0	0.000	0	0.000	
Neckring Reg	97703	0	0.000	0	0.000	
Color 2	97703	4652	4.761	42	4.200	
Neckring Reg ROI	97703	0	0.000	0	0.000	
Neckring Reg	97703	0	0.000	0	0.000	

Log Reader

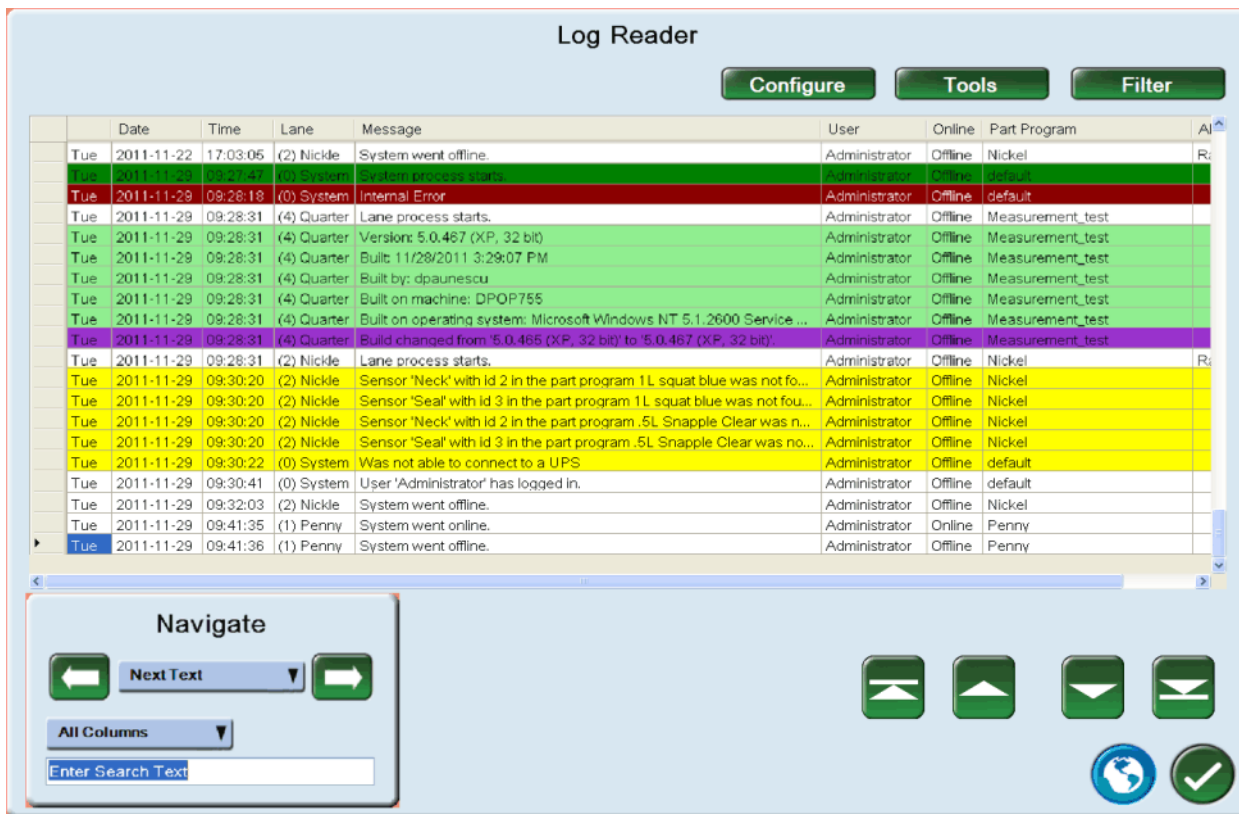
The log reader displays the Intellispec event history including:

- User log in and log out information
- Part program changes

❖ *Note: detailed part program changes are found in the **Part Program Change Log** (on page 200)*

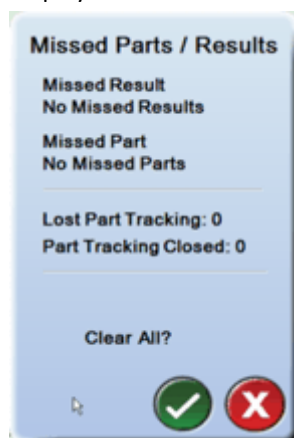
- Alarms, when triggered and cleared
- System errors
- System starting information
- Lane online/ offline history
- Lighting changes

Text files of the logs are stored at: C:\Pressco\Logs.



Sensor Missed Statistics

Displays the number of missed parts and missed part tracking for the sensor.



This information is recorded in the **Log Reader** (on page 103).

Missed Results

This can occur if you set the **Reject Delay Calibration** (on page 125) incorrectly. Another cause could be kinks or intermittent connections to cables, or the inspection time for the lane is too long.

Error messages

Part Tracker Exception

If you see an error "Part Tracker Exception" on the Intellispec screen, this means that power was lost to the Cluster Box or Part Tracker.

➤ To reset the part tracker board:

Push the **Reset** button on the part tracker board. This is found inside the inspection module or Cluster Box.

Lost Part Tracking

If you see a "Lost Part Tracking" message, possibly the power was lost to the Cluster Box or Part Tracker inside an inspection module. Reset the Part Tracker board as described above.

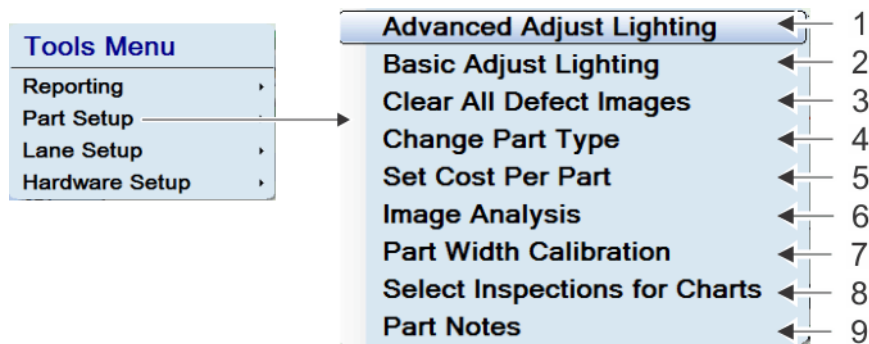
Part Setup

The Part Setup menu provides access to lighting, part display options in charts, and part width calibration.

Some menu items are only available to advanced level users.

➤ To view the Part Setup menu:

1. View the Lane Overview screen by clicking a Lane n button.
2. Click the Tools button  to view the Tools menu.
3. From the Tools menu select Part Setup >> then your desired option. These are described below.



1	Advanced Adjust Lighting (on page 162)
2	Basic Adjust Lighting (on page 162)
3	Clear All Defect Images - Remove all images from the Reject Images buffer.
4	Change Part Type - Select the type of part to be displayed on the Walk By Graphic for the current lane.
5	Set Cost Per Part - Set the cost of each product, to be used with the "Defect Cost" trend chart.
6	Image Analysis (on page 158) - Determine the gray shade value for any pixel or group of pixels in your image.
7	Part Width Calibration (on page 106) - Set the number of encoder pulses that the part detect sensor "sees" the part.
8	Select Inspections For Charts - Select which inspections (up to 8) to display on the Trend Chart and Timing Trend.
9	Part Notes - Add setup and programming information about the part. This is especially helpful if you or someone else need to modify the part program later.

Part Width Calibration

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

➤ To get to the Part Width menu:

1. From the Sensor Overview mode, right-click on a sensor button to view the **sensor menu** (on page 155).
2. Select Part Tracking, then select Part Width Calibration.

The image shows two overlapping dialog boxes. The top dialog box is titled "Part-Width Calibration" and contains input fields for "Part Width" (set to 72) and "Part-Present Disable Time" (set to 3), both in encoder ticks. It includes a "Start Calibration" button and a table of calibration results. The bottom dialog box is titled "Confirm changes" and asks for confirmation to apply the changes, with "OK" and "Cancel" buttons.

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

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.

➤ To calibrate the Part Width:

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

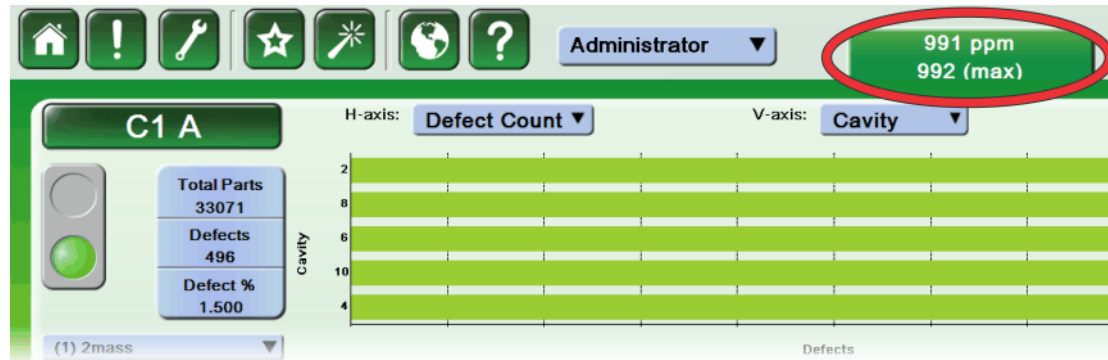
Part Rate

In Intellispec systems with software version 5.0.440 and later, the part rate is displayed in Lane Overview and Sensor Overview modes.

You can reset the part rate by right-clicking over the part rate tab and clicking **Reset Part Rate**.

The part rate displays:

- ppm (parts per minute)** - The average rate over the last five seconds. It is updated once per second.
- max** - The maximum rate found for all individual parts in the last five seconds determined in [a]. The displayed value is the largest value found in the last five minutes.



Lane Setup

Some menu items are only available to advanced level users.

Tools Menu		
Reporting	Change Lane Name	1
Part Setup	Change Sensor Name	2
Lane Setup	Image Display Configuration	3
Hardware Setup	Machine Part Correlation	4
	Manage Part Programs	5
	Remote Part Program Switching	6
	Miscellaneous Configuration	7
	Defect Recording Configuration	8
	Rejector Enable/Disable	9
	SmartCAL	10
	Image Source	11
	Start Forced Reject	12
	Stop Forced Reject	13
	Chart Configuration	14
	Statistics Configuration	15
	Statistics Grid Configuration	16
	Walk-By Setup	17

1	Change Lane Name - Change the name of the current lane.
2	Change Sensor Name - Change the name of the selected sensor.
3	Image Display Configuration (on page 108) - Set the frequency, rotation, and other display options for the sensor images.
4	Machine Part Correlation (on page 109) - Configure up to four different machine parts for correlation. [This option only appears when Correlation is configured] (This is usually done by the Pressco installer)
5	Manage Part Programs (on page 111) - Create, delete, or edit part programs.

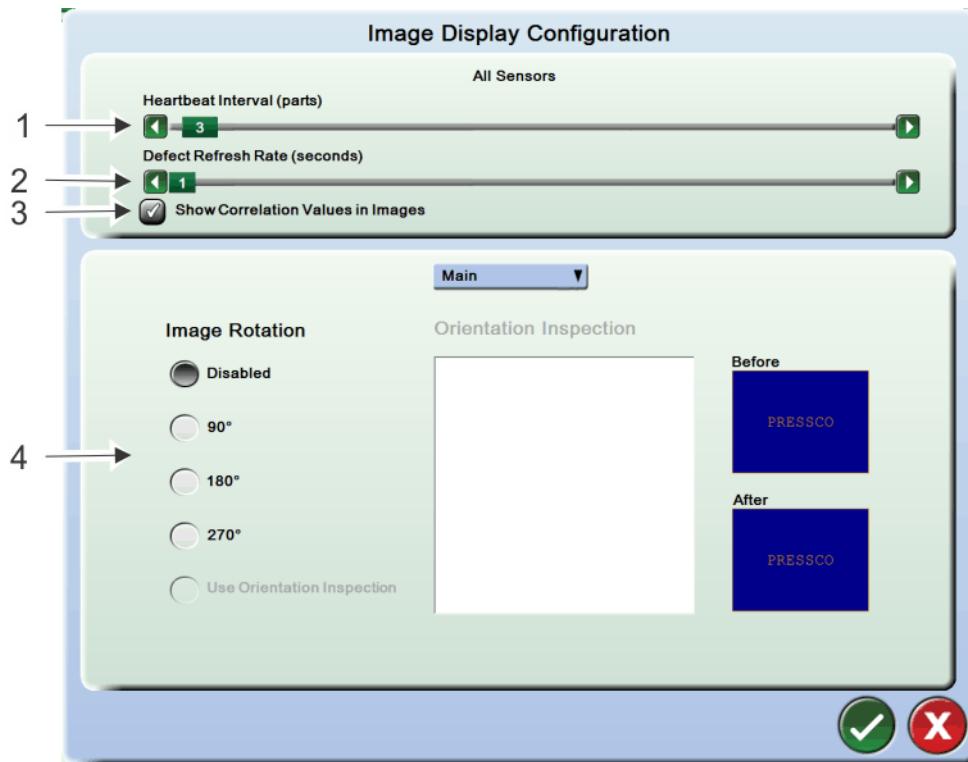
6	Remote Part Program Switching (on page 114) - Select one of two part programs remotely.
7	Miscellaneous Configuration (on page 116) - Change settings for Missed Results, Inspection Warnings, and Defect Database (not currently available).
8	Defect Recording Configuration (see " Preparing the Database " on page 325) - [only shown if this option is enabled] Enable defect recording
9	Rejector Enable/ Disable (on page 116) - Enable or disable the rejector for lane or sensors.
10	SmartCAL (on page 166) - SmartCAL is a tool that allows you to load a set of images, run them with the current part program, and make sure the part program is passing or rejecting parts as you expect.
11	Image Source (on page 168) - Select images to display on the lane.
12 and 13	Start Forced Reject (on page 118) - Force parts to be rejected based on correlation to a specific machine part. Stop Forced Reject - Stop the Forced Reject process.
14	Chart Configuration – Set the number of columns in the Trend Chart and the currency type to be used in the "Cost per Part" trend chart.
15	Statistics Configuration (on page 78) - Change the display settings for the charts displayed by the Statistics buttons.
16	Statistics Grid Configuration (on page 119) - Change the amount of information for the charts displayed by the Statistics buttons.
17	Walk By Setup (on page 62) - Set up the group names, inspections assigned to each group, and the criteria determining when the areas of the graphic turn green, yellow, or red.

Image Display Configuration

Adjust the display settings for images.

➤ **To get to this screen:**

From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu, then select Lane Setup, then select Image Display Configuration.



1	Set the frequency to update the image in the sensor view window.
2	Set the frequency to update the defective images when the system is online
3	If correlation is used, check this box to display correlation information in the Big Live Image view.
4	Rotate the defect images, sensor display images (heartbeat), and the Big Live Images by selecting rotation in degrees with respect to camera position, or rotation with respect to the orientation (if an orientation is being used).

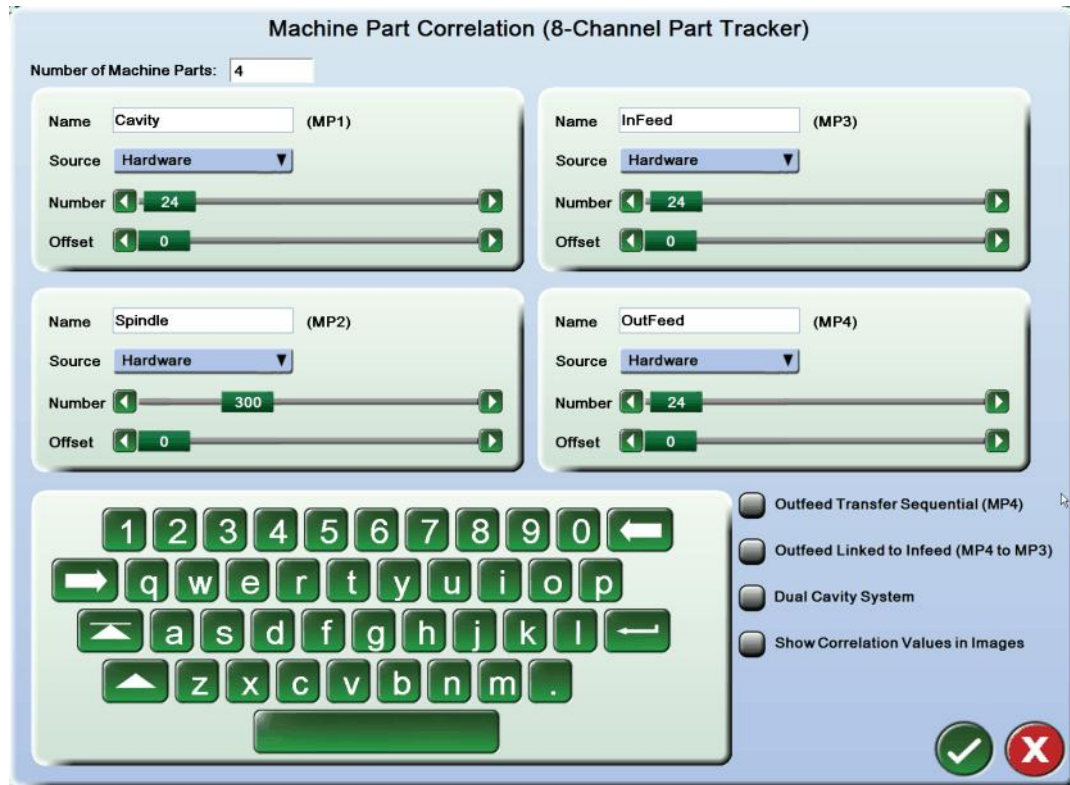
Machine Part Correlation

Configure up to four different machine parts for correlation. Each machine part can be named and assigned the correct number of stations. The offset bar is used for calibrating the displayed part with the actual machine part.

❖ *Note: This screen is usually set up by the Pressco installer.*

➤ **To get to this screen:**

From the Lane or Sensor overview screen, click the Tools button  to see the Tools menu, then select Lane Setup, then select Machine Part Correlation.



The screenshot shows the 'Machine Part Correlation (8-Channel Part Tracker)' interface. At the top, 'Number of Machine Parts' is set to 4. Below this are four configuration panels for Machine Parts (MP1, MP2, MP3, MP4). Each panel includes a 'Name' field, a 'Source' dropdown menu (all set to 'Hardware'), a 'Number' slider, and an 'Offset' slider. MP1 is 'Cavity' with Number 24 and Offset 0. MP2 is 'Spindle' with Number 300 and Offset 0. MP3 is 'InFeed' with Number 24 and Offset 0. MP4 is 'OutFeed' with Number 24 and Offset 0. A virtual keyboard is located at the bottom left. On the bottom right, there are four checkboxes: 'Outfeed Transfer Sequential (MP4)', 'Outfeed Linked to Infeed (MP4 to MP3)', 'Dual Cavity System', and 'Show Correlation Values in Images'. At the very bottom right are green and red circular buttons with checkmark and 'X' respectively.

Number Of Machine Parts

Select the number of correlation sensors in your system (1-4).

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

Name

Rename each machine part to something more recognizable to you (examples: Cavity, Spindle, or Liner Gun #1). This name will be displayed on the Intellispec screens and throughout correlation reports.

Source

Select between Hardware and Part Program to provide correlation. Some applications have inspections from which you can derive correlation information.

Number

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

Offset

This allows you to change the mapping between what the inspection system considers part #1 (or pocket #1) and the actual parts. For example, if you try to reject a part from cavity #1, and the system rejects the part from cavity #2, then you would set offset at 1. This information is required to be correct for the inspection system to track components properly.

Outfeed Transfer Sequential

(only available when four sensors are used, and only applicable to blow molder installations) Specify whether the infeed and outfeed transfer arms are numbered Independently or Sequentially. For example, say your machine has 10 infeed transfer arms and 10 outfeed transfer arms. If they are numbered Independently, the infeed transfer arms would be numbered 1 - 10, and the outfeed transfer arms would be numbered 1 - 10 as well. If they are numbered Sequentially, the infeed transfer arms would be numbered 1 - 10, and the outfeed transfer arms would be numbered 11 - 20.

Outfeed Linked to Infeed (MP4 to MP3)

(applicable to blow molder installations) Enable this to derive the outfeed correlation count (MP4) from the infeed correlation count (MP3). This is typical of most blow molders. For example, in an SBO20 machine, the infeed count will be from 1 - 10. The outfeed count will be from 11 - 20. Infeed count 1 will correspond to outfeed 11, and so forth.

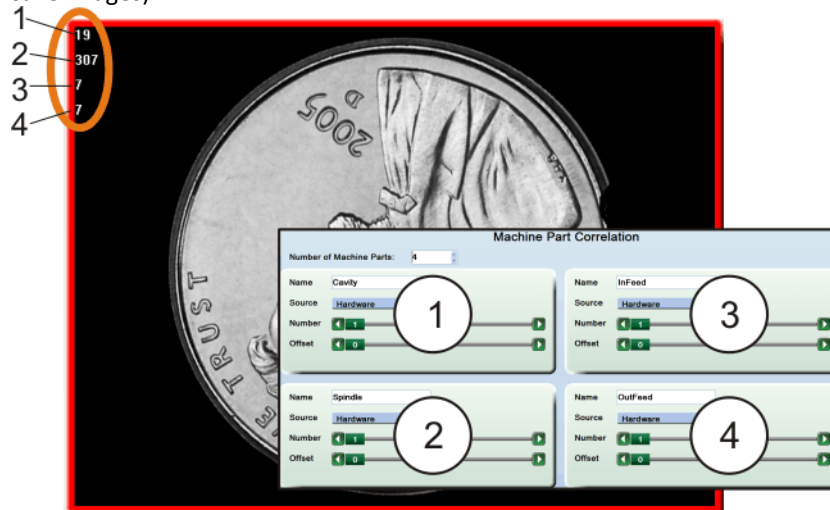
- ❖ *Note: When this feature is enabled, the number of components is forced to be equal (number of components in MP3 = number of components in MP4).*
- ❖ *Note: There is no index sensor for MP4 in the hardware configuration.*

Dual Cavity System

(only available when four sensors are used, and only applicable to blow molder installations) Enable this if your system is a dual cavity machine.

Show correlation values in images

Displays the correlation value in the images. These values are saved as part of the image file (if you save images).

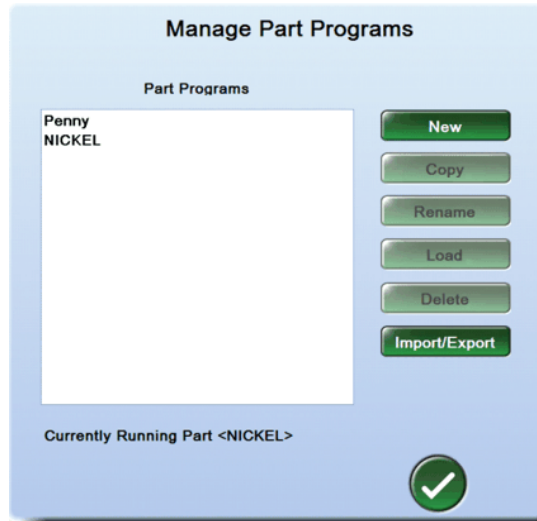


Manage Part Programs

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

➤ **To get to this screen:**

- From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu, then select Lane Setup, then select Manage Part Programs. Or:
- Right-click the Part Program drop-down menu.



For information on using this screen see:

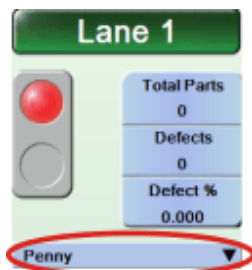
- **How to Create, Copy, or Import a Part Program** (on page 195)
- **Export a part program** (on page 113)
- **Load a Part Program** (on page 113)

Delete a part program

You can delete a part program to prevent other users from running it.

➤ **To delete a part program:**

1. Go to a Lane Overview or Sensor Overview screen [from Home: Lane button > Sensor button].
2. Load a known good part program, one that you will not delete. You cannot delete the currently running part program.
3. Right-click over the part program drop-down menu. The Manage Part Programs menu is displayed.
4. Highlight the program name in the Manage Part Programs menu, then click the **Delete** button.
5. A warning box will ask you if you are sure you want to delete the program. Click the OK button  to delete the program. The program is deleted from memory.



Right-click

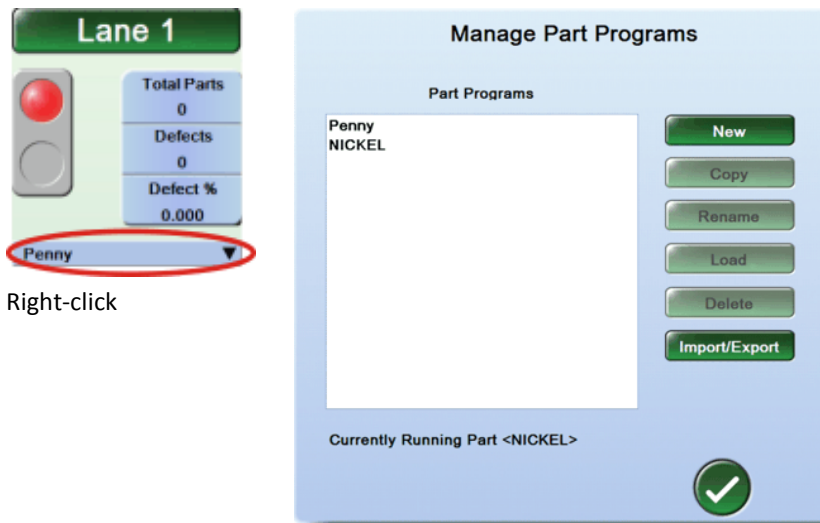


Load a part program

You can switch part programs by loading a different part program from disk.

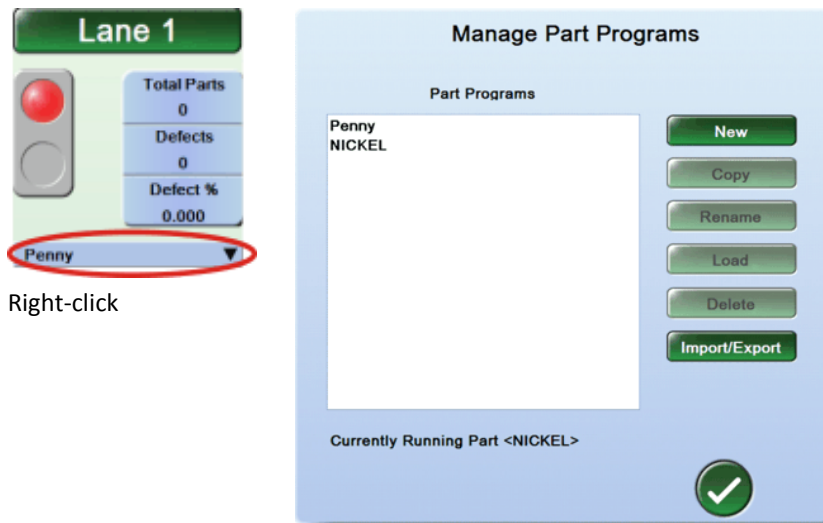
➤ To load a part program:

1. Go to a Lane Overview or Sensor Overview screen [from Home: Lane button > Sensor button].
2. Right-click over the part program drop-down menu. The Manage Part Programs menu is displayed.
3. Highlight the program name in the Manage Part Programs menu, then click the **Load** button. The program name will appear in the Part Program drop-down menu on the Lane Overview or Sensor Overview screen.
4. Click the OK button  to exit the Manage Part Programs menu. The new part program is loaded into the Intellispec memory.



Export a part program

You can export a part program to use it on another sensor, lane, or Intellispec.



➤ To export a part program:

1. Go to a Lane Overview or Sensor Overview screen [from Home: Lane button > Sensor button].
2. Right-click over the part program drop-down menu. The Manage Part Programs menu is displayed.

3. Click the **Import/Export** button. The Import or Export Part Programs menu is displayed.



4. Click the disk icon  to browse to the folder or USB destination to export the part program.
5. Highlight the part program that you want to export in the Current Part Programs column.
6. Click the right arrow button  to export the part program.
7. Click the OK button  to exit the Import or Export Part Programs menu. The part program is exported.
8. Click the OK button  to exit the Manage Part Programs menu.

Remote Part Program Switching

❖ *Note: this feature is available in versions 5.0.493, 5.2.026, 5.3.005 and higher versions of software.*

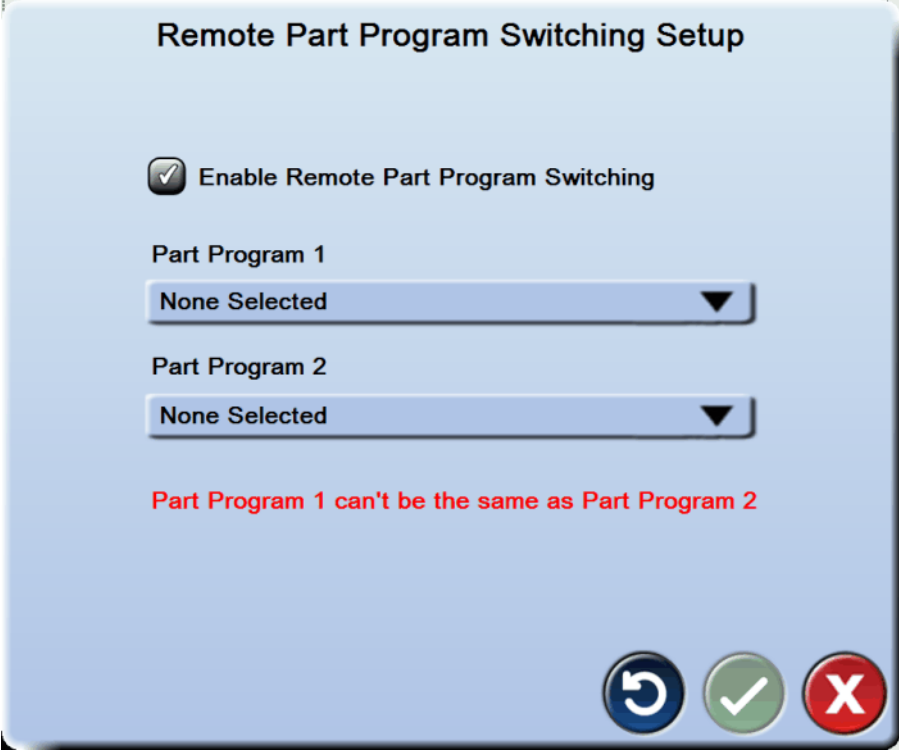
The Remote Part Program Switching function is used to select one of two part programs remotely through a PLC.

➤ **To use Remote Part Program Switching:**

- Your system must have an Extended I/O board connected to the tracker board for the lane on which you are using the function, and
- You must have user access permission to Manage Part Programs. See **Managing Permissions** (on page 55).
- You must have at least two part programs already configured

➤ **To use the Remote Part Program Switching menu:**

1. From Lane Overview or Sensor Overview mode, select the Tools  button > Lane Setup > Remote Part Program Switching. This item will be disabled if there is no Extended I/O board or if the system is online.



2. Enable the function by checking the Enable Remote Part Program Switching box.
3. Select Part Program 1 from the drop-down list available.
4. Select Part Program 2 (different from Part Program 1) from the drop-down list available.
5. Select the OK button to complete the selection and exit. The Remote Part Program Switching function is enabled.

Connect to the Extended I/O board. Reference these topics:

- **Extended I/O board** (on page 305)
- **Extended I/O signals** (on page 306)
- **Extended I/O circuits** (on page 310) (for information about how to connect your equipment to the board)

➤ **On the Extended I/O board, follow this sequence to select a part program:**

1. Set Input Port Strobe (J1-11) low.
2. Set Generic Input 0 (J1-3) and Generic Input 1 (J1-4) low.
3. Pulse Input Port Strobe high and then low. (This clears the input state.)
4. Set either Generic Input 0 or Generic Input 1 high.
5. Pulse Input Port Strobe high and then low. (This selects part program 1 if Generic Input 0 is high or part program 2 if Generic Input 1 is high.)

Timing considerations are as follows:

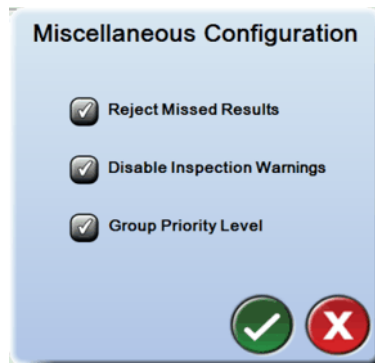
- Generic Input change to Pulse Input Port Strobe transition 10 microseconds minimum.
- Input Port Strobe high time 10 microseconds minimum.
- When the above sequence is performed, the system will go offline which brings System State (J4-16) low. The part program is changed and then the system is put back on line which sets the System State output high.
- The part selection sequence can be commanded when the system is offline. In this case, the part program is changed but the system does not go online automatically.

Miscellaneous Configuration

Enable or disable additional lane options.

➤ To get to this screen:

From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu > Lane Setup > Miscellaneous Configuration.



Reject Missed Results

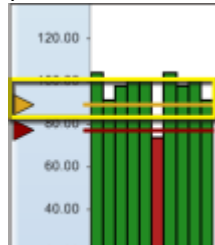
A missed result occurs if the system misses the inspection results of a part. This can happen if the inspection time is too long or if the system is too busy to process all the data before the part reaches the reject station.

Check this box if you want the system to reject parts from any missed results in the current Lane.

Disable Inspection Warnings

Inspections can have reject and/or warning limits. A warning allows you to perform maintenance or adjustments before the system starts rejecting parts.

The warning limits are represented by the yellow adjustable slider bar on the Retro-Spec graphs. If you do not wish to use warning limits, check the Disable Inspection Warnings box.



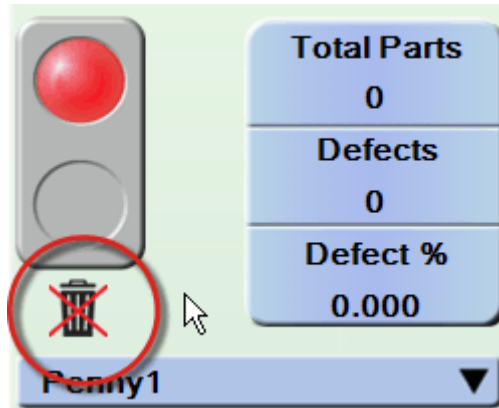
Group Priority Level

This feature allows you to assign a priority to each group within the Walk By graphic. You can designate which defects are more important and prioritize the reporting structure accordingly. See **Group Priority Level** (on page 64)

Rejector Enable/ Disable

Enable or disable the rejector at the Sensor level or at the Lane level.

- If one or more Sensors are checked, the reject device for all inspections performed by those Sensors is disabled.



- If all Sensors are checked, the reject device is disabled at the Lane level. An icon is displayed in the Lane window to indicate that the rejector is disabled.

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

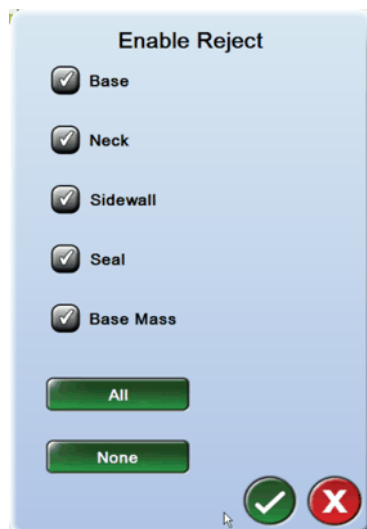
➤ **To enable or disable the rejector for one sensor only:**

1. Go to Sensor Overview mode.
2. Right-click over the desired sensor button to see the Sensor menu.
3. Click "Reject Enabled" to toggle it to "Reject Disabled" or vice versa. If Reject Enabled is displayed, the rejector is enabled.

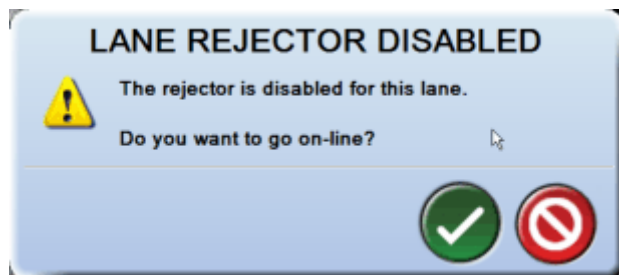
If you put the system online when the Sensor rejector is disabled, you will see a message stating "Sensor Rejector Disabled - Do you want to go online?"

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

1. From Lane Overview or Sensor Overview mode, click the Tools button  to go to the Tools menu.
2. From the Tools menu, click Lane Setup, then select Rejector Enable/ Disable.
3. Check or un-check the box next to the sensor(s) to enable or disable the rejector.
4. Click the OK button to apply the changes and exit the menu. The new setting is applied. If the rejector for all sensors within the lane is disabled, you will see the trash can icon near the statistics for that lane.



If you put the system online when the lane rejectors are disabled, you will see a message stating "Lane Rejector Disabled - Do you want to go online?"



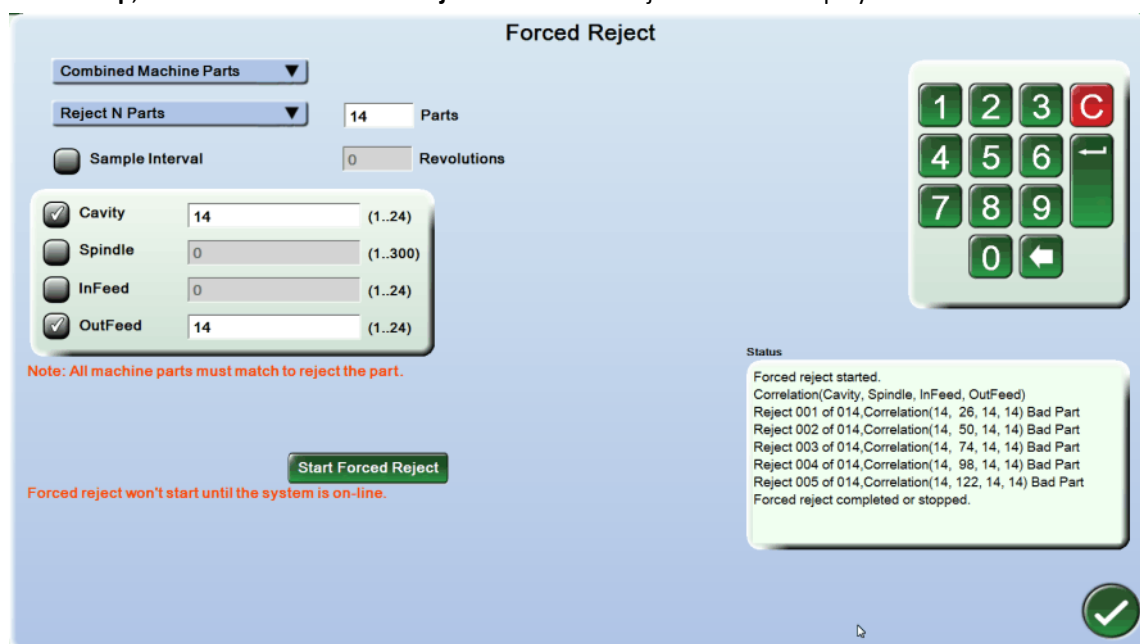
Forced Reject

The Forced Reject feature allows you to force any part to be rejected. The system will reject all parts associated with the checked components, regardless of the pass/fail condition of those parts. This provides a means of handling an emergency situation until repairs on a blow-molder or other machine can be made. If you know there is a serious problem with a particular component, you can use this method to ensure that no part from the defective machine component passes the inspection process.

❖ *Note: the correlation check boxes and machine parts are only displayed if your machine is using correlation.*

➤ To get to this menu:

From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu, then select **Lane Setup**, then select **Start Forced Reject**. The Forced Reject screen is displayed.



The different parts of the menu are as follows:

❖ *Note: The lane must be online to force rejects.*

Any Part/ Single Machine Part/ Combined Machine Parts (drop-down menu)

Any Part - The system will reject any part, regardless of correlation to a machine part.

Single Machine Part - Reject a part correlated to one type of machine part (example: cavity, or fill valve). The system displays a drop-down menu to select the desired machine part. Use the numeric keypad to enter the machine part number or series of machine part numbers.

Combined Machine Parts - All correlated machine parts are displayed (as in the example above). Check the boxes next to the desired machine parts. Use the numeric keypad to enter the desired machine part number.

❖ *Note: Combined Machine Parts is an AND function. The part must be correlated to each machine part and number entered. If there are no such parts, then no part will be rejected. In our example, if we typed Cavity 14 and Outfeed 17, no such part exists; therefore none would be rejected.*

Reject One Part/ Reject N Parts/ Continuous Reject (drop-down menu)

Reject one part, 'N' parts, or continuously reject from a specific machine part. To begin rejecting, click the **Start Forced Reject** button.

Reject One Part - rejects the next part that reaches the reject station, regardless of its inspection status. If you select Single or Combined Machine Parts in the above drop-down menu, the part must meet that criterion.

Reject N Parts - the numeric field next to this drop-down menu becomes active. Enter a number of parts you want to reject, regardless of their inspection status. If you select Single or Combined Machine Parts in the above drop-down menu, the part(s) must meet that criterion.

Continuous Reject - rejects all parts regardless of their inspection status, until you click the **Stop Forced Reject** button. If you select Single or Combined Machine Parts in the above drop-down menu, the part(s) must meet that criterion.

Sample Interval

Instead of rejecting every part specified with the Reject N Parts and Correlation menus, this option only rejects parts every n number of intervals. If you enter **3 Revolutions**, then the system will reject parts on every third revolution. If you select Single or Combined Machine Parts in the first drop-down menu, the part(s) must meet that criterion.

Cavity /spindle/ infeed/ outfeed

The names displayed in this section will correspond to the names of your machine part components. These are only shown if you select Single or Combined Machine Parts in the first drop-down menu.

Rejector

(Not shown in the above screen) Specify which rejector to force rejection of part. If you only have one rejector, then this button is not applicable.

Numeric Keypad

This is used to type values for numbers or series of rejected parts or correlation to machine parts.

Start Forced Reject/ Stop Forced Reject

When you click **Start Forced Reject**, the criteria specified in the menu are applied and the parts are rejected. Click the **Stop Forced Reject** button to stop the reject process. Note that if you only reject one part, or specify a number of parts, the button toggles back to **Start Forced Reject** automatically.

Status Box

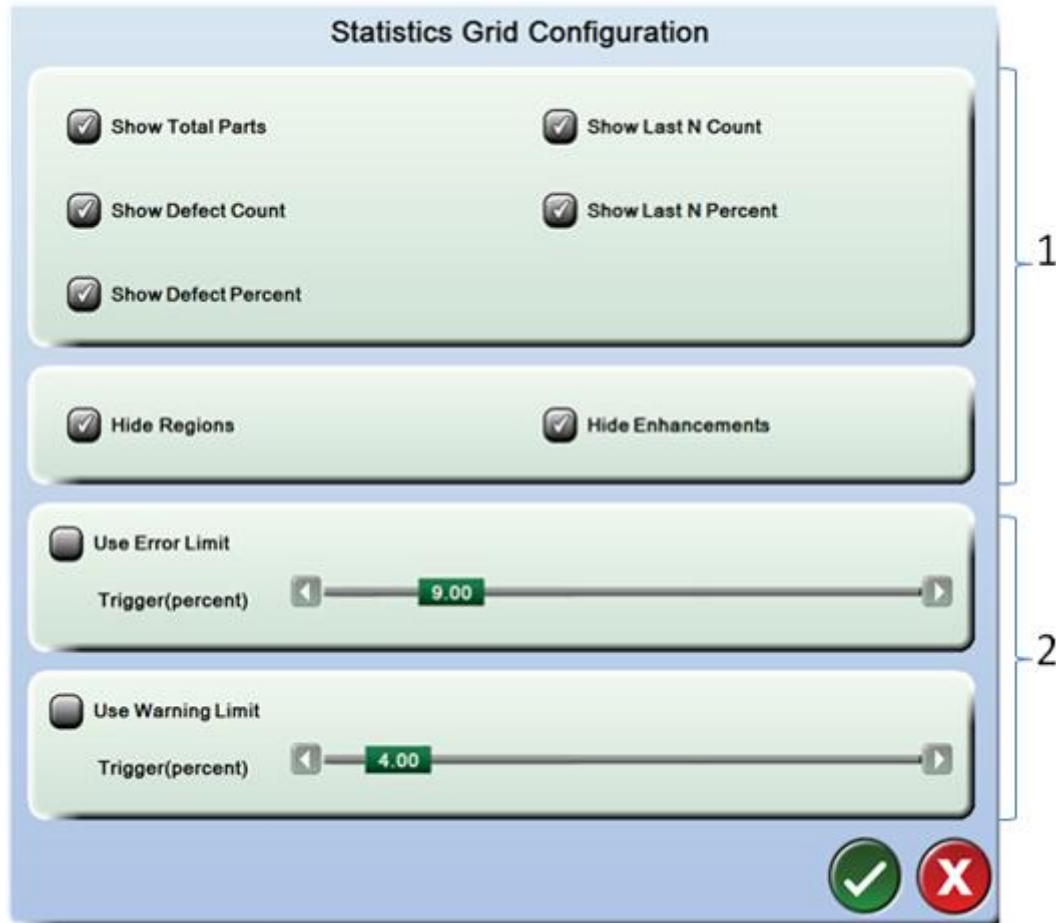
Displays information about the rejection process.

Statistics Grid Configuration

Choose how the statistics grids are displayed.

➤ **To get to this screen:**

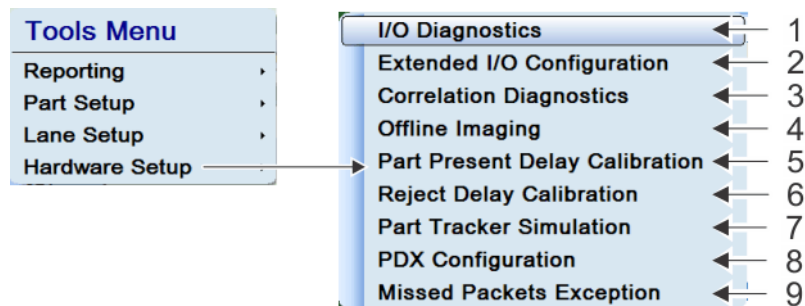
From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu, then select Lane Setup, then select Statistics Grid Configuration.



1	Checking these boxes determines what information is shown on the Statistics Grid screen.
2	These two slidebars allow you to enable/disable and determine the setting for warning and error limits applied to the Statistics Grid screen.

Hardware Setup

Some menu items are only available to advanced level users.



1	<i>I/O Diagnostics</i> (on page 121) - Verify the presence of input and output signals.
2	<i>Extended I/O Configuration</i> (on page 311) - Configure the optional Extended I/O board.

3	Correlation Diagnostics (on page 122) - Verify correlation signals.
4	Offline Imaging (on page 158) - Choose how the Intellispec acquires images when the lane is offline.
5	Part Present Delay Calibration (on page 123) - Calibrate the distance (in encoder pulses) from the part detect sensor to the camera centerline.
6	Reject Delay Calibration (on page 125) - Calibrate the distance (in encoder pulses) from the part detect sensor to the rejector.
7	Use part tracker simulation (on page 128) for troubleshooting or if a part detect sensor is bad. A simulated part rate would allow inspection to continue.
8	PDX Configuration (on page 128) - Set up the part detect generator. Only used in some applications.
9	Missed Packets Exception (on page 130) - Set the number of missed packets to trigger the part tracker to send a Lost Part Tracking message to the Intellispec.

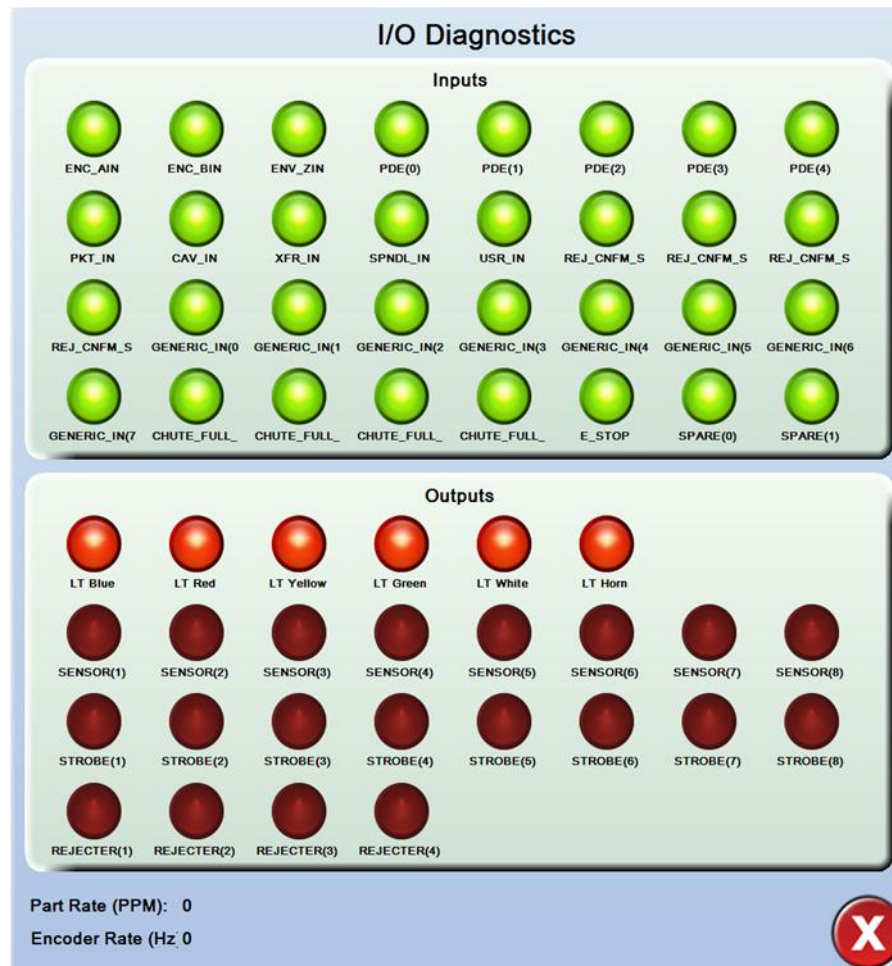
I/O Diagnostics

➤ To get to this screen:

From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu > Hardware Setup > I/O Diagnostics.

This screen can be used to verify the presence of input and output signals. Part rate and encoder rate are also displayed.

- Green lights are input signals (signals that originate outside the Intellispec and are communicated to the system). When an input is received the light is on.
- Red lights are output signals (signals that originate inside the Intellispec and are transmitted out of the system). When an output is generated the light is on. You can test an output signal by clicking on the appropriate light.



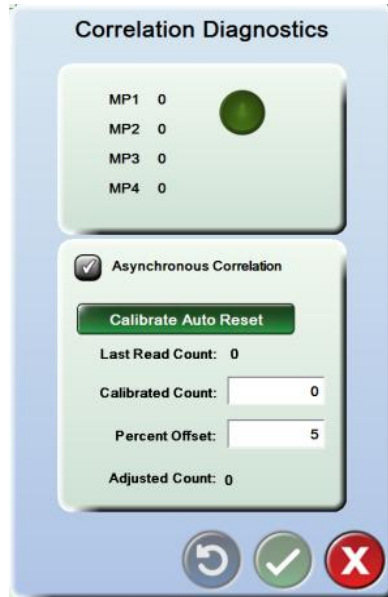
The outputs correspond to the hard-wired input and output signals throughout the Intellispec system.

Correlation Diagnostics

This is a troubleshooting tool to verify that correlation sensor information is being received by the Intellispec.

➤ **To get to this screen:**

From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu, then select Hardware Setup, then select Correlation Diagnostics.



For systems that have correlation sensors, this screen is used to verify that the correlation sensor information is being received by the system. It is a troubleshooting tool.

As the production unit is operating, if the correlation sensor is transmitting pulses, it will come up in the appropriate window. For example, if you have a cavity sensor attached to machine part one (MP1) and are running an 8-cavity blow molder, you will see MP1 increment from 1-8 repeatedly.

Make sure that each machine part (MP) increments according to the number of components in your system.

MP = Machine Part. MP1 through MP4 correspond to the correlation sensors that you have configured in the **Machine Part Correlation** (on page 109) screen.

Asynchronous Correlation is used in certain applications. For a description of how to use this feature and to set the parameters in the FHCP application, see:

Asynchronous Correlation FHCP 3X (on page 293), and **Asynchronous Correlation Software Setup FHCP 3X** (on page 294).

Part Present Delay Calibration

Part Present Delay is the distance (in encoder pulses) from the part detect sensor to the camera centerline. Two independent signals are generated: 1) light strobe and 2) camera snap.

❖ *Note: if your system is using a PDX, set up **PDX Configuration** (on page 128) before Part Present Delay.*

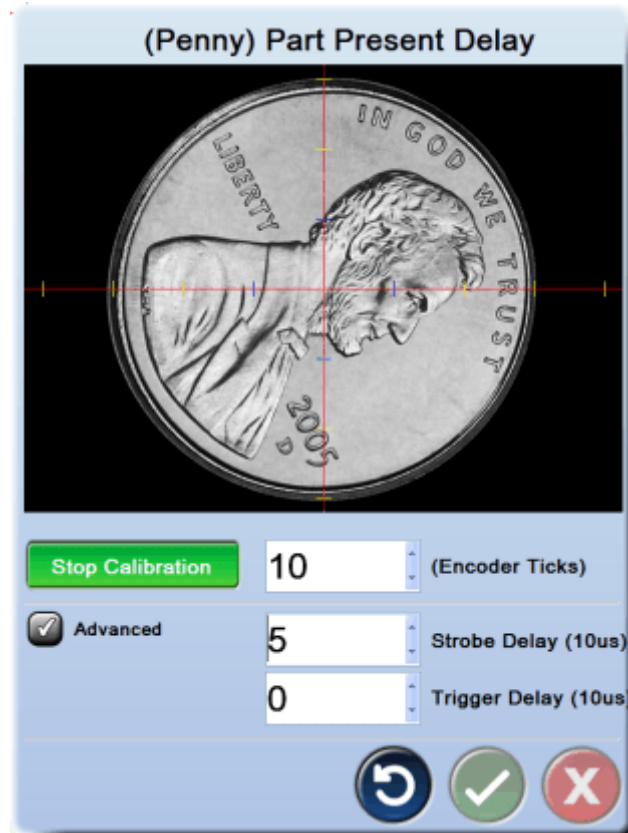
The Part Present Delay ensures that your part is in the center of the image when the camera snaps its picture. Depending on the orientation of your camera, your part could be moving from left to right, right to left, top to bottom or bottom to top as it travels through the camera's field of view. You need to be aware of the part flow direction in order to set up the Part Present Delay Calibration.

For an illustration of Part Present Delay within the inspection process, refer to the **Sequence of Events During Inspection** (on page 194).

Even if you are unsure what the Part Present Delay value should be, you can view the strobing of the lights to gauge whether the delay has been set too long or too short. When the Part Present Delay value has been set too short, the lights will strobe before the part reaches the camera; likewise when the delay is set too long, the lights will strobe after the part has passed the camera. When the part is close enough to be in the actual image that the camera acquires, you can use the image itself to center the part. A Part Present Delay calibration needs to be done for each camera in the system.

Calibration

When you calibrate the Part Present Delay, it is ideal to only use one part at a time. Otherwise, it will not be easy to determine if the part detected is actually the same part in the image or the part rejected (for Reject Delay) since all the parts look alike. If it is not possible to use only one part, an alternative is to use a different color part. You will most likely use a few parts to test the calibration, or run the same part through several times.



➤ To calibrate the Part Present Delay:

❖ *Note: you must be logged in with proper user access to calibrate the Part Present Delay.*

1. From the Sensor Overview mode, right-click on a sensor button to view the **sensor menu** (on page 155).
2. Select Part Tracking, then select Part Present Delay Calibration.
3. Click the **Start Calibration** button.
4. 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 pulses and take a picture.
5. Manually adjust the part present delay (encoder ticks) value until the image is centered every time a part is run through the system.
6. When completed, click the **Stop Calibration** button. The Part Present Delay calibration value is saved and stored in a Lane configuration file.

Advanced settings

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

Set a Base/Neck configuration as follows:

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

Also check **Advanced adjust lighting - set delay** (on page 164) to make sure that the Neck lighting delays are set correctly.

Reject Delay Calibration

Reject Delay is the distance (in encoder pulses) from the part detect sensor to the rejector. This signal ensures that the correct part is rejected.

During Reject Delay calibration, the reject device will activate for each part that flows through the system. Ensure that the rejector is activated properly and that each part is rejected properly. After calibration, ensure that adjacent parts are not being rejected (example, from too long a reject dwell time), nor being knocked off by the rejected part.

For an illustration of the Reject Time Delay within the inspection process, refer to the **Sequence of Events During Inspection** (on page 194).

➤ **To calibrate the Reject Delay:**

❖ *Note: you must be logged in with proper user access to calibrate the Reject Delay.*

1. From the Sensor Overview mode, right-click on a sensor button to view the **sensor menu** (on page 155).
2. Select Part Tracking, then select Reject Delay Calibration.
3. Click the **Start Calibration** button.
4. Place a part on the running conveyor or into the part stream. After the number of encoder pulses shown in the Reject Delay box, the rejector will be activated.
5. Make sure the correct part was rejected.
6. Continue to insert parts into the part stream.
7. Manually adjust the reject delay (encoder ticks) until the correct part is rejected every time.
8. Adjust the 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.
9. When completed, click the **Stop Calibration** button. The Reject values are saved and stored in a Lane configuration file.

Reject Dwell

The duration of the reject signal. Dwell can be set by encoder ticks or by milliseconds. Select the correct button for your application. 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

Adaptive Reject (optional) (on page 126)

Adaptive Reject (optional)

This feature is used to compensate for the reject device's turn-on time delay with varying speeds of machine operation. An example where this is used is on a Belvac machine. The turn-on time of the reject device might be over one-half of a can width at high machine speeds. The Adaptive Reject will delay the activation of the reject device as a function of encoder speed. As the belt (or production line) slows down, more delay is added.

If you do not know the fastest conveyor or production speed when you are setting Reject Delay, you could calibrate the Reject Delay again when you run a different part at a different production speed. Adaptive Reject allows for different speeds without having to recalibrate between part types.

➤ For best results when using Adaptive Reject:

- Calibrate the Reject Delay and Reject Dwell at the fastest possible conveyor or production line speed **prior to enabling the Adaptive Reject function**. Then use a value of 0 - 10 for Diff. from Calibration (%) (see more information about Diff. from Calibration % below)
- Calibrate the Reject Delay when the conveyor or production line is running at a constant speed -- not during a startup or stopping

❖ *Note: Adaptive Reject will not function properly if the reject device delay is greater than the spacing between parts.*

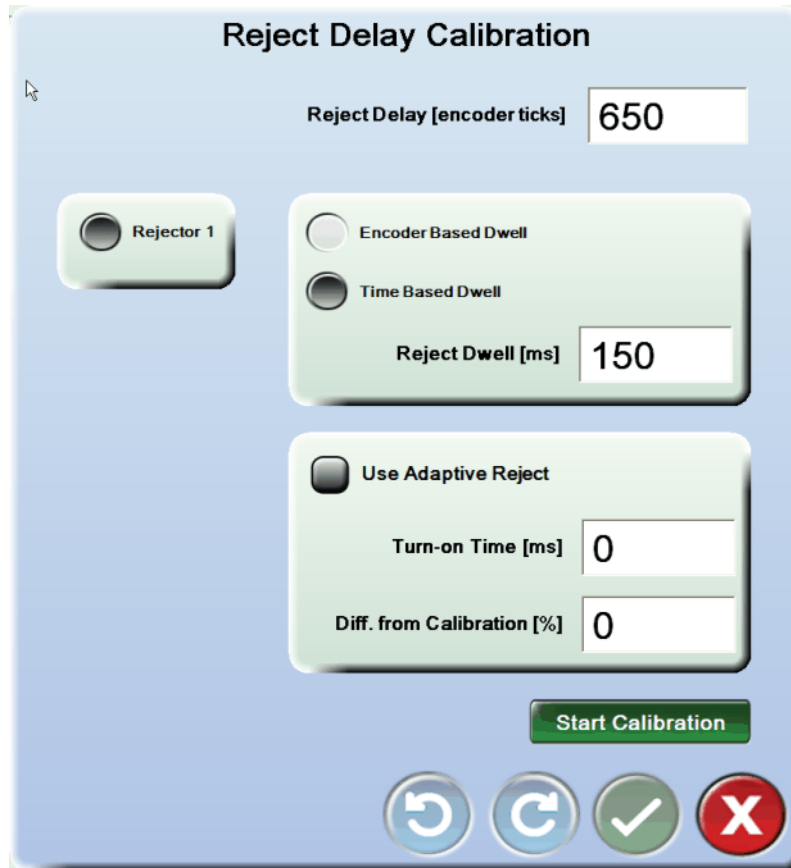
➤ Before calibrating Adaptive Reject:

1. If you have not done so already, calibrate Reject Delay and Dwell. See **Reject Delay Calibration** (on page 125) for more information.
2. Write down or make note of the Reject Dwell value after Reject Delay calibration. You will need to temporarily change this during Adaptive Reject calibration.

➤ To calibrate Adaptive Reject:

1. Click the check box next to Use Adaptive Reject in the **Reject Delay Calibration** (on page 125) menu to enable the feature.
2. Set Reject Dwell to zero during the Adaptive Reject calibration process.
3. Run the conveyor or production line at the fastest speed that you will use, and click the **Start Calibration** button.

4. Let the conveyor or production line run for about 20 seconds. The part tracker will record the maximum encoder frequency. It will use this number to determine the amount of delay to be applied to the rejector at all other encoder frequencies.
5. Click the **Stop Calibration** button.
6. Set the Reject Dwell back to the value originally calibrated during Reject Delay calibration (the number you noted *before calibrating Adaptive Reject*).
7. Enter the Turn On time of the reject device installed in your system.
8. Enter a value for Diff. from Calibration %, if applicable. See more information below.
9. Click the OK button  to save changes and exit the Reject Delay Calibration menu.



The image shows a software interface titled "Reject Delay Calibration". At the top, there is a label "Reject Delay [encoder ticks]" followed by a text input field containing the value "650". Below this, on the left, is a button labeled "Rejector 1" with a circular icon. To the right of this button are two radio button options: "Encoder Based Dwell" (which is selected) and "Time Based Dwell". Below these radio buttons is a label "Reject Dwell [ms]" followed by a text input field containing the value "150". Further down, there is a checkbox labeled "Use Adaptive Reject" which is currently unchecked. Below the checkbox are two more text input fields: "Turn-on Time [ms]" with the value "0" and "Diff. from Calibration [%]" with the value "0". At the bottom right of the main configuration area is a green button labeled "Start Calibration". At the very bottom of the screen are four circular icons: a blue circular arrow (refresh), a blue circular arrow (undo), a green checkmark (OK), and a red X (cancel).

The settings for Adaptive Reject are as follows.

Turn On Time

Latency of the rejector mechanism in milliseconds.

Diff(ERENCE) from Calibration (%)

This number is used if the maximum speed of the conveyor or production line is greater than the speed at which the Reject Delay was calibrated. For example, if you calibrated the conveyor for one part where the conveyor runs at a slower speed, and know that you will run the conveyor 20% faster for another part, then enter 20 for Diff. from Calibration.

The ideal setting is zero. However, a value of approximately 10 is acceptable, to allow for speed fluctuations due to power surges.

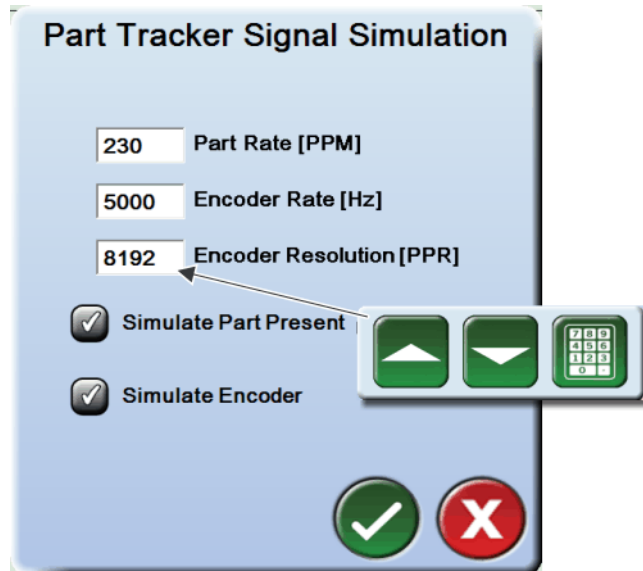
❖ *Note: this value only applies to potential speeds greater than calibration speeds, not slower speeds.*

Part Tracker Simulation

Use **part tracker simulation** (on page 128) for troubleshooting or if a part detect sensor is bad. A simulated part rate would allow inspection to continue.

➤ To get to this screen:

From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu, then select Hardware Setup, then select Part Tracker Simulation.



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

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

Encoder Rate and **Resolution** - Enter the simulated encoder properties.

❖ *Note: the system cannot run in both **PDX** (see "**PDX Configuration**" on page 128) mode and **Part Tracker Simulation** (on page 128) 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.*

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** (see "**PDX Configuration**" on page 128) mode and **Part Tracker Simulation** (on page 128) 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:**

1. From the Lane Overview or Sensor Overview screen, click the Tools button  to see the Tools menu.
2. Select Hardware Setup, then select PDX configuration. The parameters are described below:

Enable PDX

Enables the PDX circuit.

Enable PDX-Generated Pocket

- If your system is using a physical pocket disk with an index pin, leave this box un-checked.
- 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.

Reverse Encoder

Reverses the direction of the encoder pulses. Instead of the normal A, B sequence of pulses, the pulses switch to B, A.

Encoder Resolution (Pulses Per Rev)

Enter the resolution of the encoder installed on your machine.

Number of Parts Per Revolution

Enter the number of machine parts (example, number of Transfer Arms) to which the encoder is attached.

➤ **To configure the PDX:**

1. Click 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. Click the OK button  to accept changes and exit.

Missed Packets Exception

For each part and for each camera, two packets of information are communicated:

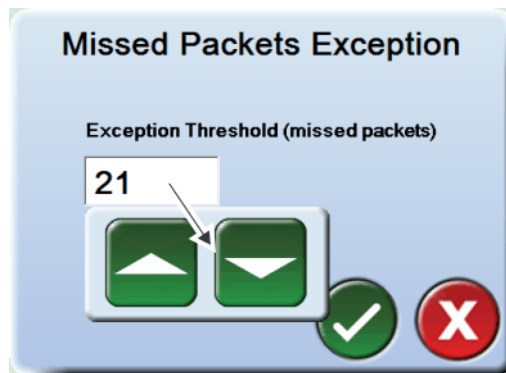
- The part tracker sends the host PC a signal stating the camera has been triggered (correlation signal)
- The host PC then sends a pass/fail signal back to the tracker (results signal) when the inspections are done

A missed packet exception occurs when the part tracker has sent out X number of correlation signals without receiving any results signals back from the PC. The default is set at 6.

When this number has been met a **Lost Part Tracking** input is received on the **Sensor Missed Statistics** (on page 104) screen.

➤ **To get to this screen:**

From the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu, then select Hardware Setup, then select Missed Packets Exception.



Set the number of missed packets to trigger the part tracker to send a Lost Part Tracking message to the Intellispec.

Reject Confirm Calibration (Optional)

Reject Confirm can detect missed rejects. Coupled with the **Missed Reject Alarm** (see "**Lane Alarms Description**" on page 91), Reject Confirm will reliably detect and notify you of any missed reject condition.

❖ *Note: Reject Confirm is an optional feature, and an additional sensor must be installed at your site.*

Reject Confirm uses a part detect sensor positioned at a calibrated and defined distance (Reject Confirm Delay) past the normal reject mechanism to determine whether the defective part was actually rejected. Reject Confirm Delay must be a value of 1024 or less.

After the rejector fires (meaning the reject delay for a part has passed), the Reject Confirm Delay starts. Once the Reject Confirm Delay has passed, the system examines the reject confirm sensor for a period of time equal to the Part Width. If the reject confirm sensor "sees" a part within that time, it means that the reject was missed. If the reject confirm sensor does not see a part, it means the part was rejected successfully.

If the reject was missed, the Missed Reject Alarm will be triggered. However, the **Missed Reject Alarm** (see "**Lane Alarms Description**" on page 91) must first be enabled and configured.

Below is a timing diagram of the Reject Confirm process.



1	Reject Delay (see " Reject Delay Calibration " on page 125)
2	Reject Dwell (see " Reject Delay Calibration " on page 125)
3	Reject Confirm Delay, set by Reject Confirm Calibration
4	Part Width (see " Part Width Calibration " on page 106)
5	Part Detect (PD) - where the part is first detected by the sensor
6	Image Acquired - image is taken, inspection is performed
7	Rejecter Station - standard rejection point
8	Reject Confirm - second part sensor to determine whether a defective part was rejected

➤ **To set up Reject Confirm Calibration:**

1 - Enable the Missed Reject alarm

Go to the **Lane Alarm Configuration** (on page 88) to enable the alarm.

2 - Calibrate Standard Reject Delay

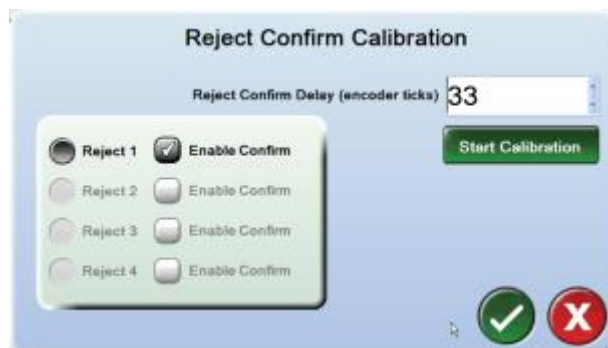
Calibrate the standard **reject delay** (see "**Reject Delay Calibration**" on page 125) using normal procedures.

3 - Set up Reject Confirm

Mount the Reject Confirm sensor at "X" distance beyond the rejector where "X" is distance in encoder ticks. For example, if there are 70 encoder pulses per inch, and the sensor is mounted five inches beyond the rejector, the Reject Confirm Delay would be set to 350.

❖ *Note: The maximum setting for Reject Confirm Delay is 1024. Mount the Reject Confirm sensor within that range of encoder ticks.*

When the Reject Confirm sensor sees a part that is not supposed to be there, it triggers the Missed Reject alarm.



➤ **To calibrate Reject Confirm:**

1. From the Sensor Overview mode, right-click on a sensor button to view the **sensor menu** (on page 155).
2. Select Part Tracking, then select Reject Confirm Calibration.
3. Enable Reject Confirm.
4. Click 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, click the **Stop Calibration** button. The system will determine the number of encoder pulses from the part detect sensor to the reject confirm sensor.

Reject Confirm Delay is computed. Reject Confirm Delay = (number of pulses from Part Detect to Reject Confirm Sensor) minus Reject Delay.

Chapter 10

Software Utilities

This section includes various software utilities that assist with Windows settings, help and support from Pressco, and sensor configuration.

Go Online at Startup

Use this option to have the Intellispec system go online to inspect when you start the software (or reboot the computer). This saves the extra step of putting each lane online, and it automatically puts the system into inspection mode if power is lost and the computer reboots as a result.

➤ *To use this option:*

1. Click the Home button to go to System Overview mode.
2. Click the Tools button to see the tools menu, then select System > Go Online at Startup. A check mark is displayed next to the menu item when this is enabled.

➤ *To disable this option:*

1. Click the Home button to go to System Overview mode.
2. Click the Tools button to see the tools menu, then select System > Go Online at Startup. The check mark is removed when this option is disabled.

Adjusting Date and Time

Adjust the date and time for the Intellispec system. The Windows operating system time is also changed.

➤ *To adjust date and time:*

1. Go to System Overview mode by clicking the Home button .
2. Click the Tools button  to see the Tools menu.
3. Select System > Set Date and Time. The System Date and Time menu is displayed.



4. Choose your time zone from the drop-down menu.
5. Enable the check box to automatically adjust for daylight savings time if applicable.

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

Setting up a printer

Configure a USB or networked printer to print Intellispec reports. The driver for the printer must be set up by an Administrator that has access to Windows.

➤ **To set up a printer:**

1. Go to System Overview mode by clicking the Home button .
2. Click the Tools button  to see the Tools menu.
3. Select System, then select Setup Printer. The printer configuration screen is displayed.



4. Select the printer to configure from the drop-down menu. The Intellispec system recognizes printers through the Windows drivers.
5. To test the printer, click the **Print Test Page** button. A basic "Intellispec Test Page" message is printed.
6. Click the OK button  to save changes and exit. The printer will be ready to use.

Creating a Support Package

A support package is a set of files that is gathered by the Intellispec system to help determine system problems. You will send this package to Pressco service specialists so that they can troubleshoot your system.

❖ *Note: A Support Package does NOT contain images. You may be asked to send images with the support package for the most effective troubleshooting. At least one image per camera is desired. See **Saving Images** (on page 174).*

➤ **What you need:**

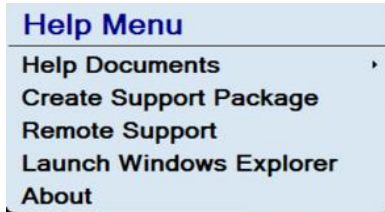
- **Mechanical keyboard (MKB)** (on page 33) to enter problem description
- USB flash drive (128MB or larger)
- If a Pressco Support representative sent you a ".pcf" file to acquire additional system information, then copy that file to the USB drive prior to connecting it to the Intellispec system

➤ **To set up for the support package procedure:**

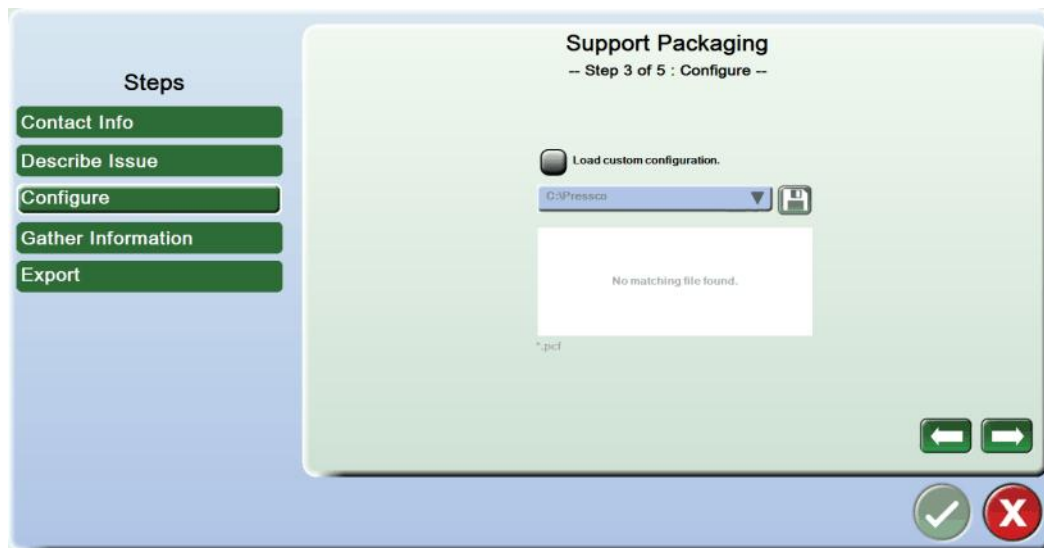
- Connect the mechanical keyboard (MKB) to the convenience **USB port** (see "**FHCP 3X User Interface Hardware**" on page 268) on the side of the user interface.

➤ **To create the support package:**

1. Click the Help button  at the top of the screen. The help menu is displayed.



2. Select the Create Support Package option. The support package wizard is displayed.
3. Follow the instructions on screen.
4. Use the forward arrows  to move to the next screens.
5. When asked to describe the problem, use the mechanical keyboard to enter information.
6. Optional: At Step 3: Configure, check the Custom Configuration box. A .pcf file is custom Pressco configuration file that gathers additional information (beyond the standard Support Package) from your system. A Pressco Support representative will send you a .pcf file to load before you run the Support Package option.



- a) If a Pressco Support representative sent you a .pcf file to acquire additional system information, then connect the USB device that contains the .pcf file.
- b) Click the disk icon  and browse to the location (usually your USB drive) where the .pcf file is stored. The system locates the .pcf file.

- When the steps are completed, verify that the Step 5: Export screen is displayed.



- Select the USB Flash Drive in the "Copy to:" location. You may need to remove the mechanical keyboard and then insert a USB flash drive into the USB port.
- Click the Copy button. The support package files are copied to the USB flash drive, then a "Copy Succeeded" message is displayed.



- Click the OK button  to continue.
- Click the OK button  at the bottom of the Support Packaging screen to exit.
- Remove the USB flash drive.
- Remove the mechanical keyboard (MKB).
- Send the support package files to Pressco.

➤ **To send the files to Pressco:**

- Copy the files that were saved, including images, from the USB drive to your computer.
- Send an e-mail to techsupport@pressco.com (<mailto:techsupport@pressco.com>) and attach the support package files. Pressco service/ tech support will respond within one business day, if possible.

Help - Remote Support

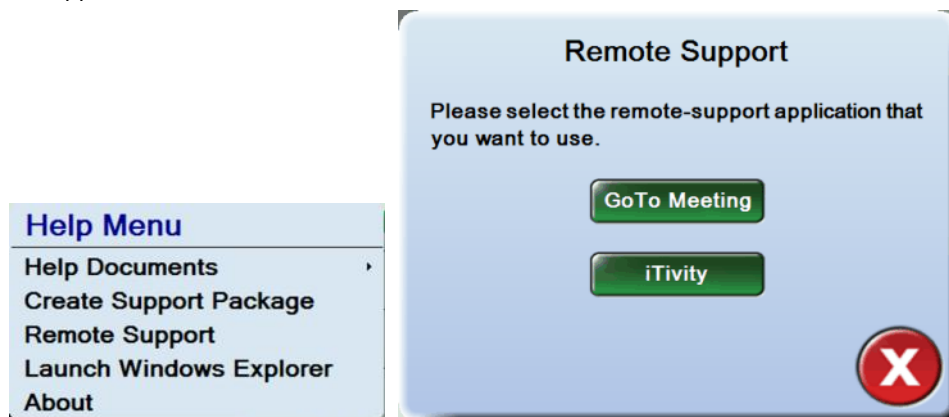
Remote Support is used to allow remote access to the Intellispec software. iTivity software is the method used by Pressco to provide remote system support if a Maintenance Agreement is purchased for that Intellispec system. With this software Pressco can log in and operate the Intellispec remotely.

➤ **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:**

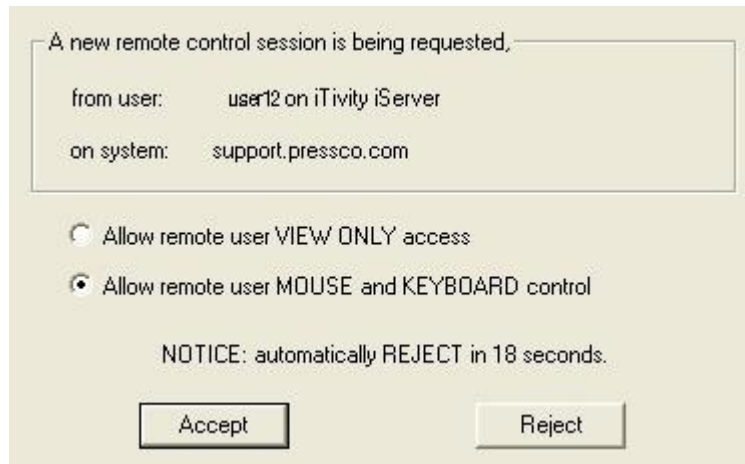
1. Notify a **Technical Support** (see "**How to Contact Pressco**" on page 357) representative that you require remote support. You will need to identify yourself, your location, and the Intellispec to which he should connect.
2. In the Intellispec software, Click the Help button . From the Help menu, select Remote Support.



3. Select the **iTivity** button. If the 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.



- 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 click Accept. The Tech Support representative will now perform the necessary troubleshooting of your system.



- 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:**

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



- Note: if you click 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, click the  button.



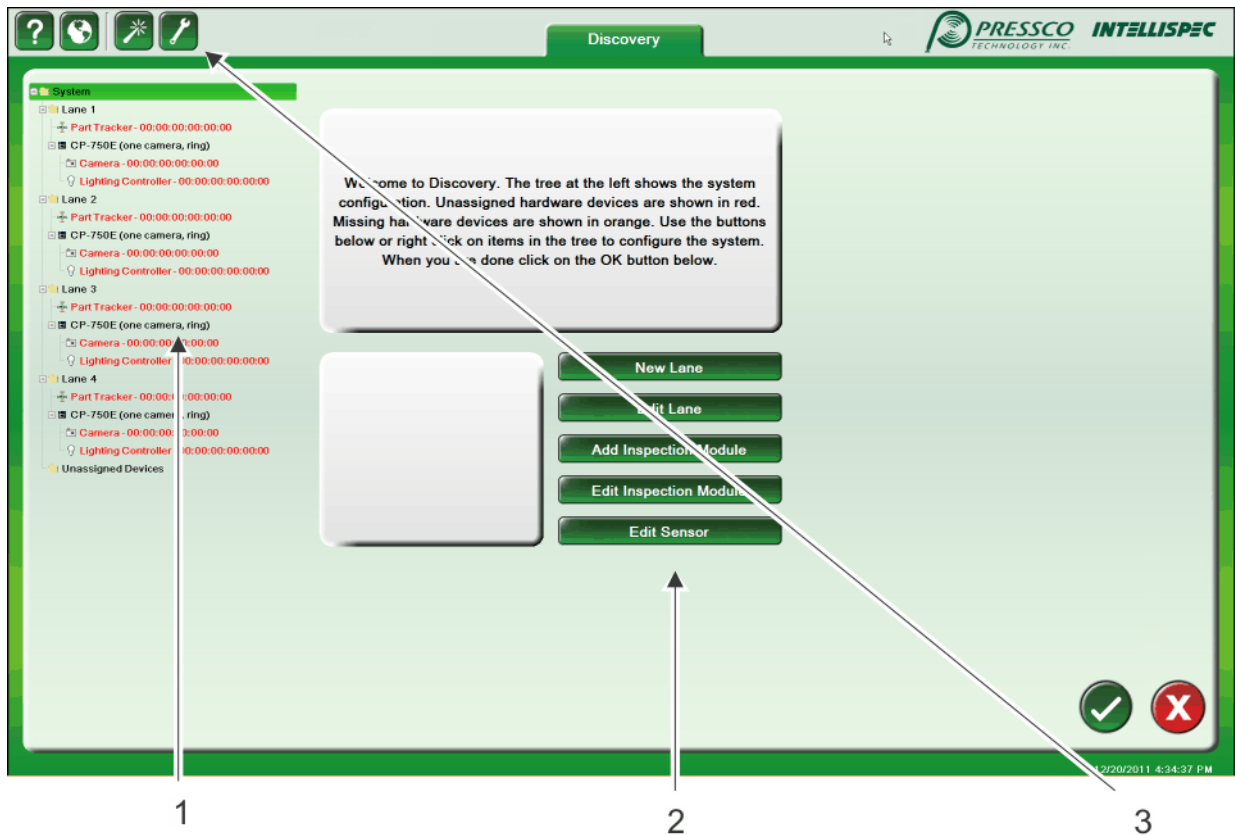
Discovery Software - What is Discovery?

Discovery is software installed on the Intellispec hard drive that automatically looks for and identifies certain components installed on each lane. Specifically, the software identifies any 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.*

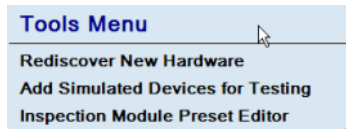
Additionally, during system startup, if a previously configured component fails to communicate with the Intellispec software, the discovery software screen will automatically appear on the user interface, alerting you to the problem.

Discovery software screen



1	The tree on the left side of the screen shows the system configuration including the lanes in the name and MAC address of each component in that lane. ▪ Unassigned hardware devices are shown in red ▪ Missing hardware devices are shown in orange
2	This menu allows you to perform specific actions, such as add or edit lanes or sensors, by clicking on the designated button.
3	The Discovery menu toolbar (on page 140) allows you to perform additional actions.

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 - lists 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.

Discovery - access and use

- The initial configuration of all hardware devices will be performed by the Pressco installer, and it is not anticipated that plant personnel will normally need to use Discovery software.
- The Discovery screen is automatically displayed during system startup anytime a hardware device that was previously configured is not communicating with the Intellispec software.
- If you need to run the Discovery screen manually, you must log in as an Administrator, shut down the Intellispec software, and run the Discovery program from Windows
- An **example** of a situation where plant personnel may use the Discovery software and actions to be taken is described next:
 - During system startup camera does not communicate with the Intellispec software
 - The Discovery screen sees this as a missing piece of hardware and automatically displays the Discovery screen. The configuration tree shows the camera in the expected location but displayed in orange, indicating that hardware device is missing.
 - As a first step you should open the tools menu icon and select "Rediscover New Hardware." This will trigger the software to search for the missing camera.
 - If the camera re-establishes communication, as seen by the camera name changing to black, you can close the discovery software and resume normal operation.
 - If the camera does not re-establish communication this indicates a hardware problem and the camera will most likely need to be replaced.

Favorites Menu

Access the Favorites menu from System Overview, Lane Overview, or Sensor Overview menu. Click the Favorites button  from the toolbar to see the menu.

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

Favorites Menu

Take Screen Shot

No Background Task Active

This menu allows you to access the following utilities:

Take Screen Shot (on page 141)

Manage **Background Tasks** (on page 141)

Take Screen Shot

This utility allows you to capture an Intellispec screen image. This is different from saving individual part images through the **Save Image** (see "**Saving Images Through the Sensor Menu**" on page 174) function. A screen shot is useful to illustrate a problem to technical support, or to capture settings for future setup.

➤ To capture the current full Intellispec screen:

1. Click the Favorites button  to access the Favorites menu.
2. Select the Take Screen Shot option. An onscreen keyboard is displayed with a default image name.
3. Re-name the screen shot if desired.
4. Click OK to save the image. The image is saved as a Portable Network Graphic (.png) file to C:\Pressco\DataExport\ScreenShots.

Background Tasks

You can control the Intellispec system's background tasks. If you are saving or copying several images, especially to a USB device, this process is slow. Therefore the Intellispec considers it a background task. The system will continue to inspect and perform regular tasks in the foreground. You may stop or remove certain background tasks if desired.

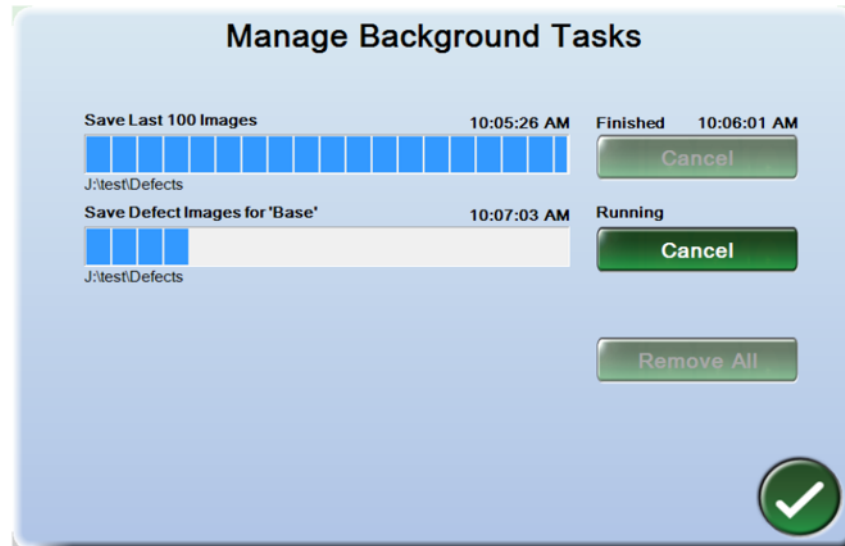
Background task management is found under the Favorites icon (except in System Overview mode). You may see different icons depending on whether the system is performing background tasks.

1		Normal. No background tasks in use.
2		One or more background task is running. None is complete.
3		One or more background task is running. At least one is complete.
4		All background tasks are complete. This icon will appear on screen until you "Remove All" tasks from the system using the Manage Background Tasks menu.

When at least one background task is active, the Manage Background Tasks menu item becomes active in the Favorites menu. Click either icon [item 2 or 3 above] to access the menu.



Select the Manage Background Tasks option from the Favorites menu to cancel or remove one or more tasks. Removing a task gets rid of all information about the task.



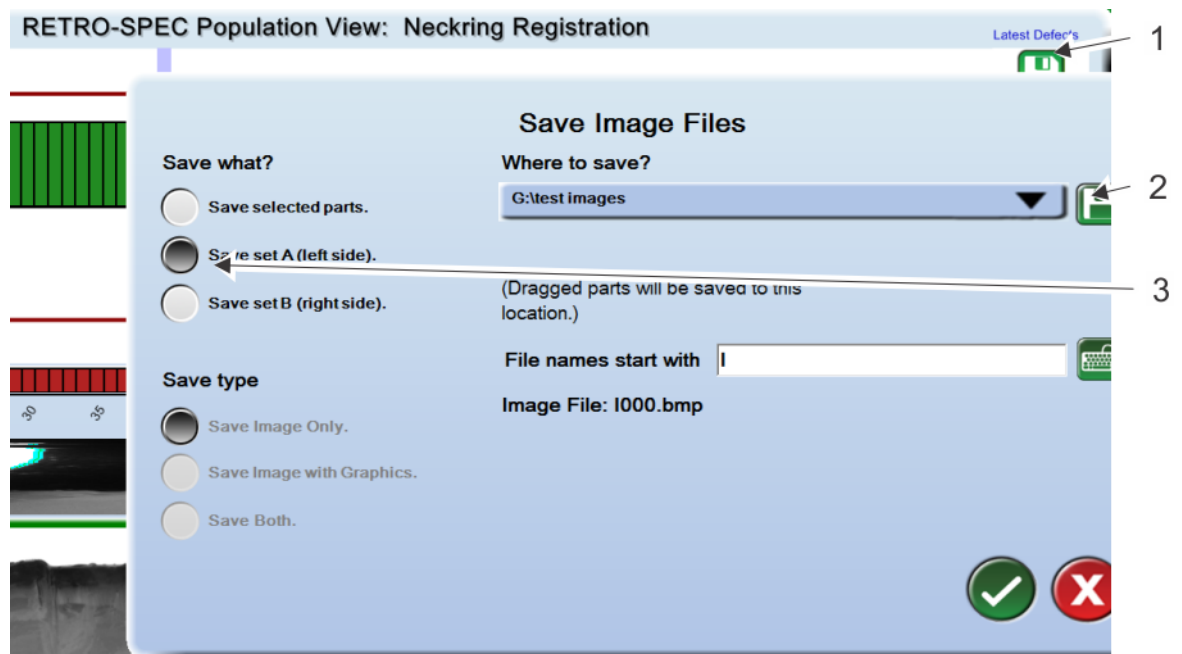
Notes:

- Each lane maintains its own list of background tasks. If you start a task on Lane 1, you must manage the task from Lane 1.
- You will not be able to close the dialog box until the task is complete or canceled. This prevents errors from occurring in the system.

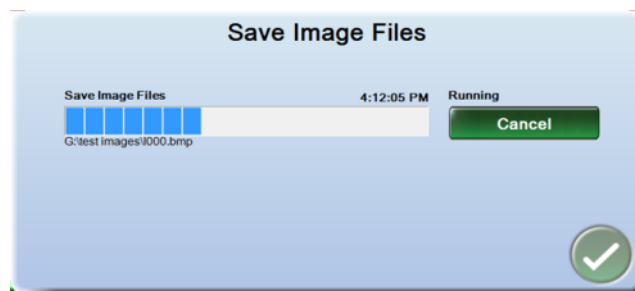
Saving images to USB using the Retro-Spec interface

When you are editing an inspection, you might save image sets to a USB device. This is not a background task, and you will not be able to perform other tasks while saving the images. However, you can cancel the task if necessary (see menu shown below). You will not be able to close the dialog box until the task is complete. This prevents errors from occurring in the system.

The sequence to save the images is (see illustration below): 1 - click the Save button. 2 - Choose the USB device. 3 - Save a data set (A or B). For more information about this menu see ***Saving Images through the Retro-Spec interface*** (on page 177).



You may cancel the task if necessary.



Chapter 11

Lighting and Images

This section includes information about:

Freeze on Defect (on page 145)

Reject Images (on page 151)

Image Magnifier (on page 154)

Sensor menu (on page 155) options

Image Analysis (on page 158)

Basic Adjust Lighting (on page 162)

Advanced Adjust Lighting (on page 162)

SmartCAL (on page 166)

PDL files (see "***Manage Simulated Lane Images (PDL)***" on page 169)

Saving Images (on page 174)

Loading Images (see "***Loading Saved Images***" on page 187)

Image Options (on page 189)

Freeze on Defect

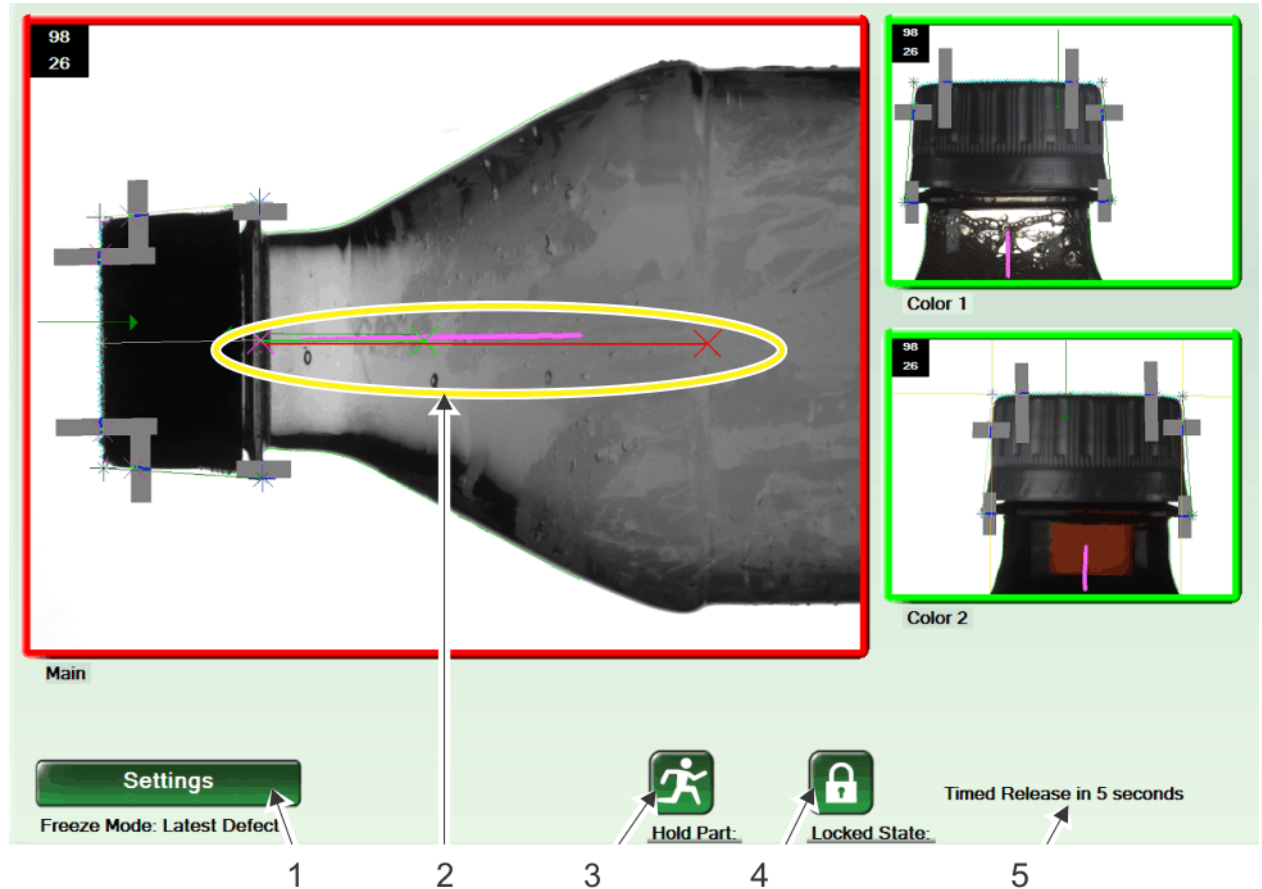


This feature automatically freezes an image on the screen when a lane is online. The frozen image depends on your chosen criteria. Freeze on Defect is available from Lane Overview or Sensor Overview screens, and appears slightly different from each mode. Click the **Freeze on Defect** button from the right side of the screen to see the image(s).

➤ **To use Freeze on Defect:**

- Select any part image (while in Freeze on Defect mode) to display it as the large image, if you entered Freeze on Defect from Lane Overview mode. If you entered Freeze on Defect from Sensor Overview, then only that sensor's image is displayed.
- Select the Hold Part button  to freeze all current images on screen. The Hold Part button  is displayed in red to indicate that an image is held. The lock button  shows a locked status. Select the lock button to release images. The button shows an unlocked status  when the images are released.
- Right-click over any image to use the **Freeze on Defect Options menu** (on page 149)
- Select the **Settings** button to use the **Freeze on Defect Setup menu** (on page 147)

The screen below is an example of Freeze on Defect images in Lane Overview mode. This lane has three sensors, and therefore three images.



1	Select Settings to go to Freeze on Defect Setup menu (on page 147)
2	Graphics displayed on the images are optional
3	Select this button to manually hold an image
4	Select this button to release an image
5	This information is displayed when the optional Timed Release feature is used

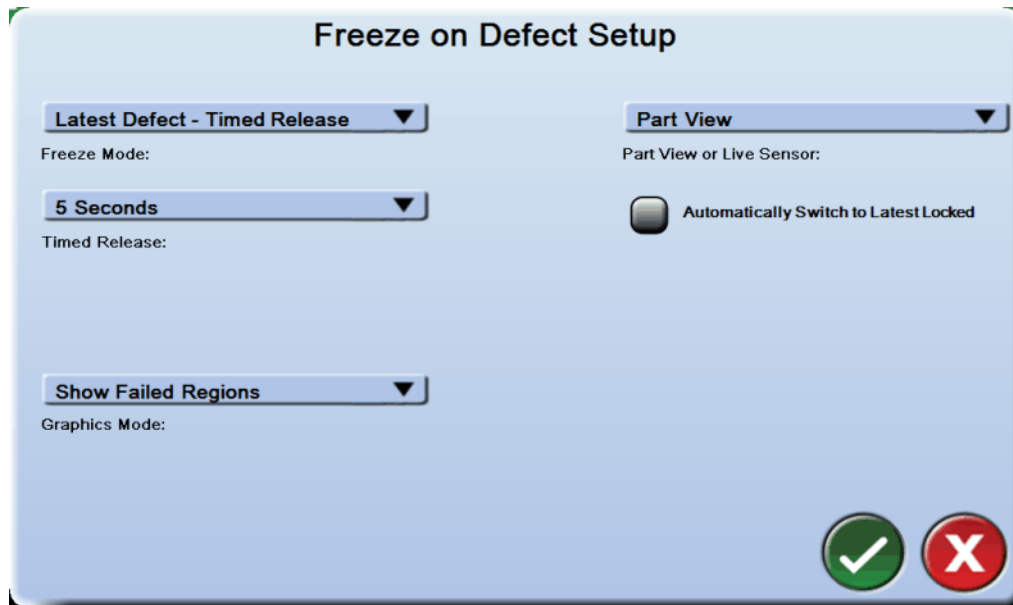
➤ **To exit Freeze on Defect:**

- Select another button on the right side of the screen (example: Trend Graphs). OR:
- Right-click over one of the images. Select **Navigate to Sensor View** from the Freeze on Defect Options menu. The Sensor Overview mode is displayed. The sensor displayed depends on which image you right-clicked over to see the **Freeze on Defect Options menu** (on page 149).

Freeze on Defect Setup menu



Click the **Settings** button from Freeze on Defect mode to enter the setup menu. This menu will display different options depending on what you select for Freeze Mode, and whether you entered from Sensor Overview or Lane Overview mode.



Freeze Mode

Disabled

If you choose Disabled, the system will not automatically hold an image. Part images will be updated on the screen continuously, except if you select the Hold Part  button.

Latest Defect

The system freezes the image of the last part to be rejected. Each subsequent part that fails will have its image frozen on the screen until another part fails.

Latest Defect - Timed Release

Holds the last defective image for up to the specified number of seconds (set by **Timed Release** criteria). For example, if Timed Release = 10 seconds, the last defective image will stay on screen for 10 seconds if no other defects occur during that time. However, if another defect occurs during those 10 seconds, its image is displayed on screen and the Timed Release countdown resets. The countdown is displayed in the lower right area of the Freeze on Defect screen.

First Defect

The system freezes the image of the first defective part after going online. The image remains on screen until you release it (select the  button) or change Freeze Mode.

First Good

The system freezes the image of the first good part after going online. The image remains on screen until you release it (select the  button) or change Freeze Mode.

Machine Part

The system freezes the next part image correlated to the selected machine part. It remains on screen until the next image correlated to the machine part becomes available and is replaced by the new image.

Use the Select Machine Part button

Select Machine Part

to choose the desired machine part.

Machine Part - Timed Release

The system freezes the next part image correlated to the selected machine part. It remains on screen for the specified time, or until the next image correlated to the machine part becomes available, whichever comes first. Use the **Timed Release** settings to set the desired display time.

Timed Release

Set the desired display time. A countdown is displayed in the lower right corner of the Freeze on Defect screen (or in the upper right corner of the image if using Live Sensor mode in Freeze on Defect). When the time expires, a new sensor image is displayed.

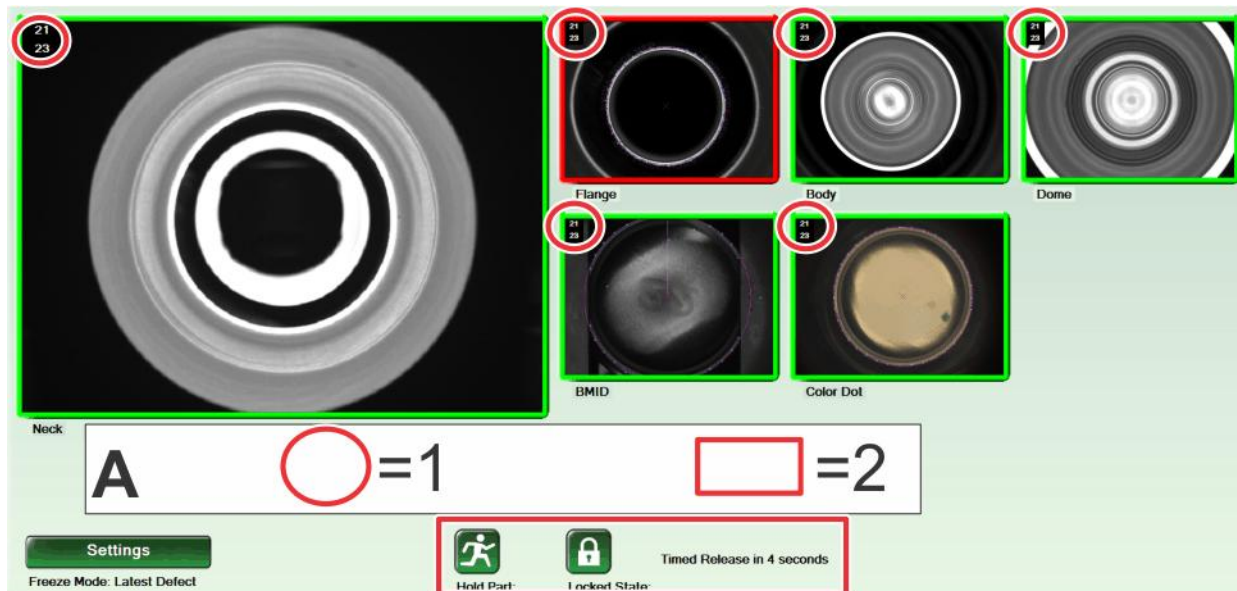
Graphics Mode

As of this publication, the only mode that works correctly is Show No Graphics. In the other modes, you will see graphics, but they may not be the graphics you are looking for.

Part View or Live Sensor

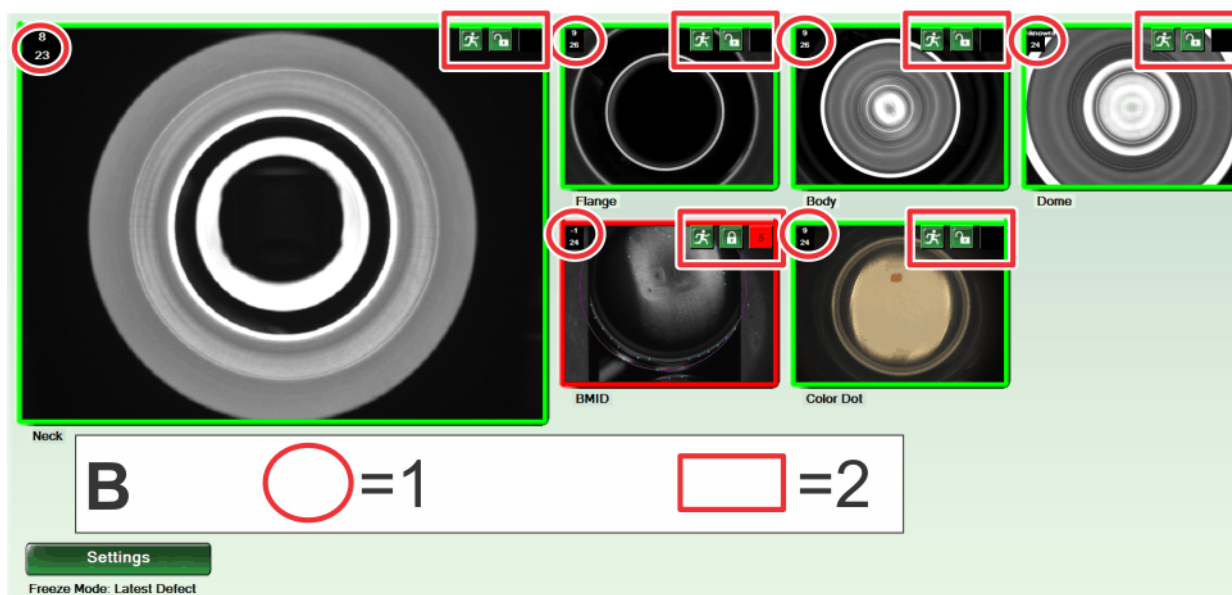
[Only displayed if you have more than one sensor and you entered this screen from Lane Overview mode]

Part View mode [item A shown below] - The images displayed are all the same part (see the machine part numbers [item 1 below]. When one image freezes, all images freeze, regardless of whether they are defective. This is a useful mode if you have sensors located far apart, and you only want to look at one part at a time. If you are using Timed Release mode, the timer countdown is located next to the freeze on defect icons [see item 2].



A	Part View mode
B	Live Sensor mode
1	Machine parts (these numbers are only shown on the image if you have "Show Correlation Values in Images" checked in the Machine Part Correlation (on page 109) menu)

Live Sensor mode [item B shown below] - The images displayed are those that were last inspected. If your sensors are located far apart, the images may be different parts [see item 1]. This mode is usually used when your sensors are close together, such as in a BNS application. The freeze on defect icons are located on each image [item 2]. If you are using Timed Release mode, the timer countdown is located in the upper right corner of the image [item 2].

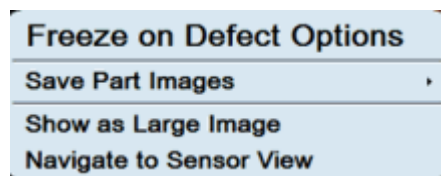


Automatically Switch to Latest Locked

[Only displayed if you entered this screen from Lane Overview mode] Check the box to enable. If you have more than one sensor, this option switches the large image to the sensor that most recently met the freeze frame conditions.

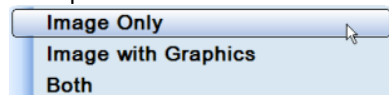
Freeze on Defect Options menu

This menu is available after you enter Freeze on Defect mode. If you have only one sensor on the lane, the "Show as Large Image" item does not appear. Right-click over one of the images to see the menu. The actions of each menu item depend on the image over which you right-clicked.



Save Part Images

The options are shown below.



- **Image Only** - Saves a bitmap (.bmp) image with no graphics.

❖ *Note: only bitmap images can be loaded back into the Intellispec*

- **Image with Graphics** - Saves the current image with inspection graphics on the image. It is saved as a Portable Network Graphic (.png) file.
- **Both** - Saves both files - (.bmp) with no graphics, and (.png) with graphics.

When you save an image, a dialog box, as shown below, provides options for saving the image. The image is saved to the default location shown in the box, unless you click the disk icon and specify a different location. A default file name including Lane name, date, and time is provided for you. You can rename the image by clicking on the keyboard icon and typing a new name using the on screen keyboard.



Show as Large Image

[Only available if you entered Freeze on Defect mode from Lane Overview mode, and if the lane has multiple sensors] Display the current image as the large image in Freeze on Defect mode.

Navigate to Sensor View

Go back to Sensor Overview mode and display the Reject Images screen for the selected sensor.

Freeze on Defect Image in Retro-Spec

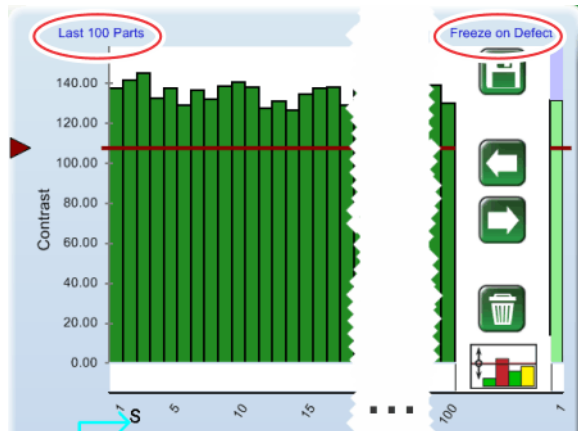
An image (good or bad) captured while the system is in Freeze on Defect mode can be viewed in the Retro-Spec interface. This allows you to adjust an inspection using a recently captured image.

➤ To get to Retro-Spec from Freeze on Defect:

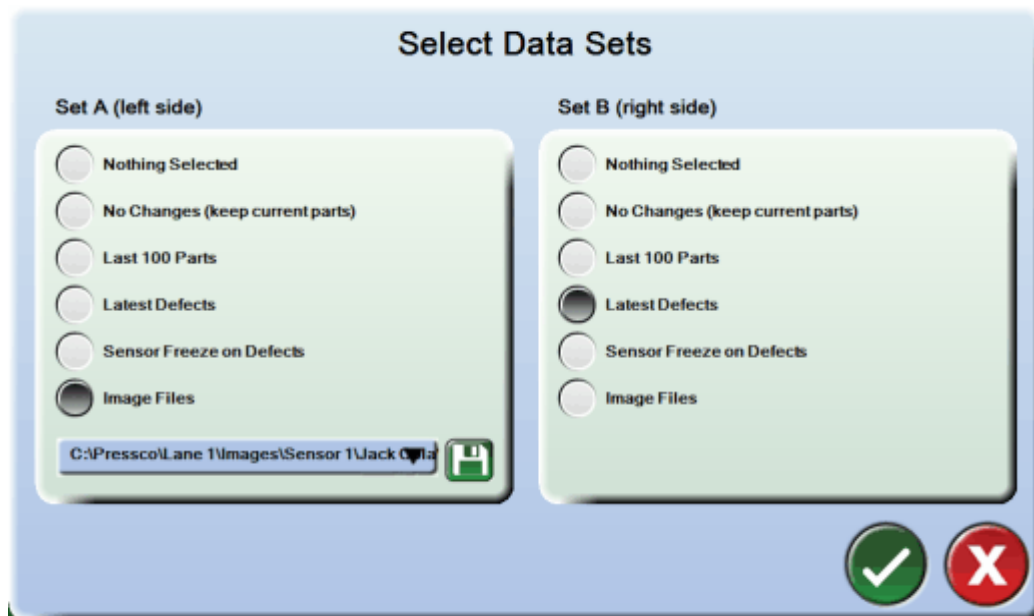
1. Right-click over a LARGE frozen image. If no images have been frozen for that sensor, then the Freeze on Defect image will not be available in Retro-Spec.
2. Choose Navigate to Sensor View.
3. Double-click an inspection name, either from the Inspection tree, or from the Inspection results. This will open the Retro-Spec interface for that inspection. While you are working in Retro-Spec, the Freeze on Defect operation is temporarily paused, so that you can keep working on the same frozen image.

Inspection Results (double click to edit)	
Inspection	Result
Ring [1]	Good
Hough [1]	Good
Ring [2]	Good
Measurement	Bad

The latest Freeze on Defect image will appear on the right side of the graph (even if the part passed the current inspection).



- To select different data for the Retro-Spec graph, click one of the left or right arrow buttons to view the **Select Data Sets** menu.



- Select the desired data set for each side of the graph.

Reject Images

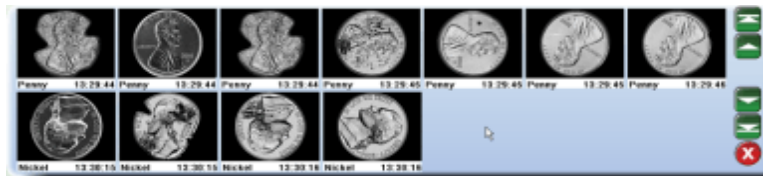


Reject Images are images from the last 100 defects from a sensor (or all sensors for Lane Overview mode). These images are available in the Lane Overview screen and the Sensor Overview screen.

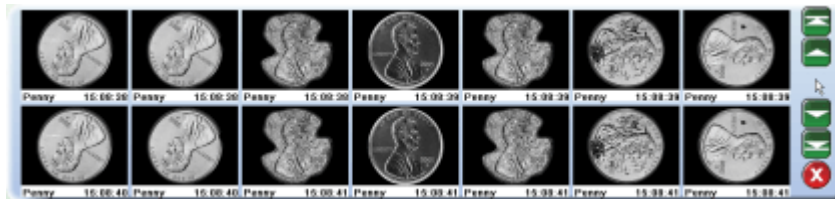
➤ To view Reject Images:

- From the System Overview screen, click a Lane n button to display lane information.
- Click a Reject Images button on the right side of the screen. Note: there are buttons for Lane and Sensor levels - these display images for the entire lane or just the sensor.

- **Lane Reject Images** show a variety of images from different Sensors. Below the image is the name of the Sensor it came from and what time it was rejected. You can scroll through the images using the arrows. Clicking on an image will bring you to the Sensor from which it failed.



- **Sensor Reject Images** show snapshots of failed images from that Sensor only. Below the snapshot is the time it was rejected.



➤ To use the images:

- Click an image from the Lane Reject images to display the corresponding Sensor information in the lower part of the screen.

Inspection	Result
Ring	Good
Radial Edge	Good
Measurement	Good
Ring	Good
Pattern Match	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Ambient	Bad

- Click any one of the small images to display a larger version of that image.
- Click on the large image to display a magnified portion of the image. This is useful to see small defects. Click and drag on the magnified portion to navigate around the image.
- See **Image Magnifier** (on page 154)

Accessing Inspections from Reject Images

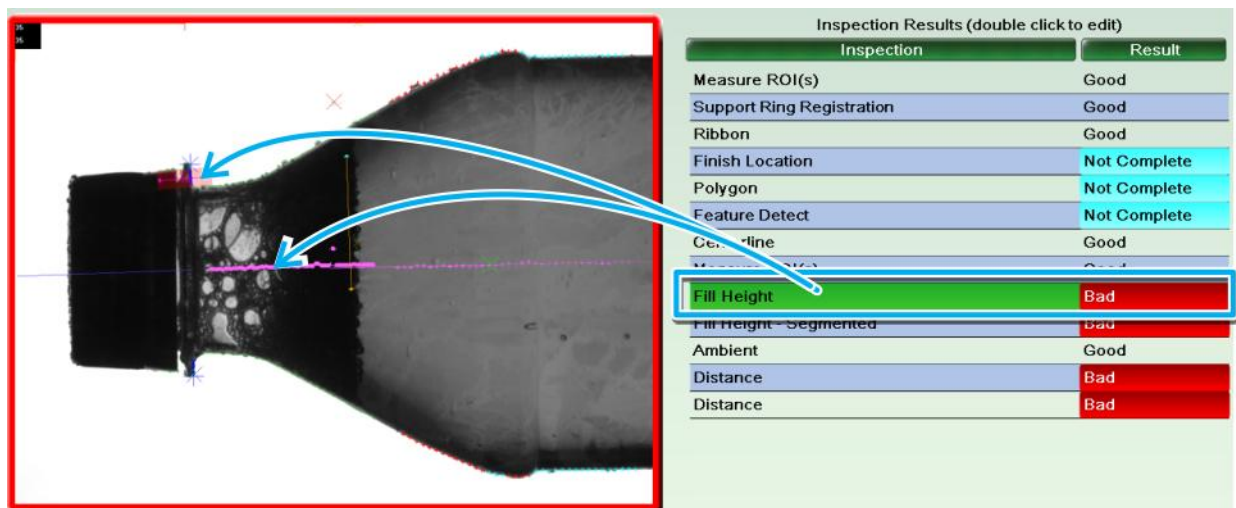
After selecting one of the reject images, you can quickly access the inspections that are related to the part. This allows you to see which inspections failed.

➤ **To use the images:**

- Click an image from the Lane Reject images to display the corresponding Sensor information in the lower part of the screen.



- Click an inspection in the list to the right of the large image. This will show defect graphics for the specific inspection, such as the region and any diagnostics that are associated with that inspection.



- Double-click the name of any inspection. This will open the inspection editor, so that you can make adjustments if necessary. In the above example, if you double-click the Fill Height inspection, then the Fill Height inspection editor opens. For more information about the inspection editor, see **Inspection Editor** (on page 207).

❖ *Note: you must have user permissions to enter the inspection editor. Contact your system administrator if you need permissions.*

- Click an inspection name in the inspection tree. The set of reject images will change to those that are associated with that inspection (only if there are defects associated with that inspection). This is useful if you want to know what types of defects are being caught by that inspection.

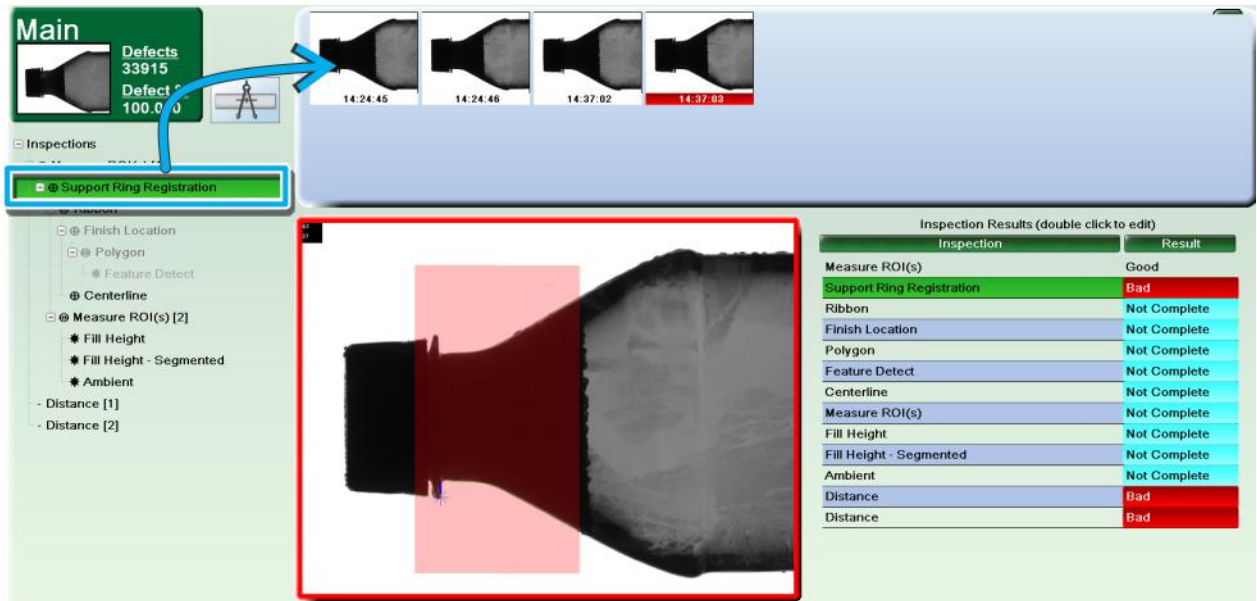
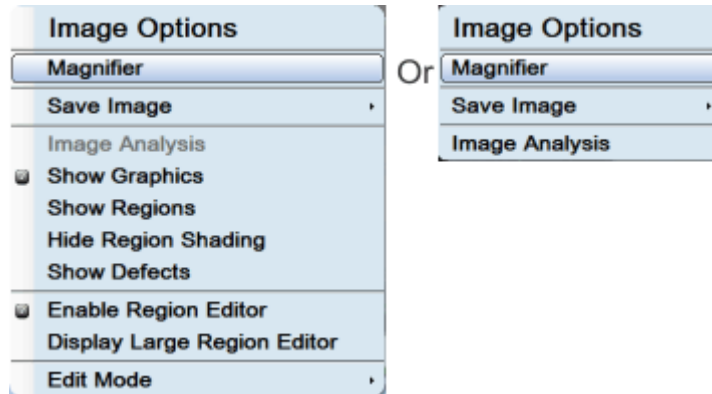


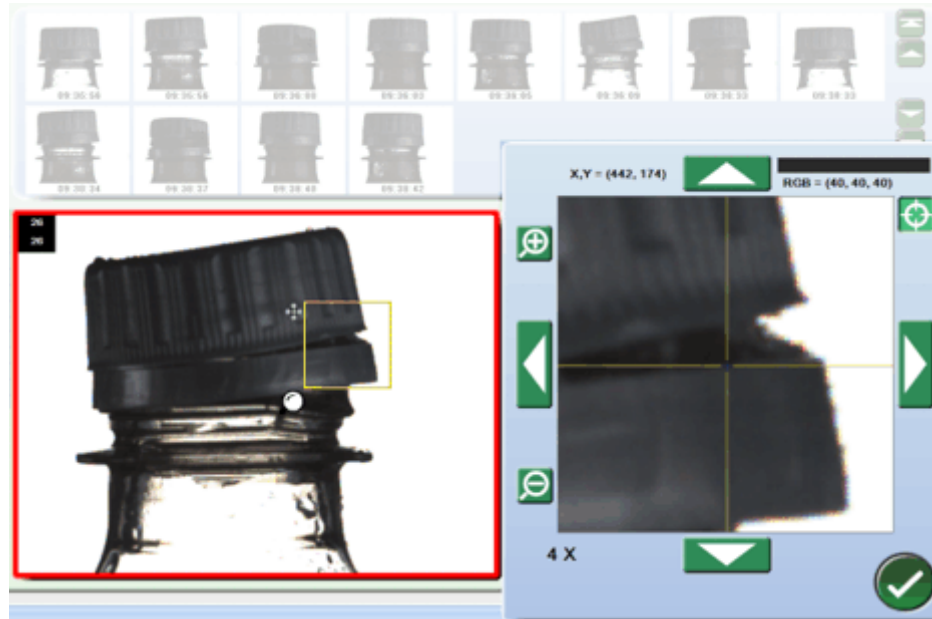
Image Magnifier

This tool is available from either the **Image Options** (on page 189) menu while you are editing an inspection, or when looking at **Reject Images** (on page 151).

- If looking at Reject Images, simply click on the large image at the bottom of the screen to see the magnifier. Or:
- Right-click over a large image to see the Magnifier option. Select **Magnifier** to use the tool. The magnifier tool is displayed.



An example of the magnifier tool from Reject Images is shown below.



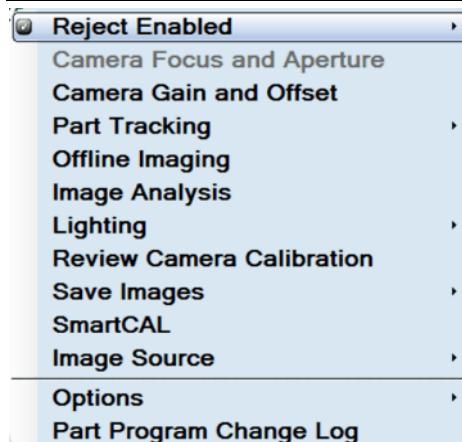
➤ **To use the magnifier:**

- When you first open the tool, the yellow box area over the original image is magnified. The magnified area moves when you move the cursor on screen. To move the magnified area independent of the cursor, right-click over the image. The arrow buttons  in the magnifier tool become available to move the magnified image.
- Select the zoom in button  to increase magnification. The amount of magnification available depends on the camera resolution.
- Select the zoom out button  to decrease magnification.
- Select the target button  to display or remove crosshairs on the magnified image. The pixel at the center of the crosshairs is where the RGB values are measured.
- Click the OK button  to exit the magnifier.

Sensor menu

The Sensor Menu provides access to part tracking, lighting, and image options. Right-click the Sensor button to view the Sensor menu from the Lane Overview or Sensor Overview mode. The items at the bottom of the menu are only available in Sensor Overview mode.

❖ *Note: the lane must be offline to access the items in the Sensor menu.*



The items in the Sensor menu are as follows:

Reject Enabled

(Toggles to Reject Disabled) This option enables or disables the rejecter for the **Sensor** only. If you disable a sensor and put the system online, you will see a message that a rejecter is disabled. See also **Rejector Enable/ Disable** (on page 116).

Camera Focus and Aperture (on page 157)

Calibrate the focus and aperture of some cameras. This menu item will be grayed out if your system does not have cameras that can be adjusted through the software.

Camera Gain and Offset

❖ *Note: This menu normally should not be adjusted. It is usually set by the Pressco installer. Improper adjustment of these parameters can cause a distortion of the image.*

- Camera gain is the amplification of the video signal
- Offset adjusts the grayscale reference values

Part Tracking

Opens Part Tracking options for:

- **Part Present Delay Calibration** (on page 123)
- **Reject Delay Calibration** (on page 125)
- **Reject Confirm Calibration** (see "**Reject Confirm Calibration (Optional)**" on page 130)
- **Part Width Calibration** (on page 106)

Offline Imaging (on page 158)

Choose how the Intellispec acquires images when the lane is offline.

Image Analysis (on page 158)

This tool displays the gray shade value for any pixel or group of pixels in your image. This is useful in programming part programs or setting up lighting. You can measure grayscale values of pixels in horizontal or vertical lines, or over a circle. Image Analysis also allows you to calibrate the pixel scale for the sensor.

Lighting

Opens lighting options: **Basic Adjust Lighting** (on page 162) and **Advanced Adjust Lighting** (on page 162).

Review Camera Calibration (on page 165)

This tool shows how the current camera is calibrated - the number of image pixels to an actual measurement on your part. Calibration is used in measurement inspections.

Save Images (see "Saving Images Through the Sensor Menu" on page 174)

Allows you to save captured images to disk.

SmartCAL (on page 166)

SmartCAL is a tool that allows you to load a set of images, run them with the current part program, and make sure the part program is passing or rejecting parts as you expect.

Image Source (on page 168)

Allows you to choose which images to display, and select between live sensor images or saved images.

The two following options are available from Sensor Overview mode.

Options (see "Options (sensor menu)" on page 203)

Provides different inspection tree views.

Part Program Change Log (on page 200)

Display the Part Program Change Log. This lists the inspections and the edit history for each. You can view all inspections from one sensor, other sensors, or other part programs.

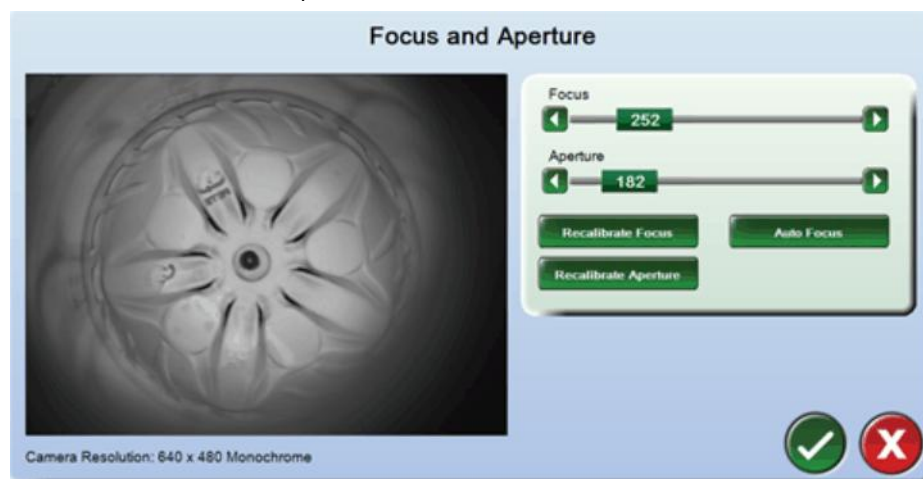
Camera Focus and Aperture

This menu allows you to adjust the focus and aperture of some cameras. It is only available when the lane is offline.

❖ *Note: only some cameras support this feature. They contain built-in motors to make these adjustments. The Camera Focus and Aperture menu item will be grayed out in the Sensor menu if your system does not support this feature.*

➤ To get to this screen:

From the Lane or Sensor Overview screen, right-click the Sensor button to see the Sensor menu, then select Camera Focus and Aperture from the menu.



Make adjustments as necessary.

Focus slider

Sets the focus position of the lens.

Aperture slider

Sets the aperture position of the lens.

Recalibrate/ Calibrate Focus

Determines and sets the usable range of focus positions for the lens.

Recalibrate/ Calibrate Aperture

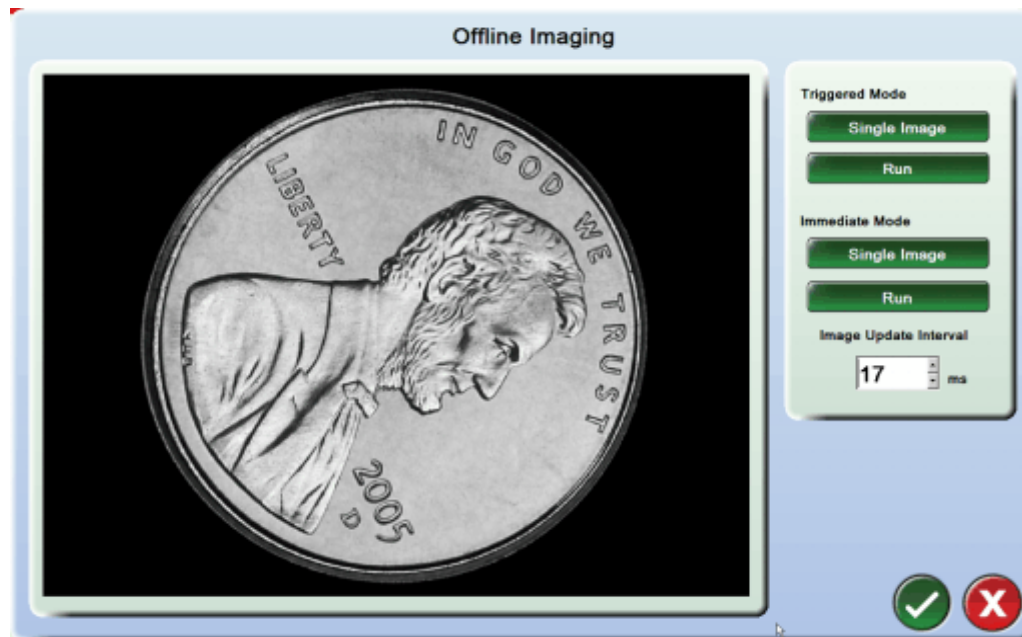
Determines and sets the usable range of aperture positions for the lens.

Auto Focus

Automatically determines and sets the best focus position for the image.

Offline Imaging

Choose how the Intellispec acquires images when the lane is offline.



Triggered Mode

- **Single Image** – using the part detect sensor, an individual picture is taken every time the button is clicked.
- **Run** – using input from the part detect sensor, pictures are taken continuously at the rate set in "Image Update Interval."

Immediate Mode

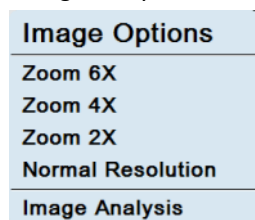
- **Single Image** – NOT using the part detect sensor, an individual picture is taken every time the button is clicked.
- **Run** – the camera takes a continuous picture, the light array is on, and you instantly see whatever is under the camera.

Image Analysis

This tool displays the gray shade value for any pixel or group of pixels in your image. This is useful in programming part programs or setting up lighting. You can measure grayscale values of pixels in horizontal or vertical lines, or over a circle. Image Analysis also allows you to calibrate the pixel scale for the sensor.

➤ To get to Image Analysis:

- Make sure the lane is offline. Image Analysis is not available in online mode.
- Right-click an image in the Sensor Overview screen to display the zoom and image options. Choose Image Analysis from the menu.



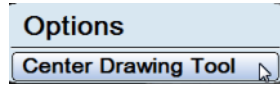
- OR -

- Right-click the **Sensor menu** (on page 155) and choose Image Analysis from the menu.

❖ *Note: you must have proper **user access** (see "**Managing Permissions**" on page 55) to use Image Analysis; otherwise, the option will be grayed out*

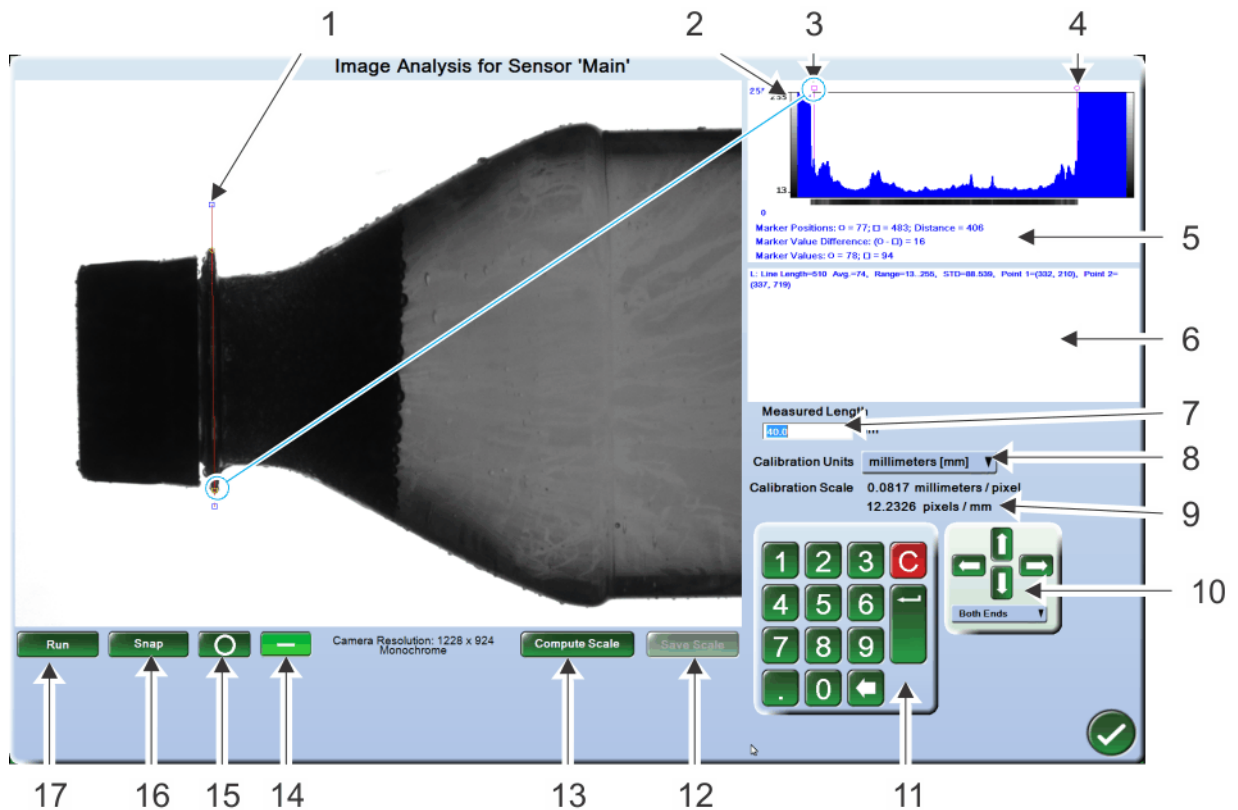
The Image Analysis screen is displayed. The components of this screen are described below.

To quickly center the line or circle, right-click over the image to display the Options menu. Then click Center Drawing Tool. The line or circle is centered on the image.



The Image Analysis screen shown below is from a high resolution camera. The regular 640 x 480 camera Image Analysis screen has the same controls, but is laid out differently. See the example below the table.

❖ *Note: use the **square** and **circle** markers [items 3 and 4] to make **measurements**. You can make your circle or line [items 15 and 14] any size you want, but the markers will give you a more accurate measurement. Use the histogram graph to place the markers, using gray level transitions as marker locations.*



Under the histogram graph, the information displayed is as follows:

Marker Positions

The distance in pixels that the square or circle markers are from the beginning of the reference (red) line. If you are using a circle, then the markers measure the length in pixels from the yellow square.

Marker Value Difference

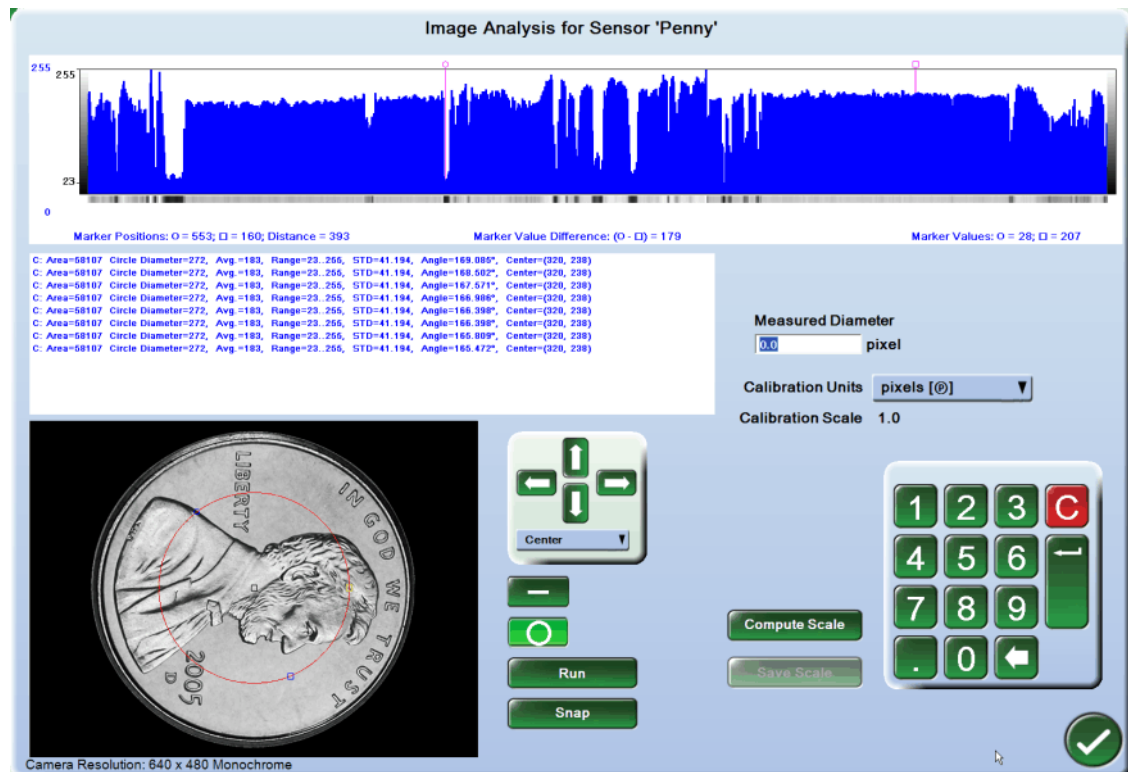
The difference in gray shade between the values of the two markers.

Marker Values

Gray shades of markers.

1	Click and drag an end square to change the length or location of the line. If you are using a circle for image analysis, use the middle square to re-position the circle on the image.
2	The highest and lowest gray shade values along the line or circle are displayed on the left of the graph
3	Square marker - click and drag the square to any point on the line or circle (either in the image or in the graph)
4	Circle marker - click and drag the circle to any point on the line or circle (either in the image or in the graph)
5	The gray shade values of the pixels at the markers are displayed, along with the differences between the markers. See below the table for more information.
6	Values for each image are displayed so that you can see the difference between images
7	Measure your actual part with a ruler or calipers and enter the measured value in this box. Place a line or circle on the image, covering the same area you measured. If using a line: place the markers [items 3 and 4] on the same area on the image that you used to measure the part. This will measure length. If using a circle: place the circle on the image over the same location you used to measure your part. This will measure the part's diameter.
8	Choose your calibration units that you used to measure your part
9	This is a computed number that is updated after you click the Compute Scale button. It computes the units of measure per pixel, and shows the number of pixels measured by the line or circle.
10	The keypad with the four arrows allows you to re-position the line or circle with buttons. The drop-down menu allows you to choose the point or feature to move.
11	Use this keypad to enter the measured value of your part.
12	Save Scale - (available after you Compute the scale) Click this button to save the number of pixels per unit of measure to the sensor file. This calibration unit can then be used in inspections such as Measurement or Distance.
13	Compute Scale - Click this button after you have entered your measured valued [item 4] and set up your line or circle. The system computes the units of measure per pixel.
14	Click the line button to view gray shades along a line
15	Click the circle button to view gray shades along a circle
16	Click Snap to acquire one new image. This option is only available if you accessed Image Analysis by right-clicking the Sensor button.
17	Click Run to continually snap new images. Different images are only displayed if your production line is running. This option is only available if you accessed Image Analysis by right-clicking the Sensor button.

The Image Analysis screen shown below is from a standard resolution camera.



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 (refer to the illustration for Image Analysis (on page 158)):**

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 [item 4].
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 [item 9]. The system computes the pixel scale and displays the values [item 6].
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 use pixel scale calibration are:

- Measurement
- Fill Height
- **Fill Height - Segmented** (on page 240)
- Support Ring Registration or **Neckring Registration** (on page 229)
- **Distance** (on page 258)

See the descriptions for the individual inspections using the links provided.

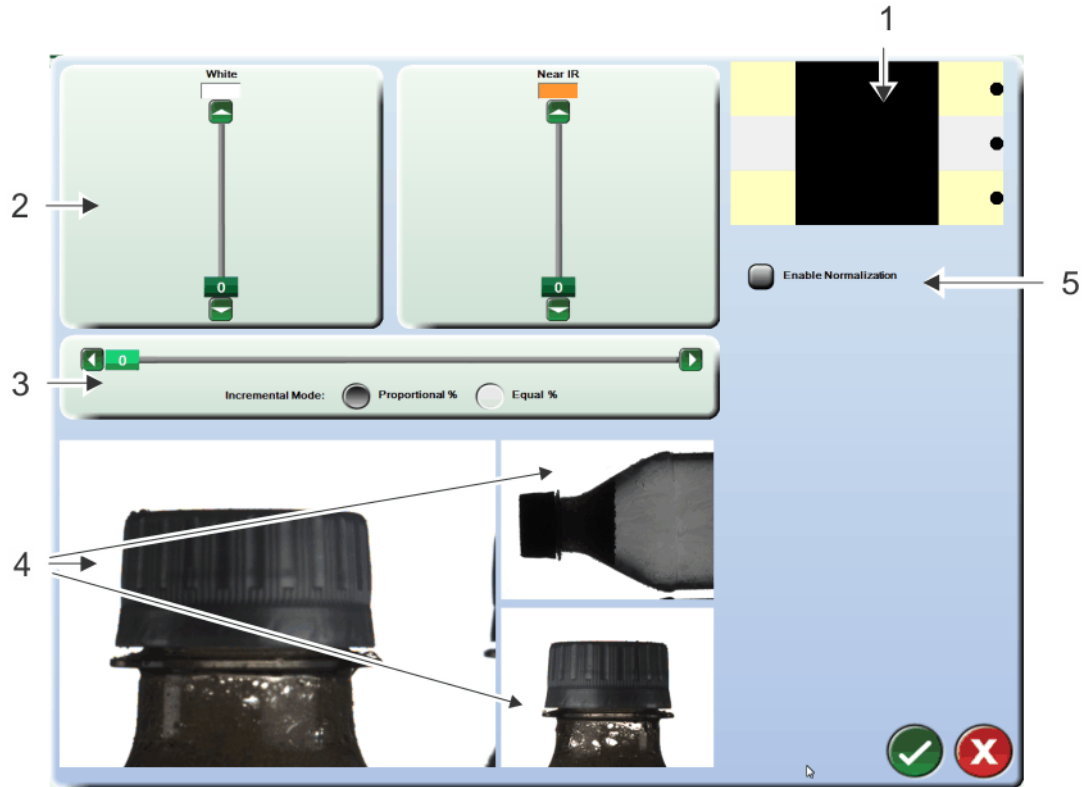
Basic Adjust Lighting

The Basic lighting provides most of the lighting adjustments you will use.

❖ *Note: lighting must be adjusted while the lane is offline.*

➤ To get to this screen:

1. From the Lane Overview or Sensor Overview screen, right-click over the desired sensor button.
2. Select Lighting, then select Basic Adjust Lighting. The Basic Lighting screen is displayed.



1	Upper right corner displays each zone. Click a zone to adjust it. You can select a single zone or multiple zones at any one time. 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	Incremental mode 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	Click any image (if applicable to your system) to select the camera to adjust its lighting.
5	Enable Normalization - (in some systems, Disable Normalization). For most applications leave normalization disabled. If you are modifying a part program that has normalization enabled, then leave it enabled. This function was previously used to limit the brightness of certain LEDs. It is no longer required.

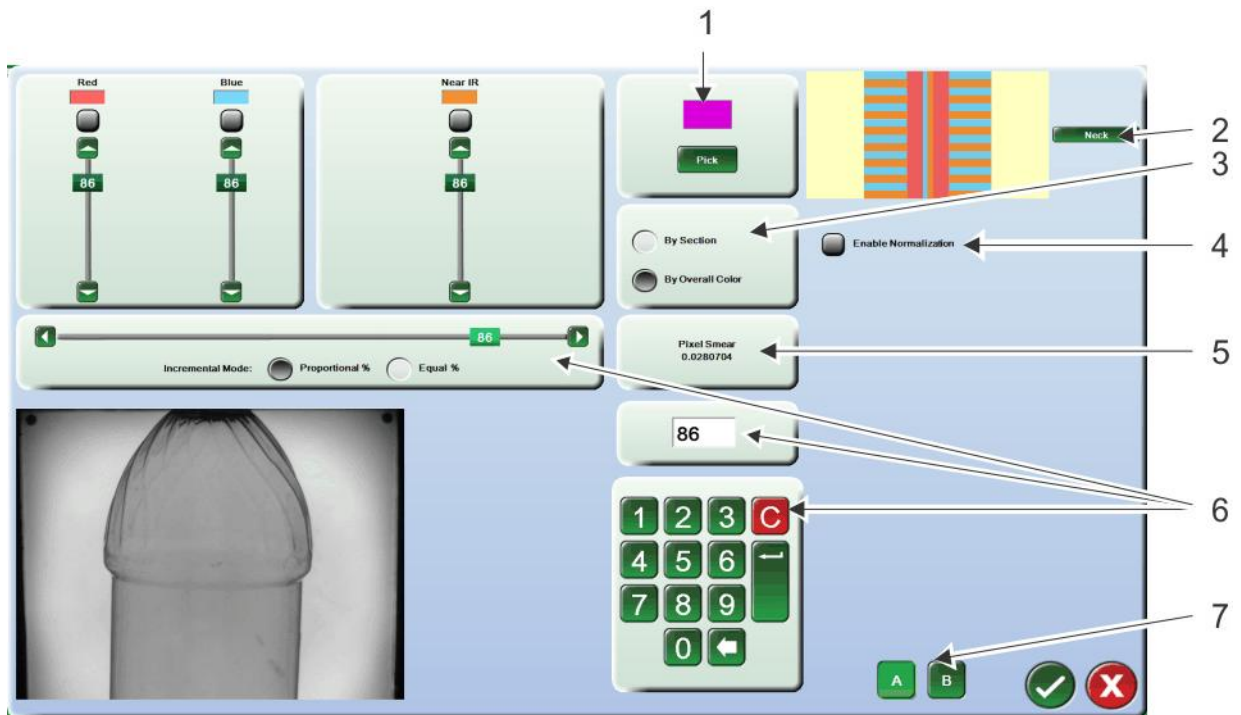
Advanced Adjust Lighting

This screen provides additional lighting setup. This is mostly used by Pressco engineers, or for making infrequently performed specialized settings.

❖ *Note: lighting must be adjusted while the lane is offline.*

➤ **To get to this screen:**

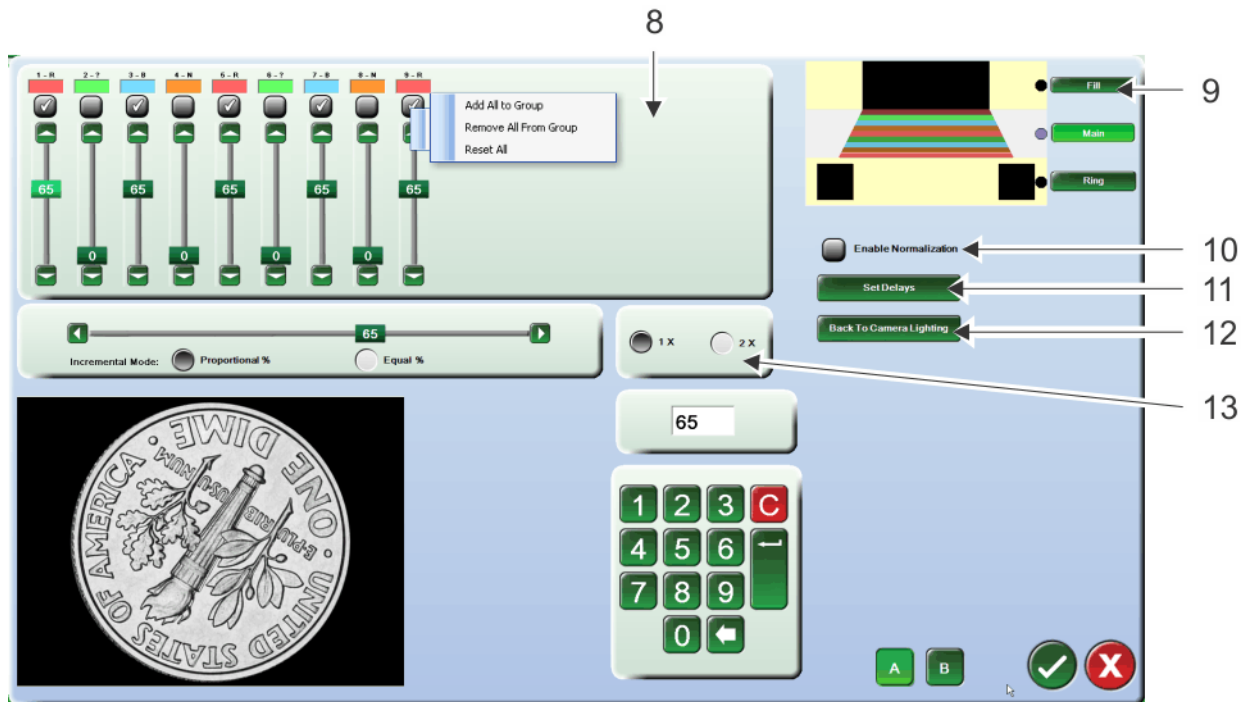
1. From the Lane Overview or Sensor Overview screen, right-click over the desired sensor button.
2. Select Lighting, then select Advanced Adjust Lighting. The Advanced Lighting screen is displayed.



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 - Allows you to change lighting by each individual section. By Color - Allows you to change lighting for multiple sections at once.
4	Enable Normalization - (in some systems, Disable Normalization). For most applications leave normalization disabled. If you are modifying a part program that has normalization enabled, then leave it enabled. This function was previously used to limit the brightness of certain LEDs. It is no longer required.
5	Pixel Smear - The Intellispec computes the amount of pixel smear based on lighting, image size, and part rate. It should be kept below one.
6	On-screen keypad (OSK) - enter the percentage of color. Type the number in the empty box (using the onscreen keypad). This also moves the percentage slider.
7	A/B buttons - Allows you to set up two different lighting settings for the same part so you can view each and compare.

Advanced adjust lighting - zones

When you select one of the array buttons from the Advanced Lighting screen, you can adjust each zone independently.



8	Adjust any zone within the light array. Options: - Adjust any zone with the slider or arrows - Select several zones by checking their gray box to adjust those zones as a group (intensity will be the same for the whole group) - Right-click over any zone for options to add all zones to the group, remove all zones from the group, or reset all zones to zero
9	Click another array button to adjust lighting zones for that array
10	Enable Normalization - (in some systems, Disable Normalization). For most applications leave normalization disabled. If you are modifying a part program that has normalization enabled, then leave it enabled. This function was previously used to limit the brightness of certain LEDs. It is no longer required.
11	Set Delay (see " Advanced adjust lighting - set delay " on page 164) is only available in a BNS application.
12	Click the Back to Camera Lighting button to go back to the main Advanced Adjust lighting screen
13	1X - 2X is an intensity multiplier. 1X is the normal setting. 2X doubles the intensity without having to adjust the intensity through the sliders. Maximum intensity is 100% - if a slider is already at 100%, then the intensity will not be doubled.

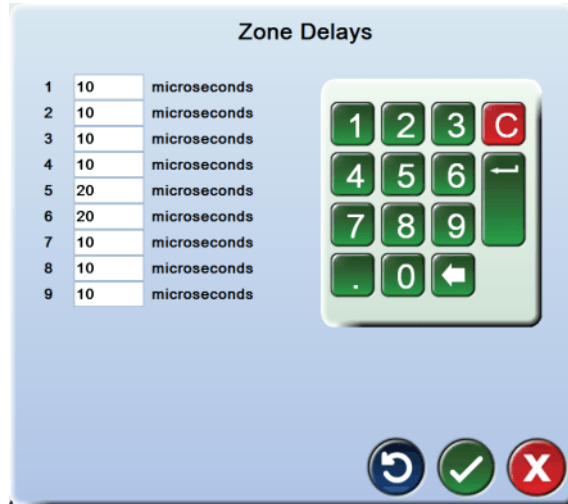
Advanced adjust lighting - set delay

Setting the zone delay is only available in a BNS application. It provides a strobe delay on the light control board for the Neck camera, so that the Neck lighting fires after the Base camera (and not at the same time). Since the Base and Neck part present signal occurs at the same time, a lighting delay is required so that the Base is lit separately from the Neck.

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

➤ **To get to this screen:**

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



➤ **To adjust zone delay:**

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

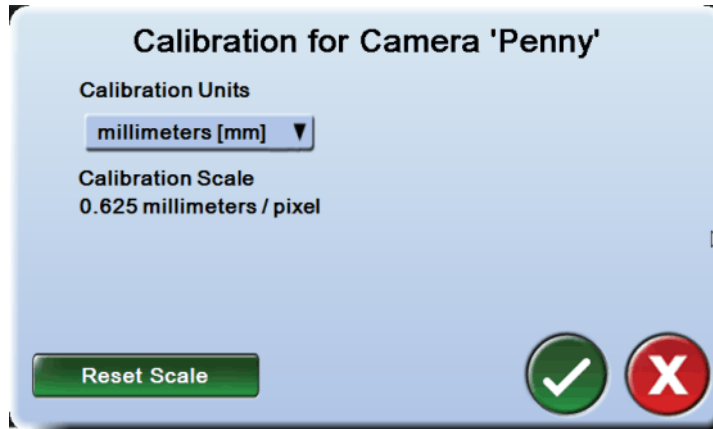
❖ *Note: this delay is separate from the Strobe Delay set in **Part Present Delay Calibration** (on page 123).*

Review Camera Calibration

This menu allows you to switch between inches and millimeters, select a custom scale, or go back to pixels. If you switch between inches and millimeters, the pixel scale is automatically converted. Calibration to pixel scale is performed in **Image Analysis** (on page 158) 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:  for pixels, mm for millimeters, " for inches, or [] blank for custom units.

To see this menu, right-click over the Sensor button in Lane Overview or Sensor Overview modes > select Review Camera Calibration.



Notes:

- If you switch from mm to inches, or inches to mm, 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.

SmartCAL

What is SmartCAL?

SmartCAL is a tool that allows you to load a set of images, run them with the current part program, and make sure the part program is passing or rejecting parts as you expect.

What is the difference between SmartCAL and PDL?

SmartCAL loads images and runs the current part program to determine whether the part program is passing or rejecting parts as you expect. PDL is a file in which you save and load images to be used in the SmartCAL process.

Before using SmartCAL

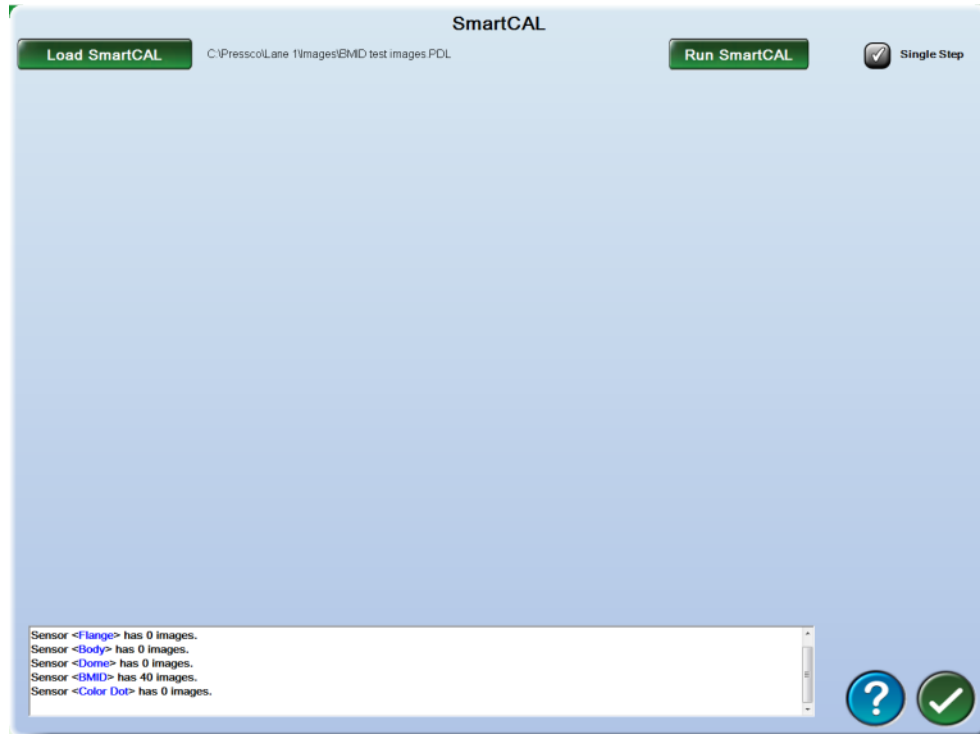
To use SmartCAL you must save good and defective images to the hard drive. Carefully name the images you save to make it easier to determine if the part program is working correctly. For example, save good images as "Good0001.bmp, Good0002.bmp, Good0003.bmp" and bad part images as "Bad0001.bmp, Bad0002.bmp, Bad0003.bmp," etc.

Using SmartCAL

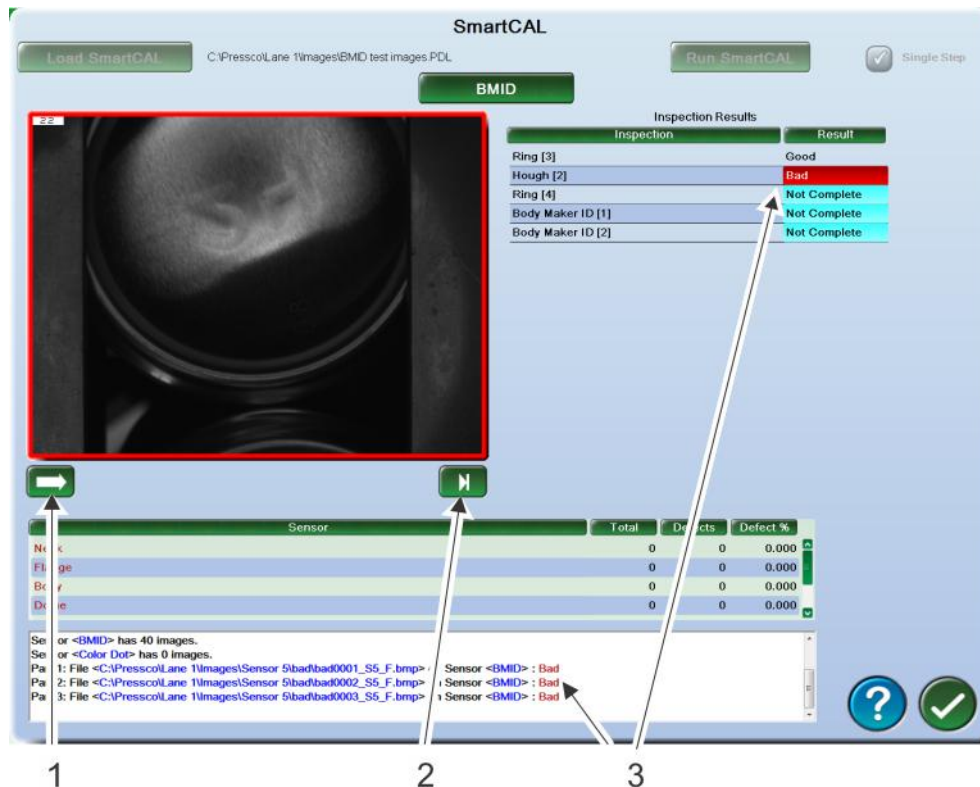
➤ *To use SmartCAL:*

1. Save two sets of images, one good set and one bad set, for each sensor. Use a tool such as **Auto-Save** (see "**Saving Images Automatically**" on page 175) and save a set of good images using **passing** status, and label the images as good. Save another set of defective images using **failing** status, and label the images as bad.
2. Create a **PDL** (see "**Manage Simulated Lane Images (PDL)**" on page 169) file containing both the good and bad images from each sensor.
3. Open SmartCAL: right-click the sensor button and select SmartCAL.
4. Click the **Load SmartCAL** button.

5. Select the PDL file you created in step 2, and click the OK button to continue. The system will load the images.



6. Click the **Run SmartCAL** button. If the **Single Step** box is checked, you will be able to run the part program on one image at a time. Otherwise, the system will run the part program on all the images in the PDL file. The results are displayed in the lower window.
7. View the results [item 3] for each image. Make sure the inspection is passing or failing the correct inspections for each image. If not, then you may need to adjust the inspections.



1	Single step through the images, running the part program for each image
2	Automatically run the part program for all the images
3	View the results for each image

Select any sensor in the table to view the results, as shown below.

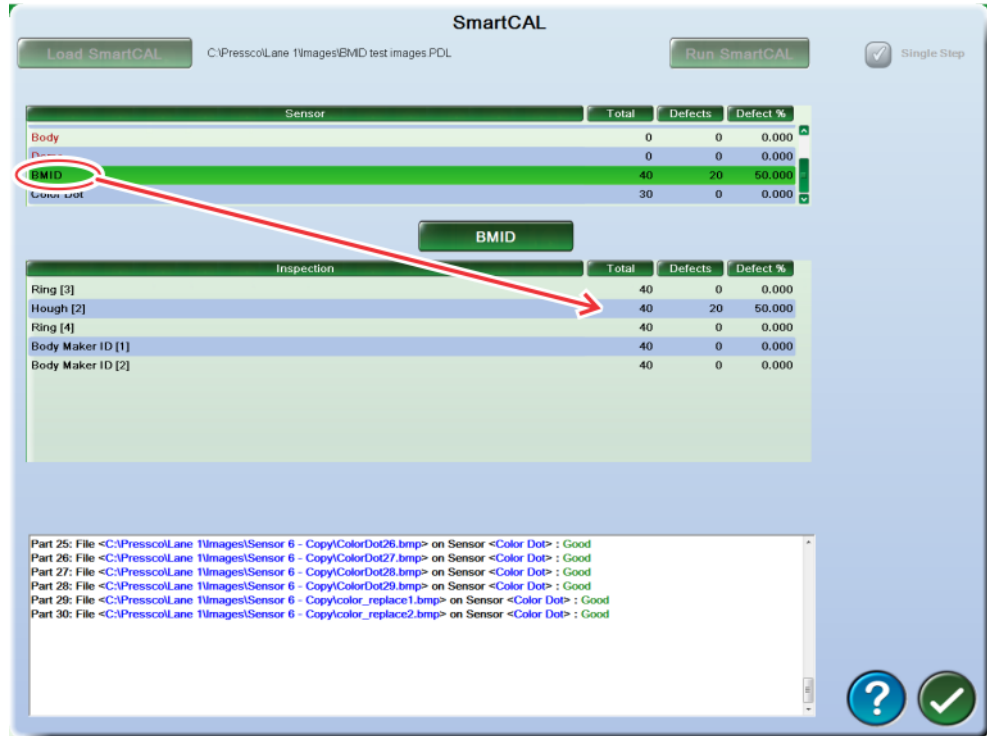
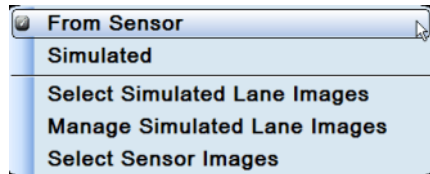


Image Source

This tool allows you to choose which images to display for the lane or sensor. You can load images to simulate inspection if your production line is not running, or choose live images from the sensor.

To see this menu, right-click the Sensor button from Lane Overview or Sensor Overview mode, then select Image Source.

❖ *Note: you can also see most of the items from this menu by clicking the Tools button in Lane Overview mode, selecting Lane Setup, then selecting Image Source.*



From Sensor

The system displays the live images from the current sensor.

Simulated

The system displays images you have previously saved to disk. When you select Simulated Images, the following happens:

- All rejectors for the current lane are disabled.
- The name of the sensor(s) is displayed in **red** to indicate that the rejector is disabled.
- You must specify images through one of the following options: Select Simulated Lane Images (PDL), Manage Simulated Lane Images (PDL), or Select Sensor Images.

Select Simulated Lane Images

Load a PDL file (on page 170)

Manage Simulated Lane Images (see "**Manage Simulated Lane Images (PDL)**" on page 169) (PDL)

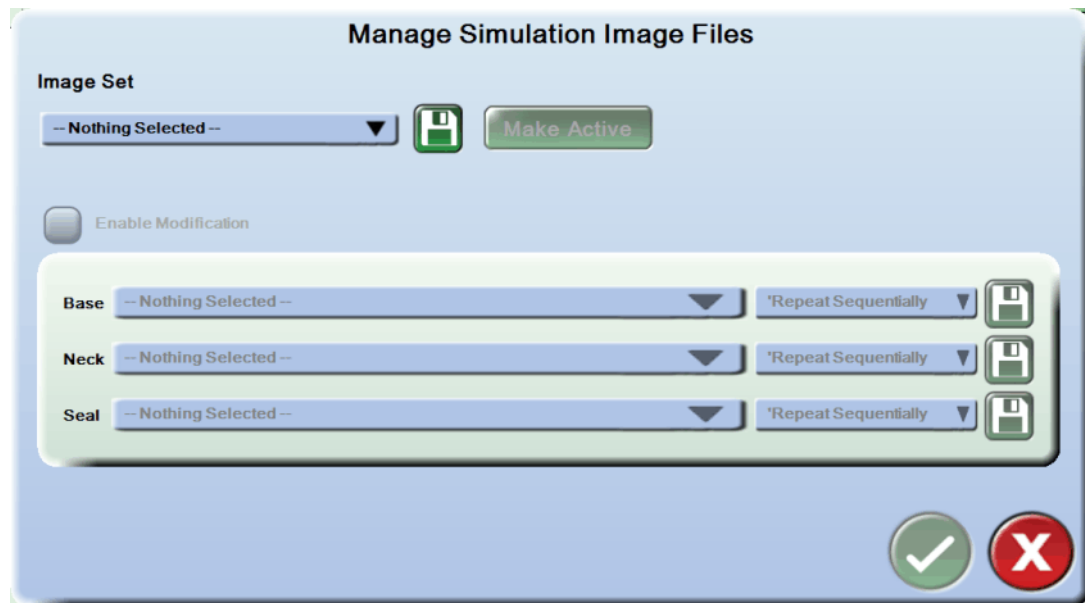
Select Sensor Images (on page 173)

Manage Simulated Lane Images (PDL)

Create a Pressco Data List file [.PDL] that lists the images to load. This way, you can easily load the same images another time. It allows you to save and load images for all sensors within the lane.

First, you must save a set of images; choose from one of the options: **How to Save Images** (see "**Saving Images**" on page 174)

To see this menu, right-click on a Sensor button in Lane or Sensor Overview mode to see the **Sensor menu** (on page 155), then choose **Image Source** (on page 168), then choose **Manage Simulated Image Files** from the menu.

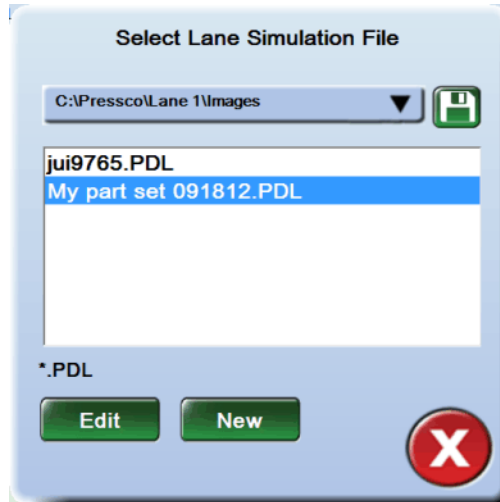


➤ To create a new PDL file:

❖ *Note: this process creates one file where you can load images from all sensors within the lane.*

1. Click the disk icon  under **Image Set**.

2. In the **Select Lane Simulation File** screen, click the **New** button. An on-screen keyboard is presented.



3. Type a name for the image file and click the OK button from the on-screen keyboard to save the file. A file is created and saved in the default directory for the sensor (example: C:\Pressco\Lane 1\Images). The file path will be displayed in the **Image Set** drop-down menu.
4. To add images to the set, highlight the file name in the **Select Lane Simulation File** screen. The **Edit** button becomes active.
5. Click the **Edit** button. The Select Lane Simulation File screen closes, and the selected file name is displayed in the **Manage Simulation Image Files** screen.
6. Check the **Enable Modification** box, then click the disk icon  next to the 'Repeat Sequentially' drop-down menu. The **Select Sensor Images** screen is displayed.
7. Select images for the set using the instructions under the **Select Sensor Images** (on page 173) section, and click the OK button to save.
8. Choose how to display the images using the drop-down menu on the right of the screen.
 - **Repeat Sequentially** - displays the images in order by file name, starting from the first image file, repeating as long as the lane is online.
 - **Repeat Randomly** - displays the images in a random order, repeating as long as the lane is online.
 - **Run Once** - not currently supported.
9. Click the **Make Active** button. A check mark is displayed next to the PDL file name, and the file is activated.
10. Exit from the Manage Simulation Image Files screen.

Next, display the list of images.

➤ **To display the simulation images:**

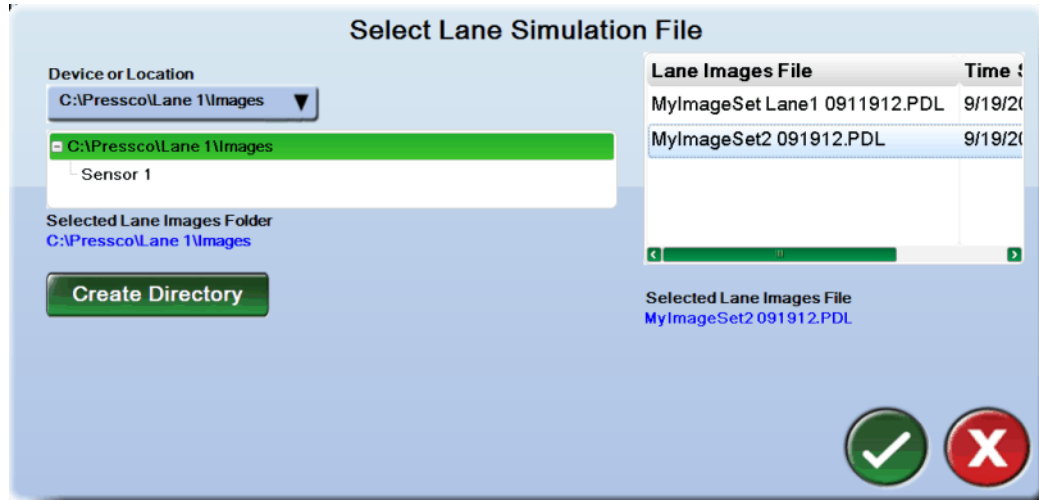
1. Make sure **Simulated** is selected in the sensor menu: Right-click over a sensor button > choose Image Source > Simulated. A check mark next to Simulated indicates the system will display images from disk, and not the camera.
2. To clear the previous images from the lane, right-click over the **Statistics menu** (on page 38), and select Clear Lane Statistics and Clear Images.
3. The next time you put the lane online, the selected PDL images will be displayed.

Load a PDL file

This topic assumes that your system already has PDL files on the hard disk. If not, create a new PDL file: **Manage Simulated Lane Images** (see "**Manage Simulated Lane Images (PDL)**" on page 169).

➤ **To load a previously created PDL file:**

1. Take the lane offline (if necessary).
2. In Lane Overview or Sensor Overview mode, right-click a sensor button to see the **Sensor menu** (on page 155).
3. Make sure **Simulated** is selected in the sensor menu: Choose Image Source > Simulated. A check mark next to Simulated indicates the system will display images from disk, and not the camera.
4. Right-click over the sensor button to view the sensor menu again. Choose Image Source > Select Simulated Lane Images. The Select Lane Simulation File screen is displayed.



5. In the right side of the screen, select the PDL file to display. Browse to a different directory (in the left side of the screen) if necessary. Click the OK button  to save the selection and exit the screen.
6. To clear the previous images from the lane, right-click over the **Statistics menu** (on page 38), and select Clear Lane Statistics and Clear Images.
7. The next time you put the lane online, the selected PDL images will be displayed.

Edit a PDL file

You can edit an existing PDL file by adding or deleting images. If your system does not already have a PDL file, create one: **Manage Simulated Lane Images** (see "**Manage Simulated Lane Images (PDL)**" on page 169).

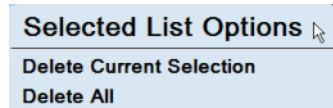
➤ **To edit an existing PDL file:**

1. Go to the **Manage Simulation Image Files** screen: Right-click a sensor button > choose Image Source > Manage Simulated Lane Images.
2. In the **Manage Simulation Image Files** screen, click the drop-down menu under **Image Set**, and select the PDL file to edit. The PDL file name is displayed in the Image Set box.
3. Check the **Enable Modification** box. The list of images in the PDL file is displayed in the drop down menu next to the sensor name. You can add or delete images as desired.

➤ **To delete images:**

1. Follow the instructions "To edit an existing PDL file" above.
2. Click the drop-down menu next to the sensor name to display the list of images in the PDL file, and select an image name to delete. Release the trackball buttons or click outside of the menu to collapse the drop-down menu.

3. Right-click over the drop-down menu next to the sensor name to see the **Selected List Options** menu.



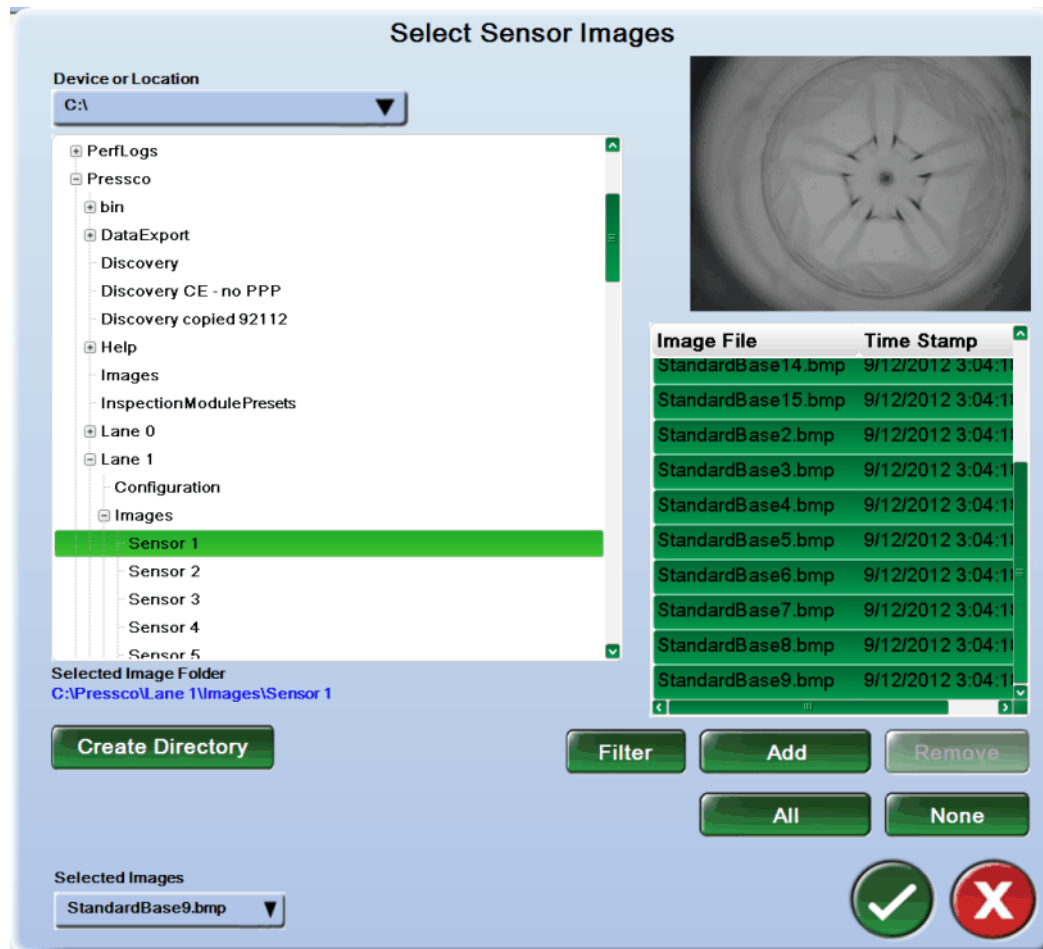
4. From the menu, choose to delete the currently selected image or all the images in the PDL file. The image(s) is deleted.
5. Click the OK button  to save the changes and exit.

➤ **To add images:**

1. Follow the instructions "To edit an existing PDL file" above.
2. Click the disk icon  next to the 'Repeat Sequentially' drop-down menu. The **Select Sensor Images** (on page 173) screen is displayed.
3. Add or remove images by browsing through the directories, using the **Add** or **Remove** buttons.
4. Exit from the **Select Sensor Images** screen. The modified list of images is displayed in the drop-down menu next to the sensor name in the Manage Simulation Image Files screen.
5. Click the OK button  to save the changes and exit.

Select Sensor Images

Select individual images or a group of images to display on the **sensor**. (To select images for all sensors within a lane, use **Select Simulated Lane Images** (see "**Image Source**" on page 168)) To see this menu, right-click on a Sensor button to see the sensor menu, then choose **Image Source**, then choose **Select Sensor Images** from the menu. (It is also displayed when you check the Enable Modification box in the Manage Simulated Lane Images screen.)



➤ To select images:

1. Browse through the directories using the drop-down menu at the top of the screen. The list of images in the selected directory is displayed on the right side of the screen.
2. Select an image name from the right side of the screen. Click the **All** button to select all images in the directory, or click **None** to de-select all the images.
 - To select a subset of common images, click the **Filter** button. This allows you to specify a portion of the file name.
 - A wild card (asterisk [*]) is required in the filter name
 - An example is using "*good*" as a filter. Since many images are saved as either good or bad parts, this allows you to select the set of images you want.
 - Another example is using "*.bmp" as a filter. The Intellispec system can only load bitmap (.bmp) images. If your directory has different image types, you can use the filter to select only the .bmp files.
3. The **Selected Images** drop-down menu contains the set of images you have chosen. Use the **Remove** button to remove an image from the set.

- You can add images from more than one directory. After adding selected images from one directory, browse to another directory in the left panel and add more images. The drop-down menu below **Selected Images** shows all the image files you have selected.
4. Click the OK button  to save the set of images. The next time you put the lane online, it displays the set of images you have selected.

Saving Images

There are a number of ways to save an image within the Intellispec system. Through most of these options, you can save images to create a **PDL** (see "**Manage Simulated Lane Images (PDL)**" on page 169) file to load at any time, to create or troubleshoot part programs. Images can be saved whether the lane is online or offline, except the option: "Saving Images Automatically" - that option allows you to save information while the lane is online.

Save any image: In most parts of the system, right-click over any image to save it. A Save Image menu item will be displayed. Select the desired type of image, and save it. When the system asks you where to save it, use the disk icon to browse to a location. If you are using a USB device, insert the device and browse to it. This is useful to save images to include with a **Support Package**.

More information about how to save images from different locations can be found through the links below:

Saving Images Through the Sensor Menu (on page 174)

Saving Images Automatically (on page 175)

Saving Images through the Retro-Spec interface (on page 177)

Saving Individual Images While Editing an Inspection (on page 181)

Saving Reject Images (on page 182)

Saving a Region of Interest (Unwrapped) Image (on page 186)

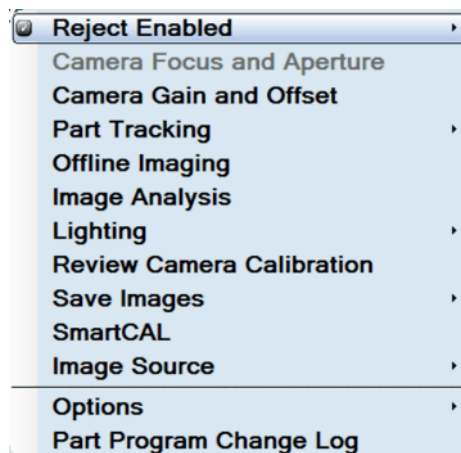
Saving Images Through the Sensor Menu

This tool allows you to quickly save a set of images from one sensor (up to 100 images). You can use these images to set up and test part programs. You can save images whether the lane is online or offline.

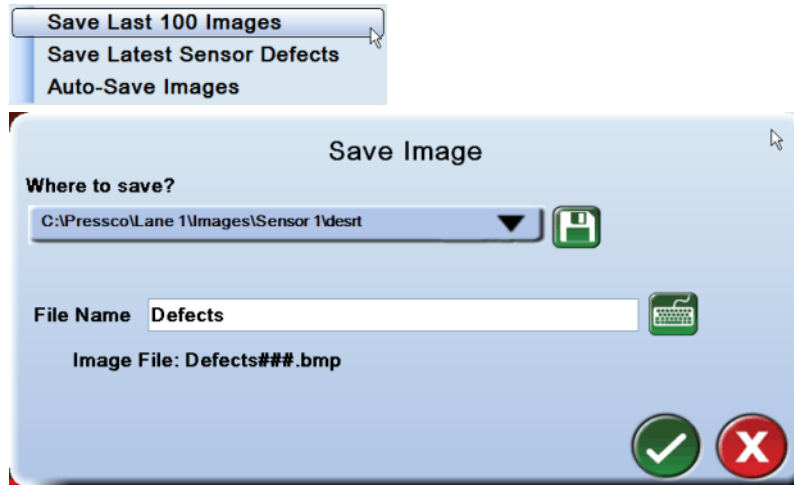
❖ *Note: Some menu items are only available to advanced level users.*

➤ To save images:

1. Right-click over the Sensor button in Lane Overview or Sensor Overview mode to see the Sensor menu.



2. From the Sensor menu, select Save Images, then choose whether to save the last 100 images, the latest sensor defect images, or auto-save images. (See ***Saving Images Automatically*** (on page 175)).



3. For the last 100 images or latest sensor defects, a dialog box prompts you to change directories. Click the disk button  to browse to a different folder if desired.
4. Type a prefix for the set of image files, if desired. The default "Defects" prefix is provided for you.
5. Click the OK button  to save the images.

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.

Saving Images Automatically

This feature automatically saves images from one sensor when the lane is online. You can set up this feature to save up to 1000 images, and specify which images to save. The images can be related to an inspection in the current part program, and they can be images from parts that pass, fail, or both.

❖ *Note: to save images, Save Online must be enabled, and the Start Auto-Save button must be clicked.*

➤ To get to this menu:

1. Right-click a sensor button. The sensor menu is displayed.

2. Select Save Images > Auto-Save Images. The Image Auto-Save menu is displayed. The menu items are described below.

The screenshot shows the 'Image Auto-Save' interface. Numbered callouts point to the following elements:

- 1: Selected Sensor dropdown (Main)
- 2: Save Location dropdown (C:\Pressco\Lane 1\Images\Sensor 1)
- 3: File Name text box (Auto)
- 4: Quantity text box (287) with range (1 .. 1000 Parts)
- 5: Skip N Parts Between Saves text box (0)
- 6: By Inspection checkbox (checked) and dropdown (-- Any Inspection --)
- 7: Part Status dropdown (Passing or Failing)
- 8: Registration dropdown (Not Registered)
- 9: Use Correlation checkbox (checked)
- 10: FILLER VALVE and CAPPER HEAD checkboxes and text boxes
- 11: Stop Auto-Save button
- 12: Numeric keypad (1-9, 0, C, backspace)
- 13: Status window showing save logs

1	Selected Sensor - Select the sensor in the current lane from which to save images
2	Save Location - Select the location to save the images. A default image path is provided. To change the location, click the disk icon  and browse to the desired location.
3	File Name - Create a file name, preferably something descriptive of the part you are inspecting. When you click in the file name box, an on-screen keyboard is provided. The system automatically appends and increases a number in the name, and indicates whether the part passed [P] or failed [F]. An example name is "Auto0001_S1_P.bmp." This name indicates the first image saved [0001], from sensor 1 [S1] and it passed inspection [P].
4	Quantity - Select how many images to auto-save, between 1 and 1000. Use the numeric keypad [item 11] to enter a number.
5	Skip N Parts Between Saves - Check the box if you do not want to save consecutive images. Place the cursor in the number box and use the numeric keypad [item 11] to enter the number [N] of parts to skip between saved images.
6	By Inspection - This is only available when you have one sensor selected [in item 1]. Check the box to enable saving images related to a specific inspection. Use the drop-down menu to select the inspection from the current part program.
7	Part Status - Select whether to 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	Registration - Select whether to save images that failed registration [Not Registered], had a found center [Centered], or had a found center and orientation [Centered and Oriented].

9	Use Correlation - [available if the correlation option is installed] Check this box to enable saving images correlated to specific machine parts.
10	Machine parts - if Use Correlation is enabled, select the machine part(s) to which the saved images are correlated. Also enter a machine part number in the box provided.
11	Start Auto-Save - Click the Start Auto-Save button to begin automatically saving images. Note that images are only saved when the lane is online. To stop the automatic saving of images before the process is complete, click the button when it reads Stop Auto-Save . If all the specified images have been saved, the button returns to the default Start Auto-Save state.
12	Numeric keypad - Use the numeric keypad to enter values for quantity of images to save [item 4], or to skip a number of images between saves [item 6].
13	Status - This area displays the status of the auto-save process.

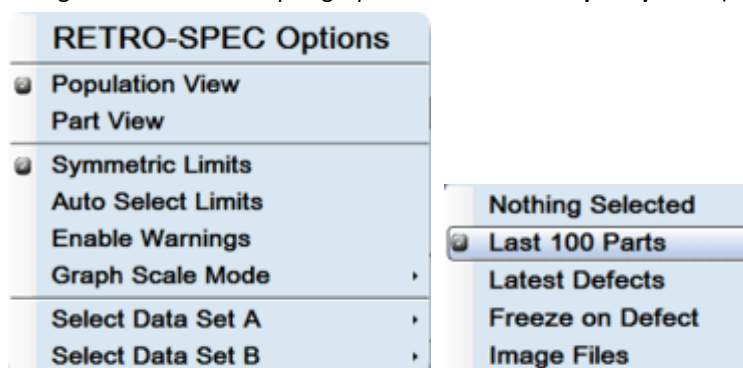
Saving Images through the Retro-Spec interface

This topic covers how to save images through the Retro-Spec interface. You may want to save images to reference later, to send to Pressco for troubleshooting help, or to set up a part program. Saving images is done through the Retro-Spec interface from Registrations, Orientations, or Analyses. You must first have at least a temporary **Part Program** (see "**How to Create, Copy, or Import a Part Program**" on page 195) loaded. You must have user permissions to edit part programs.

Images can be saved whether the lane is online or offline. Images are saved as grayscale bitmap images, at 302 KB in size. No graphics are saved with the images.

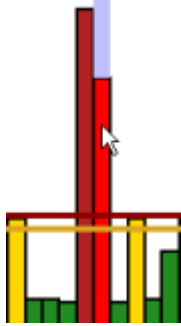
➤ To save one or more images:

1. Go to Sensor Overview mode [from Home, click Lane button, then Sensor button].
2. Put the lane online for a while to acquire several part images.
3. Take the lane offline to stop acquiring images (if desired).
4. Double-click the name of any Registration, Orientation, or Analysis in the inspection tree to view the Retro-Spec interface. Note: you cannot save images through a Region of Interest (ROI).
5. Right-click the Retro-Spec graph to see the **Retro-Spec options** (on page 213) menu.



6. Select an option for Data Set A and/or Data Set B (from **Select Data Set A** and **Select Data Set B**). The Retro-Spec graph is updated with the selected part data.

7. In the Retro-Spec graph, click the bar corresponding to the image you want to save.

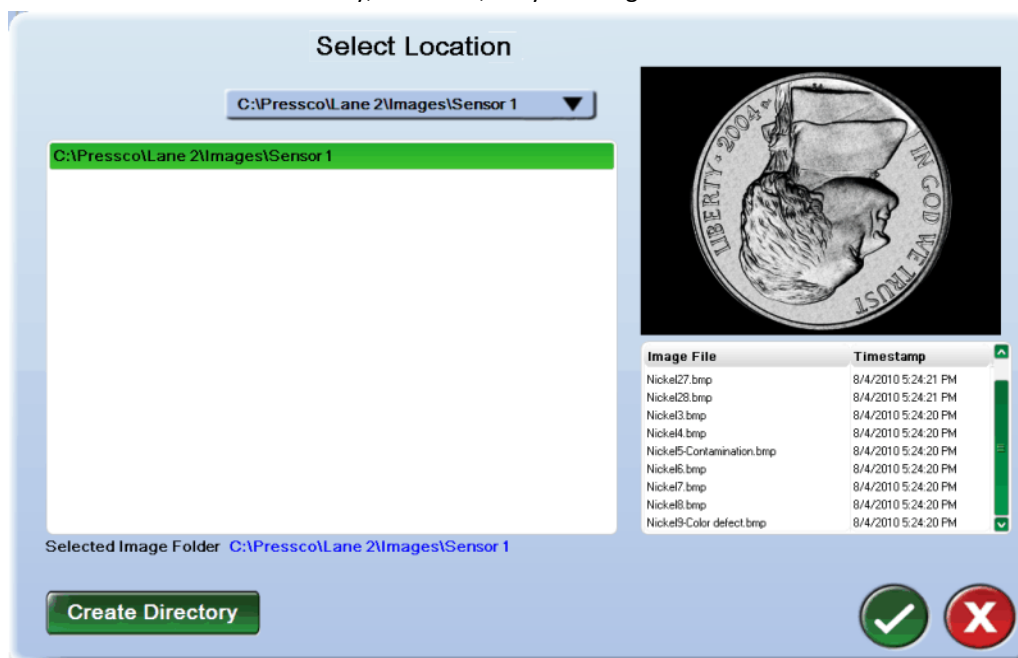


❖ *Note: You can save a whole data set from the Save Image Files menu.*

8. Click the disk icon  on the Retro-Spec graph. The Save Image Files menu is displayed.

9. Choose which images to save under the "Save What?" column. Save only the selected part image, or all the images from Data Set A or Data Set B.
10. Choose the type of image to save under the "Save Type" column. Save the image only, the image with the graphics overlaid, or two separate images (both).
11. To name the image files, enter a prefix in the "File names start with" box. The default prefix is "I" for "image." This step is important if you already have saved images and you do not wish to overwrite them.

12. Use the disk icon  under "Where to Save?" to browse to the location where you want to save images. Use the **Select Location** menu to save images to the Intellispec hard drive or to a USB device. Create a new directory, if desired, for your images.



13. Click the OK button  twice to save the image(s). The images are saved.

❖ *Note: all images in a data set will be named with unique file names. However, if you save another data set to the same folder at a later time using the same prefix, the original images will be overwritten. See **Recommendations for Image File Management** (on page 179).*

14. To save subsequent single images to the same location, click the bar on the Retro-Spec graph for another part, and then click the disk icon on the graph. Click the OK  button. The part image will be saved.

You can **load** (see "**Loading Saved Images**" on page 187) saved images at a later time for reference, setting up a part program, or testing.

❖ *Note: Part images can be dragged to the disk icon  and saved if the Lock/Move Parts button is unlocked:  See more information about this button in the **Retro-Spec Population View Graph** (on page 211).*

Recommendations for Image File Management

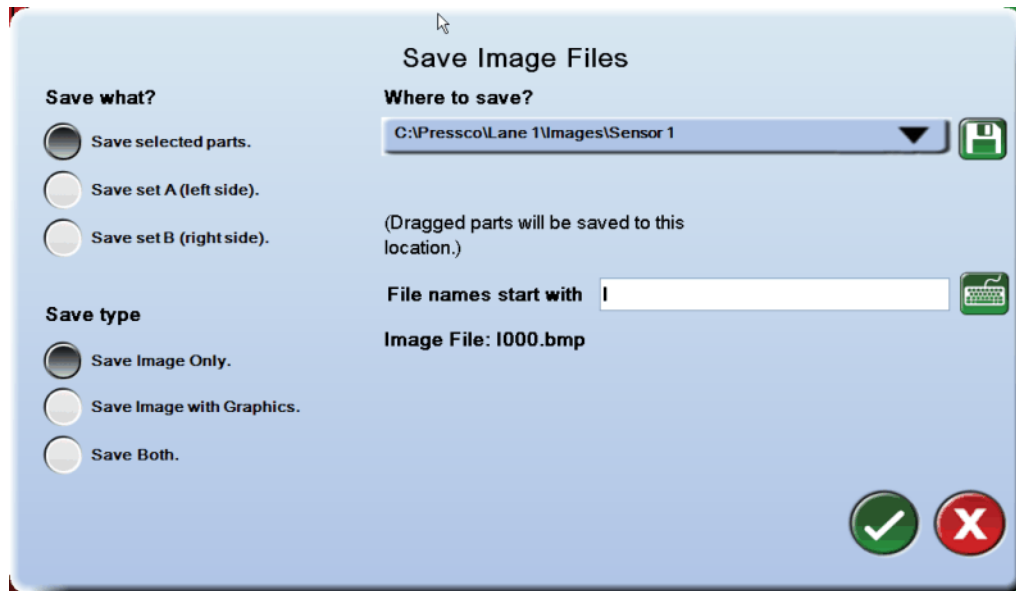
When you save the images for data sets to a folder, each image is given a unique name. However, if you save another data set to the same folder, those original images are overwritten. Therefore we recommend that you create new folders when you save data sets. Our recommendations are:

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

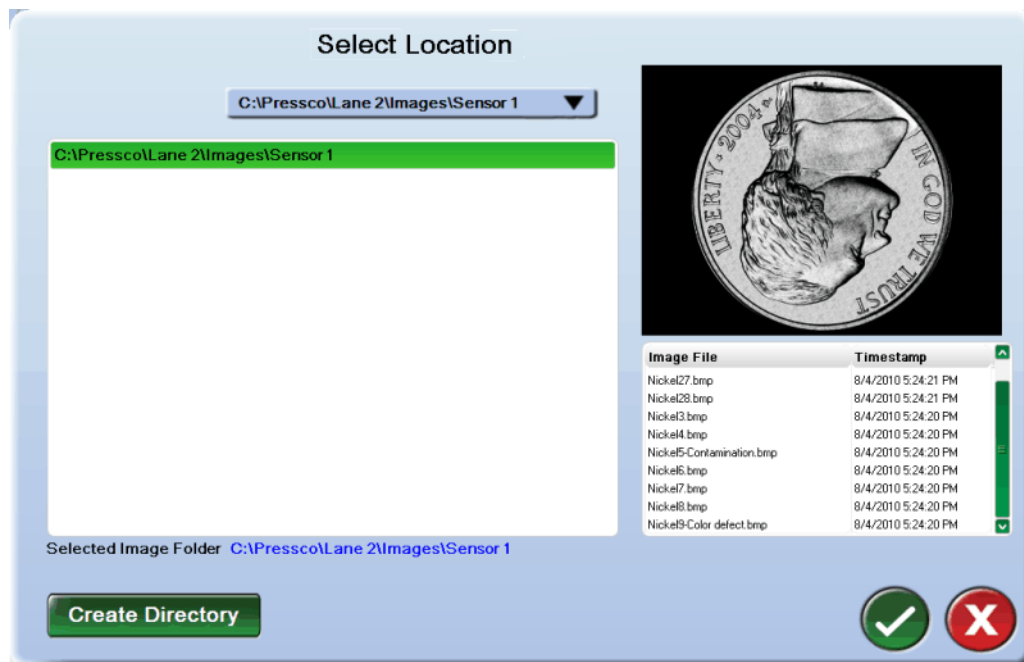
When you are **saving images** (see "**Saving Images through the Retro-Spec interface**" on page 177), you can create new folders (directories).

➤ *To create a new folder while saving images:*

1. Click the disk icon  on the Retro-Spec graph. The Save Image Files menu is displayed.



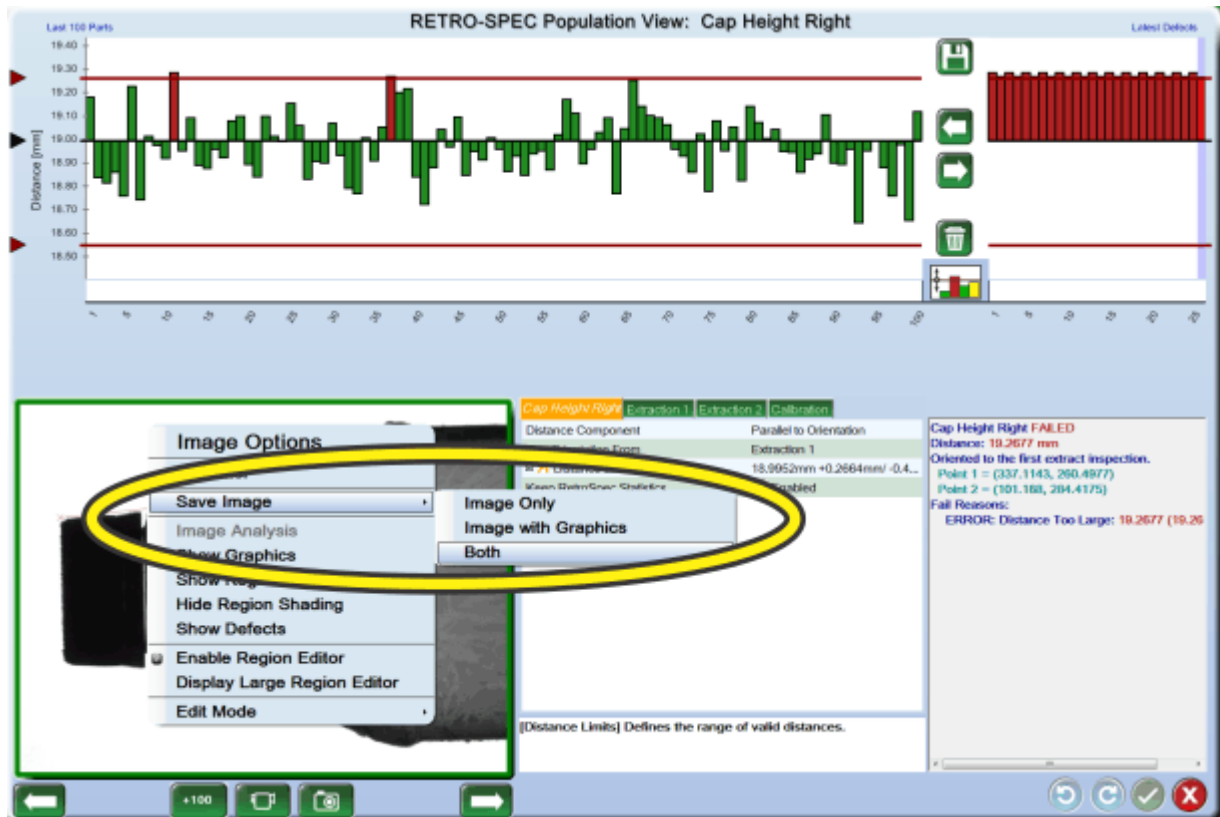
2. Click the disk icon  to browse folders. The Select Location menu is displayed.



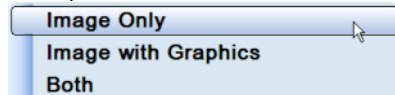
3. Click the button at the top of the menu to browse to the location that makes sense to the sensor (example, "C:\Pressco\Lane 1\Images\Sensor 1\"). Note that you can also save images to a USB device.
4. Click the **Create Directory** button to create a new folder. Rename the folder something meaningful,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

Saving Individual Images While Editing an Inspection

You can save one image while editing an inspection. To save the image, right-click over the image to see the Image Options menu. Select Save Image from the menu, then choose the desired option. The image can be saved whether the lane is online or offline.



The options are shown below.



- **Image Only** - Saves a bitmap (.bmp) image with no graphics.

❖ *Note: only bitmap images can be loaded back into the Intellispec*

- **Image with Graphics** - Saves the current image with inspection graphics on the image. It is saved as a Portable Network Graphic (.png) file.
- **Both** - Saves both files - (.bmp) with no graphics, and (.png) with graphics.

When you save an image, a dialog box, as shown below, provides options for saving the image. The image is saved to the default location shown in the box, unless you click the disk icon and specify a different location. A default file name including Lane name, date, and time is provided for you. You can rename the image by clicking on the keyboard icon and typing a new name using the on screen keyboard.



Saving Reject Images

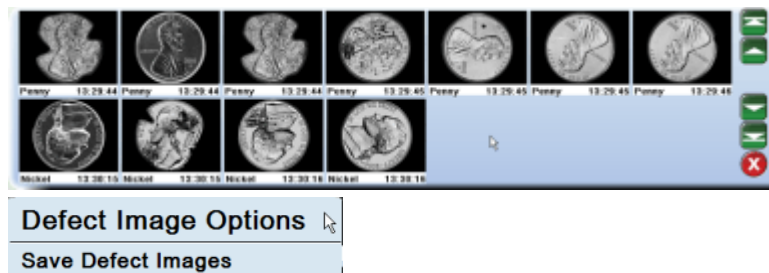
You can save images from parts that were considered defective, either from **Lane Overview** or **Sensor Overview** mode. This can be done when the **Reject Images** button on the right side of the screen is selected. Up to 100 images can be saved at a time. These images can be loaded at a later time as simulated images to assist in programming inspections or training.

Images can be saved whether the lane is online or offline.



➤ To save reject images:

1. Right-click over any image displayed in the reject image area on the screen (Images in Sensor Overview mode shown below). The Defect Image Options menu is displayed.



2. Select Save Defect Images from the menu. The Save Image menu allows you to change the directory or name of the images to be saved. A default name and directory are provided for you.
3. Change the directory or file name if desired and click the OK button to exit. The images are saved as bitmap (.bmp) images. Each image is given a unique name.

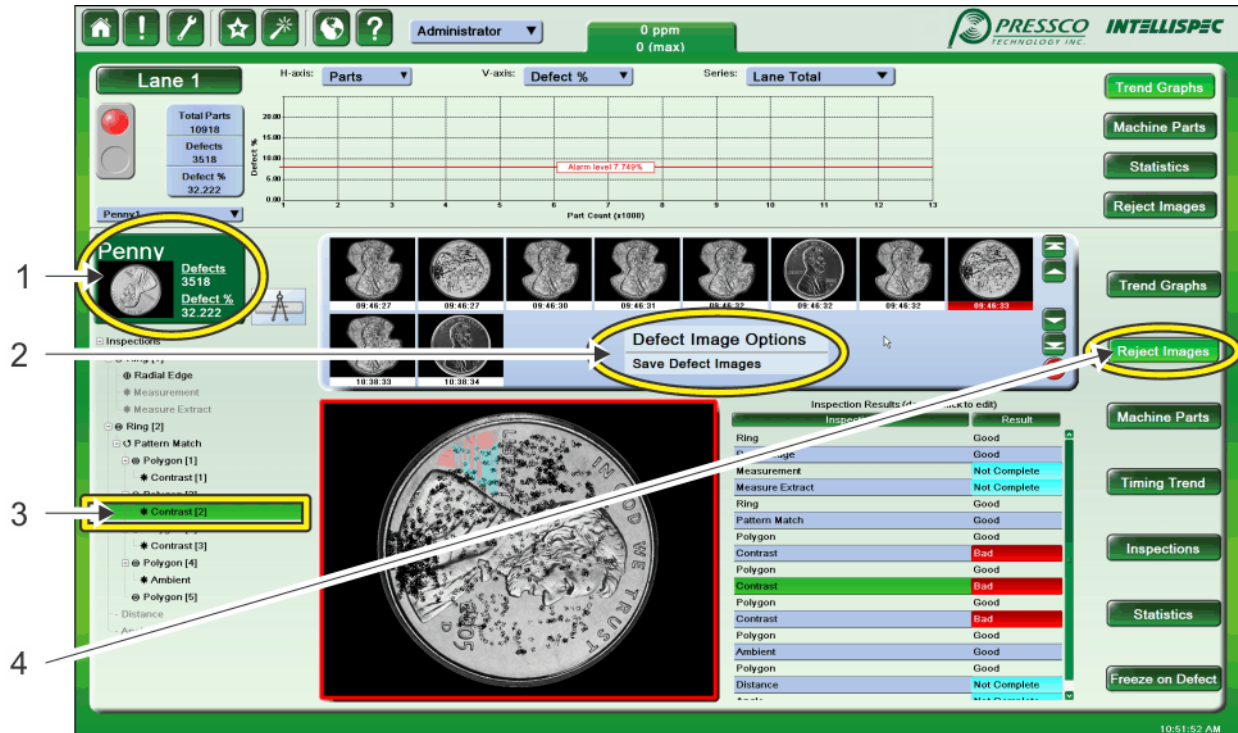
Saving Reject Images by Inspection

You can save images that failed a specific inspection in **Sensor Overview** mode [from System Overview mode, select a lane, then click a Sensor button [item 1] to go to Sensor Overview mode]. There are two ways to save inspection-specific images. Refer to the illustration below.

❖ *Note: If you select an inspection that did not fail any parts, all reject images from that sensor, up to 100 images, are saved.*

➤ *If the Reject Images button [item 4] is selected on the right side of the screen:*

1. Click the name of an inspection [item 3] in the inspection tree. The images associated with that inspection are displayed in the thumbnail image area.
2. Right-click over the set of images to see the Defect Image Options menu [item 2].
3. Select Save Defect Images from the menu. The Save Image menu allows you to change the directory or name of the images to be saved. A default name and directory are provided for you.
4. Change the directory or file name if desired and click the OK button to exit. The images are saved as bitmap (.bmp) images. Each image is given a unique name.

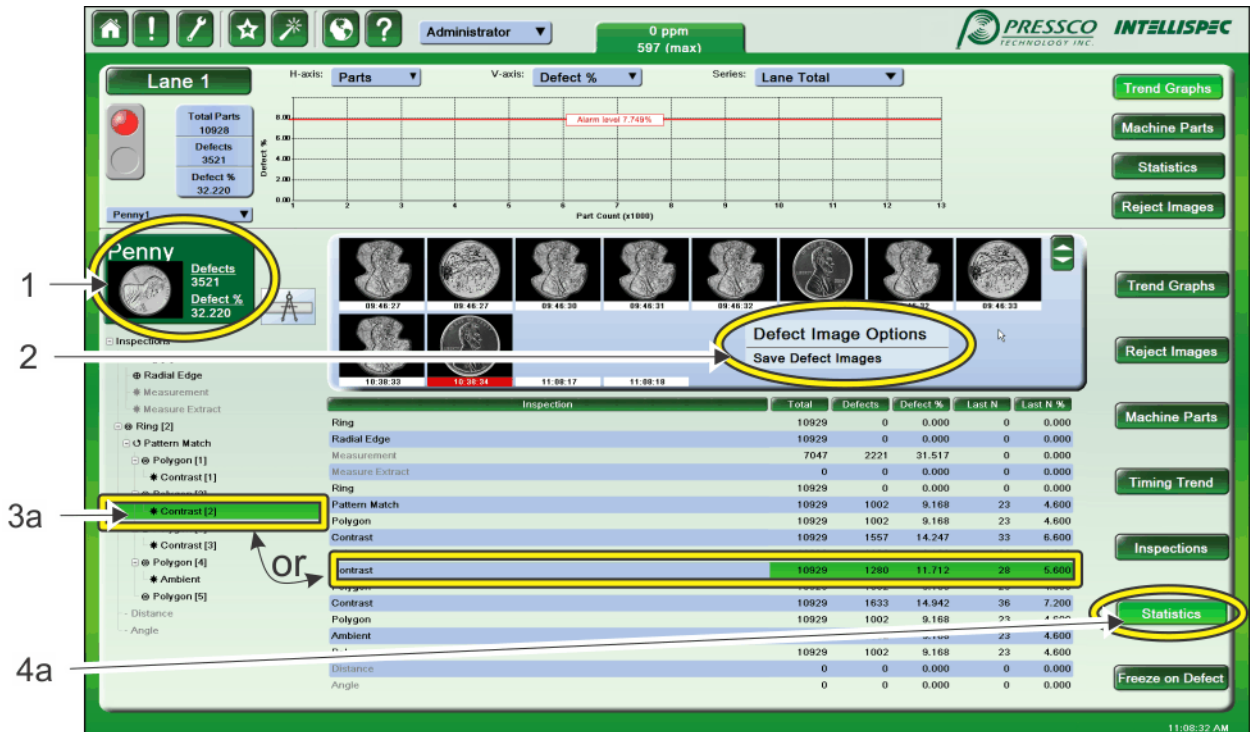


1	Sensor button
2	Right-click over image thumbnails to see Defect Image Options menu
3	Select one inspection to view defect images associated with that inspection
4	Select the Reject Images button to view thumbnails of images from defective parts

➤ *If the Statistics button [item 4a] is selected on the right side of the screen (refer to the illustration below):*

1. Click the name of an inspection [item 3a] in the inspection table. The images associated with that inspection are displayed in the thumbnail image area.
2. Right-click over the set of images to see the Defect Image Options menu [item 2].
3. Select Save Defect Images from the menu. The Save Image menu allows you to change the directory or name of the images to be saved. A default name and directory are provided for you.

4. Change the directory or file name if desired and click the OK button to exit. The images are saved as bitmap (.bmp) images. Each image is given a unique name.



1	Sensor button
2	Right-click over image thumbnails to see Defect Image Options menu
3a	Select one inspection to view defect images associated with that inspection
4a	Select the Statistics button to view detailed inspection statistics

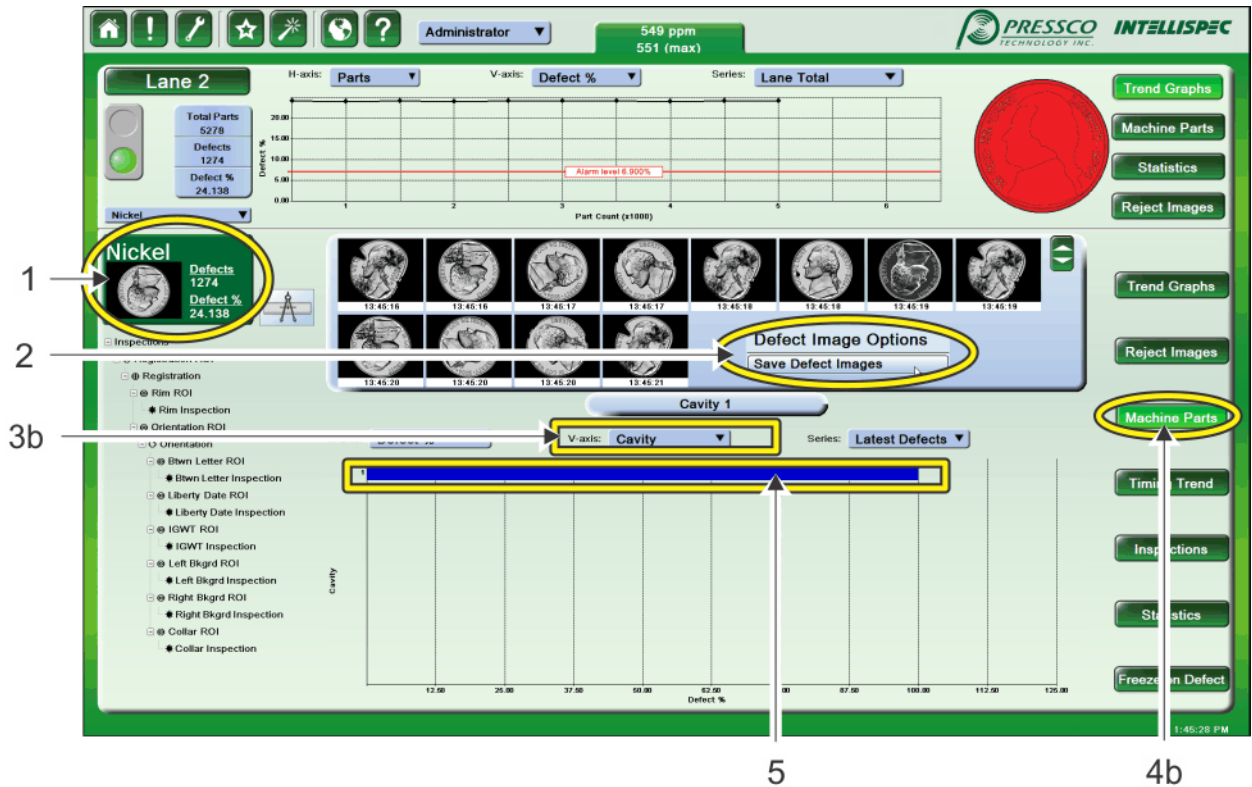
Saving Reject Images by Machine Part

You can save images that failed inspection and are associated with specific machine parts.

➤ To save images associated with a machine part (refer to the illustration below):

1. Go to Sensor Overview mode: from System Overview mode, select a lane, then click a **Sensor** button [item 1] to go to Sensor Overview mode.
2. Click the **Machine Parts** button [item 4b] on the right side of the screen. The images associated with machine parts are displayed in the thumbnail area.
3. Select a different machine part from the drop-down menu [item 3b], if desired or applicable.
4. Select a specific machine part from the graph [item 5]. The name of the machine part is displayed in the button above the V-axis selection.
5. Right-click over the set of images to see the Defect Image Options menu [item 2].
6. Select Save Defect Images from the menu. The Save Image menu allows you to change the directory or name of the images to be saved. A default name and directory are provided for you.

- Change the directory or file name if desired and click the OK button to exit. The images associated with that machine part are saved as bitmap (.bmp) images. Each image is given a unique name.



1	Sensor button
2	Right-click over image thumbnails to see Defect Image Options menu
3b	Select a machine part type
4b	Select the Machine Parts button to view thumbnails of defective parts associated with specific machine parts
5	Select a specific machine part from the graph

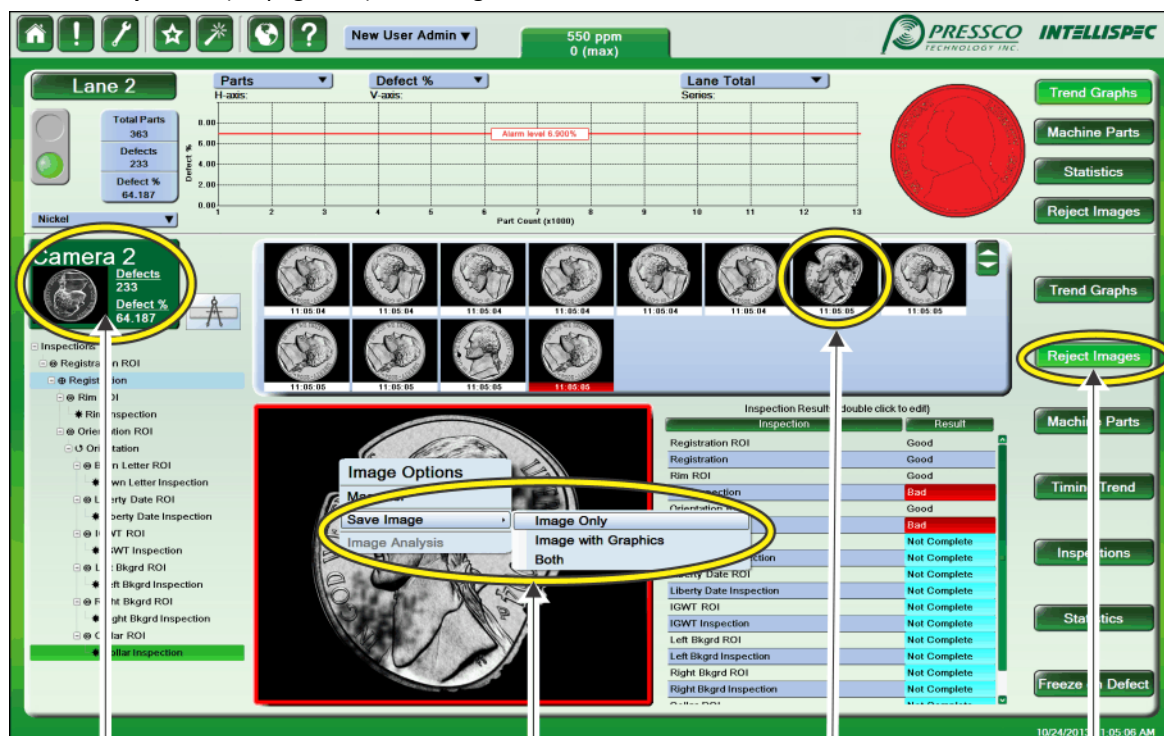
Saving Individual Reject Images

You can select any thumbnail image in **Sensor Overview** mode and save it.

➤ To save an image (refer to the illustration below):

- Go to Sensor Overview mode: from System Overview mode, select a lane, then click a **Sensor** button [item 1] to go to Sensor Overview mode.
- Click any thumbnail image [item 3c] (available when Reject Images, Machine Parts, or Statistics button is selected). The Reject Images button becomes selected after you select the thumbnail image.
- Right-click over the large image at the bottom of the screen to see the Image Options menu [item 2c].

4. Select Save Image from the menu. Choose to save the Image Only, Image with Graphics, or Both. For information about these options, refer to ***Saving Individual Images While Editing an Inspection*** (on page 181). The image is saved.



1	Sensor button
2c	Right-click over the image to see Image Options menu
3c	Select a thumbnail image
4c	When you select a thumbnail image, the Reject Images button becomes selected for you

Saving a Region of Interest (Unwrapped) Image

You can save the unwrapped region display while you are editing an inspection. The image will be saved as a Portable Network Graphic (.png) file. An example unwrapped image is shown below. The image will be the same dimensions as the defined region of interest. Note that the Intellispec stretches some images to fit the region of interest window.

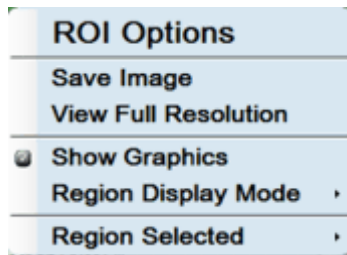
The image can be saved whether the lane is online or offline.



❖ *Note: whether regions, edges, or other graphics are saved depends on the settings when you save the image. If diagnostics are on, or if Show Graphics is enabled, those items are saved with the image.*

➤ **To save the unwrapped image while editing an inspection:**

1. Right-click in the unwrapped image area to view the **ROI Options menu** (see "**Unwrapped Region of Interest Options**" on page 211).



2. Choose Save Image from the menu. The Save Image menu allows you to change the directory or name of the image to be saved.
3. Change the directory or file name as desired and click the OK button to exit. The image is saved as a .png file.

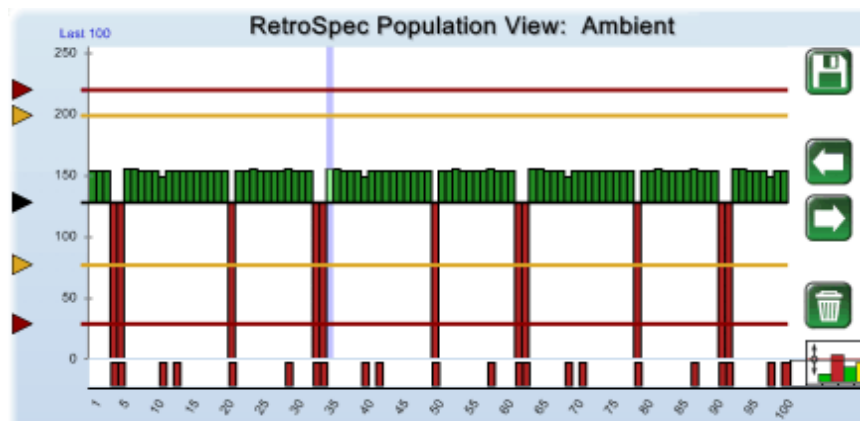
Loading Saved Images

This topic covers how to load images through the Retro-Spec interface. You can also choose an **Image Source** (on page 168) through the Sensor menu.

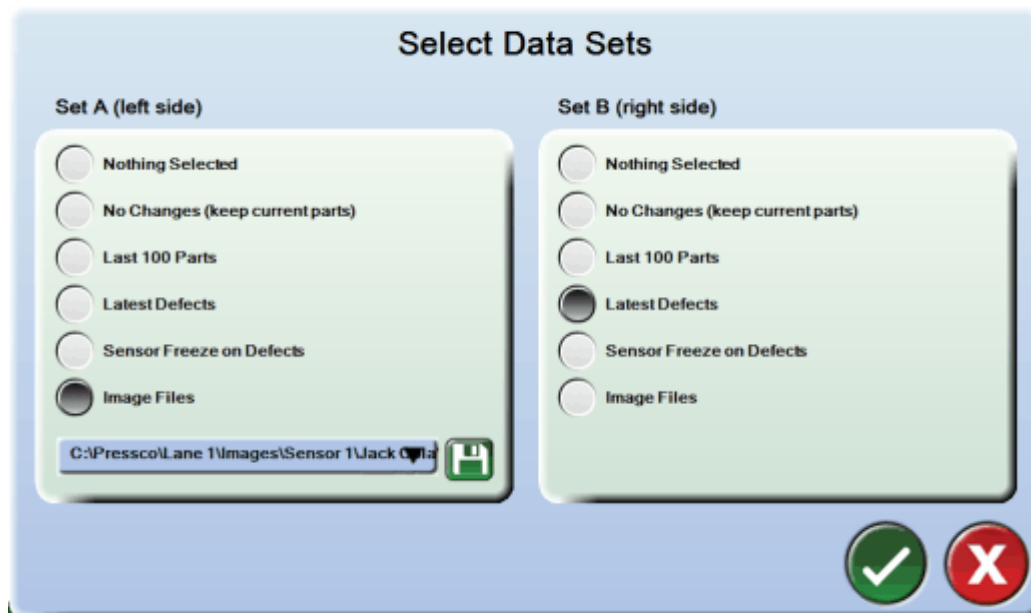
You can load images previously **saved** (see "**Saving Images through the Retro-Spec interface**" on page 177) on the Intellispec to use as reference, test part sets, or to set up a part program without the production line running. You must have user access to edit part programs.

➤ **To load images:**

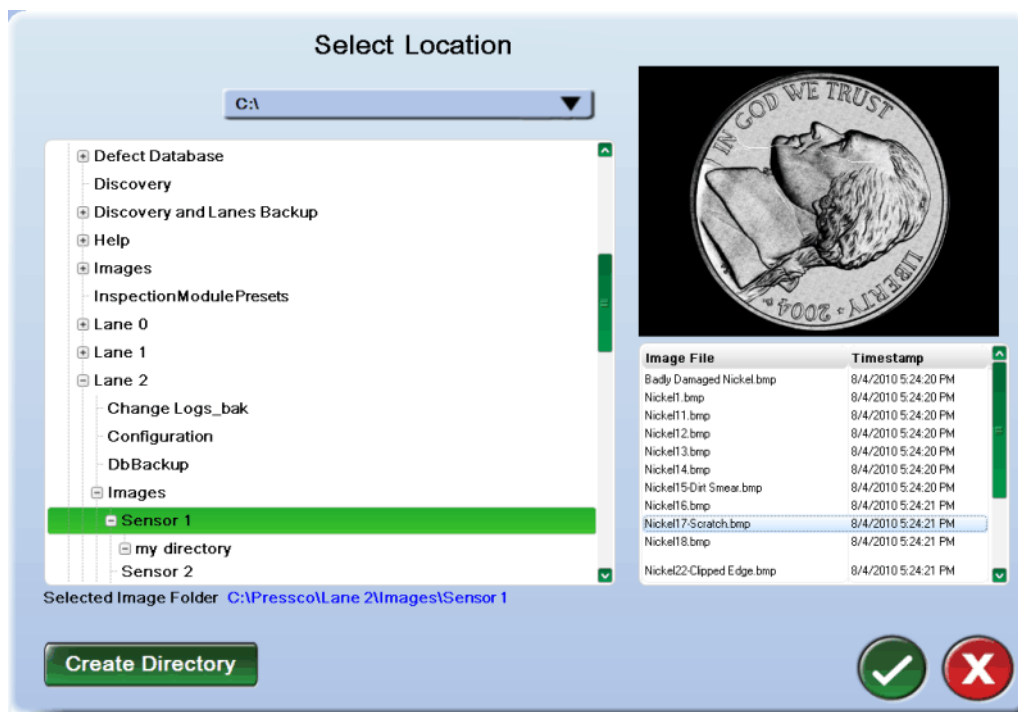
1. Go to Sensor Overview mode [from Home, click Lane button, then Sensor button].
2. Double-click the name of any Registration, Orientation, or Analysis in the inspection tree to view the Retro-Spec interface graph. A partial graph is shown below.



- Click one of the left or right arrow buttons  to view the **Select Data Sets** menu.



- Click the Image Files button for either Set A or Set B.
- Click the disk icon  to browse to the folder where the images were saved. The **Select Location** menu is displayed.

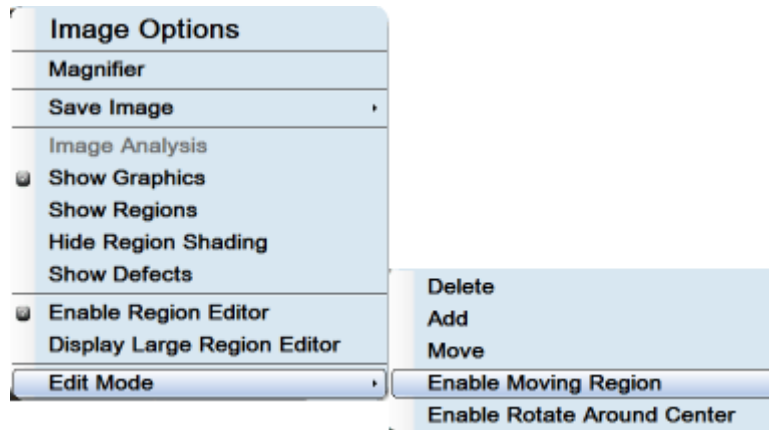


- Browse to and select the folder that contains the images you want to load.
 - To preview the images in the folder, browse through the file names in the window on the right of the Select Location menu.
- Click the OK button  twice. The Intellispec loads all the bitmap images that were previously saved in the selected folder.

Image Options

While editing an inspection screen, right-click in the part image to see the Image Options menu. A small check indicates that the option is currently active. Click an option to make it active or toggle it to inactive. The default Image Options menu is shown below.

❖ *Note: some menu items are not shown when you are viewing a registration or orientation. You see a slightly different menu in **Measure ROI** (on page 223) inspection.*



There are options for certain regions. Options are grayed out if they do not apply to the current inspection.

Magnifier

Open the **Image Magnifier** (on page 154).

Save Image

Save an individual image. Refer to **Saving Individual Images While Editing an Inspection** (on page 181).

Image Analysis

Not available from this menu as of this printing. See also **Image Analysis** (on page 158).

Show Graphics

Display the region and graphics for the current inspection.

Show Regions

Display the region(s) from other inspections in the same part program.

Hide Region Shading

Remove the shaded graphics from the screen so that you can see more of the part image.

Show Defects

Does not function from this menu as of this printing.

Enable Region Editor

Change the shape and placement of the region directly on the image. You must enable one of the options in **Edit Mode** (or at the bottom of the menu) to edit the region.

Display Large Region Editor

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

Enable Moving Center

[Available when you are editing a region inspection] Change the center of the region when you are using Region Editor directly on the image.

Enable Region Resizing

Resize the region directly on the image.

Enable Set Region Direction

[Available in certain inspections such as Measure ROI] When this feature is enabled, click on the region in the image. The region box will be displayed in yellow with diamonds around the box. Click on one of the diamonds to make the inspection search in the direction of the selected diamond. The selected diamond is filled in solid yellow.

Center Ring

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

Edit Mode

This mode is available while you are editing a Ribbon or Polygon region. A Polygon inspection has the option to “Complete Build Mode” to add points to the polygon. Edit Mode becomes available after a Build Mode is complete. Options below are only active if a check mark appears next to the option in the menu.

Delete - Click all polygon or end points that you want to delete. To stop deleting points, right-click to see Image Options menu. Select Edit Mode > and un-check Delete.

Add - Click anywhere between two points to add another point. To stop adding points, right-click to see Image Options menu. Select Edit Mode > and un-check Add.

Move - move one point in the polygon or ribbon. Move the cursor over the point you want to move, then click and drag the point.

Enable Moving Region - [only available when Move is enabled] Move the entire region at once. To move the region, click anywhere on the image except on one of the yellow polygon or ribbon points. Click and drag the region to move it.

Enable Rotate Around Center - [only available when Move is enabled] Rotate the entire region with respect to the center. To rotate the region, click anywhere on the image except on one of the yellow polygon or ribbon points. Click and drag the region to rotate it.

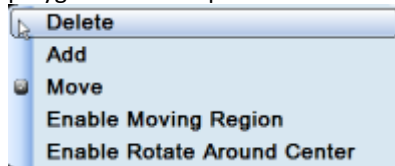
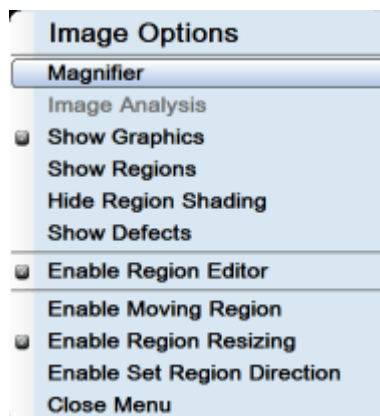


Image Options - Measure ROI and Cylindrical Regions

When you right-click the image while setting up a region, you will see a different image options menu for some regions. Most of the menu items are the same as in the default *image options* (on page 189) menu. The last three items are different.



To avoid confusion, we recommend that you make each adjustment one at a time. For example, Enable Moving Region to move the region, then disable it. Then Enable Region Size to adjust the size, then disable it. Then Enable Region Direction to set the direction.

Enable Moving Region

Enable Region Editor must be enabled before you can move the region. Click and drag the entire region.

Enable Region Resizing

Adjust the region size by clicking on the image and moving the yellow points.

Enable Set Region Direction

Click a diamond on any side of the ribbon to change the search direction for the Measure Extract inspection.

Close Menu

Until you use Close Menu or click on the image, the Image Options menu stays open.

Chapter 12

Inspection Overview

This section includes basic information about part programs, part tracking, and Retro-Spec graphs. For detailed information about adding or adjusting inspections, see the section about **Inspections** (on page 217).

Inspection Terminology

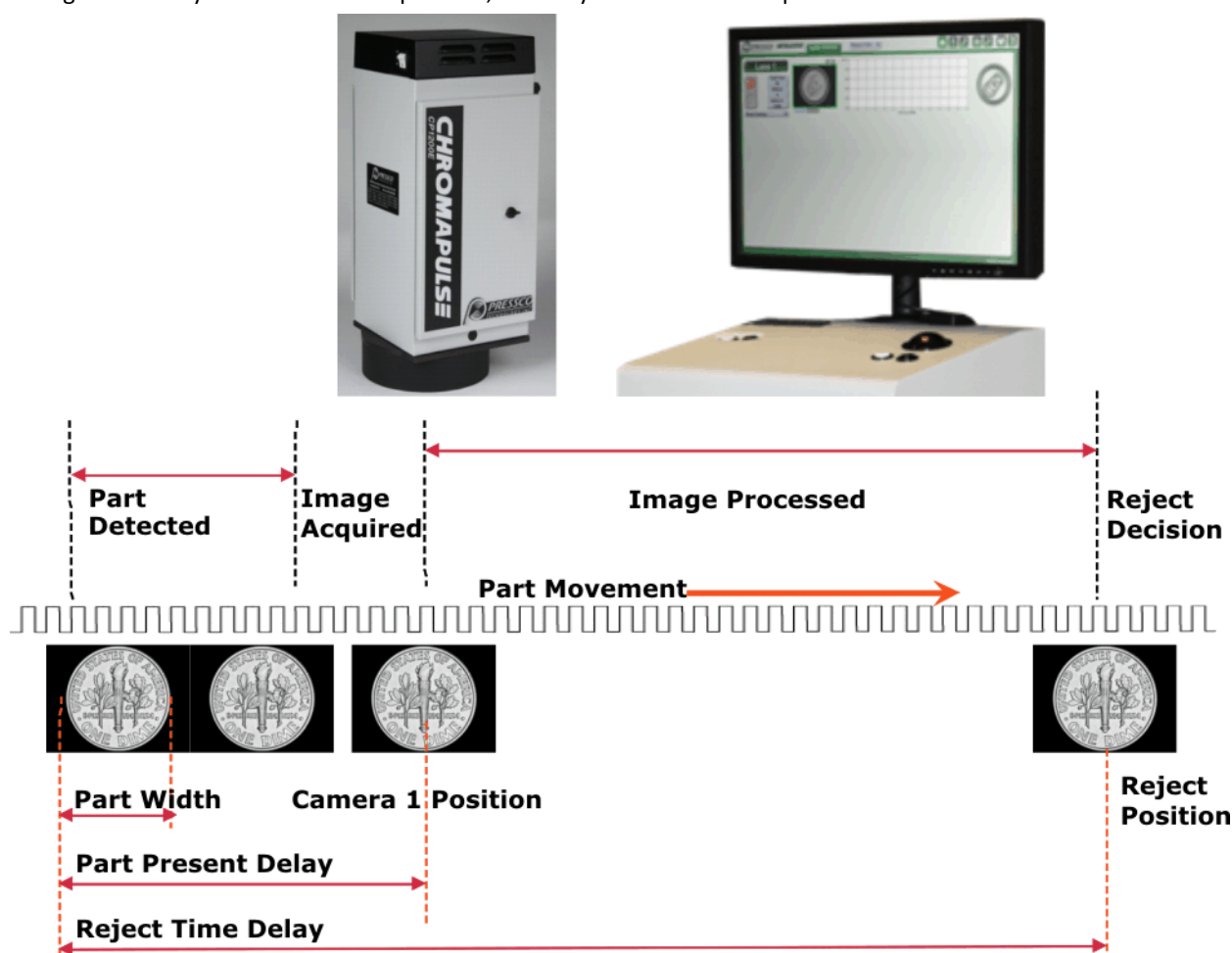
The following terms are used throughout this manual and the software. A basic understanding of this terminology will help you understand how the system operates.

Term	Description
Analyses (on page 239)	An analysis usually analyzes the pixel shade information within a region and compares it to programmed 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.
Dimensions (on page 258)	The dimension inspection type is special in that it 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 the purpose of 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 products. Sometimes referred to as a tunnel. The inspection module can consist of a different sensor than a camera to make measurements of your product.
Lane	A lane usually refers to one production line, and can contain multiple sensors.
Orientations	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 (on page 194)	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 (see " Regions of Interest (ROI) " on page 219)	The Region indicates where on the part the analyses will take place. You may have as many analyses, enhancements, registrations, or orientations as you like in one region.
Registrations (on page 225)	A registration compensates for part movement by calculating 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 used in inspections 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 would have affected the most recent inspection population, without unnecessarily rejecting parts.
Sensor	A camera, Intellimass, or other sensor that acquires images, measurements, or other data from your product.

Sequence of Events During Inspection

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



Part Tracking

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.

Part Tracking includes:

Part Present Delay Calibration (on page 123)

Reject Delay Calibration (on page 125)

Reject Confirm Calibration (see "**Reject Confirm Calibration (Optional)**" on page 130)

How to Create, Copy, or Import a Part Program

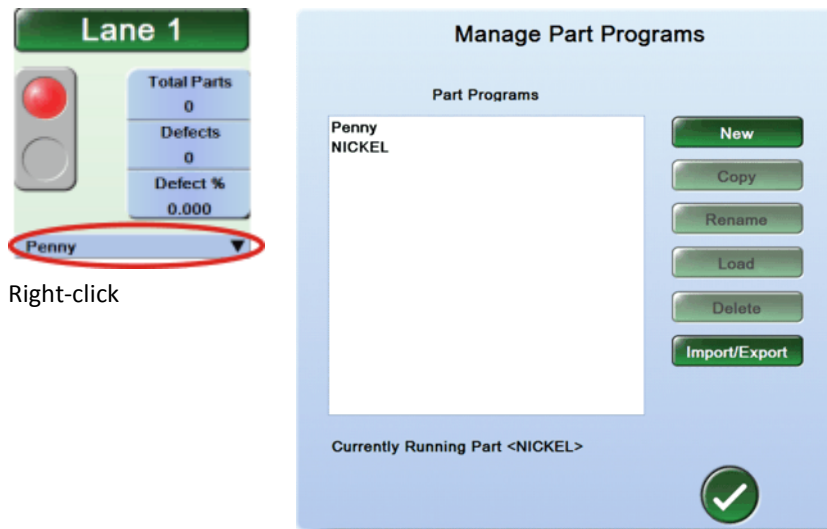
A new Part Program can be created from scratch, imported or exported to/from disk, or copied from an existing part program. A Part Program is created in the Lane Overview or Sensor Overview screen.

➤ **You will need:**

- User access to create part programs

➤ **To create a Part Program:**

1. Go to a Lane Overview or Sensor Overview screen [from Home: Lane button > Sensor button].
2. Right-click over the part program drop-down menu. The Manage Part Programs menu is displayed. Choose from the available options described below.



➤ **To create a new program:**

1. Click the **New** button. An on-screen keyboard is presented.
2. Name the new part program. We recommend that you use your part's name and size in the part program name.
3. Click the OK button  to save the new part program. The new part program is automatically loaded and displayed in the drop-down menu below the traffic light. No inspections are created yet.
4. Click the OK button again to close the Manage Part Programs menu.
5. Add inspections as appropriate for your part. Use inspections recommended by Pressco technicians to best inspect your part.

➤ **To copy a program:**

You can use a copy of a part program to modify it to inspect a slightly different part, or modify the copied part program without changing the original program.

1. Right-click over the part program drop-down menu (under the traffic light). The Manage Part Programs menu is displayed
2. Select one of the available part programs, then click the **Copy** button. A copy of that part program is saved under a default name such as "(1) Penny."
3. Select the new part program, and use the **Rename** button to rename the program to something more meaningful to you.

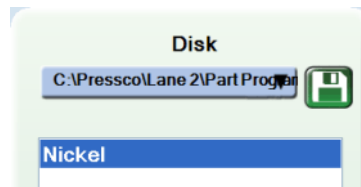
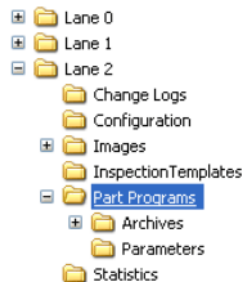
➤ **To import an existing program:**

You may have used a part program in another Intellispec system, or Pressco may have sent you a part program to use. Import that program to use it on your current system.

1. Right-click over the part program drop-down menu (under the traffic light). The Manage Part Programs menu is displayed
2. Click the Import/Export button. An "Import or Export Part Programs" menu allows you to choose a part program from disk.



3. To browse to another location on the computer, click the disk icon .
4. Locate the desired folder and click OK in the menu. The Intellispec will only choose part program names with a ".PPP" extension. You will not be able to see the names nor extensions when choosing through this menu.
 - In this example, we clicked the Part Programs folder, then clicked OK to view the available part programs.



5. To import the part program, highlight the name in the right side of the menu under "Disk."
6. Click the left arrow. The part program is imported into the "Current Part Programs" list.
7. Click the OK button to exit the menu.

➤ **To load the new program:**

1. Highlight the program name in the Manage Part Programs menu, then click the **Load** button. The program name will appear in the Part Program drop-down menu on the Lane Overview or Sensor Overview screen.
2. Click the OK button  to exit the Manage Part Programs menu.

See also **Export a part program** (on page 113)

Part Changeover

When you change your production line from one part type to another, you can quickly change the part program.

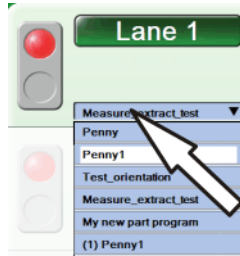
❖ *Note: Some menu items are only available to advanced level users.*

➤ **What you need:**

- User permission to Switch Part Program

➤ **To change parts:**

1. **Log in** (see "**Logging in and logging out**" on page 49).
2. Click the part drop-down menu.



3. Click the name of the new part to inspect. The new part program is loaded on the Intellispec.
4. Put the system 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, regions, enhancements, and analyses.

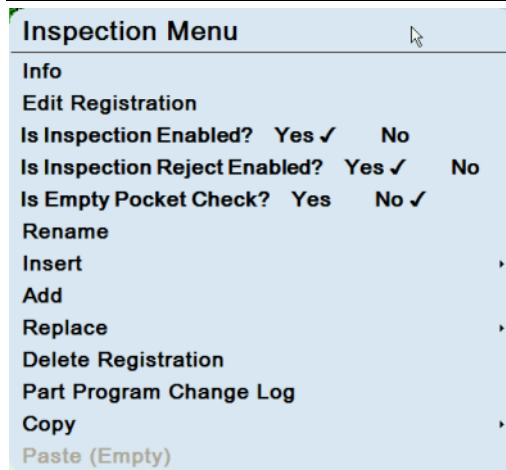
Lane Specific Information	Definition
Cameras (or other sensor)	All information for each camera or other sensor is contained in the Part Program.
Lighting	Each camera has different lighting settings for each part. When you load your Part Program after a Part Changeover, the lighting will be specific for that part and save any changes you make.
Calibration	Calibration setup for Part Present Delay and Reject Delay is saved for each part you will run. Part Present and Reject Delay will only need to be set up once.
Regions, Registrations, Orientations, Enhancements, Analyses, Dimensions	All Inspections will be contained in your Part Program. Also, parameter changes are saved for each Part Program.

Inspection menu

The Inspection menu is used to create and edit part programs. Right-click over any analysis, region, orientation, or registration name to see the Inspection menu. A menu similar to the one shown below is displayed.

❖ *Note: For simplicity, we use the term 'inspection' to include analyses, regions, enhancements, registrations, etc.*

❖ *Note: some items may be grayed out if you do not have user access to those items, or if they do not apply to the current menu.*



The items in the Inspection menu are as follows:

Info

Display general information about the inspection.



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

Edit Analysis/ Region/ Orientation/ Registration

Open the Inspection Editor - performs the same action as double clicking.

For the items below, the name of the inspection becomes color-coded. See the illustration below.

Is Inspection Enabled?

You can temporarily turn off the inspection by clicking this option. If "Yes" is checked, then inspection is enabled.

Click the menu item to disable the inspection; "No" becomes checked in the menu. If an inspection is disabled, all of its dependent inspections will be disabled as well. The inspection name is grayed out in the inspection tree when it is disabled [item d in the illustration below].

Is Inspection Reject Enabled?

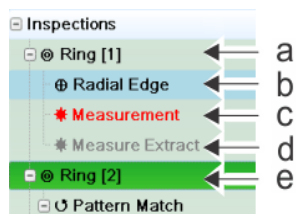
You can temporarily pass all parts regardless of whether they pass or fail the current inspection (if Reject is disabled). If "Yes" is checked, then inspection reject is enabled.

Click the menu item to disable the inspection reject; "No" becomes checked in the menu. The inspection name is displayed in red when the inspection reject is disabled [item c in the illustration below].

Is Empty Pocket Check?

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

When the Empty Pocket Check is enabled, the inspection is highlighted in blue in the menu as shown below [item b].



a	Inspection in normal state
b	Inspection is an empty pocket check
c	Inspection reject is disabled
d	Inspection is disabled
e	Inspection is currently selected by the cursor

Rename

Rename the inspection to something that makes sense to you. This name will appear in the inspection tree, graphs, and anywhere else the inspection name occurs.

Insert

Choose from the available list to add one item above the currently selected item.

Add

Add an item from the available list. The list varies, depending on the current item.

Replace

Replace the current item with a similar item. Regions can be replaced with other regions, registrations replaced with other registrations, etc.

Delete Analysis/ Region/ Orientation/ Registration

Delete the current item from the inspection tree list. If the item has other items below it (at a lower hierarchy), those items are deleted as well.

Delete All Inspections

[only shown when you right-click on "Inspections" at the top of the inspection tree] Delete all inspections from the current part program.

Part Program Change Log (on page 200)

Display the Part Program Change Log. This lists the inspections and the edit history for each. You can view all inspections from one sensor, other sensors, or other part programs.

Copy

Copy the current item and descendants (if applicable). The items are copied to the clipboard. Use Paste to place them in the inspection list. You may copy a part program to the same sensor, a different sensor, or different lane.

To copy the part program to another Intellispec system, use the Export function. See **Export a part program** (on page 113).

Paste

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

Collapse All

[only shown when you right-click on "Inspections" at the top of the inspection tree] Collapse the inspection tree to the top level inspection. This does not affect inspection.

Click the **Details** button to see more information about the highlighted item. A pop-up window displays more information, including the number of times the inspection was modified.

Change Log Details

Name: _____

Sensor: Panel

Part Program: Demo Converted End

Inspection: Pattern Match

Inspection Details

Modified Times	Last Modified	User
7	2010-04-13 11:18:45	Tricia

Change Details

Action	Time Stamp	User
Modified inspection parameter:	2010-04-13 11:18:50	Tricia

Inspection Name: Pattern Match

Parameter Name: Inspection Disabled

Before: True

After: False

☒ Show Deleted Items

Click the **Filter** button to choose the items to display in the log. As soon as you select any option, the Change Log is updated. Some options are dependent on others; for example, if you want to see the Historic Names for the Sensor, you must choose Historic Names for Inspection first.

Filters

	Historic Name	Selected	Show All	Historic Mode
Inspection	Pattern Match	Pattern Match	☒	Historic Names ▼
PartProgram	Demo Converted End	Demo Converted End	☐	Current Names ▼
Sensor	Pattern Match	Panel	☐	Current Names ▼
User		Tricia ▼	☒	

☒ Show Deleted Items

➤ **To see inspection differences:**

1. Click the **Difference** button to see a list of differences in inspections. A Mark Start/ Mark Stop menu is displayed, and the inspections in the list are highlighted in magenta (depending where your cursor is).

Mark Start

Mark Stop

☒ Show Deleted Items

Type	Time Stamp	User	Camera/Sensor
Create	2010-04-16 10:43:19	Tricia	Rivet
Create	2010-04-16 10:43:21	Tricia	Rivet
Create	2010-04-16 10:48:38	Tricia	Rivet
Create	2010-04-26 15:37:48	Tricia	Panel
Edit	2010-04-26 15:38:14	Tricia	Panel
Edit	2010-04-26 15:38:51	Tricia	Panel
Edit	2010-04-26 15:38:51	Tricia	Panel
Edit	2010-04-26 15:38:51	Tricia	Panel
Create	2010-04-26 15:48:12	Tricia	Panel
Edit	2010-04-27 14:27:18	Tricia	Rivet
Edit	2010-04-27 14:27:24	Tricia	Rivet
Edit	2010-04-27 14:27:28	Tricia	Rivet
Edit	2010-04-27 14:27:36	Tricia	Rivet
Edit	2010-04-27 14:28:11	Tricia	Panel
Edit	2010-04-27 14:28:31	Tricia	Panel
Edit	2010-04-27 14:28:41	Tricia	Panel
Edit	2010-04-27 14:28:58	Tricia	Panel

2. Click the **Mark Start** button.
3. Click on the first item in the list where you want to begin viewing inspection differences. (this is similar to holding the Shift key and selecting multiple items in a list)
4. Click the **Mark Stop** button.
5. Click on the last item in the list where you want to view inspection differences. Your selected items are highlighted in magenta.

- Click the OK button  in the Mark Start/ Mark Stop menu. A Differences table is displayed. This allows you to view a shorter list of items, only those of which have been changed. Only edited (not created) inspections are included.

User	Camera/Sensor	Part Program	Inspection	Parameter	Before	After
Tricia	Panel	Demo Converted End	Clipping	Enable Clipping	True	False
Tricia	Panel	Demo Converted End	Clipping	Clipping Mode	Clip Black Level	Clip Black and White Levels
Tricia	Panel	Demo Converted End	Clipping	Black and White Level	30 (225)	30 225
Tricia	Panel	Demo Converted End	Radial Edge	Rejector Disabled	True	False
Tricia	Panel	Demo Converted End	Ring/VO	Inspection Disabled	False	True

Details 

Rollback

This feature allows you to restore the part program to a previous state, allowing you to undo several changes at once.

➤ To use the Rollback feature:

- Check the box next to the Rollback button at the top of the Part Change Log Viewer screen.
- Scroll down towards the bottom of the inspection list. The latest changes are at the bottom of the list.
- Choose a line where you want to delete the latest changes, including the selected line.
- Click the Rollback button near the top of the screen. A Rollback Preview is displayed so that you can see what will be deleted.

Type	Time Stamp	User	Camera/Sensor	Inspection	Parameter	Before	After
Edit	2010-12-28 17:17:31	Administrator	Nickel	Contrast	Contrast Limits	G 30.74 W W 30.52 E	G 15.51 W W 32.78 E
Edit	2010-12-28 17:17:31	Administrator	Nickel	Polygon	Polygon Points	Changed	
Delete	2010-12-28 17:17:31	Administrator	Nickel	Ring			
Delete	2010-12-28 17:17:31	Administrator	Nickel	Clipping			
Delete	2010-12-28 17:17:31	Administrator	Nickel	Clipping			

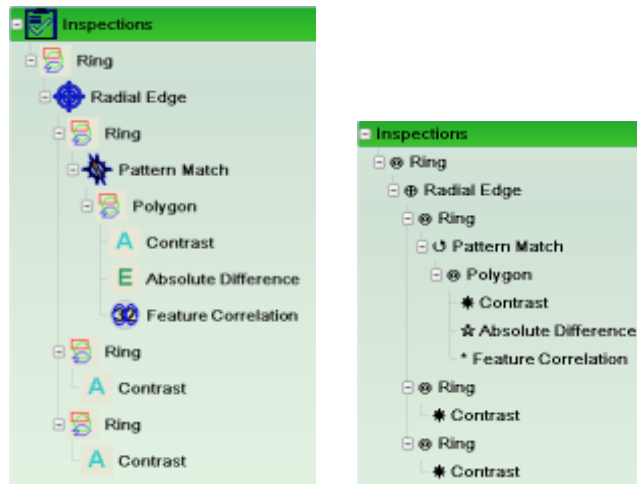
Details  

- If desired, click the Details button to see the inspection change details of each line.
- If you are ready to delete the displayed lines, click the OK button . The lines are deleted, and the part program is changed back to a previous state.

Inspection type icons

In the Inspection tree, you may see icons or symbols that indicate the General Type of inspection for each item. These allow you to quickly identify these inspections, without the need to view more information through the menus.

❖ *Note: these are options. To enable icons or symbols, right-click on a Sensor button in the Sensor Overview mode and select Options >> check Show Icons or Show Symbols.*



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

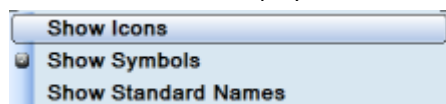
Options (sensor menu)

The Sensor Options menu allows you to display the inspection tree the best way for you. Some options hide objects from the inspection tree which makes it easier for adjustments. Other options display icons or symbols to help you quickly identify inspection types.

❖ *Note: these settings apply to the current sensor view only.*

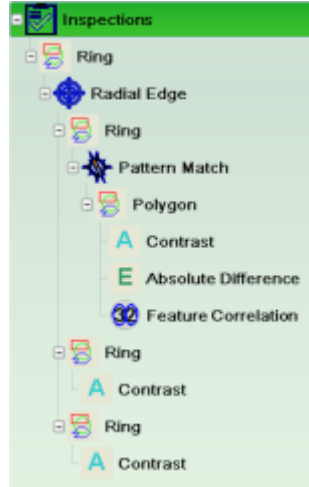
➤ To enable an option:

1. From the Sensor Overview mode, right-click a Sensor button.
2. Select Options >> then select one of the options described below. An option is enabled when a check mark is displayed next to the option.



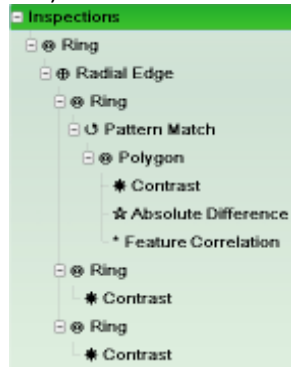
Show Icons

Displays icons that reflect the different *inspection types* (see "*Inspection type icons*" on page 202).



Show Symbols

Displays symbols that reflect the different *inspection types* (see "*Inspection type icons*" on page 202).

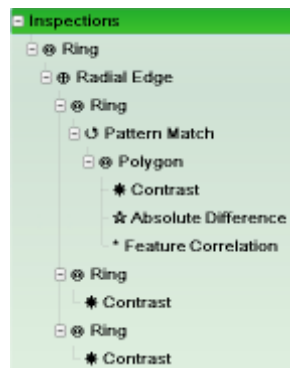


Show Standard Names

Displays the default Intellispec inspection names. You may have other inspection names that make sense to the inspection of your part. Showing Standard Names is useful to Pressco engineers or to someone troubleshooting your machine, so that they quickly know the exact inspection type.

Inspection Tree Relationships

The inspection tree shows the relationship of each inspection. Indented objects are dependent on the object above it. Indented objects are created when you "Add" an item from the Inspection menu.



Some items in the menu may be turned off. The ability to access some items depends on your user access.

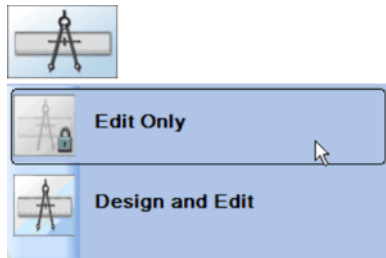
Inspection tree items may be highlighted in different colors. Below is a key.



a	Inspection in normal state
b	Inspection is an empty pocket check
c	Inspection reject is disabled
d	Inspection is disabled
e	Inspection is currently selected by the cursor

Design Mode Icon

The **Design Mode** icon provides additional part program restrictions. Click the icon to see the options.



- If you select **Edit Only**, then users are allowed to edit, but not add, the inspections. This also restricts access to regions.
- If you select **Design and Edit**, then users are allowed to edit and add inspections, as well as add and edit regions.

❖ *Note: some users (for example, Operators) cannot edit or add inspections regardless of this setting. To add and edit inspections in Design and Edit mode, users must also have proper permissions. See **Managing Permissions** (on page 55).*

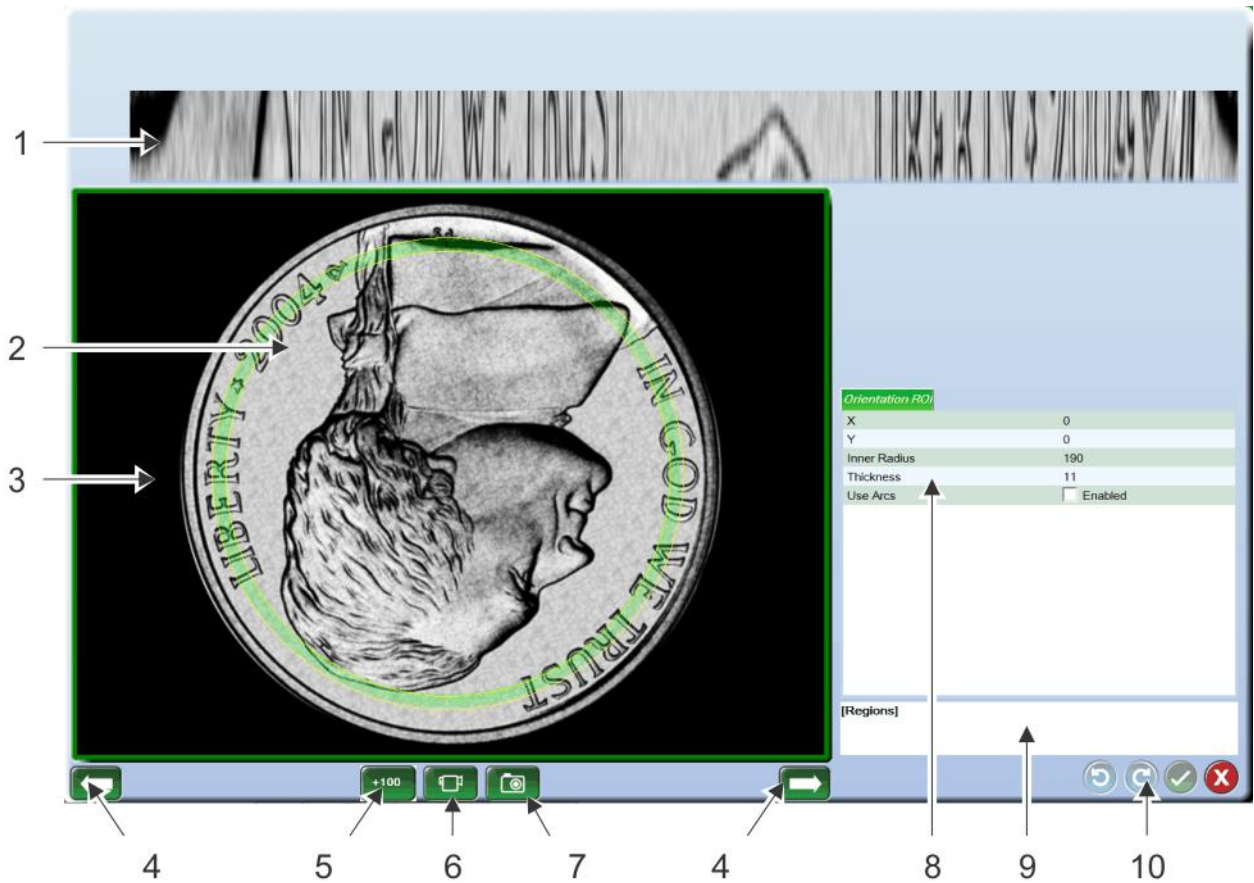
See also **how to create a part program** (see "**How to Create, Copy, or Import a Part Program**" on page 195)

Adding Regions and Inspections

To add an Analysis, Enhancement, etc., you must first add a Region. The Region indicates where on the part Analyses or Enhancements are applied. Right-click over the inspection tree, select Add, then choose an item to add. You may add as many inspections underneath the region as you wish.

Region Editor

This view is available when you are editing a region. If you have proper user access, you can edit a region by double-clicking the region name, or right-clicking the region name, then selecting Edit Region from the pop-up menu.



❖ *Note: In Region editor, you will not see anything happen if you click numbers 5, 6, or 7. The data set is changed, but you will not see the data set until you view the **Inspection Editor** (on page 207).*

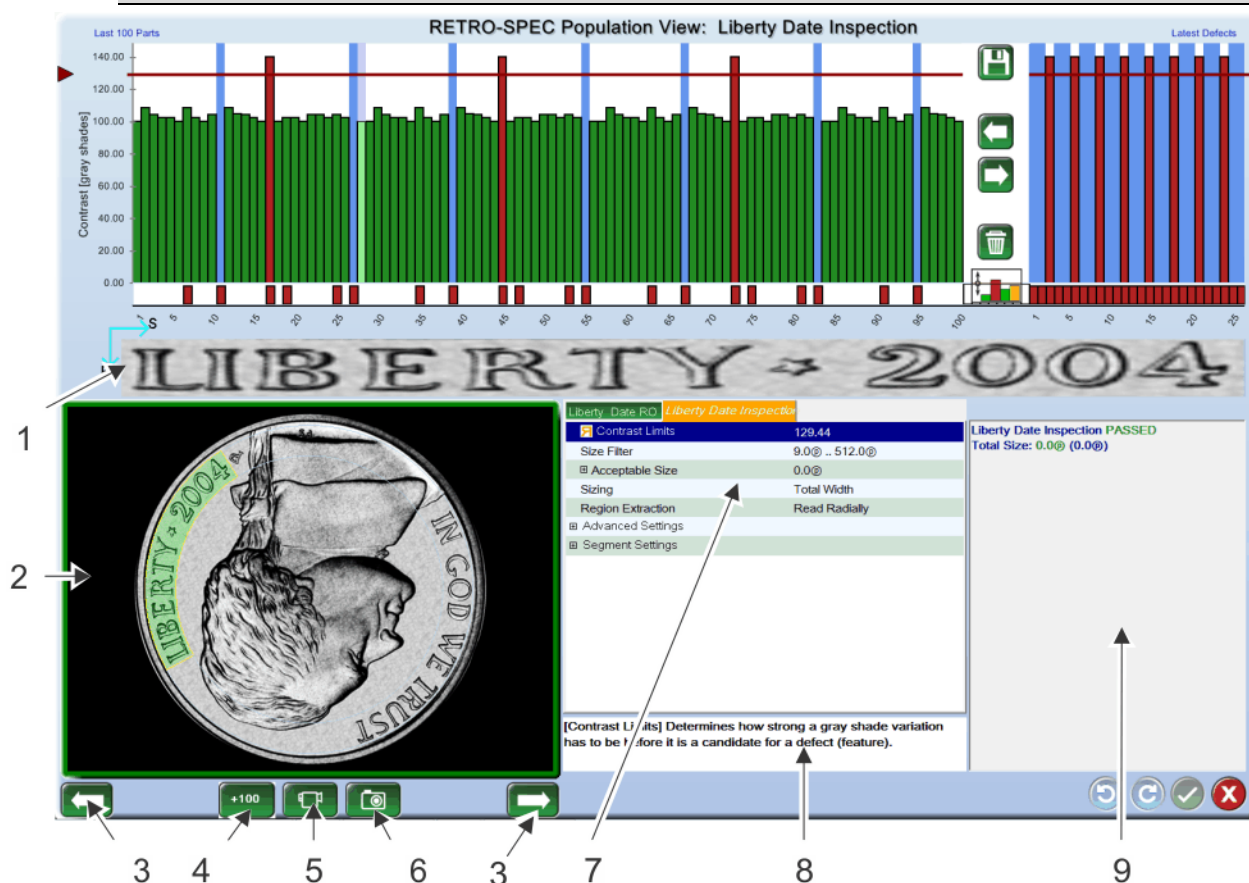
1	Unwrapped Region of Interest	Displays a linear view of the region from the edited inspection.
2	Part Image	Displays a view of the part with the editable region on the part.
3	Editable Region	This is the region on the image that can be edited. When the lines are yellow, they can be edited. To enable region editing, right-click on the region and check "Enable Region Editor." The region can be sized and moved using the track ball and buttons or by using the optional touch screen.
4	Previous and Next Image	Allows you to select the next or previous image.
5	Get 100 images	Takes up to 100 images with the current sensor and replaces Data Set A.
6	Refresh Data Set	Takes up to 100 images with the current sensor and replaces Data Set A. When you click this button, the images are refreshed. They will continue to be refreshed until you click the button again.
7	Snap Image	Takes one image with the sensor and adds it to the end of Data Set A.

8	Editable Parameters	Adjust different parameters associated with the current region.
9	Parameter Description Window	Gives a brief description of the selected parameter.
10	Undo, Redo, Accept, and Cancel	Allows you to undo, redo, accept or cancel any changes made throughout the process of editing.

Inspection Editor

The following illustration shows the various parts of the screen displayed when you edit an inspection.

❖ *Note: the Retro-Spec graph (see "Retro-Spec Population View Graph" on page 211) at the top of the screen is described separately.*



1	Unwrapped Region of Interest	Displays a linear view of the region from the edited inspection. This region is marked with two directions: "S" for "Slow direction" and "F" for "Fast direction." These designations are used in some inspection descriptions to help you understand how they work.
2	Part Image	Displays a view of the part with the editable region on the part.
3	Previous and Next Images	Allows you to select the next or previous image.
4	Get 100 images	Takes up to 100 images with the current sensor and replaces Data Set A.

5	Refresh Data Set	Takes up to 100 images with the current sensor and replaces Data Set A. When you click this button, the images are refreshed. They will continue to be refreshed until you click the button again.
6	Snap Image	Takes one image with the sensor and adds it to the end of Data Set A.
7	Inspection Parameters	Displays the available parameters for the selected inspection. Note: there can be multiple tabs; the parameters will vary per inspection.
8	Parameter Description Window	Gives a brief description of the selected parameter.
9	Results Box	Shows the results from the current inspection with the option to see results from other inspections and timing information.

Right-click over the various areas of the menu to see image options, editor options, result options, and region of interest options.

Editing Parameters

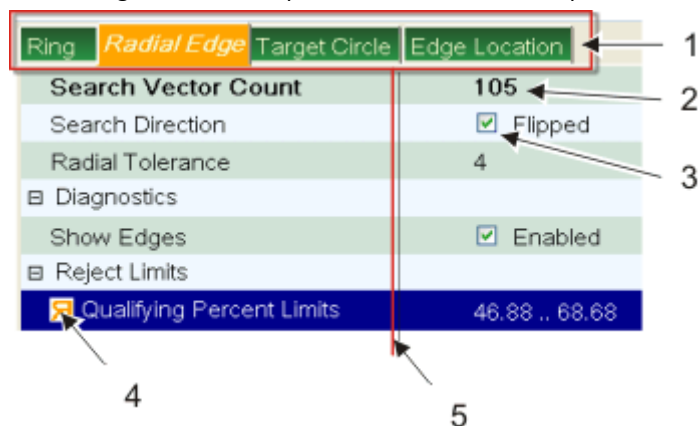
You can change values, display settings, and options that will alter the outcome of an inspection. For the purpose of this discussion, we refer to **inspections**, but the information applies to regions, registrations, orientations, enhancements, measurements, and correlations as well.

❖ *Note: you must have appropriate user permissions to edit parameters*

➤ To edit parameters:

Open the inspection from the Sensor Overview screen:

- Double-click the inspection name in the inspection tree. Or:
- Right-click the inspection and select Edit Inspection from the pop-up menu.



1	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 displayed depend on the inspection itself, and its relationship within the inspection tree.
2	Numeric value can be adjusted by Large Slider or Numeric Text Entry [described below]
3	Check box to enable or disable the feature
4	Backwards R indicates the current parameter that can be adjusted in the Retro-Spec graph (example: the red and yellow limits bars). Note that you can also adjust parameter limits by right-clicking over the Retro-Spec graph.

5	Column division for parameter settings (this line is not actually displayed in the Intellispec). You can see Large Slider AND numeric entry pad if you click in the left column, or just the numeric entry pad if you click in the right column (this only applies if Numeric Input setting = both).

There are several ways to change parameters:

- Numeric values
- Check boxes
- Drop-down menus
- Buttons
- Adjusting the bars on the Retro-Spec graph

❖ *Note: Drop-down menus and buttons are discussed separately in the inspections where they are used*

Editing Numeric Values

There are a few ways in which to change values and settings which include large slider, numeric text entry, or drop down. The method available depends on **Editor Options** as described below.

Large Slider

Allows you to make changes using a sliding bar. It displays the value in the menu as you slide the bar. Changes made on the Large Slider are reflected in the Numeric Text Entry as well if both are open. 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. Any part whose parameter value falls in the red zone fails inspection.
- Yellow = warning limit. Any part whose parameter value falls in the yellow zone is tagged as a warning level part.
- Green = passing. Any part whose parameter value falls in the green zone passes (at least this parameter).

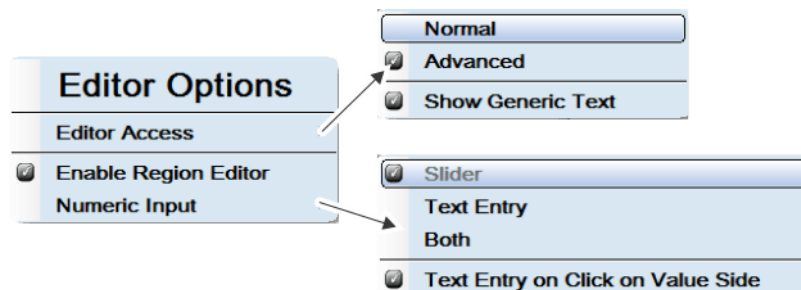
Numeric Text Entry

Allows you to type in a specific number. You can use the +1 and -1 feature to make minor adjustments. Changes made on the Numeric Text Entry are reflected in the Large Slider as well if both are open.

For more information about the numeric keyboard, see **On Screen Keyboard (OSK)** (on page 31)

Editor Options

The information displayed when you are editing parameters depends on the Editor Options settings. Right-click over the parameters menu to see the Editor Options.



Editor Access

Choose how menus are displayed:

- **Normal** - display the normal menus (for most users)
- **Advanced** - display the advanced parameters (for power users)

❖ *Note: you must have the appropriate **permissions** (see "**Managing Permissions**" on page 55) to see the advanced parameters: "Access advanced inspection parameters"*

- **Show Generic Text** - default Intellispec names. Some parameter names were changed in templates to make more sense for a particular application.

Enable Region Editor

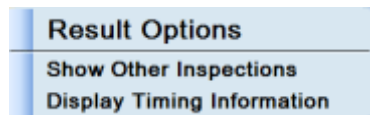
Available when the inspection has an associated region that can be modified.

Numeric Input

- Slider = Large Slider as described above
- Text Entry = Numeric Text Entry as described above
- Both = both Large Slider and Numeric Text entry. After you make changes to either input, you must click the OK button  on both to close them.
- Text entry on click on value side = if you click 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 display information for the Results Box. Right-click to see the menu. To stop displaying the other inspections, right-click the menu again, then un-check the option.



Show Other Inspections

Displays whether a part has passed or failed other inspections on the current sensor. Right-click the menu again to see the option to hide good inspections. If that option is checked, then only the failed inspections are displayed.



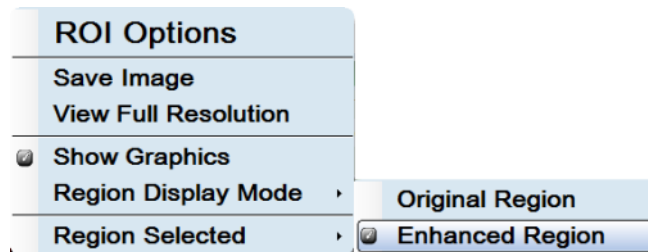
Inspection	Result
Ring	Good
Radial Edge	Good
Measurement	Not Com...
Measure Extract	Not Com...
Ring	Good
Pattern Match	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Ambient	Bad

Display Timing Information

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

Unwrapped Region of Interest Options

Right-click in the Unwrapped Region of Interest to display the region of interest (ROI) options menu. To stop displaying either option, right-click the menu again and un-check the option.

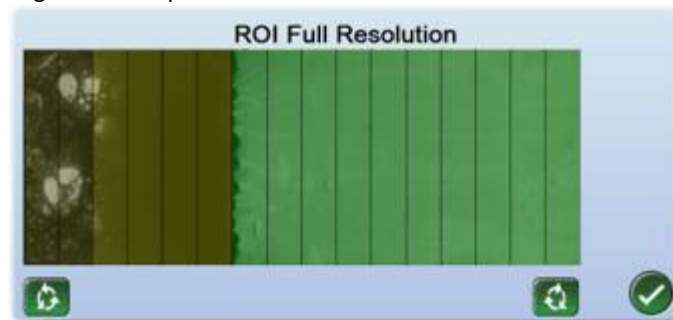


Save Image (see "Saving a Region of Interest (Unwrapped) Image" on page 186)

Save the Region of Interest image.

View Full Resolution

Display the unwrapped region at full resolution to see more detail. This example shows a Fill Height - Segmented inspection.



Click either rotate button  to change the orientation of the unwrapped ROI image on the screen.

Click the OK button  to exit.

Show Graphics

Displays any graphics that are selected, like vectors or edges, on the Unwrapped Region of Interest.

Region Display Mode

Gives you the option to show the original region, or the enhanced region, if it has an enhancement.

Region Selected

(Only available if the inspection has more than one region; example: Fill Height) Select which region to display.

Retro-Spec Population View Graph

The Retro-Spec graph is displayed when you edit a Registration, Orientation, or Inspection.

The Retro-Spec Graph can display up to 200 parts at a time, 100 in each set. Each bar on the graph represents a different part. A green bar means that the part has passed. A yellow bar means that the part has exceeded the warning limit but not the reject limit. A red bar means that the part has exceeded the reject limit. A lighter shade of green, red or yellow will be displayed when a part is selected. To select a part, simply click on a bar in the graph. When you click a bar, the part's unique Part Image, Unwrapped Region of Interest, and Results will be displayed.

Population View

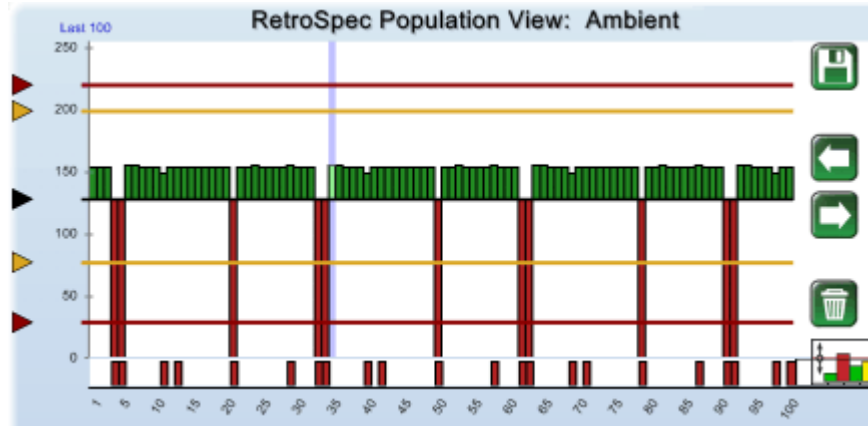
Displays details for up to the last 200 parts. The parts can be the last 100 run, the latest 100 defects for the inspection, or a set of parts previously saved to the hard drive.

Graphs with One Reject Bar

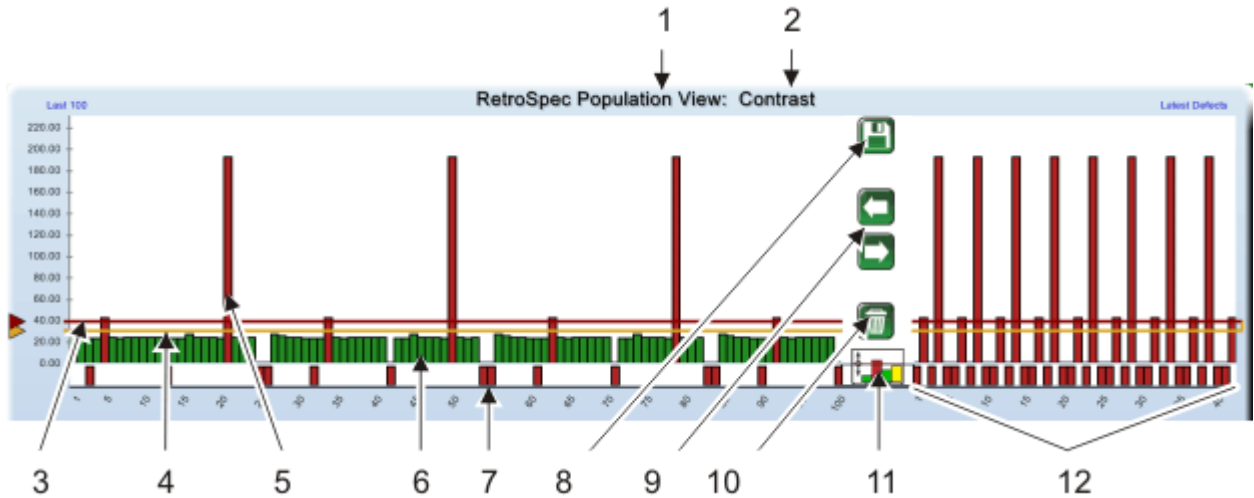
Some inspections have one reject bar on the Retro-Spec Graph. The Warning/Reject Bar can be a minimum requirement where the part Retro-Spec value must be higher than the reject bar in order to pass. The Warning/Reject Bar can also be a maximum requirement where the part Retro-spec value cannot exceed the reject bar in order to pass.

Graphs with Two Reject Bars

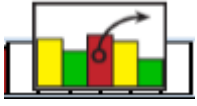
Some inspections have two reject bars. The part's value must be between the two reject limits to be considered a good part. The example below shows an ambient inspection with two reject bars (red) and two warning bars (yellow).



The components of the Retro-Spec graph are as follows:



1	Selected View	Shows which Retro-Spec graph view is being displayed.
2	Selected Inspection	Shows the type of inspection.
3	Reject Bar (red)	Shows the inspection limits. Parts that fall outside the reject limits are considered defective.
4	Warning Bar (yellow)	Shows the inspection warning limits. Parts that fall outside the warning limits are not considered defective, but are approaching reject status.
5	Reject Part	Reject Parts are displayed in Red.
	Warning Part	Warning Parts are displayed in Yellow. [not shown in this example]
6	Passing Part	Passing Parts are displayed in Green.

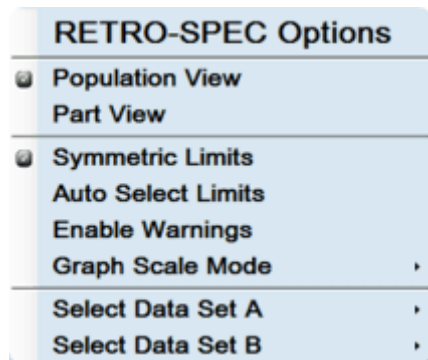
7	Other Results Indicator	Indicates whether a part has failed or had a warning on a different inspection. A small red box will appear under a part that has failed a different inspection. A small yellow box will appear under a part that has had a warning from a different inspection.
8	Save Parts	Allows you to save a set of parts which can be reloaded later. You can save the Selected Parts, Set A, or Set B. You can also choose where to save them by clicking the Save Parts button under "Where to save?"
9	Select Parts	Allows you to select a set of parts, set A or Set B, to be displayed in the Retro-spec Graph. Clicking on either the left or right arrow will bring up the Select Parts Menu below. You can choose from Last 100, Latest Defects, or Custom Set.
10	Delete Part [Trash can icon]	Gives you the ability to delete a single part. Can only be used when the lock [item 11] is unlocked. To delete a part: highlight the part, then click the trash can icon, or highlight the part then drag it to the trash can icon and release the trackball button. A message appears above the icon stating that the part has been deleted.
11	Lock/ Move Parts Toggles to: 	When the graph is locked, parts cannot be moved or deleted. When the graph is unlocked, part sets can be modified. Parts can be saved, moved within the same set, moved to the set on the other side of the divider, or deleted. Dragging the part to the Select Parts arrows [item 9] will move the part into the corresponding side. Dragging the part to the Save Parts button will allow you to save the part. Dragging the part to the Delete Parts button will delete the part.
12	Data Set B	The parts on the right side of the divider make up data Set B.

Once a part has been deleted or moved, the term ****Scratch Parts**** is displayed at the top of the data set. To save the data set with your changes, click the Save Parts icon [item 8]. This will allow you to save the data set on either side of the divider, or just the selected parts.

Retro-Spec Options

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

❖ *Note: some options are not displayed if they are not applicable to the current inspection.*



Population View

When this is checked, the **Retro-Spec population view graph** (on page 211) is displayed.

Part View

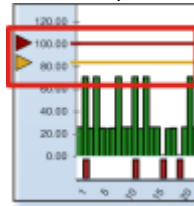
When this is checked, the Retro-Spec part view graph is displayed.

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

Locks the yellow warning bar to the red reject bar in the Retro-Spec graph, keeping them the same distance apart.



Auto Select Limits

Automatically adjusts warning and reject levels to make all parts in the data set pass.

Enable Warnings

Provides a warning level (yellow) sensitivity bar. A warning level 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.

Graph Scale Mode

Change the height scale of the graph.

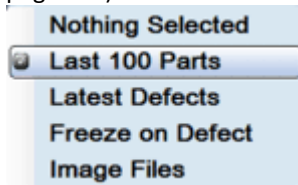
Limits Only displays part parameter values up to and including the current inspection limits. This is useful when you want to zoom in on data without extra lines on the graph. Note that the limit lines may not be displayed on the graph. As soon as you change the parameter limits from the menu, the limit lines are displayed again on the graph.

Limits and Data is the default mode that displays all the inspection data plus the limit lines.

Select Data Set A or B

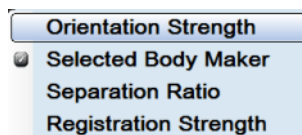
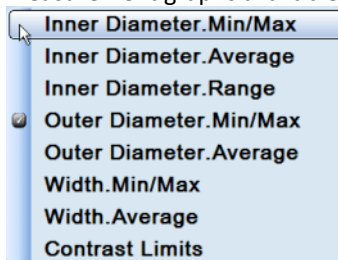
For each Data Set, you can select what you want to display. You can choose to display Nothing, Last 100 Parts, Latest Defects, a Freeze on Defect image, or a set of Image Files that have been previously saved to the computer.

See information about **Saving Images** (see "**Saving Images through the Retro-Spec interface**" on page 177). See also **Freeze on Defect Image in Retro-Spec** (on page 150).



Select Parameter

Choose a graph to display. This is available for some inspections where you have a choice to display different graphs. An example is Measurement Analysis, where there are several different measurement graphs available, as shown below. Another example is in the BMID inspection.

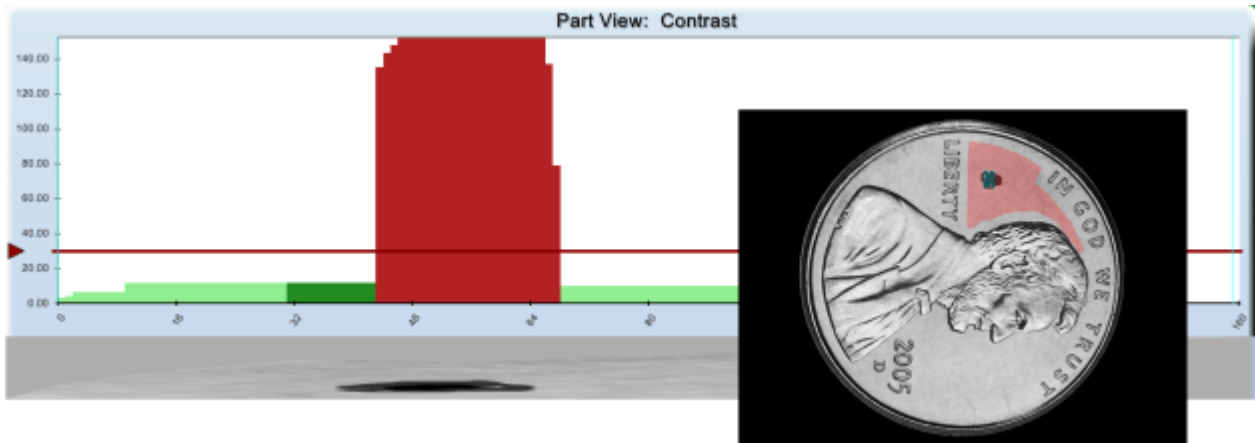


Retro-Spec Part View Graph

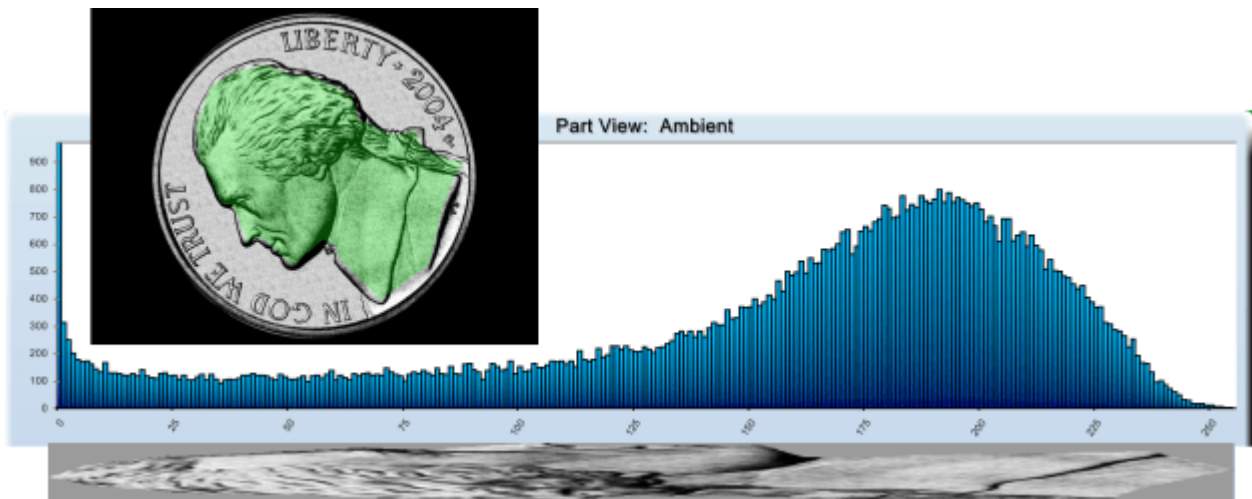
The Part View shows specific information unique to each part. To display the Part View, right click on a part and choose Population View, or double-click a part from the Population View. There are different types of Part Views that vary by inspection.

❖ *Note: not all inspections have a Part View graph available.*

Shown below is the Part View of a **Contrast** inspection. It has a reject bar and an Unwrapped Region of Interest. Any type of damage to the surface of the part, which can be seen in the Unwrapped Region of Interest, will have a corresponding value on the graph. If any part of the graph exceeds the Reject Bar, the whole part will be considered a defective image. The Reject Bar can be dragged, changing the actual reject threshold.



Shown below is a Part View of an **Ambient** inspection. This Part View does not have a reject bar but does have an Unwrapped Region of Interest. The graph does not correspond to Gray Shades on the Unwrapped Region of Interest. The graph represents how many pixels of each Gray Shade are found on the part.



Chapter 13

Inspections

This section covers regions of interest, registrations, orientations, enhancements, analyses, dimensions, and correlations. We use the term **inspections** to include all of these items, for simplicity.

The information in this section is valid as of software version 5.3.007.

FHCP Inspections Overview

This section contains the inspection details for FHCP 3X systems. The following inspections are commonly used for FHCP inspection. These inspections are described throughout this section.

Polygon Region (on page 219)

Ribbon Region (on page 221)

Measure ROI (on page 223)

Finish Location (on page 225)

Neckring Registration (on page 229)

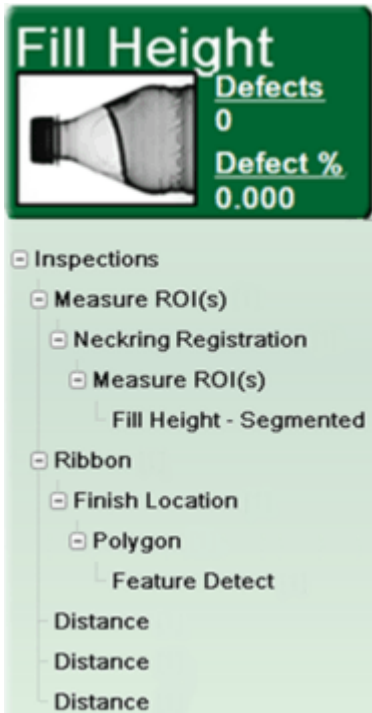
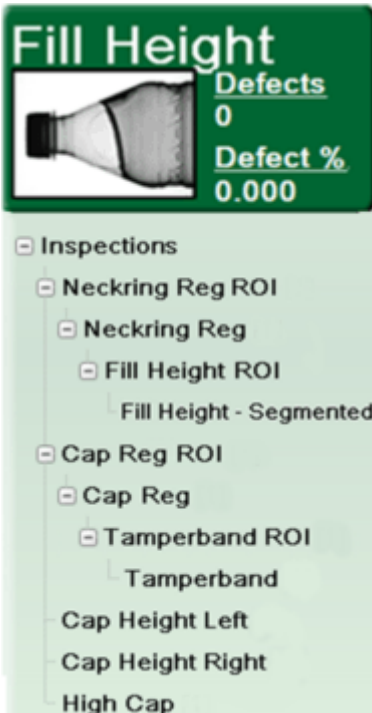
Fill Height - Segmented (on page 240)

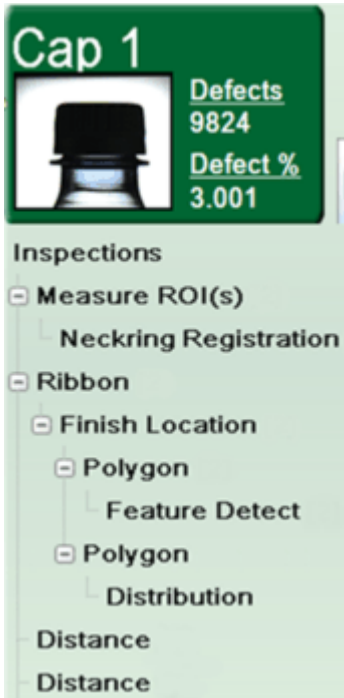
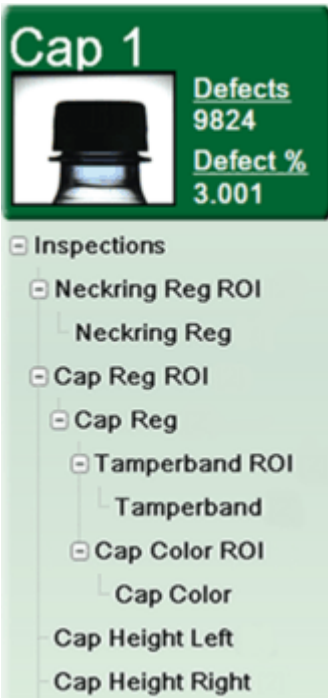
Distribution (on page 250)

Feature Detect (on page 256)

Distance (on page 258)

The screen captures below represent a typical inspection tree set up for the Fill Height and Color cameras. Your system's inspections may vary, depending on application.

Fill Height camera inspection tree - standard system inspection names	Fill Height camera inspection tree - custom inspection names
	

Color Camera inspection tree. Two cameras use the same setup. Standard system inspection names	Color Camera inspection tree. Two cameras use the same setup. Custom inspection names
 Cap 1 Defects 9824 Defect % 3.001 Inspections - Measure ROI(s) - Neckring Registration - Ribbon - Finish Location - Polygon - Feature Detect - Polygon - Distribution - Distance - Distance	 Cap 1 Defects 9824 Defect % 3.001 Inspections - Neckring Reg ROI - Neckring Reg - Cap Reg ROI - Cap Reg - Tamperband ROI - Tamperband - Cap Color ROI - Cap Color - Cap Height Left - Cap Height Right

Fill Height/ Cap Placement Inspection overview

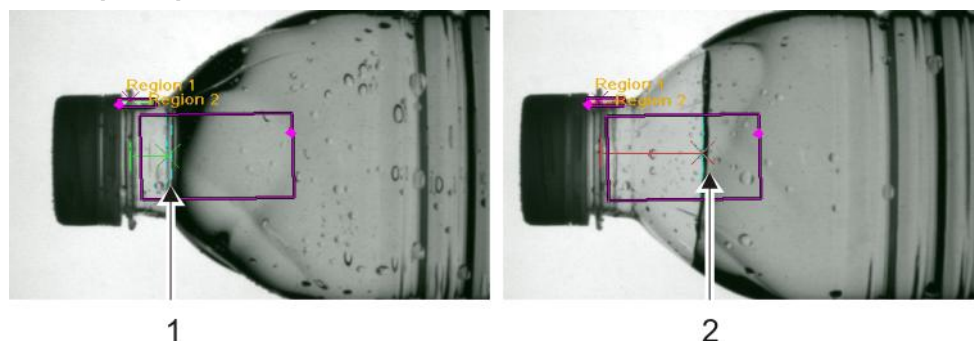
The Intellispec software, combined with the FHCP 3X inspection module, performs inspection with the following specifications:

Fill Height

- Measurement (+/- 1 mm measured 1mm above nominal fill height)
- Over-filling (no rejection – overfilling height measured and saved)
- Under-filling (rejection at -1 mm)

Fill level measurement accuracy will be maintained at +/-1.0 mm. This will be calibrated to a known good product sample representing the lower limit of acceptability. This will be measured by comparing the fill height to the neck ring of the bottle. If the over fill is present, it will not fail the bottle. If an under fill is below the minimum height as compared to the neck ring, the bottle will be rejected.

The example below shows a bottle with a normal fill height [item 1], and a bottle with a fill height that is too low [item 2].



1	Normal fill height
2	Fill height too low

Cap Placement

- 360° Inspection Around the Cap
- Cap missing
- Screwing default (H0 + 1 mm)
- Cocked cap (H0 + 1 mm)
- Safety ring/Tamper band missing
- Safety ring/Tamper band broken
- Safety ring/Tamper band detached from the cap
- Safety ring/Tamper band hidden/Partially folded under

The example below shows where a Feature Detect inspection could be used within a Fill Height/ Cap Placement inspection. It could be used to detect a defective tamper band. This tamper band did not meet tolerance criteria for gray scale range, so it failed inspection.



Regions of Interest (ROI)

Regions of Interest (ROI) are the locations where the registrations, enhancements, analyses, orientations, and correlation inspections take place. There is no inspection done in a Region of Interest. However, there is no limit to the number of inspections that can be placed in one Region of Interest.

There are six region types available to set up the region of interest on a part. All regions can be edited directly on the image (after adding them to the inspection list).

❖ *Note: Your system (and this book) may show only those items that apply to your application.*

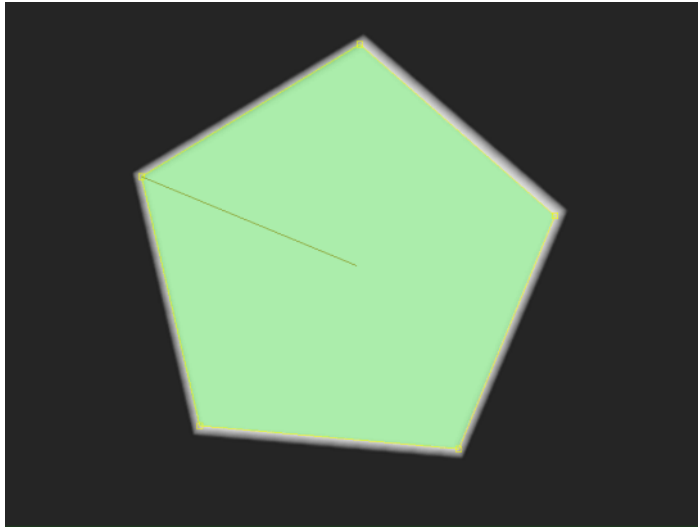
- Ring Region
- **Polygon Region** (on page 219)
- **Ribbon Region** (on page 221)
- **Measure ROI** (on page 223)
- Cylindrical Region
- Adaptive Region

Polygon Region

Similar to the **Ribbon Region** (on page 221), the Polygon Region is a customizable region that is used for:

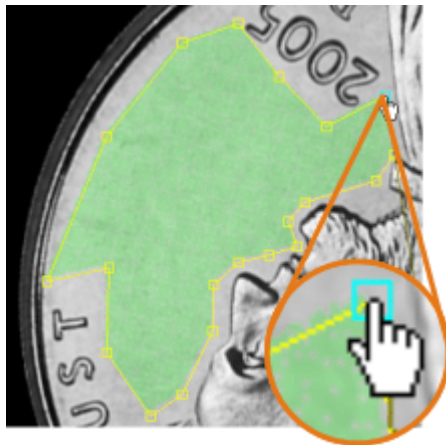
- free-form inspection areas on a part
- areas that do not fit a circle or other standard inspection region

❖ *Note: we recommend that you place a Registration and Orientation (if applicable) prior to adding a polygon region. This will ensure that the polygon is placed correctly on the part, regardless of the part's placement or rotation.*



➤ **To add a Polygon Region:**

1. Make sure that the part program has a registration and/or orientation in place to ensure proper placement of the polygon on all inspected parts.
2. Highlight the Registration or Orientation name in the inspection tree.
3. Right-click on the item you just added.
4. From the Inspection menu, select Add > Region > Polygon. Re-name it to something more meaningful to you.
5. A "NEW POLYGON: Click to add points" message is displayed in the large image area, and the Polygon Menu is displayed. (The menu is described below) Click anywhere in the image to start the polygon.
6. Continue clicking with the yellow boxes (polygon points) to create a polygon region. You may create as many points as you like.
7. When you want to close the region, click on the first box that you placed. The region closes and is filled in for you.



8. Make any necessary adjustments from the menu (described below). You can make adjustments to the region, duplicate it, or rotate it from the menu.

➤ **To edit the polygon region:**

Right-click the image to view the **Image Options** (on page 189) menu. Use Edit Mode to Delete, Add, or Move any polygon point or the entire region.

Polygon menu

Polygon	
Repeat Polygons	☒ Enabled
Repeat Count	1
Rotate Polygon	0.0°
Expand or Contract	0

Repeat Polygons

Create duplicate copies of the original polygon. Allows from 1 to 10 polygons that are centered and rotated around the registered position.

Repeat Count

(Available when using multiple polygons) Choose the number of duplicate polygons to place on the image. The system automatically distributes these polygons around the image. A common use for this feature is for the feet of a PET bottle.

Rotate Polygon

Rotate the polygon around the center of the polygon. If you have duplicate polygons, they are also rotated.

Expand or Contract

Resize the region. A negative number contracts the region, and a positive number expands the region.

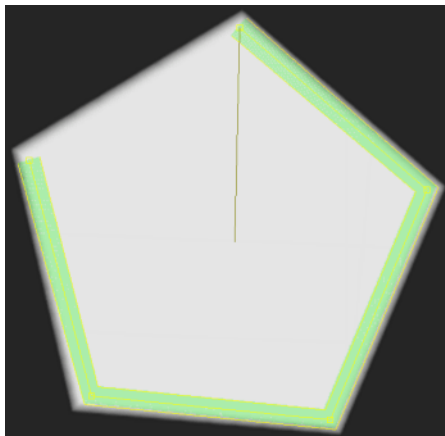
❖ *Note: be careful not to contract the region too much. This will distort the original shape.*

Ribbon Region

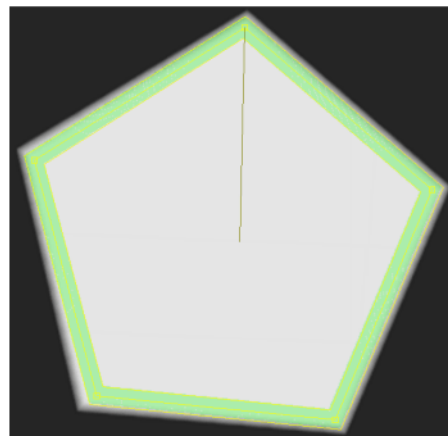
Similar to the **Polygon Region** (on page 219), the Ribbon Region is a customizable region and can come in two different forms: ribbon, and loop. This type of region is used for:

- free-form inspection areas on a part
- areas that do not fit a circle or other standard inspection region

❖ *Note: we recommend that you place a Registration and Orientation (if applicable) prior to adding a Ribbon region. This will ensure that the ribbon is placed correctly on the part, regardless of the part's placement or rotation.*



1



2

1	Ribbon - a customizable region that does not close, similar to a rubber band that has been cut. Thickness remains the same throughout the region.
2	Loop - a closed version of the ribbon region, similar to a rubber band. Thickness remains the same throughout the region.

➤ **To add a Ribbon Region:**

1. Make sure that the part program has a registration and/or orientation in place to ensure proper placement of the region on all inspected parts.
2. Highlight the Registration or Orientation name in the inspection tree.
3. Right-click on the item you just added.
4. From the Inspection menu, select Add > Region > Ribbon. Re-name it to something more meaningful to you.
5. A "NEW RIBBON: Click to add points" message is displayed in the large image area, and the Ribbon Menu is displayed. (The menu is described below) If you want to change the ribbon type to Loop, use the Ribbon Style drop-down item in the menu.
6. Click anywhere in the image to start the ribbon.
7. Continue clicking with the yellow boxes (ribbon points) to create a ribbon region. You may create as many points as you like.
8. When you want to close the region, right-click on the image to view the Image Options menu and select Complete New Ribbon. The region closes and is filled in for you.
9. Make any necessary adjustments from the menu (described below). You can make adjustments to the region, duplicate it, or rotate it from the menu.

➤ **To edit the ribbon region:**

Right-click the image to view the **Image Options** (on page 189) menu. Use Edit Mode to Delete, Add, or Move any ribbon point or the entire region.

Ribbon menu

Ribbon	
Ribbon Style	Loop
Ribbon Width	20
Repeat Ribbons	☐ Enabled
Mirror Ribbon	☐ Enabled
Rotate Ribbon	0.0°
Expand or Contract	0

Ribbon Style

Choose between Ribbon and Loop as described above.

Ribbon Width

Set the width of the region.

Repeat Ribbons

Create duplicate copies of the original ribbon. Allows from 1 to 10 ribbons that are centered and rotated around the registered position.

Mirror Ribbon

(Only used when Repeat Ribbons is disabled) Create a flipped duplicate of the region. This is typically used for the Centerline Registration where two sides are being searched for.

Mirror Angle

(Only used with Mirror Ribbon) Flip the mirrored region horizontally (90 degrees), vertically (zero degrees), or any angle in between.

Mirror Offset

(Only used with Mirror Ribbon) Move the mirrored region further or closer together.

Repeat Count

(Available when using multiple ribbons) Choose the number of duplicate ribbons to place on the image. The system automatically distributes these ribbons around the image. A common use for this feature is for the feet of a PET bottle.

Rotate Ribbon

Rotate the ribbon around the center of the ribbon. If you have duplicate ribbons, they are also rotated.

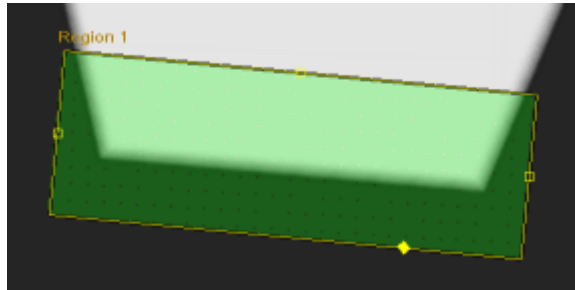
Expand or Contract

Resize the region. A negative number contracts the region, and a positive number expands the region.

❖ *Note: be careful not to contract the region too much. This will distort the original shape.*

Measure ROI

Measure ROI(s) is a region that is intended to be used in measurement type operations (such as Label Skew Extract, Measure Extract, Fill Height, and Support Ring Registration or **Neckring Registration** (on page 229)).



➤ To add a Measure ROI Region:

❖ *Tip: We recommend that you first add a standard region of interest and registration to locate a reference point on the part. The Measure ROI region will then follow the correct location on the part.*

1. Highlight the Registration name (if one is available) in the inspection tree.
2. Right-click on the item you just added.
3. From the Inspection menu, select Add > Region > Measure ROI. The Measure ROI region is added to the inspection tree. Re-name it to something more meaningful to you.
4. The Measure ROI menu is displayed and the region is shown on the image. (The menu is described below) Adjust the placement of the region and parameters as necessary. Right-click over the image to see more image options. See **Image Options - Measure ROI and Cylindrical Regions** (on page 190).

Measure ROI menu

Measure ROI(s)	
Region Count	Two Regions
Vertical Lock Mode	Independent Movement
Horizontal Lock Mode	Independent Movement
Sizing Lock Mode	Independent Sizing
Region 1	
Center Offset X	-100
Center Offset Y	-25
Region Width	100
Region Height	50
Region Angle	90.0
Region 2	

Region Count

Leave this set at One Region unless you have a Fill Height application. Most measurements require one region. Fill Height applications require two regions: one for reference, and one for fill level.

Region 1 or 2

Contains the settings for each region.

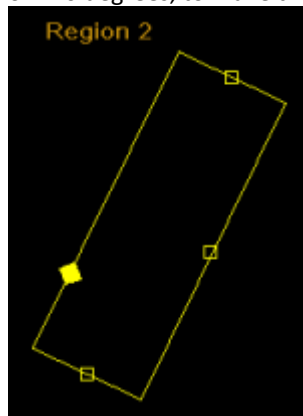
Center Offset X and Y

Set the region offset value relative to the registered center. If your region is off the screen, you may need to change these values.

Region Width, Height, and Angle

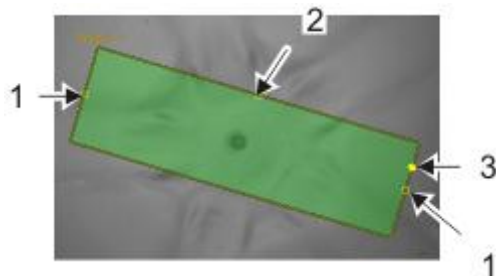
Adjust the size and rotation of the region. You can also click on the image and adjust the region graphically (if Enable Region Editor is checked in the Image Options menu). To adjust, click and drag one of the empty yellow squares.

The Region Angle allows you to ensure that the region is a rectangle. After resizing and moving the region, it can become non-rectangular. Use the **Region Angle** parameter to quickly set to 0, 90, 180, or 270 degrees, to make the region a rectangle.



The Measure ROI is a two point polygon ribbon region. Refer to the illustration below. The end points [1] adjust the length of the ribbon. The point on the side of the region [2] adjusts the width of the ribbon. The diamond [3] indicates the direction towards which the vectors are searching.

❖ *Note: for the image below, both Enable Region Editor and Enable Region Size are checked in the Image Options menu. You view the yellow boxes and points when you click on the image to adjust the region size and/or position.*



1	End points of the ribbon region
2	Point to adjust the width of the region
3	Indicates the direction towards which the vectors are searching

Additional menu items for Two Regions

Vertical Lock Mode, Horizontal Lock Mode, and Sizing Lock Mode

Choose whether to move the two regions independently, or to lock the regions (move the regions together). When you choose to mirror the regions, the regions move in opposite directions.

Registrations

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

❖ *Note: you must first place a **Region of Interest** (see "**Regions of Interest (ROI)**" on page 219) where you want the Registration to take place.*

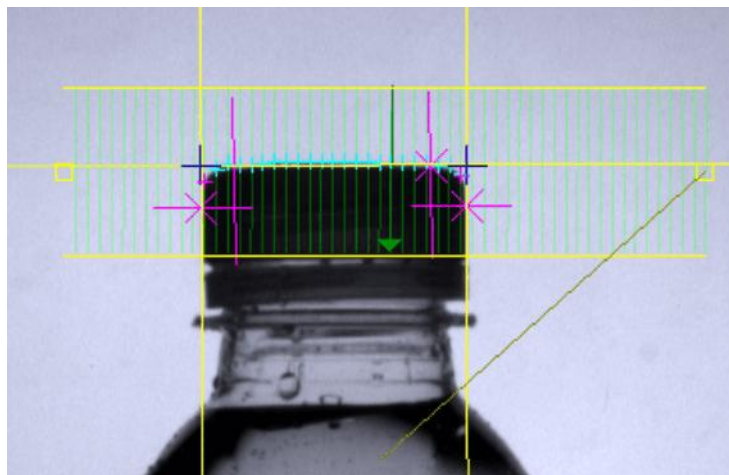
Available registrations include:

- Feature
- Center of Mass
- Hough
- Radial Edge
- Centerline
- **Finish Location** (on page 225)
- Template Registration
- **Neckring Registration** (on page 229)
- Measure Registration

❖ *Note: Your system (and this book) may show only those items that apply to your application.*

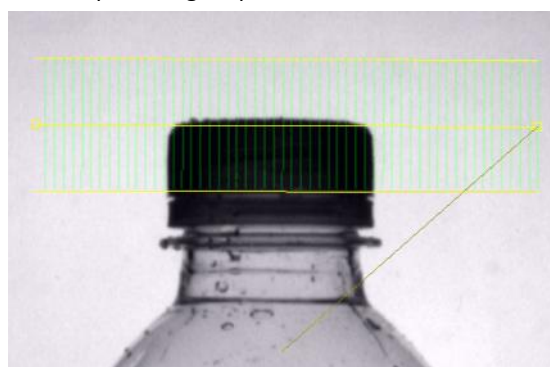
Finish Location

Finish Location is used to locate the top corners of a bottle. It uses a **ribbon region** (on page 221). Finish Location also determines part orientation, and passes on the orientation to subsequent inspections.



➤ **To add a Finish Location registration:**

1. Make sure a **Ribbon Region** (on page 221) of Interest has been added to the inspection tree. An example of region placement is shown below.



2. Right-click on the item you just added.
3. From the Inspection menu, select Add > Registration > Finish Location. The registration is added to the inspection tree. Re-name it to something more meaningful to you.
4. The Finish Location menus are displayed and the region is shown on the image. (The menus are described below) Adjust the placement of the region and parameters as necessary.

Finish Location menu

Ribbon	Finish Location	Search	Corner	Diagnostics
Search Vector Count		36		
Search Direction		☒ Flipped		
[-] Finish Settings				
[-]  Tilt Limits		0.0° +10.0°/ -10.0°		
Nominal		0.0°		
Region Extraction		Feed Forward		

Search Vector Count

Set the number of search vectors to locate the feature on the container. More vectors provide a more accurate search, but also take more processing time.

Search Direction

Change the search to the opposite direction.

Finish Settings

Tilt Limits

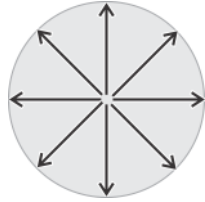
Set the allowed range of tilt of the part within the image.

Nominal

The expected degree of tilt. This is usually set to the target tilt value with the **Tilt Limits** being around this nominal. On most vertical parts the nominal would be 0, with the **Tilt Limits** + and – some amount.

Region Extraction

Choose how the Intellispec should read the information from the region. This usually depends on the shape of your region. In this inspection, only Read Radially is used. The data is extracted in a radial direction as shown in the illustration below.



Search menu

Ribbon	Finish Location	Search	Corner	Diagnostics
Edge Polarity		Either		
Edge Gradient		15 .. 30		
Edge Delta		2		
Edge Size		2		
Use Subpixel		☐ Enabled		
Edge Thickness		1		

Edge Polarity

Choose the type of edge to search for – Light to Dark, Dark to Light, or Either. For example, if the feature you want to find is very bright, choose Dark to Light.

Edge Gradient

The minimum and maximum difference in gray shades, between two pixels, to be considered an edge.

Edge Delta

The distance between pixels being compared when seeking an edge. A higher Delta value is more sensitive because it finds more edges.

Edge Size

Indicates how many pixels in a row to compare (1 to 1, 2 to 2, etc.). The larger the Edge Size, the stronger the edge will need to be. This parameter acts like a filter that looks at a length in pixels before and after the edge.

Use Subpixel

Finds edges based on their subpixel location, rather than rounding off to the nearest pixel. This gives greater centering accuracy.

Edge Thickness

The number of consecutive times that the gradient must be met to define an edge.

Corner menu

Adjust these settings to best find the corner on your part.

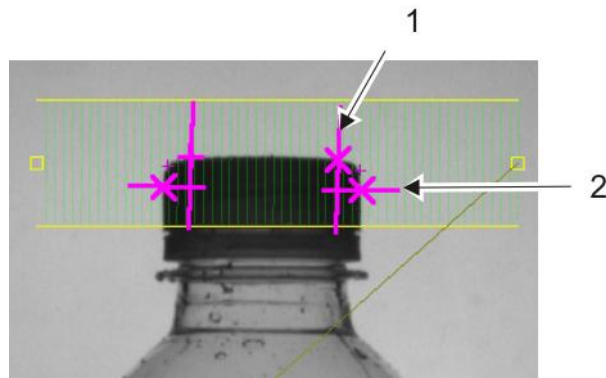
❖ *Note: Enable the **Show Corners** option in the Diagnostics menu to see the position of the vectors.*

Cap Reg ROI	Cap Reg	Search	Corner	Diagnostics
Corner Desensitization				10
Top Search: Side Shift				30
Top Search: Vector Count				60
Top Search: Edges Percentage				20
Side Search: Down Shift				25
Side Search: Side Shift				-8
Side Search: Vector Count				30
Side Search: Vector Length				70
Side Search: Edges Percentage				50

Corner Desensitization

Larger values are used to detect more rounded corners. This is used to prevent detection of false corners.

The illustration below shows the top and side vectors that search for the part. Note that your image may be rotated depending on application. Regardless of orientation, the top vectors search for the top of your part, and the side vectors search for the sides of your part.



1	Top vector (perpendicular to the ribbon)
2	Side vector (parallel to the ribbon)

Top Search: Side Shift

Move the top vectors closer or further away from the corner.

Top Search: Vector Count

Set the number of vectors to search for the top of the cap. If your parts have water droplets, use a higher number of vectors to minimize errors in locating the corner of the cap.

Top Search: Edges Percentage

Set the percentage of vectors that will determine the top of the cap. For example, if 100 vectors are used, and this parameter is set at 15, then the 15 vectors that found the lowest edges would be used (and colored green). Vectors that find higher edges may be from water droplets. The other 85 vectors are colored blue and are ignored.

Side Search: Down Shift

Move the side vectors closer or further away from the corner.

Side Search: Side Shift

Move the side vectors closer to or further away from the midpoint of the cap or part.

Side Search: Vector Count

Set the number of vectors to search for the sides of the cap.

Side Search: Vector Length

Increase or decrease the length of the side search vectors.

Side Search: Edges Percentage

Set the percentage of vectors that will determine the sides of the cap. This helps ignore water droplets.

Diagnostics menu

Ribbon	Finish Locatio	Search	Corner	Diagnostics
Show Vectors				☐ Enabled
Show Search Direction				☒ Enabled
Show Edges				☒ Enabled
Show Corners				☒ Enabled
Show Corner Search				☐ Enabled
Show Framing				☐ Enabled

Show Vectors

Show the search lines on the image.

Show Search Direction

Show the search direction of the vectors with an arrow.

Show Edges

Show the found edges on the image.

Show Corners

Display the location of the finish corners.

Show Corner Search

Display the search used to find the corners. You must also enable 'Show Graphics' in the **Image Options** (on page 189) menu.

Show Framing

Display the lines that show where the finish is located based on the projected corners.

Neckring Registration

The Neckring Registration is used in the filling application to locate both sides of the neck ring on a bottle and then position the following inspections with respect to these points. This registration always uses a **Measure ROI** (on page 223) Region. The Neckring registration finds the edges of the neck ring, then it computes the tilt of the bottle.

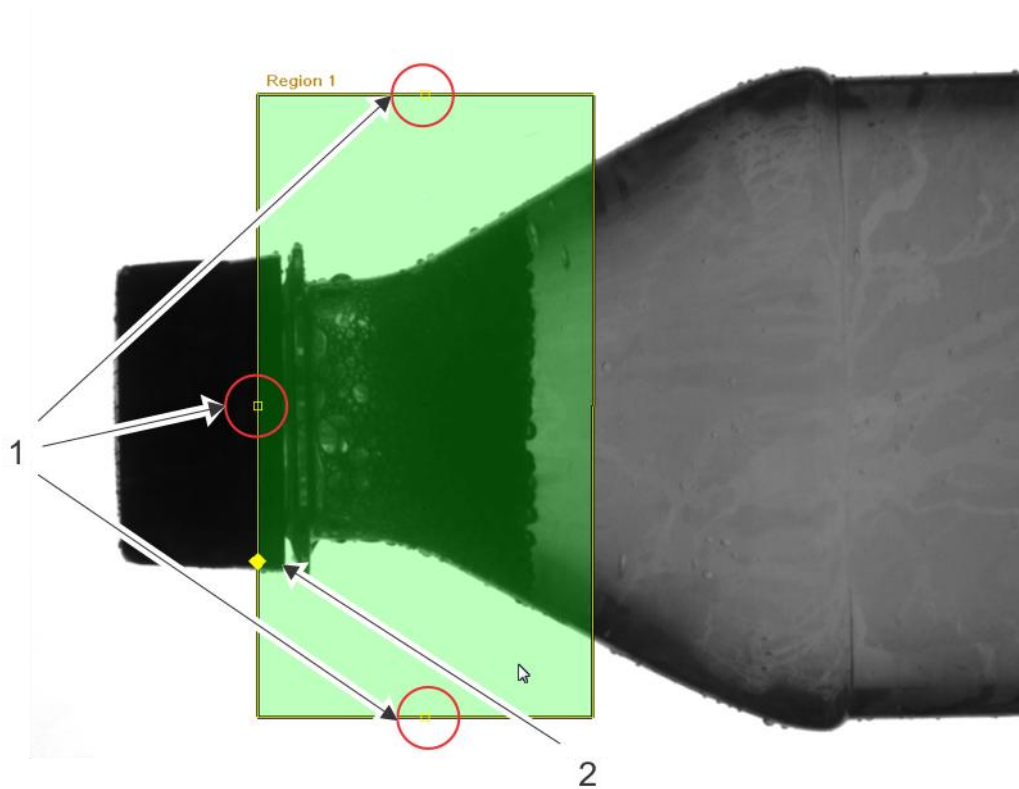
Note: Neckring is the new name for Support Ring Registration that was available in version 5.1 software.

❖ *Note: Neckring Registration requires a **Measure ROI** (on page 223) region.*

➤ Before adding a Neckring registration:

Add a **Measure ROI** (on page 223) Region of Interest to the inspection tree (if you do not already have one). This region of interest should cover the neckring, a portion of the cap, and enough of the bottle so that it can accurately determine the tilt of the bottle. It should also be wide enough to accommodate some part movement in the camera's field of view, but not so wide that adjacent bottles can be seen in the region of interest.

- The Measure ROI region of interest should be oriented such that the search direction (yellow diamond) is pointing towards the cap.
- A sample Measure ROI placement is shown below.



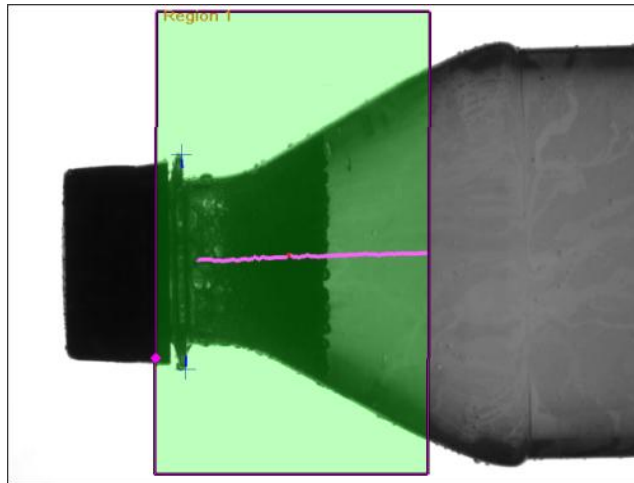
Measure ROI placement for Neckring Registration	
1	Measure ROI re-sizing handles. Make sure these are oriented towards the cap and sides.
2	Yellow diamond indicates search direction. Make sure search direction is towards cap.

Next add a Neckring registration.

➤ **To add a Neckring registration:**

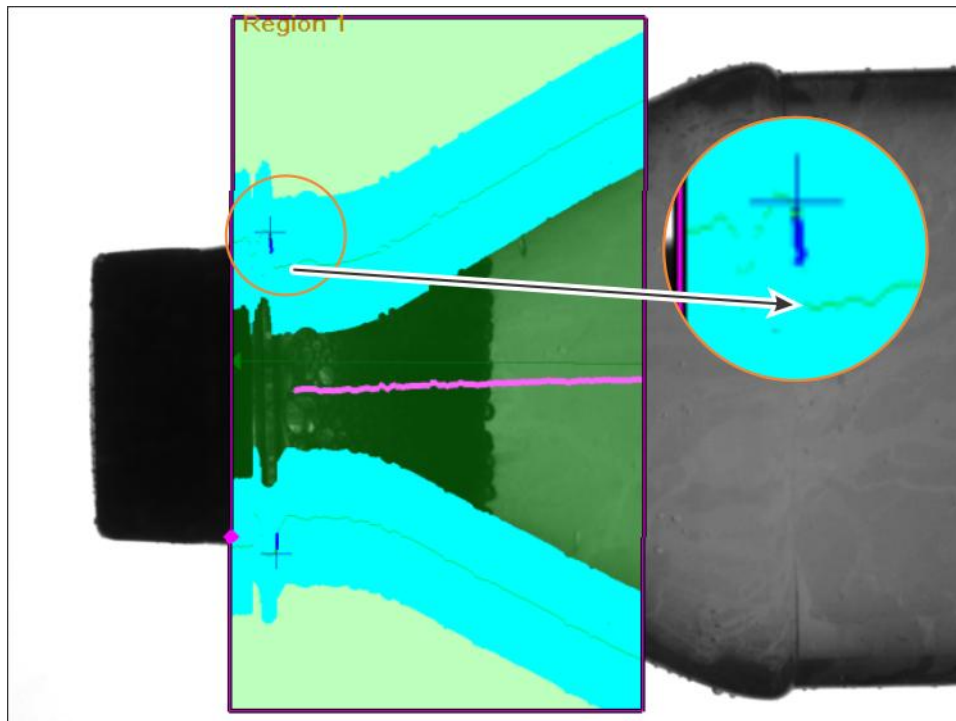
1. Make sure a Measure ROI region of interest has been added to the inspection tree. A sample Measure ROI placement is shown above.
2. Right-click on the item you just added.
3. From the Inspection menu, select Add > Registration > Neckring Registration. The registration is added to the inspection tree. Re-name it to something more meaningful to you.

4. The Neckring menus are displayed and the region is shown on the image. (The menus are described after the procedures) Adjust the placement of the region and parameters as necessary.



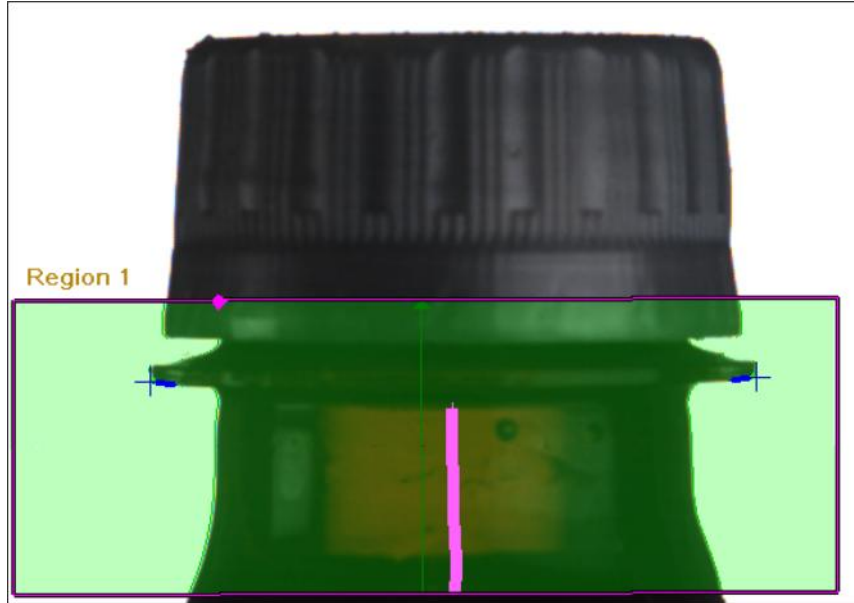
➤ **To set up the Neckring Registration:**

1. In the Part Search menu, adjust the Edge Polarity, Gradient, Delta, and Size to find the edge points on the outside edges of the bottle, neckring, and cap. Leave Use Subpixel un-checked. Edge Thickness should be set so that thin pieces of flash in the region will be ignored (a value of 5-8 is usually good).
 - a) To see the effects of these settings, go to the Neckring Registration menu and enable Show Vectors, Show Search Direction, and Show Edges.
 - b) Look for green (good) edges at the edges of the bottle, as shown below. To zoom in, right-click over the image and select a zoom option from the Image Options menu.



2. In the Neckring Search menu, adjust the number and length of vectors so that they can locate the underside of the neckring.

3. If there are many water droplets or flash hanging down from the neckring, you may want to disable "Use Common Edge Settings" in the Part Search menu. This will provide independent edge location settings for the vectors looking for the sides of the bottle and the vectors that search upwards towards the bottom of the neckring.
4. If desired, adjust Tilt Limits in the Neckring Registration menu. Normally, this is not used to reject bottles, so we normally use a wide range for Tilt Limits values.
5. Scroll through the images to test the registration and make sure that the blue '+' marks are in the correct places on the bottle (that is, at the edges of the neckring). Adjust the parameters in the menus as needed. The parameters are described below. An example of a good neckring search is shown below.



How the neckring search works

➤ The registration finds the neckring as follows:

1. It uses the parameters in the Part Search menu to search from the bottom of the bottle to the top, looking for edges on the outside of the bottle, as well as the neckring and cap.
2. It finds edges on the bottle and compares the edges, looking for a large jump in the direction perpendicular to the bottle (indicating the neckring). It creates "neckring candidates" when it finds these large jumps. You will see a blue "X" in the candidate location if you check the Show Candidates box in the Neckring Registration menu. You will see a red "X" if a candidate was found but did not meet inspection criteria. For example, this could happen if the system sees a large water droplet.
3. When a potential neckring candidate is found, the inspection uses the parameters in the Part Search menu to verify that the candidate is part of the actual neckring and not a piece of flash or large water droplet.
4. When the inspection determines the actual neckring points, it places a blue "+" in those locations.
5. The parameters in the Neckring Search are used to locate the underside of the neckring for more accuracy.

Neckring Registration menu

Use the Neckring Registration menu to locate the neckring. Use the settings recommended by Pressco support engineers, and adjust as necessary for your part.

Neckring Search	
Neckring Reg ROI	Neckring Registration
Use Linear Hough	☐ Enabled
Centerline Sensitivity	95
 Tilt Limits	0.0° +360.0°/-360.0°
Show Vectors	☐ Enabled
Show Neckring Vectors	☐ Enabled
Show Search Direction	☐ Enabled
Show Edges	☒ Enabled
Show Candidates	☐ Enabled

Use Linear Hough

Do not use this feature, as of the date of this publication.

Centerline Sensitivity

Set the orientation sensitivity. The range is from one to 100 with one being the least sensitive and 100 being the most sensitive. The value of 90 is good sensitivity in almost all cases.

Tilt Limits

Set the allowed range of tilt of the part within the image.

Nominal

The expected degree of tilt.

❖ *Note: for the following parameters, you must also Show Graphics. Right-click over the part image and make sure Show Graphics is checked.*

Show Vectors

Show the search lines on the image.

Show Neckring Vectors

Show the gray vectors that are searching for the neckring.

Show Search Direction

Show the search direction of the vectors with an arrow.

Show Edges

Show the found edges on the image.

Show Candidates

Show the potential neckring positions.

Part Search menu

The settings in this menu determine which edges are used to find the sides of the bottle and the neckring.

Neckring Search	
Neckring Reg ROI	Neckring Registration
Part Search	
Use Common Edge Settings	☒ Enabled
Edge Polarity	Light-to-Dark
Edge Gradient	15 .. 50
Edge Delta	2
Edge Size	2
Use Subpixel	☒ Enabled

Use Common Edge Settings

Typically, you would leave this box un-checked. This allows the search for the neckring to use different settings to ignore flash and other possible flaws. If this box is un-checked, then you will set the search vectors both in this menu and in the Neckring Search menu.

If this is enabled, then the registration uses common edge location settings for the search vectors looking for the sides of the bottle (part search), AND the search vectors looking for the neckring.

Edge Polarity

Choose the type of edge to search for – Light to Dark, Dark to Light, or Either. For example, if the feature you want to find is very bright, choose Dark to Light.

Edge Gradient

The minimum and maximum difference in gray shades, between two pixels, to be considered an edge.

Edge Delta

The distance between pixels being compared when seeking an edge. A higher Delta value is more sensitive because it finds more edges.

Edge Size

Indicates how many pixels in a row to compare (1 to 1, 2 to 2, etc.). The larger the Edge Size, the stronger the edge will need to be. This parameter acts like a filter that looks at a length in pixels before and after the edge.

Use Subpixel

Finds edges based on their subpixel location, rather than rounding off to the nearest pixel. This gives greater centering accuracy.

Neckring Search menu

Use the Neckring Search menu to find the edges along the underside of the neckring and then locate the outer edges.

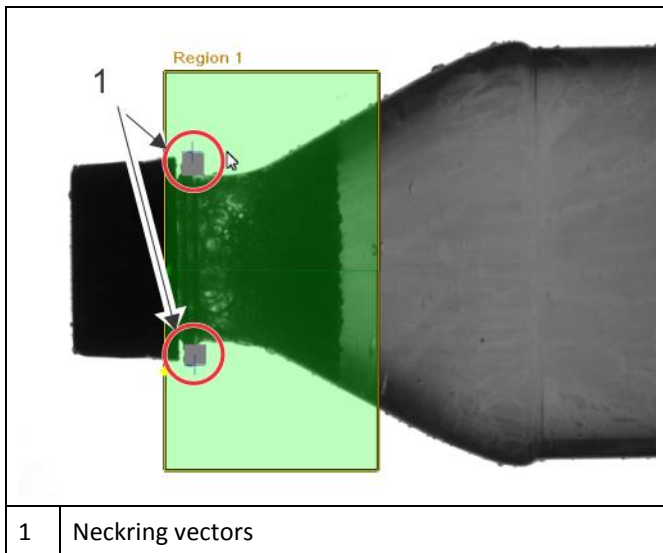
Neckring Reg ROI	Neckring Registratio	Part Search
Neckring Search		
Neckring Vector Length	80	
Neckring Vectors	25	
Neckring Offset	-1	
Edge Polarity	Light-to-Dark	
Edge Gradient	30 .. 75	
Edge Delta	2	
Edge Size	4	
Use Subpixel	☒ Enabled	

❖ *Note: if "Use Common Edge Settings" is enabled on the Part Search menu, then only the first three parameters are shown in this menu.*

Neckring Vector Length

The length, in pixels, of the vectors that search for the neckring.

You can see the neckring vectors when you enable "Show Neckring Vectors" in the Neckring Registration menu.



Neckring Vector

Set the number of vectors to search for the neckring.

Neckring Offset

Set the number of pixels away from the neckring corner that the vectors will begin their search. If you enter a value, then the offset position is referenced to the centerline of the part.

If the offset is [-1], then the inspection automatically determines the offset as the average of edges found on the neckring. The system provides a suggested value to use; look at the Results window to see that value.

Edge Polarity

Choose the type of edge to search for – Light to Dark, Dark to Light, or Either. For example, if the feature you want to find is very bright, choose Dark to Light.

Edge Gradient

The minimum and maximum difference in gray shades, between two pixels, to be considered an edge.

Edge Delta

The distance between pixels being compared when seeking an edge. A higher Delta value is more sensitive because it finds more edges.

Edge Size

Indicates how many pixels in a row to compare (1 to 1, 2 to 2, etc.). The larger the Edge Size, the stronger the edge will need to be. This parameter acts like a filter that looks at a length in pixels before and after the edge.

Use Subpixel

Finds edges based on their subpixel location, rather than rounding off to the nearest pixel. This gives greater centering accuracy.

Advanced Parameters for Neckring Registration

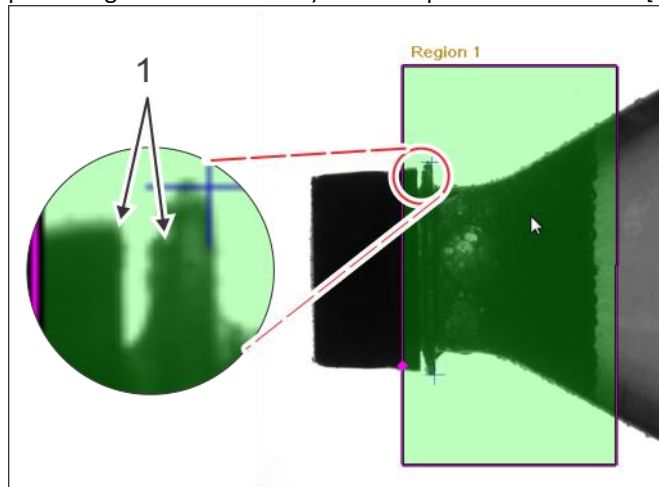
One or more additional parameters are available for this inspection, only visible when you have **Advanced parameters** (see "**Editor Options**" on page 209) shown. You must have the "Access advanced inspection parameters" **permission** (see "**Managing Permissions**" on page 55) to access these parameters. The advanced parameters are described in this topic. For other parameters, refer to the description of **Neckring Registration** (on page 229).

Measure ROI(s)	Neckring Registration	Part Search	Neckring Search
Search Technique	Neckring with Gap		
Apply Neckring Search	☒ Enabled		
Applied Results	Center and Orientation		
Neckring Threshold	15		
Neckring Delta	10		
Neckring Thickness	5		
Neckring Percentage	15		
Centerline Start Offset	10		
Centerline Correction Iterations	0		
Use Linear Hough	☐ Enabled		
Centerline Sensitivity	95		
 Tilt Limits	0.0° +360.0°/ -360.0°		
Nominal	0.0°		
Show Vectors	☐ Enabled		
Show Neckring Vectors	☐ Enabled		

Search Technique

Choose a technique based on your part type:

Neckring with Gap - This works well with parts that have a Neckring and a closure that does not sit right on top of the neckring. The system looks for a transition out from the part (Neckring Threshold), followed by a width (Neckring Thickness), then a return back toward the part (automatically set as a percentage of the threshold). An example is shown below. [item 1 = gap].



Neckring with No Gap - This works well when the closure sits right on top of the Neckring. The system looks for a transition out from the part (Neckring Threshold), followed by a width (Neckring Thickness).

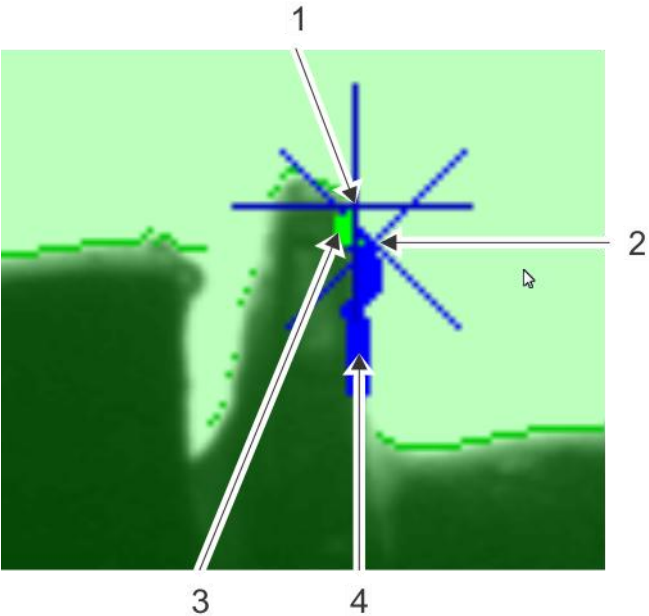
Furthest Out Feature - This works well with parts that do not have a visible neckring. The system looks for the feature that is furthest out, within the field of view. Make sure the search region is not too far down on the bottle. Neckring Threshold, Delta, and Thickness are not used. An example of a part where this feature would be used is shown below.



Apply Neckring Search

This is a re-computed location to determine the position of the Neckring, after Neckring Percentage is used. Initially, the system finds a candidate for Neckring position, shown [item 2] in the illustration below. Apply Neckring Search can find a more accurate position. This parameter is most often used with **Neckring With Gap** Search Technique.

If you are using other search techniques, then you may get better results with Apply Neckring Search turned off. The example orange juice bottle shown above (under Furthest Out Feature) is a case where the neckring cannot be used for the search. Therefore, we would keep Apply Neckring Search off for the orange juice bottle.



1	Large '+' is the re-computed location used when Apply Neckring Search is enabled.
2	Large 'X' is the initial Neckring position found. It is <i>not</i> used when Apply Neckring Search is enabled. In some cases, multiple 'X' marks show where other candidate positions were found and discarded. The discarded candidates are drawn in red .
3	Green edges are used to determine the Neckring position. Percentage of edges is set by Neckring Percentage .

Applied Results

The Neckring Registration can produce a left and right position, centerline, as well as orientation of the bottle. This parameter allows you to choose which results to use. In some cases, you may not want the orientation result, for example.

Center and Orientation - (most often used). Compute both the center of the bottle and the orientation of the bottle.

Orientation - Compute only the orientation of the bottle.

Center - Compute only the center of the bottle. Bottle tilt does not get computed when orientation is not used.

Necking Threshold

The minimum distance you expect the Neckring to extend from the profile of the bottle. Set this value at a minimum distance, such as 15. Setting this value too high may make the inspection less accurate if there is water under the Neckring.

Necking Delta

The number of pixels between each edge comparison that the system looks for transitions that indicate the Neckring. The system looks at the edge profile of the bottle. A typical setting is 10.

Necking Thickness

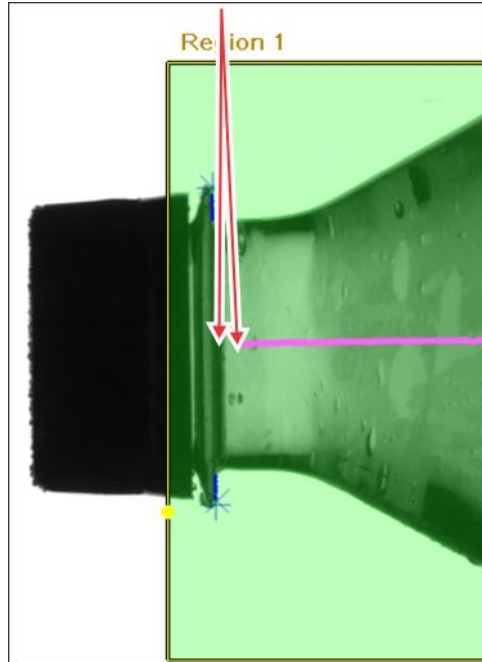
The minimum width (in pixels) that you expect the Neckring to be. You can usually set this to a small value, such as five.

Necking Percentage

The percentage of vectors that will determine the bottom of the Neckring. This is used to eliminate false edges that might occur if water droplets are hanging from the bottom of the Neckring. It also helps to ignore flash that might occur on the bottle. For example, if this parameter is set at 15%, then the 15 vectors that find the highest edges (closer to the top of the bottle) would be used and colored green. The other 85 vectors would be colored blue and ignored. See illustration under **Apply Neckring Search** above.

Centerline Start Offset

The distance, in pixels, below the Neckring, where the registration begins to compute the tilt of the bottle. For example, if this is set to 10, then the registration will determine the tilt of the bottle starting at the 10th vector down from the Neckring corner points. Make sure this number is large enough so that the system is using data from side bottle edges, not edges from the neck ring.



Centerline Correction Iterations

Set the number of passes you want to use to correct the centerline angle. A value of zero does no correction.

Analyses

These inspections analyze the part for defects, features, measurements, or gray shades.

❖ *Note: you must first place a **Region of Interest** (see "**Regions of Interest (ROI)**" on page 219) where you want the analysis to take place. We also recommend a **Registration** (see "**Registrations**" on page 225) and an **Orientation** (depending on the part type) prior to an analysis.*

The available types of analyses are:

- Ambient
- Shape Check
- Contrast
- Measurement
- Fill Height
- **Fill Height - Segmented** (on page 240)
- Measure Extract
- **Distribution** (on page 250)
- Label Skew Extract
- **Feature Detect** (on page 256)

❖ *Note: Your system (and this book) may show only those items that apply to your application.*

Fill Height - Segmented

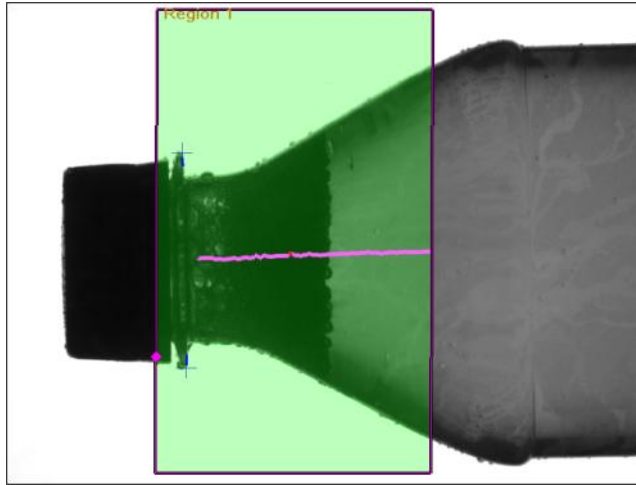
Fill Height - Segmented inspection is used for determining the fill level of containers. It can determine whether containers have high fill, low fill, or no fill. The Fill Height - Segmented inspection compares the fill level of the liquid to a standard reference point, which is typically the neckring of a container.

The differences between Fill Height and Fill Height - Segmented inspection are:

- **Fill Height - Segmented** inspection uses an external reference point, meaning that you can choose any point of reference on the bottle to measure fill height. **Fill Height** inspection uses an internal reference point - one Measure ROI for the reference point, and one Measure ROI for the measurement.
- **Fill Height - Segmented** inspection uses ambient analysis to find the fill line. **Fill Height** inspection uses edge point analysis to find the fill line.

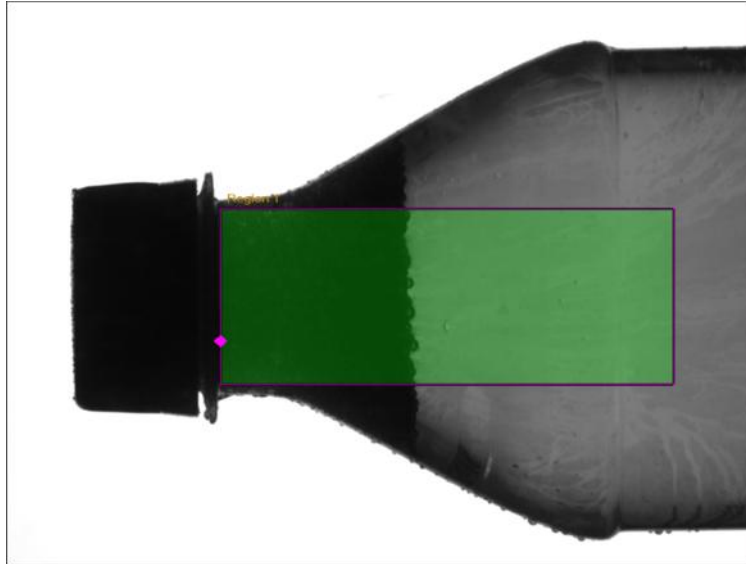
➤ A. Before setting up the Fill Height - Segmented inspection:

1. Set up a **Neckring Registration** (on page 229) that locates the neckring, and allows the system to place inspections with respect to the neckring location. An example is shown below.



2. Set up a **Measure ROI** (on page 223) region of interest for the Fill Height - Segmented inspection. Suggested settings are as follows:
 - In the Measure ROI menu, set Region Count to One Region.
 - Place the region on the bottle so that:
 - The region is high enough on the bottle as possible, but does not overlap the neckring
 - The region is far down enough on the bottle to accommodate the normal fill range of the bottle
 - The region is as wide as possible but does not fall outside of the bottle. It should be narrow enough to fit inside the narrow part of the bottle.
 - The search direction goes from the bottom of the bottle towards the top: place the diamond towards the top of the bottle.

- An example is shown below.



- Save and close the Measure ROI region menu.

Next add the Fill Height - Segmented inspection.

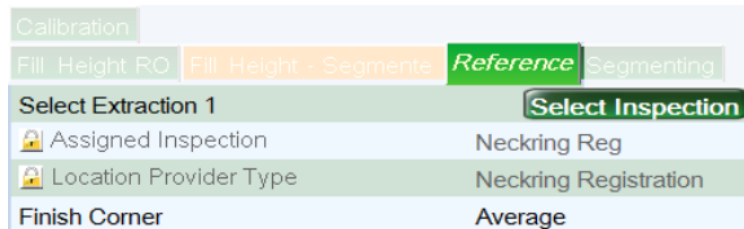
➤ **B. To add a Fill Height - Segmented inspection:**

1. Highlight the Measure ROI region name in the inspection tree.
2. Right-click on the item you just added.
3. From the Inspection menu, select Add > Analysis > Fill Height - Segmented. The analysis is added to the inspection tree. Re-name the inspection to something more meaningful to you.
4. The Fill Height - Segmented menus are displayed and the region is shown on the image. (The menus are described below) Adjust the placement of the region and parameters as necessary.

First, you will set the reference to the registration that you placed earlier.

➤ **C. To set up the Fill Height - Segmented inspection reference:**

1. Go to the Fill Height ROI menu and select One Region for Region Count.
2. Go to the Reference menu and click the **Select Inspection** button.



3. In the inspection menu, select the Neckring registration that you set up earlier. This tells the inspection to use data from the registration as a reference.



4. Click the **Select Inspection** button again to complete the selection.
5. From the Finish Corner drop-down menu in the Reference menu, select Average.

Next, set up the product description for the type of bottle you will be inspecting.

➤ **D. To set up the product description:**

1. Go to the Segmenting menu.

Calibration	
Fill Height RO	Fill Height - Segmented
Reference	Segmenting
Product Description	Carbonated Soft Drink (C...
Classification Segments	16
Vector Spacing	1
Ambient Technique	Density
Reject on Over Fill	☒ Enabled

2. Optional: from the Product Description drop-down menu, select the type of product you are inspecting. At this time, this selection does not affect inspection. It is only a label.
3. If you want the system to reject bottles that are over-filled, check the Reject on Over Fill box. Otherwise leave it un-checked.
4. Leave the default values for the remaining parameters for now. You can change them later, if necessary. These are described later in this section.

Next, set up the segments to determine fill height.

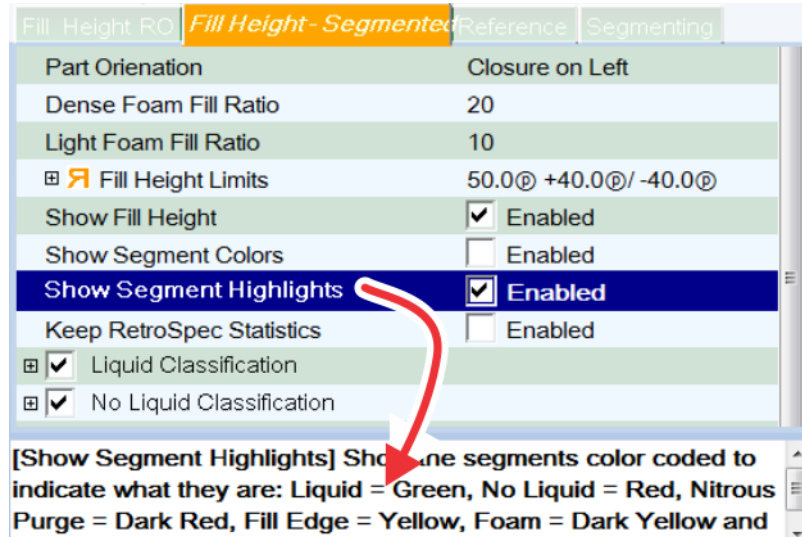
➤ **E. To set up the segments:**

1. Go to the Fill Height - Segmented menu.

Calibration	
Fill Height RO	Fill Height - Segmented
Reference	Segmenting
Part Orientation	Closure on Left
Dense Foam Fill Ratio	20
Light Foam Fill Ratio	10
☒ Fill Height Limits	50.0@ +40.0@/-40.0@
Show Fill Height	☒ Enabled
Show Segment Colors	☒ Enabled
Show Segment Highlights	☒ Enabled
Keep RetroSpec Statistics	☐ Enabled
☒ Liquid Classification	
☒ No Liquid Classification	
☐ Nitrous Dose Classification	
☒ Fill Edge Classification	
☒ Dense Foam Classification	
☒ Light Foam Classification	

2. From the Part Orientation drop-down menu, select the appropriate orientation. In our example, the closure is on the left.
3. To see the segments as you set them up, check the Show Fill Height box. Also choose Show Segment Colors [displays solid colors] or the Show Segment Highlights [displays transparent colors] box. These allow you to see the setup on the screen. You can turn these off later, if desired.
4. In the Fill Height - Segmented menu, check all the classifications that pertain to your bottle. The classification key is shown below. The abbreviations are used in the Results window next to the inspection menus.

❖ *Note: these classifications are color coded. The colors are listed in the information box when you select Show Segment Colors or Show Segment Highlights in the menu.*



The screenshot shows the 'Fill Height - Segmented' menu. The 'Show Segment Highlights' option is highlighted with a red arrow. Below the menu, a text box explains the color coding for the highlights.

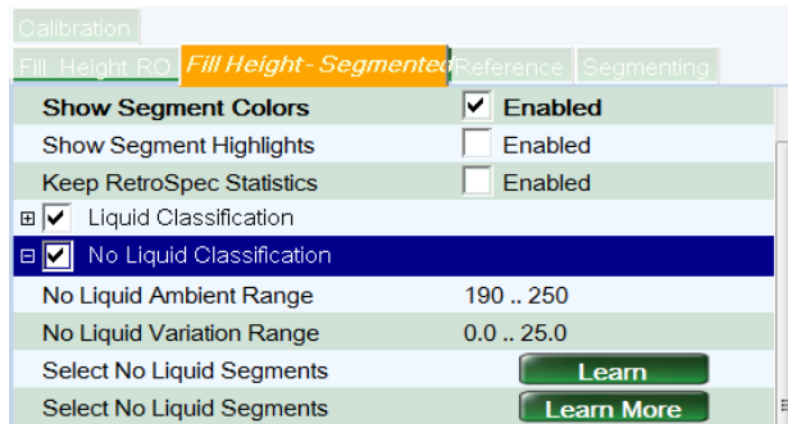
Fill Height RO	Fill Height - Segmented	Reference	Segmenting
Part Orientation		Closure on Left	
Dense Foam Fill Ratio		20	
Light Foam Fill Ratio		10	
Fill Height Limits		50.0@ +40.0@/-40.0@	
Show Fill Height	☒	Enabled	
Show Segment Colors	☐	Enabled	
Show Segment Highlights	☒	Enabled	
Keep RetroSpec Statistics	☐	Enabled	
Liquid Classification	☒		
No Liquid Classification	☒		

[Show Segment Highlights] Show the segments color coded to indicate what they are: Liquid = Green, No Liquid = Red, Nitrous Purge = Dark Red, Fill Edge = Yellow, Foam = Dark Yellow and

Next, set up the inspection to learn the ambient values of each classification.

➤ F. To learn the classifications:

1. In the Fill Height - Segmented menu, expand the classification you want to learn by clicking the [+] sign next to the classification. Start with Liquid Classification. More menu items are displayed. (See also Tips for Setting Classifications below)

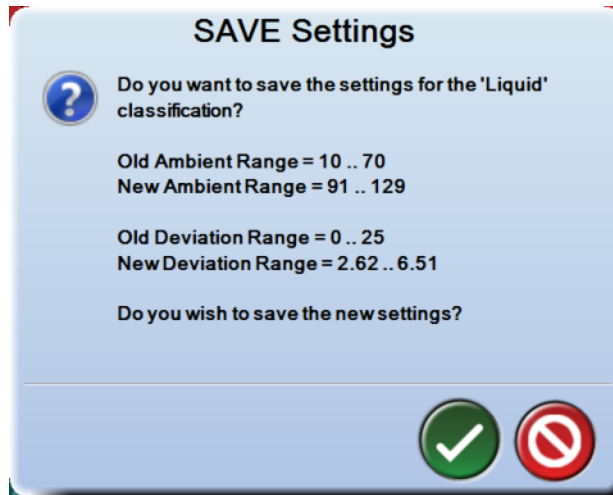


The screenshot shows the 'Fill Height - Segmented' menu with the 'No Liquid Classification' option expanded. The 'Learn' button is visible next to the 'No Liquid Segments' option.

Calibration	Fill Height RO	Fill Height - Segmented	Reference	Segmenting
Show Segment Colors	☒	Enabled		
Show Segment Highlights	☐	Enabled		
Keep RetroSpec Statistics	☐	Enabled		
Liquid Classification	☒			
No Liquid Classification	☒			
No Liquid Ambient Range		190 .. 250		
No Liquid Variation Range		0.0 .. 25.0		
Select No Liquid Segments		Learn		
Select No Liquid Segments		Learn More		

2. Click the **Learn** button.
3. In the image to the left of the menu, click all the segments that match the classification, using the crosshair cursor. For example, for liquid classification, click all the segments that have only liquid showing in the current image. If you inadvertently select an undesired segment, click it again to de-select it.

- Click the Learn button again to complete the selection. A menu is displayed, asking you to confirm your selections. Click the OK button to accept the selections. The system displays the ambient values it measured for the selected segments.



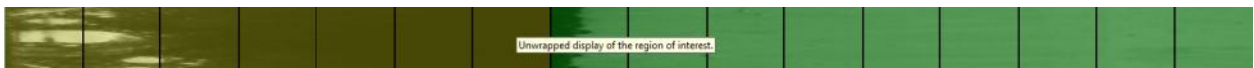
- Click the OK button to accept and save the new settings.

❖ *Note: this inspection uses only the displayed image to learn. You may need to use the Learn More button on additional images to get a good sample population.*

- Click the right arrow button below the image to display a new image. If the new image does not contain a good example of the classification (light foam, for example), select a new image.
- Click the **Learn More** button. This adds data to the information already learned using the Learn button.
- Use the crosshair cursor to select all the segments that match the current classification.
- Click the **Learn More** button again to complete the selection.
- Click OK twice to confirm your selections.
- Repeat steps 6-10 several more times to get a good sample population. Select different bottles in the Retro-Spec graph, and make sure that the segments are properly highlighted for the classification you are setting. Learn more as necessary.
- Repeat steps 1-11 above for the remaining classifications. Tips are provided below.

Tips for setting classifications:

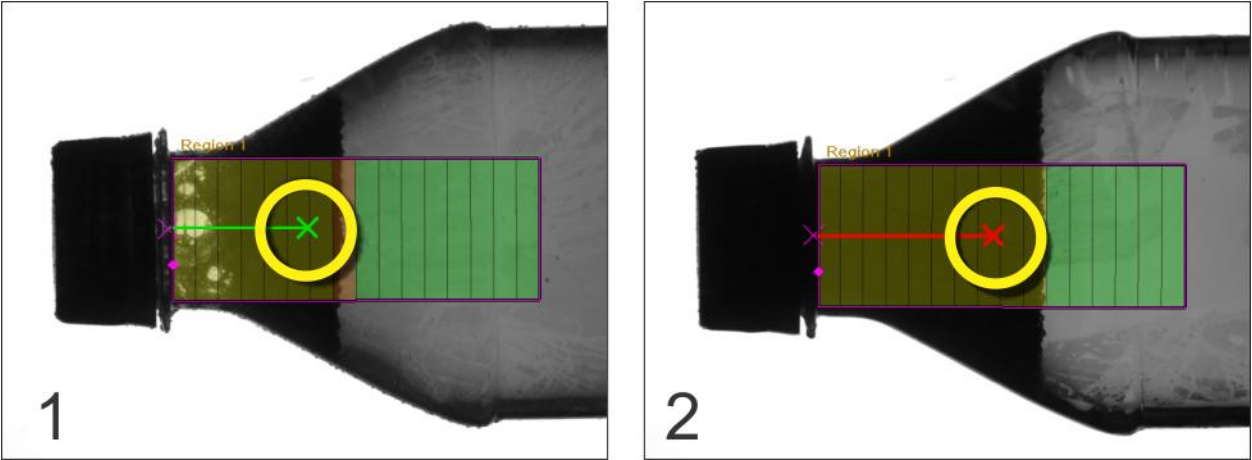
- You might be able to see the differences between segments better by using **Show Segment Highlights** rather than Show Segment Colors. This allows you to see the fill line, and when the segments change classification.
- Use the unwrapped Region of Interest on the Retro-Spec screen to view the segments better. This provides a magnified view of the segments.



Finding the fill level edge:

- For learning **fill edge**, try to use a segment that has the fill line in the middle of the segment. You may need to scroll through images, or you may need to adjust the number of segments to make the fill line fall in the middle of a segment. The system uses only one segment at a time when learning.
- The system places a **large X** (green for passing, red for failing) where it determines the fill level. An example is shown below.
- If the product has **foam**, the system compensates for it by:
 - determining how much and what type of foam is detected, and

- the value you assign to the Dense Foam Fill and Light Foam Fill ratios in the Fill Height - Segmented menu



1	Bottle passes - fill level was within specifications
2	Bottle fails - fill level was too low

➤ **G. To test the Fill Height - Segmented inspection:**

1. In the Retro-Spec graph, right-click to see the Retro-Spec Options menu. Select Auto Select Limits. This sets the pass/fail limits for the inspection based on current settings.
2. Test the inspection by looking at selecting more images on the Retro-Spec graph. Make sure each bottle passes or fails according to your specifications. You can adjust the bars on the Retro-Spec graph to make bottles pass or fail.
3. Test several more images to make sure bottles are passing and failing correctly. To acquire more images, put the lane online and click the [+100] button below the image in the Retro-Spec screen.
4. If bottles are not passing and failing correctly, then go back to "F. To learn the classifications" and learn more bottles for the classifications. Or you may need to adjust other menu parameters. These are listed below for your reference.

Fill Height - Segmented menus

To set up this inspection, follow the procedures A - G above. The following menu descriptions are for reference.

Fill Height ROI menu

Set up the Fill Height - Segmented region.

Calibration	
Fill Height ROI	Fill Height - Segments
Region Count	One Region
Region 1	
Center Offset X	-9
Center Offset Y	381
Region Width	744
Region Height	288
Region Angle	358.54

Region Count

For this inspection, only use One Region.

Region 1

Usually the region can be set up using the tools on the image. Refer to "A. Before setting up the Fill Height - Segmented inspection" for tips to set up the region using the Measure ROI tools.

Reference menu

Select the inspection to which the fill level is referenced. Refer to "C. To set up the Fill Height - Segmented inspection reference" above to set this menu.

Calibration	
Fill Height RO	Fill Height - Segmente
Reference	
Segmenting	
Select Extraction 1	
Select Inspection	
Assigned Inspection	Neckring Reg
Location Provider Type	Neckring Registration
Finish Corner	Average

Select Extraction

These menus allow you to choose an inspection to use as a reference point for the measurement. Click the **Select Inspection** button, then choose an inspection from the inspection tree. Click the **Select Inspection** button again to set the choice. The Assigned Inspection and Location Provider Type information is filled in -- you cannot manually change these.

Finish Corner

If the inspection chosen for the Extraction has multiple reference points, then this parameter allows you to choose which point to use. For Fill Height - Segmented inspection, you will usually use Average.

Segmenting menu

Set up the types of segments needed for your current product. See "D. To set up the product description."

Calibration	
Fill Height RO	Fill Height - Segmente
Reference	Segmenting
Product Description	
Carbonated Soft Drink (C...	
Classification Segments	16
Vector Spacing	1
Ambient Technique	Density
Reject on Over Fill	☒ Enabled

Product Description

Choose the type of product you are inspecting. As of this publication, this selection does not affect inspection. It is used as a label.

Classification Segments

Divide the search region into a number of segments between one and 32. The default is 16 and usually works well. Increasing the number of segments may be more accurate; however this may increase inspection time and it may be affected by sloshing or decorative features on the bottle.

Vector Spacing

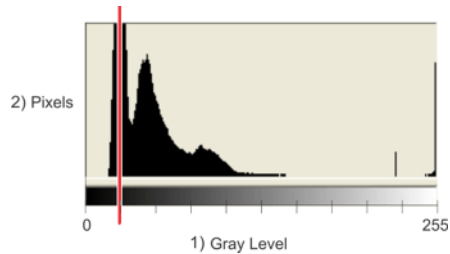
The distance between search vectors. For this inspection, leave the value at one.

For Fill Height - Segmented inspection, **Ambient Technique** is usually set to the default **Density**.

Ambient Technique

This method determines the region's ambient. Choose the method through the drop-down menu.

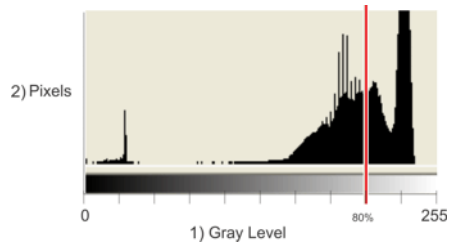
- **Max Amplitude** looks for the maximum gray level amplitude — the gray level with the most pixel counts — within the histogram of the search area.



1	Gray level
2	Pixels in the histogram of the image

Peak Percentile locates the gray level value that exceeds the **threshold**. In the example below, the system would use the gray level to the right of the line marking 80%.

- **Ambient Threshold** defines what percentage of the search area to use.



1	Gray level - choose a percentage
2	Pixels in the histogram of the image

- **Density** computes the average of all the pixel gray levels — total gray level divided by pixels.

Reject on Over Fill

If you want the system to reject bottles that are too full, then check this box.

Fill Height - Segmented menu

Program the inspection to learn your product. See "E. To set up the segments."

Calibration	
Fill Height RO	Fill Height - Segmented
Reference	Segmenting
Part Orientation	Closure on Left
Dense Foam Fill Ratio	20
Light Foam Fill Ratio	10
☒ Fill Height Limits	50.0@ +40.0@/-40.0@
Show Fill Height	☒ Enabled
Show Segment Colors	☒ Enabled
Show Segment Highlights	☒ Enabled
Keep RetroSpec Statistics	☐ Enabled
☒ Liquid Classification	
☒ No Liquid Classification	
☐ Nitrous Dose Classification	
☒ Fill Edge Classification	
☒ Dense Foam Classification	
☒ Light Foam Classification	

Part Orientation

Choose the orientation of your part. In many cases, the part image is sideways to optimize the inspection area on the screen.

Dense Foam and Light Foam Fill Ratio

These are usually used for carbonated soft drink or beer applications. Set the amount of liquid volume contained in the dense foam and light foam. The default values are 20% (dense foam) and 10% (light foam).

Fill Height Limits

Define the valid fill height range per your specifications. This value is measured with respect to your reference point (the neck ring, in our example). You can use the bars on the Retro-Spec graph to adjust the limits.

Nominal

The ideal fill height value.

❖ *Note: for the following parameters, you must have Show Graphics enabled. Right-click over the image and make sure Show Graphics is checked.*

Show Fill Height

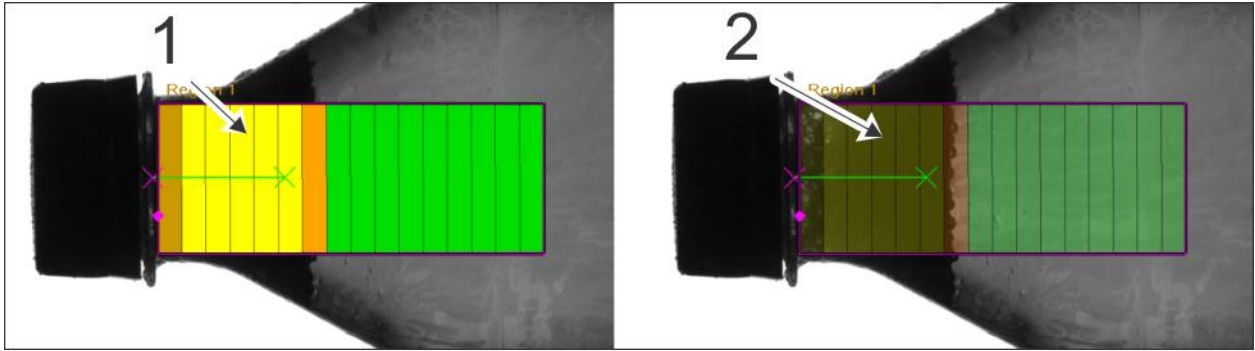
Show the fill height measurement on the image. A large 'X' is displayed to indicate the computed fill height.

Show Segment Colors

Show the segments with the color-coding based on classification.

Show Segment Highlights

Show the segments with transparent color-coding based on classification.



❖ *Note: If you have both Show Segment Colors and Show Segment Highlights enabled, only Show Highlights is displayed.*

1	Show Segment Colors
2	Show Segment Highlights

Keep Retro-Spec Statistics

Check this box to keep statistics such as Mean, Standard Deviation, and CPK, from this inspection. For more information see **Retro-Spec Statistics** (on page 74).

Classifications

Enable the proper classifications based on the product you are inspecting. The following parameters are available for each classification.

Ambient Range - This is automatically populated during the learn process.

Variation Range - This is automatically populated during the learn process.

Learn button - Use this button during the first learn process for a classification. Click the **Learn** button, then in the image, click all the segments that match that classification. Then click the **Learn** button again.

Learn More - Use this button to add data to the learned values. Select a different image than used for the Learn process, then click the **Learn More** button, then in the image, click all the segments that match that classification. Then click the **Learn More** button again.

❖ *Note: the system uses only ONE image for the Learn and Learn More processes. We recommend that you select additional images and use the Learn More button to add data to the learned population.*

Calibration menu

Use this menu to program the system to translate pixels into your desired units of measure (mm, for example).

Fill Height RO	Fill Height - Segments	Reference	Segmenting
Calibration			
Calibration Mode	Inspection Calibration		
Units	Pixels		
Conversion Factor	1.0		
Learn Calibration	Learn Calibration		
Save Calibration	Save Calibration		
Measured Distance	-1.0@		
Distance to Reference	-1.0@		

❖ *Note: The symbol [Ⓟ] indicates that this value is in pixels. Your system may show [mm] for millimeters, ["] for inches, or [] blank for custom units. It indicates that this value can be calibrated using **Review Camera Calibration** (on page 165) or **Image Analysis** (on page 158) for the current sensor.*

Calibration Mode

The system will convert the pixel dimensions into your preferred unit of measurement.

Sensor Calibration -- Use the calibration previously set up for the sensor through **Image Analysis** (on page 158) or through another inspection.

Inspection Calibration -- Use the calibration from this inspection only.

Units

Choose your preference in the reporting of the measurements. Choose from millimeters, inches, pixels, and custom. Custom allows any calibration factor to be used.

Conversion Factor

This indicates the pixel size and is used to convert one pixel into the units selected. The initial conversion will be controlled by the Learn Calibration results. You can adjust this value manually if necessary.

Learn Calibration

Click the **Learn Calibration** button to automatically determine the scale factor, which converts the value to the desired units.

Save Calibration

Click the **Save Calibration** button to save the calibration scale and units to the sensor for use by other inspections.

Measured Distance

Measure your part with calipers or another tool, then enter the actual value for Measured Distance. This is used to help calibrate the measurement. The measurement should be the physical length from the neckring to the normal fill height, in your selected unit of measurement.

Distance to Reference

Measure your part's normal fill level (with respect to the bottom of the bottle) with calipers or another tool, then enter the actual value for Distance to Reference. This is used to help calibrate the measurement.

Distribution

The Distribution inspection looks at color printing on parts, detecting 'tramp cans' or gross decoration errors on parts. If you are familiar with the Pressco Extractor product, the Distribution inspection will seem familiar to you.

This inspection can also inspect for proper color of a product. For example, if you are inspecting blue preforms, it can detect when a preform is not the proper color blue, or if it is an incorrect color.

The Distribution inspection can inspect for gross decorator defects in gray scale images or color images. Use Gray Scale mode if your system does not have a color camera, or you want to focus on a specific range of gray shades. This can help detect scratches or other defects where the color is missing from an area on the part.



The inspection uses:

- A learned data set to compare to newly inspected parts
- **Color histograms** (see "**Distribution Histogram Types**" on page 255) that consist of a number of color bins. Each color in the region of interest is analyzed. The total number of pixels containing a certain color (or gray scale) are counted and placed in each bin.

➤ **To add a Distribution analysis:**

1. Make sure a Region of Interest has been added to the inspection tree.
2. Right-click on the item you just added.
3. From the Inspection menu, select Add > Analysis > Distribution. The analysis is added to the inspection tree. Re-name the inspection to something more meaningful to you.
4. The Distribution menu is displayed and the region is shown on the image. (The menu is described below) Adjust the placement of the region and parameters as necessary.

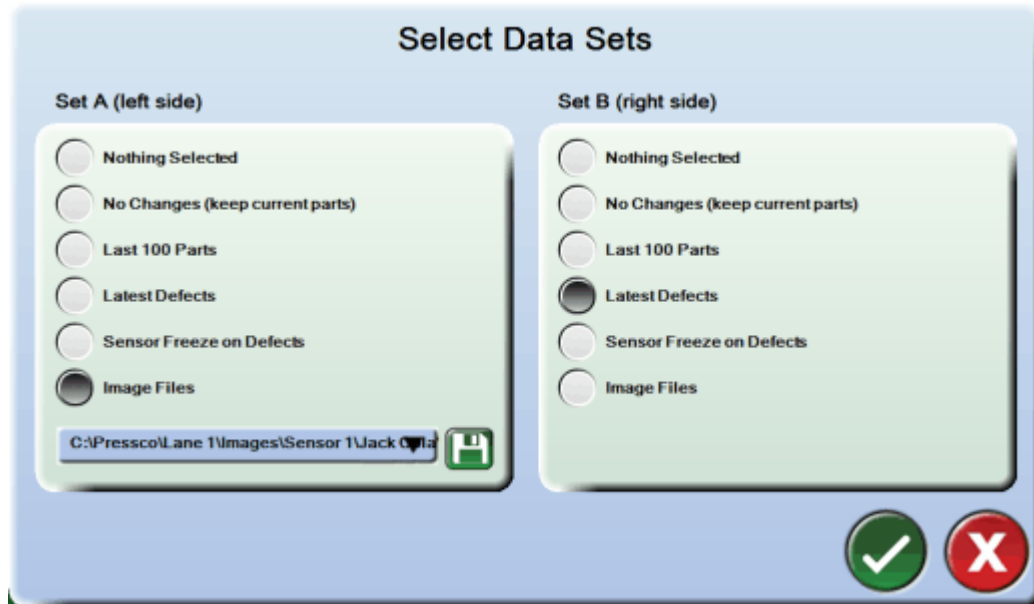
Load a set of good images into Data Set A

You can use images of the last parts run (up to 100 parts) and learn using this data. However, you must make sure that all the images in the data set are from good parts. You can look at the Population View graph and delete the images you do not want. Alternately, you can load a set of known good images that you have saved previously using the steps below.

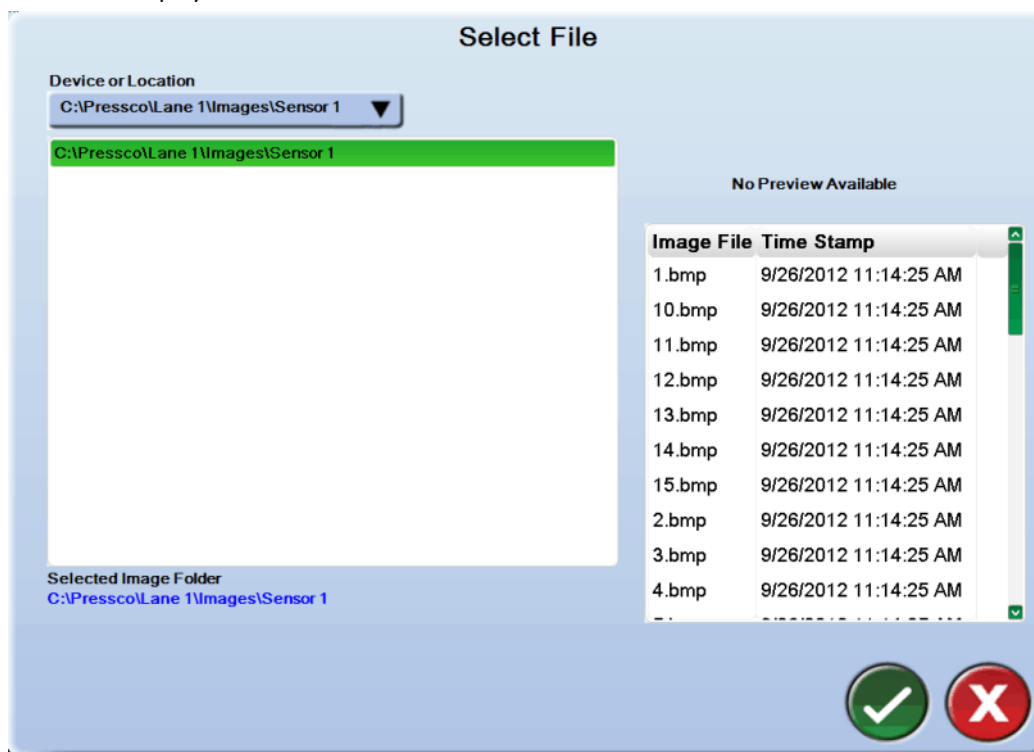
➤ **To load Data Set A:**

1. Look at the **Retro-Spec Population View Graph** (on page 211).

- Click the left arrow  button on the Retro-Spec graph to view the **Select Data Sets** menu.



- Click the Image Files button for Set A.
- Click the disk icon  to browse to the folder where the images were saved. The **Select File** menu is displayed.



- Browse to and select the folder that contains the images you want to load.
- Click the OK button  in the Select Location and Select Data Sets menus to load all the bitmap images that were previously saved in the selected folder.

Set up the Distribution inspection

➤ To set up a Distribution inspection:

1. Make sure a good set of images is loaded into Data Set A (see above).

❖ *Note: descriptions of the parameters mentioned are described under the Distribution menu section below.*

2. Choose a different **Histogram Type** if appropriate for your part.
3. Use the **Learn** function.
4. Set the Attenuation if desired.
5. Use the **Learn More** function if desired.

❖ *Note: To use the Learn More function, you will need a set of part images in Data Set A. The images can be the last 100 parts you have inspected, or images from a file. To load more images, use the instructions to "Load a set of good images into Data Set A" listed above.*

Distribution menu

Ring	Distribution
Histogram Type	New RETRO-SPEC Color Hist...
Gray Scale	0 .. 255
Bin Count	255
Deviation Limits	+20.0/ -20.0
Attenuation	0
Learn	<button>Learn</button>
Learn More	<button>Learn More</button>
Region Extraction	Read Radially
Color Mode	Gray Scale

Histogram Type

Select one of the **Distribution Histogram Types** (on page 255). This is *not* used if **Color Mode** = Gray Scale.

Gray Scale

Specify the range of gray scales for the distribution inspection. This is *not* used if **Color Mode** = RGB.

Bin Count

This is only used when **Color Mode** = Gray Scale. Set the number of bins (gray shades) the histogram is divided into. Note that some constraints may apply, and this number may not exactly match the number of bins.

Deviation Limits

Set the tolerance level for the colors or gray scale values. Positive values represent too much of some color. Negative values represent too little of some color. The values correspond to the largest deviations of some color from its expected amount, which is determined when learning the data set. Values of zero represent no deviation of color.

Attenuation

Set the minimum number of pixels of a color or gray shade that must be seen before they are counted. For example, if Attenuation is set at 100, there must be at least 100 pixels of that color or gray shade, or it will be ignored. Increasing attenuation reduces sensitivity to small changes. It ensures that only significant color changes cause the product to fail.

Learn

The inspection needs to learn the colors or gray shades of your product. To learn, the inspection looks at the samples in Data Set A. Therefore, you will need a set of images in Data Set A. The data set should contain a good sample of your production line. Ideally, you should store the images of about 100 good parts in Data Set A. The larger the sample population, the better the inspection results.

- ❖ *Note: if there are any defective parts in Data Set A, they will be included in the learned data. Therefore, you might want to look through the data set using the Comparison View graph, and move defective parts to Data Set B.*
- ❖ *Note: Learn overwrites existing data. It can be used if you are testing the inspection on a new part, or want to clear the data from a previous learn.*

Learn More

[Only available after you use Learn] - After you have used the Learn function, you can add to the learned data. Use this to learn new parts where the colors might be slightly different than your original data set, but are still good parts. This builds a wider tolerance of colors for your parts. This feature can be used at any time - for example: immediately after the initial learn, or several weeks later.

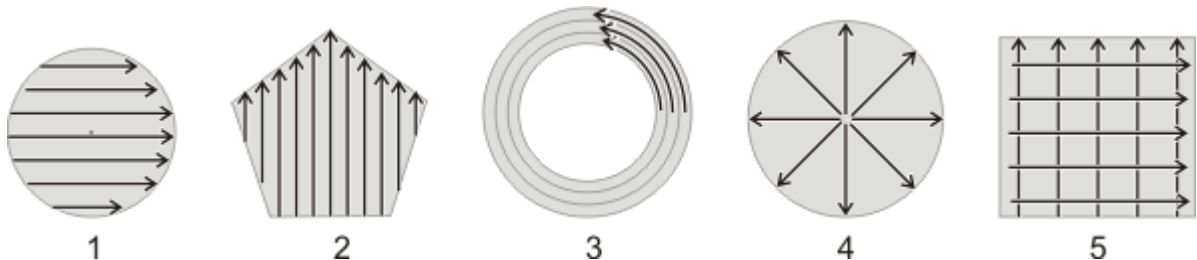


Region Extraction

Choose how the Intellispec should read the information from the region. This usually depends on the shape of your region.

- ❖ *Note: some inspections do not use all of these options*

The illustration below shows how the information is read by each method. Note that these shapes are examples only - your region does not have to match the shape.



1	Read Horizontally - Extract the region horizontally - 90 degrees with respect to orientation.
2	Read Vertically - Extract the region vertically - parallel with respect to orientation.
3	Read Circularly - Extract in a circular fashion around the region.
4	Read Radially - Extract region in a radial direction.
5	Read Horizontally and Vertically - Extract the region both horizontally and vertically (with respect to orientation). This is used in special cases.

Color Mode

Choose whether to extract the data in Gray Scale or RGB mode. Note that your system must have a color camera to use RGB mode.

Information about the graphs in Distribution inspection

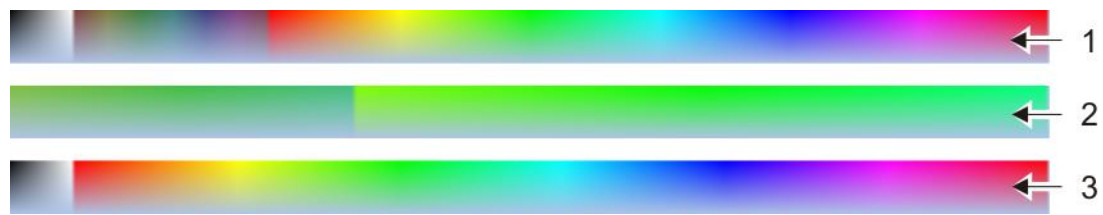
The Part View graph view shows the distribution of the color of pixels in the inspection's region of interest. Each bar on the graph represents a number of pixels in each color bin. The color bins are shown in the color band at the bottom of the graph. For information about the color bins, refer to **Distribution Histogram Types** (on page 255).

The example below shows a Part View graph with a good part (top) and a defective part (bottom). The defective part had too many pixels of several different colors in this example - possibly a 'tramp' part.



Distribution Histogram Types

In the **Distribution** (on page 250) inspection, there are several color histograms available. Most often, you will be using the New Retro-Spec Color Histogram. You will notice the difference between the histograms in the color bar directly below the **Retro-Spec Part View Graph** (on page 215).



1	New Retro-Spec Color Histogram
2	Special Color Histogram (Chartreuse, Green, Spring Green shown)
3	Classic Extractor Histogram
4	White Level Histogram - not shown

➤ To see a different histogram:

1. Select a different from the **Histogram Type** drop-down menu.
2. Switch to Population View on the graph by right-clicking the Retro-Spec graph, then selecting Population View from the Retro-Spec Options menu.
3. Switch to Part view by right-clicking on the Retro-Spec graph, then selecting Part View from the Retro-Spec Options menu. The new histogram is displayed below the graph.

New Retro-Spec Color Histogram

In this histogram, there are 16 bins of gray scale, 48 bins of dark or pastel colors, and 192 bins of very bright colors. The 48 bins of dark or pastel colors have a wider tolerance, and therefore you may see most of the colors of your part in those bins. This histogram also has some overlapping of colors - that is, pixels may be mapped to more than one color bin. This ensures that slight variations of color do not cause the product to fail.

Special Color Histograms

In special cases, you may use other color histograms. The color bars are viewable under the Part View graph.

If you are trying to detect off-color parts, such as preforms, use one of the special color histograms. For example, if your preforms are supposed to be green, use the histogram that most closely matches the correct color. This provides a large range of green colors to be detected. When a different color part (blue, for example) goes through your product stream, that part will be easily detected because it will not fall into the learned green color range.

Classic Extractor Histogram

This histogram is the same as the original Pressco Extractor product. It has 16 gray scale bins and 240 color bins. This is different from the New Retro-Spec Color Histogram in that it does not have the middle section of 48 bins of dark or pastel color.

This histogram is only used when an approximate comparison between the original Extractor product and the Retro-Spec Distribution is required.

White Level Histogram

(As of this printing, the white level histogram is not displayed under the Retro-Spec graph)

This histogram is used for pastel colors, or if you want to differentiate between shades of the same color. For example, you might need to detect when a yellow color is too light compared to the normal yellow shade.

Feature Detect

Feature Detect analysis can be used to detect a range of specific gray shades to determine defects. For example, in a fill height/ cap placement inspection, it can be used on the cap to determine whether a tamper band is broken.

❖ *Note: Feature Detect analysis requires either a Ring Region or Polygon Region (on page 219) of interest.*

Series IV users: Feature detect is similar to Zones Inspection.

➤ To add a Feature Detect analysis:

1. Make sure a Ring Region or **Polygon Region** (on page 219) of interest is already added to the inspection tree. Adjust the region to examine the area of interest where you will place the Feature Detect inspection.
2. Right-click on the item you just added.
3. From the Inspection menu, select Add > Analysis > Feature Detect. The analysis is added to the inspection tree. Re-name it to something more meaningful to you.
4. The Feature Detect menus are displayed and the region is shown on the image. (The menus are described below) Adjust the placement of the region and parameters as necessary.

Feature Detect menu

Use the Feature Detect menu to specify a range of gray shades to find.

Polygon	Feature Detect
Feature Method	Use All Data
Feature Gray Scale	30 .. 100
Second Feature Range	☐ Enabled
Show Features	☐ Enabled
☒ Check Feature Area	
☐ Allowed Area	1000 - 1000 - 1000
Nominal	1000
Learn Nominal Area	<button>Learn</button>
☐ Check Feature Count	

Feature Method

Choose a method to determine the ambient value in a search region.

Use All Data - Analyzes all the pixels in the search region, and counts the total number of pixels that meet the criteria set in **Feature Gray Scale**.

Use Qualified Features - Analyzes all the pixels in the search region, but only counts pixels if:

- The pixels meet the **Feature Gray Scale** criteria, AND
- The pixels meet the **Feature Size** criteria.

Feature Gray Scale

Set the range of gray shades of the feature you want to locate.

Second Feature Range

Set a second range of gray shades to locate within the search region.

Second Feature Gray Scale

[Only shown if Second Feature Range is enabled] Set the range of gray shades of the second feature you want to locate.

Show Features

Highlight the found features on the image.

Check Feature Area

Check the area of the feature to see that it is within the specified tolerance.

Allowed Area

[only available if Check Feature Area is enabled] The tolerance (in pixel area) of the feature you want to locate.

Nominal

The expected area size. This number is populated when you press the **Learn** button.

Learn Nominal Area

Click the **Learn** button to automatically learn the area.

Check Feature Count

Check to see that the correct number of features is found.

The following parameters are available when **Feature Method = Qualified Features**.

Feature Size

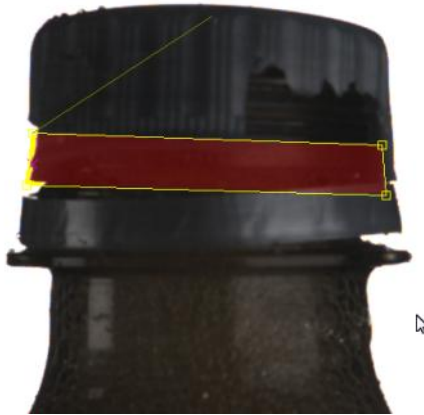
Set the allowable size of the feature you want to locate.

Show Feature Centers

Show the center points of the found features, marked with an 'X.'

Feature Detect - example FHCP 3X

The example below shows where a Feature Detect inspection could be used within a Fill Height/ Cap Placement inspection. It could be used to detect a defective tamper band. This tamper band did not meet tolerance criteria for gray scale range, so it failed inspection.



Dimensions

The dimension inspection type is special in that it 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.

The Dimension inspections include:

- **Distance** (on page 258)
- Angle
- Closure Angle

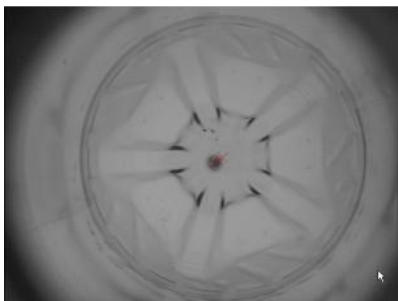
❖ *Note: Your system (and this book) may show only those items that apply to your application.*

Distance

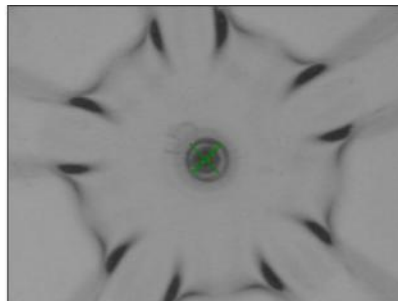
The Distance inspection computes the distance between two points. This is useful if you want to find features that are out of tolerance or out of place on a part. Distance inspection does NOT use a region. It obtains information produced in other inspections. The other inspections can include a Registration (it uses the found registration point), or a Measure Extract inspection.

Series IV users: this inspection produces the same results of Dimension inspection, but in Series V the measurement points are found by other inspections.

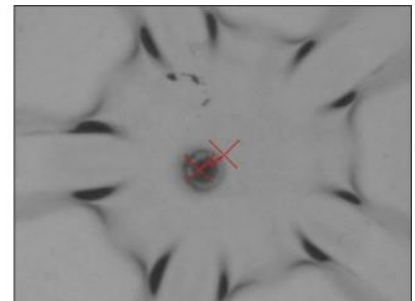
Examples of where Distance inspection might be used is for detecting swung gates or high caps on bottles, turned tabs on converted or EZO ends, or computing finish dimensions. The example below shows a gate position computed with respect to the center of the base.



1



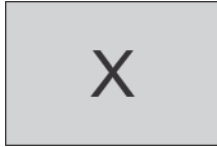
2



3

1	Full image with swung gate
2	Enlarged image of good part
3	Enlarged image of bad part showing incorrect position of gate

Distance can be computed with respect to the center of the screen, if desired.



➤ To add a Distance measurement:

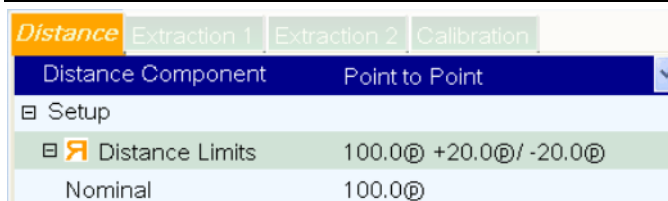
1. Make sure at least one **Registration** (see "**Registrations**" on page 225) or Measure Extract inspection is placed in the inspection tree. To find the distance between two points, place the registrations or Measure Extract inspections for each point.
2. Right-click in the inspection tree to see the Inspection menu.
3. From the Inspection menu, select Add > Dimension > Distance. The dimension is added to the inspection tree. Re-name it to something more meaningful to you.
4. The Distance menus are displayed and the region is shown on the image. (The menus are described below) Adjust the parameters as necessary.

➤ To set up a basic Distance measurement:

1. Choose a Distance Component from the Distance tab.
2. Go to the Extraction 1 tab and click the **Select Inspection** button.
3. Select the first reference point (in the inspection tree) you want to use for the Distance measurement. Click the **Select Inspection** button again to complete the selection.
4. Go to the Extraction 2 tab and click the **Select Inspection** button.
5. Select the second reference point (in the inspection tree) you want to use for the Distance measurement. Click the **Select Inspection** button again to complete the selection.
6. Go back to the Distance tab and set the Distance Limits.
7. Adjust other parameters as necessary.

Distance menu

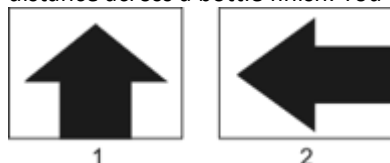
❖ *Note: The symbol [P] indicates that this value is in pixels. Your system may show [mm] for millimeters, ["] for inches, or [] blank for custom units. It indicates that this value can be calibrated using **Review Camera Calibration** (on page 165) or **Image Analysis** (on page 158) for the current sensor.*



Distance Component

Point to Point -- [most common] Find the distance between two reference points.

Perpendicular to Orientation and **Parallel to Orientation** -- These two modes are good for measuring distance across a bottle finish. You would set this mode depending on the part orientation.



1	Part oriented upright - use Perpendicular to Orientation
2	Part oriented sideways - use Parallel to Orientation

❖ *Note: If you use Finish Location or Centerline registrations for either of the extractions, note that these registrations produce an orientation. The distance measured will reference the orientation produced by the Finish Location or Centerline registrations. If using other inspections, zero degrees or ninety degrees is used as a reference.*

Setup

Set up the reject criteria for the measurement.

Distance Limits

Specify the minimum and maximum distance between the two reference points.

Nominal

The ideal distance.

Extraction 1 and Extraction 2 menus

❖ *Note: when only one inspection is used for Extraction, the second reference point used is the center of the screen.*

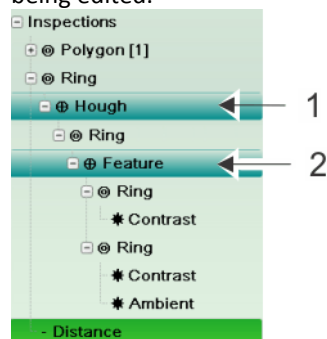
Distance	Extraction 1	Extraction 2	Calibration
Select Extraction 1	Select Inspection		
Assigned Inspection	UNDEFINED		
Location Provider Type	No Measurements		

Select Extraction

These menus allow you to choose an inspection to use as a reference point for the measurement.

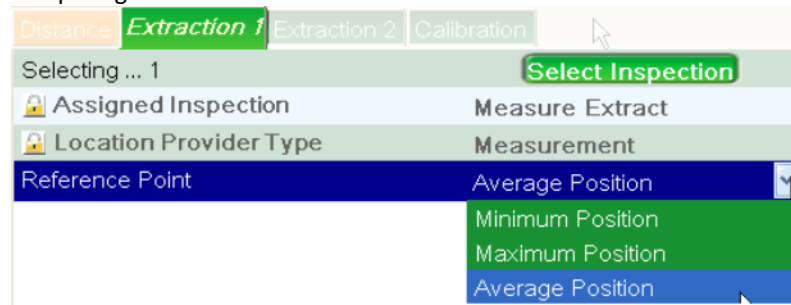
Click the **Select Inspection** button, then choose an inspection from the inspection tree. Click the **Select Inspection** button again to set the choice. The Assigned Inspection and Location Provider Type information is filled in -- you cannot manually change these.

In this example, we chose Hough as Extraction 1 and Feature as Extraction 2 from the inspection tree. Those inspections become highlighted when Distance is selected in the inspection tree and/or is being edited.



Reference Point

(Available when you use the Measure Extract inspection) Choose which edges to use when computing Distance.

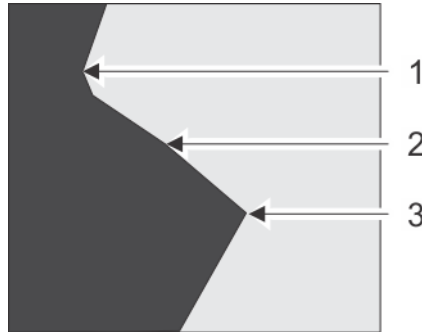


Minimum Position -- The system will use the minimum distance of the search region, and reject parts if the measurement is out of limits.

Maximum Position -- The system will report the maximum distance of the search region, and reject parts if the measurement is out of limits.

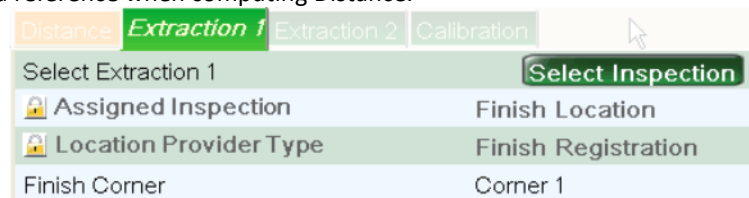
Average Position -- The system will report the average distance of the search region, and reject parts if the measurement is out of limits.

Suppose the illustration below indicates a search region, in which the system is searching from right to left, seeking a light to dark transition. Position 1 is the Maximum Position. Position 2 is the Average Position. Position 3 is the Minimum Position found in the search region.



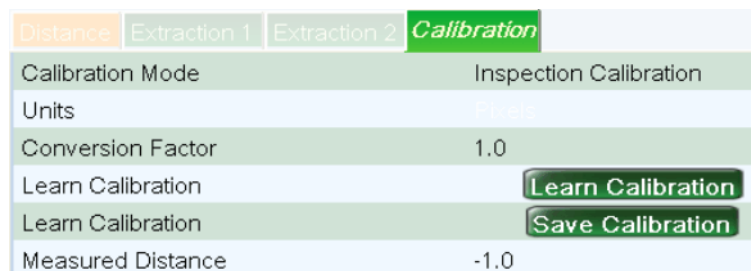
Finish Corner

(Available when you use Finish Location as the extraction for Distance) Choose which corner to use as a reference when computing Distance.



Calibration menu

Use this menu to program the system to translate pixels into your desired units of measure (mm, for example).



Calibration Mode

The system will convert the pixel dimensions into your preferred unit of measurement.

Sensor Calibration -- Use the calibration previously set up for the sensor through **Image Analysis** (on page 158) or through another inspection.

Inspection Calibration -- Use the calibration from this inspection only.

Units

Choose your preference in the reporting of the measurements. Choose from millimeters, inches, pixels, and custom. Custom allows any calibration factor to be used.

Conversion Factor

This indicates the pixel size and is used to convert one pixel into the units selected. The initial conversion will be controlled by the Learn Calibration results. You can adjust this value manually if necessary.

Learn Calibration

Click the **Learn Calibration** button to automatically determine the scale factor, which converts the value to the desired units.

❖ *Note: you must first enter the Measured Distance before learning calibration.*

Save Calibration

Click the **Save Calibration** button to save the calibration scale and units to the sensor for use by other inspections.

Measured Distance

Measure your part with calipers or another tool, then enter the actual value for Measured Distance. This is used to help calibrate the measurement.

Chapter 14

Troubleshooting

See the following table for a list of symptoms with possible causes and solutions. For other problems or further help, contact **Pressco** (see "**How to Contact Pressco**" on page 357).

Symptom	Probable Cause	Solution
No image (image is black or solid cream color)	Part program was not changed during part changeover	Change part program to match the part you are inspecting Part Changeover (on page 43)
	Lighting not set up correctly	Set up lighting Basic Adjust Lighting (on page 162) or Advanced Adjust Lighting (on page 162)
	Part tracker board not communicating	Restart the system (Restarting the Intellispec FHCP 3X System (on page 264))
System log reads "missed acquisitions" or "Part Tracker Error" Error message on screen that reads "Part Tracker Error - Reset Part Tracker" Error message on screen: "Part Tracker Exception"	Part tracker board not communicating	Restart the system (Restarting the Intellispec FHCP 3X System (on page 264))

Before Servicing the Unit



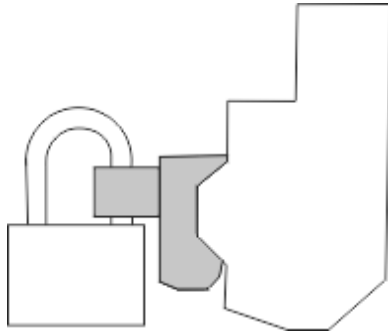
Warning

Potential hazardous voltage from the UPS. Use caution when servicing.

➤ **Before servicing any electrical or mechanical components inside the FHCP 3X system:**

1. Power off the system using power switch DISC 1. **Power On/ Off** (on page 27)
2. Carefully open the FHCP 3X computer and inspection module doors. **Accessing the internal components** (on page 270)
3. Locate the circuit breaker lockout clips. These are shipped with the system, and should be stored inside the unit.

4. Install the circuit breaker lockout clips, as shown below, and attach a lock. This will ensure that no incoming power (if applicable) will reach the unit.



Resetting the Part Tracker Board in FHCP 3X

If you get an error message about the part tracker board, you may need to reset it. To reset the Part Tracker board in the FHCP 3X system, restart the system. This will clear errors and reset the hardware. See *Restarting the Intellispec FHCP 3X System* (on page 264).

Restarting the Intellispec FHCP 3X System

You may need to restart the system if power or communication has been lost. Symptoms may include that the inspection module light has stopped flashing, and the system is no longer taking pictures. Restarting the system will reconnect the Vision Processor with the Part Tracker.

❖ *Note: if the power to the UPS is interrupted for more than 30 seconds, the software will automatically shut itself down and then shut down the Vision Processor PC. The software will restart. You will just need to log in and put the system back online.*

Restarting the System

If your system has stopped communicating, or the software has stopped operating, we recommend that you restart the whole system. This will reset the software, the inspection module, and all the communication devices of the system.

➤ **To restart the system:**

1. Turn off the main power switch (DISC 1). The system will shut down, including a controlled shut down of the software.
2. Wait until the software and all the components have shut down, and then wait for about 40 more seconds to allow the electronic components to reset.
3. Turn on the main power switch (DISC 1). The system will start, and the Intellispec software will load. Log in to begin using the system.
4. Verify that the red E-stop button on the front panel is pulled out.
5. Press the green reset button on the front panel until the light turns green.

❖ *Note: The system restart takes several minutes to complete.*

If the system restart does not fix the problem, try one of the solutions below, or contact Pressco. (**How to Contact Pressco** (on page 357))

Restarting the Software Application

You may need to restart the software if you see a software error that, for some reason, may not have been cleared by restarting the entire system.

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

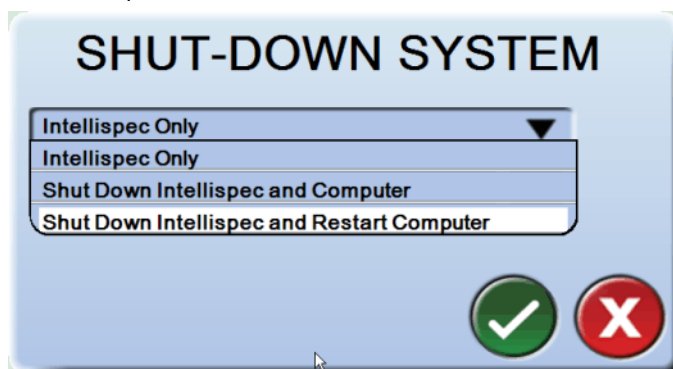


Important

When restarting the software, it is important to choose the correct option from the Shut Down System menu. Only select Shut Down Intellispec and Restart Computer as described below.

➤ To restart the Intellispec software:

1. Log in.
2. Make sure all lanes are offline (all lanes have the red stoplight). For more information, see **Online / Offline** (on page 28).
3. Click the Home button .
4. Click the Tools button  to display the Tools menu.
5. Click the Exit System option.
6. A drop-down menu allows you to choose an option. Choose: "Shut down the Intellispec and restart the computer."



7. Click the OK  button. The Intellispec software and computer shuts down and restarts. The software will come up in System Overview mode where you can log in to continue operating the system.

Rebooting the computer

If restarting the software application does not clear the errors, or the software does not restart, or you see the "System in Transition" message, try rebooting the computer.

➤ To reboot the computer:

1. Connect the **Mechanical keyboard (MKB)** (on page 33) to the USB port under the monitor, closest to the center of the monitor. The keyboard is stored inside the **Intellispec Computer Enclosure** (see "**Intellispec Computer Enclosure (backpack)**" on page 277).
2. Press Ctrl + Alt + Delete on the mechanical keyboard.
3. Use the Log Off option to log off of Intellispec.
4. At the Windows Login Prompt, enter "pvpass" as the password for the Intellispec user account. Once login is complete the Series V application software will be launched.
5. Remove the Mechanical keyboard and properly store it.

❖ *Note: The system reboot takes several minutes to complete.*

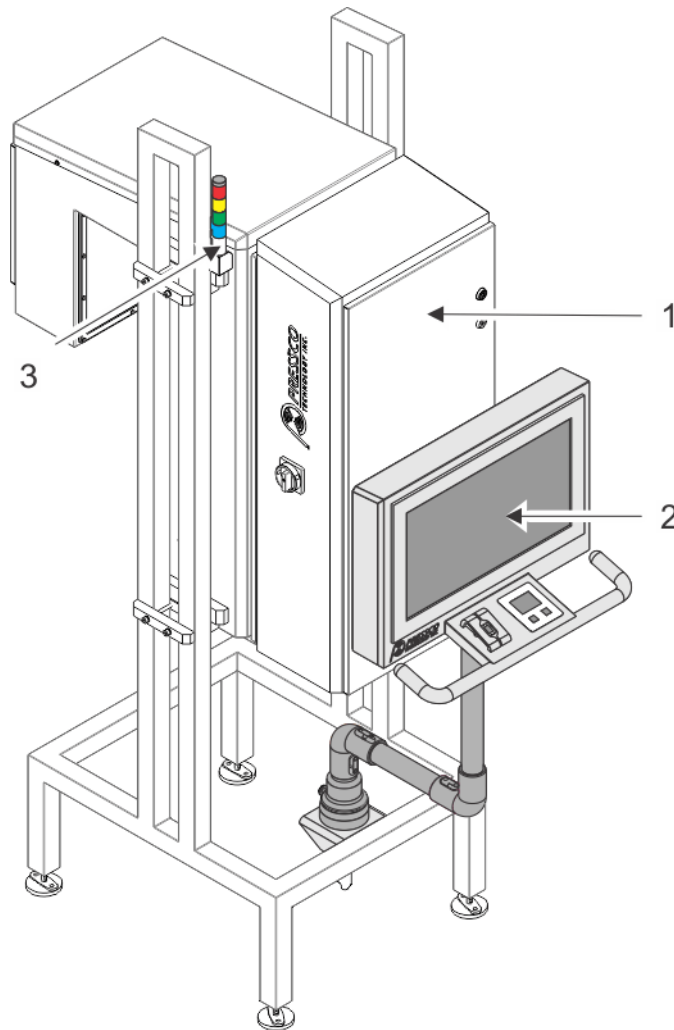
Chapter 15

FHCP 3X Hardware

This section includes information and wiring diagrams for the inspection module and related components for the FHCP 3X module.

FHCP 3X Module Overview

The Fill Height Cap Inspection (FHCP) Module inspects filled plastic bottles after they exit the filler. It inspects both the fill height of the bottle and the position of the cap on the bottle. It contains:

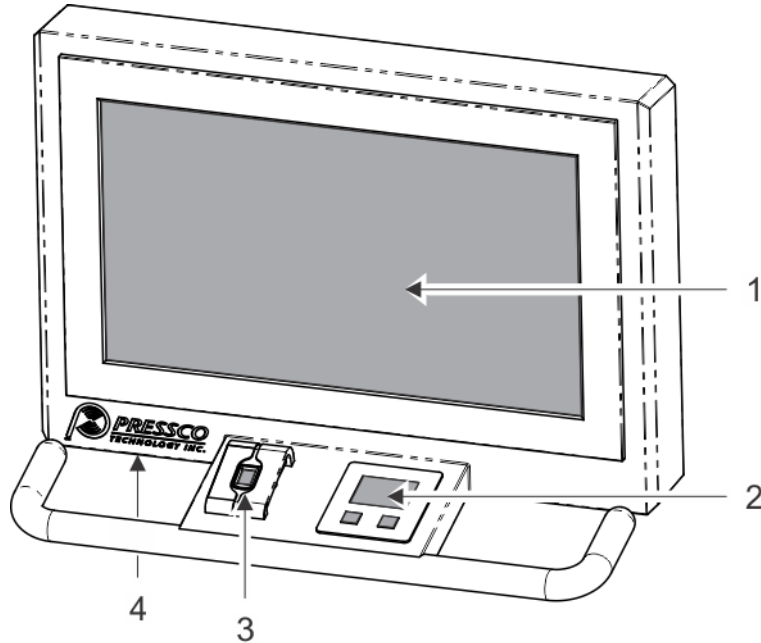


1	Heavy duty stainless steel enclosure housing, including inspection module and vision processor computer
2	Integrated NEMA4X Operator Interface with trackball
3	Four segment light tree device

Also included but not shown in the illustration are:

- Part Tracking and Rejection Control
- Pneumatic Pusher Rejecter

FHCP 3X User Interface Hardware



The monitor housing contains:

1	User interface monitor. Touch Screen Monitor (see " Touch Screen Monitor (optional) " on page 34)
2	Glide pad with buttons to move cursor and select (see " How to select menu items " on page 30) items on the screen.
3	Biometric login device (on page 34)
4	Two USB (see " USB Port " on page 33) convenience ports - underneath: - Outside (towards left side of monitor) used for jump drive to create Support Package (see "Creating a Support Package" on page 134) - Inside (towards center of monitor) used for Mechanical keyboard (see "Mechanical keyboard (MKB)" on page 33)

Power On/ Off

Power on

➤ Before turning on the power:

Make sure the following are ON. Normally you can leave these ON all the time:

- Power switch on the UPS, located inside the **Intellispec Computer Enclosure (backpack)** (on page 277) [item 9]
- Circuit breakers CB1 and CB2, located inside the inspection module on TB1

➤ To turn on the power to the Intellispec FHCP 3X system:

1. Turn on the rotary disconnect switch (DISC 1, shown in the illustration below). The system will start, and the Intellispec software will load.
2. Verify the red E-stop button on the front panel is pulled out, and not in E-stop mode. **Emergency E-Stop Button** (on page 42)

3. Press the green reset button on the front panel until the light on the button turns green. This will ensure the guide rail and camera motors are enabled for motion. The guide rails will calibrate and move into the correct position for the currently selected part program.
4. Log in to begin using the system.

Power off

To turn the power off to the Intellispec FHCP 3X system, turn off the main power switch (DISC 1). When you shut down the system:

- The system, including the computer, shuts down,
- The UPS shuts down

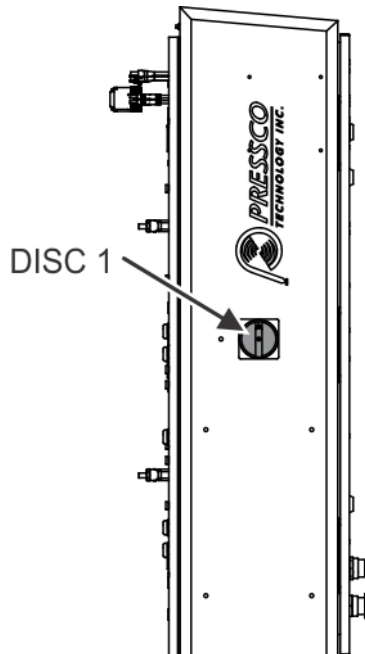
❖ *Note: there is a selectable UPS shutdown time that must expire before the computer and UPS shut down (30 seconds default) **System Alarms Description** (on page 88)*

- The software shuts down, and
- The guide rails within the inspection system go to a home position.



Warning

When you shut down power using this switch, there will still be voltage present on the UPS inside the unit until it discharges. The **interlock switch** (see "**Interlock for computer door**" on page 270) will be energized to prevent access to the inside of the unit.



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 40 seconds before turning it back on. This allows the electronic components to correctly reset.

Interlock for computer door

At the top of the computer backpack door is an electrical interlock that prevents the door from opening. The only way to open the door is to use a key in the defeater. This allows only **AUTHORIZED SERVICE PERSONNEL** to access the inside of the computer while the power to the FHCP 3X unit is still applied. See *Accessing the internal components* (on page 270).



Warning

The door is electrically interlocked. When lock is engaged, live voltage is present within the cabinet. To override interlock, complete a controlled **shutdown** (see "**Power On/ Off**" on page 27), or use key to override.

If the door is open, you can push it shut and the interlock switch will engage. It is spring-loaded.

Accessing the internal components

To access the components inside of the FHCP 3X computer, you will need two keys, which are supplied with the system. The standard key [item 1] opens most of the locks on the system, and the interlock key [item 2] opens the *Interlock for computer door* (on page 270).

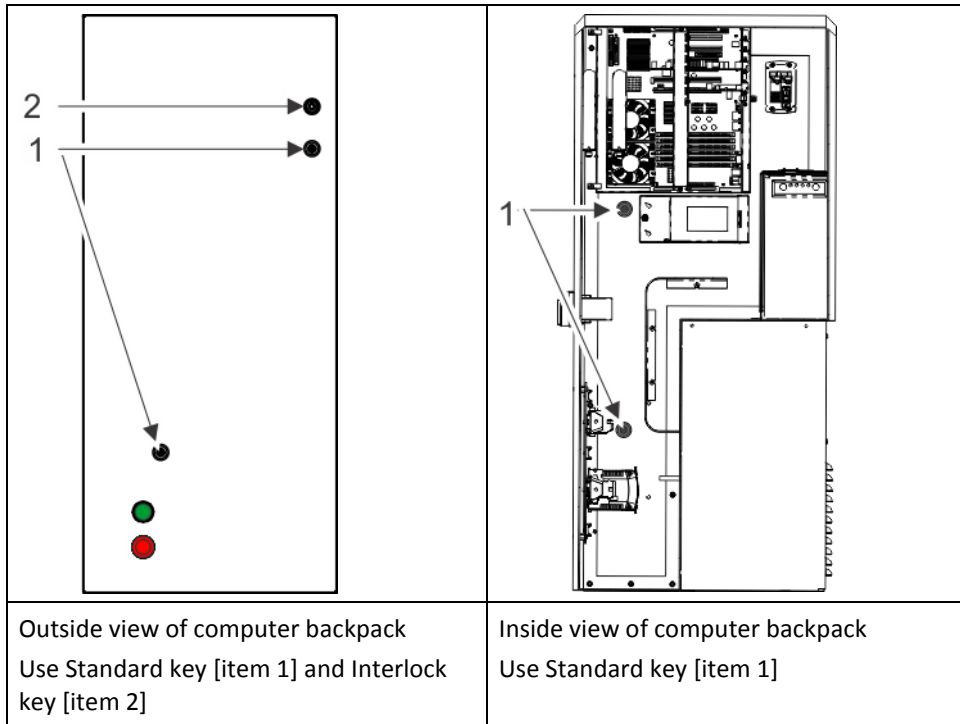


WARNING

Even 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.

1	Standard key
	
2	Interlock key
	

To access the inspection module cameras and other internal components, you will need to unlock the locks shown in the Inside view with key [item 1]. The computer backpack will swing open, providing access to the inspection module components.



Before Servicing the Unit

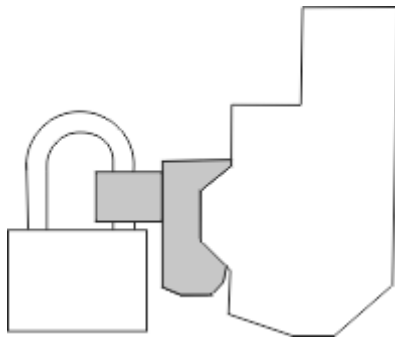


Warning

Potential hazardous voltage from the UPS. Use caution when servicing.

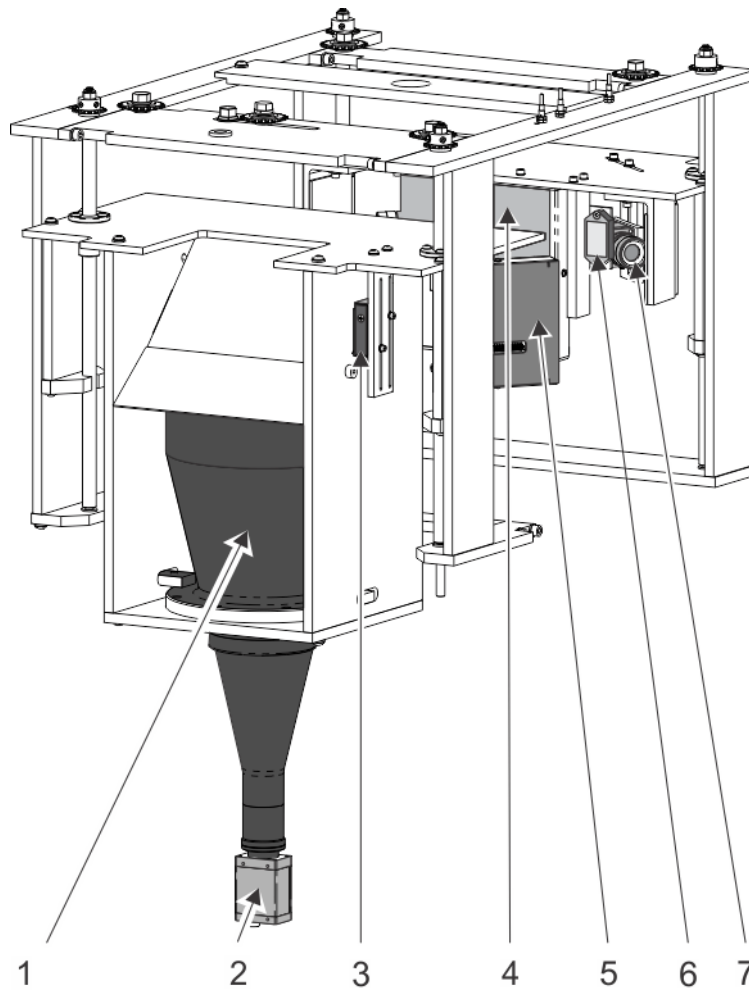
➤ **Before servicing any electrical or mechanical components inside the FHCP 3X system:**

1. Power off the system using power switch DISC 1. **Power On/ Off** (on page 27)
2. Carefully open the FHCP 3X computer and inspection module doors. **Accessing the internal components** (on page 270)
3. Locate the circuit breaker lockout clips. These are shipped with the system, and should be stored inside the unit.
4. Install the circuit breaker lockout clips, as shown below, and attach a lock. This will ensure that no incoming power (if applicable) will reach the unit.



FHCP 3X Internal Components

The following illustration shows some internal components of the module.



1	Telecentric lens
2	One High Resolution black and white camera, 1,360 x 1024 pixels, for fill height inspection
3	Part Detect Sensor
4 and 5	Three solid-state lighting modules with programmable multiple zone and directional control. (one is not seen in this view)
6	Part Detect Reflector
7	Two Standard Resolution color cameras, 640 x 480 pixels, for cap inspection (one is not seen in this view)

Guide Rails

The inspection tunnel contains a set of guide rails that ensure bottles are presented uniformly to the cameras. Rail width is controlled by a stepper motor system. The width adjusts automatically when changing part programs, and manually through the user interface. See **Guide Rail Adjustment** (on page 45).

The red **Emergency E-Stop Button** (on page 42) stops these rails in case you need to stop them immediately. The green button on the computer panel restores power to the guide rail motor.



Inspection Module Adjustments

This section covers camera adjustments that may be required to keep the inspection modules working properly. Adjustments include the camera position, aperture, and camera focus.

The focus adjustment controls the clarity of the image; the aperture adjustment controls the amount of light admitted by the shutter. Normally the inspection modules do not require further adjustment after initial system setup. Circumstances that might require additional adjustments are camera replacement, strobe replacement, or a substantial change in part size or color.

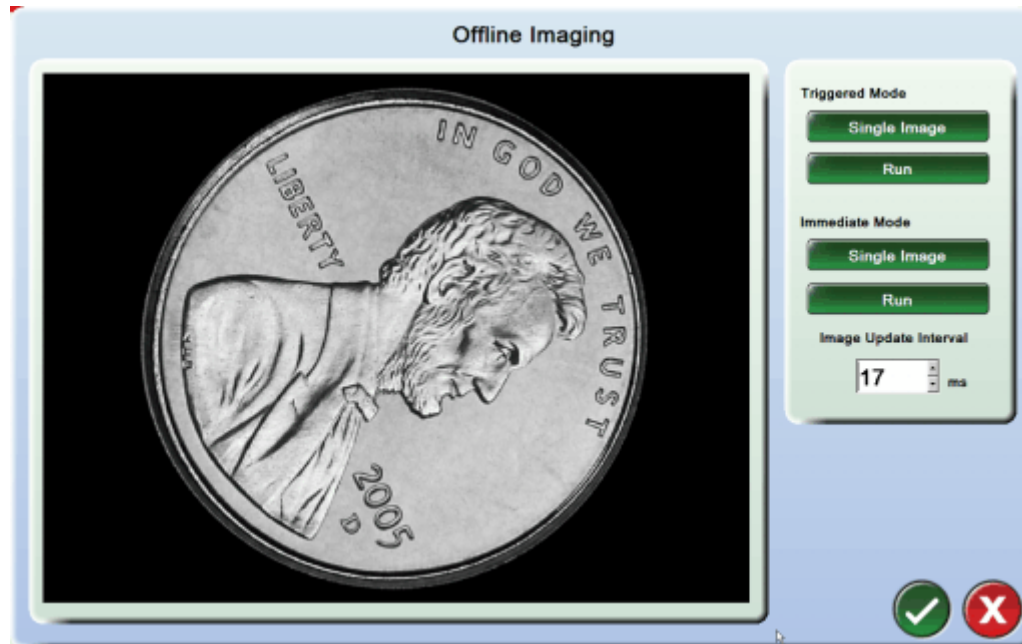


Danger

The inspection modules are mounted near moving machinery. Use extreme caution to avoid contact with moving machinery when servicing inspection modules as serious personal injury could result. Ensure machinery is in an emergency stop state before servicing inspection modules.

Observe Part Image

When adjusting the focus, aperture, or height for any inspection module, it is helpful to use **Offline Imaging** (on page 158) so that you can immediately see the effect of an adjustment on the image quality. Use the Run feature in Immediate Mode.



➤ To use Run in Immediate Mode:

1. Make sure the lane is offline.



2. Click the desired Sensor button to view Sensor Overview mode.
3. Right-click the Sensor button to see the Sensor menu.
4. Select **Offline Imaging** from the menu.
5. Click the **Run** button under Immediate Mode. The camera will snap pictures continuously without the need for a part present signal.

While the system is in this mode, you will be able to make adjustments to focus, aperture, or camera height.

Lighting Adjustments

To adjust the lighting, use the software adjustments.

To see the image on the screen:

Observe Part Image (on page 274)

Adjust lighting through either:

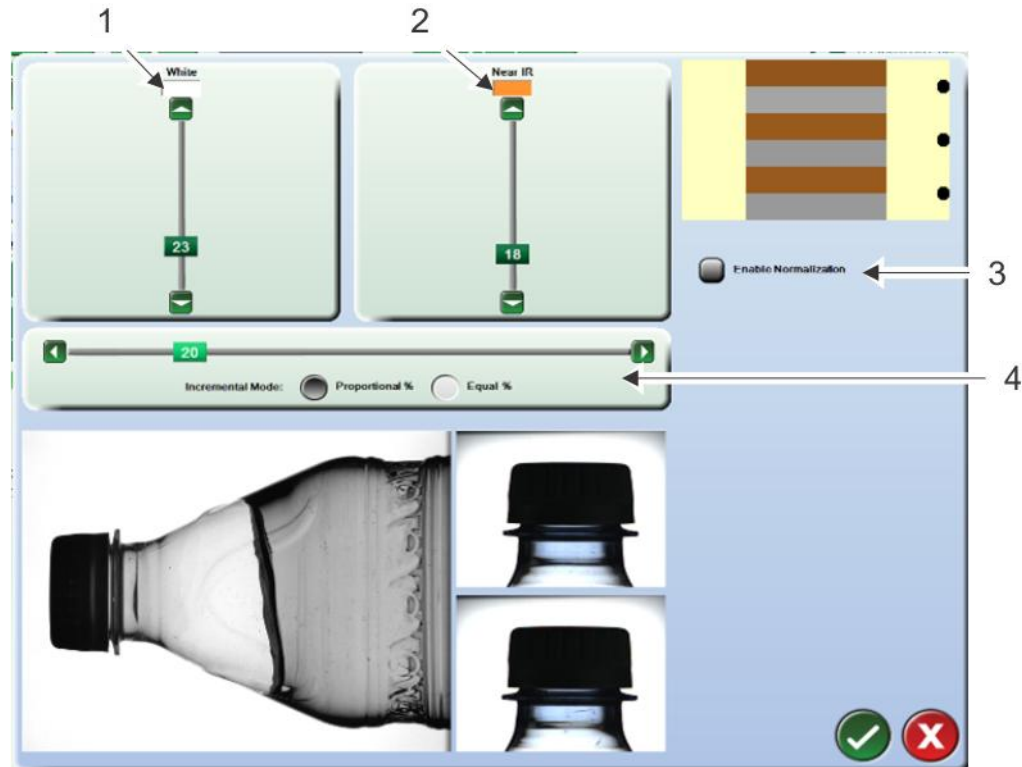
- **Basic adjust lighting** (on page 162), or
- **Advanced adjust lighting** (on page 162)

Most often, you will use Basic Adjust Lighting.

Lighting for FHCP 3X Systems

Typically, **Basic Adjust Lighting** (on page 162) is enough to adjust the lighting for FHCP 3X systems. If there is a need for fine tuning color and / or certain lighting zones, then use **Advanced Adjust Lighting** (on page 162).

Basic Adjust Lighting screen



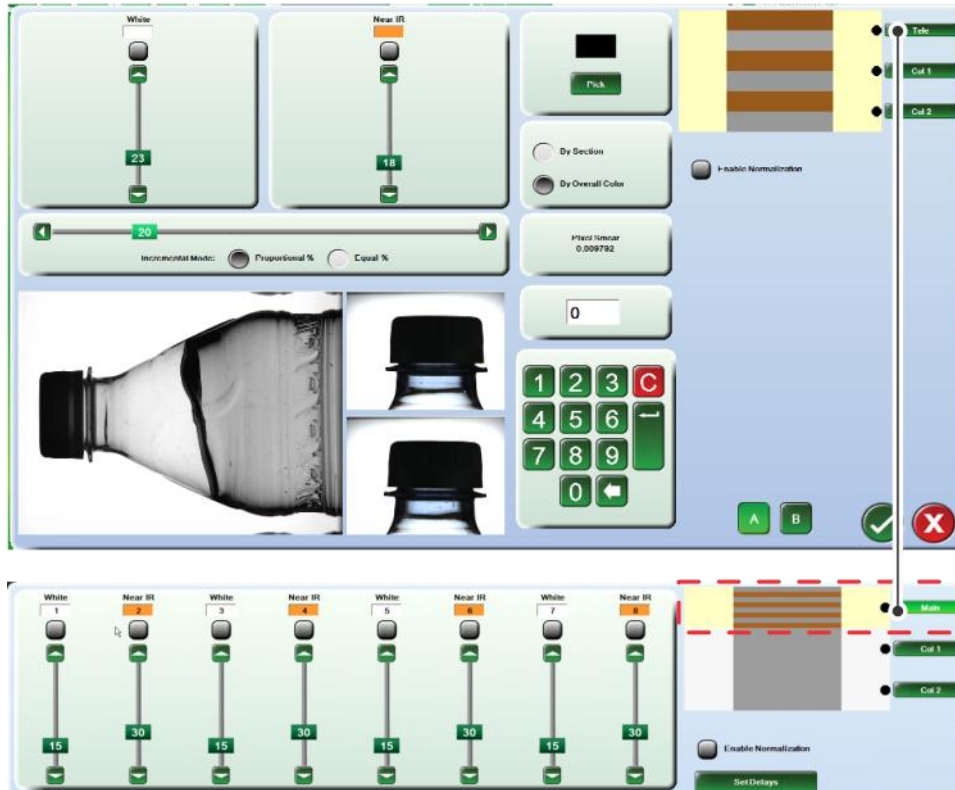
The Fill Height and both Cap cameras use white and Near infrared (IR) to illuminate the part.

1	White light enhances and sharpens features. It also defines the contrast between light and dark areas. Use the slider bar to adjust lighting individually.
2	Near IR is used to distinguish differences in the color of bottles and penetrate the dense / dark area of the upper neck. Use the slider bar to adjust lighting individually.
3	Enable normalization is NOT used in FHCP applications. Leave the box un-checked.
4	Instead of using the slider bars for items 1 and 2, you can use the Proportional % mode to adjust both types of lighting at once.

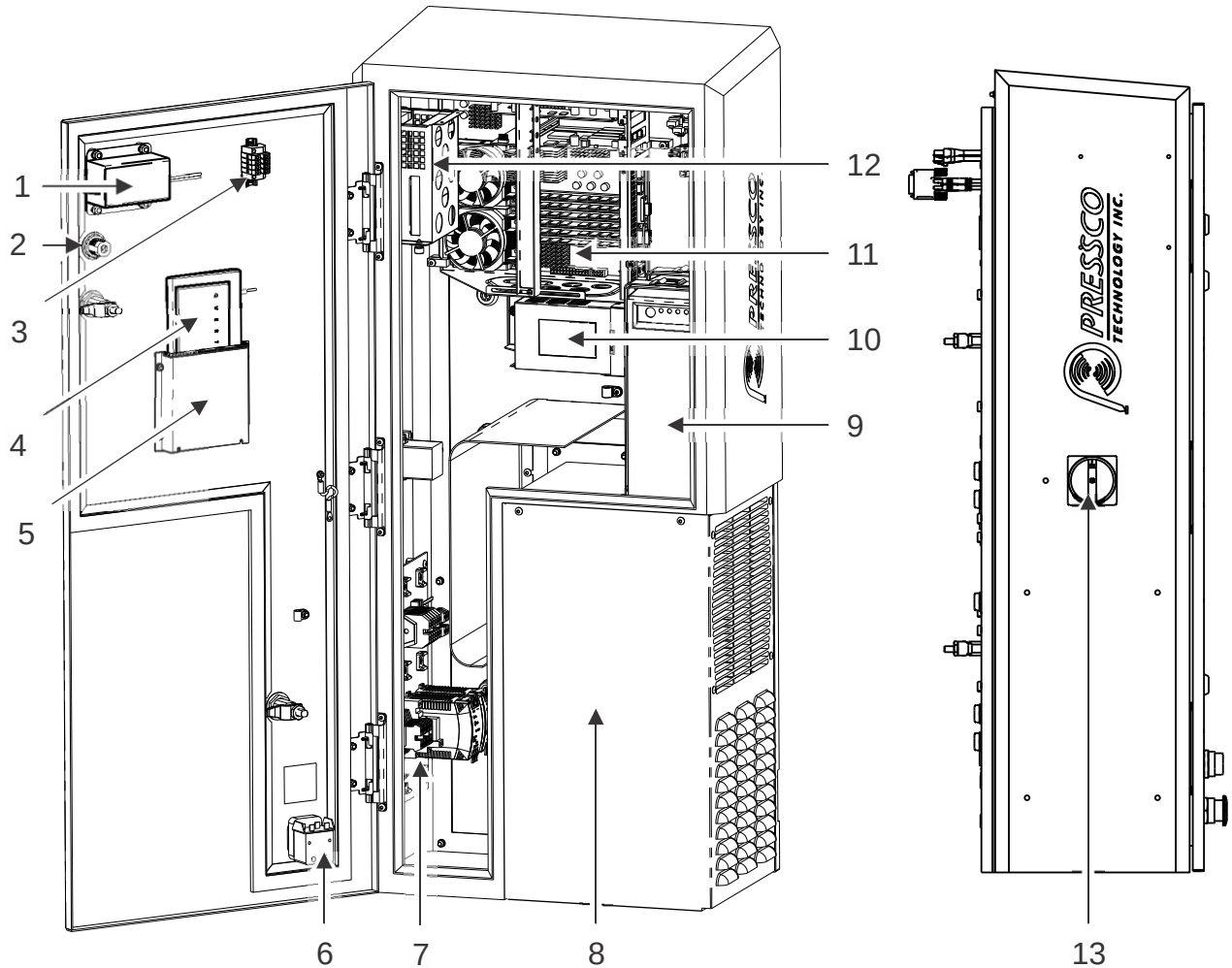
Advanced Adjust Lighting screen

Lighting adjustments depend on the part. The Cap cameras' view is front lit by the Fill camera's larger LED light array, therefore images of the cap(s) often have reflective spots that can show up in the Region of Interest and cause false rejects. When this happens, setting **Zone Delays** will lessen the contrast of the shiny spots. In those cases, use **Advanced Adjust Lighting** (on page 162) to set the delays.

Click the button for the desired camera to access the correct screen for the desired camera.



Intellispec Computer Enclosure (backpack)

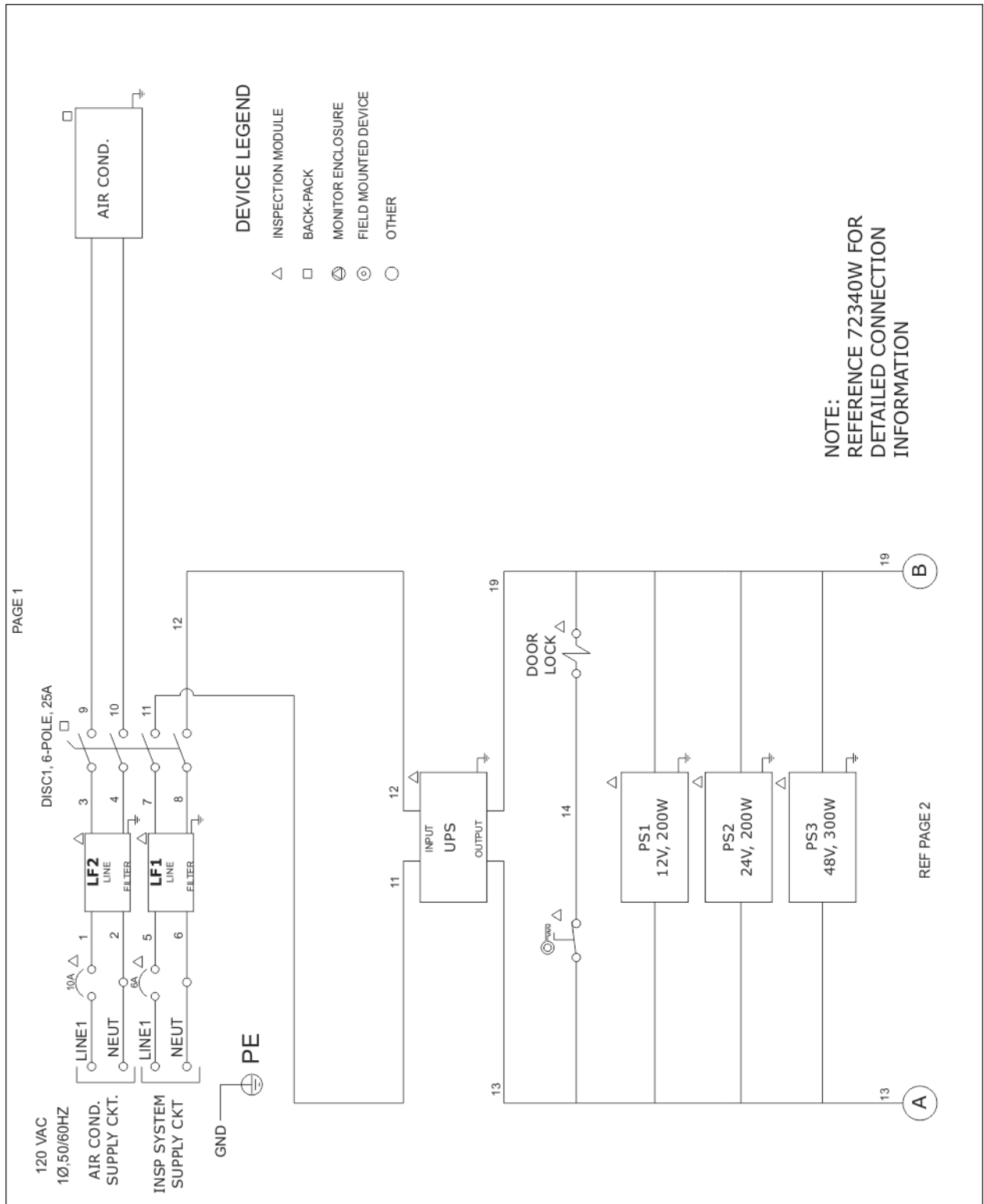


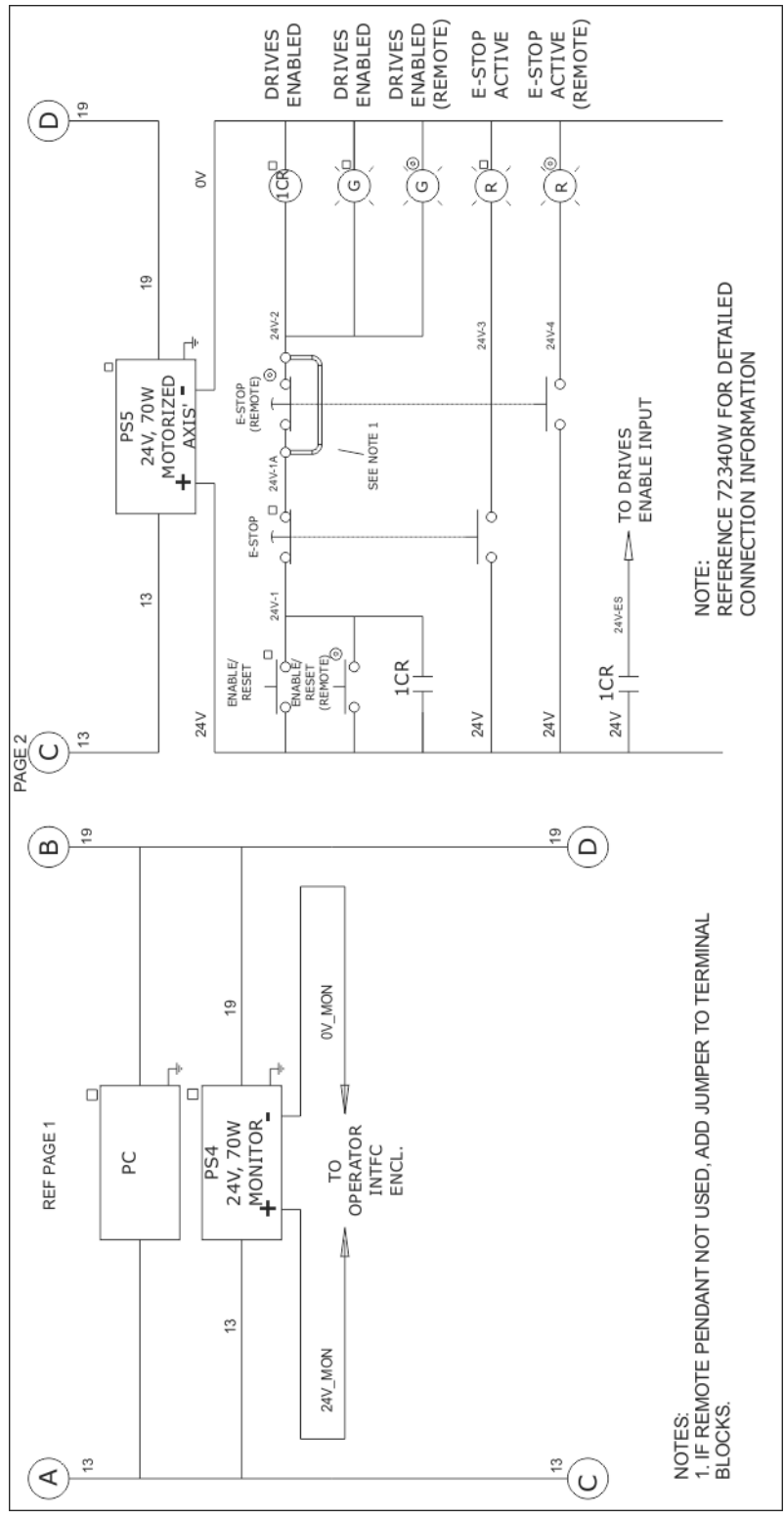
1	Electrical interlock - prevents door from being opened
2	Def eater switch
3	Sub-assembly TB-6
4	Mechanical keyboard (see " Mechanical keyboard (MKB) " on page 33)
5	Keyboard pocket
6	E-stop switch
7	Sub-assembly TB2/ TB3
8	Air conditioner
9	UPS
10	Computer power supply
11	Computer
12	Hard drives
13	Disconnect switch (DISC 1)

Wiring Diagrams FHCP 3X Module

The following pages show the internal wiring of the FHCP 3X module. The wiring diagram for the **8-port I/O** box underneath the module is in ***FHCP 3X Wiring Diagram 7*** (on page 287)

FHCP 3X Electrical Diagram

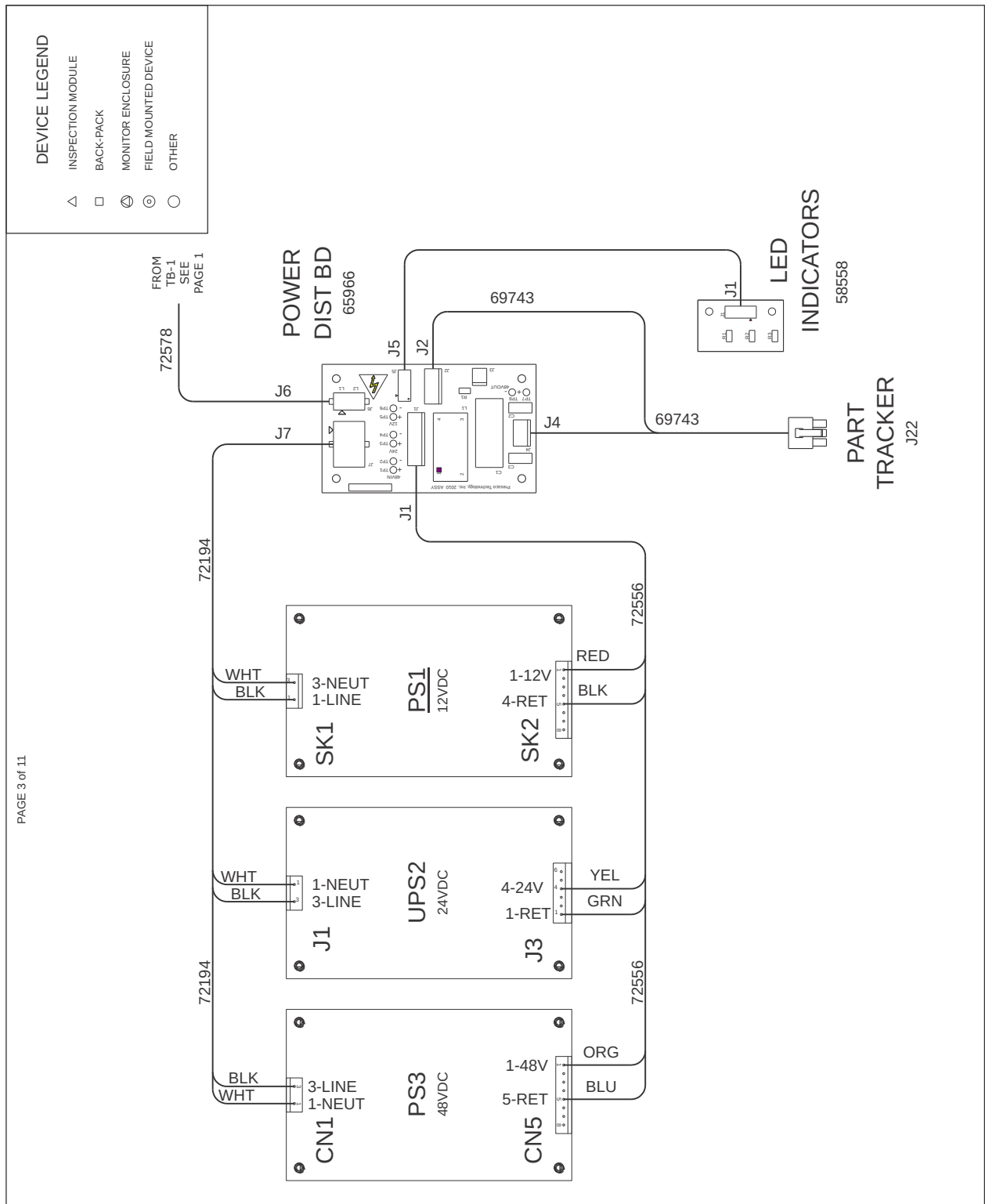




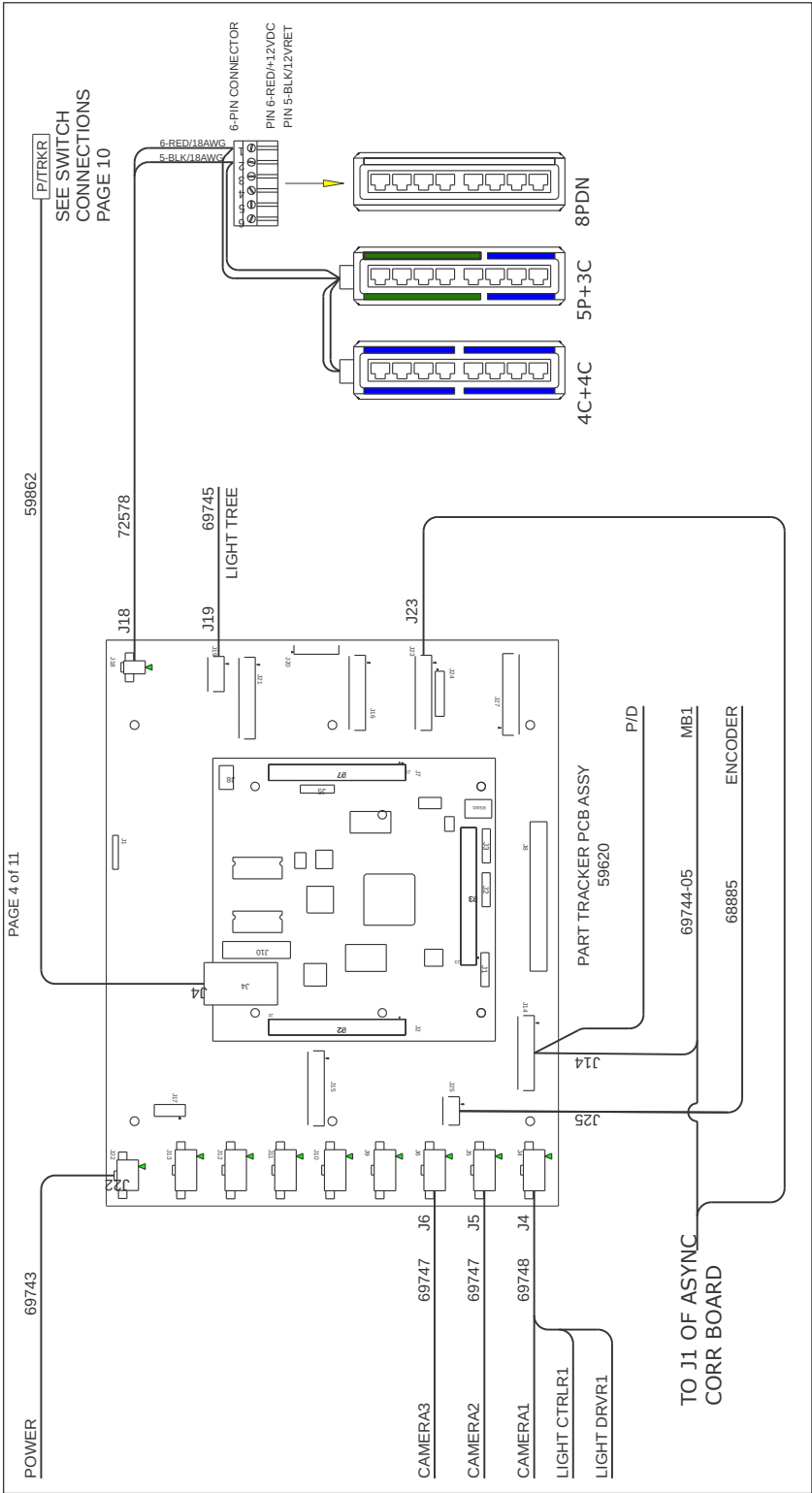
[illegible]

[illegible]

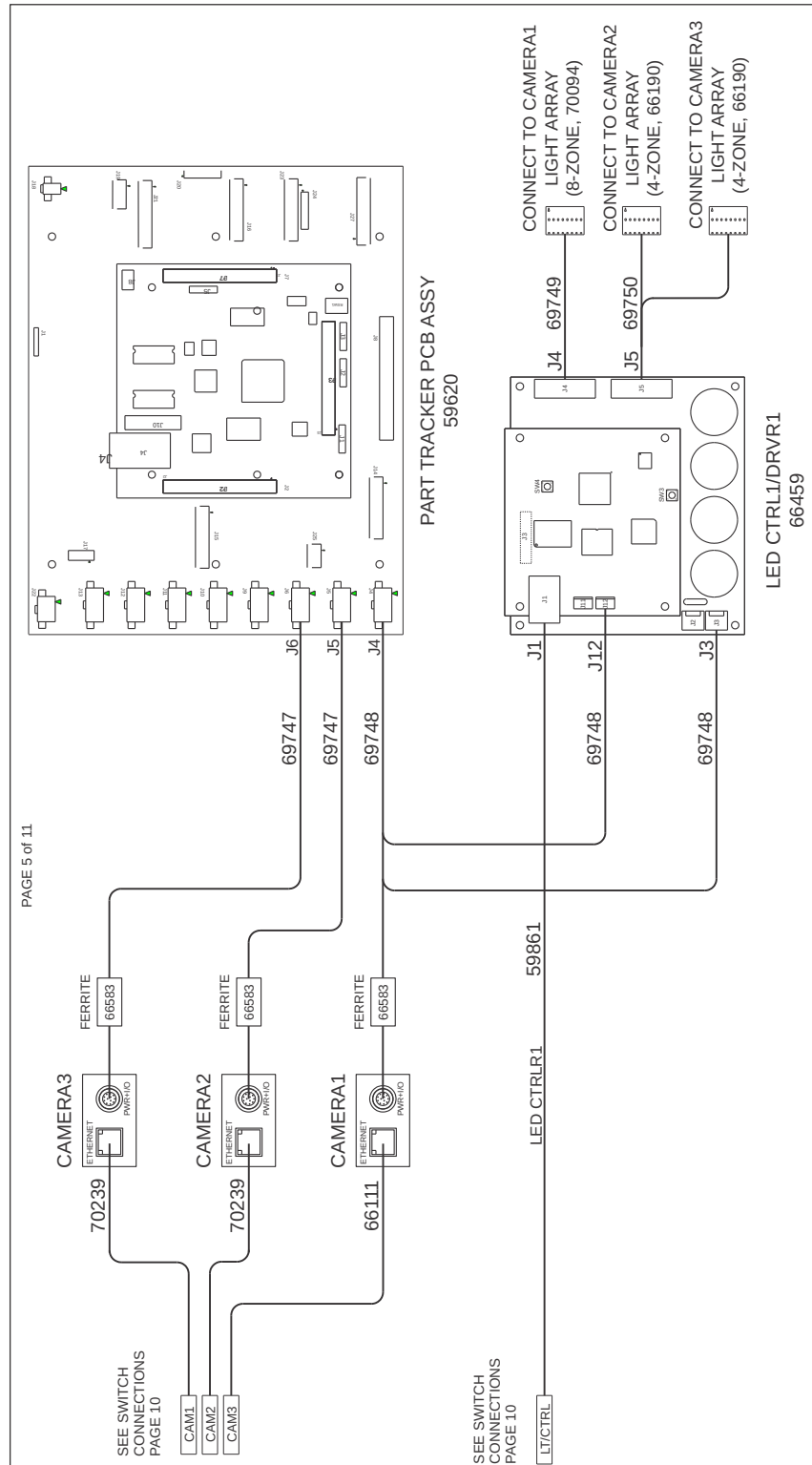
FHCP 3X Wiring Diagram 3



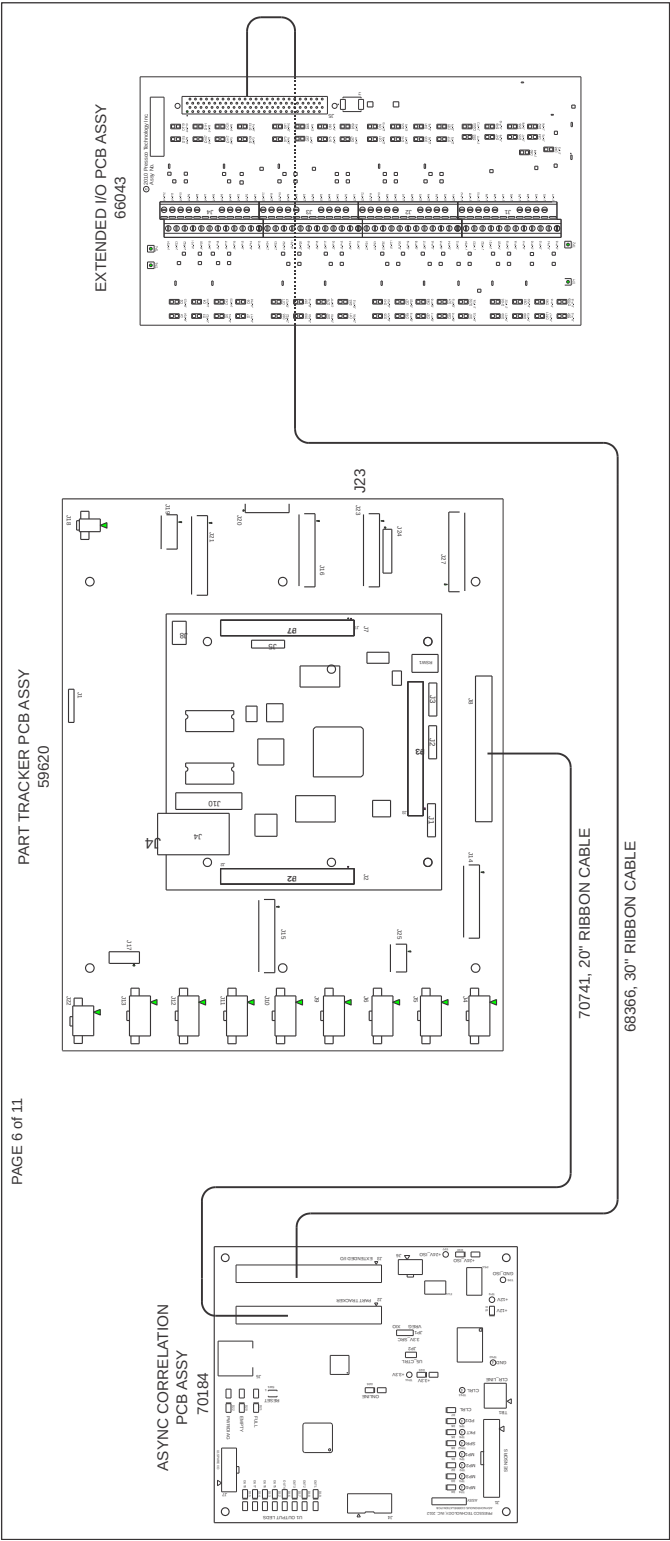
FHCP 3X Wiring Diagram 4



FHCP 3X Wiring Diagram 5



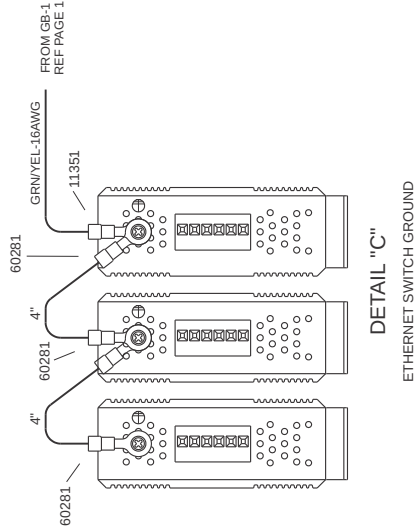
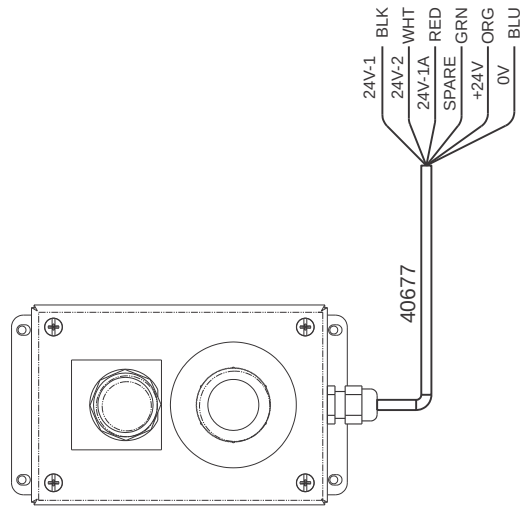
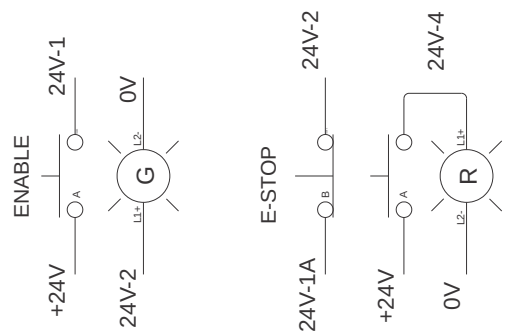
FHCP 3X Wiring Diagram 6



FHCP 3X Wiring Diagram 7

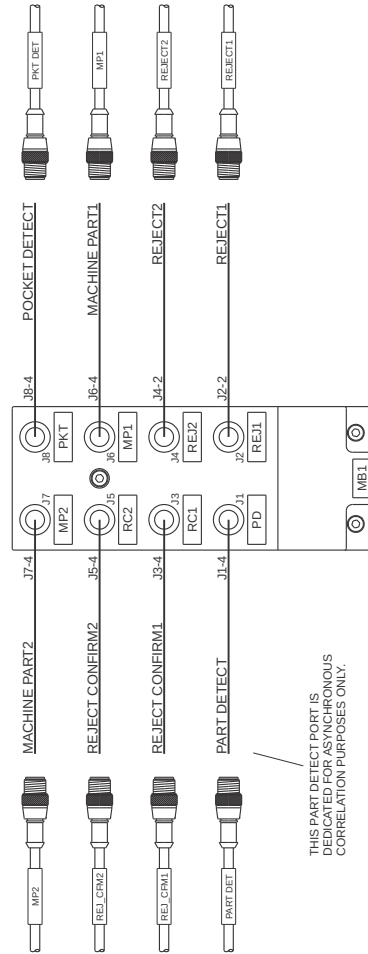
PAGE 7 of 11

REMOTE PENDANT (OPTIONAL)

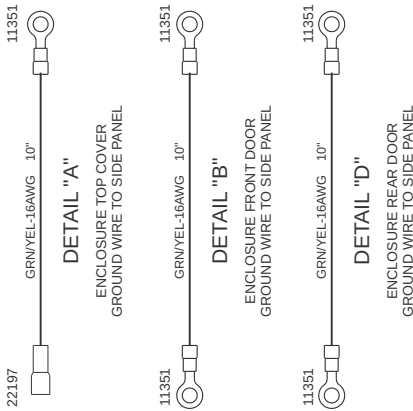


8-PORT I/O BOX-MB1

APPLY LABELS AS SHOWN



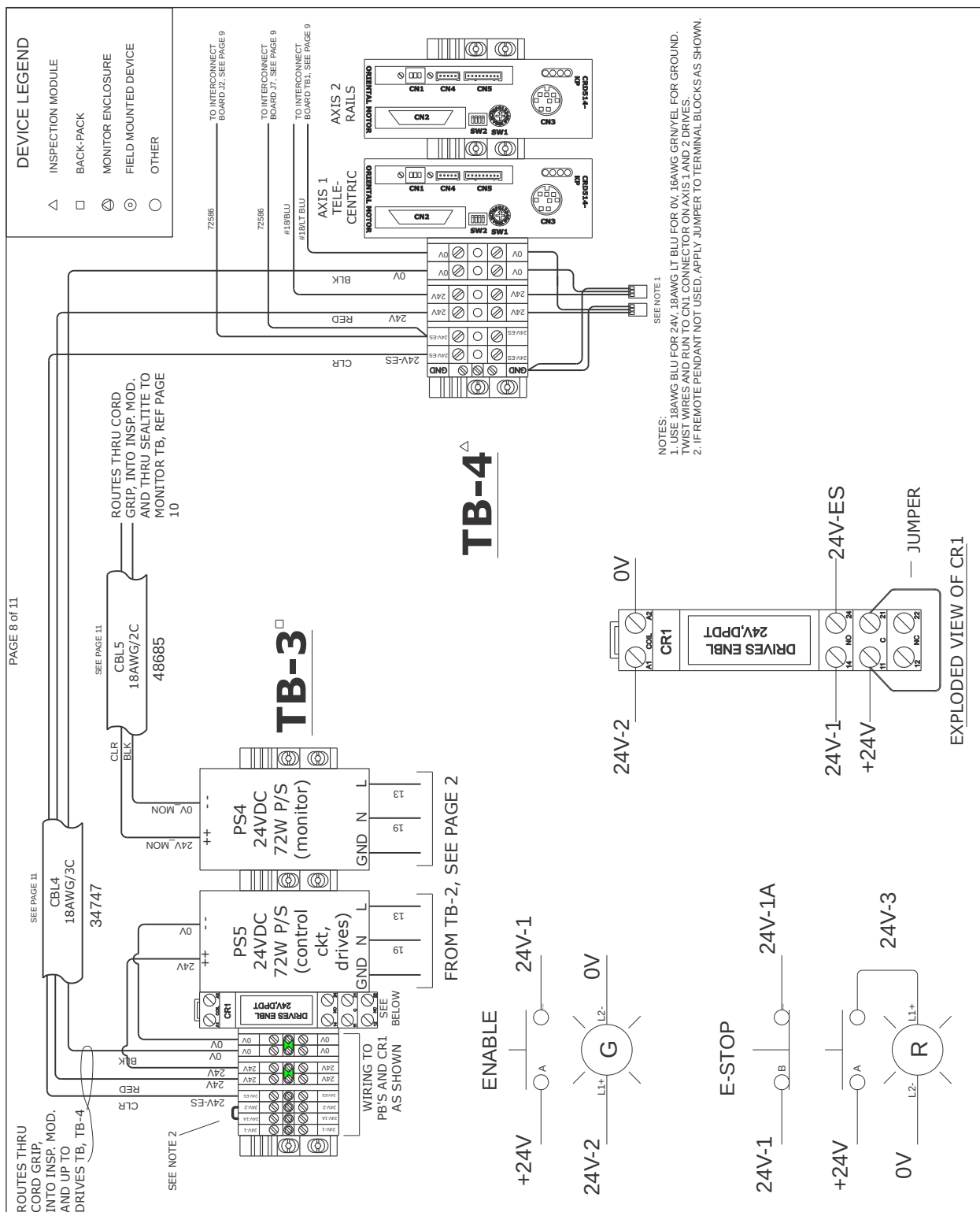
THIS PART DETECT PORT IS DEDICATED FOR ASYNCHRONOUS CORRELATION PURPOSES ONLY.



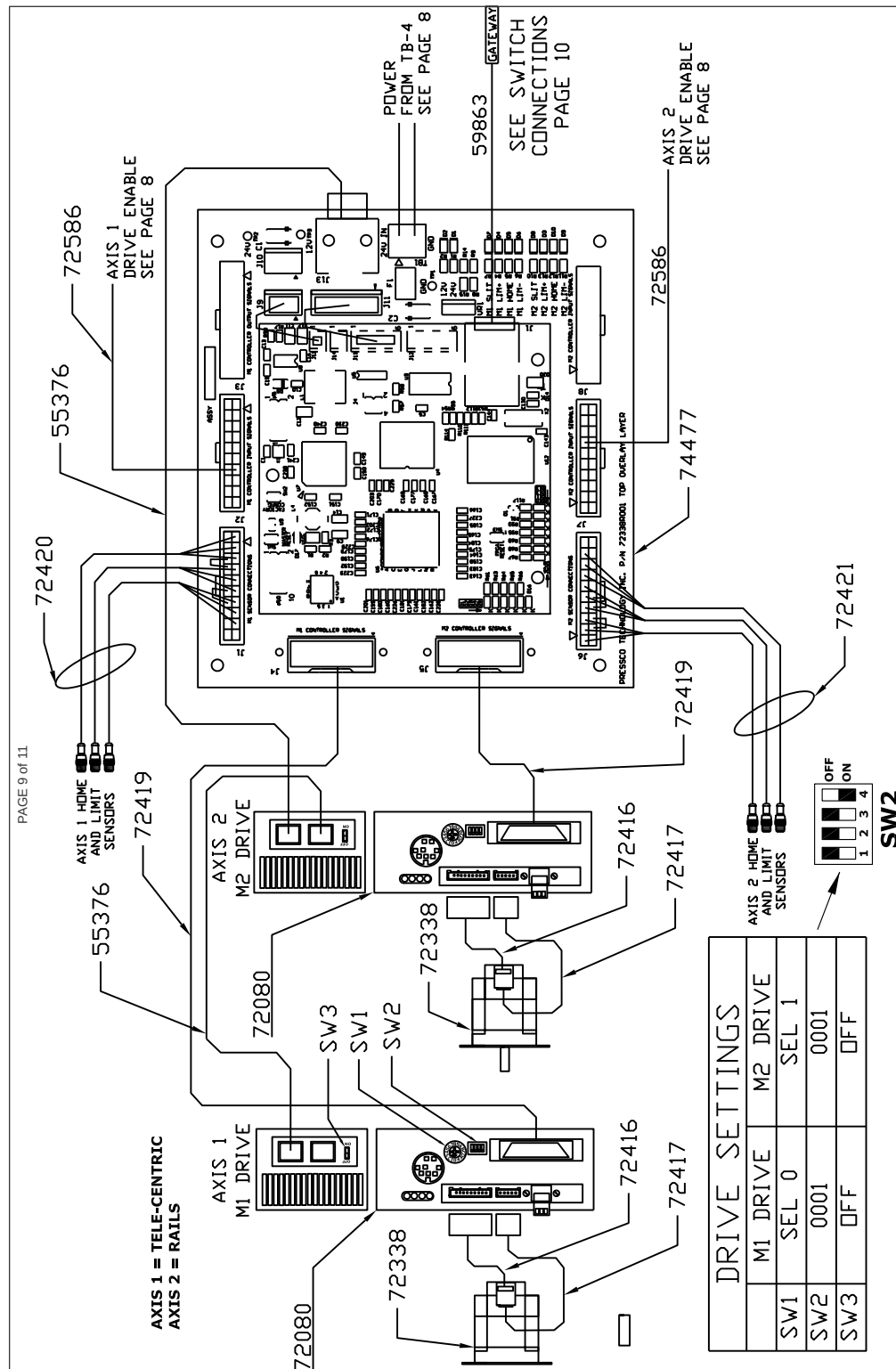
6-PIN PANEL CONNECTOR



FHCP 3X Wiring Diagram 8

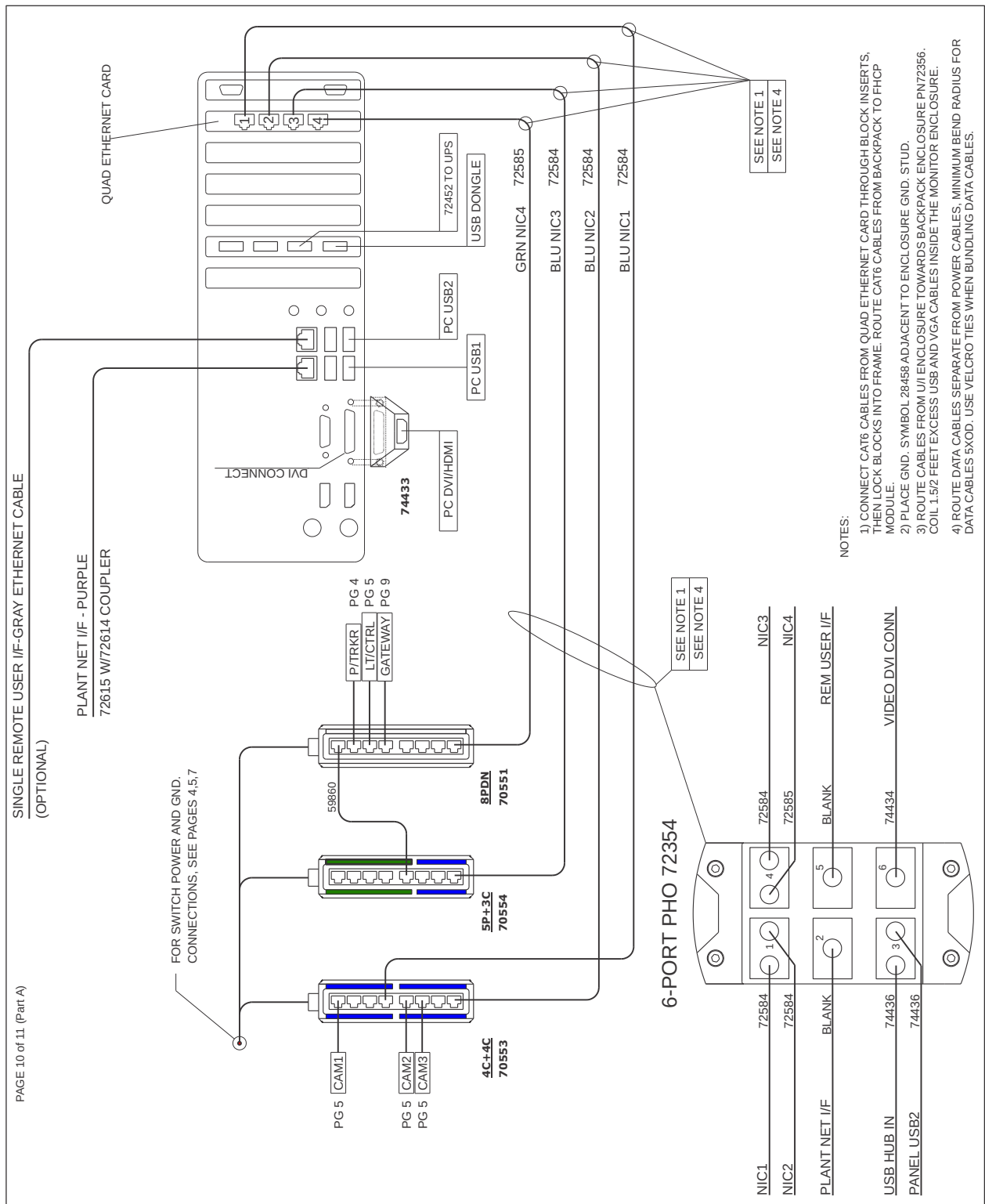


FHCP 3X Wiring Diagram 9

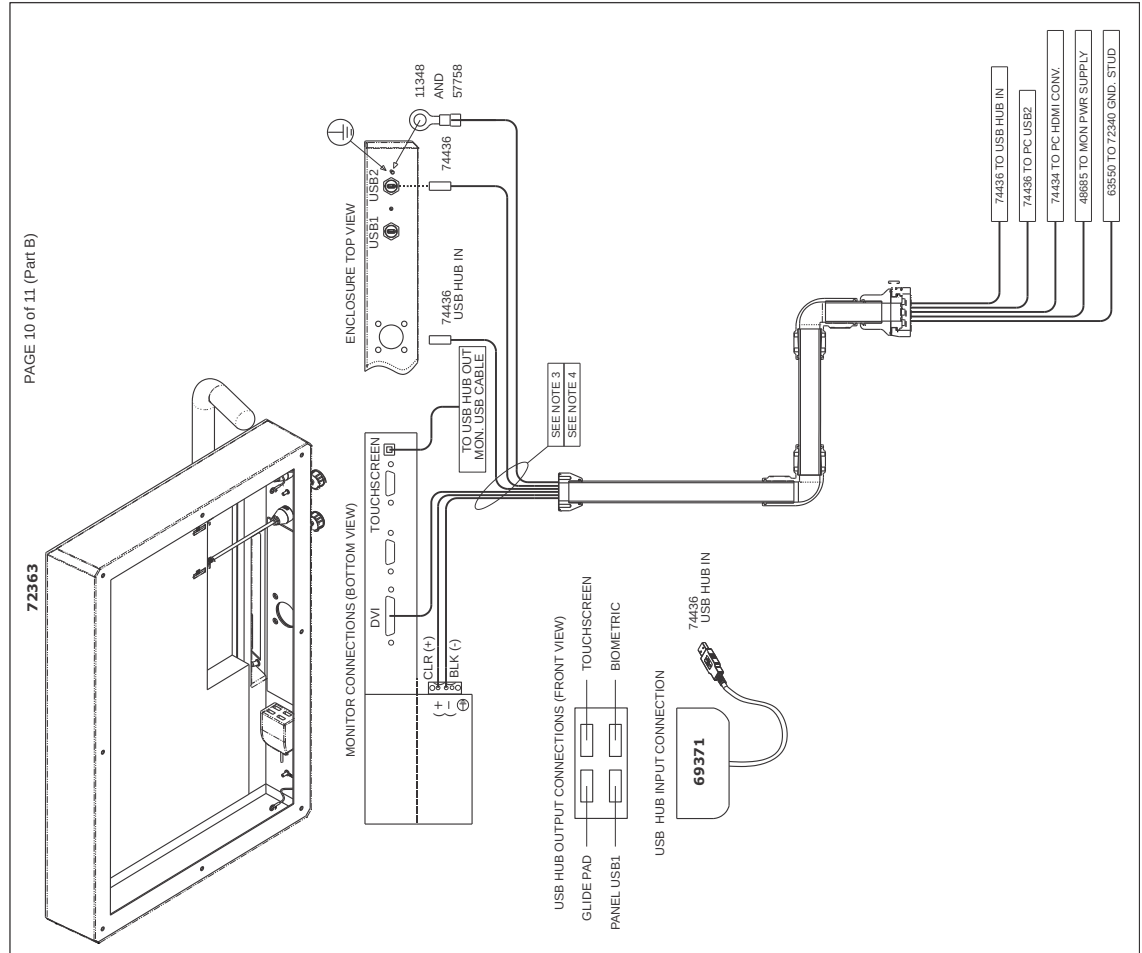


FHCP 3X Wiring Diagram 10

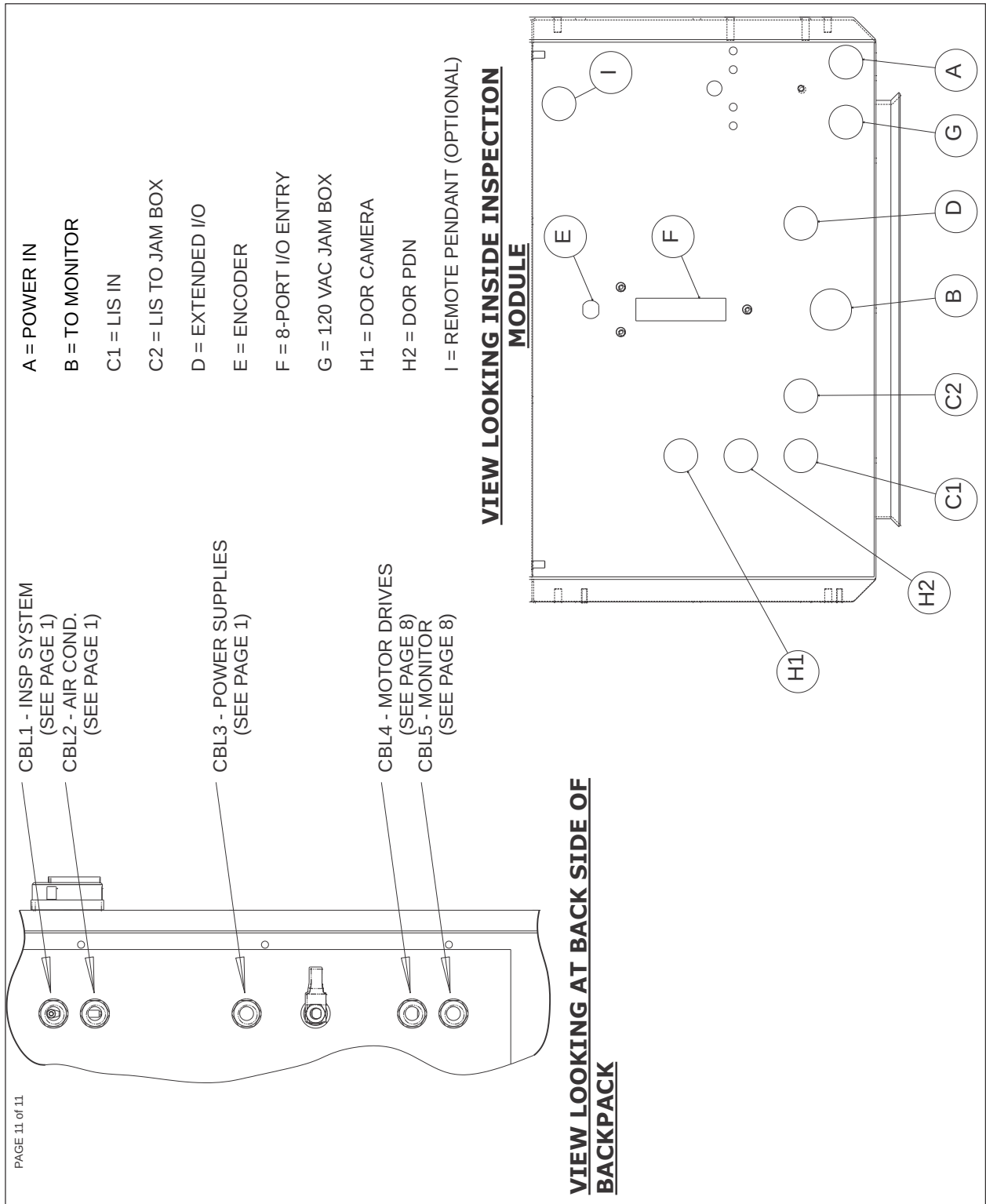
User Interface to Vision Processor Connections - FHCP 3X Wiring Diagram 10 - part A



FHCP 3X Wiring Diagram 10 - part B



FHCP 3X Wiring Diagram 11



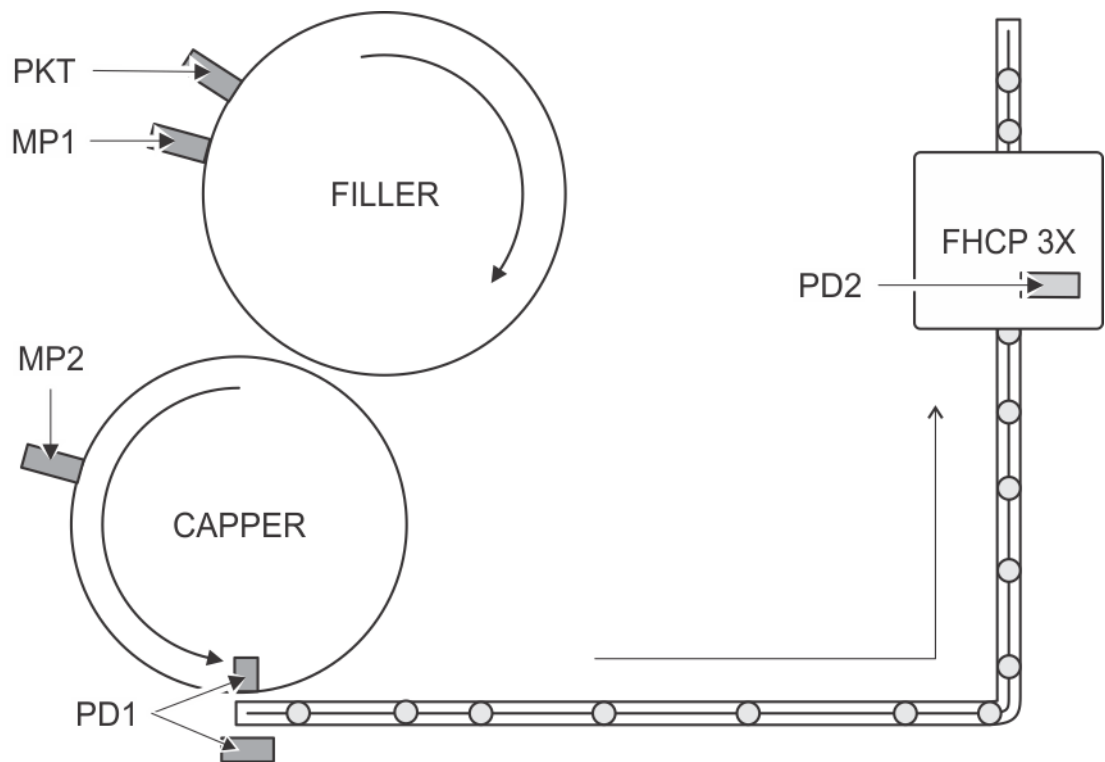
Asynchronous Correlation FHCP 3X

In FHCP 3X systems, you may have an asynchronous correlation board. The asynchronous correlation board is located inside the FHCP 3X inspection module, and is connected to a set of sensors, PKT, MP1, MP2, and PD1. See diagram below. These sensors collect correlation information from your plant's machine parts, and transfer that information to a shift register FIFO in the Intellispec. A second part detect sensor, PD2, which is located inside the FHCP 3X inspection module, unloads the information from the FIFO. Parts inspected by the FHCP 3X module have the correct machine part data, so that defects can be correlated back to the machine parts.

Below is a basic system diagram showing the locations of the asynchronous correlation sensors. Your plant may be configured differently.

**Important**

To maintain proper correlation during inspection, do not remove bottles between PD1 and PD2. Also make sure that bottles do not fall - fallen bottles between PD1 and PD2 will shift the correlation data.



Asynchronous Correlation Hardware Setup FHCP 3X

The Asynchronous Correlation kit includes four sensors and associated cables, as well as a PC board. The wiring connections are shown in the following diagrams:

FHCP 3X Wiring Diagram 4 (on page 284)

FHCP 3X Wiring Diagram 6 (on page 286)

FHCP 3X Wiring Diagram 7 (on page 287)

Sensor Setup

There are four sensors associated with asynchronous correlation. To connect the sensor cables to the FHCP 3X system, use the 8-port I/O box located underneath the inspection module. For details, refer to this diagram: Wiring Diagram FHCP 3X module - sheet 5

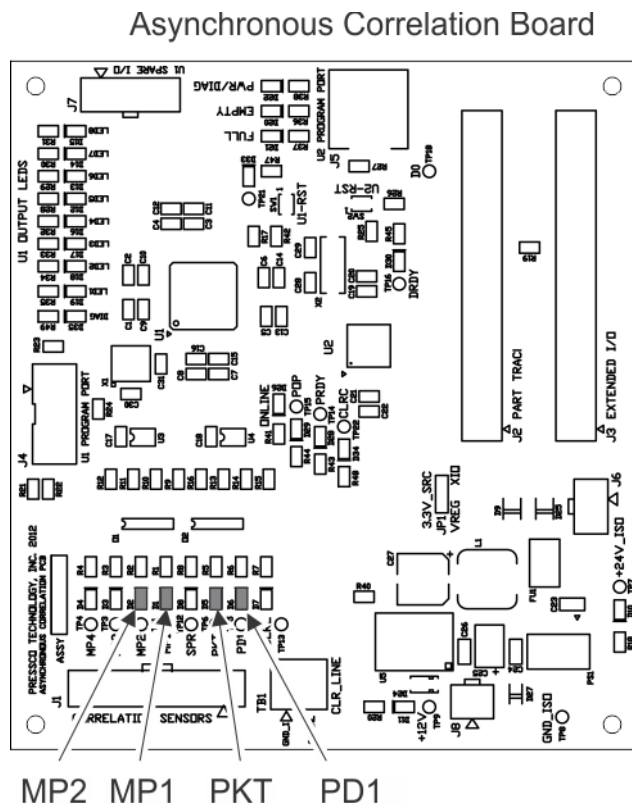
Set up the sensors as follows:

- **PKT** - can be mounted on filler or capper. It detects every pocket.
- **MP1** - triggers once per revolution of the filler wheel
- **MP2** - triggers once per revolution of the capper wheel
- **PD1** - the ultrasonic sensor mounted at the capper exit. It detects each part exiting. It is important that this sensor be positioned at a point where it is guaranteed that bottles will complete the transfer to the conveyor if the capper starwheel stops. It is also important that it be positioned where there is minimal part slippage (example of a good location: as close as possible to the exit of the starwheel pocket, without violating the preceding requirement).

Sensor Verification

Use a high speed camera and look at the LEDs at the bottom of the Asynchronous Correlation board to verify the following:

- Make sure that **MP1** and **MP2** pulses occur in between **PKT** pulses. The pulses do not need to be exactly in the middle, but make sure there are a couple milliseconds between the leading edges.
- Make sure that the **PD1** pulse is slightly offset from the **PKT** pulse. The reason for this is that PD1 loads the FIFO register, and you do not want to load a value into the FIFO while the value is changing.



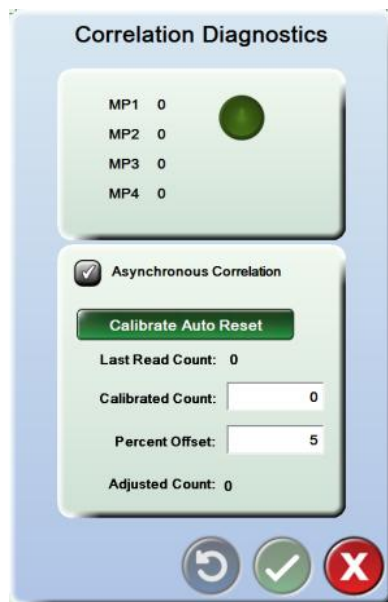
Asynchronous Correlation Software Setup FHCP 3X

The instructions below are for a filling/ capping operation. Assume there are 144 filling stations and 36 capping stations. For other configurations, the procedure is the same, but the numbers will differ.

Software Setup

➤ To set up the software:

1. Enable asynchronous correlation: from the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu, then select Hardware Setup, then select Correlation Diagnostics.



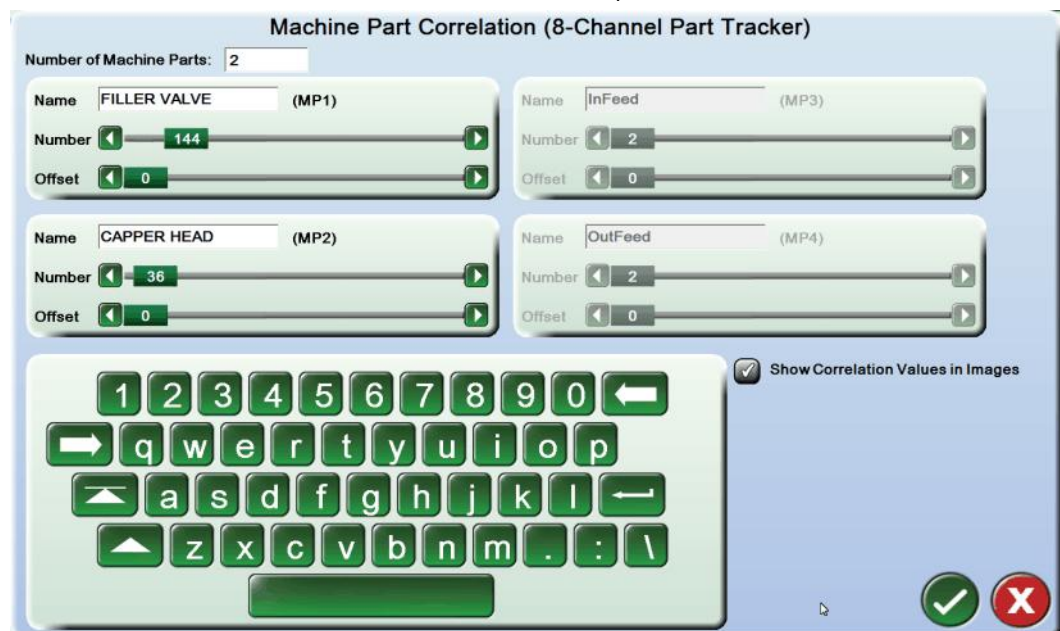
2. Check the box to enable Asynchronous Correlation.
3. Click OK to accept the changes and exit.

Correlation Setup

Next, set up the correlation.

➤ To set FHCP correlation:

1. Set up the correlation machine parts: from the Lane or Sensor overview screen, click the Tools button  to see the Tools menu, then select Lane Setup, then select Machine Part Correlation.



2. Set MP1 as Filler Valve with 144 parts.
3. Set MP2 as Capper Head with 36 parts, as shown above. Offsets should remain at zero at this time.

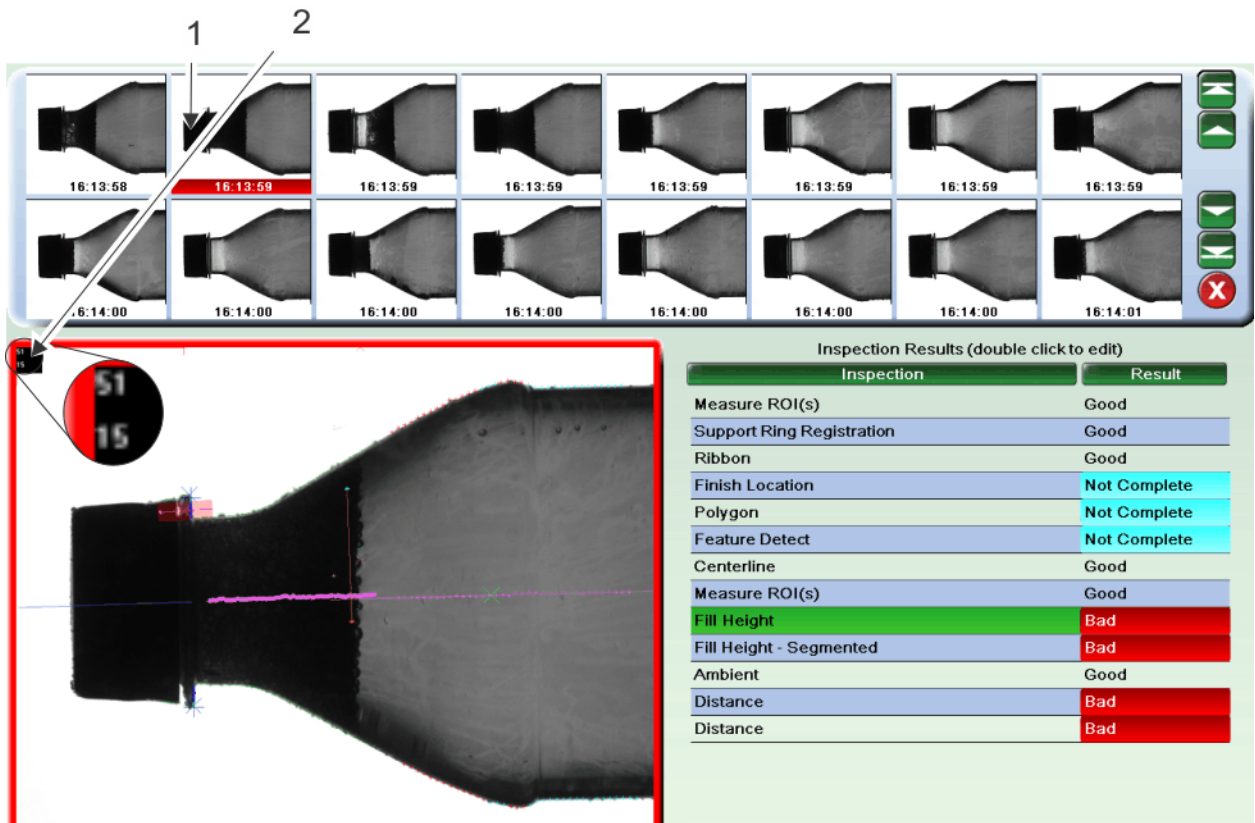
4. In the above screen, check the box to Show Correlation Values in Images.
5. Click OK to accept the changes and exit.

Sensor Count Verification

Next, verify that the sensors are set up properly.

➤ To verify the sensor count:

1. Disable the rejectors for all cameras: from Lane Overview mode, click the Tools button , then select Lane Setup, then select **Rejector Enable/Disable** (see "**Rejector Enable/Disable**" on page 116).
2. From the Enable Reject menu, click the **None** button to disable the rejector for all cameras.
3. Click OK to accept the changes and exit. You should see a trash can with a line through it underneath the stop light on the Intellispec screen.
4. Change your inspection so that all cameras produce a reject, perhaps by inserting a sheet of paper over the tunnel inspection window.
5. Put the lane online to inspect at least 100 parts. Put the lane offline.
6. Look at the Reject Images from the last 100 parts, and verify that the correlation values tagged in the image are incrementing by one and not skipping. Skipped numbers or double counting is a sign that there is a setup problem with one of the sensors. Look at the sensor setup, or contact Pressco to determine the problem.
7. Enable the rejectors for all cameras through the **Rejector Enable/Disable** (on page 116) menu. You should no longer see the trash can on the Intellispec screen.



The screenshot displays the Intellispec software interface. At the top, a sequence of reject images is shown in a grid, with timestamps ranging from 16:13:58 to 16:14:01. A red box highlights the first image, and a circular inset shows a close-up of the correlation value '51' and '15'. Below the grid, a large image shows a detailed view of a part with a red box highlighting a specific area. To the right, the 'Inspection Results' table is visible, showing various inspection parameters and their results.

Inspection Results (double click to edit)	
Inspection	Result
Measure ROI(s)	Good
Support Ring Registration	Good
Ribbon	Good
Finish Location	Not Complete
Polygon	Not Complete
Feature Detect	Not Complete
Centerline	Good
Measure ROI(s)	Good
Fill Height	Bad
Fill Height - Segmented	Bad
Ambient	Good
Distance	Bad
Distance	Bad

1	Reject Images - look at each one to verify correlation sequence
2	Look at correlation values to determine correlation sequence

Offset Setup

Next, set the offsets.

➤ To set the offsets:

1. Designate a station to produce a reject. This must be done for both machine parts (filler and capper head). You can do this simultaneously or one at a time. Since the offset must be verified by running more defective parts, it is best to set the station to produce a reject for the duration of this procedure.
2. Once the designated stations have been disabled (set to produce rejects), clear the Intellispec statistics, and begin to run the production line.
3. After a few revolutions of the wheels, you should see several defects logged. Stop the bottle flow and check the correlation data.
4. Set the offsets: From the Lane or Sensor overview screen, click the Tools button  to see the Tools menu, then select Lane Setup, then select Machine Part Correlation. Enter the correct offset values for both the Filler Valve and Capper Head.
 - Example 1: If station 86 on the filler was set to fail, and the system logs it as 19, then set the MP1 offset = 67. $[86-19 = 67]$
 - Example 2: If station 12 on the filler was set to fail, and the system logs it as 73, then set MP1 offset = 83. $[(144-73) + 12 = 83]$. This is because you cannot enter a negative offset.
5. Set the capper offsets in the same manner.
6. Once the offsets have been made, then continue to run the system for a few more cycles to verify that the designated reject stations are being logged in the correlation data correctly.
7. Re-enable the machine part stations to no longer produce defective parts.

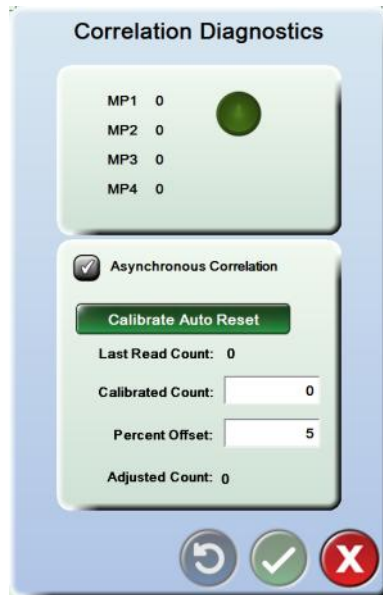
Auto Reset Setup

Auto Reset enables the Intellispec system to clear the FIFO shift register if it has not seen encoder ticks for a certain distance. Occasionally, correlation data can become out of sync due to the addition, or removal, or falling bottles on the conveyor. To get the system back in sync, the FIFO must be reset. The Auto Reset feature will automatically reset the correlation FIFO when it detects that bottles are clear of the zone between PD1 and PD2.

The system must first be calibrated before the Auto Reset feature will work.

➤ To calibrate Auto Reset:

1. Make sure that:
 - a) The capper is stopped
 - b) The conveyor is running
 - c) There are no bottles between PD1 and PD2
2. Go to the Correlation Diagnostics menu: from the Lane or Sensor Overview screen, click the Tools button  to see the Tools menu, then select Hardware Setup, then select Correlation Diagnostics.



3. Click the **Calibrate Auto Reset** button.
4. Place a bottle on the line, first triggering the PD1 sensor, and allow the conveyor to carry the bottle past PD2.
5. Click the **Calibrate Auto Reset** button again to stop the count. The system learns the distance between PD1 and PD2 in encoder ticks. The value will be displayed in the **Calibrated Count** box.

The other parameters in the Asynchronous Correlation part of the menu are as follows:

Last Read Count

This value is displayed when Auto Reset has been previously programmed. Last Read Count displays the former value, before the current calibration.

Percent Offset

If you want the system to perform the Auto Reset at a position AFTER the FHCP 3X module on the conveyor, then use Percent Offset. Example: set Percent Offset to 20 (percent) if you want the Auto Reset to occur about 20 percent of the conveyor length beyond the FHCP 3X module. This is 20 percent of the distance between PD1 and PD2.

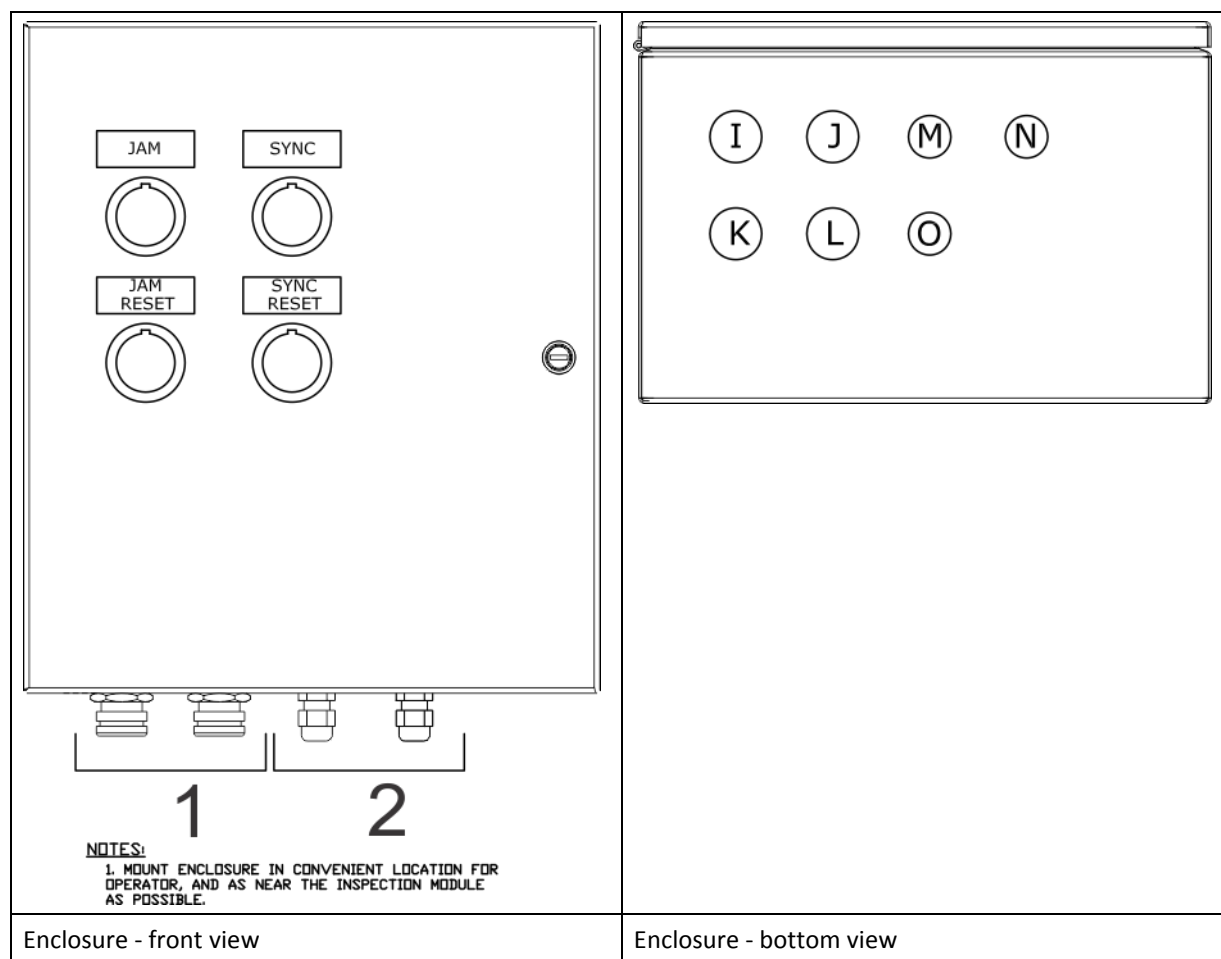
Adjusted Count

This value is the calibrated count between PD1 and PD2 plus the Percent Offset. Example: if Calibrated Count is 3000 encoder ticks and the Percent Offset is 10, then the Adjusted Count is 3300 encoder ticks. This Adjusted Count is sent to the Part Tracker. If the Part Tracker does not see a part detect on PD1 for 3300 encoder ticks, it triggers the Auto Reset logic.

Enclosure PLC Interface Jam Detect - optional

This optional box contains a Programmable Logic Controller (PLC) interface that interfaces with the **Extended I/O** (on page 305) board and various sensors. It performs:

- jam detection
- correlation reset
- sending data to the customer Line Information System

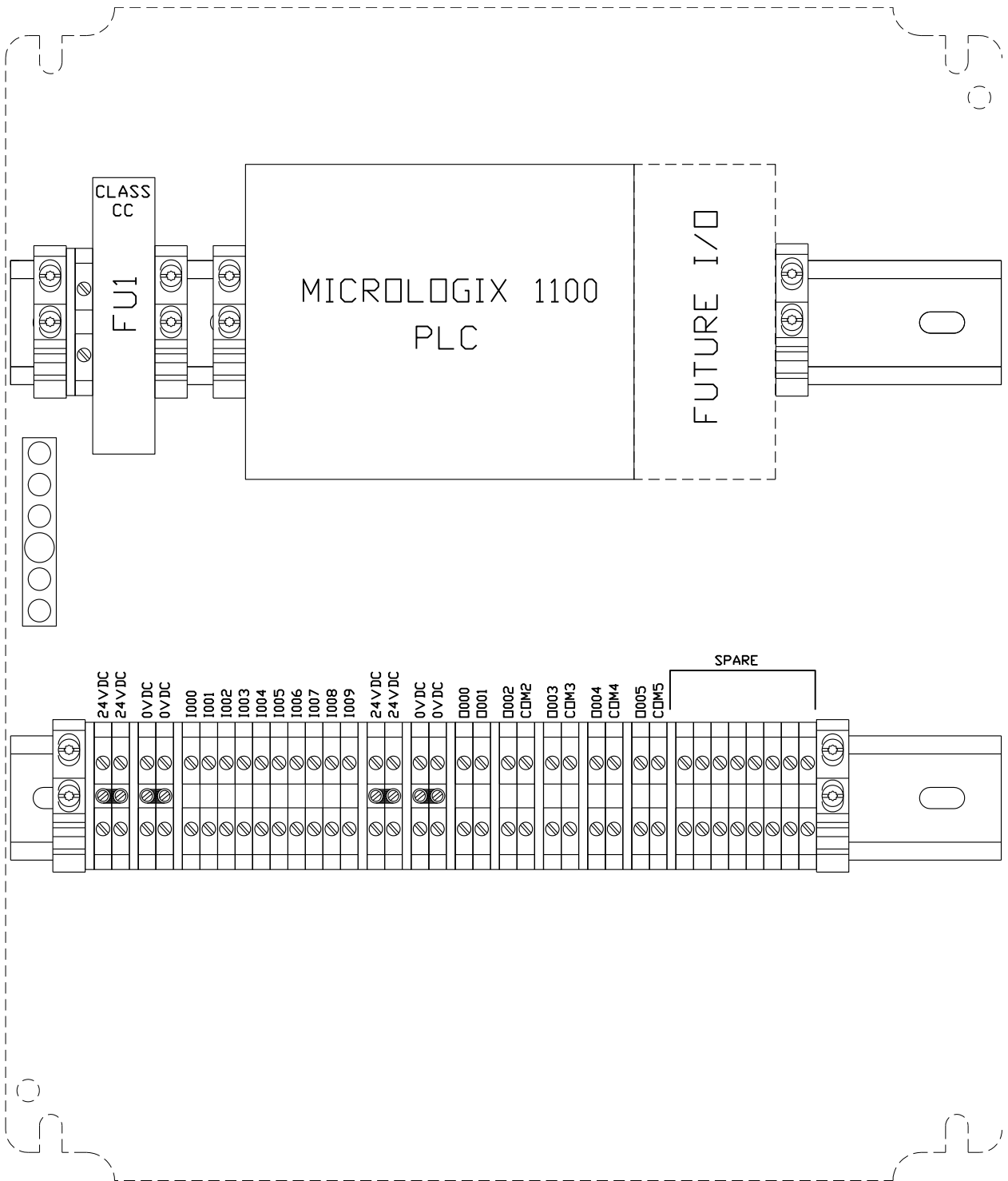


The connectors on the bottom of the box are routed as listed below	
1	Four (4) 3/4 inch sealtite fittings:
I	Extended I/O from inspection system
J	CAT6 from inspection system
K	120 VAC from inspection system
L	I/O from blow molder
2	Three (3) 1/2 inch cord grip fittings:
M	Sensor, capper exit (split)
N	Sensor, reject confirm (split)
O	Sensor, reject bin

Enclosure PLC Interface Jam Detect components

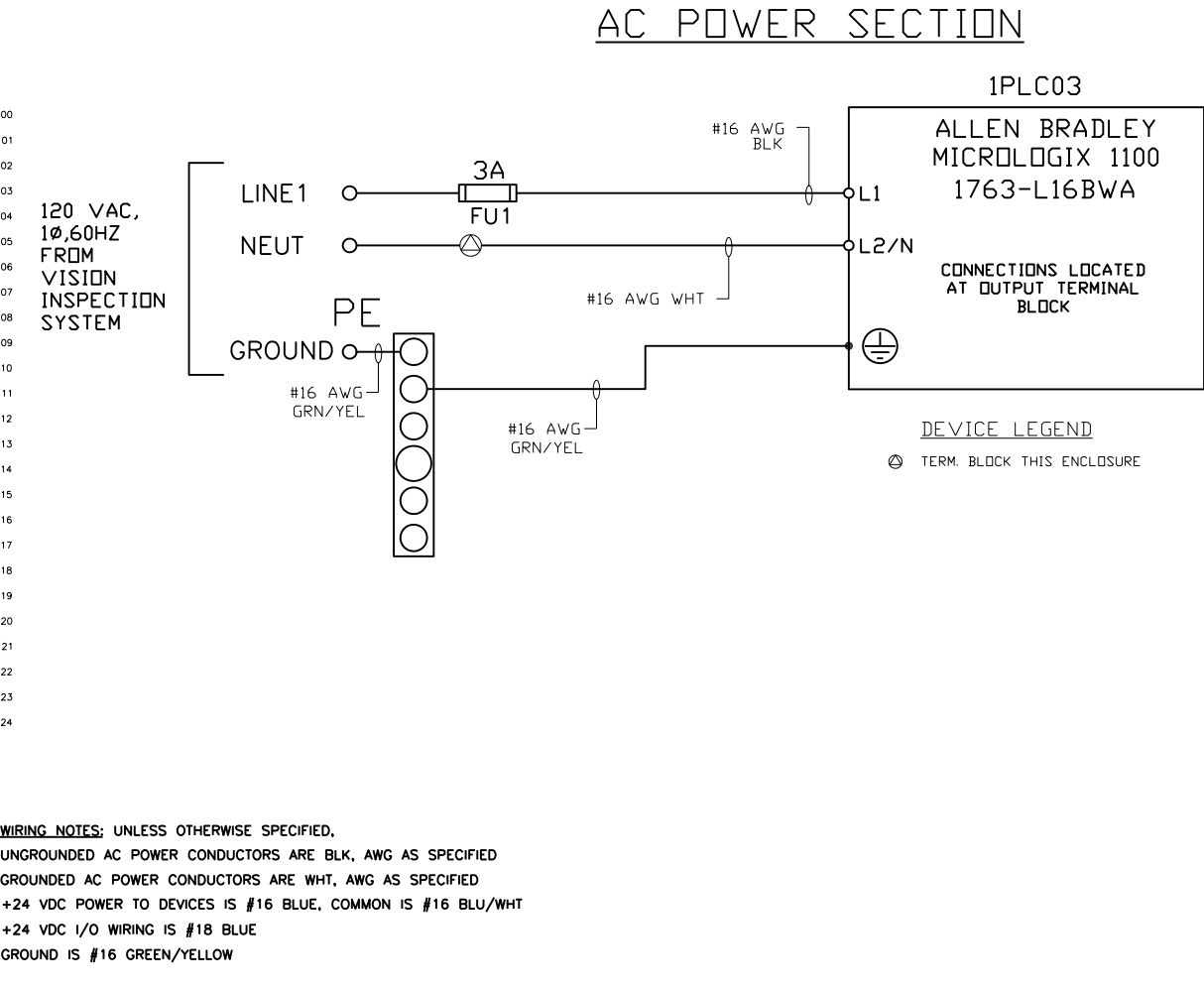
The internal components of the enclosure are shown below. Replaceable fuse is:

FU1	Fuse 1 - 3A 600V Class CC Time Delay. Pressco part number 54286

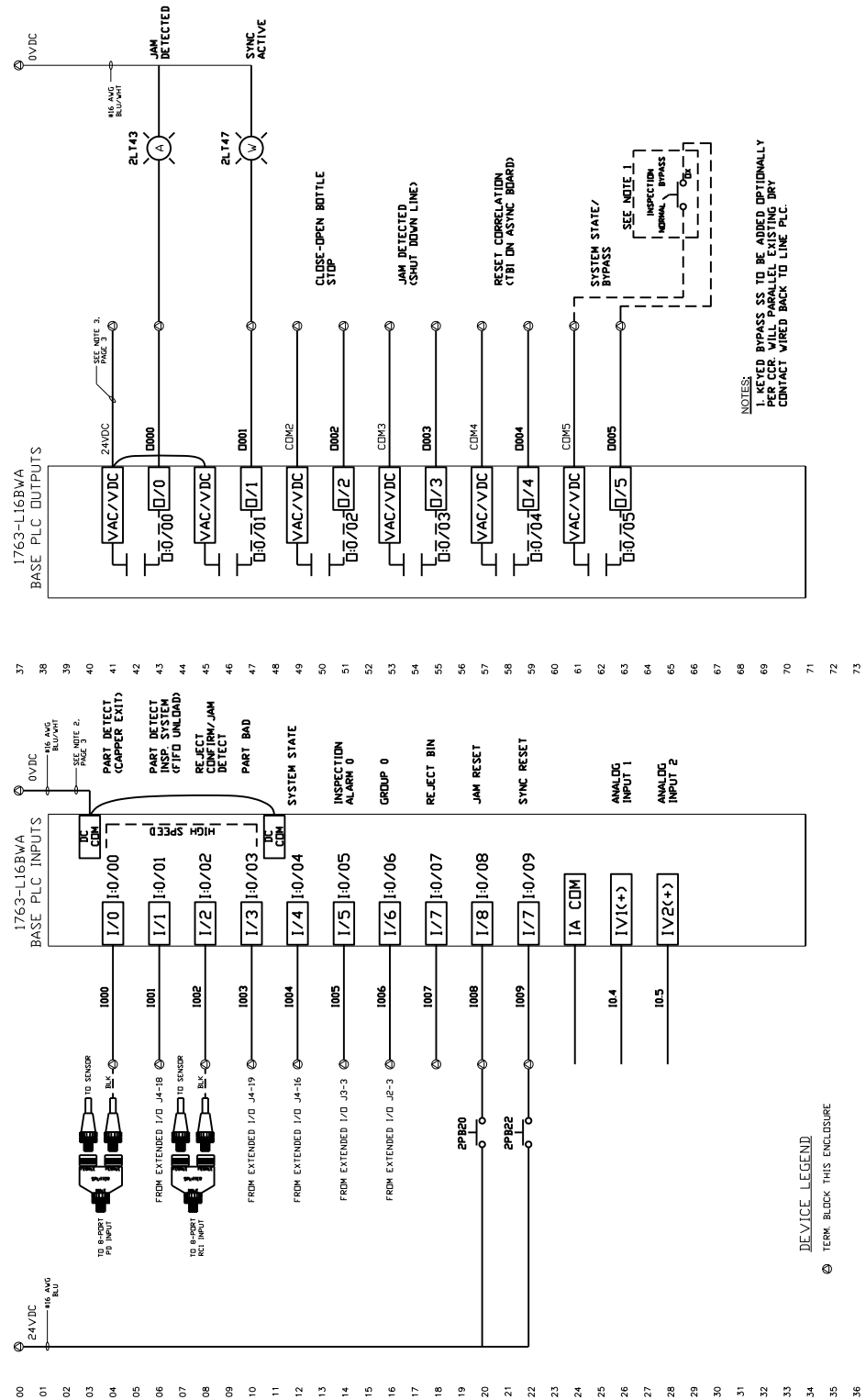


Electrical Diagram Enclosure PLC Interface - sheet 1

70576E sheet 1



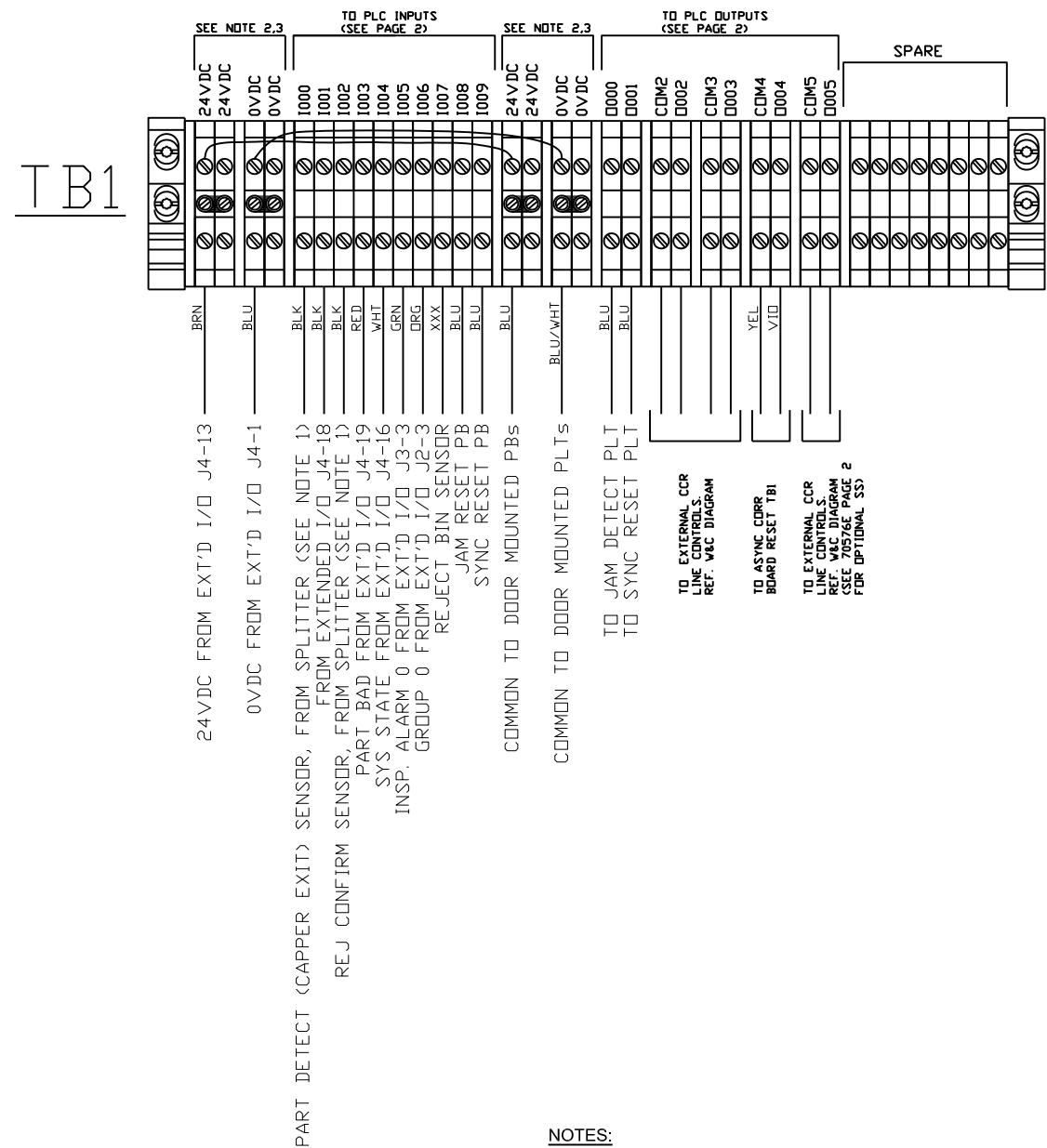
70576E sheet 2



Electrical Diagram Enclosure PLC Interface - sheet 3

70576E sheet 3

TERMINAL BLOCK WIRING DETAIL



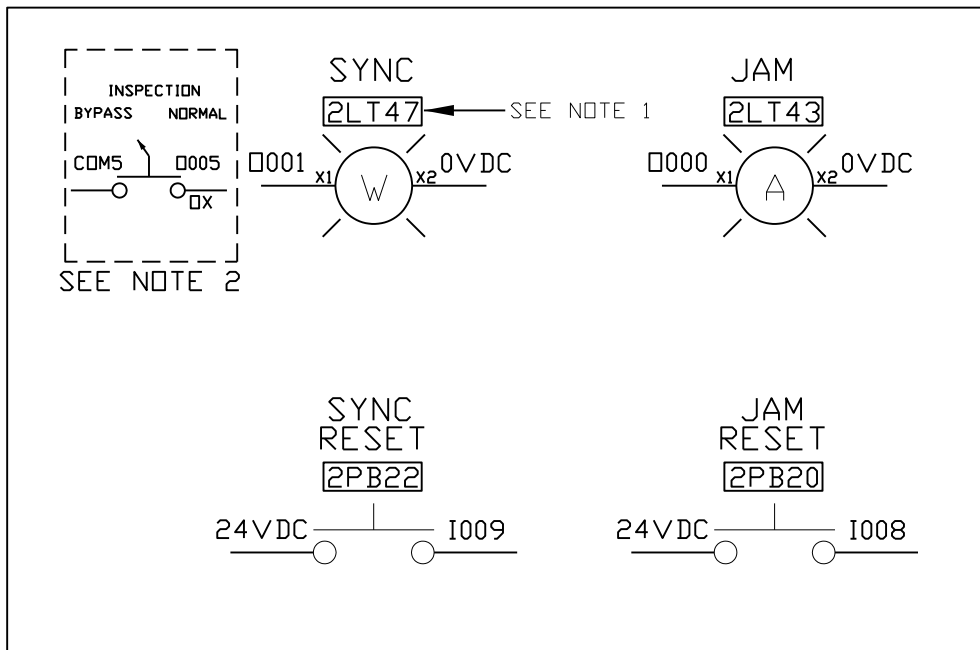
WIRING NOTES: UNLESS OTHERWISE SPECIFIED,
UNGROUND AC POWER CONDUCTORS ARE BLK, AWG AS SPECIFIED
GROUND AC POWER CONDUCTORS ARE WHT, AWG AS SPECIFIED
+24 VDC POWER TO DEVICES IS #16 BLUE, COMMON IS #16 BLUE/WHITE
+24 VDC I/O WIRING IS #18 BLUE
GROUND IS #16 GREEN/YELLOW

- NOTES:**
1. CONNECT ONLY THE BLACK WIRE OF THE M12 CABLE TO THE TERMINAL BLOCK. WHT,BRN,BLU TO BE TRIMMED BACK.
 2. INSTALL JUMPERS BETWEEN COMMONS AS SHOWN. BLUE FOR 24VDC, BLU/WHT FOR 0VDC.
 3. FOR PLC INPUTS, RUN 0VDC FROM TOP SIDE OF TB1 TO FIRST DC CDM TERMINAL ON PLC AS SHOWN ON PAGE 2. THEN JUMPER TO SECOND DC CDM TERMINAL. FOR PLC OUTPUTS, RUN 24VDC FROM TOP SIDE OF TB1 TO FIRST VAC/VDC TERMINAL ON PLC AS SHOWN ON PAGE 2, THEN JUMPER TO SECOND.

Electrical Diagram Enclosure PLC Interface - sheet 4

70576E sheet 4

OPERATOR DEVICES AS VIEWED FROM INSIDE OF ENCLOSURE DOOR



NOTES:

1. APPLY LABELS ADJACENT TO DEVICES ON "INSIDE" OF DOOR PER TEXT INSIDE RECTANGLES.
2. THIS SWITCH IS OPTIONALLY INSTALLED ON-SITE

WIRING NOTES; UNLESS OTHERWISE SPECIFIED,

UNGROUND AC POWER CONDUCTORS ARE BLK, AWG AS SPECIFIED
 GROUNDED AC POWER CONDUCTORS ARE WHI, AWG AS SPECIFIED
 +24 VDC POWER TO DEVICES IS #16 BLUE, COMMON IS #16 BLUE/WHITE
 +24 VDC I/O WIRING IS #18 BLUE
 GROUND IS #16 GREEN/YELLOW

Chapter 16

Extended I/O

This section contains information about the **optional** Extended I/O board.

- ❖ *Note: In some systems, such as FHCP 3X inspection systems, the Extended I/O board is always included (not optional).*

Location of Extended I/O in FHCP 3X Module

The Extended I/O board is located within the inspection module cabinet.



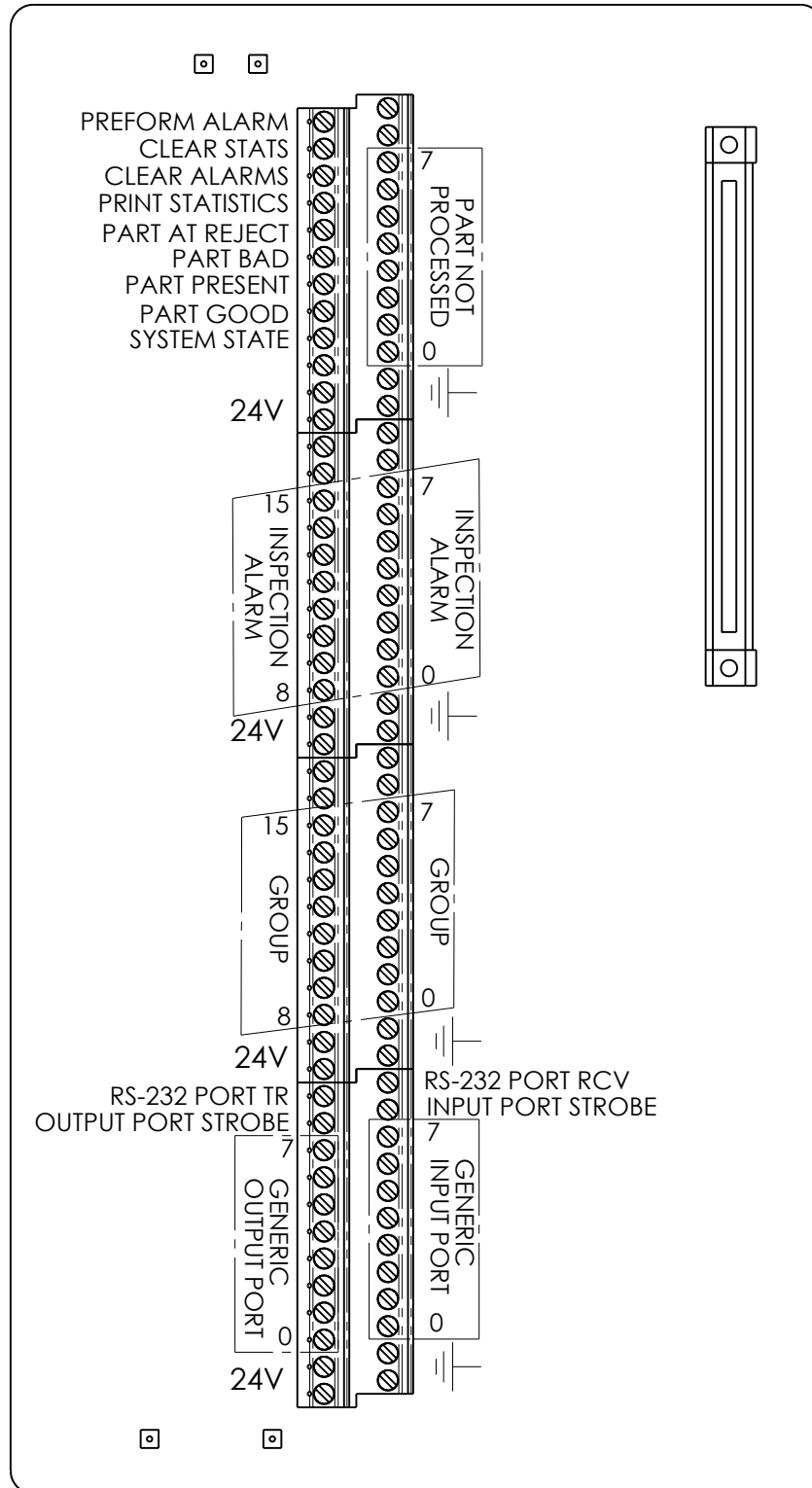
Extended I/O board

This optional module provides additional input and output ports for communicating with the Intellispec Series V system. The board may be installed within a cluster box or within an inspection module. The board is connected to the lane's Part Tracker board via a ribbon cable.

- ❖ *Note: Each Extended I/O board handles only one lane.*
- ❖ *Note: Extended I/O is not available with an Embedded Cluster Box.*

Some signals must be enabled in the software through the **Extended I/O Configuration** (on page 311).

Below is the basic layout for the Extended I/O module.



Extended I/O signals

The Series V Extended I/O signals are listed in the table below. For the location on the Extended I/O board, refer to the **Extended I/O terminal block reference** (on page 310).

❖ *Note: some signals are not currently used*

All Extended I/O inputs are PNP. Outputs are selectable to be either open collector or open emitter. However, that selection applies to ALL output signals.

The input and power LEDs are visual indicators. The output LEDs illuminate if the current reaches 40mA or higher, which is approaching maximum current. The maximum current output is 50mA. See also information about **Extended I/O circuits** (on page 310).

*The signals marked with an asterisk must be enabled through **Extended I/O Configuration** (on page 311) in the software.

Signal	I/O	Connector	Indicator LED	Comments/ Reference
Clear Stats*	I	J4-23	D2	Clears the lane statistics
Clear Alarms*	I	J4-22	D3	Clears the lane alarms
Print Statistics*	I	J4-21	D4	Prints the lane statistics to currently configured printer or file Schedule Reports (on page 101)
Preform Alarm	I	J4-24	D1	Used only in special applications. Activated by the Preform Material Handling system.
System State*	O	J4-16	D11	Indicates whether the lane is online or offline. Online = active. Offline = inactive.
Part Present (Part Detect)*	O	J4-18	D9	Pulses for 12 ms when the part present sensor detects a part
Part Good* (Group A)	O	J4-17	D7	Pulses for 12 ms for each part declared good by the inspection
Part Bad* (Group A)	O	J4-19	D5	Pulses for 12 ms for each part declared bad by the inspection
Part at Reject* (Group A)	O	J4-20	D13	Pulses for 12 ms for each part that crosses the reject point (online mode only)
Group 0	O	J2-3	D17	Pulses for 12 ms when an inspection fails in the user-defined group (online mode only) Walk By Setup (on page 62)
Group 1	O	J2-4	D25	
Group 2	O	J2-5	D33	
Group 3	O	J2-6	D41	
Group 4	O	J2-7	D15	
Group 5	O	J2-8	D23	
Group 6	O	J2-9	D31	
Group 7	O	J2-10	D39	
Group 8	O	J2-15	D21	
Group 9	O	J2-16	D29	
Group 10	O	J2-17	D37	
Group 11	O	J2-18	D45	
Group 12	O	J2-19	D19	

Signal	I/O	Connector	Indicator LED	Comments/ Reference
Group 13	O	J2-20	D27	
Group 14	O	J2-21	D35	
Group 15	O	J2-22	D43	
Part Not Processed: (Rejector 0)	O	J4-3	D109	Pulses for 12 ms when a part is not processed due to a system malfunction (online mode only)
Part Not Processed: (Rejector 1)	O	J4-4	D113	
Part Not Processed: (Rejector 2)	O	J4-5	D117	
Part Not Processed: (Rejector 3)	O	J4-6	D121	
Reject Confirm 0	O	J4-7	D107	Output signal when reject is confirmed (F168 and later DPT firmware)
Reject Confirm 1	O	J4-8	D111	
Reject Confirm Sensor blocked	O	J4-9	D115	Reject confirm sensor signal pulse width exceeding programmed limit (F168 and later DPT firmware)
Host communication lost	O	J4-10	D119	Output signal when communication to/from host is disrupted (F168 and later DPT firmware)
Inspection Alarm 0	O	J3-3	D59	Pulses when the associated alarm condition occurs and stays active until the alarm is cleared Lane Alarm Configuration (on page 88) and Sensor Alarm Configuration (on page 92) *J3-22 Inspection Alarm 15 supported with F168 and later DPT firmware. In earlier firmware versions, this signal is "Host Communication Lost"
Inspection Alarm 1	O	J3-4	D67	
Inspection Alarm 2	O	J3-5	D75	
Inspection Alarm 3	O	J3-6	D83	
Inspection Alarm 4	O	J3-7	D57	
Inspection Alarm 5	O	J3-8	D65	
Inspection Alarm 6	O	J3-9	D73	
Inspection Alarm 7	O	J3-10	D81	
Inspection Alarm 8	O	J3-15	D63	
Inspection Alarm 9	O	J3-16	D71	
Inspection Alarm 10	O	J3-17	D79	
Inspection Alarm 11	O	J3-18	D87	
Inspection Alarm 12	O	J3-19	D61	
Inspection Alarm 13	O	J3-20	D69	
Inspection Alarm 14	O	J3-21	D77	
Inspection Alarm 15*	O	J3-22	D85	
Generic Input Port 0	I	J1-3	D48	Reserved for Asynchronous Correlation
Generic Input Port 1	I	J1-4	D50	
Generic Input Port 2	I	J1-5	D51	

Signal	I/O	Connector	Indicator LED	Comments/ Reference
Generic Input Port 3	I	J1-6	D52	
Generic Input Port 4	I	J1-7	D55	
Generic Input Port 5	I	J1-8	D56	
Generic Input Port 6	I	J1-9	D47	
Generic Input Port 7	I	J1-10	D49	
Input Port Strobe	I	J1-11	D53	Reserved for Asynchronous Correlation
Generic Output Port 0	O	J1-15	D91	Reserved for Asynchronous Correlation
Generic Output Port 1	O	J1-16	D95	
Generic Output Port 2	O	J1-17	D101	
Generic Output Port 3	O	J1-18	D105	
Generic Output Port 4	O	J1-19	D89	Encoder Z pulse output
Generic Output Port 5	O	J1-20	D93	Part at Reject (Group B)
Generic Output Port 6	O	J1-21	D99	Part Bad (Group B)
Generic Output Port 7	O	J1-22	D103	Part Good (Group B)
Output Port Strobe	O	J1-23	D97	Reserved for future use
RS-232 Port TR	O	J1-24	D202	Reserved for future use
RS-232 Port RCV	I	J1-12	D200	Reserved for future use

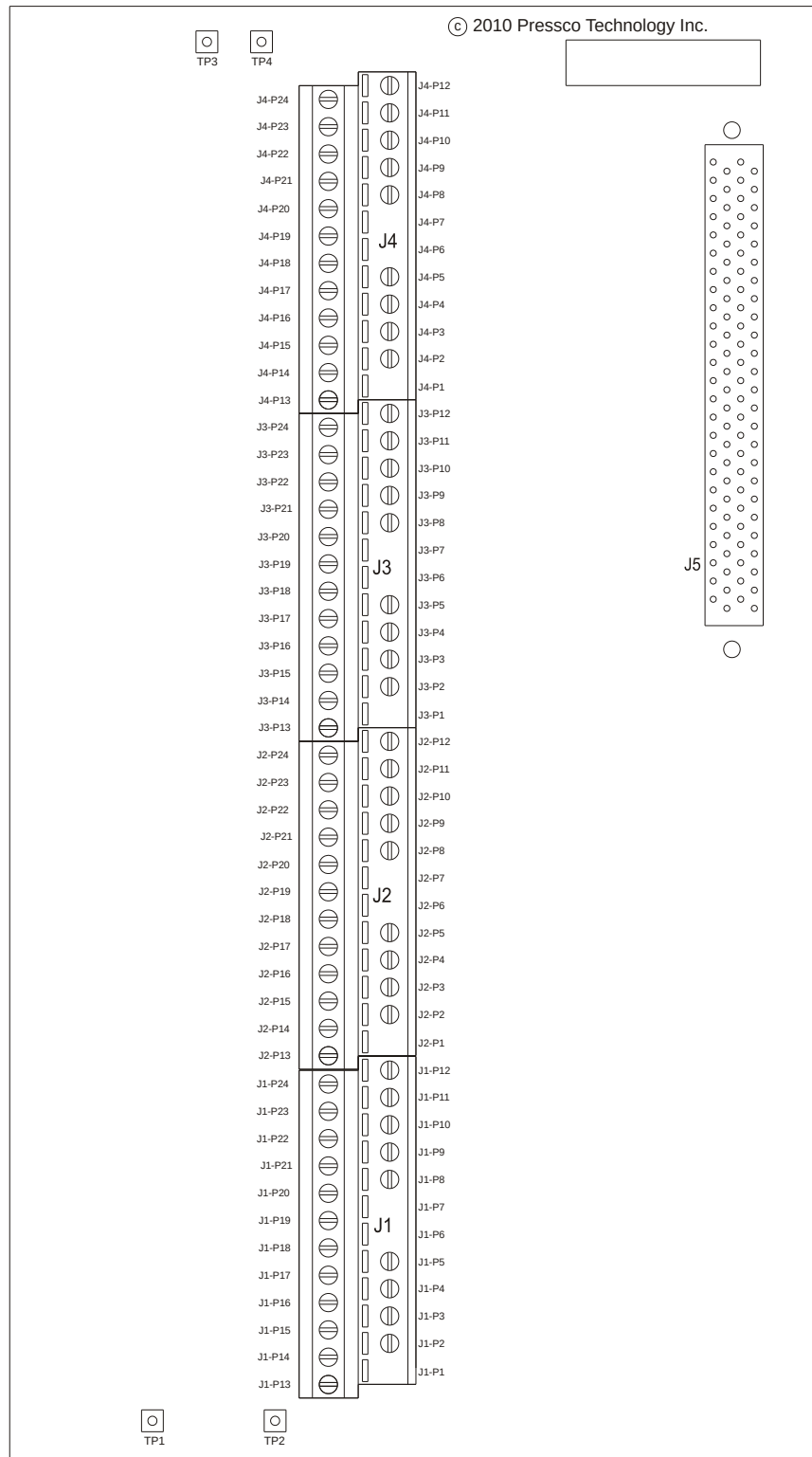
All Connectors

Function	Pin
Isolated ground	1, 2
24 V (isolated)	13, 14

Test Points

Function	Test Point
24 V	2
24 V Gnd	3
3.3 V	1
3.3 V Gnd.	4

Extended I/O terminal block reference



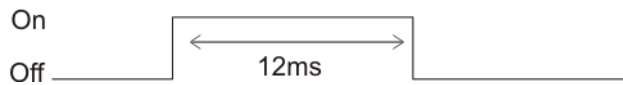
Extended I/O circuits

The following illustrations show typical input and output circuits you can use to communicate with your plant's PLC, or to connect external LEDs or light trees.

➤ **Specifications:**

- Minimum dwell time of the **input** device is 1.1 ms
- Maximum **output** load is 50 mA
- Default value of **output** pulse is 12ms. Some output signals, such as alarms, must be cleared on the Intellispec before they turn off.

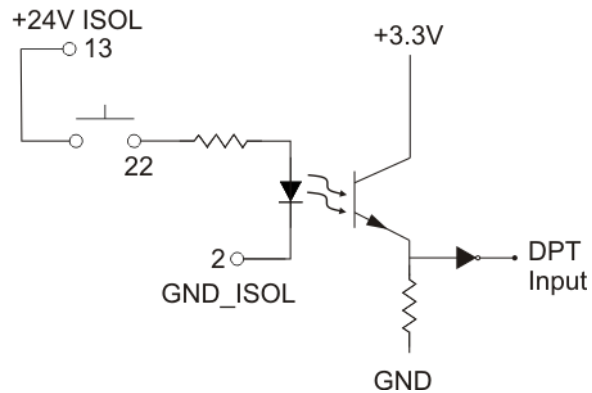
Default timing of pulsed output



The following illustration shows a typical circuit that can be used to clear alarms.

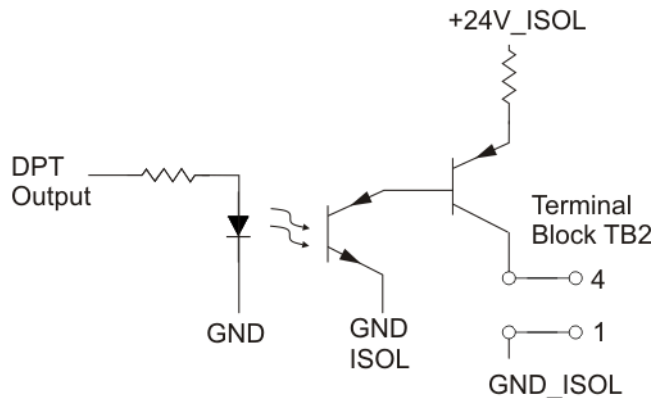
CLEAR ALARMS - INPUT

Terminal Block TB4



The following illustration shows a typical circuit that can be used for a group output.

GROUP 1 - OUTPUT



Extended I/O Configuration

Through this menu you can enable input or output signals to either perform a function on the Intellispec system or allow you to monitor the production lane in your plant. These settings must be done for each Extended I/O board for each lane.

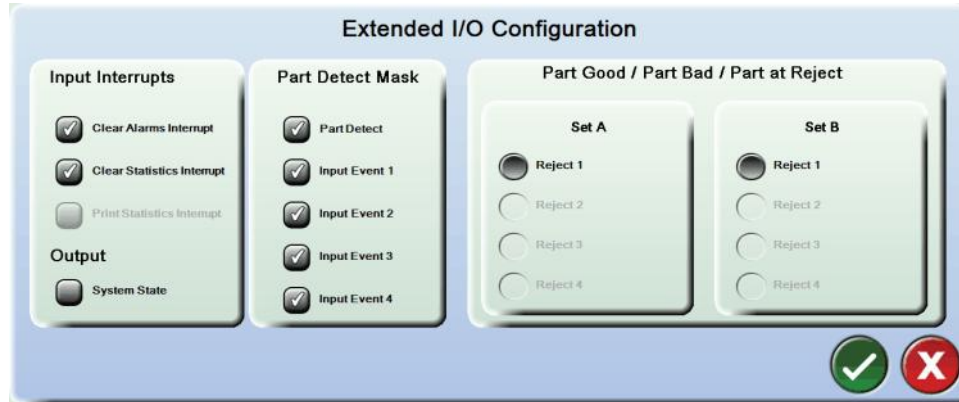
See also the sections about **Extended I/O** (see "**Extended I/O board**" on page 305) and **Extended I/O Signals** (on page 306).

➤ **To get to this screen:**

From the Lane or Sensor Overview screen, click the Tools button  to see the Tools Menu, then select Hardware Setup, then select Extended I/O Configuration.

This screen displays some of the inputs and outputs on the optional extended I/O board.

If one of the extended I/O ports is used it must be enabled here in the software, and the hardware must be connected appropriately.



Input Interrupts

These signals produce an input pulse to the Intellispec processor to perform the following functions.

Clear Alarms Interrupt

Clears the lane alarms.

Clear Statistics Interrupt

Clears the lane statistics.

Print Statistics Interrupt

Prints the lane statistics to the currently configured printer or file. See also **Schedule Reports** (on page 101).

Output

System State

Produces an output pulse to notify your plant whether the lane is online or offline. Online = active. Offline = inactive.

Part Detect Mask

Choose which Part Detect or other input events to trigger the Part Present output on the Extended I/O board. This is an OR function. Any enabled Part Detect signal or Input Event that goes active will activate the Extended I/O Part Present output.

Part Detect

The signal goes active when the sensor detects a part.

Input Event N

The Part Tracker board accepts up to five* input events (Part detectors or other sensors). Part tracking is always controlled by the Part Detect signal (Input Event 0). You might use other input events (1 - 4) in your system to trigger the Part Present output signal.

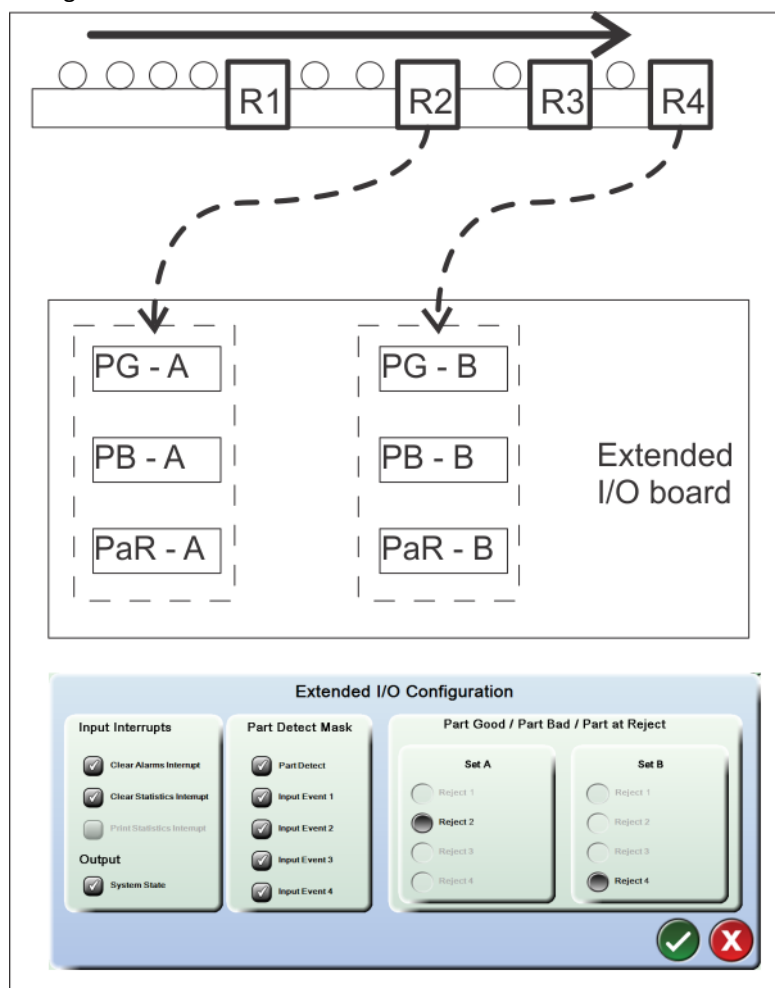
*Only if your system has an 8-channel Part Tracker board. If your system has a 2-channel Part Tracker board, then only one Part Detect signal is used. The other input events are not available.

Part Good/ Part Bad/ Part at Reject

Choose which rejector signal to activate the **Part Good**, **Part Bad**, and **Part at Reject** signals on the Extended I/O board. After a part is inspected, the system determines whether the part is good or bad. As the part passes by Rejector 1, 2, 3, or 4, the Part Good/ Part Bad/ and Part at Reject signals are activated on the Extended I/O board. There are two groups of Part Good/ Part Bad/ and Part at Reject signals - Group A and Group B. You choose which rejector is associated with Group A and/or Group B. You can have both groups associated with the same rejector, if desired. See **Extended I/O signals** (on page 306).

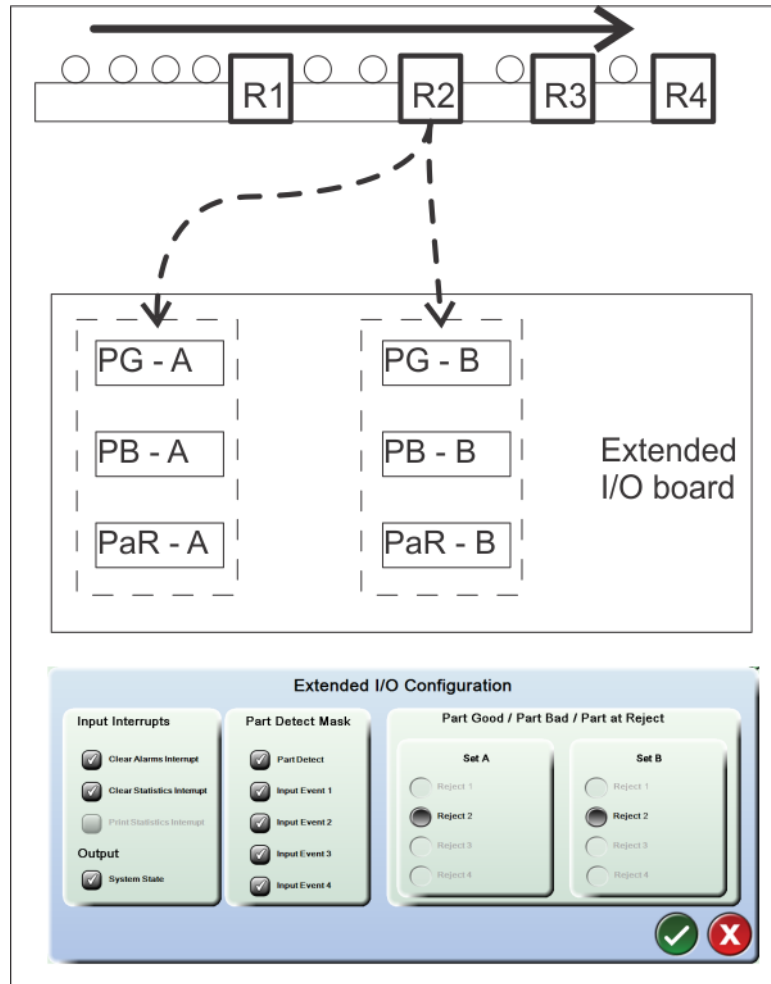
❖ *Note: If your system has a 2-channel Part Tracker board, then the lane has up to two rejectors. If your system has an 8-channel Part Tracker board, then the lane has up to four rejectors.*

Example 1 below: Group A is triggered when the part passes Rejector 2, and Group B is triggered when the part passes Rejector 4. The illustration below shows a basic block diagram with a conveyor with four rejectors. Those rejectors output a signal to the Extended I/O board, based on the Extended I/O configuration.



R	Rejector
PG	Part Good signal, Group A and Group B
PB	Part Bad signal, Group A and Group B
PaR	Part at Reject signal, Group A and Group B

Example 2 below: Group A is triggered when the part passes Rejector 2, and Group B is also triggered when the part passes Rejector 2.



Chapter 17

Maintenance

When conducting maintenance or repair work:

	Follow the Machine Maintenance Lockout Procedure.
	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, authorized personnel who ensure the prevention of personal injury or damage to the machine must supervise this operation. All machine movements must be performed with limited speed and limited movements.
	Exclusively authorized and trained personnel must carry out maintenance or repair work on electrical components. 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 a structure and must always move with extreme caution. The harness must not be connected to Pressco equipment or structure as it cannot support body weight.
	Never perform lubrication or maintenance procedures on mechanical parts with the machine running.

Maintenance Frequency

Intellispec Series V Computer enclosure, FHCP 3X module, and general components				
Item	Description	Once per day or shift	Once per week	Once per month
Observe Proper inspection	Verify that defective parts are being rejected by inserting a known defective part through inspection	X		
Observe Proper inspection	Verify that no stray parts are stuck in or near the inspection module or reject station	X		
Observe Proper inspection	Verify that no buildup of dirt or contaminants has occurred on inspection module, part detector, or conveyor. Clean if necessary.	X		
Observe Proper inspection	Verify that each sensor image is properly centered, focused, and properly lit. Adjust if necessary.	X		
FHCP 3X inspection system cabinet	Clean system cabinet after wash-down, and/or as needed <i>Cleaning the system cabinet</i> (on page 318)		X	
Vision Processor Computer Filter	Rinse in clean water; use mild soap and water solution if oily. Use the procedure that matches the equipment in your plant. <i>Cleaning the NEMA 4X Vision Processor filter</i> (on page 317)			X
Plastic surfaces: Inspection tunnel windows	Clean with soft, clean, oil-free cloth dampened with mild soap and water solution. Wipe dry. <i>Cleaning Plastic Surfaces</i> (on page 318)			X
Part Detect Sensor and Reflector	Clean with soft, clean, oil-free cloth dampened with mild soap and water solution. Wipe dry. <i>Cleaning the Part Detector</i> (on page 319)	Only if needed. These items are inside the inspection module enclosure, and should not need cleaning under normal conditions.		
Camera lens	Clean only with lens tissue and lens cleaner. Be careful not to alter focus or aperture. <i>Cleaning the Camera Lens</i> (on page 321)			
Glass surfaces: Mirrors	Clean with soft, clean, oil-free cloth dampened with lens cleaning solution. <i>Cleaning Glass Surfaces</i> (on page 320)			

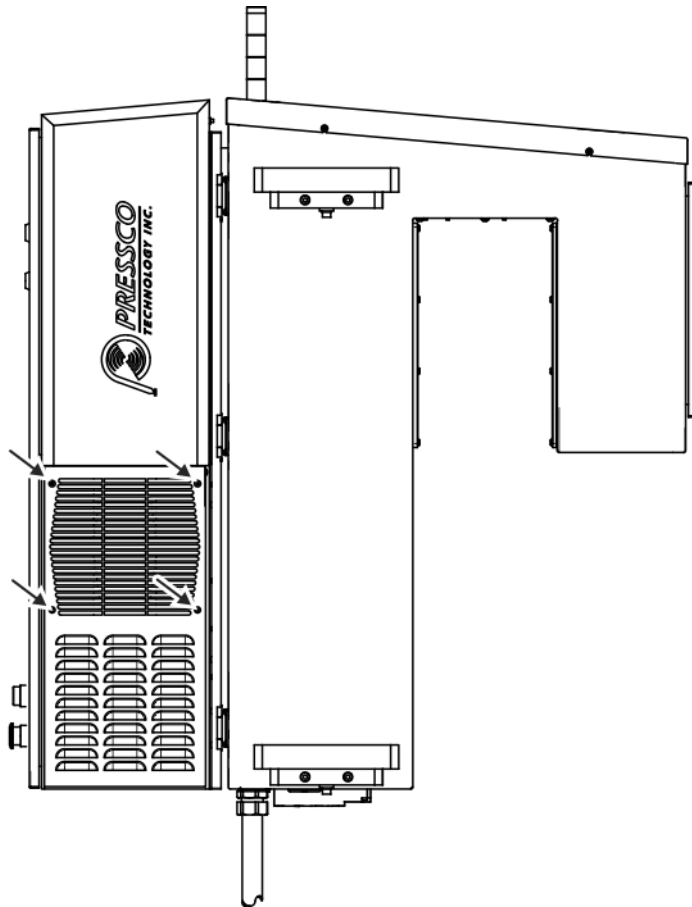
Cleaning the NEMA 4X Vision Processor filter

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*

➤ *To clean the filter:*

1. Remove the four screws that hold the filter cover.
2. Remove the filter and clean it.
 - If the filter contains dry dust and dirt, rinse it in plain water
 - If the filter contains oily dust and dirt, clean it in soapy water, then rinse in clear water
3. Dry the filter completely, then place it back inside the cabinet.
4. Replace the filter cover and replace the four holding screws.



Cleaning the system cabinet

This unit is NEMA 4X standard, and does not need any parts covered during plant wash-down or unit cleaning.

After a plant wash-down, or at least once per week, clean the exterior of the vision processor.

➤ **To clean:**

- Use stainless steel cleaner and clean, dry cotton rags, lint-free cloths, or soft non-abrasive paper towels
- Wipe the exterior surface of the cabinet after a wash-down, or once per week

Cleaning Optical Surfaces



Important

Debris and contamination could build up on both the glass and plastic surfaces. This dirt could appear in the inspection windows, causing false rejects of parts, or it could degrade lighting.

Clean glass and plastic surfaces often to avoid false rejects.

To maintain proper image quality and system performance, the clear glass and plastic surfaces on the Inspection Modules must be cleaned on a regular basis. Dirt and debris that appear in the image can cause false rejects. An oily film on optical surfaces can cause false rejects or missed defects.

Cleaning Plastic Surfaces

Plastic surfaces that require cleaning are:

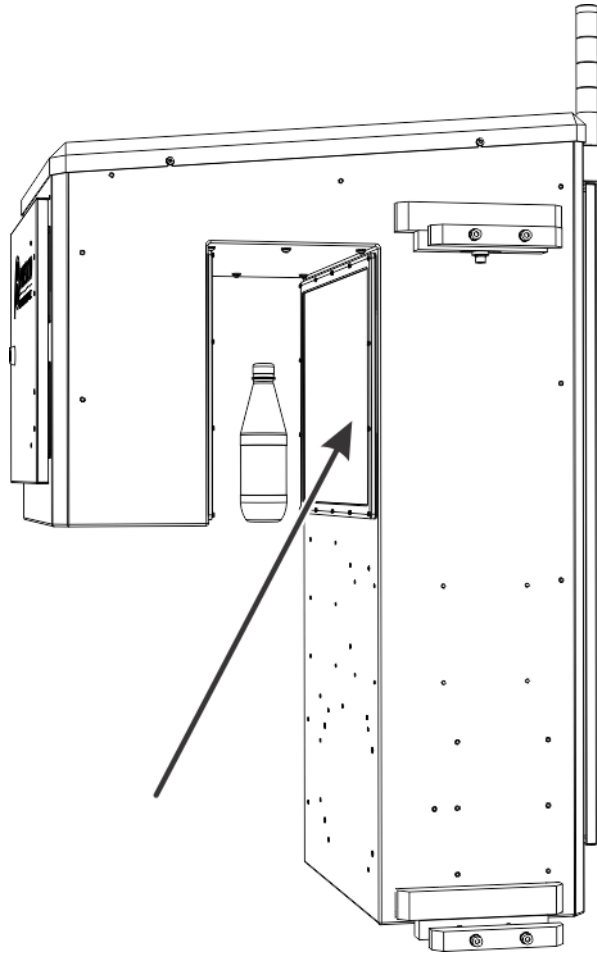
- Inspection tunnel windows (both sides)

Other items, such as backlight diffusers and the part detect sensor and reflector, are located inside the tunnel enclosure, and should not need cleaning under normal conditions.

❖ *Note: Cleaning frequency will depend on plant and process conditions.*

➤ **To clean plastic surfaces:**

Do	Do Not
Use canned compressed air to blow away dust	Do not wipe away dirt as plastic coating may be scratched
Use a clean, non-abrasive cloth dampened with mild soap and water solution. Saturate surface completely to let particles wash away.	Do not use paper towels or paper napkins – these may scratch surfaces
Dry the surface with clean, compressed air	



Cleaning the Part Detector

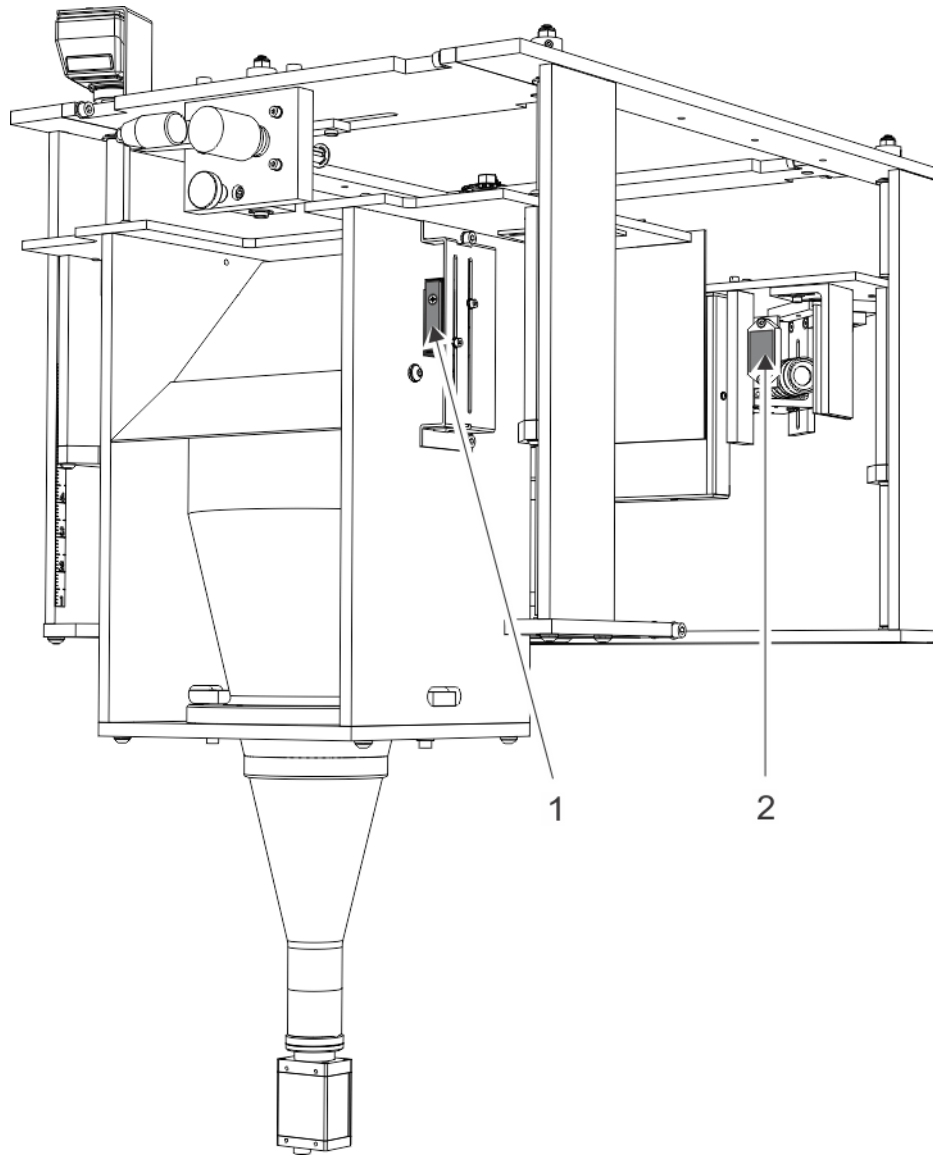
Under normal conditions, you do not need to clean these components, as they are inside the inspection module enclosure. Be sure to keep the inspection windows clean so that the optical components inside can properly detect parts and defects.

If these items need cleaning, follow the instructions below.

➤ **To clean the part detector:**

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

❖ *Note: The frequency of cleaning will depend on plant and process conditions.*



1	Part detect sensor (lens is towards the center of the tunnel)
2	Part detect reflector

Cleaning Glass Surfaces

Glass surfaces that may require cleaning are:

- Camera Lens
- Beam Splitter (if present)
- Secondary lens (if present)
- Secondary mirror (if present)

➤ **To clean glass surfaces:**

- Blow off dust with canned, compressed air
- Use a clean non-abrasive cloth dampened with lens cleaning solution
- Use lens tissue and lens cleaning solution on camera lenses
- If surface has compound on it, first clean with alcohol, then with lens cleaning solution

❖ *Note: Cleaning frequency will depend on plant and process conditions.*

Cleaning the Camera Lens

Under normal conditions, you do not need to clean these components, as they are inside the inspection module enclosure. Be sure to keep the inspection windows clean so that the optical components inside can properly detect parts and defects.

If these items need cleaning, follow the instructions below.

Clean all camera lenses carefully.



Caution

Do not touch the lens with fingers or oily cloths.

➤ **To clean the camera lenses:**

1. Clean all camera lenses with lens tissue and lens cleaning fluid. Be careful not to alter the focus or aperture of the cameras.
2. Re-adjust aperture and focus if needed.

Chapter 18

Defect Database Tool (option)

❖ *Note: the Defect Database tool is an optional feature. To purchase this feature, please contact your Pressco Sales Manager. Additional hardware may be required, depending on your system. **How to Contact Pressco** (on page 357).*

The Series V Intellispec system is capable of archiving data associated with defective parts. The archiving of this data may be enabled or disabled. The defect data collected includes information related to the part program, lanes, inspections, sensors and correlated machine parts. The information can be from any type of sensor - camera, x-ray, mass, etc. The Defect Database tool allows you to search, view, and report defect information.

This information is valid as of 5.0.491/ 5.2.022/ 5.3.004 software.

What is the Defect Database?

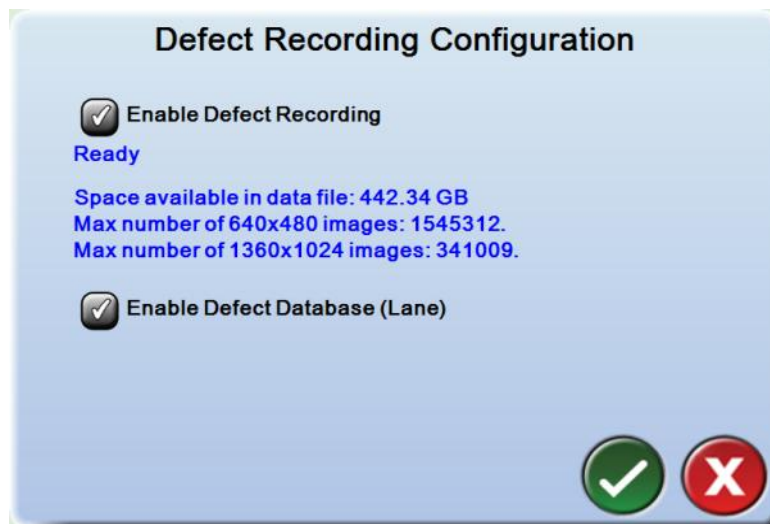
The Defect Database is a tool within the Intellispec system that uses a separate hard drive used to archive information associated with rejected parts. This tool has two components:

- The Defect Data File that contains images of parts that have been rejected, and
- The Defect Database that stores defect information for each part that has been rejected.

Defect Database Specifications and Limitations

- The Defect Database is an option and therefore has to be part of the original install, or purchased as an upgrade.
- A separate hard drive is installed to support this database. A minimum 500GB hard drive is recommended.
 - If your system has a part number 70315 or higher, then it is hardware-ready. This means that the system has the hardware capable of running the Defect Database.
 - If your system has a part number below 70315, then additional hardware (hard drive and possibly memory) may be required. Contact Pressco.

- The Defect Database is maintenance-free.
- A separate database is created for each lane. You must enable the Defect Database individually for each lane.
- The Defect Database supports up to 500,000 records for each lane.
- The number of images available depends on the size of the Defect DB hard drive installed. You can see this information on the Intellispec screen on your system. (see example below) This total number of images is shared between all lanes. As defect images are written first-come first-served, more images are stored for a lane with a higher number of defects.
- There may be more records for all lanes than available image space. Therefore the oldest records may have no valid image associated.
- We cannot guarantee that all records and all images are saved because of memory constraints and available time for writing images to a hard drive.
- The Defect Database is designed to limit interference with the inspection system. This means that under high system load data may not be recorded as the database has to yield to the inspection system.
- The Defect Database file size is fixed. The entire hard drive space is allocated upon initial setup. When the database reaches its maximum number of records or images, it overwrites the oldest information.
- Example file size and number of images available:



Note the following about the Defect Database

The information below refers to content you can find by using the ***Defect Database Viewer*** (on page 331).

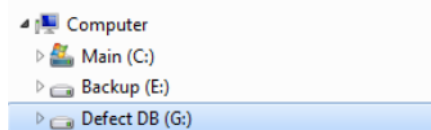
- Defect images can be accessed from the Defect Database by looking at details of a search result record.
- You can create defect rate reports over a time span for any or all part programs.
- You can search the database by criteria including:
 - Part program
 - Sensor
 - Inspection (your name for the inspection, such as "Find Center")
 - Inspection type (Intellispec inspection type, such as "Contrast")
 - Sets of machine parts (such as "Cavity 3 through 10" or "Spindle 1 through 100")
 - Time span of calendar dates and clock times

Preparing the Database

❖ *Note: the Pressco installer will configure your database upon installation if you have purchased this option with your system. However, if you purchase this option as an upgrade, you may need to configure the database as described below.*

➤ *What you need:*

- A dongle with the Defect Database feature enabled (provided with the purchase of the feature).
- A hard drive labeled “Defect DB” The size of the hard drive determines the number of images that can be stored. (At least 500 GB of storage is recommended, more if you are using cameras of resolutions higher than 640x480). Name the hard drive "Defect DB" using the Computer or Windows Explorer on the Intellispec system. The drive letter does not matter. Make sure to use the exact capitalization and spacing as shown.



Enabling Defect Recording versus Defect Database

Enabling **Defect Recording** will start saving **images** to the Defect Data File, which can be accessed by using the **Defect Data (Images) Viewer** (on page 329). You can disable Defect Recording (recording of images and data of non-image type sensors) for each lane individually. However, in order to enable the **Defect Database** that stores defect information for each part that has been rejected, Defect Recording must be enabled. Enabling the searchable Defect Database is described next.

➤ *To see whether the Defect Database is already enabled:*

1. From Lane Overview or Sensor Overview mode, click the Tools button to see the tools menu.
2. Select Lane Setup > Defect Recording Configuration. The configuration menu is displayed. (This menu is only available when you have the configured dongle and hard drive as described above)



- If "Preparation Required" is displayed, then you need to set up the Defect Database; see below. Otherwise, if any box is unchecked you can enable the option by checking it. You can only check "Enable Defect Database (Lane)" if "Enable Defect Recording" is already checked.
- If both boxes are checked, then the Defect Database is ready to use.

Prepare the hard drive for defect recording. This process needs to be done only once.

➤ *To prepare the hard drive:*



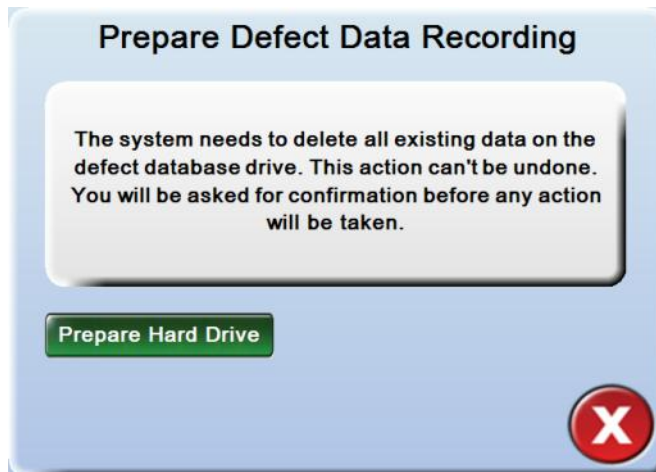
Warning

When you complete these steps, all information from the Defect DB hard drive is deleted. In addition, if you are upgrading from a system with software earlier than 5.0.480 that was already using the Defect Database, then the entire old database will be erased. This action cannot be undone.

1. From the Intellispec application, go to Lane Overview or Sensor Overview mode and click the Tools button to see the tools menu.
2. Select Lane Setup > Defect Recording Configuration. The configuration menu is displayed. It should indicate that preparation is required.

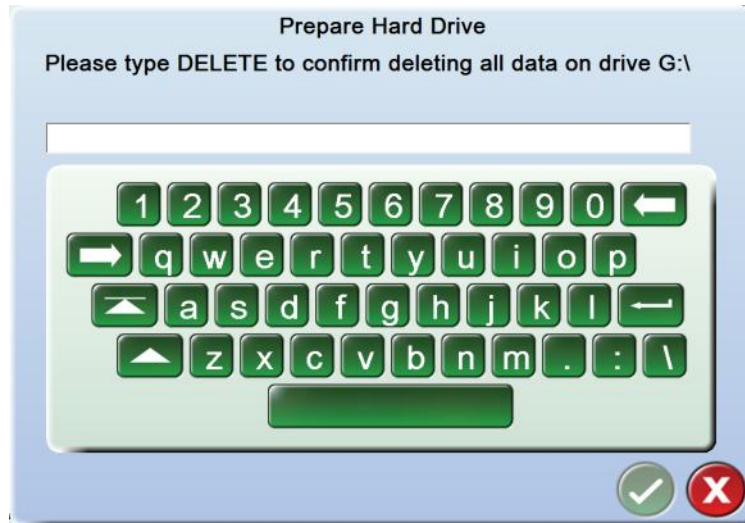


3. Check the **Enable Defect Recording** box. A message will explain that the Intellispec system will delete everything from the hard drive that it recognizes as "Defect DB."

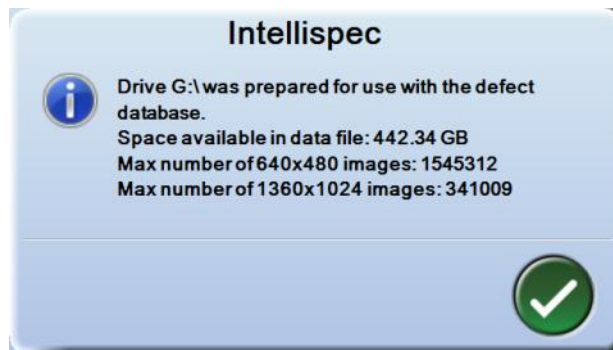


4. Click the **Prepare Hard Drive** button. As a safety precaution, the system asks you to type the word "DELETE" before it prepares the hard drive.
5. If you are sure that you want all information deleted from the "Defect DB" hard drive, type DELETE in all capital letters on the displayed keyboard, then click the OK button. This action does two things:
 - Formats the hard drive, and

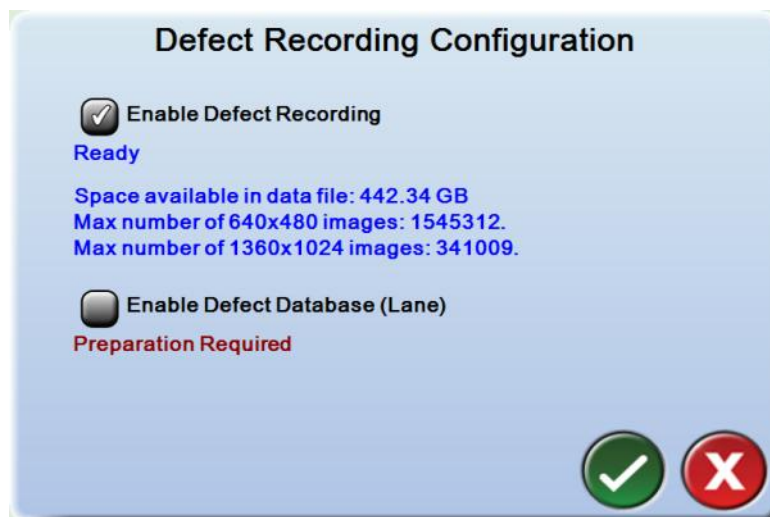
- Creates a large file on the hard drive that holds the images and the non-image sensor data. This file is shared by all lanes.



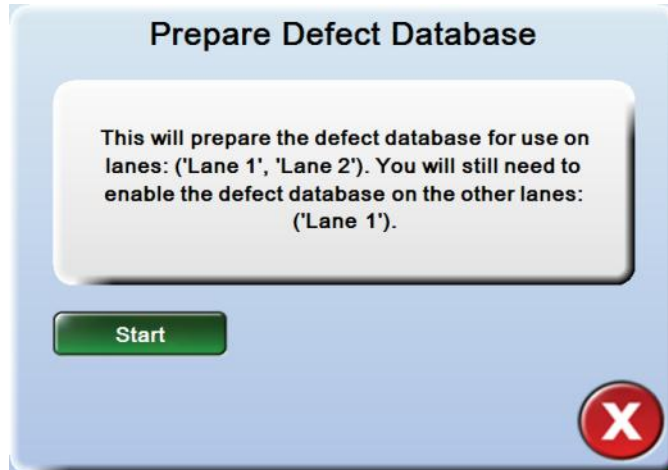
- The hard drive is prepared. A message indicating the space available on your hard drive is displayed. Click the OK button to continue.



- The configuration menu is displayed, showing that Defect Recording has been enabled. The Defect Database (non-image sensor data) still needs to be prepared. Check the **Enable Defect Database (Lane)** box to begin preparation.



8. The system displays a message stating that it will prepare the database for all lanes. Click the Start button to continue.



The Defect Database is ready to use on the lane on which it was enabled. The database will record defects and images each time you put the lane online. Enable the Defect Database for other lanes through the **Defect Writing menu** (see "**Enabling/ Disabling Defect Writing**" on page 328).

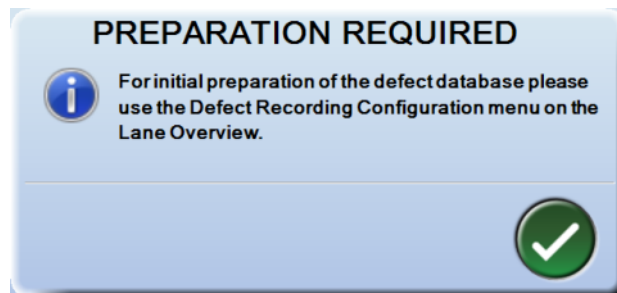
Enabling/ Disabling Defect Writing

From System Overview mode, you can enable or disable Defect Recording (images) and the Defect Database (data) for all lanes.

❖ *Note: this feature is available in software versions 5.0.493, 5.2.026, 5.3.005 and later.*

First time usage

If this is the first time you are using this feature, you must prepare the hard drive once from Lane Overview mode. If you select Defect Writing > Configure Defect Writing from the Tools menu in System Overview mode without first preparing the hard drive, the following message will be displayed.



Go to **Preparing the Database** (on page 325) for information on setting up the hard drive to configure your defect database.

❖ *Note: once the hard drive is prepared initially, you do not need to prepare it again for additional lanes, except if you add a lane subsequent to preparing the database the first time. If you have added a lane, then you will need to prepare the database through Lane Overview mode on the new lane.*

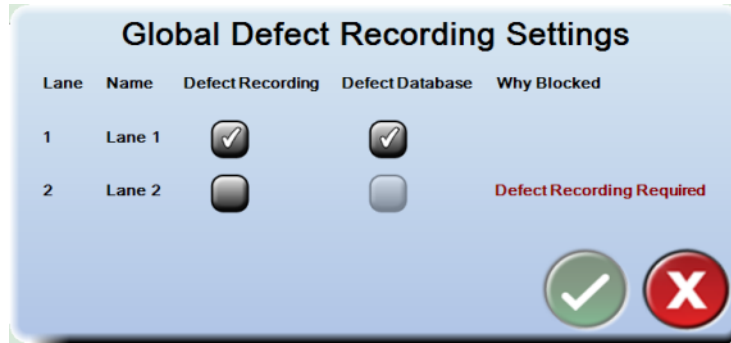
Subsequent usage

If you have previously used the Defect Database and disabled it from any or all lanes, you can enable it for multiple lanes at once. No further hard drive preparation is required after initial setup.

➤ To enable the Defect Database on any lane:

1. From System Overview  mode, select the Tools button  to see the tools menu.

2. Select Defect Writing > Configure Defect Writing. The Global Defect Recording Settings menu is displayed.



3. To enable Defect Recording (the recording of images), check the **Defect Recording** box.
4. Check the **Defect Database** box to enable recording of non-image sensor data. The database is enabled for the selected lane(s).
5. Click the OK button to save changes and exit.

The system is ready to record defect images and data as you selected.

Saving Items to the Database

To save items to the database, the database must first be enabled. See *Preparing the Database* (on page 325).

Each time you put a lane online, the Intellispec saves defect information and images to the database. The defect database for each lane has a fixed number of 500,000 records, and once this number is reached the oldest records will be overwritten with the newest ones.

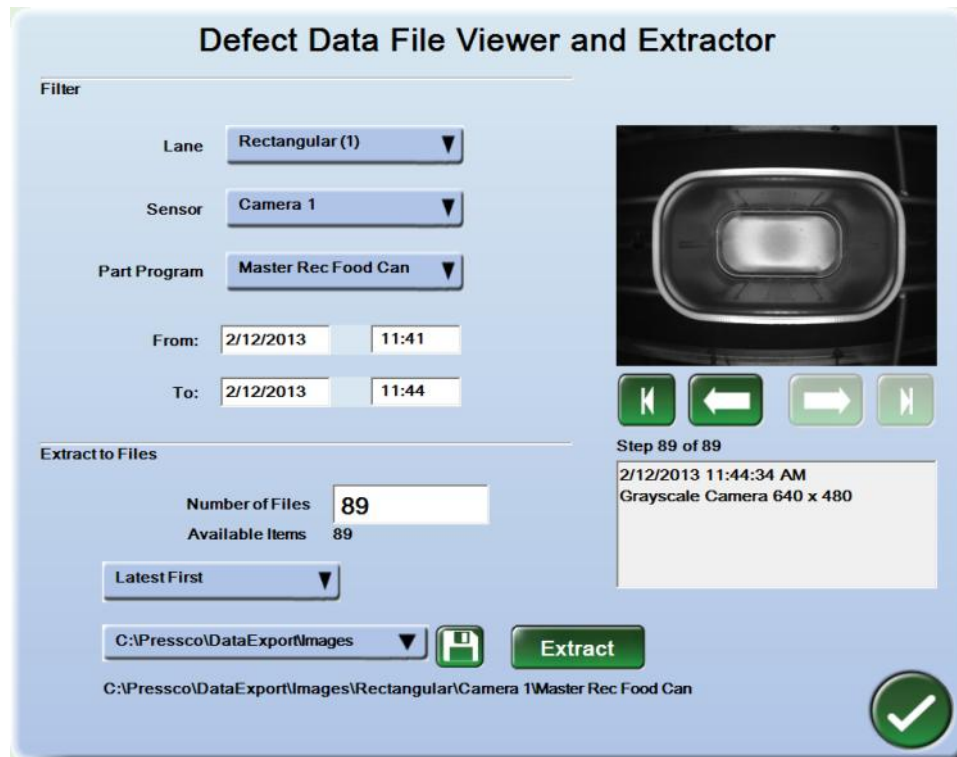
❖ *Note: when the database is prepared, the entire hard drive space is used, so the "Defect DB" hard drive will appear full. The Defect Database Tool places images and defect information into the database, using allocated placeholders in the database. You will not be able to tell whether the database is full by looking at hard drive space.*

Defect Data (Images) Viewer

The defect data viewer is an auxiliary tool that allows access to the contents of the Defect Data File, which is a very large file containing image data and data of non-image sensors, such as Mass. This tool is not part of the defect database but provided for your convenience.

➤ *To open the Defect Data Viewer:*

From Lane Overview or Sensor Overview mode, click the Tools button , and select Reporting > Defect Data Viewer. The Defect Data File Viewer and Extractor screen is displayed.



If the lane was online when you opened the viewer, the database will continue to collect defect data and images. However, the information in the viewer reflects only the data as of the time you opened the viewer. To see more recent data, you must close and re-open the Defect Data Viewer.

Filtering images

In the upper part of the menu, you can filter the images you want from the database. Choose from lane, sensor, part program, and date range. This affects the list of images available to view on the right of the menu, as well as the images you may export from the lower part of the menu.

Viewing defect images

Images are displayed on the right side of the viewer. Use the buttons below the image to scroll through the available images.

Extracting images

In the lower part of the menu, you can extract images from the database for use in another location or during part program setup. The images available for extracting are determined by the filter settings in the upper menu.

➤ *To extract images:*

1. Enter the **Number of Files** if you want to save a different number of images than the available items.
2. Click the disk icon  to change the location to which to extract the images, and browse to the desired location.
3. Click the **Extract** button to save the selected images.

Defect Database Viewer

This tool allows you to:

- Search the defect database
- Examine and export images of defects
- Export search results, and
- Create and export defect rate reports from the database.

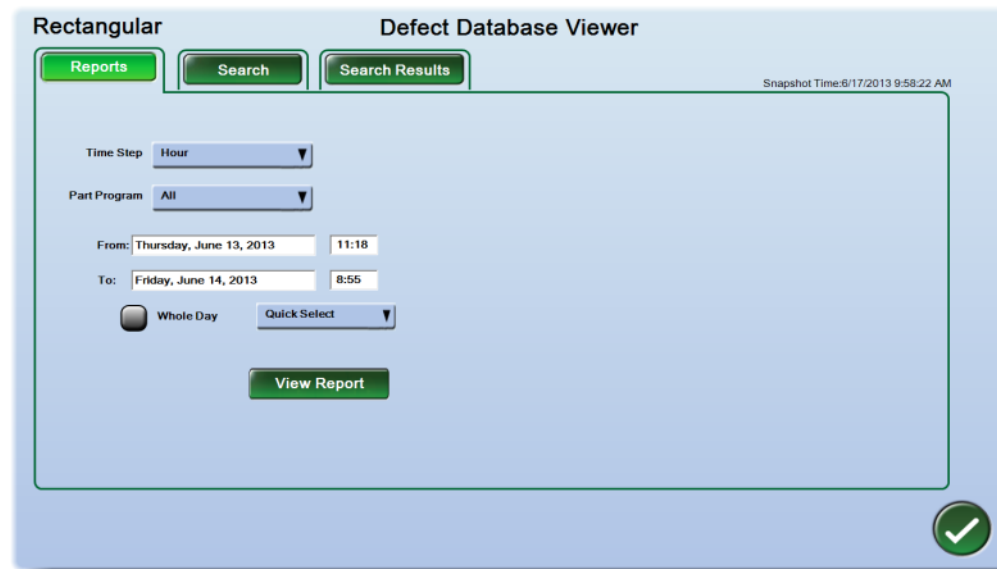
➤ To open the Defect Database Viewer:

From Lane Overview or Sensor Overview mode, click the Tools button  and select Reporting > Defect Database. The Defect Database Viewer is displayed.

In the upper right corner, a **Snapshot** time is displayed. This is the time when you entered this menu. If the lane is online, the Intellispec keeps saving defect data and images, but any data collected while this window is open will not be available for searching. You can close and re-open the menu for the most recent data.

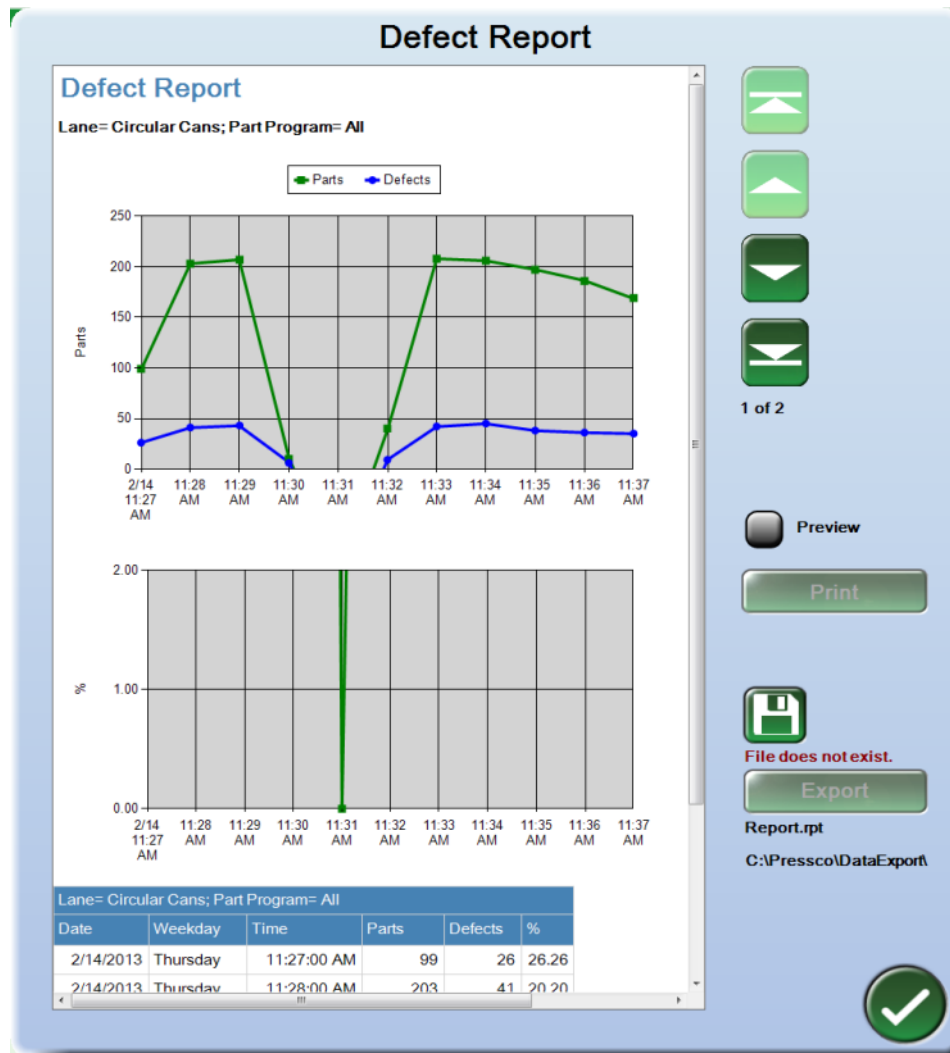
Reports

The Reports tab allows you to view reports by minute, hour, or day. You can choose from all or a single part program. A date/time range picker is provided to limit the report to a specific period. The Quick Select drop-down menu allows you to choose a time period of the last 24 hours, today's data (until the snapshot time), or all available data.



Click the **View Report** button to see the report from the selected criteria.

The example below shows a report with a time step of one minute. Use the buttons on the right side of the window to page through the reports.



Printing the report

Click the Preview button to enable the print function. A print preview is displayed. Use the **Print** button to print the report to the configured printer. (For more information, see **Setting up a printer** (on page 134))

Saving the report to file

If you have not yet saved any reports, then a message stating "File Does Not Exist" is displayed below the disk icon.

➤ To save a new report:

1. Click the disk icon . The Select File window is displayed.
2. If desired, use the disk icon in the Select File window to browse to a different location on the hard drive, or a USB drive. Browse to the desired location and click the OK button to continue.
3. Click the New button in the Select File menu to create a new report file name. The onscreen keyboard is displayed.
4. Type the report name, and click the OK button to continue. A file is created at C:\Pressco\DataExport (or another location that you selected in step 2) but no data is saved yet.
5. Click the **Export** button from the Defect Report window. The report is saved as a text (.txt) file and the file name contains lane, time interval, and time stamp information. You can use this data in your own spreadsheets or other databases to chart your plant's defect data.

➤ **To save new data to an existing report name:**

You can use an existing report name to save more data to a new file. The last used report name is displayed under the Export button.

Click the **Export** button to save new data. The report is saved as a new text (.txt) file. The file name contains lane, time interval, and time stamp information. You can use this data in your own spreadsheets or other databases to chart your plant's defect data.

Exported Report Example

The file below is an example of a text file exported from the Defect Database. The file is tab-separated, and you can import it into your preferred reporting software. The header describes the contents in detail. The header text and all number and time formatting depend on the currently chosen language.

File Edit Format View Help

Number of Comment Lines=23

Separator=Tab

#

Column Descriptions

Row

The running number of the record.

Weekday

The weekday of the start of the record's time interval.

Date

The date part of the start of the record's time interval.

Time

The time part of the start of the record's time interval.

Part Program

Each part program that was loaded and reported defects during the record's time interval.

Seconds

The start of the record's time interval, given in number of seconds since 1/1/2012 12:00:00 AM.

Parts

Number of parts processed during the record's time interval and while using the selected part program

Defects

Number of defects found in processed parts during the record's time interval and while using the selected part program

Defect %

The ratio of defects to parts, in percent.

#

Parameters

#p Lane

Lane 1

#p Part Program

All

#p From:

Friday, June 21, 2013 12:00:00 AM

#p To:

Saturday, June 22, 2013 12:00:00 AM

#p Snapshot Time

Friday, June 21, 2013 4:16:53 PM

#p Time Step

One Minute

#p Report Creation Time

Friday, June 21, 2013 4:17:31 PM

#

Row	Weekday	Date	Time	Part Program	Seconds	Parts	Defects	Defect %
1	"Friday"	6/21/2013	10:49:00	"FHCP3X Master"	46435740	1	1	100.00
2	"Friday"	6/21/2013	10:50:00	"FHCP3X Master"	46435800	44	4	9.09
3	"Friday"	6/21/2013	15:11:00	"FHCP3X Master"	46451460	170	23	13.53
4	"Friday"	6/21/2013	15:12:00	"FHCP3X Master"	46451520	428	63	14.72
5	"Friday"	6/21/2013	15:13:00	"FHCP3X Master"	46451580	141	23	16.31
6	"Friday"	6/21/2013	16:14:00	"FHCP3X Master"	46455240	32	6	18.75
7	"Friday"	6/21/2013	16:15:00	"FHCP3X 5.2 testing"	46455300	126	110	87.30
8	"Friday"	6/21/2013	16:15:00	"FHCP3X 5.2 testing - enhancements"	46455300	119	119	100.00
9	"Friday"	6/21/2013	16:16:00	"FHCP3X 5.2 testing - enhancements"	46455360	9	9	100.00
10	"Friday"	6/21/2013	16:16:00	"FHCP3X Master"	46455360	271	39	14.39

Search

The Search tab allows you to search the database by part program, sensor, inspection, inspection type, date, time, and machine part.

Lane 1

Defect Database Viewer

Reports

Search

Search Results

Snapshot Time: 6/21/2013 3:11:55 PM

Part Program

FHCP3X Master

Machine Parts

Sensor

All

FILLER VALVE

Use Filter

(3-10)

Inspection

All

CAPPER HEAD

All

Inspection Type

All

From

Thursday, June 20, 2013

15:12:11

To

Friday, June 21, 2013

15:12:11

Whole Day

Quick Select

Search

➤ **To start the search:**

1. Choose the desired filters from the available options.
2. Click the **Search** button. The search may take a few seconds depending on the search criterion and the size of the database. Afterwards, the Search Results tab is automatically selected.

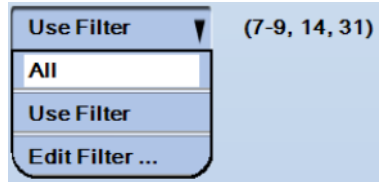
System Guide Series V (5.3) FHCP 3X EZ INTELLISPEC™ (71840 Rev. 02)
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Defect Database Tool (option) 333

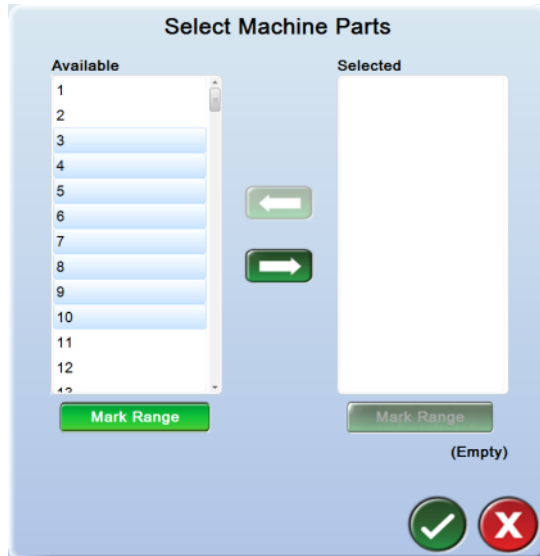
If your system uses machine parts, you have the option of searching for defects by machine part.

➤ **To search by Machine Part:**

1. Check the box next to "Machine Parts" to enable the search filters.
2. If you want to search by all machine parts, leave the drop-down menu at "All."



3. To select specific machine parts, select "Use Filter" in the drop-down menu. The Select Machine Parts screen is displayed.



4. Select a machine part number in the "Available" column. Click the right arrow button to move that machine part number to the "Selected" column.
 - a) To select additional machine parts, select each machine part, then click the right arrow button to move each into the "Selected" column.
 - b) To select contiguously listed machine parts, select the first desired machine part, then click the **Mark Range** button. Select the last listed machine part you want to search for. The system selects all machine parts between the first and last machine part you selected. Click the right arrow button to move all those machine parts to the "Selected" column.
5. To de-select any machine part, highlight it in the "Selected" column, then click the left arrow button to move it to the "Available" column. Use the Mark Range feature to select a group of contiguously listed machine parts.
6. All selected machine parts are listed below the "Selected" column. Click the OK button to save changes and exit. The selected machine parts are also displayed in the Defect Database Viewer Search screen.
7. In the Defect Database Viewer Search tab, an "Edit Filter" option is added to the drop-down menu. You can change the list of machine parts to search using the "Edit Filter" option.

Search Results

After performing a search, the Search Results tab is automatically selected. Defect data returned as search results is presented within the grid. Each row represents an inspection associated with a defective part based on the search criteria. Each column represents specific information about the inspection (for example, part program, inspection name, sensor, status, time stamp, etc.). Use the scroll bars to see data from a specific time period.

Lane 1 Defect Database Viewer

Reports Search **Search Results** Snapshot Time: 6/18/2013 3:31:12 PM

Time Stamp	Part Program	Sensor	Inspection	Inspection Type	FILLER VALVE	CAPPER HEAD
6/18/2013 10:41:23 AM	FHCP3X Master	Color 1	Cap Height Right	Distance	132	24
6/18/2013 10:41:23 AM	FHCP3X Master	Color 1	Cap Height Left	Distance	132	24
6/18/2013 10:41:23 AM	FHCP3X Master	Color 1	Cap Height Right	Distance	134	26
6/18/2013 10:41:24 AM	FHCP3X Master	Color 1	Cap Height Right	Distance	135	27
6/18/2013 10:41:24 AM	FHCP3X Master	Color 1	Cap Height Left	Distance	135	27
6/18/2013 10:41:25 AM	FHCP3X Master	Main	Cap Height Right	Distance	142	34
6/18/2013 10:41:27 AM	FHCP3X Master	Main	Fill Height	Fill Height - Segmented	16	16
6/18/2013 10:41:27 AM	FHCP3X Master	Main	Fill Height	Fill Height - Segmented	16	16
6/18/2013 10:41:27 AM	FHCP3X Master	Color 1	Cap Height Left	Distance	18	18
6/18/2013 10:41:27 AM	FHCP3X Master	Color 1	Cap Height Right	Distance	18	18
6/18/2013 10:41:27 AM	FHCP3X Master	Color 1	Tamperband	Feature Detect	18	18
6/18/2013 10:41:27 AM	FHCP3X Master	Color 1	Tamperband	Feature Detect	18	18
6/18/2013 10:41:30 AM	FHCP3X Master	Color 2	Cap Height Left	Distance	34	34
6/18/2013 10:41:30 AM	FHCP3X Master	Color 2	Cap Height Right	Distance	39	3
6/18/2013 10:41:30 AM	FHCP3X Master	Color 2	Cap Height Left	Distance	39	3
6/18/2013 10:41:31 AM	FHCP3X Master	Color 1	Cap Height Right	Distance	40	4

Details Export

Elapsed Time [seconds]: 0.428

Data Zoom

Scrolling through the data

Click the scroll bar to the immediate right of the grid to scroll to a specific record. Labels appear indicating the time stamps that will be scrolled to when moving the button next to the label. Note that the labels are spaced by records not by time.

Lane 1 Defect Database Viewer

Reports Search **Search Results** Snapshot Time: 6/18/2013 3:54:54 PM

Time Stamp	Part Program	Sensor	Inspection	Inspection Type	FILLER VALVE	CAPPER HEAD
6/18/2013 11:29:26 AM	FHCP3X Master	Color 2	Cap Height Left	Distance	70	34
6/18/2013 11:29:26 AM	FHCP3X Master	Color 2	Tamperband	Feature Detect	70	34
6/18/2013 11:29:26 AM	FHCP3X Master	Color 2	Tamperband	Feature Detect	70	34
6/18/2013 11:29:26 AM	FHCP3X Master	Color 1	Cap Height Left	Distance	73	1
6/18/2013 11:29:26 AM	FHCP3X Master	Color 1	Cap Height Right	Distance	73	1
6/18/2013 11:29:26 AM	FHCP3X Master	Color 1	Tamperband	Feature Detect	73	1
6/18/2013 11:29:26 AM	FHCP3X Master	Color 1	Cap Height Right	Distance	95	23
6/18/2013 11:29:29 AM	FHCP3X Master	Color 1	Cap Height Left	Distance	95	23
6/18/2013 11:29:29 AM	FHCP3X Master	Main	Fill Height	Fill Height - Segmented	96	24
6/18/2013 11:29:29 AM	FHCP3X Master	Main	Fill Height	Fill Height - Segmented	96	24
6/18/2013 11:29:29 AM	FHCP3X Master	Color 2	Cap Height Right	Distance	97	25
6/18/2013 11:29:29 AM	FHCP3X Master	Color 2	Cap Height Left	Distance	97	25
6/18/2013 11:29:30 AM	FHCP3X Master	Color 2	Cap Height Right	Distance	102	30
6/18/2013 11:29:30 AM	FHCP3X Master	Color 2	Cap Height Left	Distance	102	30
6/18/2013 11:29:31 AM	FHCP3X Master	Color 1	Cap Height Right	Distance	107	35

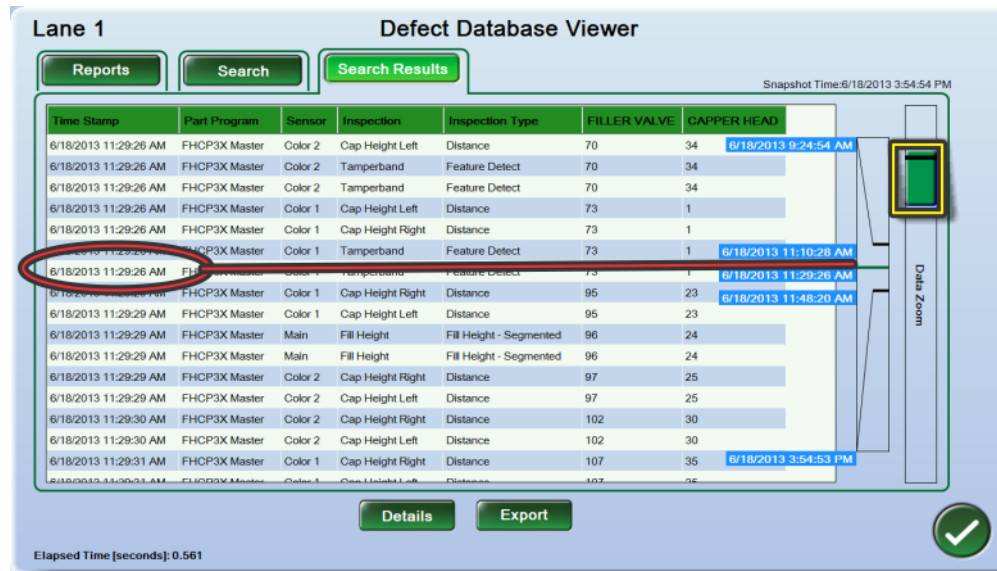
Details Export

Elapsed Time [seconds]: 0.561

Data Zoom

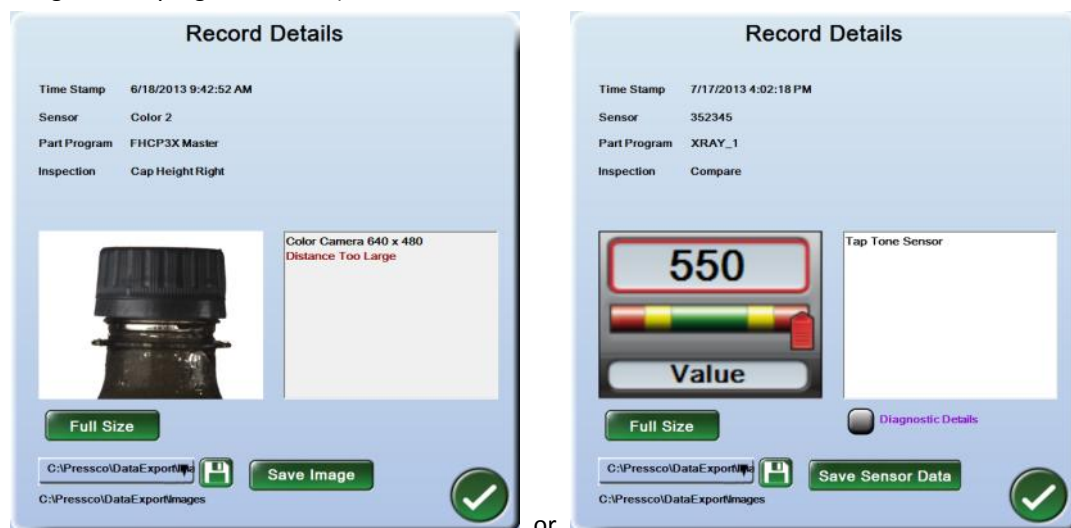
6/18/2013 9:24:54 AM
6/18/2013 10:47:11 AM
6/18/2013 11:51:28 AM
6/18/2013 12:55:41 PM
6/18/2013 3:54:53 PM

For larger data sets (more than about 160 records) a second scrollbar “Data Zoom” appears to the right of the first scroll bar. This allows narrowing in on the time of interest. While moving the Data Zoom scrollbar two thick lines appear in the first scroll bar, which indicate the time span to which scrolling will be restricted. Labels indicate the times of the first and last record of the search result; the first and last record of the current scroll restriction selected by Data Zoom and of one currently displayed record. Use the first scroll bar to get closer to the desired time and repeat the process as needed.



Viewing result details

Click the **Details** button for a highlighted item to view the Record Details. This window displays the associated image and inspection information. It also allows you to export the image. The **Full Size** button brings up a viewer showing the unscaled image in full resolution (screen resolution may restrict this for images of very high resolution).

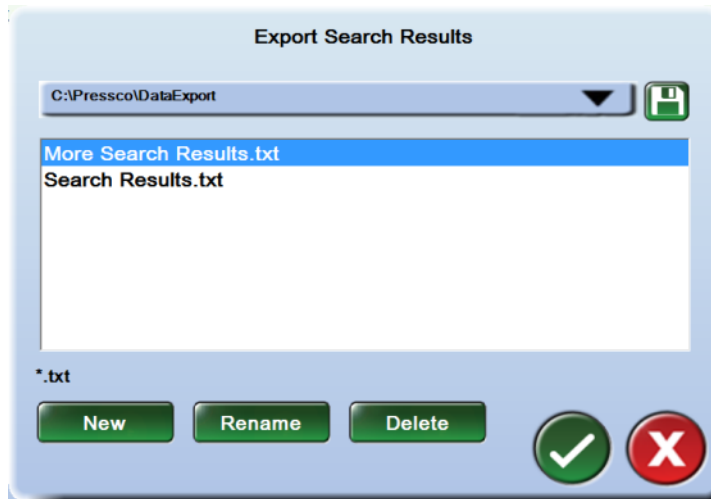


❖ *Note: The details viewer will not always show a specific text such as “Distance too Large.” This depends on the type of inspection and the specific type of defect.*

Exporting the results

➤ To export the results:

1. Click the **Export** button at the bottom of the Defect Database Viewer Search Results screen. The Export Search Results window is displayed.



2. If desired, use the disk icon to browse to a different location on the hard drive or a USB drive. Browse to the desired location and click the OK button to continue.
3. Select an existing file from the displayed box, or click the **New** button to create a new report file name.
4. (If creating a new file) In the on-screen keyboard type a file name, and click the OK button to continue. A file is created at the location displayed in the drop-down but no data is saved yet. Highlight the new file as in step 3.
5. Click the OK button. The search results are saved as a text (.txt) file. You can use this data in your own spreadsheets or other databases to chart your plant's defect data. **Exported Search Results Example** (on page 338).

Exported Search Results Example

The file below is an example of a text file exported from the Defect Database after using the Search feature. The file is tab-separated, and you can import it into your preferred reporting software. The header describes the contents in detail. The header text and all number and time formatting depend on the currently chosen language.

Results June 24 04.txt - Microsoft Excel						
	A	B	C	D	E	F
1	# Number of Comment Lines=21					
2	# Separator=Tab					
3	#					
4	# Column Descriptions					
5	# Time Stamp	The time at which the part was inspected.				
6	# Part Program	The part program that was running while the part was inspected.				
7	# Sensor	The sensor for which the defect was recorded.				
8	# Inspection	The name of the inspection that failed.				
9	# Inspection Type	The type of the inspection that failed.				
10	# FILLER VALVE	Machine Part 1				
11	# CAPPER HEAD	Machine Part 2				
12	#					
13	# Parameters					
14	#p From:	Thursday, June 13, 2013 11:18:36 AM				
15	#p To:	Monday, June 24, 2013 12:00:56 PM				
16	#p Snapshot Time	Monday, June 24, 2013 1:53:13 PM				
17	#p Lane	Lane 1				
18	#p Part Programs	FHCP3X Master				
19	#p Inspections	All				
20	#p Inspection Types	All				
21	#					
22	Time Stamp	Part Program	Sensor	Inspection	Inspection Type	FILLER VALVE
23	6/17/2013 13:22	FHCP3X Master	Color 1	Tamperband	Feature Detect	84
24	6/17/2013 13:22	FHCP3X Master	Color 1	Tamperband	Feature Detect	84
25	6/17/2013 13:22	FHCP3X Master	Color 1	Cap Height Left	Distance	84
26	6/17/2013 13:22	FHCP3X Master	Color 1	Cap Height Right	Distance	84
27	6/17/2013 13:22	FHCP3X Master	Color 2	Cap Height Left	Distance	97
28	6/17/2013 13:22	FHCP3X Master	Color 2	Cap Height Right	Distance	97
29	6/17/2013 13:22	FHCP3X Master	Color 2	Cap Height Left	Distance	102
30	6/17/2013 13:22	FHCP3X Master	Color 2	Cap Height Right	Distance	102
31	6/17/2013 13:22	FHCP3X Master	Color 1	Cap Height Left	Distance	106
32	6/17/2013 13:22	FHCP3X Master	Color 1	Cap Height Right	Distance	106
33	6/17/2013 13:22	FHCP3X Master	Main	Cap Height Right	Distance	108
34	6/17/2013 13:22	FHCP3X Master	Color 1	Cap Height Left	Distance	118
35	6/17/2013 13:22	FHCP3X Master	Color 1	Cap Height Right	Distance	118
36	6/17/2013 13:22	FHCP3X Master	Main	Fill Height	Fill Height - Segmented	126
37	6/17/2013 13:22	FHCP3X Master	Main	Fill Height	Fill Height - Segmented	126
38	6/17/2013 13:22	FHCP3X Master	Color 1	Cap Reg	Finish Location	1
39	6/17/2013 13:22	FHCP3X Master	Main	Fill Height	Fill Height - Segmented	10
40	6/17/2013 13:22	FHCP3X Master	Main	Fill Height	Fill Height - Segmented	10
41	6/17/2013 13:22	FHCP3X Master	Color 1	Cap Height Left	Distance	11
42	6/17/2013 13:22	FHCP3X Master	Color 1	Cap Height Right	Distance	11

Abnormal Results

Sometimes you may see results in the database that do not show defect data. These are rare situations, but can be caused by high part rates, high defect rates, or a heavy processor load on the system. You may also have less space for images in the defect data file than the total number of defect database records over all lanes, so images in the defect data file may already have been overwritten for the oldest records in the defect database.

Stale Data

This happens when the real time processor was busy for too long while the image was pending a write to the hard drive. This condition may happen when there is a high defect rate and a high load on the system. In this case the record exists in the database but the image is not valid because it was never written in the first place.



Recycled Data

This happens for the oldest records in the defect database when their images in the defect data file have been overwritten.



Spilled Record

This happens when the defect record (not image) cannot be written to the hard drive. This may occur if the system is too busy writing images to the hard drive. The screen will indicate how many defect records were spilled during which time interval.

Chapter 19

About OPC

OPC (OLE {Object Linking and Embedding} for Process Control) is a data communication standard developed by leading manufacturing equipment and software vendors, in conjunction with Microsoft. Its purpose is to promote interoperability between a wide variety of data sources and the consumers of that data, eliminating the need for diverse and incompatible “drivers” for each separate device or program.

The OPC specifications are developed and administered by the OPC Foundation:

<http://www.OPCFoundation.org> **<http://www.OPCFoundation.org>**

Pressco has been an OPC Foundation Member since Spring of 2004, and participated in their Interoperability Workshop of April 2005.

The Intellispec OPC Server

The Pressco OPC Server for Intellispec systems supports the OPC Foundation “Data Access” specification. It is compatible with all versions of the specification in widespread use today (1.0a, 2.05 and 3.00). The OPC Server does not support other OPC specifications (including Alarms & Events, Historical Data or XML Data or Unified Architecture).

The Intellispec OPC Server is an optional feature - **contact** (see “**How to Contact Pressco**” on page 357) your Pressco sales manager for details.

Sampling rate

Sampling of data is based on an ‘update rate,’ which is specific to a group of OPC data items. There may be several groups of items, each having an update rate appropriate for the items in that group. The maximum update rate supported by the OPC Server is 100 milliseconds (i.e. 10 updates / second); this may be less depending on the system configuration, part programs and part rates. Note that OPC does NOT support event-driven data updates; example, every 10,000 parts inspected or every rotation of a machine part.

Defect statistics

The data items available from the Intellispec OPC Server include most inspection defect statistics produced by the system. In particular, the following five items will be found:

- **TotalNumberInspected:** the number of parts inspected since last reset.
- **TotalNumberDefects:** the number of defective parts identified since last reset.
- **TotalPercentDefects:** the defective part rate expressed as a percentage of total number inspected, since statistics were last reset.
- **RecentNumberDefects:** the number of defective parts over the last “N” number of parts inspected, where “N” is a configurable system parameter.
- **RecentPercentDefects:** the defective part rate expressed as a percentage of the last “N” parts inspected, where “N” is a configurable system parameter.

These data items appear repeatedly within a hierarchical (“multi-level”) structuring of the data items and represent a variety of different subsets of the parts inspected. More specifically, they are maintained for every lane in the system (top level), every camera or sensor within each lane (second level) and every individual inspection within each camera (third level). Some values are also available for correlated machine parts when the system is so configured.

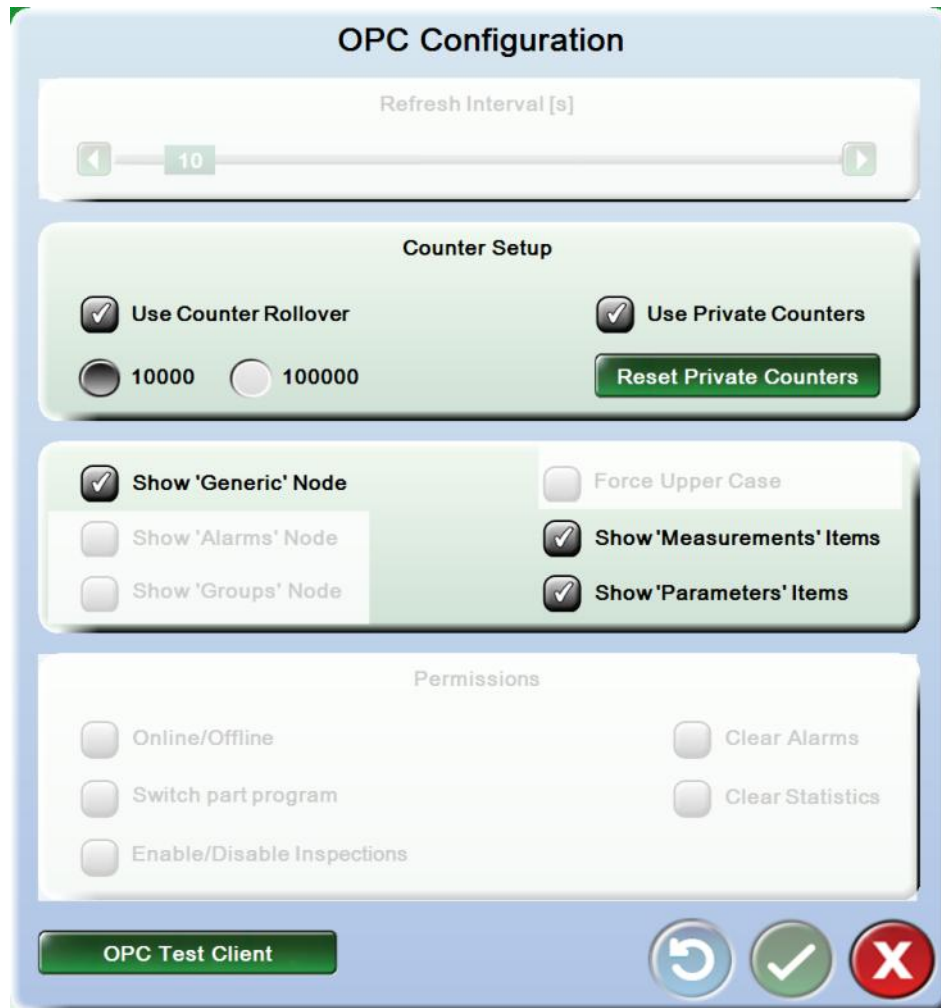
The exact names of the levels containing these data items are automatically derived from the names given to the lanes, cameras and inspections programmed into the Intellispec system. This makes “browsing the tree” of available data items extremely intuitive and eliminates the tedious and time-consuming process of OPC server configuration.

OPC Configuration

The OPC Configuration screen provides access and settings to the OPC server.

To access OPC Configuration:

1. Log in.
2. Click the  button.
3. Click the Tools button  to see the Tools menu > select OPC Configuration. The OPC Configuration menu opens. Please see the information about each section below.



Refresh Interval

Not used.

Counter Setup

See **Counter Rollover** (on page 352) or **Using the OPC Private Counters option** (on page 349).

Options

"Show Alarms Node" and "Show Groups Node" are not used. "Force Upper Case" is only used for compatibility with a specific OPC client - in most cases it is not used.

Show 'Generic' Mode

Use this to view items when inspection names or other parameters have been re-named using non-ASCII characters. Note that everything is named generically, including sensors, lanes, and inspections.

❖ *Tip: This can be used by Pressco Service Engineers to view data that is not in English.*

Show 'Measurements' Items

See **Measurement data items** (on page 347).

Show 'Parameters' Items

See **Parameter data items** (on page 348).

Permissions

Reserved for Pressco Technicians only.

OPC Test Client button

Click this button to open **The Intellispec OPC test client** (on page 343).

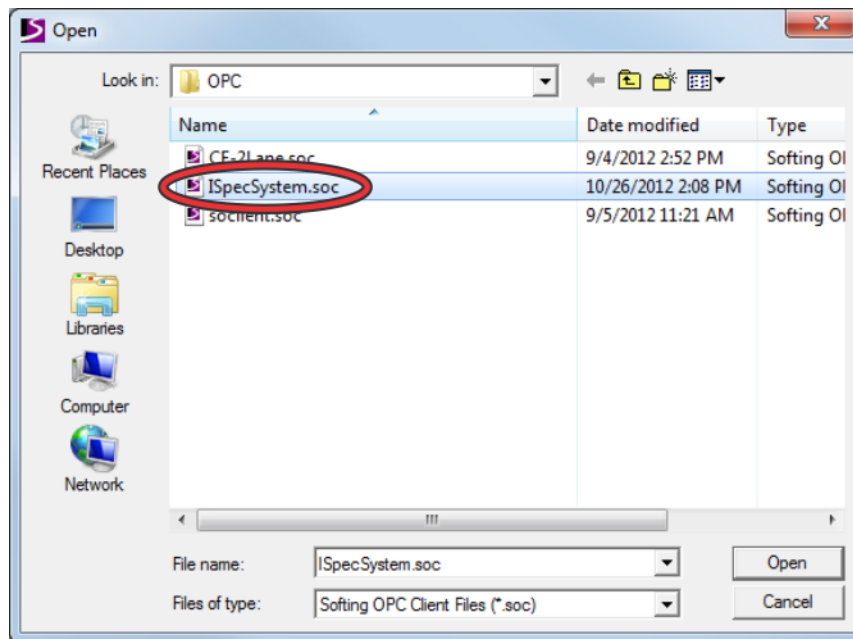
The Intellispec OPC test client

USER LEVEL: ADMINISTRATOR

The Intellispec provides test client software to make sure that the OPC server is properly working. It is not a fully functional software client - it is only intended to be used to verify the functionality of the server. This is only available if your system has been configured for OPC.

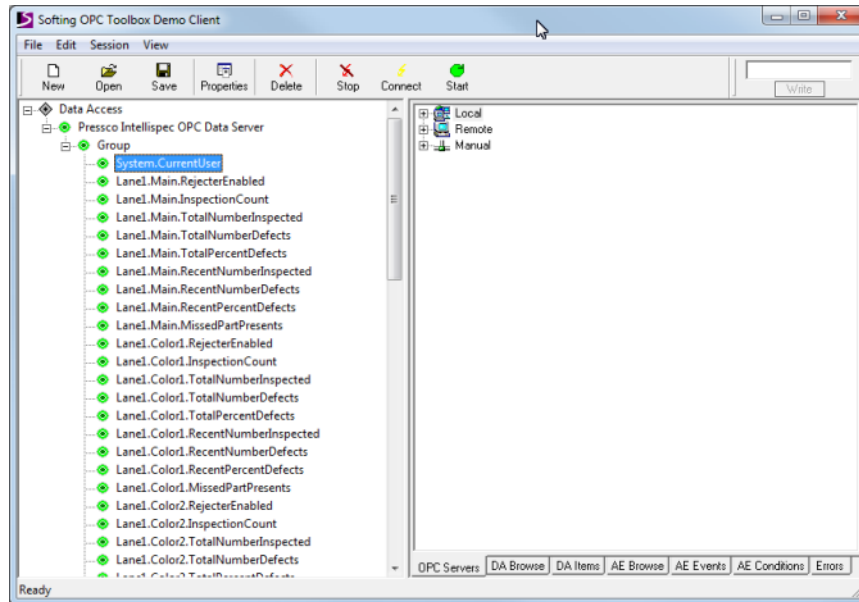
➤ To use the OPC test client:

1. Log in.
2. Click the  button.
3. Click the Tools button  to see the Tools menu > select OPC Configuration. The OPC Configuration menu opens.
4. Click the **OPC Test Client** button. The Softing OPC Toolbox Demo Client opens.
5. Click Open on the program's toolbar. The File Open dialog box is displayed.

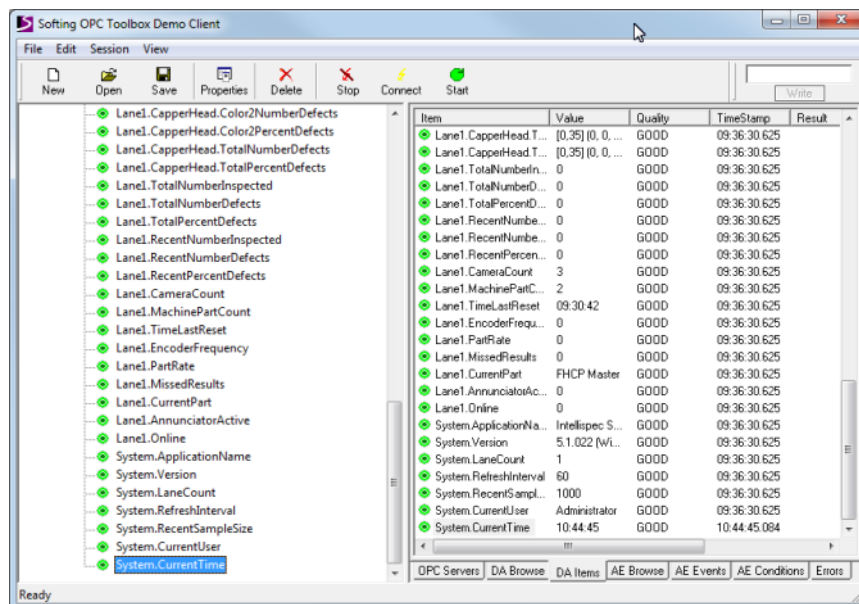


6. Click the ISpecSystem.soc file >> click Open.

- The left pane of the demo client window should now display 'Data Access' at the very top, with 'Pressco Intellispec OPC Data Server' below that, a group below that, and a list of data items (all beginning with Lane.) below the group. Each of these items (except 'Data Access') should have a solid green circle containing a black dot to the left of it.

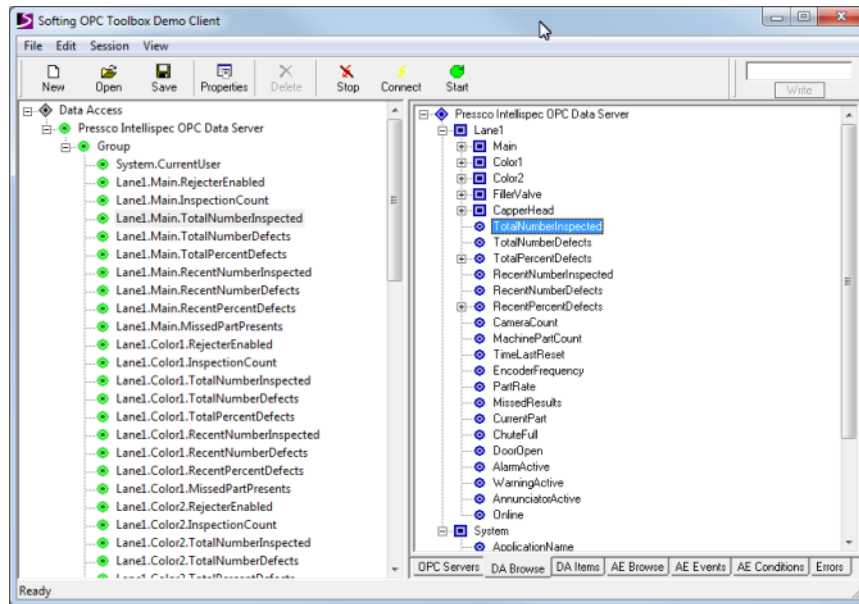


7. Click the DA Items tab at the bottom of the window. Note that there are columns for Item, Value, Quality, and Time Stamp for each of the items in the left window frame.



8. Verify that all data items have a solid green circle next to them.
9. Verify that all data items have GOOD status in the Quality column.
10. Verify that data item "System.Current.Time" is being updated once per second.
11. In the left window frame, select Pressco Intellispec OPC Data Server.
12. At the bottom of the right window frame, select the DA Browse tab.

13. At the top of the right window frame, click the '+' to the left of the blue diamond. There should be one blue square for each lane configured on the Intellispec, plus a blue square named System. Each blue square is a container for whatever data items are available for each group, and additional nested containers if appropriate.



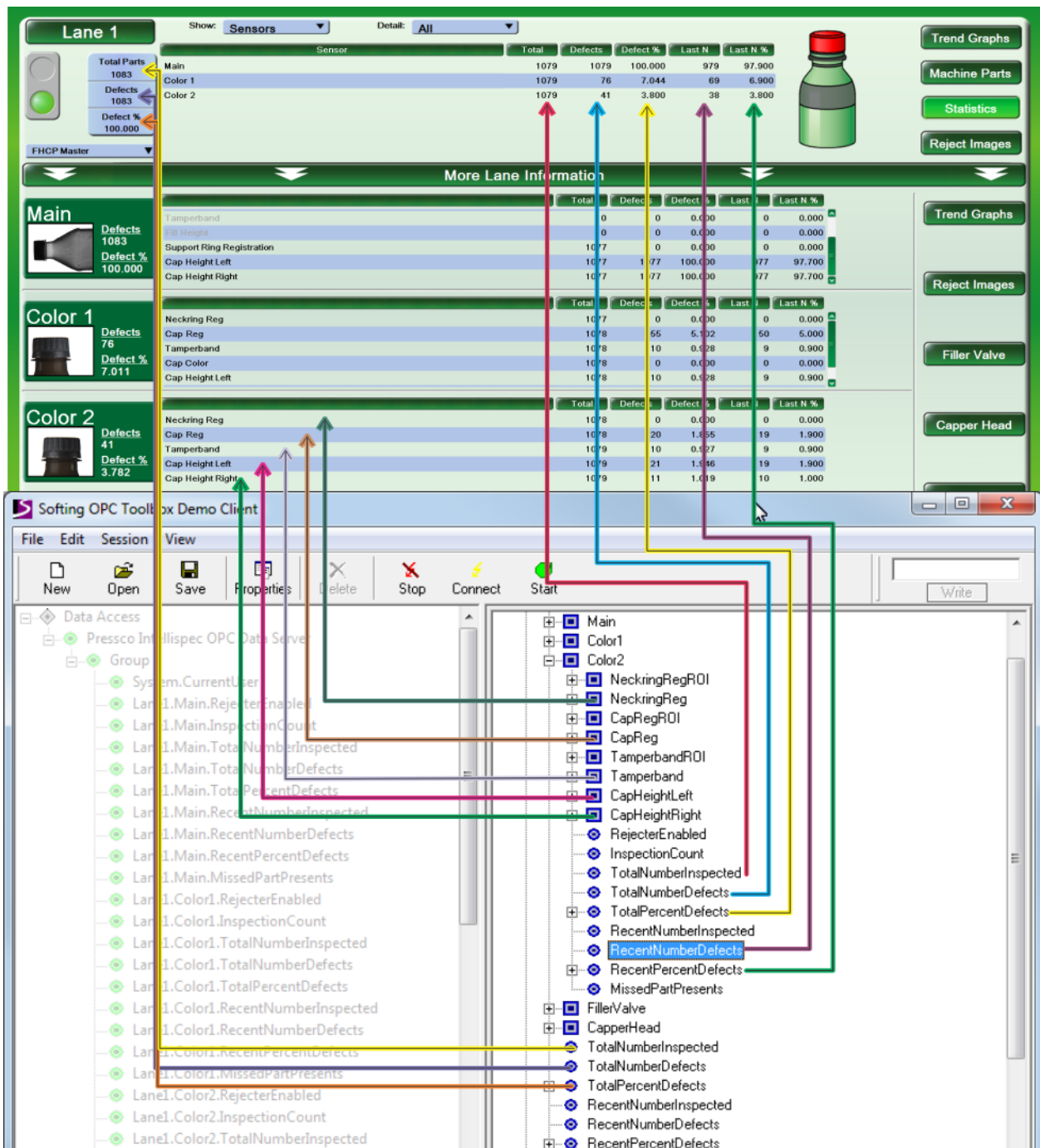
Interpreting the Data

The data items in the OPC test client correspond to the statistics on the Intellispec screen.

➤ **To see the individual data items:**

1. Click the 'DA Browse' tab on the lower right screen.
2. Click on the '+' next to the blue square for a lane. This will display a nested blue square for each camera and machine part configured on that lane, plus several more blue circles for the data items summarizing that lane, including: TotalNumberInspected, TotalNumberDefects, TotalPercentDefects and TimeLastReset.

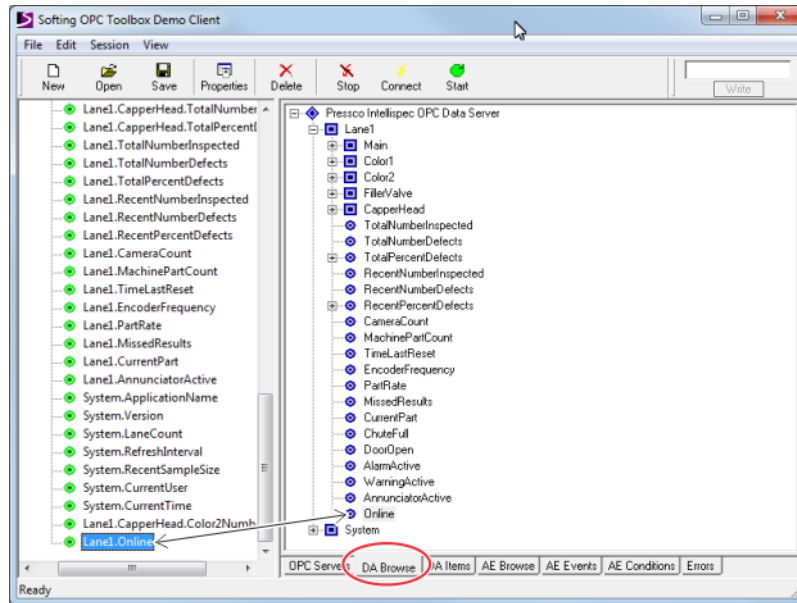
- Click on the '+' next to the blue square for a camera. This will display a nested blue square for each inspection currently programmed for that camera, plus several blue circles for the data items summarizing that camera. These items correspond to the statistics on the screen, as shown below.



- Click on the '+' next to the blue square for an inspection (example, Tamperband). This will display several more blue circles for the data items summarizing that inspection, including: Enabled, TotalNumberDefects, TotalPercentDefects, RecentNumberDefects and RecentPercentDefects.
- Click the '+' next to the blue square for a machine part (if any) (example, CopperHead). This will display a blue circle for each camera in the lane, named '<CameraName>NumberDefects', '<CameraName>PercentDefects,' plus 'TotalNumberDefects' and 'TotalPercentDefects.' Note that each of these data items is an array containing defect counts for the machine part correlation feature.

Adding data items to those being monitored

Double-click a data item (blue circle) in the 'DA Browse' tab to add that data item to the list of those which are being monitored in the 'DA Items' tab.



Measurement data items

Additional inspection data is presented for some inspections.

To see measurement data items, check the **Show 'Measurements' Items** box in the **OPC Configuration** (on page 342) screen.

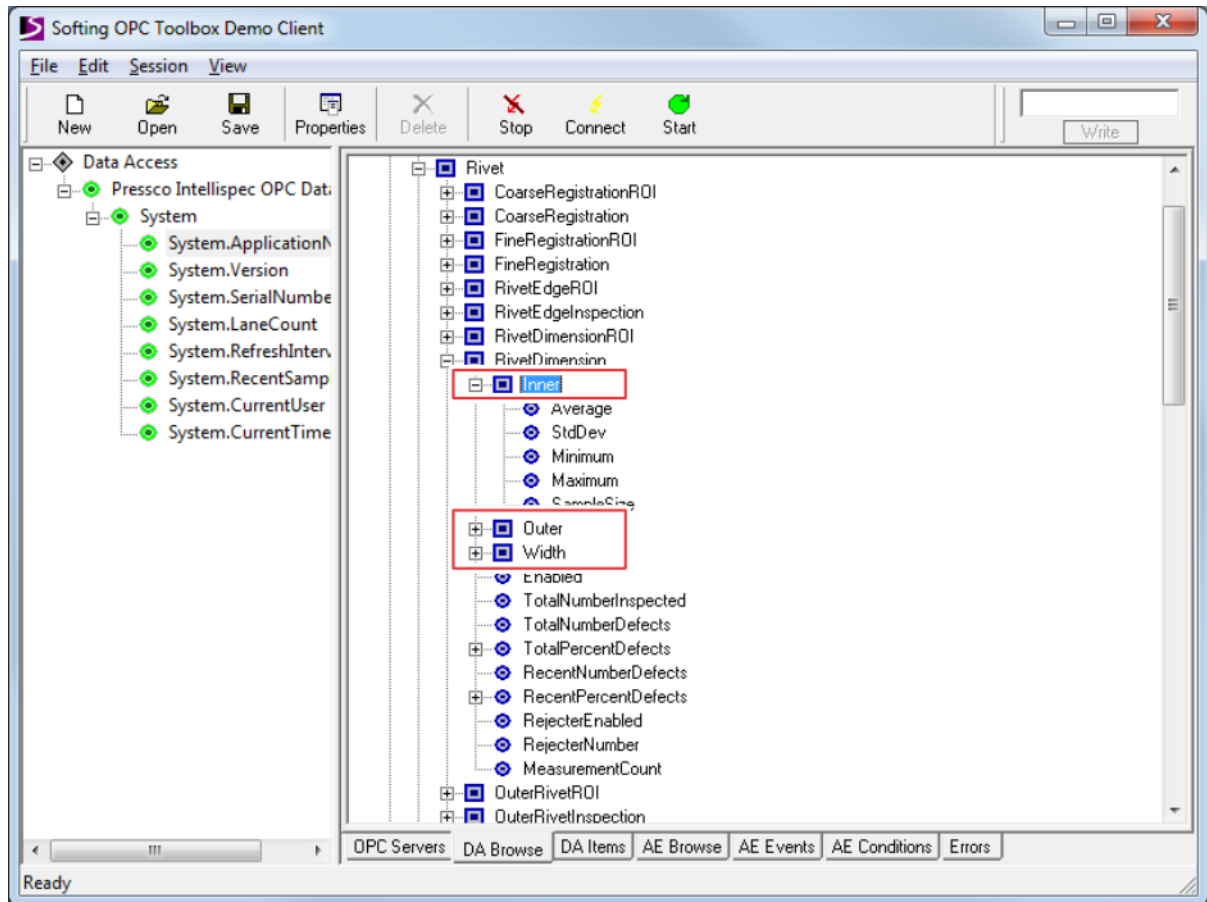
A number of inspections include data items providing measurements, including:

- **Measurement inspection:** the measurements "Inner," "Outer," and "Width" are available (see note 1 below)
- **Distance inspection:** the measurement "Distance" is available
- **Angle inspection:** the measurement "Angle" is available
- **Mass inspection:** the measurement "Value" is available (see note 2 below)

❖ *Note 1: some of the measurements for the "Measurement" inspection may not be active, depending on the specific configuration of the inspection.*

❖ *Note 2: if machine part correlation is available on the system, the single "Value" measurement will instead be named "AllCavities" and the per-cavity measurements "Cavity1," "Cavity2," "Cavity3," ... "Cavity(N)" where (N) is the total number of cavities configured will also be available.*

For each available measurement, the data items “Average,” “StdDev,” “Minimum,” and “Maximum” are presented, based upon a running sample of the last 100 good parts inspected while online. The following example shows the items for a Measurement inspection.

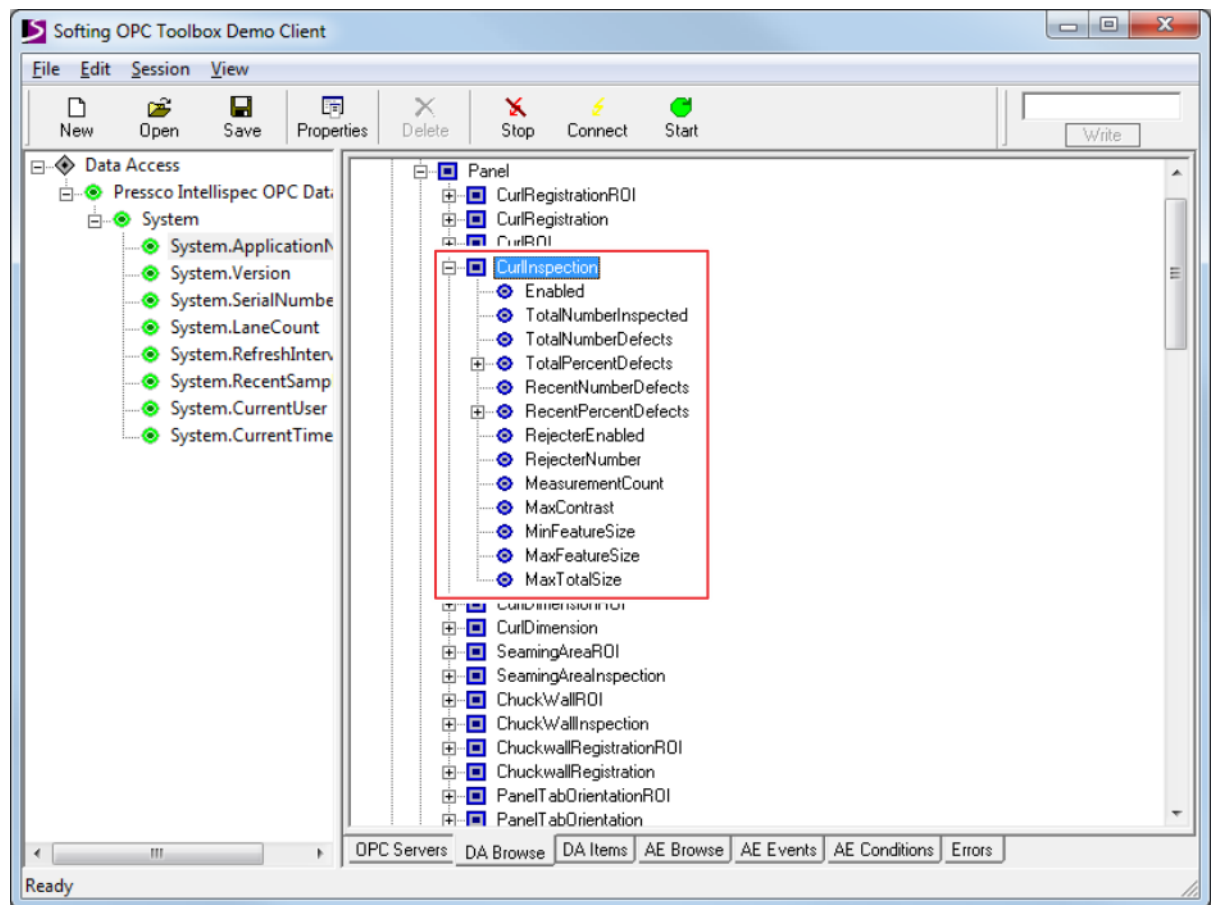


Parameter data items

Additional inspection data is presented for some inspections.

To see parameter data items, check the **Show 'Parameters' Items** box in the **OPC Configuration** (on page 342) screen.

Contrast inspection includes parameter values (user settings affecting the performance of the inspection), including: “MaxContrast,” “MinFeatureSize,” “MaxFeatureSize,” and “MaxTotalSize” are presented. An example of a Contrast inspection is shown below.



Checking for Errors

At the bottom of the right window frame, click the Errors tab. Verify that no errors have been reported.

Exiting the Test Client

Click the ‘X’ in the upper right corner of the Softing OPC Toolbox Demo Client window to close the program. If you are prompted to save changes (probably due to changing the list of data items being monitored), click No.

Using the OPC Private Counters option

A separate set of OPC counters is available for long-term statistics tracking. When this feature is **enabled**, OPC counters are unaffected when the system statistics are reset either manually or automatically. When this feature is **not enabled**, the OPC counters are reset the same as the system statistics you see on the Intellispec screen.

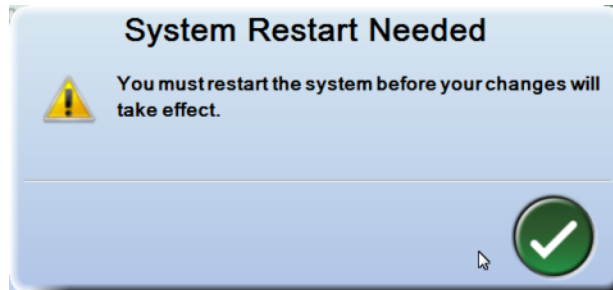
When the Private Counters option is enabled, the OPC Counters will only reset when:

- A new part program is loaded, or:
- You use the Reset Private Counters button

➤ To enable the OPC Private Counters:

1. Log in as Administrator.
2. Click the  button.

3. Click the Tools button  to see the Tools menu > select OPC Configuration from the menu. The **OPC Configuration** (on page 342) menu is displayed.
4. Check the Use Private Counters box.
5. Click the OK button to save changes and exit.
6. The Intellispec must re-start for changes to take effect. Click the OK button (check mark) to acknowledge the message.

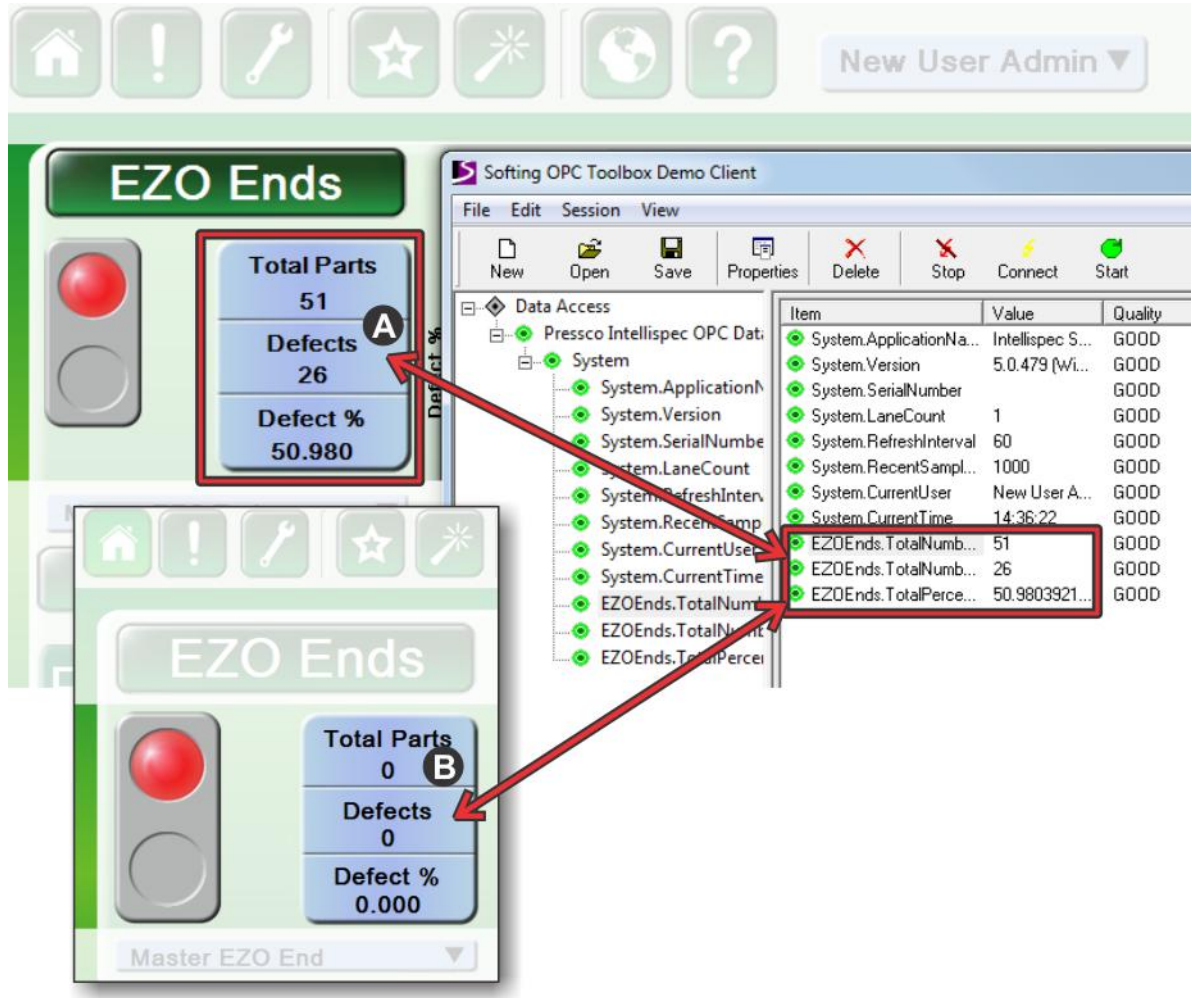


7. Click the Tools button  to see the Tools menu > select Exit System from the menu.
8. Select "Shut Down Intellispec and Restart Computer" from the drop-down menu. The Intellispec system shuts down and restarts. The Private Counters are enabled.

To see the difference between the statistics on the Intellispec screen and the OPC Private Counters, use **The Intellispec OPC test client** (on page 343).

To view only items such as parts inspected, number of defects, etc., see how to **View only defect data** (on page 352).

The example below shows what happens when Private Counters is used.



A	Normal condition. Intellispec and OPC statistics are the same.
B	Private counters enabled. The Intellispec statistics are reset, but the OPC statistics do not get reset.

Reset Private Counters

When you use the OPC Private Counters option, you may need to manually reset the OPC data.

➤ To reset the OPC Private Counters:

1. Take the Intellispec system offline.
2. Log in.
3. Click the  button.
4. Click the Tools button  to see the Tools menu > select OPC Configuration. The OPC Configuration menu opens.
5. Click the **Reset Private Counters** button. A confirmation box appears to notify you that the counters will be reset on the OPC server.
6. Click OK. The OPC counters are reset.

Counter Rollover

Counter Rollover is an advanced option for the OPC server. It allows the OPC server to behave like PLC counters if the digits are limited. For example, you may use a PLC where the data rolls over after 9,999. In this example, set the Counter Rollover value to 10,000. This would make the OPC data roll over after 9,999 to be compatible with your PLC.

❖ *Note: if your plant is **not** limited in the number of digits for your OPC counter, make sure the Use Counter Rollover box is un-checked.*

If you have a PLC that has limited digits, set the Counter Rollover to a number equal to one greater than your PLC's highest number.

- If your PLC rolls over after 9,999, set Counter Rollover to 10,000
- If your PLC rolls over after 99,999, set Counter Rollover to 100,000

➤ To set Counter Rollover:

1. Take the Intellispec system offline.
2. Log in.
3. Click the  button.
4. Click the Tools button  to see the Tools menu > select OPC Configuration. The **OPC Configuration** (on page 342) menu opens.
5. Check the **Use Counter Rollover** button.
6. Click either the 10,000 or 100,000 button.
7. Click the OK button to save changes and exit. The Intellispec needs to re-start for the changes to take effect.
8. Click the  button.
9. Click the Tools button  to see the Tools menu > select Exit System.
10. Select Shut Down Intellispec and Restart the Computer from the drop-down menu. The Intellispec software shuts down and restarts.
11. Log in after the software restarts, and continue operation.

View only defect data

To see the effects of Private Counters, set up the OPC test client to show only the defect items such as parts inspected and number of defects.

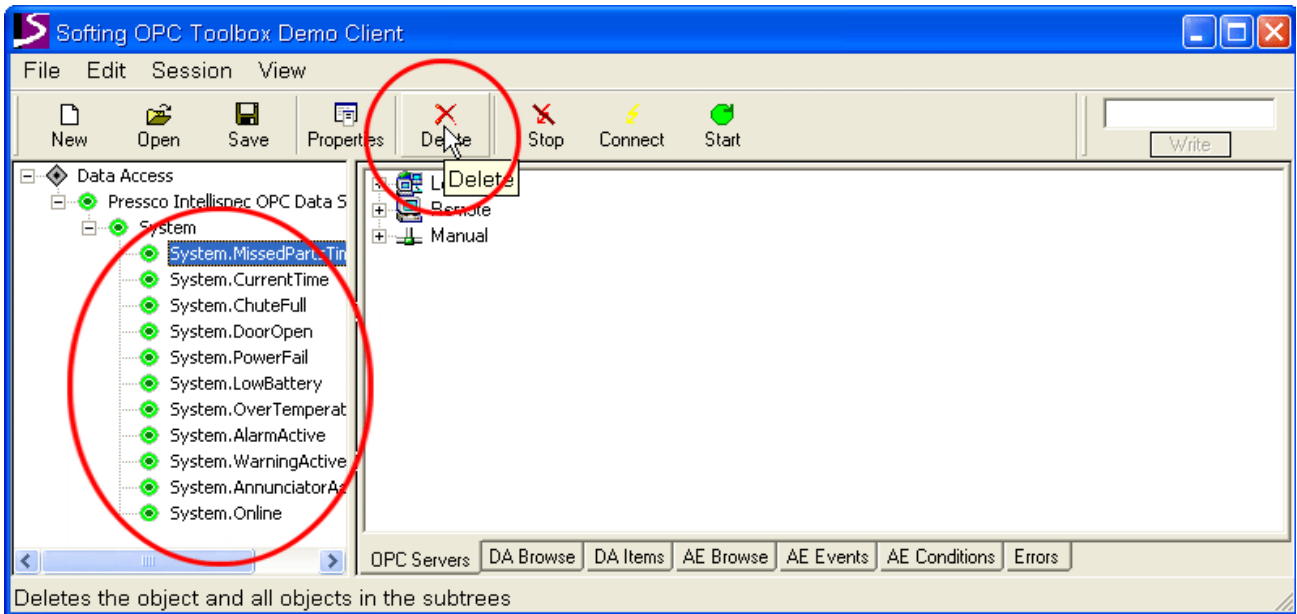
Open the **The Intellispec OPC test client** (on page 343).

Next, set up the data items to display only defect information.

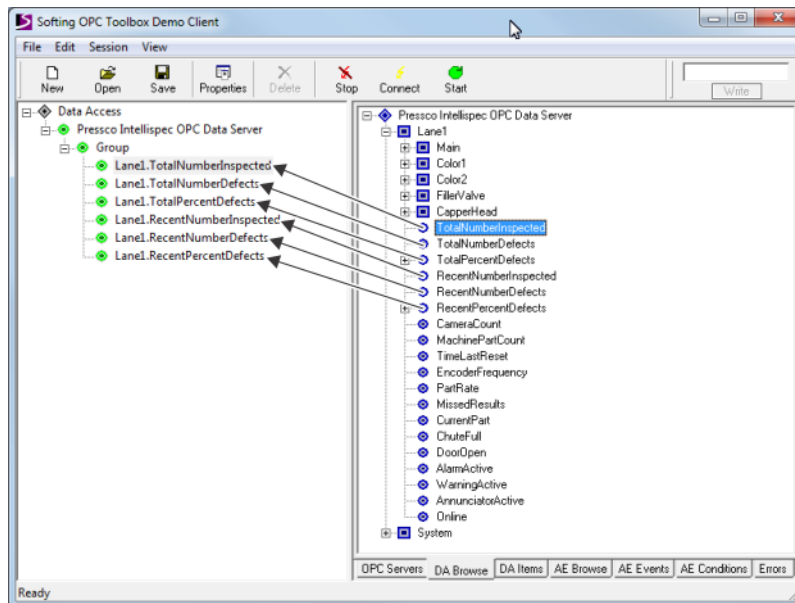
➤ To see the defect items:

1. Remove the items that you do **not** want to see by clicking each item, then clicking the Delete button at the top of the menu.

❖ *Note: do not click the "System" item in the left pane. If you remove that item, then none of the statistics items will be available to view.*



2. Click the DA Browse tab at the bottom of the window. The "Pressco Intellispec OPC Data Server" item is displayed in the right pane.
3. Click the '+' next to the Data Server item to expand the tree.
4. Click the '+' next to a Lane name to expand the Lane tree.
5. Choose the items from the right pane that you **do** want to view by double-clicking each item.



6. Continue choosing all the items you want to see. Expand the individual camera trees and choose the defect statistics for each camera, if desired.
7. Once you have all the items you want to see in the left pane, click the DA Items tab at the bottom of the window. Your selected items appear in the right pane.

Next, test the Private Counters: Put the Intellispec system online. Observe the defect data on screen and in the OPC test client. Notice that the numbers are essentially the same. Due to different update rates, the numbers may be slightly off at times.

List of Data Items

The following list contains the common data item IDs that are available on the Intellispec OPC Server. Note that the names of the data items depend on your system configuration.

TotalNumberInspected

Total number of parts inspected since statistics were last reset. Present for each lane, camera and inspection.

TotalNumberDefects

Total number of defective parts found since statistics were last reset. Present for each lane, camera and inspection, and also for each machine part when machine part correlation is in effect (in which case this item is a one-dimensional array with each array element representing the defect count for one occurrence of the machine part).

TotalPercentDefects

Percentage of defective parts per the total number of parts inspected since statistics were last reset. Present for each lane, camera and inspection, and also for each machine part when machine part correlation is in effect (in which case this item is a one-dimensional array with each array element representing the defect percentage for one occurrence of the machine part).

RecentNumberDefects

The number of defective parts found in the last “N” number of parts inspected, where “N” is a configurable parameter. Present for each lane, camera and inspection.

RecentPercentDefects

Percentage of defective parts found per the last “N” number of parts inspected, where “N” is a configurable parameter. Present for each lane, camera and inspection.

RecentSampleSize

Gives the value of the configurable parameter “N” mentioned in the preceding “Recent...” data items. Present for System.

Enabled

True if the inspection is currently enabled or False if it is disabled. Present for each inspection.

RejecterEnabled

True if the rejecter for this camera or inspection is currently enabled or False if it is disabled. Present for each camera and inspection.

RejecterNumber

Gives the rejecter number assigned to this camera in lanes configured to have multiple rejecters. Present for each camera.

TimeLastReset

Gives the date and time statistics were last reset to zero. Present for each lane.

CurrentPart

Name of the currently selected part program. Present for each lane.

ChuteFull

True if the defective part container for this lane is currently full or False if it is not. Present for each lane.

MissedResults

The number of parts that reached the reject point on the conveyor before the system was able to determine if the part was defective or not. Present for each lane.

PartRate

The number of parts to be inspected being encountered per minute. Present for each lane.

EncoderFrequency

The number of encoder pulses being produced per second (which is proportional to the conveyor speed). Present for each lane.

AlarmActive

True if the red light on the light tree is currently illuminated or False if it is not. Present for each lane.

WarningActive

True if the yellow light on the light tree is currently illuminated or False if it is not. Present for each lane.

AnnunciatorActive

True if the horn or buzzer on the light tree is currently sounding or False if it is not. Present for each lane.

Online

True if parts are currently being inspected with defective parts being rejected or False if they are not. Present for each lane.

MissedPartPresents

Total number of parts for which a usable image was not received from the camera. Present for each camera.

Average

Arithmetic mean of measurement. Present for each inspection measurement.

StdDev

Standard deviation of measurement. Present for each inspection measurement.

Minimum

Lowest value of measurement. Present for each inspection measurement.

Maximum

Highest value of measurement. Present for each inspection measurement.

Version

String giving the major, minor and build numbers of the software currently running on the Intellispec system. Present for System.

SerialNumber

String giving the system serial number. Present for System.

CurrentUser

String giving the name of the user currently logged onto the system, or empty string if no user is currently logged on. Present for System.

CurrentTime

Current date and time as given by system clock. Present for System.

References

To learn more about OPC, visit these links:

OPC Foundation

(http://www.opcfoundation.org/Default.aspx/01_about/01_what_is.asp?MID=AboutOPC)

OLE for process control (http://en.wikipedia.org/wiki/OLE_for_process_control)

Or perform a search on the Internet, using "OLE for process control" as the search criteria.

Chapter 20

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Web Site:

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Business Hours:

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

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